6.6 Measurement procedures

6.6.1 Intra-frequency measurements

6.6.1.0 Minimum conformance requirements

6.6.1.0.1 Minimum conformance requirements for event-triggered measurement without gap

[TS 38.133, clause 9.2.5.1 and 9.2.5.2]

The UE shall be able to identify a new detectable intra frequency cell within T_{identify_intra_without_index} if UE is not indicated to report SSB based RRM measurement result with the associated SSB index(*reportQuantityRsIndexes* or *maxNrofRSIndexesToReport* is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). The UE shall be able to identify a new detectable intra frequency SS block of an already detected cell within T_{identify_intra_without_index}. It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) ms$

Where:

T_{PSS/SSS_sync_intra}: it is the time period used in PSS/SSS detection given in table 6.6.1.0.1-1.

T_{SSB_measurement_period_intra}: equal to a measurement period of SSB based measurement given in table 6.6.1.0.1-2.

 $CSSF_{intra}$: it is a carrier specific scaling factor and is determined according to $CSSF_{outside_gap,i}$ in TS 38.133 [6] clause 9.1.5.1 for measurement conducted outside measurement gaps.

When intra-frequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, Kp=1.

When intrafrequency SMTC is partially overlapping with measurement gaps, Kp = 1/(1 - (SMTC period /MGRP)), where SMTC period < MGRP

DRX cycle	TPSS/SSS_sync_intra
No DRX	max(600ms, ceil(5 x K _p) x SMTC period) ^{Note 1} x
	CSSF _{intra}
DRX cycle≤ 320ms	max(600ms, ceil(1.5x 5 x Kp) x max(SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	ceil([5] x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

Table 6.6.1.0.1-2: Measurement period for intra-frequency measurements without gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max(200ms, ceil(5 x K _p) x SMTC period) ^{Note 1} x
	CSSFintra
DRX cycle≤ 320ms	max(200ms, ceil(1.5x 5 x K _p) x max(SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle > 320ms	ceil(5 x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified	

[TS 38.133, clause 9.2.4.3]

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in TS 38.133 [6] clause 10.1.2.1, 10.1.7.1 and 10.1.12.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify intra without index} defined in TS 38.133 [6] clause 9.2.5.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period than $T_{identify intra without index}$ defined in TS 38.133 [6] clause 9.2.5.1 becomes undetectable for a period and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measurement, Intra}$ provided the timing to that cell has not changed more than \pm 3200 Tc while the measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used, an additional delay can be expected.

[TS 38.133, clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,
- SSB_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

References: The conformance requirements covered in the current TC are specified in: TS 38.133 [6], clauses 9.2.2, 9.2.4.3, 9.2.5.1 and 9.2.5.2.

6.6.1.0.2 Minimum conformance requirements for event-triggered measurement with gap

[TS 38.133 [6], clause 9.2.6.2, 9.2.6.3]

The UE shall be able to identify a new detectable intra frequency cell within T_{identify_intra_without_index} if UE is not indicated to report SSB based RRM measurement result with the associated SSB index (*reportQuantityRsIndexes* or *maxNrofRSIndexesToReport* is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

 $T_{identify_intra_without_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra} ms$

Where:

T_{PSS/SSS_sync_intra}: it is the time period used in PSS/SSS detection given in table 6.6.1.0.2-1.

T_{SSB_measurement_period_intra}: equal to a measurement period of SSB based measurement given in table 6.6.1.0.2-2.

 $CSSF_{intra}$: it is a carrier specific scaling factor and is determined according to $CSSF_{within_gap,i}$ in TS 38.133 [6] section 9.1.5.2.2 for measurement within outside measurement gaps.

Table 6.6.1.0.2-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	TPSS/SSS_sync_intra
No DRX	max(600ms, 5 x max(MGRP, SMTC period)) x
	CSSF _{intra}
DRX cycle≤ 320ms	max(600ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle > 320ms	5 x max(MGRP, DRX cycle) x CSSF _{intra}

Table 6.6.1.0.2-2: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max(200ms, 5 x max(MGRP, SMTC period)) x
	CSSF _{intra}
DRX cycle≤ 320ms	max(200ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	5 x max(MGRP, DRX cycle) x CSSF _{intra}

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] Sections 10.1.12 are fulfilled for a corresponding Band,
- SSB_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_without_index}$ defined in TS 38.133 [6] section 9.2.6.2. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.6.2 and 9.2.6.3.

6.6.1.0.3 Minimum conformance requirements for event-triggered measurement without gap with SSB index reading

[TS 38.133 [6], clause 9.2.5.1, 9.2.5.2]

UE shall be able to identify a new detectable intra frequency cell within T_{identify_intra_with_index}.

 $T_{identify_intra_with_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra} + T_{SSB_time_index_intra} \ ms$

Where:

T_{PSS/SSS_sync_intra}: it is the time period used in PSS/SSS detection given in table 6.6.1.0.3-1.

T_{SSB_time_index_intra}: it is the time period used to acquire the index of the SSB being measured given in table 6.6.1.0.3-2.

T_{SSB_measurement_period_intra}: equal to a measurement period of SSB based measurement given in table 6.6.1.0.3-3.

- CSSF_{intra}: it is a carrier specific scaling factor and is determined according to CSSF_{outside_gap,i} in TS 38.133 [6] section 9.1.5.1 for measurement conducted outside measurement gaps
- When intrafrequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, $K_p=1$
- When intrafrequency SMTC is partially overlapping with measurement gaps, $K_p = 1/(1 (SMTC \text{ period }/MGRP))$, where SMTC period < MGRP

Table 6.6.1.0.3-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	TPSS/SSS_sync_intra
No DRX	max(600ms, ceil(5 x K _p) x SMTC period) ^{Note 1} x
	CSSFintra
DRX cycle ≤ 320ms	max(600ms, ceil(1.5x 5 x Kp) x max(SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle > 320ms	ceil(5 x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified	

Table 6.6.1.0.3-2: Time period for time index detection (Frequency range FR1)

DRX cycle	TSSB_time_index_intra
No DRX	max(120ms, ceil(3 x K _p) x SMTC period) ^{Note 1} x
	CSSFintra
DRX cycle≤ 320ms	max(120ms, ceil (1.5 x 3 x K _p) x max(SMTC period,
	DRX cycle)] x CSSF _{intra}
DRX cycle>320ms	Ceil(3 x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

Table 6.6.1.0.3-3: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max(200ms, ceil(5 x K _p) x SMTC period) ^{Note 1} x
	CSSF _{intra}
DRX cycle≤ 320ms	max(200ms, ceil(1.5x 5 x K _p) x max(SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	ceil(5 x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] Sections 10.1.12 are fulfilled for a corresponding Band,
- SSB_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses

10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_with_index}$ defined in TS 38.133 [6] section 9.2.5.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.5.1 and 9.2.5.2.

6.6.1.0.4 Minimum conformance requirements for event-triggered measurement with gap with SSB index reading

[TS 38.133 [6], clause 9.2.6.2, 9.2.6.3]

UE shall be able to identify a new detectable intra frequency cell within $T_{identify_intra_with_index}$.

 $T_{identify_intra_with_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra} + T_{SSB_time_index_intra} \ ms$

Where:

T_{PSS/SSS_sync_intra}: it is the time period used in PSS/SSS detection given in table 6.6.1.0.4-1.

T_{SSB_time_index_intra}: it is the time period used to acquire the index of the SSB being measured given in table 6.6.1.0.4-2.

T_{SSB_measurement_period_intra}: equal to a measurement period of SSB based measurement given in table 6.6.1.0.4-3.

CSSF_{intra}: it is a carrier specific scaling factor and is determined according to CSSF_{within_gap, i} in TS 38.133 section 9.1.5.2.2 for measurement conducted within measurement gaps.

When intrafrequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, $K_p=1$

When intrafrequency SMTC is partially overlapping with measurement gaps, $K_p = 1/(1 - (SMTC \text{ period }/MGRP))$, where SMTC period < MGRP.

Table 6.6.1.0.4-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	TPSS/SSS_sync_intra
No DRX	max(600ms, 5 x max(MGRP, SMTC period)) x
	CSSF _{intra}
DRX cycle≤ 320ms	max(600ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	[5] x max(MGRP, DRX cycle) x CSSF _{intra}

Table 6.6.1.0.4-2: Time period for time index detection (Frequency range FR1)

DRX cycle	T _{SSB_time_index_intra}
No DRX	max(120ms, ceil(3 x K _p) x SMTC period) ^{Note 1} x
	CSSFintra
DRX cycle≤ 320ms	max(120ms, ceil (1.5 x 3 x K _p) x max(SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	ceil(3 x K _p) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

Table 6.6.1.0.4-3: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max(200ms, 5 x max(MGRP, SMTC period)) x
	CSSF _{intra}
DRX cycle≤ 320ms	max(200ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF _{intra}
DRX cycle>320ms	5 x max(MGRP, DRX cycle) x CSSF _{intra}

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,
- SSB_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than Tidentify_intra_with_index defined in TS 38.133 [6] section 9.2.6.2. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.6.2 and 9.2.6.3.

6.6.1.0.5 Minimum conformance requirements for event-triggered measurement without gap for UE configured with highSpeedMeasFlag-r16

[TS 38.133, clause 9.2.5.1 and 9.2.5.2]

The UE shall be able to identify a new detectable intra frequency cell within T_{identify_intra_without_index} if UE is not indicated to report SSB based RRM measurement result with the associated SSB index(*reportQuantityRsIndexes* or *maxNrofRSIndexesToReport* is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). The UE shall be able to identify a new detectable intra frequency SS block of an already detected cell within T_{identify_intra_without_index}. It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) \ ms$

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Where:

T_{PSS/SSS_sync_intra}: it is the time period used in PSS/SSS detection given in table 6.6.1.0.1-1.

T SSB_measurement_period_intra: it is specified in Table 6.6.1.0.5-1 when highSpeedMeasFlag-r16 is configured,

 $CSSF_{intra}$: it is a carrier specific scaling factor and is determined according to $CSSF_{outside_gap,i}$ in TS 38.133 [6] clause 9.1.5.1 for measurement conducted outside measurement gaps.

When intra-frequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, Kp=1.

When intrafrequency SMTC is partially overlapping with measurement gaps, Kp = 1/(1 - (SMTC period /MGRP)), where SMTC period < MGRP

Table 6.6.1.0.5-1: T SSB_measurement_period_intra When highSpeedMeasFlag-r16 is configured (Frequency range FR1

DRX cycle	T SSB_measurement_period_intra
No DRX Note 2	max(200ms, ceil(5 x K _p) x SMTC period) ^{Note 1} x
	CSSFintra
DRX cycle≤ 160ms	max(200ms, ceil(5 x M2 ^{Note 2} x K _p) x max(SMTC
	period,DRX cycle)) x CSSF _{intra}
160ms < DRX cycle≤ 320ms	ceil(4 x M2 Note 2 x Kp) x max(SMTC period,DRX cycle)
DRX cycle>320ms	ceil(Y Note 3 x Kp) x DRX cycle x CSSF _{intra}
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	
NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1	
NOTE 3: Y=3 when SMTC <= 40ms, Y=5 when SMTC > 40ms	

[TS 38.133, clause 9.2.4.3]

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in TS 38.133 [6] clause 10.1.2.1, 10.1.7.1 and 10.1.12.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify intra without index} defined in TS 38.133 [6] clause 9.2.5.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period than $T_{identify intra without index}$ defined in TS 38.133 [6] clause 9.2.5.1 becomes undetectable for a period and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measurement, Intra}$ provided the timing to that cell has not changed more than \pm 3200 Tc while the measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used, an additional delay can be expected.

[TS 38.133, clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,

- SSB_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

References: The conformance requirements covered in the current TC are specified in: TS 38.133 [6], clauses 9.2.2, 9.2.4.3, 9.2.5.1 and 9.2.5.2.

6.6.1.1 NR SA FR1 event-triggered reporting without gap in non-DRX

6.6.1.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under non-DRX.

6.6.1.1.2 Test applicability

This test applies to all types of NR UE release 15 onwards.

6.6.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.1.

6.6.1.1.4 Test description

6.6.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.1.4.1-1.

Table 6.6.1.1.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in non-DRX

Test Case ID	Description			
6.6.1.1-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.1.1-2	15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.1.1-3	30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note: The UE is only require	Note: The UE is only required to be tested in one of the supported test configurations.			

Configure the test requirement and the DUT according to the parameters in Table 6.6.1.1.4.1-2.

Table 6.6.1.1.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in non-DRX

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	.508-1 [14] clause 4.3.1.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.1.1.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.					

1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.1.4.1-3 below.

- 2. Message contents are defined in clause 6.6.1.1.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
-		2	SMTC.1	
		3	SMTC.1	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX		1, 2, 3		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3 ms later than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	S	1, 2, 3	5	
T2	S	1, 2, 3	5	

Table 6.6.1.1.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under non-DRX

6.6.1.1.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.1.4.1-3 and Table 6.6.1.1.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.1.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.1.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current NR cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),

Or

- if the device has been switched off, switcheson the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.1.4.3-1: Common Exception messages SA intra frequency event triggered reporting tests without gap under non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
	Table H.3.1-2 with Condition INTRA-FREQ
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for configuration 6.6.1.1-1
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.1-2
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.2 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.1-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition SSB RLM

6.6.1.1.5 Test requirement

Table 6.6.1.1.4.1-3 and Table 6.6.1.1.5-1 define the primary level settings including test tolerances for NR SA event triggered reporting test without gap under non-DRX.

Parameter	Unit	Test		II 1	Ce	
		configuration	T1	T2	T1	T2
TDD configuration		1	N	/A	N/	Ά
		2	TDDC	onf.1.1	TDDCo	onf.1.1
		3		onf.2.1	TDDCo	onf.2.1
PDSCH RMC		1		1 FDD	N/	A
configuration		2	SR.1.	1 TDD		
		3	SR.2.	1 TDD		
RMSI CORESET		1	CR.1.	1 FDD	CR.1.1	I FDD
RMC		2		1 TDD	CR.1.1	
configuration		3		1 TDD	CR.2.	
Dedicated		1		.1 FDD	CCR.1.	
CORESET RMC		2		.1 TDD	CCR.1	
configuration		3				
5				.1 TDD	CCR.2	
OCNG Patterns		1, 2, 3		P.1	OF	
TRS		1		.1 FDD	N/	
Configuration		2		.1 TDD	N/	
Initial BWP		3		.2 TDD	N/	
		1, 2, 3		VP.0.1	DLBW	
configuration Active DL BWP		1, 2, 3		VP.0.1 VP.1.1	ULBW DLBW	
configuration		1, 2, 3	DLDV	VF.I.I	DLDW	F.I.I
Active UL BWP		1, 2, 3	LILBW	VP.1.1	ULBW	/D 1 1
configuration		1, 2, 3	OLDV	VI .I.I	OLDW	1.1.1
RLM-RS		1, 2, 3	SSB SSI		B	
	dBm/SCS	1, 2, 5	-98			
Note 2 dBm/SCS 1 2 2 2			.98			
		3			.95	
37	dBm/15 KHz	1			.98	
$N_{_{oc}}$ Note 2		2	-	-	30	
		3	-			
τ̂ /r	dB	1	4	-1.46	-Infinity	-1.46
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	GD	2		1.10	y	1.10
		3				
$\hat{\mathbf{r}}$ / \mathbf{v}	dB	1	4	4	-Infinity	4
\hat{E}_{s}/N_{oc}	üb	2				•
		3				
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94
		2	-94	-94	-Infinity	-94
		3	-91	-91	-Infinity	-91
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified	
	dBm/9.36 MHz	2	-64.60	-62.25	colu	
	dBm/38.16 MHz	3	-58.50	-56.16	1	
Propagation 1, 2, 3 AWGN						
Note 2: Interference constant N_{oc} to b	es for uplink transmis from other cells and over subcarriers and e fulfilled.	noise sources not sp time and shall be mo	pecified in the odelled as A	ne test is as WGN of ap	ssumed to b opropriate p	e ower for
	evels have been deriv ole parameters thems		eters for inf	ormation p	urposes. Th	ey are

Table 6.6.1.1.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under non-DRX

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to NR Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting $delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) ms$

 $T_{PSS/SSS \text{ sync intr}} = \max [600 \text{ ms, ceil } (5 \times K_p) \times \text{SMTC period }] \times \text{CSSF}_{intra} = 600 \text{ ms}$

 $T_{SSB_measurement_period_intra} = max [200 ms, ceil(5 × K_p) × SMTC period] × CSSF_intra = 200 ms$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.2 NR SA FR1 event-triggered reporting without gap in DRX

6.6.1.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under DRX.

6.6.1.2.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

6.6.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.2.

6.6.1.2.4 Test description

6.6.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.2.4.1-1.

Table 6.6.1.2.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in DRX

Test Case ID	Description
6.6.1.2-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
6.6.1.2-2	15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode
6.6.1.2-3	30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode
Note: The UE is only require	d to be tested in one of the supported test configurations.

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.2.4.1-2.

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1.		
Channel bandwidth	As specified by the test configuration selected from Table 6.6.1.2.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.				

Table 6.6.1.2.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in DRX

- 1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.2.4.1-3 below.
- 2. Message contents are defined in clause 6.6.1.2.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.2.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under DRX

Parameter	Unit	Test	Value		Comment
		configur ation	Test 1	Test 2	
Active cell		1, 2, 3	Cell 1	1	
Neighbour cell		1, 2, 3	Cell 2		Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and	Cell 2	
SSB configuration		1	SSB.1 FR1		
		2	SSB.1 FR1		
		3	SSB.2 FR1		
SMTC configuration		1	SMTC.2		
		2	SMTC.1		
		3	SMTC.1		
A3-Offset	dB	1, 2, 3	-4.5		
CP length		1, 2, 3	Normal		
Hysteresis	dB	1, 2, 3	0		
Time To Trigger	S	1, 2, 3	0		
Filter coefficient		1, 2, 3	0		L3 filtering is not used
DRX	ms	1, 2, 3	DRX.1	DRX.7	
Time offset between serving		1	3 ms		Asynchronous cells.
and neighbour cells					The timing of Cell 2 is 3ms later
					than the timing of Cell 1
		2	3 us		Synchronous cells
		3	3 us		Synchronous cells
T1	S	1, 2, 3	5		
T2	S	1, 2, 3	5	10	

6.6.1.2.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.2.4.1-3 and Table 6.6.1.2.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

- 2. Set the parameters according to T1 in Table 6.6.1.2.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.2.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms for Test 1 or less than 6402 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current NR cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.1.2.4.1-1 as appropriate.

6.6.1.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.2.4.3-1: Common Exception messages for SA intra frequency event triggered reporting tests without gap under DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
	Table H.3.1-2 with Condition INTRA-FREQ
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.1 FR1, SMTC.2 for configuration 6.6.1.2-1
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.1 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.2-2
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.2 FR1, SMTC
	.1 and synchronous cells for configuration 6.6.1.2-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition SSB RLM
	Table H.3.7-1 with Condition DRX.1 and Offset for test 1
	Table H.3.7-1 with Condition DRX.7 and Offset for test 2

6.6.1.2.5 Test requirement

Table 6.6.1.2.4.1-3 and Table 6.6.1.2.5-1 define the primary level settings including test tolerances for NR event triggered reporting in synchronous cells when DRX is used test.

Parameter	Unit	Test	Ce	ll 1	Ce	ll 2
		configuration	T1	T2	T1	T2
TDD configuration		1	N	/A	N	/Α
5		2		onf.1.1	TDDC	
		3	TDDC		TDDC	
PDSCH RMC		1		1 FDD	N	
configuration		2		1 TDD		
C C		3		1 TDD	1	
RMSI CORESET		1		1 FDD	CR.1.	
RMC		2		1 TDD	CR.1.	
configuration				1 TDD	CR.2.	
-		3				
Dedicated CORESET RMC		1		.1 FDD	CCR.1	
		2		.1 TDD	CCR.1	
configuration		3		.1 TDD	CCR.2	
OCNG Patterns		1, 2, 3	OF		OF	
TRS		1		.1 FDD	N	
Configuration		2		.1 TDD	N	
		3		.2 TDD	N	
Initial BWP		1, 2, 3	DLBW		DLBW	
configuration			ULBW		ULBW	
Active DL BWP		1, 2, 3	DLBV	VP.1.1	DLBW	/P.1.1
configuration						
Active UL BWP		1, 2, 3	ULBWP.1.1		ULBWP.1.1	
configuration						
RLM-RS	5 (000	1, 2, 3	SSB		SSB	
$N_{ m oc}$ Note 2	dBm/SCS	1	-98			
00		2			-98	
		3			-95	
$N_{_{oc}}$ Note 2	dBm/15 KHz	1	_	-	-98	
00		2	_			
		3				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1	4	-1.46	-Infinity	-1.46
\$7 01		2	-			
	ġ	3	· .			
\hat{E}_{s}/N_{oc}	dB	1	4	4	-Infinity	4
57 00		2	-			
		3	0.1	0.4	La Gaster	0.1
SS-RSRP Note 3	dBm/SCS KHz	1 2	-94	-94	-Infinity	-94
		3	-94	-94	-Infinity	-94
lo		<u> </u>	-91	-91	-Infinity	-91
lo	dBm/9.36 MHz		-64.60	-62.25	Specified colu	
	dBm/9.36 MHz	2	-64.60	-62.25	colu	11113
Propagation	dBm/38.16 MHz	3 1, 2, 3	-58.50 -56.16 AWGN			
Condition						
Note 2: Interference	es for uplink transmis from other cells and over subcarriers and	noise sources not sp	ecified in th	ne test is as	ssumed to b	е
N_{oc} to b	e fulfilled.					
Note 3: SS-RSRP le	evels have been deriv		eters for inf	ormation p	ourposes. Th	ey are

Table 6.6.1.2.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under DRX

In Test 1 when DRX cycle length = 40 ms, the overall delay measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 640 ms, the overall delay measured is defined as the time from the beginning of time period T2 to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to NR Cell 2 on PUSCH.

For both tests:

The overall delays measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report to NR Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting $delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) ms$

 $T_{PSS/SSS_sync_intra} = max[600ms, ceil(1.5 \times 5 x K_p) \times max(SMTC period, DRX cycle)] \times CSSF_{intra} = 600ms$

 $T_{SSB_measurement_period_intra} = max[200ms, ceil(1.5 \times 5 \times K_p) \ x \ max(SMTC \ period, DRX \ cycle)] \times CSSF_{intra} = 320ms$

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 922 ms.

The overall delay measured when DRX cycle length is 640 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting $delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) ms$

 $T_{PSS/SSS_sync_intra} = ceil(5 \times K_p) \times DRX cycle \times CSSF_{intra} = 3200 ms$

 $T_{SSB_measurement_period_intra} = ceil(5 \times K_p) \times DRX cycle \times CSSF_{intra} = 3200 ms$

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 640 ms shall be less than a total of 6402 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.3 NR SA FR1 event-triggered reporting with gap in non-DRX

6.6.1.3.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event with gaps under non-DRX within intra-frequency cell search with gaps requirements.

6.6.1.3.2 Test applicability

This test applies to all types of NR UE release 15 onwards supporting 5GS NR SA FR1, CSI-RS-based RLM and BWP operation without bandwidth restriction.

6.6.1.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.3.

6.6.1.3.4 Test description

6.6.1.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.3.4.1-1.

Table 6.6.1.3.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in non-DRX

Test Case ID	Description			
6.6.1.3-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.1.3-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.1.3-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE	Note 1: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.3.4.1-2.

Table 6.6.1.3.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in non-DRX

Parameter	Value		Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.
Channel bandwidth	As specified	by the test configuration selected fr	rom Table 6.6.1.3.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.		

- 1. The general test parameter settings are set up according to Table 6.6.1.3.4.1-3.
- 2. Message contents are defined in clause 6.6.1.3.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
Measurement gap type		1, 2, 3	Per-UE gaps	
Measurement gap repetition periodicity	ms	1, 2, 3	40	
Measurement gap length	ms	1, 2, 3	6	
Measurement gap offset	ms	1, 2, 3	39	
SSB configuration		1	SSB.1 FR1	
-		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
-		2	SMTC.1	
		3	SMTC.1	
CSI-RS parameters		1	CSI-RS.1.2 FDD resource #0	
		2	CSI-RS.1.2 TDD resource #0	
		3	CSI-RS.2.2 TDD resource #0	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX	ms	1, 2, 3		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	S	1, 2, 3	5	
T2	S	1, 2, 3	5	

Table 6.6.1.3.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX

6.6.1.3.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.3.4.1-3 and Table 6.6.1.3.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.3.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.3.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.1.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.3.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
	Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDED
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for Configuration 6.6.1.3-1
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and Synchronous cells for Configuration 6.6.1.3-2
	Table H.3.1-3 with ConditionINTRA-FREQ MO, SSB.2 FR1, SMTC.1 and Synchronous cells for Configuration 6.6.1.3-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-6 with Condition Pattern #0
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition CSI-RS RLM

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167			
Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {			
downlinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with	DLBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID (BWP2)	BWP-Id1
defaultDownlinkBWP-Id	0	Initial BWP (BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with	ULBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveUplinkBWP-Id	1	Active UL BWP-ID (BWP2)	BWP-Id1
}			
}			

Table 6.6.1.3.4.3-2: ServingCellConfig

Condition	Explanation
BWP-Id1	Active BWP (BWP2)

6.6.1.3.5 Test requirement

Table 6.6.1.3.4.1-3 and Table 6.6.1.3.5-1 define the primary level settings including test tolerances for NR SA FR1 event-triggered reporting with gap in non-DRX test.

Parameter	Unit	Test	Ce	ll 1	Ce	ll 2
		configuration	T1	T2	T1	T2
TDD configuration		1	N	/A	N/	/A
-		2	TDDC	onf.1.1	TDDC	onf.1.1
		3	TDDC	onf.2.1	TDDC	
PDSCH RMC		1	SR.1.	1 FDD	N/	/A
configuration		2	SR.1.	1 TDD		
		3	SR.2.	1 TDD		
RMSI CORESET		1		1 FDD	CR.1.	1 FDD
RMC		2	CR.1.	1 TDD		1 TDD
configuration		3		1 TDD		1 TDD
Dedicated		1	CCR.1.2 FDD		CCR.1	
CORESET RMC		2		.2 TDD	CCR.1	
configuration		3		.2 TDD .1 TDD	CCR.1	
-						
OCNG Patterns		1, 2, 3			OF	
TRS		1		.1 FDD	N/	
Configuration		2 3		.1 TDD	N/	
Initial BWP		1, 2, 3		. <u>2 TDD</u> VP.0.1	DLBW	
configuration		1, 2, 3	ULBV		ULBW	
Active DL BWP		1, 2, 3		VP.1.2	DLBW	
configuration		1, 2, 0	DLDV	VI . I.Z	DLDW	/1 . 1 . 1
Active UL BWP		1, 2, 3	ULBWP.1.2		ULBWP.1.1	
configuration		1, 2, 0	01201		012011	
RLM-RS		1, 2, 3	CSI	-RS	SSB	
N_{oc} Note 2	dBm/SCS	1			-98	
IV _{oc}		2		-	-98	
		3			-95	
$N_{_{oc}}$ Note 2	dBm/15 KHz	1			-98	
IV _{oc}		2				
		3				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1	4	-1.46	-Infinity	-1.46
$\mathbf{L}_{s}/\mathbf{I}_{ot}$		2			-	
		3				
\hat{E}_s/N_{oc}	dB	1	4	4	-Infinity	4
L_s / T_{oc}		2				
		3				
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94
		2	-94	-94	-Infinity	-94
-		3	-91	-91	-Infinity	-91
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified	
	dBm/9.36 MHz	2	-64.60	-62.25	colu	mns
6 <i>i</i>	dBm/38.16 MHz	3	-58.50	-56.16		
Propagation Condition		1, 2, 3		AV	VGN	
	ces for uplink transmis	sion are assigned to	the UF pric	or to the sta	art of time of	eriod T2
	e from other cells and					
	over subcarriers and					
		-				
¹ v _{oc} to k	be fulfilled.					
Note 3: SS-RSRP le	evels have been deriv		eters for inf	ormation p	urposes. Th	ey are
not setta	ble parameters thems	elves.				

Table 6.6.1.3.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}$

 $T_{PSS/SSS_sync_intra} = 600 \text{ ms}$

 $T_{SSB_measurement_period_intra} = 200 \text{ ms}$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.4 NR SA FR1 event-triggered reporting with gap in DRX

6.6.1.4.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event with gaps under DRX within intra-frequency cell search with gaps requirements.

6.6.1.4.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1, CSI-RS-based RLM, BWP operation without bandwidth restriction and long DRX cycle.

6.6.1.4.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.4.

- 6.6.1.4.4 Test description
- 6.6.1.4.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.4.4.1-1.

Table 6.6.1.4.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in DRX

Test Case ID	Description
6.6.1.4-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
6.6.1.4-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode
6.6.1.4-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode
Note 1: The UE	is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.4.4.1-2.

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	ed by the test configuration selected from Table 6.6.1.4.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram		pable UEs without any 2Rx RF		

Table 6.6.1.4.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in DRX

- 1. The general test parameter settings are set up according to Table 6.6.1.4.4.1-3.
- 2. Message contents are defined in clause 6.6.1.4.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.4.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in DRX

Parameter	Unit	Test configur	Va	lue	Comment
		ation	Test 1	Test 2	
Active cell		1, 2, 3	Cell 1		
Neighbour cell		1, 2, 3	Cell 2		Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and		
Measurement gap type		1, 2, 3	Per-UE gaps		
Measurement gap repetition periodicity	ms	1, 2, 3	40		
Measurement gap length	ms	1, 2, 3	6		
Measurement gap offset	ms	1, 2, 3	39		
SSB configuration		1	SSB.1 FR1		
		2	SSB.1 FR1		
		3	SSB.2 FR1		
SMTC configuration		1	SMTC.2		
-		2	SMTC.1		
		3	SMTC.1		
CSI-RS parameters		1	CSI-RS.1.2 F	DD resource	
			#0		
		2	CSI-RS.1.2 T	DD resource	
			#0		
		3	CSI-RS.2.2 T	DD resource	
			#0		
A3-Offset	dB	1, 2, 3	-4.5		
CP length		1, 2, 3	Normal		
Hysteresis	dB	1, 2, 3	0		
Time To Trigger	S	1, 2, 3	0		
Filter coefficient		1, 2, 3	0		L3 filtering is not used
DRX	ms	1, 2, 3	DRX.1	DRX.7	
Time offset between serving and neighbour cells		1	3 ms		Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs		Synchronous cells
		3	3 μs		Synchronous cells
T1	S	1, 2, 3	5		
T2	S	1, 2, 3	5	10	

6.6.1.4.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.4.4.1-3 and Table 6.6.1.4.4.2-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

In Test 1 when DRX cycle = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 640 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.4.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.4.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms for Test 1 or less than 6402 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the *MeasurementReport* message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 6.6.1.4.4.1-3 as appropriate.

6.6.1.4.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

OR

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
	Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDED
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for configuration 6.6.1.4-1
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.4-2
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.2 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.4-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-6 with Condition Pattern #0
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.7-1 with Condition DRX.1 and Gap for test 1
	Table H.3.7-1 with Condition DRX.7 and Gap for test 2
	Table H.3.1-8 with Condition CSI-RS RLM

Table 6.6.1.4.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in DRX

Table 6.6.1.4.4.3-2: ServingCellConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167 Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {	Value, remark		Condition
downlinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with	DLBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID (BWP2)	BWP-Id1
defaultDownlinkBWP-Id	0	Initial BWP (BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with condition BWP-Id1	ULBWP.1.2 configuration	
}		Ŭ	
firstActiveUplinkBWP-Id	1	Active UL BWP-ID (BWP2)	BWP-Id1
}			
}			

Condition	Explanation
BWP-Id1	Active BWP (BWP2)

6.6.1.4.5 Test requirement

Table 6.6.1.4.4.1-3 and Table 6.6.1.4.5-1 define the primary level settings including test tolerances for NR SA FR1 event-triggered reporting with gap in DRX test.

Parameter	Unit	Test	Ce	1	Ce	ll 2
		configuration	T1	T2	T1	T2
TDD configuration		1	N	/A	N	Ά
		2	TDDC	onf.1.1	TDDC	
		3	TDDC	onf.2.1	TDDC	onf.2.1
PDSCH RMC		1	SR.1.	1 FDD	N/	'A
configuration	-	2	SR.1.	1 TDD		
		3	SR.2.	1 TDD		
RMSI CORESET		1	CR.1.	1 FDD	CR.1.1	1 FDD
RMC	-	2		1 TDD	CR.1.	
configuration	-	3		1 TDD	CR.2.	
Dedicated		1		.2 FDD	CCR.1	
CORESET RMC	-	2		.2 TDD	CCR.1	
configuration	-	3				
-				.1 TDD	CCR.2	
OCNG Patterns		1, 2, 3	OF		OF	
FRS configuration	ŀ	1		1 FDD	N/	
	ŀ	2		.1 TDD	N/	
		3		.2 TDD	N/	
nitial BWP		1, 2, 3	DLBW		DLBW	
configuration Active DL BWP		4.0.0	ULBW		ULBW	
		1, 2, 3	DLBV	/P.1.2	DLBWP.1.1	
configuration Active UL BWP		1, 2, 3			ULBWP.1.1	
configuration		1, 2, 3	ULBWP.1.2		ULDVVP.1.1	
RLM-RS		1, 2, 3	CSI-RS		SSB	
	dBm/SCS	1, 2, 3			-98	
$N_{_{oc}}$ Note 2	ubiii/303	2	-98			
	-	3				
	dBm/15 KHz	<u> </u>	-95 -98			
N_{oc} Note 2		2	-	•	90	
	-	3	-			
<u>^ /</u>	dB	<u> </u>	4	-1.46	-Infinity	-1.46
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	uD .	2	- 4	-1.40	-mining	-1.40
.,	-	3	-			
^ /	dB	<u> </u>	4	4	-Infinity	4
\hat{E}_s / N_{oc}	uВ	2		4	-mining	4
	-	3	-			
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94
		2	-94	-94 -94	-Infinity	-94
	-	3	-94	-94 -91	-Infinity	-94
0	dBm/9.36 MHz	1	-64.60	-62.25	Specified	
ř	dBm/9.36 MHz	2	-64.60	-62.25	colu	
	dBm/38.16 MHz	3	-58.50	-56.16		
Propagation		1, 2, 3	00.00		VGN	
Condition		., _, •				
Note 1: The resourc	es for uplink transmis					
Note 2: Interference	from other cells and i	noise sources not sp	ecified in th	e test is as	sumed to b	е
	over subcarriers and t					
constant						
	e fulfilled.					
$N_{\scriptscriptstyle oc}$ to b	e fulfilled. evels have been derive	ad from other accord	otoro for inf	ormotion -		01/ 07-0

Table 6.6.1.4.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in DRX

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 640 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting $delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}$

T_{PSS/SSS_sync_intra} = 600 ms for Test 1, and T_{PSS/SSS_sync_intra} = 3200 ms for Test 2

 $T_{SSB_measurement_period_intra} = 320 \text{ ms}$ for Test 1, and $T_{SSB_measurement_period_intra} = 3200 \text{ ms}$ for Test 2

TTI insertion uncertainty = 2 ms

For Test 1, the overall delays measured shall be less than a total of 922 ms (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For Test 2, the overall delays measured shall be less than a total of 6402 ms (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.5 NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

6.6.1.5.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event within intra-frequency cell search without gaps requirements.

6.6.1.5.2 Test applicability

This test applies to all types of NR UE release 15 onwards.

6.6.1.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.5.

6.6.1.5.4 Test description

6.6.1.5.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.5.4.1-1.

Table 6.6.1.5.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Configuration	Description
6.6.1.5-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
Note: The UE is only re	quired to be tested in one of the supported test configurations.

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.5.4.1-2.

Table 6.6.1.5.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Parameter	Value		Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.		
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.1.5.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.				

- 1. The general test parameter settings are set up according to Table 6.6.1.5.4.1-3.
- 2. Message contents are defined in clause 6.6.1.5.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.5.4.1-3: General test parameters for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1	Cell 1	
Neighbour cell		1	Cell 2	Cell to be identified.
RF Channel Number		1	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
SMTC configuration		1	SMTC.2	
A3-Offset	dB	1	-4.5	
CP length		1	Normal	
Hysteresis	dB	1	0	
Time To Trigger	S	1	0	
Filter coefficient		1	0	L3 filtering is not used
DRX	ms	1		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
T1	S	1	5	
T2	S	1	5	

6.6.1.5.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.5.4.1-3 and Table 6.6.1.5.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.5.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit *RRCReconfigurationComplete* message. T1 starts.

- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.5.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.1.5.4.3 Message contents

Message contents are according to TS 38.508-1 clause 4.6 with the following exceptions:

Table 6.6.1.5.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Defa	ult Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Condition INTRA-FREQ Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for Configuration 6.6.1.5-1 Table H.3.1-4 with SSB Index and A3-offset = -4.5 dB Table H.3.1-5 with Condition INTRA-FREQ Table H.3.1-7 with Condition INTRA-FREQ and SSB Index Table H.3.1-8 with Condition SSB RLM

6.6.1.5.5 Test requirement

Table 6.6.1.5.4.1-3 and Table 6.6.1.5.5-1 define the primary level settings including test tolerances for SA event triggered reporting without gap under non-DRX with SSB index reading test.

Parameter	Unit	Test	Cell 1 Cell 2		ll 2		
		configuration	T1 T2		T1	T2	
TDD configuration		1	N/A		N/A		
PDSCH RMC		1	SR.1.	1 FDD	N	N/A	
configuration							
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC							
configuration							
Dedicated		1	CCR.1	.1 FDD	CCR.1	.1 FDD	
CORESET RMC							
configuration							
OCNG Patterns		1		P.1		P.1	
TRS configuration		1		.1 FDD		/A	
Initial BWP		1		VP.0.1	DLBV		
configuration				VP.0.1	ULBV		
Active DL BWP		1	DLBV	VP.1.1	DLBV	/P.1.1	
configuration							
Active UL BWP		1	ULBV	VP.1.1	ULBWP.1.1		
configuration							
RLM-RS		1	SSB			SB	
$N_{_{oc}}$ Note 2	dBm/SCS	1	-98				
$N_{_{oc}}$ Note 2	dBm/15 KHz	1	-98				
\hat{E}_{s}/I_{ot}	dB	1	4	-1.46	-Infinity	-1.46	
\hat{E}_s/N_{oc}	dB	1	4	4	-Infinity	4	
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified		
		•	000	00		mns	
Propagation		1	1	۸۱	VGN		
Condition		•					
	urces for uplink transi	mission are assigned	to the UE	prior to the	start of time	e period	
	nce from other cells a over subcarriers and						
	be fulfilled.						
Note 3: SS-RSR	P levels have been de ble parameters thems		ameters for	informatio	n purposes.	They are	

Table 6.6.1.5.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify_intra_with_index}$

 $T_{identify_intra_with_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra} + T_{SSB_time_index_intra}$

 $T_{PSS/SSS_sync_intra} = 600 \text{ ms}$

 $T_{SSB_time_index_intra} = 120 \text{ ms}$

 $T_{SSB_measurement_period_intra} = 200 \text{ ms}$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 922 ms in this test case (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.6 NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

6.6.1.6.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event within intra-frequency cell search with gaps requirements.

6.6.1.6.2 Test applicability

This test applies to all types of NR UE release 15 onwards supporting 5GS NR SA FR1, CSI-RS-based RLM and BWP operation without bandwidth restriction.

6.6.1.6.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.6.

6.6.1.6.4 Test description

6.6.1.6.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.6.4.1-1.

Table 6.6.1.6.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Configuration	Description
6.6.1.6-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
Note: The UE is only red	quired to be tested in one of the supported test configurations.

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.3.4.1-2.

Table 6.6.1.6.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Parameter	Value		Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.		
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.1.6.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4	1		
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.				

1. The general test parameter settings are set up according to Table 6.6.1.6.4.1-3.

2. Message contents are defined in clause 6.6.1.6.4.3.

3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1	Cell 1	
Neighbour cell		1	Cell 2	Cell to be identified.
RF Channel Number		1	1: Cell 1 and Cell 2	
Measurement gap type		1	Per-UE gaps	
Measurement gap repetition periodicity	ms	1	40	
Measurement gap length	ms	1	6	
Measurement gap offset	ms	1	39	
SSB configuration		1	SSB.1 FR1	
SMTC configuration		1	SMTC.2	
CSI-RS parameters		1	CSI-RS.1.2 FDD resource #0	
A3-Offset	dB	1	-4.5	
CP length		1	Normal	
Hysteresis	dB	1	0	
Time To Trigger	S	1	0	
Filter coefficient		1	0	L3 filtering is not used
DRX	ms	1		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
T1	S	1	5	
T2	S	1	5	

Table 6.6.1.6.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

6.6.1.6.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.6.4.1-3 and Table 6.6.1.6.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.6.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.3.5-1.
- 6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.1.6.4.3 Message contents

Message contents are according to TS 38.508-1 clause 4.6 with the following exceptions:

Table 6.6.1.6.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Defa	ult Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDEDTable H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1,SMTC.2 for Configuration 6.6.1.6-1Table H.3.1-4 with SSB index and A3-offset = -4.5dB.Table H.3.1-5 with Condition INTRA-FREQTable H.3.1-6 with Condition Pattern #0Table H.3.1-7 with Condition INTRA-FREQ and SSB indexTable H.3.1-8 with Condition CSI-RS RLM

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167	-		•
Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {			
downlinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with	DLBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID	BWP-Id1
		(BWP2)	
defaultDownlinkBWP-Id	0	Initial BWP	
		(BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with	ULBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveUplinkBWP-Id	1	Active UL BWP-ID	BWP-Id1
•		(BWP2)	
}			
}			

Condition	Explanation
BWP-Id1	Active BWP (BWP2)

6.6.1.6.5 Test requirement

Table 6.6.1.6.4.1-3 and Table 6.6.1.6.5-1 define the primary level settings including test tolerances for SA event triggered reporting tests with per-UE gaps under non-DRX with SSB index reading test.

Table 6.6.1.6.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Parameter	Unit	Test	Cell 1		Cell 2		
		configuration	T1	T2	T1	T2	
TDD configuration		1	N	/A	N	/A	
PDSCH RMC		1	SR.1.1 FDD			N/A	
configuration							
RMSI CORESET		1	CR.1.1 FDD		CR.1.1 FDD		
RMC							
configuration							
Dedicated		1	CCR.1.2 FDD		CCR.1.1 FDD		
CORESET RMC							
configuration							
OCNG Patterns		1	OP.1		OP.1		
TRS configuration		1	TRS.1.1 FDD		N/A		
Initial BWP		1	DLBWP.0.1		DLBWP.0.1		
configuration			ULBWP.0.1		ULBWP.0.1		
Active DL BWP		1	DLBWP.1.2		DLBWP.1.1		
configuration							
Active UL BWP		1	ULBWP.1.2		ULBWP.1.1		
configuration							
RLM-RS		1	CSI-RS		SS	SSB	
$N_{_{oc}}$ Note 2	dBm/SCS	1	-98				
N_{oc} Note 2	dBm/15 KHz	1	-98				
\hat{E}_{s}/I_{ot}	dB	1	4	-1.46	-Infinity	-1.46	
\hat{E}_s/N_{oc}	dB	1	4	4	-Infinity	4	
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified		
					. colu	mns	
Propagation		1	AWGN				
Condition							
Note 1: The reso T2.	urces for uplink trans	mission are assigned	I to the UE	prior to the	start of time	e period	
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for							
N_{oc} to t	$_{pc}$ to be fulfilled.						
	-RSRP levels have been derived from other parameters for information purposes. They are t settable parameters themselves.						

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify_intra_with_index}$

 $T_{identify_intra_with_index} = T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra} + T_{SSB_time_index_intra}$

 $T_{PSS/SSS_sync_intra} = 600 \text{ ms}$

 $T_{SSB \ time \ index \ intra} = 120 \ ms$

 $T_{SSB_measurement_period_intra} = 200 \text{ ms}$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 922 ms in this test case (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.1.7 NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

6.6.1.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under DRX for UE configured with highSpeedMeasFlag-r16.

6.6.1.7.2 Test applicability

This test applies to all types of NR UE release 15 onwards that supports measurement enhancements in high speed scenario.

6.6.1.7.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.5.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.7.

6.6.1.7.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.7.4.1-1.

Table 6.6.1.7.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

Configuration	Description		
6.6.1.7-1	15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
6.6.1.7-2	15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
6.6.1.7-3	30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode		
Note: The UE is only required to be tested in one of the supported test configurations.			

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.7.4.1-2.

Table 6.6.1.7.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

Parameter		Value	Comment				
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.				
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1.				
Channel	As specified	by the test configuration selected fr	rom Table 6.6.1.2.4.1-1.				
bandwidth							
Propagation	AWGN		As specified in Annex C.2.2.				
conditions							
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.				
Diagram	DUT Part	A.3.2.3.4					
Exceptions to	- Without LT	- Without LTE link					
connection		pable UEs without any 2Rx RF					
diagram bands use A.3.2.5.2 for DUT part and							
	A.3.1.8.4 for TE part.						

- 1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.7.4.1-3 below.
- 2. Message contents are defined in clause 6.6.1.7.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.7.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under DRX for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Test configur ation	Value	Comment
highSpeedMeasFlag-r16		1,2,3	Present	To enable high speed measurement enhancements
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
-		2	SMTC.1	
		3	SMTC.1	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX		1, 2, 3	DRX.7	640ms DRX cycle
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	S	1, 2, 3	5	
T2	S	1, 2, 3	6	

6.6.1.7.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.7.4.1-3 and Table 6.6.1.7.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.7.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.7.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 1008) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.1.7.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.7.4.3-1: Common Exception messages for SA intra frequency event triggered reporting tests without gap under DRX for UE configured with highSpeedMeasFlag-r16

Defau	It Message Contents
Common contents of system information blocks exceptions	Table H.2.1-3 with Condition HighSpeedMeas
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-4 with A3-offset = -4.5dB Table H.3.1-5 Table H.3.1-7 with Condition INTRA-FREQ Table H.3.1-8 with Condition SSB RLM Table H.3.7-1 with Condition DRX.7 and Offset
Specific message contents exceptions for Test Configuration 6.6.1.7-1	Table H.3.1-3 with Condition INTRA-FREQ MO Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2 Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.1 FR1
Specific message contents exceptions for Test Configuration 6.6.1.7-2	Table H.3.1-3 with Condition INTRA-FREQ MO and synchronouscellsTable 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.1 FR1
Specific message contents exceptions for Test Configuration 6.6.1.7-3	Table H.3.1-3 with Condition INTRA-FREQ MO and synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1 Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.2 FR1

6.6.1.7.5 Test requirement

Table 6.6.1.7.4.1-3 and Table 6.6.1.7.5-1 define the primary level settings including test tolerances for NR event triggered reporting in synchronous cells when DRX is used

Table 6.6.1.7.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under DRX for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Test	Ce	II 1	Ce	ll 2	
		configuration	T1	T2	T1	T2	
TDD configuration		4		12 V/A	TN		
TDD configuration		1 2		onf.1.1			
						TDDConf.1.1 TDDConf.2.1	
PDSCH RMC		3		onf.2.1			
		1		1 FDD	N/	A	
configuration		2		1 TDD			
		3		1 TDD			
RMSI CORESET		1	CR.1.	1 FDD	CR.1.*	1 FDD	
RMC		2	CR.1.	1 TDD	CR.1.	1 TDD	
configuration		3	CR.2.	1 TDD	CR.2.1	1 TDD	
Dedicated		1	CCR.1	.1 FDD	CCR.1	1 FDD	
CORESET RMC		2		.1 TDD	CCR.1		
configuration		3		.1 TDD	CCR.2		
-		-					
OCNG Patterns		1, 2, 3		<u>2.1</u>	OF		
TRS configuration		2		. <u>1 FDD</u> .1 TDD	N/		
					N/ N/		
Initial BWP		3 1, 2, 3		. <u>2 TDD</u> VP.0.1	DLBW		
configuration		1, 2, 3					
Active DL BWP		1, 2, 3		VP.0.1 VP.1.1	ULBW DLBW		
configuration		1, 2, 3	DLDV	VF.I.I	DLDW	/F.I.I	
Active UL BWP		1, 2, 3				/D 1 1	
configuration		1, 2, 3	ULBV	ULBWP.1.1		ULBWP.1.1	
RLM-RS		1, 2, 3		SB	SSB		
	dBm/SCS	1, 2, 3			-98		
$N_{_{oc}}$ Note 2	ubm/SCS	2	-98				
		3					
			-95				
$N_{_{oc}}$ Note 2	dBm/15 kHz	1	_		-98		
00		2	_				
^ /	JD	3	4	4.40	La Caster	4.40	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	1	4	-1.46	-Infinity	-1.46	
37 01		2	-				
	5	3					
\hat{E}_s/N_{oc}	dB	1	4	4	-Infinity	4	
si oc		2	_				
O O O O O O O Noto 2	15 (2.2.2.1.1.1	3					
SS-RSRP Note 3	dBm/SCS kHz	1	-94+TT	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
		3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	1	-64.60	-62.25	-64.60	-62.25	
	dBm/9.36 MHz	2	-64.60	-62.25T	-64.60	-62.25	
<u> </u>	dBm/38.16 MHz	3	-58.50	-56.16	-58.50	-56.16	
Propagation		1, 2	AW		AWGN 194		
Condition	3 AWGN AWGN 3334H esources for uplink transmission are assigned to the UE prior to the start of time pe						
T2. Note 2: Interferen constant	urces for uplink transince from other cells a over subcarriers and be fulfilled.	nd noise sources not	specified in	n the test is	s assumed to	be	
Note 3: SS-RSR	P levels have been de ble parameters thems		ameters for	informatio	n purposes.	They are	
Note 4: The AWC is a cons	GN 1944 Hz condition tant 1944 Hz.	is a non fading prop	-			-	
	GN 3334 Hz condition tant 3334Hz.	is a non fading prop	agation cha	annel with o	one tap. Dop	pler shift	

The overall delays measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report to NR Cell 2. When DRX cycle length = 640 ms, the overall delay

measured is defined as the time from the beginning of time period T2 to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to NR Cell 2 on PUSCH.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured when DRX cycle length is 640 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting $delay = T_{identify_intra_without_index}$

 $T_{identify_intra_without_index} = (T_{PSS/SSS_sync_intra} + T_{SSB_measurement_period_intra}) \ ms$

 $T_{PSS/SSS_sync_intra} = ceil(5 \times K_p) \times DRX cycle \times CSSF_{intra} = 3200 ms$

 $T_{SSB_measurement_period_intra} = ceil(Y \times K_p) \times DRX cycle \times CSSF_{intra} = 1920ms$

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 640 ms shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.6.2 Inter-frequency measurements

6.6.2.0 Minimum conformance requirements for Inter-frequency measurements

Same as clause 4.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause 9.3.2, 9.3.4, 9.3.5, 9.3.6.3.

6.6.2.1 NR SA FR1-FR1 event-triggered reporting in non-DRX

6.6.2.1.1 Test purpose

To verify that the UE makes correct reporting of an event in non-DRX within inter-frequency NR cell search requirements without SSB time index detection in TS 38.133 [6] clause 9.3.4.

6.6.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards. Test 1 is applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 2 is applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

6.6.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.1.

6.6.2.1.4 Test description

6.6.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.1.4.1-2. Test environment parameters are given in Table 6.6.2.1.4.1-3.

Table 6.6.2.1.4.1-1: SA FR1-FR1 event triggered reporting tests in non-DRX supported test configurations

Test Case ID	Description				
6.6.2.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode				
6.6.2.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode				
6.6.2.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode				
Note 1: The UE	Note 1: The UE is only required to be tested in one of the supported test configurations				
Note 2: target NI	Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell				

Table 6.6.2.1.4.1-2: SA FR1-FR1 general test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non DRX

Parameter	Unit	Test	Va	alue	Comment				
		configurati on	Test 1	Test 2					
NR RF Channel Number		Config 1,2,3	1, 2		Two FR1 NR carrier frequencies are used.				
Active cell		Config 1,2,3	NR cell 1 (Pcell)		NR cell 1 (Pcell)		NR cell 1 (Pcell)		NR Cell 1 is on NR RF channel number 1.
Neighbour cell		Config 1,2,3	NR cell2		NR cell 2 is on NR RF channel number 2.				
Gap Pattern Id		Config 1,2,3	0	4	As specified in TS 38.133 clause 9.1.2-1.				
Measurement gap offset		Config 1,2,3	9	9					
A3-Offset	dB	Config 1,2,3	-6						
Hysteresis	dB	Config 1,2,3	0						
CP length		Config 1,2,3	Normal						
TimeToTrigger	s	Config 1,2,3	0						
Filter coefficient		Config 1,2,3	0		L3 filtering is not used				
DRX		Config 1,2,3			OFF		DRX is not used		
Time offset between serving and neighbour		Config 1	3ms		Asynchronous cells. The timing of Cell 2 is 3ms later				
cells		Config 2,3	3μs		than the timing of Cell 1. Synchronous cells.				
<u> </u>		Confin 4.0.0							
T1	S	Config 1,2,3	5	4					
T2	S	Config 1,2,3	1	1					

Table 6.6.2.1.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting without SSB time index detection in non-DRX

Parameter	Value	Comment
-----------	-------	---------

Test environment	NC	NC As specified in TS 38.508-1 [14] clause 4.1.				
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 3	8.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.1.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		A.3.2.5.1 for DUT part and				

- 1. Message contents are defined in clause 6.6.2.1.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

6.6.2.1.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1 measurement gap pattern configuration # 0 as defined in Table 6.6.2.1.4.1-2 is provided for UE that does not support per-FR gap and in test 2 measurement gap pattern configuration #4 as defined in Table 6.6.2.1.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.1.4.1-2.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.1.4.1-2. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 920 ms for Test 1 and 760 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the *MeasurementReport* message in step 6 or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters

Connectivity NR SA, Connected without release On according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release On according to TS 38.508-1 [14] clause 4.5.), OR:

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.1.4.1-2 as appropriate.

6.6.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.1.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQTable H.3.1-2 with A3-offset = -6dBTable H.3.1-5Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 forTest 1Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9for Test 2Table H.3.1-7 with Condition INTER-FREQ
Specific message contents exceptions for Test Configuration 6.6.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5
Specific message contents exceptions for Test Configuration 6.6.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4
Specific message contents exceptions for Test Configuration 6.6.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4

6.6.2.1.5 Test requirement

Table 6.6.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.1.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non-DRX

Parameter		Unit	Test	Cell 1	Cell 2	
			configuratio n	T1 T2	T1 T2	
NR RF Channel Number			Config 1,2,3	1	2	
Duplex mod	е		Config 1		FDD	
-			Config 2,3		TDD	
TDD configu	uration		Config 1		Applicable	
			Config 2		Conf.1.1	
DW		N 41 1	Config 3		Conf.2.1	
BWchannel		MHz	Config 1,2 Config 3		N _{RB,c} = 52 I _{RB,c} = 106	
BWP BW		MHz	Config 1,2		$N_{RB,c} = 52$	
			Config 3		IRB,c = 106	
BWP configurati	Initial DL BWP			DLBWP.0.1	NA	
on	Initial UL BWP		Config 1, 2,	ULBWP.0.1	NA	
	Dedicated DL BWP		3	DLBWP.1.1	NA	
	Dedicated UL BWP			ULBWP.1.1	NA	
TRS configu	ıration		Config 1	TRS.1.1 FDD	NA	
			Config 2	TRS.1.1 TDD	NA	
			Config 3	TRS.1.2 TDD	NA	
OCNG Patte			Config 1,2,3	OP.1	OP.1	
PDSCH Reference			Config 1	SR.1.1 FDD	-	
measureme	nt channel		Config 2	SR.1.1 TDD		
			Config 3	SR 2.1 TDD		
	ESET Reference		Config 1	CR.1.1 FDD	-	
Channel	•		Config 2	CR.1.1 TDD	_	
Dedicated C	OPESET		Config 3 Config 1	CR 2.1 TDD CCR.1.1 FDD	-	
Reference C			Config 2	CCR.1.1 TDD	-	
			Config 3	CCR.2.1 TDD	_	
SSB parameters			Config 1	SSB.1 FR1	SSB.5 FR1	
•			Config 2	SSB.1 FR1	SSB.5 FR1	
			Config 3	SSB.2 FR1	SSB.6 FR1	
SMTC config	guration		Config 1	SMTC.2	SMTC.5	
			Config 2, 3	SMTC.1	SMTC.4	
PDSCH/PDCCH subcarrier		kHz	Config 1,2		15	
spacing	of PSS to SSS		Config 3		30	
EPRE ratio	of PBCH DMRS		-			
to SSS EPRE ratio of PBCH to PBCH DMRS						
EPRE ratio of PDCCH DMRS			1			
to SSS EPRE ratio of PDCCH to						
PDCCH DMRS EPRE ratio of PDSCH DMRS			Config 1,2,3	0	0	
to SSS						
EPRE ratio of PDSCH to PDSCH						
to SSS(Note	of OCNG DMRS					
EPRE ratio						

$N_{_{oc}}$ Note	2	dBm/15 kHz		-(98		-98
$N_{oc}^{ m Note}$	2	dBm/S	Config 1,2	-98		-98	
1 00		CS	Config 3	-6	95	-95	
SS-RSRF	Note 3	dBm/S	Config 1,2	-94	-94	-Infinity	-91
		CS	Config 3	-91	-91	-Infinity	-88
\hat{E}_{s}/I_{ot}		dB	Config 1,2,3,4,5,6	4	4	-Infinity	7
\hat{E}_s/N_{oc}		dB	Config 1,2,3	4	4	-Infinity	7
Io ^{Note3}		dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.26
		dBm/38. 16MHz	Config 3	-58.49	-58.49	-63.94	-56.15
Propagat	ion Condition		Config 1,2,3	AW	/GN	A	WGN
Note 1: Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\rm exp}$ to be						
Note 3: Note 4:	fulfilled. SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.						

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 920 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%. with a confidence level of 95%

In test 2 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 760 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1 and 2 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.2.2 NR SA FR1-FR1 event-triggered reporting in DRX

6.6.2.2.1 Test purpose

To verify that the UE makes correct reporting of an event in DRX within inter-frequency NR cell search requirements without SSB time index detection in TS 38.133 [6] clause 9.3.4.

6.6.2.2.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle. Test 1 and Test 2 are applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 3 and Test 4 are applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

6.6.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.2.

6.6.2.2.4 Test description

6.6.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.2.4.1-2. Test environment parameters are given in Table 6.6.2.2.4.1-3.

Table 6.6.2.2.4.1-1: SA FR1-FR1 event triggered reporting tests in DRX supported test configurations

Test Case ID	Description			
6.6.2.2-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.2.2-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.2.2-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE is only required to be tested in one of the supported test configurations Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell				

Table 6.6.2.2.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

Parameter	Unit	Test	Value				Comment
		configurati	Test	Test	Test	Test	
		on	1	2	3	4	
NR RF Channel Number		Config 1,2,3		1,	2		Two FR1 NR carrier frequencies are used
Active cell		Config 1,2,3	NR ce	ll 1 (Pce	:II)		NR Cell 1 is on NR RF channel number 1
Neighbour cell		Config 1,2,3	NR ce	112			NR cell 2 is on NR RF channel number 2.
Gap Pattern Id		Config 1,2,3	0		4		As specified in TS 38.133 clause 9.1.2-1
Measurement gap offset		Config 1,2,3	9		9		
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Norma	al			
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0				L3 filtering is not used
DRX		Config 1,2,3	DRX .1	DRX .7	DRX .1	DRX .7	As specified in clause A.5
Time offset between serving and neighbour cells		Config 1	3ms				Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3μs			Synchronous cells	
T1	S	Config 1,2,3	5				
T2	s	Config 1,2,3	1.1	11	1.1	11	

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.2.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		able UEs without any 2Rx RF .3.2.5.1 for DUT part and				

Table 6.6.2.2.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

- 1. Message contents are defined in clause 6.6.2.2.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

6.6.2.2.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1&2 measurement gap pattern configuration # 0 as defined in Table 6.6.2.2.4.1-2 is provided for UE that does not support per-FR gap and in test 3&4 measurement gap pattern configuration #4 as defined in Table 6.6.2.2.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.2.4.1-2 and 6.6.2.2.5-1.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.2.5-1. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1080 ms for Test 1, 10240 ms for Test 2, 1080 ms for Test 3 and 10240 ms for Test 4 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.2.4.1-2 as appropriate.

6.6.2.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.2.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

Default Message Contents					
Common contents of system information					
blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ Table H.3.1-2 with A3-offset = -6dB Table H.3.1-5 Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1 and Test 2 Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9 for Test 3 and Test 4 Table H.3.1-7 with Condition INTER-FREQ Table H.3.7-1 with Condition DRX.1 and Gap and INTER-FREQ for Test 1 and Test 3 Table H.3.7-1 with Condition DRX.7 and Gap and INTER-FREQ for Test 2 and Test 4				
Specific message contents exceptions for Test Configuration 6.6.2.2-1	Table H.3.1-3 with Conditions INTER-FREQ MO and Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5				
Specific message contents exceptions for Test Configuration 6.6.2.2-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4				
Specific message contents exceptions for Test Configuration 6.6.2.2-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4				

6.6.2.2.5 Test requirement

Table 6.6.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.2.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection

Para	ameter	Unit	Test	Ce			Cell 2
			configuratio n	T1	T2	T1	T2
NR RF Chanr	nel Number		Config 1,2,3	1			2
Duplex mode			Config 1			FDD	
•			Config 2,3		-	TDD	
TDD configura	ation		Config 1			pplicable	
			Config 2			Conf.1.1	
			Config 3			Conf.2.1	
BW _{channel}		MHz	Config 1,2			RB,c = 52	
			Config 3			_{RB,c} = 106	
BWP BW		MHz	Config 1,2	10: N _{RB,c} = 52 40: N _{RB,c} = 106			
BWP	Initial DL BWP		Config 3 Config 1, 2,			RB,c = 100	NA
configuratio			3	DLBWP.0.1			NA
n	Initial UL BWP			ULBW			NA
	Dedicated DL BWP			DLBW	/P.1.1		NA
	Dedicated UL BWP			ULBW	/P.1.1		NA
TRS configura	ation		Config 1	TRS.1.	1 FDD		NA
			Config 2	TRS.1.	1 TDD		NA
			Config 3	TRS.1.	2 TDD		NA
OCNG Patter	ns		Config 1,2,3	OF	P.1	OP.1	
PDSCH Refe	rence		Config 1	SR.1.1	SR.1.1 FDD		-
measurement	channel		Config 2		SR.1.1 TDD		
			Config 3	SR 2.1			
RMSI CORES	SET Reference		Config 1		CR.1.1 FDD		-
Channel			Config 2	CR.1.1	1 TDD		
			Config 3		CR 2.1 TDD		
Dedicated CC			Config 1		CCR.1.1 FDD		-
Reference Ch	annel		Config 2		CCR.1.1 TDD		
			Config 3	CCR.2.1 TDD			
SSB parameter	ers		Config 1	SSB.1 FR1 SSB.1 FR1		SSB.5 FR1	
			Config 2 Config 3	SSB.1 SSB.2		SSB.5 FR1	
SMTC configu	uration		Config 1	SMT		SSB.6 FR1 SMTC.5	
			Config 2, 3				MTC.4
PDSCH/PDC	CH subcarrier	kHz	Config 1,2	0		15	
spacing		AT 12	Config 3			30	
EPRE ratio of	PSS to SSS						
	PBCH DMRS						
to SSS EPRE ratio of	PBCH to PBCH						
DMRS							
EPRE ratio of to SSS	PDCCH DMRS						
EPRE ratio of PDCCH to PDCCH DMRS			Config 1,2,3	C)		0
	PDSCH DMRS						
EPRE ratio of PDSCH	PDSCH to						
EPRE ratio of	OCNG DMRS						
to SSS(Note EPRE ratio of	OCNG to						
OCNG DMRS	S (Note 1)	dBm/15	Config 1,2,3		0		09
N_{oc}		kHz		-9	ⁱ O		-98

N_{oc} Note	2	dBm/S	Config 1,2	-9	98		-98	
		CS	Config 3	-95		-95		
SS-RSR	Note 3	dBm/S	Config 1,2	-94	-94	-Infinity	-91	
		CS	Config 3	-91	-91	-Infinity	-88	
$\hat{E}_{_{s}}/I_{_{ot}}$		dB	Config 1,2,3,4,5,6	4	4	-Infinity	7	
\hat{E}_s/N_{oc}		dB	Config 1,2,3	4	4	-Infinity	7	
IO ^{Note3}		dBm/9. 36MHz	Config 1,2	-64.59	-64.59	-70.05	-62.2	
		dBm/38 .16MHz	Config 3	-58.49	-58.49	-63.94	-56.15	
Propagat	tion Condition		Config 1,2,3		'GN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{intervent}$ to be								
Note 3: Note 4:	fulfilled. SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.							

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1080 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 10240 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 3 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1080 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 4 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 10240 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1, 2, 3 and 4 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

- 6.6.2.3 Void
- 6.6.2.4 Void

6.6.2.5 NR SA FR1-FR1 event-triggered reporting in non-DRX with SSB time index detection

6.6.2.5.1 Test purpose

To verify that the UE makes correct reporting of an event in non-DRX within inter-frequency NR cell search requirements with SSB time index detection in TS 38.133 [6] clause 9.3.4.

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6.6.2.5.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards. Test 1 is applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 2 is applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

6.6.2.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.5.

6.6.2.5.4	Test description

6.6.2.5.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.5.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.5.4.1-2. Test environment parameters are given in Table 6.6.2.5.4.1-3.

Table 6.6.2.5.4.1-1: SA FR1-FR1 event triggered reporting tests in non-DRX with SSB time index detection supported test configurations

Test Case ID	Description					
6.6.2.5-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode					
6.6.2.5-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode					
6.6.2.5-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode					
Note 1: The UE	Note 1: The UE is only required to be tested in one of the supported test configurations					
Note 2: target NI	Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell					

Table 6.6.2.5.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection in non-DRX

Parameter	Unit	Test	Va	lue	Comment		
		configurati on	Test 1	Test 2			
NR RF Channel Number		Config 1,2,3	1, 2		Two FR1 NR carrier frequencies are used		
Active cell		Config 1,2,3	NR cell 1 (Pce	ell)	NR Cell 1 is on NR RF channel number 1		
Neighbour cell		Config 1,2,3	NR cell2		NR cell 2 is on NR RF channel number 2		
Gap Pattern Id		Config 1,2,3	0	4	As specified in TS 38.133 clause 9.1.2-1		
Measurement gap offset		Config 1,2,3	9	9			
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Normal				
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0		L3 filtering is not used		
DRX		Config 1,2,3	OFF		DRX is not used		
Time offset between serving and neighbour cells		Config 1	3ms		Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.		
		Config 2,3	3μs		Synchronous cells		
T1	s	Config 1,2,3	5				
T2	S	Config 1,2,3	1.1	1			

Table 6.6.2.5.4.1-3: Environment test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non-DRX

Parameter	Value		Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	3.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	fied by the test configuration selected from Table 6.6.2.5.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		pable UEs without any 2Rx RF 3.2.5.1 for DUT part and				

- 1. Message contents are defined in clause 6.6.2.5.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

6.6.2.5.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1 measurement gap pattern configuration # 0 as defined in Table 6.6.2.5.4.1-2 is provided for UE that does not support per-FR gap and in test 2 measurement gap pattern configuration #4 as defined in Table 6.6.2.5.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.5.4.1-2.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.5.4.1-2. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1040 ms for Test 1 and 880 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 6.6.2.5.4.1-2 as appropriate.

6.6.2.5.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Default Message Contents					
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ Table H.3.1-2 with A3-offset = -6dB and Condition SSB Index Table H.3.1-5 Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1 Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9 for Test 2 Table H.3.1-7 with Conditions INTER-FREQ and SSB Index				
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO				
Test Configuration 6.6.2.5-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5				
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells				
Test Configuration 6.6.2.5-2	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4				
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells				
Test Configuration 6.6.2.5-3	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4				

Table 6.6.2.5.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

6.6.2.5.5 Test requirement

Table 6.6.2.4.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.5.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting forFR1 with SSB time index detection

Para	meter	Unit	Test	Ce		Cell 2		
			configuratio n	T1	T2	T1 T2		
NR RF Channe	el Number		Config 1,2,3	1	l		2	
Duplex mode			Config 1			FDD		
•			Config 2,3		•	TDD		
TDD configura	tion		Config 1		Not A	pplicable		
-			Config 2		TDD	Conf.1.1		
			Config 3		TDD	Conf.2.1		
BW _{channel}		MHz	Config 1,2			RB,c = 52		
			Config 3			_{RB,c} = 106		
BWP BW		MHz	Config 1,2			_{RB,c} = 52		
			Config 3			_{RB,c} = 106		
BWP configuration	Initial DL BWP			DLBW			NA	
	Initial UL BWP		Config 1, 2,	ULBW	/P.0.1		NA	
	Dedicated DL BWP		3	DLBW	/P.1.1		NA	
	Dedicated UL BWP			ULBW	/P.1.1		NA	
TRS configura		1	Config 1	TRS.1.	1 FDD	ł	NA	
			Config 2	TRS.1.			NA	
			Config 3	TRS.1.			NA	
OCNG Pattern	S		Config 1,2,3	OF	P.1	(OP.1	
PDSCH Refere			Config 1	SR.1.1 FDD		-		
measurement	channel		Config 2	SR.1.1	SR.1.1 TDD			
			Config 3	SR 2.′	1 TDD			
RMSI CORES	I CORESET Reference		Config 1	CR.1.1	1 FDD		-	
Channel			Config 2	CR.1.1				
			Config 3	CR 2.1 TDD				
Dedicated CORESET			Config 1	CCR.1		-	-	
Reference Cha	annel		Config 2	CCR.1.1 TDD				
000			Config 3	CCR.2.1 TDD				
SSB paramete	rs		Config 1	SSB.1 FR1		SSB.5 FR1		
			Config 2	SSB.1 FR1 SSB.2 FR1		SSB.5 FR1 SSB.6 FR1		
SMTC configu	ration		Config 3	SMTC.2				
<u>j</u>			Config 1			SMTC.5		
			Config 2, 3	SMT	SMTC.1		SMTC.4	
PDSCH/PDCC	H subcarrier	kHz	Config 1,2			15		
spacing			Config 3			30		
EPRE ratio of	PSS to SSS							
EPRE ratio of to SSS	PBCH DMRS							
	PBCH to PBCH							
	PDCCH DMRS							
EPRE ratio of			Config 1,2,3	()		0	
PDCCH DMRS EPRE ratio of PDSCH DMRS to SSS EPRE ratio of PDSCH to PDSCH EPRE ratio of OCNG DMRS			50mg 1,2,0		,		J.	
to SSS(Note 1)							
EPRE ratio of OCNG DMRS								
$N_{oc}^{ m Note2}$		dBm/15 kHz		-9	8		-98	
			Config 1,2	-9	18		-98	

N_{oc} Note:	2	dBm/S CS	Config 3	-9	95	-95	
SS-RSRF	Note 3	dBm/S	Config 1,2	-94	-94	-Infinity	-91
		CS	Config 3	-91	-91	-Infinity	-88
\hat{E}_{s}/I_{ot}		dB	Config 1,2,3	4	4	-Infinity	7
\hat{E}_{s}/N_{oc}		dB	Config 1,2,3	4	4	-Infinity	7
lo ^{Note3}		dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.2
		dBm/38. 16MHz	Config 3	-58.4	-58.49	-63.94	-56.15
Propagati	ion Condition		Config 1,2,3	AW	'GN	A۱	NGN
 Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Note be 							
Note 3: Note 4:	fulfilled. e 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1040 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 880 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1 and 2 UE is required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.2.6 NR SA FR1-FR1 event-triggered reporting in DRX with SSB time index detection

6.6.2.6.1 Test purpose

To verify that the UE makes correct reporting of an event in DRX within inter-frequency NR cell search requirements with SSB time index detection in TS 38.133 [6] clause 9.3.4.

6.6.2.6.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle. Test 1 and Test 2 are applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 3 and Test 4 are applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

6.6.2.6.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.6.

6.6.2.6.4 Test description

6.6.2.6.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.6.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.6.4.1-2. Test environment parameters are given in Table 6.6.2.6.4.1-3.

Table 6.6.2.6.4.1-1: SA FR1-FR1 event triggered reporting tests in DRX with SSB time index detection supported test configurations

Test Case ID	Description		
6.6.2.6-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode		
6.6.2.64-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode		
6.6.2.6-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode		
Note 1: The UE i	Note 1: The UE is only required to be tested in one of the supported test configurations		
Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell			

Table 6.6.2.6.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection

Parameter	Unit	Test	Value				Comment
		configurati	Test Test Test Test		Test		
		on	1	2	3	4	
NR RF Channel		Config 1,2,3	1, 2			Two FR1 NR carrier frequencies	
Number							are used
Active cell		Config 1,2,3	NR ce	ll 1 (Pce	ell)		NR Cell 1 is on NR RF channel
							number 1
Neighbour cell		Config 1,2,3	NR ce	112			NR cell 2 is on NR RF channel
		001111g 1,2,0					number 2
Gap Pattern Id		Config 1,2,3	0		4		As specified in TS 38.133
•		0					clause 9.1.2-1
Measurement gap		Config 1,2,3	9		9		
offset							
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Norma	al			
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0				L3 filtering is not used
DRX		Config 1,2,3	DRX	DRX	DRX	DRX	As specified in clause A.5
			.1	.7	.1	.7	
Time offset between		Config 1	3ms				Asynchronous cells.
serving and neighbour							The timing of Cell 2 is 3ms later
cells							than the timing of Cell 1.
		Config 2,3	3µs				Synchronous cells
T1	s	Config 1,2,3	5				
T2	s	Config 1,2,3	1.3	13.5	1.3	13.5	
		, _ , _ , _					

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	5.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.6.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		pable UEs without any 2Rx RF .3.2.5.1 for DUT part and				

Table 6.6.2.6.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

- 1. Message contents are defined in clause 6.6.2.6.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Table Annex C.1.2.

6.6.2.6.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1&2 measurement gap pattern configuration # 0 as defined in Table 6.6.2.6.4.1-2 is provided for UE that does not support per-FR gap and in test 3&4 measurement gap pattern configuration #4 as defined in Table 6.6.2.6.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.6.4.1-2 and Table 6.6.2.6.5-1.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.6.5-1. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1280 ms for Test 1, 13440 ms for Test 2, 1280 ms for Test 3 and 13440 ms for Test 4, then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the *MeasurementReport* message in step 6 or when T2 expires, the SS shall:
 - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

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- if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.6.4.1-2 as appropriate.

6.6.2.6.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.6.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information elements contents exceptions	Table H.3.1-1Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQTable H.3.1-2 with Conditions GAP NEEDED and INTER-FREQTable H.3.1-4 with A3-offset = -6dB and Condition SSB IndexTable H.3.1-5Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 forTest 1 and Test 2Table H.3.1-6 with Conditions gapFR1 and Pattern #4 and gap offset =9 for Test 3 and Test 4Table H.3.1-7 with Conditions INTER-FREQ and SSB IndexTable H.3.7-1 with Condition DRX.1 and Gap and INTER-FREQ forTest 1 and Test 3Table H.3.7-1 with Condition DRX.7 and Gap and INTER-FREQ forTest 2 and Test 4		
Specific message contents exceptions for Test Configuration 6.6.2.6-1	Table H.3.1-3 with Conditions INTER-FREQ MO Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5		
Specific message contents exceptions for Test Configuration 6.6.2.6-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4		
Specific message contents exceptions for Test Configuration 6.6.2.6-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4		

6.6.2.6.5 Test requirement

Table 6.6.2.6.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.6.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting forFR1 with SSB time index detection

Parameter		Unit	Test	Cell 1 Cell 2				
			configuratio n	T1	T2	T1	T2	
NR RF Channel Number			Config 1,2,3	1			2	
Duplex mode		Config 1		FDD				
			Config 2,3		TDD			
TDD configu	Iration		Config 1		Not Applicable			
			Config 2		TDDConf.1.1			
BWchannel		MHz	Config 3		TDDConf.2.1			
DVVchannel			Config 1,2 Config 3		10: N _{RB,c} = 52 40: N _{RB,c} = 106			
BWP BW		MHz	Config 1,2		10: N _{RB,c} = 52			
Bill Bill			Config 3			$_{RB,c} = 106$		
BWP	Initial DL BWP		Ŭ	DLBW			NA	
configurati	Initial UL BWP]	ULBW	′P.0.1		NA	
on	Dedicated DL BWP		Config 1, 2, 3	DLBW	′P.1.1		NA	
	Dedicated UL BWP			ULBW	′P.1.1		NA	
TRS configu			Config 1	TRS.1.	1 FDD		NA	
5			Config 2	TRS.1.	1 TDD		NA	
			Config 3	TRS.1.			NA	
OCNG Patte	erns		Config 1,2,3	OP	P.1		OP.1	
PDSCH Ref	erence		Config 1	SR.1.1 FDD		-		
measureme	nt channel		Config 2	SR.1.1		-		
			Config 3	SR 2.1				
RMSI CORE	SET Reference		Config 1	CR.1.1			-	
Channel			Config 2	CR.1.1				
			Config 3	CR 2.1				
Dedicated C			Config 1	CCR.1.1 FDD		_	-	
Reference Channel			Config 2	CCR.1.		-		
CCD poromotoro			Config 3 Config 1	CCR.2.		SSB.5 FR1		
SSB parame	SSB parameters		Config 2	SSB.1 FR1 SSB.1 FR1		SSB.5 FR1		
			Config 3	SSB.2		SSB.6 FR1		
SMTC config	guration		Config 1	SMT			MTC.5	
			Config 2, 3	SMTC.1		SMTC.4		
PDSCH/PDCCH subcarrier		kHz	Config 1,2	1		15		
spacing			Config 3	30				
	of PSS to SSS							
to SSS	of PBCH DMRS							
EPRE ratio	of PBCH to PBCH							
EPRE ratio to SSS	of PDCCH DMRS							
	of PDCCH to							
PDCCH DMRS			Config 1,2,3	0)	0		
EPRE ratio of PDSCH DMRS to SSS EPRE ratio of PDSCH to PDSCH								
EPRE ratio of OCNG DMRS to SSS(Note 1)								
EPRE ratio of OCNG to OCNG DMRS (Note 1)								
		dBm/15		-9	8		-98	
Note2		kHz dBm/S	Config 1,2	۵.	8		-98	
N_{oc}		CS	Config 3	-98 -95		-98		
SS-RSRP Note 3		1	Config 1,2			-Infinity		

		dBm/S CS	Config 3	-91	-91	-Infinity	-88
\hat{E}_{s}/I_{ot}		dB	Config 1,2,3,4,5,6	4	4	-Infinity	7
\hat{E}_s/N_{oc}		dB	Config 1,2,3	4	4	-Infinity	7
Io ^{Note3}		dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.26
		dBm/38. 16MHz	Config 3	-58.49	-58.49	-63.94	-56.15
Propagat	ion Condition		Config 1,2,3	AW	'GN	A	WGN
Note 1: Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N , to be						
Note 3: Note 4:	fulfilled. SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.						

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1280 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 13440 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 3 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1280 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 4 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 13440 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1, 2, 3 and 4 UE is required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

- 6.6.2.7 Void
- 6.6.2.8 Void
- 6.6.3 Inter-RAT Measurements
- 6.6.3.0 Minimum conformance requirements
- 6.6.3.0.1 Minimum conformance requirements for inter-RAT event triggered reporting to E-UTRAN FDD

The requirements are applicable for NR-E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements.

In the requirements, an E-UTRAN FDD cell is considered to be detectable when:

- RSRP related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.2 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RSRQ related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.3 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RS-SINR related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.5 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.19 of TS 36.133 [23].

6.6.3.0.1.1 Requirements when no DRX is used

When the UE requires measurement gaps to identify and measure inter-RAT cells and an appropriate measurement gap pattern is scheduled, the UE shall be able to identify a new detectable FDD cell within $T_{Identify, E-UTRAN FDD}$ according to the following expression:

$$T_{Identify,E-UTRAN \ FDD} = T_{BasicIdentify} * \frac{480}{T_{Inter1}} * CSSF_{interRAT} \quad ms,$$

where:

 $T_{\text{BasicIdentify}} = 480 \text{ ms},$

T_{Inter1} is defined in TS 38.133 [6] section 9.4.1,

 $CSSF_{interRAT} = CSSF_{within_{gap_i_}}$ is the scaling factor for the measured inter-RAT E-UTRA carrier i which is calculated as specified in TS 38.133 [6] section 9.1.5.2.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measure, E-UTRAN FDD}$ defined in Table 6.6.3.0.1.1-1.

Configuration	Physical Layer Measurement period: T _{Measure, E-UTRAN FDD} [ms]	Measurement bandwidth [RB]			
0	480 x CSSFinterRAT	6			
1 (note 1)	240 x CSSFinterRAT	50			
NOTE 1: This co	NOTE 1: This configuration is optional.				

The UE shall be capable of identifying and performing NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements of at least 4 E-UTRAN FDD cells per E-UTRA FDD carrier frequency layer for up to 7 E-UTRA FDD carrier frequency layers.

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN FDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.2. The NR – E-UTRAN FDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.3. The NR – E-UTRAN FDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.5.

6.6.3.0.1.2 Requirements when DRX is used

When DRX is in use and measurement gaps are configured, the UE shall be able to identify a new detectable E-UTRAN FDD cell within $T_{Identify, E-UTRAN FDD}$ specified in Table 6.6.3.0.1.2-1. When RRM enhancement for high speed is configured the UE shall be able to identify a new detectable E-UTRAN FDD cell within $T_{Identify, E-UTRAN FDD}$ specified in Table 6.6.3.0.1.2-2.

DRX cycle length (s)	TIdentify, E-UTRAN FDD (S) (DRX cycles)				
	Gap period = 40 ms, 20 ms	Gap period = 80 ms			
≤0.16	Non-DRX requirements in	Non-DRX requirements in			
	Section 6.6.3.0.1.1 apply	Section 6.6.3.0.1.1 apply			
0.256	5.12*K (20*CSSF _{interRAT})	7.68*K (30*CSSFinterRAT)			
0.32	6.4*K (20*CSSF _{interRAT})	7.68*K (24*CSSFinterRAT)			
0.32< DRX-cycle	Note1 (20*CSSFinterRAT)	Note1 (20*CSSFinterRAT)			
≤10.24					
NOTE 1: The time depends on the DRX cycle length.					
NOTE 2: CSSF _{interRAT} is as defined in Section 6.6.3.0.1.1.					

Table 6.6.3.0.1.2-2: Requirement to identify a newly detectable E-UTRAN FDD cell for UE configured with RRM enhancement for high speed

DRX cycle length (s)	TIdentify, E-UTRAN FDD (S) (DRX cycles)					
	Gap period = 40 ms, 20 ms	Gap period = 80 ms				
≤0.16	Non-DRX requirements in	Non-DRX requirements in				
	clause 9.4.2.2 apply	clause 9.4.2.2 apply				
0.16 <drx cycle<="0.32</td"><td>Note 1(15*CSSFinterRAT)</td><td></td></drx>	Note 1(15*CSSFinterRAT)					
0.32 <drx <="</td" cycle=""><td>Note 1(10*CSSF_{interRAT})</td><td></td></drx>	Note 1(10*CSSF _{interRAT})					
0.64						
DRx cycle = 1.024	Note 1(10*CSSF _{interRAT})	Note 1(10*CSSFinterRAT)				
DRx cycle = 1.28	Note 1(8*CSSF _{interRAT})	Note 1(8*CSSF _{interRAT})				
1.28< DRX-cycle	Note1 (20*CSSF _{interRAT})	Note1 (20*CSSFinterRAT)				
≤10.24						
NOTE 1: The time depe	NOTE 1: The time depends on the DRX cycle length.					
NOTE 2: CSSF _{interRAT} is as defined in clause 9.4.2.2.						

When DRX is in use, the UE shall be capable of performing NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements of at least 4 identified E-UTRAN FDD cells per E-UTRA FDD frequency layer during each layer 1 measurement period, for up to 7 E-UTRA FDD carrier frequency layers, and the UE physical layer shall be capable of reporting NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{measure, E-UTRAN FDD}$ specified in Table 6.6.3.0.1.2-3.

Table 6.6.3.0.1.2-3: Requirement to measure E-UTRAN FDD cells

DRX cycle length (s)	Tmeasure, E-UTRAN FDD (S) (DRX cycles)		
≤0.08	Non-DRX requirements in Section 6.6.3.0.1.1 apply		
0< DRX-cycle ≤10.24	Note1 (5* CSSFinterRAT)		
NOTE 1: The time depends on the DRX cycle length.			
NOTE 2: CSSF _{interRAT} is as defined in Section 6.6.3.0.1.1.			

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN FDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.2. The NR – E-UTRAN FDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.3. The NR – E-UTRAN FDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.5.

6.6.3.0.1.3 Measurement reporting requirements for Event-Triggered Reporting

The reported NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements contained in event-triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.2.2, 10.2.3, and 10.2.5, respectively.

The UE shall not send any event-triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH} where TTI_{DCCH} is the duration of subframe or slot or subslot when the measurement report is

transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{Identify, E-UTRAN FDD} defined in clauses 6.6.3.0.1.1 and 6.6.3.0.1.2 without DRX and with DRX, respectively. When L3 filtering is used, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify, E-UTRAN FDD}$ becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers are event as per TS 38.331 [13], the event triggered measurement reporting delay shall be less than $T_{Measure, E-UTRAN FDD}$ provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 38.133 [6] clause 9.4.2.

6.6.3.0.2 Minimum conformance requirements for inter-RAT event triggered reporting to E-UTRAN TDD

The requirements are applicable for NR-E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements.

In the requirements, an E-UTRAN TDD cell is considered to be detectable when:

- RSRP related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.2 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RSRQ related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.3 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RS-SINR related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.5 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.19 of TS 36.133 [23].

6.6.3.0.2.1 Requirements when no DRX is used

When the UE requires measurement gaps to idenitify and measure inter-RAT cells and an appropriate measurement gap pattern is scheduled, the UE shall be able to identify a new detectable TDD cell within $T_{Identify, E-UTRAN TDD}$ according to the following expression:

- When configuration 0 or configuration 1 in Table 6.6.3.0.2-1 is applied,

$$T_{Identify,E-UTRAN\ TDD} = T_{BasicIdentify} * \frac{480}{T_{Inter1}} * CSSF_{interRAT} \quad ms ,$$

- When configuration 2 or configuration 3 in Table 6.6.3.0.2-1 is applied,

$$T_{Identify,E-UTRAN\,TDD} = (T_{BasicIdentify} * \frac{480}{T_{Inter1}} + 240) * CSSF_{interRAT} \quad ms,$$

where:

 $T_{\text{BasicIdentify}} = 480 \text{ ms},$

T_{Inter1} is defined in TS 38.133 [6] section 9.4.1,

CSSF_{interRAT} = CSSF_{within_gap_i} is the scaling factor for the measured inter-RAT E-UTRA carrier i which is calculated as specified in TS 38.133 [6] section 9.1.5.2.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measure, E-UTRAN TDD}$ defined in Table 6.6.3.0.2.1-1.

Table 6.6.3.0.2.1-1: T_{Measure, E-UTRAN TDD} for different configurations

Configuration	Measurement bandwidth	Number of UL/DL sub- frames per half frame (5 ms)		DwPTS		T _{Measure} , E-UTRAN TDD [MS]
	[RB]	DL	UL	Normal CP	Extende d CP	

0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x CSSF _{interRAT}
1 (note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x CSSF _{interRAT}
2	6	1	3	$19760 \cdot T_{\rm s}$	$20480 \cdot T_s$	720 x CSSF _{interRAT}
3 (Note 1)	50	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x CSSF _{interRAT}
NOTE 1: This c NOTE 2: Void	onfiguration is opt	ional.				

The UE shall be capable of identifying and performing NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements of at least 4 E-UTRAN TDD cells per E-UTRA TDD carrier frequency layer for up to 7 E-UTRA TDD carrier frequency layers.

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN TDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.2. The NR – E-UTRAN TDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.3. The NR – E-UTRAN TDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.5.

6.6.3.0.2.1 Requirements when DRX is used

When DRX is in use and measurement gaps are configured, the UE shall be able to identify a new detectable E-UTRAN TDD cell within $T_{Identify, E-UTRAN TDD}$ specified in Table 6.6.3.0.2.1-1. When RRM enhancement for high speed is configured the UE shall be able to identify a new detectable E-UTRAN TDD cell within $T_{Identify, E-UTRAN TDD}$ specified in Table 6.6.3.0.2.1-2.

DRX cycle length (s)	TIdentify, E-UTRAN TDD (S) (DRX cycles)		
	Gap period = 40 ms, 20 ms	Gap period = 80 ms	
≤0.16	Non-DRX requirements in	Non-DRX requirements in	
	Section 6.6.3.0.2.1 apply	Section 6.6.3.0.2.1 apply	
0.256	5.12*K (20*CSSF _{interRAT})	7.68*K (30*CSSF _{interRAT})	
0.32	6.4*K (20*CSSF _{interRAT})	7.68*K (24*CSSF _{interRAT})	
0.32< DRX-cycle ≤10.24	Note1 (20*CSSFinterRAT)	Note1 (20*CSSFinterRAT)	
NOTE 1: The time depends on the DRX cycle length.			
NOTE 2: CSSF _{interRAT} is as defined in Section 6.6.3.0.2.1.			

Table 6.6.3.0.2.1-1: Requirement to identify a newly detectable E-UTRAN TDD cell

Table 6.6.3.0.2.1-2: Requirement to identify a newly detectable E-UTRAN TDD cell for UE configured with RRM enhancement for high speed

DRX cycle length (s)	TIdentify, E-UTRAN TDD (S) (DRX cycles)		
	Gap period = 40 ms, 20 ms	Gap period = 80 ms	
≤0.16	Non-DRX requirements in clause 9.4.3.2 apply	Non-DRX requirements in clause 9.4.3.2 apply	
0.16 <drx cycle<="0.32</td"><td>Note 1(15*CSSF_{interRAT})</td><td></td></drx>	Note 1(15*CSSF _{interRAT})		
0.32 <drx <="<br" cycle="">0.64</drx>	Note 1(10*CSSF _{interRAT})		
DRx cycle = 1.024	Note 1(10*CSSF _{interRAT})	Note 1(10*CSSF _{interRAT})	
DRx cycle = 1.28	Note 1(8*CSSFinterRAT)	Note 1(8*CSSFinterRAT)	
1.28< DRX-cycle ≤10.24	Note1 (20*CSSF _{interRAT})	Note1 (20*CSSF _{interRAT})	
NOTE 1: The time depends on the DRX cycle length. NOTE 2: CSSF _{interRAT} is as defined in clause 9.4.3.2.			

When DRX is in use, the UE shall be capable of performing NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements of at least 4 identified E-UTRAN TDD cells per E-UTRA TDD frequency layer during each layer 1 measurement period, for up to 7 E-UTRA TDD carrier frequency layers, and the UE physical layer shall be capable of reporting NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{measure, E-UTRAN TDD}$ specified in Table 6.6.3.0.2.1-3.

DRX cycle length (s)	Tmeasure, E-UTRAN TDD (S) (DRX cycles)		
≤0.08	Non-DRX Requirements in Section 6.6.3.0.2.1		
	apply		
0.128	For configuration 2, non-DRX requirements in		
	section 6.6.3.0.2.1 apply,		
	Otherwise: Note1 (5*CSSF _{interRAT})		
0.128 <drx-cycle≤10.24 (5*cssf<sub="" note1="">interRAT)</drx-cycle≤10.24>			
NOTE 1: The time depends on the DRX cycle length.			
NOTE 2: CSSF _{interRAT} is as defined in Section 6.6.3.0.2.1.			

Table 6.6.3.0.2.1-3: Requirement to measure E-UTRAN TDD cells

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN TDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.2. The NR – E-UTRAN TDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.3. The NR – E-UTRAN TDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.5.

6.6.3.0.2.3 Measurement reporting requirements for Event-Triggered Reporting

The reported NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements contained in event-triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.2.2, 10.2.3, and 10.2.5, respectively.

The UE shall not send any event-triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH} where TTI_{DCCH} is the duration of subframe or slot or subslot when the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{Identify, E-UTRAN TDD} defined in clauses 6.6.3.0.2.1 and 6.6.3.0.2.2 without DRX and with DRX, respectively. When L3 filtering is used, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify, E-UTRAN TDD}$ becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event as per TS 38.331 [13], the event triggered measurement reporting delay shall be less than $T_{Measure, E-UTRAN TDD}$ provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 38.133 [6] clause 9.4.3.

6.6.3.1 NR SA FR1 – E-UTRAN event-triggered reporting in non-DRX

6.6.3.1.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 under the cell search and measurement requirements.

6.6.3.1.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 from Release 15 onwards.

6.6.3.1.3 Minimum conformance requirements

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.1.

6.6.3.1.3.1 NR – E-UTRAN FDD requirement

The minimum conformance requirements are specified in clause 6.6.3.0.1.

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6.6.3.1.3.2 NR – E-UTRAN TDD requirement

The minimum conformance requirements are specified in clause 6.6.3.0.2.

6.6.3.1.4	Test description
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6.6.3.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.1.4.1-1.

Table 6.6.3.1.4.1-1: s	supported test	configurations
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Test Case ID	Description			
6.6.3.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD			
6.6.3.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD			
6.6.3.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD			
6.6.3.1-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD			
6.6.3.1-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD			
6.6.3.1-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD			
NOTE: The	NOTE: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.1.4.1-2 and Table 6.6.3.1.4.1-3.

Table 6.6.3.1.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, Table E.4-2 and TS 38	.508-1 [14] sclause 4.3.1.	
Channel bandwidth	As specified by the test configuration selected from Table 6.6.3.1.5-1 and Table 6.6.3.1.5-2			
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.2		
Exceptions to connection diagram	N/A	•		

Parameter	Unit	Value	Comment
NR RF Channel Number		1	1 NR carrier frequency is used in the test
LTE RF Channel Number		1	1 LTE carrier frequency is used in the test
Channel Bandwidth	MHz	As specified in Tables 6.6.3.1.5-1 and 6.6.3.1.5-2.	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in Clause TS 38.133 [6] Table 9.1.2-1. Per-UE gap pattern.
NR measurement quantity		SS-RSRP	Measurement quantity for Cell 1
Inter-RAT E-UTRAN measurement quantity		RSRP	Measurement quantity for Cell 2
b2-Threshold1	dBm	Note 1	SS-RSRP threshold for SS-RSRP measurement on cell1 for event B2
b2-Threshold2EUTRA	dBm	-97	E-UTRAN RSRP threshold for SS-RSRP measurement on cell1 for event B2
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	S	5	
T2	S	5	
NOTE 1: Values are define	ed in Table	6.6.3.1.5-1	·

Table 6.6.3.1.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

- 1. Message contents are defined in clause 6.6.3.1.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

6.6.3.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.1.5-1 and 6.6.3.1.5-2. Propagation conditions are set according to Annex C clause C.2.2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.3.1.5-1 and 6.6.3.1.5-2.
- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6 or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED according to TS 38.508-1 [14] clause 4.5.4 (if the paging fails, switches off and on the UE and ensures the UE is in the state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5,
OR
- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED

with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.3.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.3.1.4.3-1: Common Exception messages NR SA FR1 – E-UTRAN event-triggered reporting in non-DRX

Default Message Contents					
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-RAT Table H.3.1-3A Table H.3.1-4A Table H.3.1-5 with Condition INTER-RAT Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTER-RAT				
Specific message content exceptions for Test Configurations 6.6.3.1-1 and 6.6.3.1-4	Table H.3.1-3 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message content exceptions for Test Configurations 6.6.3.1-2, 6.6.3.1-3, 6.6.3.1-5 and 6.6.3.1-6	Table H.3.1-3 with Condition Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

6.6.3.1.5 Test requirement

Table 6.6.3.1.5-1 and Table 6.6.3.1.5-2 define the primary level settings including test tolerances for all tests.

Table 6.6.3.1.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in non-DRX with PCell in FR1

Parameter		Unit	Configuration	Cell 1	
DE abannal number				T1	T2
RF channel number			1, 2, 3, 4, 5, 6		1
Duplex mode			1, 2, 3		FDD
			4, 5, 6		TDD
TDD Configuration	SCS=15 KHz		2, 5		Conf.1.1
	SCS=30 KHz		3, 6		Conf.2.1
BW _{channel}		MHz	1, 4		_c = 52 (FDD)
			2, 5		c = 52 (TDD)
			3, 6		= 106 (TDD)
PDSCH reference r	neasurement		1, 4		1.1 FDD
channel			2, 5		1.1 TDD
			3, 6		2.1 TDD
CORESET reference	e channel		1, 4		1.1 FDD
			2, 5		1.1 TDD
			3, 6		2.1 TDD
Dedicated CORSET	reference channel		1, 4	CCR	.1.1 FDD
			2, 5		1.1 TDD
			3, 6		2.1 TDD
BWP	Initial DL BWP		1, 2, 3, 4, 5, 6		BWP.0.1
configurations	Dedicated DL BWP		1, 2, 3, 4, 5, 6	DLE	3WP.1.1
	Initial UL BWP		1, 2, 3, 4, 5, 6		3WP.0.1
	UL BWP		1, 2, 3, 4, 5, 6	ULE	3WP.1.1
OCNG pattern note1			1, 2, 3, 4, 5, 6		OP.1
SMTC configuration	1		1, 2, 3, 4, 5, 6		MTC.1
SSB configuration			1, 2, 4, 5		B.1 FR1
			3, 6	SSB.2 FR1	
CSI-RS for tracking			1, 4	TRS.1.1 FDD	
-			2, 5	TRS.1.1 TDD	
			3, 6	TRS.1.2 TDD	
b2-Threshold1		dBm	1, 2, 4, 5	-98	
		ubiii	3, 6		-95
EPRE ratio of PSS to SSS			1, 2, 3, 4, 5, 6		
EPRE ratio of PBC					
EPRE ratio of PBC					
EPRE ratio of PDC	CH_DMRS to SSS				
EPRE ratio of PDC	CH to				
PDCCH_DMRS		dB		0	
EPRE ratio of PDS					
EPRE ratio of PDS	CH to				
PDSCH_DMRS		-			
EPRE ratio of OCN		-			
EPRE ratio of OCN	G to OCNG DMRS				
Noc ^{note2}		dBm/15 KHz	1, 2, 3, 4, 5, 6		-106
Noc note2		dBm/SCS	1, 2, 4, 5		-106
			3, 6		-103
Ês/Noc		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
Ês/lot note3		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
SS-RSRP note3		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
			3, 6	-83.35	-106.65
SSB_RP note3		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
			3, 6	-83.35	-106.65
		dBm/9.36	1, 2, 4, 5	-58.35	-76.49
lo note3		MHz		-	
		dBm/38.16	3, 6	-52.25	-70.39
		MHz			
Propagation condition			1, 2, 3, 4, 5, 6		300ns 100Hz
Antenna Configurat Matrix	ion and Correlation		1, 2, 3, 4, 5, 6	1)	<2 Low
		1			

NOTE 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant
	over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be
NOTE 3:	fulfilled. \hat{E}_s/I_{ot} , SS-RSRP, SSB_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Parameter	Unit	Configuration	Cell 2		
			T1	T2	
RF channel number		1, 2, 3, 4, 5, 6	2		
Duplex mode		1, 2, 3	FDD		
		4, 5, 6	TDD		
TDD special subframe configuration ^{note1}		4, 5, 6	6		
TDD uplink-downlink configuration		4, 5, 6	1		
BW _{channel}	MHz	1, 2, 3, 4, 5, 6	5MHz: N _{RB,}		
			10MHz: N _{RB} 20MHz: N _{RB,}		
PDSCH parameters:		1, 2, 3	5MHz: R.7		
DL Reference Measurement		, , -	10MHz: R.3	FDD	
Channel note2			20MHz: R.6		
		4, 5, 6	5MHz: R.4		
			10MHz: R.0		
DOFICH/BROCH/BHICH		100	20MHz: R.3		
PCFICH/PDCCH/PHICH parameters:		1, 2, 3	5MHz: R.11 10MHz: R.6		
DL Reference Measurement			20MHz: R.1		
Channel note2		4, 5, 6	5MHz: R.11		
		1, 0, 0	10MHz: R.6		
			20MHz: R.1		
OCNG Patterns note2		1, 2, 3	5MHz: OP.2	0 FDD	
			10MHz: OP.1		
			20MHz: OP.1		
		4, 5, 6	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		
PBCH_RA		1, 2, 3, 4, 5, 6	2010112.01.		
PBCH_RB	-	1, 2, 0, 1, 0, 0			
PSS_RA	-				
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB	dB		0		
PDCCH_RA	_				
PDCCH_RB	_				
PDSCH_RA	_				
PDSCH_RB OCNG_RA ^{note3}	-				
OCNG_RB ^{note3}	-				
Noc note4	dBm/15kHz	1, 2, 3, 4, 5, 6	-106		
Ês/Noc	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65	
Ê _s /I _{ot} ^{note5}	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65	
RSRP note5	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35	
SCH_RP note5	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35	
lo ^{note5}	dBm/9MHz	1, 2, 3, 4, 5, 6	-78.22+10log (N _{RB,c} /50)	-57.53+10log (N _{RB,c} /50)	
Propagation Condition not 6		1, 2, 3, 4, 5, 6	ETU70		
Antenna Configuration and Correlation Matrix ^{note6}		1, 2, 3, 4, 5, 6	1x2 Lov	N	
NOTE 1: Special subframe and up NOTE 2: DL RMCs and OCNG pat NOTE 3: OCNG shall be used such density is achieved for all	terns are speci n that all cells a OFDM symbo	ified in sections A are fully allocated ls.	3.1 and A 3.2 of TS 36.133 [and a constant total transmitt	23] respectively. ed power spectral	
	shall be model	led as AWGN of a	appropriate power for Noc to b	e fulfilled.	
NOTE 5: Ê _s /I _{ot} , RSRP, SCH_RP ar They are not settable par	ameters thems	elves.			
NOTE 6: Propagation condition and	u correlation m	aurix are defined l	n secuon 6.2 in 15 36.101 [2	<i>i</i> j.	

Table 6.6.3.1.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3842ms from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The overall delays measured test requirement is expressed as:

 $T_{identify,E-UTRAN FDD} = T_{BasicIdentify} * 480 / T_{Inter1} * CSSF_{interRAT} ms$

Which:

 $T_{\text{BasicIdentify}} = 480,$

 $T_{Inter1} = 60$,

 $CSSF_{interRAT} = 1$

TTI insertion uncertainty = $TTI_{DCCH} = 1$ ms; $2xTTI_{DCCH} = 2$ ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with confidence level of 95%.

6.6.3.2 NR SA FR1 – E-UTRAN event-triggered reporting in DRX

6.6.3.2.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 when DRX is used under the cell search and measurement requirements.

6.6.3.2.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1, E-UTRAN and long DRX cycle.

6.6.3.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clauses 6.6.3.0.1 and 6.6.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.2.

6.6.3.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.2.4.1-1.

Table 6.6.3.2.4.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Test Case ID	Description			
6.6.3.2-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD			
6.6.3.2-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD			
6.6.3.2-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD			
6.6.3.2-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD			
6.6.3.2-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD			
6.6.3.2-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD			
NOTE: The L	IE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.2.4.1-2 and Table 6.6.3.2.4.1-3.

Parameter		Value	Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, Table E.4-2 and TS 38	.508-1 [14] sclause 4.3.1.
Channel bandwidth	As specified by the test configuration selected from Table 6.6.3.2.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.2	
Exceptions to connection diagram	N/A		

Table 6.6.3.2.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Table 6.6.3.2.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Parameter	Unit	· · · · ·	Value	Comment	
NR RF Channel Number		1		1 NR carrier frequency is used in the test	
LTE RF Channel Number		2		1 LTE carrier frequency is used in the test	
Channel Bandwidth	MHz		ed in Tables		
		6.6.3.2.5-			
		6.6.3.2.5-	2.		
Active cell		Cell 1		Cell 1 is on RF channel number 1	
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2	
Gap Pattern Id		0		As specified in Clause TS 38.133 [6] Table	
				9.1.2-1. Per-UE gap pattern.	
NR measurement quantity		SS-RSRF)	Measurement quantity for Cell 1	
Inter-RAT E-UTRAN		RSRP		Measurement quantity for Cell 2	
measurement quantity					
b2-Threshold1	dBm no			SS-RSRP threshold for SS-RSRP	
				measurement on cell1 for event B2	
b2-Threshold2EUTRA	dBm	-97		E-UTRAN RSRP threshold for SS-RSRP	
				measurement on cell1 for event B2	
Hysteresis	dB	0			
TimeToTrigger	S	0			
Filter coefficient		0		L3 filtering is not used	
DRX		DRX.1	DRX.7	DRX cycle configurations DRX.1 and	
				DRX.7 are defined in Table A.3.3.1-1 and	
				Table A.3.3.2-1 respectively.	
T1	S	5			
T2	S	5	15		
NOTE 1: Values are define	ed in Table 6	6.6.3.2.5-1			

- 1. Message contents are defined in clause 6.6.3.2.4.3.
- 2. There are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. Cell 1 is configured according to Annex C.1.1 and C.1.2, Cell 2 is configured according to TS 36.521-3 [26] Annex C.1.0 and C.1.1.

6.6.3.2.4.2 Test procedure

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. In the measurement control information from the PCell it is indictated to the UE that eventtriggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

In each test the UE shall be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the UE shall be allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.2.5-1 and 6.6.3.2.5-2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 6.6.3.2.5-1 and 6.6.3.2.5-2. T2 starts.
- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the overall delays measured from the beginning of time period T2 is less than 3.48 s for Test 1 or less than 12.8 s for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off .

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14+2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.3.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Default Message Contents					
Common contents of system information					
blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-RAT Table H.3.1-3A Table H.3.1-4A Table H.3.1-5 with Condition INTER-RAT Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTER-RAT Table H.3.7-1 with Condition DRX.1 and Gap for Test 1 Table H.3.7-1 with Condition DRX.7 and OFFSET for Test 2				
Specific message content exceptions for Test Configurations 6.6.3.2-1 and 6.6.3.2-4	Table H.3.1-3 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message content exceptions for Test Configurations 6.6.3.2-2, 6.6.3.2-3, 6.6.3.2-5 and 6.6.3.2-6	Table H.3.1-3 with Condition Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

Table 6.6.3.2.4.3-1: Common Exception messages NR SA FR1 – E-UTRAN event-triggered reporting in DRX

6.6.3.2.5 Test requirement

Table 6.6.3.2.5-1 and Table 6.6.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Table 6.6.3.2.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in DRX with PCell in FR1

Parameter	Unit	Configuration	Cell 1	
			T1	T2

RF channel numbe	r		1, 2, 3, 4, 5, 6		1
Duplex mode			1, 2, 3	I	- FDD
-			4, 5, 6		TDD
TDD Configuration SCS=15 KHz			2, 5		Conf.1.1
TEE Configuration	SCS=30 KHz		3, 6		Conf.2.1
BW _{channel}		MHz	1, 4		
DVVchannel					r = 52 (FDD)
			2, 5		s = 52 (TDD)
			3, 6		= 106 (TDD)
PDSCH reference	measurement		1, 4		1.1 FDD
channel			2, 5	SR.	1.1 TDD
			3, 6	SR.2	2.1 TDD
RMSI CORESET re	eference channel		1, 4	CR.	1.1 FDD
			2, 5		1.1 TDD
			3, 6		2.1 TDD
Dedicated CORSE	T reference channel		1, 4		.1.1 FDD
	Telefence channel		2, 5		
				CCR.1.1 TDD CCR.2.1 TDD	
			3, 6		
BWP	Initial DL BWP		1, 2, 3, 4, 5, 6		SWP.0.1
configurations	Dedicated DL BWP		1, 2, 3, 4, 5, 6	DLB	SWP.1.1
	Initial UL BWP		1, 2, 3, 4, 5, 6	ULB	SWP.0.1
	Dedicated UL BWP		1, 2, 3, 4, 5, 6		SWP.1.1
OCNG pattern ^{Note1}			1, 2, 3, 4, 5, 6		DP.1
SMTC configuration	า		1, 2, 3, 4, 5, 6		MTC.1
SSB configuration	1		1, 2, 4, 5		3.1 FR1
SSB configuration					
			3, 6		3.2 FR1
CSI-RS for tracking	1		1, 4		1.1 FDD
			2, 5		1.1 TDD
			3, 6	TRS.	1.2 TDD
b2-Threshold1		d Dues	1, 2, 4, 5	-98	
		dBm	3, 6	-95	
EPRE ratio of PSS	to SSS		1, 2, 3, 4, 5, 6		
EPRE ratio of PBC			., _, o, ., o, o		
	H to PBCH_DMRS	-			
		-			
EPRE ratio of PDCCH_DMRS to SSS EPRE ratio of PDCCH to PDCCH_DMRS		_			
					_
		dB			0
EPRE ratio of PDSCH_DMRS to SSS					
EPRE ratio of PDSCH to					
PDSCH_DMRS					
EPRE ratio of OCNG DMRS to SSS					
	G to OCNG DMRS				
Noc ^{Note2}		dBm/15 KHz	1, 2, 3, 4, 5, 6	-106	
		dBm/SCS			
N _{oc} ^{Note2}		UDIII/SUS	1, 2, 4, 5		-106
			3, 6		-103
Ês/Noc		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
Ês/lot ^{Note3}		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
SS-RSRP ^{Note3}		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
			3, 6	-83.35	-106.65
SSB_RP ^{Note3}		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
_			3, 6	-83.35	-106.65
		dBm/9.36	1, 2, 4, 5	-58.35	-76.49
		MHz	, <u>,</u> , , J	00.00	-10.43
O ^{Note3}			2.6	ED 0E	70.00
		dBm/38.16	3, 6	-52.25	-70.39
		MHz			
Propagation condition			1, 2, 3, 4, 5, 6		00ns 100Hz
Antenna Configuration and Correlation			1, 2, 3, 4, 5, 6	1x2 Low	
Vatrix					
Note 1: OCNG s	hall be used such that	both cells are fully	y allocated and a cor	stant total trans	smitted power
	density is achieved for				
	nce from other cells ar			st is assumed to	o be constant
	carriers and time and	shall be modelled	as AWGN of approp	riate power for	v to be fulfilled
-					66
Note 3: Ês/Iot, SS	S-RSRP, SSB_RP and			r parameters fo	r information
	s. They are not settabl				

Parameter	Unit	Configuration	Cell 2		
			T1 T2		
RF channel number		1, 2, 3, 4, 5, 6	2		
Duplex mode		1, 2, 3	FDD		
		4, 5, 6	TDD		
TDD special subframe configuration ^{Note1}		4, 5, 6	6		
TDD uplink-downlink configuration ^{Note1}		4, 5, 6	1		
BW _{channel}	MHz	1, 2, 3, 4, 5, 6	5MHz: N _{RB,c}	= 25	
		-,_,_,_,_,_,_	10 MHz: N _{RB,c} = 50		
			20MHz: N _{RB,c}	= 100	
PDSCH parameters:		1, 2, 3	5MHz: R.7 I	DD	
DL Reference Measurement			10MHz: R.3		
Channel ^{Note2}			20MHz: R.6		
		4, 5, 6	5MHz: R.4		
			10MHz: R.0		
PCFICH/PDCCH/PHICH		100	20MHz: R.3 5MHz: R.11		
PCFICH/PDCCH/PHICH parameters:		1, 2, 3	10MHz: R.11		
DL Reference Measurement			20MHz: R.10		
Channel ^{Note2}		4, 5, 6	5MHz: R.11		
		1, 0, 0	10MHz: R.6		
			20MHz: R.10 TDD		
OCNG Patterns ^{Note2}		1, 2, 3	5MHz: OP.20 FDD		
			10MHz: OP.10) FDD	
			20MHz: OP.1		
	4, 5, 6 5MHz: OP.9 TDD				
			10MHz: OP.1 TDD 20MHz: OP.7 TDD		
PBCH_RA		1, 2, 3, 4, 5, 6	20MH2. OP.7	וסט	
PBCH_RB	-	1, 2, 3, 4, 3, 0			
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB	dB 0				
PDCCH_RA					
PDCCH_RB	-				
PDSCH_RA	CH_RA				
PDSCH_RB	-				
OCNG_RA ^{Note3} OCNG RB ^{Note3}	-				
Noc ^{Note4}	dBm/15kHz	1 2 2 4 5 6	-106		
Ês/Noc	dB	1, 2, 3, 4, 5, 6 1, 2, 3, 4, 5, 6	-Infinity	20.65	
Ês/lot ^{Note5}	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65	
RSRP ^{Note5}	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35	
SCH RP ^{Note5}	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35	
IO ^{Note5}	dBm/9MHz	1, 2, 3, 4, 5, 6	-78.22+10log (N _{RB,c} /50)	-57.53+10log (N _{RB,c} /50)	
ropagation Condition Note6 1, 2, 3, 4, 5, 6 ETU70					
Interna Configuration and 1, 2, 3, 4, 5, 6 1x2 Low					
Correlation Matrix Note6					
			specified in table 4.2-1 in TS 3		
			3.1 and A 3.2 of TS 36.133 re		
			and a constant total transmitte	a power spectral	
density is achieved for all Note 4: Interference from other ce			ind in the test is assumed to h	e constant over	
Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.					
	nd lo levels hav	e been derived fro	om other parameters for inforr		
			n section B.2 in TS 36.101 [27].	

Table 6.6.3.2.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

In test 1, the UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3.84s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

In test 2, the UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 12.8s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

6.6.3.3 NR SA FR1 – E-UTRAN event-triggered reporting in DRX for UE configured with highSpeedMeasFlag-r16

6.6.3.3.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 when DRX is used under the cell search and measurement requirements for UE configured with RRM enhancement for high speed.

6.6.3.3.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 configured with RRM enhancement for high speed from Release 15 onwards.

6.6.3.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clauses 6.6.3.0.1 and 6.6.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.3.

6.6.3.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.3.4.1-1.

Table 6.6.3.3.4.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Test Case ID	Description
6.6.3.3-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD
6.6.3.3-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.3-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.3-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD
6.6.3.3-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD
6.6.3.3-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD
NOTE: The	JE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.3.4.1-2 and Table 6.6.3.3.4.1-3.

Table 6.6.3.3.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.4-2 and TS 38		.508-1 [14] clause 4.3.1.	
Channel bandwidth	As specified	by the test configuration selected fr	om Table 6.6.3.3.4.1-1.	
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.2		

Exceptions to	N/A	
connection		
diagram		

Table 6.6.3.3.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Value	Comment
NR RF Channel Number		1	1 NR carrier frequency is used in the test
LTE RF Channel Number		2	1 LTE carrier frequency is used in the test
Channel Bandwidth	MHz	As specified in Tables	
		A.6.6.3.3.1-2 and	
		A.6.6.3.3.1-3.	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in Clause Table 9.1.2-1. Per-UE
			gap pattern.
NR measurement quantity		SS-RSRP	Measurement quantity for Cell 1
Inter-RAT E-UTRAN		RSRP	Measurement quantity for Cell 2
measurement quantity			
b2-Threshold1	dBm	Note 1	SS-RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
b2-Threshold2EUTRA	dBm	-97	E-UTRAN RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX.6	DRX cycle configurations DRX.6 is defined in
			Table A.3.3.1-6.
T1	S	5	
T2	S	5	
Note 1: Values are define	ed in TS 38	3.133 Table 6.6.3.3.5-1	

- 1. Message contents are defined in clause 6.6.3.3.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.
- 3. UE is configured with highSpeedMeasFlag-r16

6.6.3.3.4.2 Test procedure

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. In the measurement control information from the PCell it is indictated to the UE that eventtriggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

In each test the UE shall be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the UE shall be allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.3.5-1 and 6.6.3.3.5-2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 6.6.3.3.5-1 and 6.6.3.3.5-2. T2 starts.

- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the overall delays measured from the beginning of time period T2 is less than 4.8s then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14+2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.3.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.3.3.4.3-1: Common Exception messages

Defau	It Message Contents
Common contents of system information blocks on condition of HighSpeedMeas with exceptions	Table H.2.1-3 with Condition HighSpeedMeas
Default RRC messages and information elements contents exceptions	Table H.3.1-1Table H.3.1-2 with Conditions GAP NEEDED andINTER-RATTable H.3.1-3 with Condition SSB.1 FR1 forconfiguration 6.6.3.3-1, 6.6.3.3-2, 6.6.3.3-4, 6.6.3.3-5Table H.3.1-3 with Condition SSB.2 FR1 forconfiguration 6.6.3.3-3, 6.6.3.3-6Table H.3.1-3ATable H.3.1-3ATable H.3.1-4ATable H.3.1-5 with Condition INTER-RATTable H.3.1-6 with Condition Pattern #0Table H.3.1-7 with Condition INTER-RATTable H.3.1-7 with Condition INTER-RATTable H.3.1-1 with Condition DRX.6 and Gap

6.6.3.3.5

Test requirement

Table 6.6.3.3.5-1 and Table 6.6.3.3.5-2 defines the primary level settings including test tolerances for all tests.

Table 6.6.3.3.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

RF channel number 1, 2, 3, 4, 5, 6 1 Duplex mode 1, 2, 3, 4, 5, 6 1 Duplex mode 1, 2, 3, 4, 5, 6 1 TDD Configuration SCS=15 KHz 2, 5 TDDConf.12.1 BWchannel MHz 1, 4 10: Nese. = 52 (FI BWchannel MHz 1, 4 10: Nese. = 52 (FI CORSET reference measurement channel 3, 6 40: Nese. = 106 (T CORSET reference channel 1, 4 CR.1.1 FDD Configuration Initial DL BWP 1, 2, 3, 4, 5, 6 DLBWP.0.1 Configuration Initial DL BWP 1, 2, 3, 4, 5, 6 DLBWP.0.1 Configuration Initial DL BWP 1, 2, 3, 4, 5, 6 DLBWP.0.1 Configuration 1, 2, 3, 4, 5, 6 DLBWP.0.1 Dedicated DL BWP Initial UL BWP 1, 2, 3, 4, 5, 6 OLB.WP.0.1 SSB configuration 1, 2, 3, 4, 5, 6 OLBWP.0.1 SSB configuration 1, 2, 3, 4, 5, 6 OLB.WP.0.1 SSB configuration 1, 2, 3, 4, 5, 6 OLB.WP.0.1 Decidated UL BWP 1, 2, 3, 4, 5, 6 OLB.WP.0.1						
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EPRE ratio of PDCCH_DMRS to SSS EPRE ratio of PDCCH to PDCCH_DMRS EPRE ratio of PDSCH_DMRS to SSS EPRE ratio of PDSCH to PDSCH_DMRS EPRE ratio of OCNG DMRS to SSS EPRE ratio of OCNG DMRS to SSS EPRE ratio of OCNG to OCNG DMRS dBm/15 KHz 1, 2, 3, 4, 5, 6 -106 <t< td=""><td></td></t<>						
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PDCCH_DMRS Image: constraint of PDSCH_DMRS to SSS Image: constraint of PDSCH to PDSCH to PDSCH_DMRS Image: constraint of PDSCH to PDSCH_DMRS Image: constraint of PDSCH_DMRS to SSS Image: constraint of PDSCH_DMRS to SSS Image: constraint of PDSCH_DMRS Image: constraint of PDSCH_DMRS <td></td>						
EPRE ratio of PDSCH_DMRS to SSS Additional and the second se						
EPRE ratio of PDSCH to PDSCH_DMRS Additional and the second						
$\begin{array}{c c c c c c c c } \hline PDSCH_DMRS \\ \hline EPRE ratio of OCNG DMRS to SSS \\ \hline EPRE ratio of OCNG to OCNG DMRS \\ \hline N_{0c}^{Note2} & dBm/15 \ KHz & 1, 2, 3, 4, 5, 6 & -106 \\ \hline N_{0c}^{Note2} & dBm/SCS & 1, 2, 4, 5 & -106 \\ \hline & 3, 6 & -103 \\ \hline & 3, 6 & -103 \\ \hline & & 3, 6 & -103 \\ \hline & & 3, 6 & -103 \\ \hline & & & 6 & -103 \\ \hline & & & & 6 & -103 \\ \hline & & & & & & & & & & & & & & & & & &$						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
$\begin{array}{c c c c c c c c c } \hline EPRE ratio of OCNG to OCNG DMRS & & & & & & & & & & & & & & & & & & &$						
$ \begin{array}{c c c c c c c c } \hline N_{oc}^{Note2} & dBm/15 \ \text{KHz} & 1, 2, 3, 4, 5, 6 & -106 \\ \hline N_{oc}^{Note2} & dBm/SCS & 1, 2, 4, 5 & -106 \\ \hline 3, 6 & -103 \\ \hline \hline & & & & & & & \\ \hline & & & & & & & \\ \hline & & & &$						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	-2					
SS-RSRPNote3 dBm/SCS 1, 2, 4, 5 -88 -1 3, 6 -85 -1 SSB_RPNote3 dBm/SCS 1, 2, 4, 5 -88 -1 0 3, 6 -85 -1 3, 6 -85 -1 3, 6 -85 -1 0 0 1, 2, 4, 5 -88 10 ^{Note3} dBm/9.36 MHz 1, 2, 4, 5 -59.98	-2					
3,6 -85 -1 SSB_RPNote3 dBm/SCS 1,2,4,5 -88 -1 3,6 -85 -1 -1 -1 -1 IoNote3 dBm/9.36 1,2,4,5 -85 -1 MHz -59.98 -75 -75	-108					
SSB_RPNote3 dBm/SCS 1, 2, 4, 5 -88 -1 0Note3 dBm/9.36 3, 6 -85 -1 dBm/9.36 MHz 1, 2, 4, 5 -59.98 -75	-105					
3,6 -85 -1 Io ^{Note3} dBm/9.36 1, 2, 4, 5 -59.98 -75 MHz MHz -59.98 -75	-103 -108					
lo ^{Note3} dBm/9.36 1, 2, 4, 5 -59.98 -75 MHz						
MHz	-105					
dBm/38.16 3,6 -53.88 -69	75.92					
MHz	69.82					
Propagation condition 1, 2, 3, 4, 5, 6 AWGN						
Antenna Configuration and Correlation 1, 2, 3, 4, 5, 6 1x2 Low						
Matrix	ad power					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power						
spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant						
over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{ m oc}$ to be						
fulfilled.						
Note 3: Ê _s /I _{ot} , SS-RSRP, SSB_RP and Io levels have been derived from other parameters for inform	rmation					
purposes. They are not settable parameters themselves.						

Table 6.6.3.3.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Configuration	Cell 2		
		J	T1 T2		
RF channel number		1, 2, 3, 4, 5, 6	2		
Duplex mode		1, 2, 3	FDD		
		4, 5, 6	TDD		
TDD special subframe		4, 5, 6	6		
configuration ^{Note1}					
TDD uplink-downlink		4, 5, 6	1		
configuration ^{Note1}					
BW _{channel}	MHz	1, 2, 3, 4, 5, 6	5 MHz: N _{RB,}	c = 25	
			10 MHz: N _{RB}	,c = 50	
			20 MHz: N _{RB,}		
PDSCH parameters:		1, 2, 3	5 MHz: R.7		
DL Reference Measurement			10 MHz: R.3		
Channel ^{Note2}			20 MHz: R.6		
		4, 5, 6	5 MHz: R.4		
			10 MHz: R.0		
			20 MHz: R.3		
PCFICH/PDCCH/PHICH		1, 2, 3	5 MHz: R.11		
parameters:			10 MHz: R.6		
DL Reference Measurement Channel ^{Note2}			20 MHz: R.1		
Channel		4, 5, 6	5 MHz: R.11	חחד	
		4, 5, 6			
			10 MHz: R.6 TDD 20 MHz: R.10 TDD		
OCNG Patterns ^{Note2}		1, 2, 3	5 MHz: OP.20 FDD		
OCING I allerns		1, 2, 5	10 MHz: OP.1		
			20 MHz: OP.1		
		4, 5, 6	5 MHz: OP.9		
		1, 0, 0	10 MHz: OP.1 TDD		
			20 MHz: OP.		
PBCH_RA	dB	1, 2, 3, 4, 5, 6	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note3}					
OCNG_RB ^{Note3}					
N _{oc} ^{Note4}	dBm/15kHz	1, 2, 3, 4, 5, 6	-106		
Ês/Noc	dB	1, 2, 3, 4, 5, 6	-Infinity	19	
Ê _s /I _{ot} Note5	dB	1, 2, 3, 4, 5, 6	-Infinity	19	
RSRP ^{Note5}	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-87	
SCH_RP ^{Note5}	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-87	
Io ^{Note5}	dBm/9MHz	1, 2, 3, 4, 5, 6	-78.22+10log (N _{RB,c} /50)	-59.16+10log (NRB,c	
				/50)	
Propagation Condition Note6		1, 2, 3, 4, 5, 6	AWGN19		
Antenna Configuration and		1, 2, 3, 4, 5, 6	1x2 Lov	v	
Correlation Matrix Note6					
			specified in table 4.2-1 in TS		
			3.1 and A 3.2 of TS 36.133 [1		
			and a constant total transmitte	ed power spectral	
density is achieved for					
			ed in the test is assumed to b		
subcarriers and time ar	nd shall be model	led as AWGN of a	ppropriate power for Noc to b	e tulfilled.	
			om other parameters for infor	mation purposes.	
They are not settable p				1	
Note 6: Propagation condition a	and correlation m	atrix are defined i	n clause B.2 in TS 36.101 [25].	

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 4.8s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

6.6.4 L1-RSRP measurement for beam reporting

6.6.4.0 Minimum conformance requirements

6.6.4.0.1 Minimum conformance requirements for SSB-based L1-RSRP measurement for beam reporting

Same as clause 4.6.4.0.1

The normative reference for this requirement is TS 38.133 [6] clause 9.5.3.1, 9.5.4.1 and 9.5.5.1.

6.6.4.0.2 Minimum conformance requirements for CSI-RS-based L1-RSRP measurement for beam reporting

Same as clause 4.6.4.0.2

The normative reference for this requirement is TS 38.133 [6] clauses 9.5.3.1, 9.5.4.2 and 9.5.5.2.

6.6.4.1 NR SA FR1 SSB-based L1-RSRP measurement in non-DRX

6.6.4.1.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in non-DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

6.6.4.1.2 Test applicability

This test applies to all types of NR UE release 15 and forward.

6.6.4.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.1.

6.6.4.1.4 Test description

6.6.4.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.1.4.1-2. Test environment parameters are given in Table 6.6.4.1.4.1-3.

Table 6.6.4.1.4.1-1: NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description		
6.6.4.1-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
6.6.4.1-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
6.6.4.1-3 NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode			
Note: The UE is only required to be tested in one of the supported test configurations			

Table 6.6.4.1.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD

		[N1/A
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
Chaimer	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2		CR.1.1 TDD
Charmer	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
Channel	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BW/D Configuration	1.0		DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated DM/D configuration	4.0		DLBWP.1.1
Dedicated BWP configuration	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
	3		TRS.1.2 TDD
DRX configuration	1~3		Off
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	1
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS	1.2	dD	0
EPRE ratio of PDSCH DMRS to	1~3	dB	0
SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS ^{Note 1}			
EPRE ratio of OCNG to OCNG			
DMRS Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such t			
total transmitted power spe	ctral density	is achieved for a	all OFDM symbols.

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel	As specified	by the test configuration selected fr	om Table 4.6.3.1.4.1-1.	
bandwidth				
Propagation	AWGN		As specified in Annex C.2.2.	
conditions				
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to	For 4Rx capable UEs without any 2 Rx RF			
connection	bands use A.3.2.5.2 for DUT part and			
diagram	A.3.1.8.4 for	TE Part		

Table 6.6.4.1.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

- 1. Message contents are defined in clause 6.6.4.1.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.1.4.1-2 and 6.6.4.1.5-1. UE is configured to perform RLM and BFD based on the SSBs.

6.6.4.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 4.6.4.1.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.4.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.4.1.5-1. T1 starts.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in 6.6.4.1.5-1. T2 starts.
- 5. The UE shall start sending valid L1-RSRP reports. The SS shall check following requirements:
 - R1: the UE shall start to transmit valid reports no later than 720 ms for configuration 1, 2, 4 and 5 and no later than 680 ms for configuration 3 and 6 from the beginning of time period T2. A valid report shall meet the absolute L1-RSRP requirement for SSB#1 (Table 6.6.4.1.5-2 for test configurations 1, 2, 4 and 5 and Table 6.6.4.1.5-3 for test configurations 3 and 6) and the relative L1-RSRP requirement for SSB#0 in Table 6.6.4.1.5-4. If the first valid report is received earlier than the specified time, the number of passed iterations for R1 is increased by one.
 - R2: the UE shall transmit reports every 80 slots until the end of time period T2. If the reports are received accordingly, the number of passed iterations for R2 is increased by one. Otherwise, the number of failed iterations for R2 is increased by one.
 - R3: The L1-RSRP value of SSB#1 reported by the UE is compared to the expected L1-RSRP value for SSB#1. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.4.1.5-2 for test configurations 1, 2, 4 and 5 and in Table 6.6.4.1.5-3 for test configurations 3 and 6 or the UE fails to report the measurement value for SSB#1, the number of failed iterations for R3 is increased by one.
 - -R4: The DIFF RSRP value of SSB#0 reported by the UE is compared to the expected DIFF RSRP value. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.4.1.5-4 or the UE fails to report the measurement value for SSB#0, the number of failed iterations for R4 is increased by one. Otherwise, the number of passed iterations for R4 is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.4.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.1.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP		
elements contents exceptions	Table H.3.6-3 with conditions SSB and PERIODIC		

Table 6.6.4.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

6.6.4.1.5 Test requirement

Table 6.6.4.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.1.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config Unit		SS	SSB#0		SSB#1	
	Conng	Unit	T1	T2	T1	T2	
N_{oc} Note2	1~3	dBm/15kHz	-94.65				
N Note2	1,2	dBm/SSB SCS	-94.65				
N_{oc} Note2	3	UDIII/33D 3C3	-91.65				
${f \hat{E}}_{_{ m s}}/{ m I}_{_{ m ot}}$	1~3	dB	0	0	-Infinity	3.5	
SSB RSRP Note3	1,2		-94.65	-94.65	-Infinity	-91.15	
SOD KOKF	3	dBm/SSB SCS	-91.65	-91.65	-Infinity	-88.14	
lo Note3	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59	

		3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49
\hat{E}_s/N_{od}	c	1~3	dB	0	0	-Infinity	3.5
Note 1:	Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 2:	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for						
	N_{oc} to be fulfilled.						
Note 3:	3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

The UE shall send L1-RSRP report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 4.6.4.1.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 4.6.4.1.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 4.6.4.1.5-4 for all test configurations.

Table 6.6.4.1.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.1.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	58
Highest reported value (SSB#1)	-	78

Table 6.6.4.1.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	-	0
Highest DIFF RSRP reported (SSB#0)	-	3

For the test to pass, the ratio of successful reported values for each requirement (R1 to R4) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.4.2 NR SA FR1 SSB-based L1-RSRP measurement in DRX

6.6.4.2.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

6.6.4.2.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

6.6.4.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.2.

6.6.4.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.2.4.1-2. Test environment parameters are given in Table 6.6.4.2.4.1-3.

Table 6.6.4.2.4.1-1: SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description	
6.6.4.2-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
6.6.4.2-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
6.6.4.2-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note: The UE is only	required to be tested in one of the supported test configurations	

Table 6.6.4.2.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52
	2 MHz 3 1 2 3 1 2 3 1 2 3 3		40: N _{RB,c} = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
channel	3		SR.2.1 TDD
DMSLCODESET Deference	1		CR.1.1 FDD
RMSI CORESET Reference	2		CR.1.1 TDD
Channel	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
Channel	1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration			SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BWP Configuration	1 2		DLBWP.0.1
	1~3		ULBWP.0.1
Dedicated BWP configuration	1.3		DLBWP.1.1
	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
	1		TRS.1.1 FDD
TRS Configuration			TRS.1.1 TDD
	3		TRS.1.2 TDD

DRX configuration	1~3		DRX.3
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	1
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS	1~3	dB	0
EPRE ratio of PDSCH DMRS to	1~3	uБ	0
SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS ^{Note 1}			
EPRE ratio of OCNG to OCNG			
DMRS Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such t			
total transmitted power spe	ctral density	is achieved for a	all OFDM symbols.

Table 6.6.4.2.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

Parameter		Value	Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.		
Channel	As specified	by the test configuration selected fr	om Table 4.6.3.1.4.1-1.
bandwidth			
Propagation	AWGN		As specified in Annex C.2.2.
conditions			
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to	For 4Rx capable UEs without any 2 Rx RF		
connection	bands use A.3.2.5.2 for DUT part and		
diagram	A.3.1.8.4 for TE Part		

- 1. Message contents are defined in clause 6.6.4.2.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.2.4.1-2 and 6.6.4.2.5-1. UE is configured to perform RLM and BFD based on the SSBs. DRX is configured as specified in Table 6.6.4.2.4.1-2.

6.6.4.2.4.2 Test procedure

Same test procedure as in subclause 6.6.4.1.4.2 with tables 6.6.4.1.4.1-2 and 6.6.4.1.5-1 replaced by tables 6.6.4.2.4.1-2 and 6.6.4.2.5-1.

6.6.4.2.4.3 Message contents

Same message content as in subclause 6.6.4.1.4.3 with the following exception:

Table 6.6.4.2.4.3-1: Common Exception messages EN-DC SSB based L1-RSRP measurement in DRX

Default Message Contents				
Common contents of system information blocks exceptions				
Default RRC messages and information elements contents exceptions	Table H.3.7-1 with condition DRX.3			

6.6.4.2.5 Test requirement

Table 6.6.4.2.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.2.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	SS	B#0	SSB#1		
Parameter	Config	Unit	T1	T2	T1	T2	
N_{oc} Note2	1~3	dBm/15kHz	-94.65				
N_{oc} Note2	1,2	dBm/SSB SCS	-94.6			5	
I V _{oc}	3 -91.65						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	1~3	dB	0	0	-Infinity	3.5	
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.65	-94.65	-Infinity	-91.15	
	3		-91.65	-91.65	-Infinity	-88.14	
lo Note3	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59	
10 1000	3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49	
\hat{E}_s/N_{oc}	1~3	dB	0	0	-Infinity	3.5	
Note 1:The resources for uplink transmission are assigned to the UE prior to the start of time period T2.Note 2:Interference from other cells and noise sources not specified in the test is assumed to be constant							
over su	over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be						
Note 3: SS-RS	fulfilled. Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

The UE shall send L1-RSRP report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.2.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.2.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.2.5-4 for all test configurations.

Table 6.6.4.2.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.2.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	58
Highest reported value (SSB#1)	-	78

Table 6.6.4.2.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	-	0
Highest DIFF RSRP reported (SSB#0)	-	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.4.3 NR SA FR1 CSI-RS-based L1-RSRP measurement in non-DRX

6.6.4.3.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in non-DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

6.6.4.3.2 Test applicability

This test applies to all types of NR UE release 15 and forward.

6.6.4.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.3.

6.6.4.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.3.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.3.4.1-2. Test environment parameters are given in Table 6.6.4.3.4.1-3.

Table 6.6.4.3.4.1-1:NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description
6.6.4.3-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
6.6.4.3-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
6.6.4.3-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note: The UE is only	required to be tested in one of the supported test configurations

Table 6.6.4.3.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
	3		SR.2.1 TDD

	4		
	1		CR.1.1 FDD
RMSI CORESET Reference Channel	2		CR.1.1 TDD
	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
	1		CSI-RS 1.3 FDD
CSI-RS configuration	2		CSI-RS 1.3 TDD
	3		CSI-RS 2.3 TDD
OCNG Patterns	1~3		OP.1
	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
-	3		TRS.1.2 TDD
Initial DMD Configuration	4.0		DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated DW/D configuration	4.0		DLBWP.1.1
Dedicated BWP configuration	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
DRX configuration	1~3		Off
reportConfigType	1~3		aperiodic
reportQuantity	1~3		cri-RSRP
Number of reported RS	1~3		2
qcl-Info	1~3		SSB#0 for resource#0
	1~5		SSB#1 for resource#1
reportSlotOffsetList	1~3	slots	8
T1	1~3	S	5
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH DMRS			
EPRE ratio of PDCCH DMRS to SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS			
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	0
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS ^{Note 1}			
EPRE ratio of OCNG to OCNG DMRS			
Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such that			
total transmitted power spectral density is achieved for all OFDM symbols.			

Table 6.6.4.3.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement
--

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel	As specified by the test configuration selected from Table 4.6.3.1.4.1-1.			
bandwidth				
Propagation	AWGN		As specified in Annex C.2.2.	
conditions				
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to	For 4Rx capable UEs without any 2 Rx RF			
connection	bands use A.3.2.5.2 for DUT part and			
diagram	A.3.1.8.4 for	TE Part		

- 1. Message contents are defined in clause 6.6.4.3.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.3.4.1-2 and 6.6.4.3.5-1. UE is configured to perform RLM and BFD based on the SSBs.

6.6.4.3.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-RSRP on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-RSRP based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in table 6.6.4.3.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.4.3.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 0 for configuration 1,2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
 - R1: the UE shall send L1-RSRP report at slot 8 from the reception of DCI trigger. If the report is received at slot 8 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
 - R2: The L1-RSRP value of CSI-RS#1 reported by the UE is compared to the expected L1-RSRP value for CSI-RS #1. If the resulting value is outside the limits in Table 4.6.4.3.5-2 for test configurations 1, 2, 4 and 5 and in Table 4.6.4.3.5-3 for test configurations 3 and 6 or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
 - -R3: The DIFF RSRP value of CSI-RS #0 reported by the UE is compared to the expected DIFF RSRP value. If the resulting value is outside the limits in Table 4.6.4.3.5-4 or the UE fails to report the measurement value for CSI-RS #0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.
- 5. Void.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release On and Test Mode On according to TS 38.508-1 [14] clause 4.5.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.4.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.3.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6-2 with conditions APERIODIC and CSI-RSRP		
elements contents exceptions	Table H.3.6-3 with conditions CSI-RS and APERIODIC		
	TS 38.508-1 [14] Table 7.3.1-21 with condition APERIODIC		

Table 6.6.4.3.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133						
Information Element	Value/remark	Comment	Condition			
RadioLinkMonitoringConfig ::= SEQUENCE {						
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry					
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.				
}						
}						

6.6.4.3.5 Test requirement

Table 6.6.4.3.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.3.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1		
$N_{oc}^{\rm Note1}$	1~3	dBm/15kHz	-94.65			
N_{ac}^{Note1}	1,2	dBm/SSB SCS	-94.65			
IV _{oc}	3	UDIII/358 3C3	-91.65			
\hat{E}_{s}/I_{ot}	1~3	dB	0	3.5		
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.15		
Note2	3		-91.65	-88.14		
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.59		
10	3	dBm/38.16 MHz	-57.59	-55.49		
\hat{E}_{s}/N_{oc}	1~3	1~3 dB 0 3.5				
Note 1: Void Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.						
Note 3: CSI-RS RSRP and to levels have been derived from other parameters for information						

Note 3: CSI-RS RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

After 80ms from the beginning of the test, the UE shall send L1-RSRP report at slot 8 from the reception of DCI triggering the L1-RSRP measurement. The L1-RSRP report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.3.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.3.5-3 for

test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.3.5-4 for all test configurations.

Table 6.6.4.3.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

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Normal Conditions	T1
Lowest reported value (CSI-RS#1)	55
Highest reported value (CSI-RS#1)	75

Table 6.6.4.3.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	58
Highest reported value (CSI-RS#1)	78

Table 6.6.4.3.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF RSRP reported (CSI- RS#0)	0
Highest DIFF RSRP reported (CSI- RS#0)	3

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement

reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.4.4 NR SA FR1 CSI-RS-based L1-RSRP measurement in DRX

6.6.4.4.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

6.6.4.4.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

6.6.4.4.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.4.

6.6.4.4.4 Test description

6.6.4.4.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.4.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.4.1-2. Test environment parameters are given in Table 6.6.4.4.1-3.

Table 6.6.4.4.4.1-1: NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description		
6.6.4.4-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
6.6.4.4-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
6.6.4.4-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode		
Note: The UE is only required to be tested in one of the supported test configurations			

Parameter	Config	Unit	Value			
SSB GSCN	1~3		freq1			
Duplex mode	1		FDD			
	2	1	TDD			
	3		TDD			
TDD Configuration	1		N/A			
	2		TDDConf.1.1			
	3		TDDConf.2.1			
BW _{channel}	1	MHz	10: N _{RB,c} = 52			
	2		10: N _{RB,c} = 52			
	3		40: N _{RB,c} = 106			
PDSCH Reference measurement	1		SR.1.1 FDD			
channel	2		SR.1.1 TDD			
	3		SR.2.1 TDD			
RMSI CORESET Reference Channel	1		CR.1.1 FDD			
	2		CR.1.1 TDD			
	3		CR.2.1 TDD			
Dedicated CORESET Reference	1		CCR.1.1 FDD			
Channel	2		CCR.1.1 TDD			
Channer	3		CCR.2.1 TDD			
SSB configuration	1		SSB.3 FR1			
	2		SSB.3 FR1 SSB.3 FR1			
	3		SSB.3 FR1 SSB.4 FR1			
CSI-RS configuration	1		CSI-RS 1.3 FDD			
	2		CSI-RS 1.3 TDD			
0010 5 //	3		CSI-RS 2.3 TDD			
OCNG Patterns	1~3		OP.1			
TRS Configuration	1		TRS.1.1 FDD			
	2		TRS.1.1 TDD			
	3		TRS.1.2 TDD			
Initial BWP Configuration	1~3		DLBWP.0.1 ULBWP.0.1			
Dedicated BWP configuration	1~3		DLBWP.1.1 ULBWP.1.1			
SMTC configuration	1~3		SMTC.1			
DRX configuration	1~3		DRX.3			
	1~3					
reportConfigType reportQuantity	1~3		aperiodic cri-RSRP			
			0			
Number of reported RS	1~3		2			
qcl-Info	1~3		SSB#0 for resource#0			
	1.0		SSB#1 for resource#1			
reportSlotOffsetList	1~3	slots	8			
T1	1~3	S	5			
EPRE ratio of PSS to SSS	1~3	dB	0			
EPRE ratio of PBCH DMRS to SSS						
EPRE ratio of PBCH to PBCH DMRS						
EPRE ratio of PDCCH DMRS to SSS						
EPRE ratio of PDCCH to PDCCH						
DMRS						
EPRE ratio of PDSCH DMRS to SSS						
EPRE ratio of PDSCH to PDSCH DMRS						
EPRE ratio of OCNG DMRS to	1					
SSS ^{Note 1} EPRE ratio of OCNG to OCNG DMRS Note 1						
	4.0		ΔΙΔΙΩΝΙ			
Propagation condition Note 1: OCNG shall be used such that	1~3	oro fully alla	AWGN			
total transmitted power spectral density is achieved for all OFDM symbols.						

Table 6.6.4.4.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Value		Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.
Channel	As specified	by the test configuration selected fr	rom Table 4.6.3.1.4.1-1.
bandwidth			
Propagation	AWGN		As specified in Annex C.2.2.
conditions			
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to	For 4Rx capable UEs without any 2 Rx RF		
connection	bands use A.3.2.5.2 for DUT part and		
diagram	A.3.1.8.4 for	TE Part	

Table 6.6.4.4.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

- 1. Message contents are defined in clause 6.6.4.4.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.4.1-2 and 6.6.4.4.5-1. UE is configured to perform RLM and BFD based on the SSBs.

6.6.4.4.4.2 Test procedure

Same test procedure as in subclause 6.6.4.3.4.2 with tables 6.6.4.3.4.1-2 and 6.6.4.3.5-1 replaced by tables 6.6.4.4.1-2 and 6.6.4.4.5-1.

6.6.4.4.3 Message contents

Same message content as in subclause 6.6.4.3.4.3 with the following exception:

Table 6.6.4.4.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.7-1 with condition DRX.3		
elements contents exceptions			

6.6.4.4.5 Test requirement

Table 6.6.4.4.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.4.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1
$N_{\scriptscriptstyle oc}$ Note1	1~3	dBm/15kHz	-94.65	
No. Note1	Note1 1,2 dBm/SSB SCS		-94.65	
1 ° oc	3		-91.65	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	1~3	dB	0	3.5
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.15
Note2	3		-91.65	-88.14
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.59
	3	dBm/38.16 MHz	-57.59	-55.49

\hat{E}_{s}/N_{od}	c	1~3	dB	0	3.5
Note 1:	Void				
Note 2:	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for				
N_{oc} to be fulfilled.					
Note 3:			els have been derived fro ettable parameters thems	•	or information

After 80ms from the beginning of the test, the UE shall send L1-RSRP report at slot 8 from the reception of DCI triggering the L1-RSRP measurement. The L1-RSRP report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.4.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.4.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.4.5-4 for all test configurations.

Table 6.6.4.4.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	55
Highest reported value (CSI-RS#1)	75

Table 6.6.4.4.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	58
Highest reported value (CSI-RS#1)	78

Table 6.6.4.4.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF RSRP reported (CSI- RS#0)	0
Highest DIFF RSRP reported (CSI- RS#0)	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.4.5 NR SA FR1 SSB-based L1-RSRP measurement in DRX for UE configured with highSpeedMeasFlag-r16

6.6.4.5.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements for UE configured with highSpeedMeasFlag-r16 in TS 38.133 clause 9.5.4.1

6.6.4.5.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1, measurement enhancements in high speed scenario and long DRX cycle

6.6.4.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.5.

6.6.4.5.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.5.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.5.4.1-2. Test environment parameters are given in Table 6.6.4.5.4.1-3.

Table 6.6.4.5.4.1-1: SA SSB based L1-RSRP measurement supported test configurations for UE configured with highSpeedMeasFlag-r16

Test Case ID	Description	
6.6.4.5-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
6.6.4.5-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
6.6.4.5-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note: The UE is only required to be tested in one of the supported test configurations		

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
Duplex mode	1		FDD
•	2		TDD
	3		TDD
TDD Configuration	1		N/A
	2		TDDConf.1.1
	3		TDDConf.2.1
BWchannel	1	MHz	10: N _{RB,c} = 52
	2		$10: N_{RB,c} = 52$ 10: N _{RB,c} = 52
	3		$40: N_{RB,c} = 32$
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		
Channel			SR.1.1 TDD
	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2		CR.1.1 TDD
	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
	3		CCR.2.1 TDD
SSB configuration	1		SSB.3 FR1
	2		SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BWP Configuration	1~3		DLBWP.0.1
and a second second			ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1
Dealeated Diff. Configuration	. 0		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
TRS Configuration	1~0		TRS.1.1 FDD
TKS Configuration	2		TRS.1.1 TDD
DRX configuration	3 1~3		TRS.1.2 TDD DRX.3
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	2
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS			
EPRE ratio of PDSCH DMRS to	1~3	dB	0
SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to	4		
SSS ^{Note 1}			
	4		
EPRE ratio of OCNG to OCNG			
DMRS Note 1			
Propagation condition	1~2		AWGN 1944 Hz
riopagation condition			
Note 1: OCNG shall be used such t	3		AWGN 3334 Hz

Table 6.6.4.5.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement for UE configured with highSpeedMeasFlag-r16

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified by the test configuration selected from Table 6.6.4.5.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2 with n=1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 with n=1 for TE Part			

Table 6.6.4.5.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

- 1. Message contents are defined in clause 6.6.4.5.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in Table 6.6.4.5.4.1-2 and 6.6.4.5.5-1. UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. DRX is configured as specified in Table 6.6.4.5.4.1-2.

6.6.4.5.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.6.4.5.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.4.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.4.1.5-1. T1 starts.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in 6.6.4.1.5-1. T2 starts.
- 5. If the UE sends L1-RSRP reports meeting the corresponding absolute accuracy requirements in Table 6.6.4.5.5-2 for test configurations 1 and 2 the corresponding absolute accuracy requirements in Table 6.6.4.5.5-3 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.4.5.5-4 for all test configurations every 80 slots from no later than 1920 ms plus 80 slots for all configurations from the beginning of time period T2 until the end of time period T2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 8. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.4.5.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.5.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents			
Common contents of system information	Table H.2.1-3 with Condition HighSpeedMeas		
blocks exceptions			
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP		
elements contents exceptions	Table H.3.6-3 with conditions SSB		
	Table H.3.7-1 with condition DRX.3		

Table 6.6.4.5.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

6.6.4.5.5 Test requirement

Parameter	Config	Unit	SSB#0 SSB#1		B#1	
	_		T1	T2	T1	T2
$N_{_{oc}}$ Note2	1~3	dBm/15kHz		-94.6		
N_{oc} Note2	1,2	dBm/SSB SCS		-94	.65	
	3			-91	.65	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	0	-Infinity	3.53
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.65	-94.65	-Infinity	-91.15
	3		-91.65	-91.65	-Infinity	-88.14
lo Note3	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59
	3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49
$\hat{E}_{_s}/N_{_{oc}}$	1~3	dB	0	0	-Infinity	3.5
Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for						
$N_{\scriptscriptstyle oc}$ to be fulfilled.						
Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

The UE shall send L1-RSRP report every 80 slots. No later than 1920ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.5.5-2 for for test configurations 1 and 2 and the

corresponding absolute accuracy requirements in Table 6.6.4.5.5-3 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.4.5.5-4 for all test configurations.

Table 6.6.4.5.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.5.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	58
Highest reported value (SSB#1)	-	78

Table 6.6.4.5.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	-	0
Highest DIFF RSRP reported (SSB#0)	-	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.5 UTRAN inter-RAT measurement

6.6.5.1 NR SA FR1 – UTRAN event-triggered reporting in non-DRX

6.6.5.1.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 under the cell search and measurement requirements.

6.6.5.1.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 from Release 16 onwards and support UTRA FDD.

6.6.5.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.3.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.5.1.

- 6.6.5.1.4 Test description
- 6.6.5.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.5.1.4.1-1.

Table 6.6.5.1.4.1-1: supported test configurations

Test Case ID	Description
6.6.5.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, UTRAN FDD
6.6.5.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, UTRAN FDD
6.6.5.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, UTRAN FDD
NOTE: The L	IE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.5.1.4.1-2 and Table 6.6.5.1.4.1-3.

Table 6.6.5.1.4.1-2: Initial conditions for SA inter-RAT UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, Table E.4-3 and TS 3	38.508-1 [14] sclause 4.3.1.	
Channel bandwidth	As specified	ecified by the test configuration selected from Table 6.6.5.1.5-1 and Table 6.6.5.1.5-2.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	UE Part	A.3.2.3.2		
Exceptions to connection diagram	SS LTE in Figure A.3.1.8.2 is replaced by SS UTRA LTE TX/RX in Figure A.3.2.3.2 is replaced by UTRA TX/RX			

Table 6.6.5.1.4.1-3: General test parameters for SA inter-RAT UTRAN FDD event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Value	Comment		
NR RF Channel Number		1	1 NR carrier frequency is used in the test		
UTRA RF Channel		2	1 UTRA carrier frequency is used in the test		
Number					
Channel Bandwidth	MHz	As specified in Table			
		6.6.5.1.5-1 and Table			
		6.6.5.1.5-2			
Active cell		Cell 1	Cell 1 is on RF channel number 1		
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2		
Gap Pattern Id		0	As specified in Clause Table FFS Per-UE		
			gap pattern.		
Inter-RAT UTRA		CPICH Ec/lo	Measurement quantity for Cell 2		
measurement quantity					
b1-ThresholdUTRA-FDD	dB	-16.5	CPICH Ec/lo threshold for SS-RSRP		
			measurement on cell1 for event B1		
Hysteresis	dB	0			
TimeToTrigger	S	0			
Filter coefficient		0	L3 filtering is not used		
DRX		OFF	OFF		
T1	S	5			
T2	S	5			
Note 1: Values are defined in Table A.6.6.5.1.1-3					

- 1. Message contents are defined in clause 6.6.5.1.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT UTRAN inter-RAT neighbour cell. Cell 1 is configured according to Annex C.1.1 and C.1.2, Cell 2 is configured according to TS 36.521-3 Annex C.0 and C.1.

6.6.5.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.5.1.5-1 and 6.6.5.1.5-2. Propagation conditions are set according to Annex C clause C.2.2.T1 starts.
- 3. SS shall transmit an *RRCReconfiguration* message to confogure Event B1 measurement reporting.

- 4. The UE shall transmit an *RRCReconfigurationComplete* message.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.5.1.5-1 and 6.6.5.1.5-2.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6 or when T2 expires, the SS shall:
 - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code 50) mod 200 + 100) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC_CONNECTED according to TS 38.508-1 [14] clause 4.5.4 (if the paging fails, switches off and on the UE and ensures the UE is in the state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5,

OR - if the device has been switched

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10.Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.5.1.4.3 Message contents

Table 6.6.5.1.4.3-1: RRCReconfiguration (Step 3)

Derivation Path: TS 38.508-1 [14] Table 4.6.1-13 with condition NR_MEAS						
Information Element	Value/remark	Comment	Condition			
RRCReconfiguration ::= SEQUENCE {						
criticalExtensions CHOICE {						
rrcReconfiguration SEQUENCE {						
measConfig	MeasConfig	Table 6.6.5.1.4.3-				
		2				
}						
}						
}						

Derivation Path: Table H.3.1-2 with condition INTER-RA	AT and GAP NEEDED		
Information Element	Value/remark	Comment	Condition
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE	2 entries		
(1maxNrofMeasId)) OF MeasObjectToAddMod {			
MeasObjectToAddMod[1] SEQUENCE {		entry 1	
measObjectId	1		
measObject CHOICE {			
measObjectNR	MeasObjectNR- DEFAULT specified in Table H.3.1-3 with condition INTRA-FREQ MO		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {		entry 2	
measObjectId	2		
measObject CHOICE {			
measObjectUTRA-FDD-r16	MeasObjectUTRA-FDD	Table 6.6.5.1.4.3- 3	
}			
}			
}			
reportConfigToAddModList SEQUENCE (SIZE (1maxReportConfigId)) OF ReportConfigToAddMod	1 entry		
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigId	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT(<i>16</i>) specified in 38.508-1 [14] Table 4.6.3-141 with condition EVENT_B1_UTRA	Actual value of UTRA threshold = (16-49)/2 = - 16.5dB	
}			
}			
}			
measGapConfig	MeasGapConfig specified in Table H.3.1-6 with condition gapUE and Pattern #0		
}			

Table 6.6.5.1.4.3-2: MeasConfig (Table 6.6.5.1.4.3-1)

Table 6.6.5.1.4.3-3: MeasObjectUTRA-FDD (Table 6.6.5.1.4.3-2)

Derivation Path: TS 38.508-1 [14], Table 4.6.3-77A			
Information Element	Value/remark	Comment	Condition
MeasObjectUTRA-FDD-r16 ::= SEQUENCE {			
carrierFreq-r16	ARFCN-ValueUTRA-		
	FDD-r16 for UTRA Cell 2		
}			

Derivation Path: TS 38.508-1 [14], Table 4.6.1-5A					
Information Element	Value/remark	Comment	Condition		
MeasurementReport ::= SEQUENCE {					
criticalExtensions CHOICE {					
measurementReport SEQUENCE {					
measResults	MeasResults	Table 6.6.5.1.4.3-			
		5			
}					
}					
}					

Table 6.6.5.1.4.3-4: MeasurementReport (Step 6)

Table 6.6.5.1.4.3-5: MeasResults (Table 6.6.5.1.4.3-4)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-79 with condition B1_UTRA					
Information Element	Value/remark	Comment	Condition		
MeasResults ::= SEQUENCE {					
measResultNeighCells CHOICE {					
measResultListUTRA-FDD-r16 SEQUENCE (SIZE	1 entry				
(1maxCellReport)) OF MeasResultUTRA-FDD-r16 {					
MeasResultUTRA-FDD-r16[1] SEQUENCE {		entry 1			
physCellId-r16	PhysCellIdUTRA-FDD-				
	r16 of UTRA Cell 2				
measResult-r16 SEQUENCE {					
utra-FDD-EcN0-r16	INTEGER (049)				
}					
}					
}					
}					
}					

6.6.5.1.5 Test requirement

Table 6.6.5.1.5-1 and Table 6.6.5.1.5-2 define the primary level settings including test tolerances for all tests.

Table 6.6.5.1.5-1: PCell specific test parameters for SA inter-RAT UTRA FDD event triggered reporting in non-DRX with PCell in FR1

Parar	neter	Unit	Configuration		ell 1
				T1	T2
RF channel number			1, 2, 3		1
Duplex mode			1, 2, 3	F	DD
TDD Configuration	SCS=15 KHz		2	TDD	Conf.1.1
· • • · · · · · · · · · ·	SCS=30 KHz		3		Conf.1.2
BW _{channel}		MHz	1		= 52 (FDD)
			2		= 52 (TDD)
			3		= 106 (TDD)
PDSCH reference m channel	easurement		1		.1 FDD
			2	SR.1	.1 TDD
			3		2.1 TDD
CORSET reference	channel		1		.1 FDD
			2		.1 TDD
			3		2.1 TDD
BWP	Initial DL BWP		1, 2, 3		WP.0.1
configurations			.,_,_		
	Dedicated DL BWP		1, 2, 3	DLB	WP.1.1
	Initial UL BWP		1, 2, 3	LII B	WP.0.1
	Dedicated UL		1, 2, 3		WP.1.1
	BWP		1, 2, 3	ULD	VVF.I.I
OCNG pattern ^{Note1}			1, 2, 3)P.1
SMTC configuration			1, 2, 3		ITC.1
SSB configuration			1, 2		5.1 FR1
			3	SSB	3.2 FR1
CSI-RS for tracking			1	TRS.	1.1 FDD
			2	TRS.	1.1 TDD
			3	TRS.	1.2 TDD
EPRE ratio of PSS to SSS		dB	1, 2, 3		0
EPRE ratio of PBCH_DMRS to SSS					
EPRE ratio of PBCH to PBCH_DMRS					
EPRE ratio of PDCC					
EPRE ratio of PDCC	H to				
PDCCH_DMRS					
EPRE ratio of PDSC					
EPRE ratio of PDSC	H to				
PDSCH_DMRS		-			
EPRE ratio of OCNO					
EPRE ratio of OCNO	G to OCNG DMRS				
Noc ^{Note2}		dBm/15 KHz	1, 2, 3		106
Noc ^{Note2}		dBm/SCS	1, 2		106
Ê AL			3		103
Ês/Noc		dB	1, 2, 3	18	-2
Ê _s /I _{ot} ^{Note3}		dB	1, 2, 3	18	-2
SS-RSRP ^{Note3}		dBm/SCS	1, 2	-88	-108
			3	-85	-105
SSB_RP ^{Note3}		dBm/SCS	1, 2	-88	-108
lo ^{Note3}		dDm/0.00 MUL	3	-85	-105
10.000		dBm/9.36 MHz	1, 2 3	-59.98	-75.92
		dBm/38.16 MHz	3	-53.88	-69.82
Propagation conditio	n		1, 2, 3	ETI	DLA30
Antenna Configuratio			1, 2, 3 1, 2, 3		2 Low
Matrix Note 1: OCNG sh	all be used such that	both cells are fully	allocated and a cons	stant total trans	mitted power
spectral d	ensity is achieved for	all OFDM symbols	S.		
Note 2: Interferen	ce from other cells an	d noise sources n	ot specified in the tes		
subcarrier	rs and time and shall	be modelled as AV	vGN of appropriate p	ower for N_{oc} f	to be fulfilled.
Note 3: Ês/Iot, SS-	RSRP, SSB_RP and	lo levels have bee	en derived from other	parameters for	information
	They are not settable				
		•			

Table 6.6.5.1.5-2: UTRAN neighbour cell specific test parameters for SA inter-RAT UTRAN FDD event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Cell 2		
		T1	T2	
UTRA RF Channel Number		2		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.941		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8	
I _{oc} dBm/3.84 -70 MHz				
CPICH_Ec/lo	dB	-Infinity	-14	
Propagation Condition	Propagation Condition AWGN			
Note 1: The DPCH level is controlled by the power control loop.				
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to				
l _{or} .				

The UE shall send one Event B1 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 2.4s from the start of period T2, i.e. when Cell 2 becomes detectable. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

6.6.6 to 6.6.7

6.6.8 L1-SINR measurement for beam reporting

6.6.8.0 Minimum conformance requirements

6.6.8.0.1 L1-SINR reporting with CSI-RS based CMR and no dedicated IMR configured

Same as clause 4.6.7.0.1

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.1 and 9.8.5.2.

6.6.8.0.2 L1-SINR reporting with SSB based CMR and dedicated IMR configured

Same as clause 4.6.7.0.2

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.2 and 9.8.5.

6.6.8.0.3 L1-SINR reporting with CSI-RS based CMR and dedicated IMR configured

Same as clause 4.6.7.0.3

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.3 and 9.8.5.

6.6.8.1 NR SA FR1 CSI-RS based CMR and no dedicated IMR L1-SINR measurement in DRX

6.6.8.1.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.1.

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6.6.8.1.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement and long DRX cycle.

6.6.8.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.1.

6.6.8.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.1.4.1-2. Test environment parameters are given in Table 6.6.8.1.4.1-3.

Table 6.6.8.1.4.1-1: NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement supported test configurations

	Config	Description		
	1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
	2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
	3 NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode			
Note:	Note: The UE is only required to be tested in one of the supported test configurations			

Parameter Config Unit Value SSB GSCN 1~3 freq1 FDD 1 Duplex mode 2 TDD 3 TDD N/A 1 TDDConf.1.1 **TDD** Configuration 2 3 TDDConf.2.1 1 10: N_{RB,c} = 52 **BW**_{channel} 2 MHz 10: N_{RB.c} = 52 3 40: N_{RB.c} = 106 1 SR.1.1 FDD **PDSCH Reference measurement** 2 SR.1.1 TDD channel SR.2.1 TDD 3 CR.1.1 FDD 1 CR.1.1 TDD **RMSI CORESET Reference Channel** 2 CR.2.1 TDD 3 CCR.1.1 FDD 1 **Dedicated CORESET Reference** 2 CCR.1.1 TDD Channel 3 CCR.2.1 TDD 1 SSB.3 FR1 SSB configuration 2 SSB.3 FR1 3 SSB.4 FR1 CSI-RS 1.3 FDD 1 **CSI-RS** configuration 2 CSI-RS 1.3 TDD 3 CSI-RS 2.3 TDD **OCNG** Patterns 1~3 OP.1 TRS.1.1 FDD 1 TRS.1.1 TDD **TRS** Configuration 2 3 TRS.1.2 TDD DLBWP.0.1 Initial BWP Configuration 1~3 ULBWP.0.1 DLBWP.1.1 **Dedicated BWP configuration** 1~3 ULBWP.1.1 SMTC configuration 1~3 SMTC.1 DRX configuration DRX.3 1~3 reportConfigType 1~3 aperiodic reportQuantity-r16 1~3 cri-SINR-r16 Number of reported RS 1~3 2 SSB#0 for resource#0 qcl-Info 1~3 SSB#1 for resource#1 reportSlotOffsetList 1~3 slots 26 Τ1 1~3 5 s EPRE ratio of PSS to SSS EPRE ratio of PBCH DMRS to SSS EPRE ratio of PBCH to PBCH DMRS EPRE ratio of PDCCH DMRS to SSS EPRE ratio of PDCCH to PDCCH DMRS EPRE ratio of PDSCH DMRS to SSS 1~3 dB 0 EPRE ratio of PDSCH to PDSCH DMRS EPRE ratio of OCNG DMRS to SSS^{Note 1} EPRE ratio of OCNG to OCNG DMRS Note 1 1~3 AWGN Propagation condition Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table 6.6.8.1.4.1-2: General test parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Table 6.6.8.1.4.1-3: Test Environment parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	by the test configuration selected from Table 6.6.8.1.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram		able UEs without any 2 Rx RF 3.2.5.2 for DUT part and TE Part		

- 1. Message contents are defined in clause 6.6.8.1.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.1.4.1-2 and 6.6.8.1.5-1. UE is configured to perform RLM and BFD based on the SSBs.

6.6.8.1.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-SINR on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-SINR based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in Table 6.6.8.1.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.8.1.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 1 for configuration 1, 2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
 - R1: the UE shall send L1-SINR report at slot 26 from the reception of DCI trigger. If the report is received at slot 26 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
 - R2: The L1-SINR value of CSI-RS#1 reported by the UE is compared to the expected L1-SINR value for CSI-RS#1. If the resulting value is outside the limits in Table 6.6.8.1.5-2 for all test configurations or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
 - R3: The DIFF SINR value of CSI-RS #0 reported by the UE is compared to the expected DIFF SINR value. If the resulting value is outside the limits in Table 6.6.8.1.5-4 or the UE fails to report the measurement value for CSI-RS#0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.
- 5. If after T1 expiry no report is received or received report did not contain L1-SINR of both CSI-RS#0 and CSI-RS#1 or UE sent the L1-SINR report at different slot than 26 from the reception of DCI trigger, the number of 'failed' iterations is increased by one, otherwise, the number of 'passed' iterations is increased by one.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on

the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.8.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.1.4.3-1: Common Exception messages NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6A-1 with conditions APERIODIC and CSI-SINR		
elements contents exceptions Table H.3.6A-2 with conditions CSI-RS and APERIODIC			
-	Table H.3.7-1 with condition DRX.3		

Table 6.6.8.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133					
Information Element	Value/remark	Comment	Condition		
RadioLinkMonitoringConfig ::= SEQUENCE {					
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry				
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.			
}					
}					

6.6.8.1.5 Test requirement

Table 6.6.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1	
N_{oc} Note1	1~3	dBm/15kHz	-94	.65	
N Note1	1,2		-94	.65	
N_{oc} Note1	3	dBm/SSB SCS	-91	.65	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	1~3	dB	0	3	
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.65	
Note3	3	ubiii/338 303	-91.65	-88.65	
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.93	
10	3	dBm/38.16 MHz	-57.59	-55.84	
\hat{E}_s/N_{oc}	1~3	dB	0 3		
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for					
N _{oc} t	$N_{_{ m oc}}$ to be fulfilled.				
	Note 3: CSI-RS RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 6.6.8.1.5-1: CSI-RS specific test parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

After 80ms from the beginning of the test, the UE shall send L1-SINR report at slot 26 from the reception of DCI triggering the L1-SINR measurement. The L1-SINR report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.1.5-2 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.1.5-4 for all test configurations.

Table 6.6.8.1.5-2: L1-SINR absolute accuracy requirements for the reported values for all test configurations

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	41
Highest reported value (CSI-RS#1)	64

Table 6.6.8.1.5-3: Void

Table 6.6.8.1.5-4: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF SINR reported (CSI- RS#0)	0
Highest DIFF SINR reported (CSI- RS#0)	7

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others..

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.8.2 NR SA FR1 SSB based CMR and dedicated IMR L1-SINR measurement in non-DRX

6.6.8.2.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in non-DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.2.

6.6.8.2.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement.

6.6.8.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.2.

6.6.8.2.4 Test description

6.6.8.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.2.4.1-2. Test environment parameters are given in Table 6.6.8.2.4.1-3.

Table 6.6.8.2.4.1-1: NR SA SSB based CMR and dedicated IMR L1-SINR measurement supported test configurations

Config Description		Description		
	1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
2		NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
	3 NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode			
Note:	Note: The UE is only required to be tested in one of the supported test configurations			

Table 6.6.8.2.4.1-2: General test parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106
	1		SR.1.1 FDD
PDSCH Reference measurement channel	2		SR.1.1 TDD
Channel	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2		CR.1.1 TDD
Channer	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
Channel	3		CCR.2.1 TDD
	С		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
C .	3		SSB.4 FR1
	1		CSI-RS 1.1A FDD
CSI-RS configuration	2		CSI-RS 1.1A TDD
een ne een genaaren	3		CSI-RS 2.1A TDD
OCNG Patterns	1~3		0P.1
			DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1 ULBWP.1.1
SMTC configuration	1~3		SMTC.1
	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
	3		TRS.1.2 TDD
DRX configuration	1~3		off
reportConfigType	1~3		periodic
reportQuantity-r16	1~3		ssb-Index-SINR- r16
Number of reported RS	1~3		2
L1-SINR reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	s	1
EPRE ratio of PSS to SSS		U U	
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
	1~3	dB	0
EPRE ratio of PDSCH DMRS to SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS EPRE ratio of OCNG DMRS to			
SSS ^{Note 1} EPRE ratio of OCNG to OCNG			
DMRS Note 1			
			A14/01/
Propagation condition Note 1: OCNG shall be used such t	1~3		AWGN

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 38	3.508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.8.2.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2 with n = 1TBD	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4TBD		
Exceptions to connection diagram	For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.5 for TE Part			

Table 6.6.8.2.4.1-3: Test Environment parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

- 1. Message contents are defined in clause 6.6.8.2.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.2.4.1-2, 6.6.8.2.5-1 and 6.6.8.2.5-2. UE is configured to perform RLM and BFD based on the SSBs.

6.6.8.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above Table 6.6.8.2.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-SINR measurement based on the SSBs.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.8.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2. T1 starts. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2. T2 starts. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 5. If the UE sends L1-SINR reports meeting the corresponding absolute accuracy requirements in Table 6.6.8.2.5-3 for test configurations 1 and 2 the corresponding absolute accuracy requirements in Table 6.6.8.2.5-4 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.8.2.5-5 for all test configurations every 80 slots from no later than 720 ms for configuration 1 and 2 and no later than 680 ms for configuration 3 from the beginning of time period T2 until the end of time period T2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one. The UE shall start sending valid L1-SINR reports. The SS shall check following requirements:
 - R1: the UE shall start to transmit valid reports no later than 720 ms for configuration 1,2 and no later than 680 ms for configuration 3 from the beginning of time period T2. A valid report shall meet the absolute L1-SINR requirement for SSB#1 (Table 6.6.8.2.5-3 for all configurations) and the relative L1-SINR requirement for SSB#0 in Table 6.6.8.2.5-5. If the first valid report is received earlier than the specified time, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
 - R2: the UE shall transmit reports every 80 slots until the end of time period T2. If the reports are received accordingly, the number of passed iterations for R2 is increased by one. Otherwise, the number of failed iterations for R2 is increased by one.
 - R3: The L1-SINR value of SSB#1 reported by the UE is compared to the expected L1-SINR value for SSB#1. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.8.2.5-3 for all configurations or the UE fails to report the measurement value for SSB#1, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.

- -R4: The DIFF SINR value of SSB#0 reported by the UE is compared to the expected DIFF SINR value. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table6.6.8.2.5-5 for all configurations or the UE fails to report the measurement value for SSB#0, the number of failed iterations for R4 is increased by one. Otherwise, the number of passed iterations for R4 is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 8. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.8.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.2.4.3-1: Common Exception messages NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Default Message Contents			
Common contents of system information blocks exceptions			
Default RRC messages and information elements contents exceptions	Table H.3.6A-1 with conditions PERIODIC and SS-SINR and CSI- RS_IMR Table H.3.6A-2 with conditions SSB and PERIODIC Table H.3.6A-3 with condition PERIODIC		

Table 6.6.8.2.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

6.6.8.2.5 Test requirement

Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2 define the primary level settings including test tolerances for all tests.

Deremeter	Config	Unit	SS	B#0	SSB#1		
Parameter	Config	Unit	T1	T2	T1	T2	
$N_{\scriptscriptstyle oc}$ Note2	1~3	dBm/15kHz		-94.65			
Note2	1,2			-94	.65	65	
N_{oc} Note2	3	dBm/SSB SCS		-91.65			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	1~3	dB	0.5	0.5	-Infinity	3	
SSB RSRP Note3	1,2	- dBm/SSB SCS	-94.15	-94.15	-Infinity	-91.65	
	3		-91.14	-91.14	-Infinity	-88.65	
In Note3	1,2	dBm/9.36 MHz	-63.43	-63.43	-66.70	-61.93	
10 1000	3	dBm/38.16 MHz	-57.33	-57.33	-60.61	-55.84	
\hat{E}_{s}/N_{oc}	1~3	dB	0.5	0.5	-Infinity	3	
Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time perior T2.			ne period				
Note 2: Interference from other cells and noise sources not specified in the test is assumed to constant over subcarriers and time and shall be modelled as AWGN of appropriate por							
N_{oc}	$N_{_{oc}}$ to be fulfilled.						
	SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

Table 6.6.8.2.5-1: SSB specific test parameters for NR SA SSB based CMR and dedicated IMR L1-**SINR** measurement

Table 6.6.8.2.5-2: CSI-RS specific test parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit -	CSI-	RS#0	CSI-RS#1	
Parameter	Config		T1	T2	T1	T2
N_{oc} Note2	1~3	dBm/15kHz		-94	.65	
N_{oc} Note2	1,2	dBm/CSI-RS SCS		-94	.65	
IV _{oc}	3	UDIII/CSI-KS 5C5		-91	.65	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	1~3	dB	0.5	0.5	-Infinity	3
CSI-RS RSRP	1,2	- dBm/CSI-RS SCS -	-94.15	-94.15	-Infinity	-91.65
Note3	3		-91.14	-91.14	-Infinity	-88.65
Io Note3	1,2	dBm/9.36 MHz	-63.43	-63.43	-66.70	-61.93
10 1000	3	dBm/38.16 MHz	-57.33	-57.33	-60.61	-55.84
\hat{E}_s/N_{oc}	1~3	dB	0.5	0.5	-Infinity	3
Note 1: The re T2.	sources for uplink	transmission are assigne	d to the UE	prior to the	e start of tin	ne period
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power filles.						
N _{oc} t	o be fulfilled.					
Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes They are not settable parameters themselves.				urposes.		

The UE shall send L1-SINR report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-SINR report including results of both SSB#0+CSI-RS#0 and SSB#1+CSI-RS#1. Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.2.5-3 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.2.5-4 for all test configurations.

Table 6.6.8.2.5-3: L1-SINR absolute accuracy requirements for the reported values for all test configurations

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	44
Highest reported value (SSB#1)	-	61

Table 6.6.8.2.5-4: Void

Table 6.6.8.2.5-5: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF SINR reported (SSB#0)	-	0
Highest DIFF SINR reported (SSB#0)	-	5

For the test to pass, the ratio of successful reported values for each requirement (R1 to R4) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others..

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.8.3 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR measurement in non-DRX

6.6.8.3.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in non-DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.3.

6.6.8.3.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement.

6.6.8.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.3.

- 6.6.8.3.4 Test description
- 6.6.8.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.3.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.3.4.1-2. Test environment parameters are given in Table 6.6.8.3.4.1-3.

Table 6.6.8.3.4.1-1: NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement supported test configurations

Config Description				
	1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
	2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
	3 NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode			
Note:	Note: The UE is only required to be tested in one of the supported test configurations			

Table 6.6.8.3.4.1-2: General test parameters for NR SA CSI-RS based CMR and dedicated IMR L1 SINR measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
3 1 1 1	3		TDDConf.2.1
	1		10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106
	1		SR.1.1 FDD
PDSCH Reference measurement	2		SR.1.1 TDD
channel	3		SR.2.1 TDD
	1		CR.1.1 FDD
RMSI CORESET Reference Channel	2		CR.1.1 TDD
	3		CR.2.1 TDD
	1		CCR.1.1 FDD
Dedicated CORESET Reference	2		CCR.1.1 TDD
Channel	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
SSB comgulation	3		SSB.4 FR1
	1		CSI-RS 1.3 FDD
CSI BS configuration	2		CSI-RS 1.3 TDD
CSI-RS configuration			
	3		CSI-RS 2.3 TDD
	2		CSI-IM.1.2 FDD
CSI-IM configuration			CSI-IM.1.2 TDD
	3		CSI-IM.2.2 TDD
OCNG Patterns	1~3		OP.1 TRS.1.1 FDD
TDO Orafianation	1		
TRS Configuration	2		TRS.1.1 TDD TRS.1.2 TDD
	_		DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1 ULBWP.1.1
SMTC configuration	1~3		SMTC.1
DRX configuration	1~3		Off
reportConfigType	1~3		aperiodic
reportQuantity-r16	1~3		cri-SINR-r16
Number of reported RS	1~3		2
	1~3		SSB#0 for resource#0
qcl-Info	1~3		SSB#1 for resource#1
reportSlotOffsetList	1~3	slots	26
T1	1~3	S	5
EPRE ratio of PSS to SSS			-
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH DMRS			
EPRE ratio of PDCCH DMRS to SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS			
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	0
EPRE ratio of PDSCH to PDSCH	1 -		-
DMRS			
EPRE ratio of OCNG DMRS to	1		
SSS ^{Note 1}	ļ		
EPRE ratio of OCNG to OCNG DMRS Note 1			
Propagation condition	1~3		AWGN
		are fully allo	
Note 1: OCNG shall be used such that	al Doin Cens		

Parameter	Value		Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	d in Annex E, Table E.2-1 and TS	38.508-1 [14] clause 4.3.1 and 4.4.2.
Channel bandwidth	As specified by the test configuration selected from Table 6.6.8.3.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to connection diagram	For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.5 for TE Part		

Table 6.6.8.3.4.1-3: Test Environment parameters for NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

- 1. Message contents are defined in clause 6.6.8.3.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.3.4.1-2 and 6.6.8.3.5-1. UE is configured to perform RLM and BFD based on the SSBs.

6.6.8.3.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-SINR on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-SINR based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in table 6.6.8.3.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.8.3.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 1 for configuration 1, 2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
 - R1: the UE shall send L1-SINR report at slot 26 from the reception of DCI trigger. If the report is received at slot 26 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
 - R2: The L1-SINR value of CSI-RS#1 reported by the UE is compared to the expected L1-SINR value for CSI-RS#1. If the resulting value is outside the limits in Table 6.6.8.3.5-2 for all test configurations or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
- R3: The DIFF SINR value of CSI-RS #0 reported by the UE is compared to the expected DIFF SINR value. If the resulting value is outside the limits in Table 6.6.8.3.5-4 or the UE fails to report the measurement value for CSI-RS#0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.5. If after T1 expiry no report is received or received report did not contain L1-SINR of both CSI-RS#0 as CMR + CSI-IM#0 as IMR and CSI-RS#1 as CMR + CSI-IM#1 as IMR or UE sent the L1-SINR report at different slot than 26 from the reception of DCI trigger, the number of 'failed' iterations is increased by one.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:

- transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on

the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

6.6.8.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.3.4.3-1: Common Exception messages NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Default Message Contents		
Common contents of system information		
blocks exceptions		
Default RRC messages and information	Table H.3.6A-1 with conditions APERIODIC and CSI-SINR and CSI-	
elements contents exceptions	IM_IMR	
	Table H.3.6A-2 with conditions CSI-RS and APERIODIC	
	Table H.3.6A-4 with condition APERIODIC	

Table 6.6.8.3.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133					
Information Element	Value/remark	Comment	Condition		
RadioLinkMonitoringConfig ::= SEQUENCE {					
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry				
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.			
}					

6.6.8.3.5 Test requirement

Table 6.6.8.3.5-1 defines the primary level settings including test tolerances for all tests.

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1		
$N_{oc}^{\rm Note1}$	1~3	dBm/15kHz	-94.65			
N_{oc}^{Note1}	1,2	dBm/SSB SCS	-94.65			
IV _{oc}	3	dbiii/33b 303	-91.65			
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	1~3	dB	0	3		
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.65		
Note2	3	dbm/330 303	-91.65	-88.65		
Io Note2	1,2	dBm/9.36 MHz	-63.69	-61.93		
10	3	dBm/38.16 MHz	-57.59	-55.84		
\hat{E}_s/N_{oc} 1~3 dB			0	3		
Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for						
N_{oc} to	N_{oc} to be fulfilled.					
Note 2: CSI-RS RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

Table 6.6.8.3.5-1: CSI-RS specific test parameters for NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

After 80ms from the beginning of the test, the UE shall send L1-SINR report at slot 26 from the reception of DCI triggering the L1-SINR measurement. The L1-SINR report shall include the results for both CSI-RS#0 as CMR + CSI-IM#0 as IMR and CSI-RS#1 as CMR + CSI-IM#1 as IMR.

Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.3.5-2 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.3.5-4 for all test configurations.

Table 6.6.8.3.5-2: L1-SINR absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	43
Highest reported value (CSI-RS#1)	62

Table 6.6.8.3.5-3: Void

Table 6.6.8.3.5-4: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF SINR reported (CSI- RS#0)	0
Highest DIFF SINR reported (CSI- RS#0)	6

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.9 Idle Mode CA/DC Measurements

6.6.9.0 Minimum conformance requirements

For a UE which supports *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16* the UE shall support the idle mode CA measurements on the serving cell, and carriers configured for idle mode CA/DC measurement reporting provided T331 has not expired, the serving cell is supporting idle mode CA/DC measurement reporting and the serving cell is in the validity area.

This subclause defines the requirements for the detected cell status for the idle mode CA/DC measurement when UE transitions from RRC Connected mode to Idle mode and after UE has entered Idle mode. The requirements are applicable to an NE-DC and NR carrier aggregation capable UE which has been configured with one or more of following, one or more SCells, one E-UTRAN PSCell or one or more downlink E-UTRAN SCells during the Connected mode and which supports *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16*. The requirements are applicable for SCell(s) and E-UTRAN FDD and TDD PSCell and SCells.

Upon releasing the connection and if the UE has been configured with idle mode CA measurement reporting, following requirements apply concerning the detected cells in Connected mode upon state transitioning to Idle mode and during Idle mode:

- A cell which is detected cell in Connected mode prior to connection release, shall remain detected after UE has entered Idle mode and during Idle mode, provided that the following conditions are met:
 - The UE has been provided with a list of cells and/or carrier frequencies for early measurement reporting by dedicated RRC signalling and
 - The detected cell is among the list of cells or on a carrier frequency provided for early measurement reporting, and
 - The UE is provided with a valid timer T331 by dedicated RRC signalling, and
 - The detected cell and SSBs remains detectable until UE reconnect to the network and transmits the early measurement report, and
 - The carrier frequency of the detected cell and the carrier frequency of the serving cell are among the supported band combination of the UE.

An inter-RAT E-UTRAN cell is considered detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in TS 36.133 [23] Annex B.1.1 and Annex B.1.2 for a corresponding Band. An inter-frequency cell is considered detectable according to the conditions in TS 38.133 [6] Annex B.1.2 and B.1.3 for a corresponding band. An SSB of an inter-frequency cell is considered detectable according to SSB_RP and SSB Ês/Iot defined in TS 38.133 [6] Annex B.1.2 and B.1.3 for a corresponding Band.

While T331 is running, the UE shall perform measurement on the configured inter-frequency carriers for idle mode CA/DC measurement reporting according to the UE measurement capability.

A UE which supports *idleInactiveNR-MeasReport-r16* shall support idle mode CA/DC measurements of:

- at least 7 inter-frequency carriers which are also configured for inter-frequency mobility measurements, and
- at least 7 inter-frequency carriers which are not configured for inter-frequency mobility measurements.

The UE shall be capable of monitoring a total of at least 7 inter-frequency carriers for idle mode CA/DC measurements comprising of carriers configured for inter-frequency mobility measurements and carriers not configured for inter-frequency mobility measurements.

For inter-frequency carriers configured for idle mode CA/DC measurements, if $Srxlev \leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchQ}$ the inter-frequency measurement requirements in TS 38.133 [6] clause 4.2.2.4 shall apply, where UE shall search for and measure inter-frequency layers configured for idle mode CA/DC measurements in preparation for possible reporting. If $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ the UE shall search for inter-frequency layers configured for idle mode CA/DC measurements in greation for possible reporting. If $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ the UE shall search for inter-frequency layers configured for idle mode CA/DC measurements at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in TS 38.133 [6] clause 4.2.2.7, where UE shall search for and measure inter-frequency layers configured for idle mode CA/DC measurements in preparation for possible reporting.

For UE supporting *idleInactiveNR-MeasBeamReport-r16*, if the UE is configured with *beamMeasConfigIdle-r16* for idle mode CA/DC measurement, the UE shall be capable of performing SS-RSRP, SS-RSRQ for at least

- 7 SSBs with different SSB index and/or PCI on an inter-frequency layer in FR1,
- 10 SSBs with different SSB index and/or PCI on an inter-frequency layer in FR2.

For UE supporting *idleInactiveNR-MeasBeamReport-r16*, if the UE is configured with *beamMeasConfigIdle-r16* for idle mode CA/DC measurement, the UE shall be able to acquire the SSB index for a newly detectable inter-RAT NR cell and perform RSRP/RSRQ measurement within the requirements defined in TS 38.133 [6] clause 4.2.2.4 plus $T_{SSB_index,NR}$, where $T_{SSB_index,NR}$ is the additional time period used to acquire the index of the SSB being measured as defined in table 4.4.2.2-1.

DRX cycle length [s]		Scaling Factor (N1)		T _{SSB_index,NR_Inter} [S] (number of DRX cycles)
		FR1	FR2 ^{Note1}	
0.32		1	8	N2 x 1.28 x N1 x 1.5 (N2 x 4 x N1 x 1.5)
0.64			5	N2 x 1.28 x N1 (N2 x 2 x N1)
1.28			4	N2 x 1.28 x N1 (N2 x 1 x N1)
2.56			3	N2 x 2.56 x N1 (N2 x 1 x N1)
Note 1:	ŪĒ	plies for UE supporting power class 2&3&4. For supporting power class 1, N1 = 8 for all DRX cle length.		
NOTE 2:	CA if t	= 3 if the NR inter-frequency carrier for idle mode /DC measurement reporting is in FR1, and N2 = 5 ne NR inter-frequency carrier for idle mode CA/DC easurement reporting is in FR2.		

Table 6.6.9.0-1: T_{SSB_index,NR_Inter}

In the absence or expiration of T331, it is up to UE implementation to perform the idle mode CA/DC measurement.

For inter-frequency carriers configured for idle mode CA/DC measurements, the UE shall be capable of performing SS-RSRP and SS-RSRQ measurements of the carriers, and the UE physical layer shall be capable of reporting SS-RSRP and SS-RSRQ measurements of the carriers configured for idle mode CA/DC measurements to higher layers, with measurement accuracy as specified in clauses [38.133] and [38.133], respectively.

The UE shall be able to report idle mode CA/DC measurements when idle mode CA/DC measurement reporting is requested by the network.

The UE shall measure the RSRP and RSRQ level of the serving cell and evaluate the cell selection criterion S defined in clause 4.2.2.2 and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements of the serving cell to higher layers, with measurement accuracy as specified in TS 38.133 [6] clauses 10.1.2B, 10.1.3B, 10.1.7B and 10.1.8B.

6.6.9.1 NR SA FR1 SA Idle mode CA/DC measurement for FR1

Editor's note: This test case is incomplete. The following aspects are either missing or TBD

- Test case applicability is missing
- Cell configuration in Annex E is missing
- Test procedure
- Message contents
- TT analysis is missing
- Initial conditions and test requirements are contain []

6.6.9.1.1 Test purpose

The purpose of this test is to verify that the UE performs the required measurements on the serving cell and the configured inter-frequency carrier for idle mode measurement reporting after the UE has entered Idle mode. This test will partly verify the Idle mode CA/DC measurements requirements in TS 38.133 [6] clause 4.4.

6.6.9.1.2 Test applicability

This test applies to all types of NR UE release 16 onwards, supporting *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16*.

6.6.9.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.9.0.

The normative reference for this requirement is TS 38.133 [6] clause 4.4and A.6.6.9.1

6.6.9.1.4 Test description

6.6.9.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.9.1.4.1-1.

Table 6.6.9.1.4.1-1: Supported test configurations

Test Case ID	Description		
6.6.9.1-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode		
6.6.9.1-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode		
6.6.9.1-3	NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode		
Note 1: The UE is only re	te 1: The UE is only required to be tested in one of the supported test configurations		
Note 2: Target NR cell has the same SCS, BW and duplex mode as NR serving cell			

Test environment parameters are given in Table 6.6.9.1.4.1-2.

Table 6.6.9.1.4.1-2: Initial conditions for SA Idle mode CA/DC measurement for FR1

Parameter		Value	Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	3.508-1 [14] clause 4.3.1.
Channel bandwidth	As specified by the test configuration selected from Table 6.6.9.1.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.2	

Exceptions to connection	
diagram	

- 1. The general test parameter settings are set up according to Table 6.6.9.1.4.1-3.
- 2. Message contents are defined in clause 6.6.9.1.4.3.
- 3. The test scenario comprises of two NR Cells. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.9.1.4.1-3: General test parameters for SA Idle mode CA/DC measurement for FR1

Parameter	Unit	Test configurati on	Value	Comment
NR RF Channel Number		Config 1,2,3	1, 2	Two FR1 NR carrier frequencies is used
Active cell		Config 1,2,3	NR cell 1 (Pcell)	NR Cell 1 is on NR RF channel number 1.
Neighbour cell		Config 1,2,3	NR cell2	NR cell 2 is on NR RF channel number 2.
SMTC-SSB parameters		Config 1	SSB.1 FR1	As specified in clause A.3.10.1
		Config 2	SSB.1 FR1	As specified in clause A.3.10.1
		Config 3	SSB.2 FR1	As specified in clause A.3.10.1
Hysteresis	dB	Config 1,2,3	0	
PRACH configuration index		Config 1,2,3	102	The detailed configuration is specified in TS 38.211 clause 6.3.3.2
CP length		Config 1,2,3	Normal	
TimeToTrigger	S	Config 1,2,3	0	
Filter coefficient		Config 1,2,3	0	L3 filtering is not used
DRX in connected mode		Config 1,2,3	OFF	DRX is not used
DRX in idle mode	S	Config 1,2,3	[0.32]	The value shall be used for all cells in the test.
T331	s		300	
Time offset between serving and neighbour cells		Config 1	3ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3µs	Synchronous cells
T1	S	Config 1,2,3	10	
T2	S	Config 1,2,3	[11.52]	
Т3	S	Config 1,2,3	10	

6.6.9.1.4.2 Test procedure

TBD

6.6.9.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.9.1.4.3-1: Common Exception messages for SA Idle mode CA/DC measurement for FR1

Default Message Contents				
Common contents of system information				
blocks exceptions				

6.6.9.1.5 Test requirements

Table 6.6.9.1.5-1 defines the primary level settings including test tolerances for SA Idle mode CA/DC measurement for FR1

Table 6.6.9.1.5-1: Cell specific test parameters for connected mode for SA Idle mode CA/DC measurement for FR1

Parameter		Unit	Test configuration	Cell 1			Cell 2			
			•	T1	T2	Т3	T1	T2	Т3	
NR RF Channel Number			Config 1,2,3		1			2		
Duplex mod	е		Config 1				DD			
			Config 2,3				DD			
TDD configu	uration		Config 1				pplicable			
			Config 2	TDDConf.1.1						
D 14/		N 41 I	Config 3	TDDConf.2.1						
BW _{channel}		MHz	Config 1,2	$10: N_{RB,c} = 52$						
BWP BW		MHz	Config 3 Config 1,2	40: N _{RB,c} = 106 10: N _{RB,c} = 52						
DVVF DVV			Config 3	10. NRB,c = 52 40: NRB,c = 106						
BWP	Initial DL BWP		Config 1, 2, 3	Г	DLBWP.		B,C - 100	NA		
configurati on			001111g 1, 2, 0	-						
	Initial UL BWP				JLBWP.(NA		
	Dedicated DL			[DLBWP.'	1.1		NA		
	BWP		_							
	Dedicated UL BWP				JLBWP.			NA		
TRS configu	uration		Config 1		RS.1.1 F			NA		
			Config 2		RS.1.1 T			NA		
			Config 3	TI	RS.1.2 T	DD		NA		
A.3.2.1.1 (O			Config 1,2,3	OP.1			OP.1			
PDSCH Ref measureme			Config 1	S	SR.1.1 FDD SR.1.1		SR.1.1 FD	D		
			Config 2	S	SR.1.1 TI	DD	5	SR.1.1 TD	D	
			Config 3		SR2.1 TE			SR2.1 TD	D	
CORESET Reference Channel			Config 1	C	CR.1.1 FI	DD	(CR.1.1 FD	D	
			Config 2		CR.1.1 TI			CR.1.1 TC		
			Config 3		CR2.1 TE			CR2.1 TD		
SSB parameters			Config 1		SSB.1 FI			SSB.5 FR		
			Config 2		SSB.1 FI			SSB.5 FR		
			Config 3	ę	SSB.2 FI			SSB.6 FR		
in A.3.11	guration defined		Config 1		SMTC.2			SMTC.5		
			Config 2, 3		SMTC.		1-	SMTC.4		
PDSCH/PDCCH subcarrier spacing		kHz	Config 1,2				15			
		<u> </u>	Config 3		0		30	0		
EPRE ratio	of PSS to SSS of PBCH DMRS		Config 1,2,3		0			0		
to SSS EPRE ratio	of PBCH to									
PBCH DMR	S									
EPRE ratio										
	of PDCCH to									
EPRE ratio	of PDSCH									
DMRS to SS										
EPRE ratio of PDSCH to PDSCH										
to SSS(Note										
EPRE ratio of OCNG to OCNG DMRS (Note 1)										
OCNG DMR				-98 -9		-98				
		dBm/15 kHz			50			-30		
OCNG DMR		dBm/15 kHz dBm/S CS	Config 1,2		-98			-98		

SS-RSRF	Note 3	dBm/S	Config 1,2	-91	-91	-91	-	-98	-98
		CS					infinit		
							у		
			Config 3	-88	-88	-88	-	-95	-95
							infinit		
							у		
$\mathbf{\hat{E}}_{s}/\mathbf{I}_{ot}$		dB	Config	7	7	7	-	0	0
			1,2,3,4,5,6				infinit		
<u> </u>		ID	0 5 4 0 0	-	-	-	<u>y</u>	-	
\hat{E}_{s}/N_{oc}		dB	Config 1,2,3	7	7	7	infinit	0	0
Io ^{Note3}		dBm/9.	Config 1 2				у -70.5		
10.1000		авті/э. 36MHz	Config 1,2	62.2	- 62.2	- 62.26	-70.5	- 67.04	- 67.04
		SOIVITIZ		6	6	02.20		07.04	07.04
		dBm/38	Config 3	-	-	-	-	-	-
		.16MHz	e eg e	56.1	56.1	56.15	63.94	60.93	60.93
		-		5	5				
Propagation Condition Config 1,2,3 AWGN AWGN									
Note 1:	OCNG shall be use	d such that	both cells are ful	ly alloca	ted and	a constar	nt total tra	ansmitted	power
	spectral density is achieved for all OFDM symbols.								
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant								
	over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be								
	fulfilled.								
Note 3:	SS-RSRP and lo levels have been derived from other parameters for information purposes. They								
	are not settable parameters themselves.								
Note 4:									se at
	each receiver anten	ina port.							

Table 6.6.9.1.5-2: Cell specific test parameters for idle mode for SA Idle mode CA/DC measurement for FR1

Parameter	Unit	Test		Cell 1			Cell 2		
		configuration	T1	T2	T3	T1	T2	T3	

NR RF Channel		1,2,3		1			2		
Number		- ,—, ∞					_		
TDD configuration	-	1		N/A		N/A			
	-	2	TDDConf.1.1			TDDConf.1.1			
		3	TDDConf.2.1			TDDConf.2.1			
PDSCH RMC		1		SR.1.1 FDD		SR.1.1 FDD			
configuration		2		SR.1.1 TDD			SR.1.1 TDI		
		3		SR.2.1 TDD			SR.2.1 TDI		
RMSI CORESET		1		CR.1.1 FDD			CR.1.1 FDI		
RMC configuration		2	CR.1.1 TDD				CR.1.1 TDD		
		3		CR.2.1 TDD			CR.2.1 TDD		
Dedicated CORESET		1	CCR.1.1 FDD			CCR.1.1 FDD			
RMC configuration		2	CCR.1.1 TDD			CCR.1.1 TDD			
		3		CR.2.1 TD			CCR.2.1 TDD		
OCNG Pattern		1, 2, 3		defined in A			defined in A		
Initial DL BWP		1, 2, 3	[DLBWP.0.1			DLBWP.0.		
configuration									
Initial UL BWP		1, 2, 3	I	ULBWP.0.1			JLBWP.0.	l	
configuration							ac-		
RLM-RS		1, 2, 3		SSB	SSB				
Qrxlevmin	dBm/SCS	1, 2	-140			-140			
		3	-137			-137			
Pcompensation	dB	1, 2, 3		0			0		
Cell_selection_and_		1, 2, 3	SS-RSRP			SS-RSRP			
reselection_quality_									
measurement									
$\mathbf{\hat{E}}_{s}/\mathbf{I}_{ot}$	dB	1	[14]	[14]	[14]	-infinity	[12]	[12]	
		2							
		3							
$N_{_{oc}}$ Note2	dBm/SCS	1			[-98]			
		2			[-98]			
		3			[-95]			
$N_{_{OC}}$ Note2	dBm/15 kHz	1			[-98]			
1 v _{oc}									
	_	2							
		3		-		-	-		
\hat{E}_{s}/N_{oc}	dB	1	[7]	[7]	[7]	-infinity	[0]	[0]	
		2							
		3							
SS-RSRP Note3	dBm/SCS	1	[-91]	[-91]	[-91]	-infinity	[-98]	[-98]	
		2	[-91]	[-91]	[-91]	-infinity	[-98]	[-98]	
		3	[-88]	[-88]	[-88]	-infinity	[-95]	[-95]	
lo	dBm/9.36 MHz	1	[-62.26]	[-62.26]	[-62.26]	[-70.5]	[-67.04]	[-	
								67.04]	
	dBm/9.36 MHz	2	[-62.26]	[-62.26]	[-62.26]	[-70.5]	[-67.04]	[-	
								67.04]	
	dBm/38.16 MHz	3	[-56.15]	[-56.15]	[-56.15]	[-	[-60.93]	[-	
						63.94]		60.93]	
Treselection	S	1, 2, 3	0	0	0	0	0	0	
SnonintrasearchP	dB	1, 2, 3		Not sent			Not sent		
Propagation		1, 2, 3			AWG	N			
Condition									
	be used such that both	cells are fully al	located and a	a constant t	otal transm	itted powe	r spectral o	density	
Note 2: Interference	for all OFDM symbols. from other cells and no					e constan	t over subo	carriers	
and time and Note 3: SS-RSRP le	d shall be modelled as A evels have been derived	AWGN of approp I from other para	priate power f meters for inf	or N_{oc} to formation p	be fulfilled. urposes. Tł	ney are no	t settable		
parameters	themselves.	-							

During the time period T2 the UE is in Idle mode and the signal level of cell 2 is changed. The UE shall not perform reselection. The UE shall perform Idle Mode CA measurement according to Section 4.4.

At the start of T3 the UE is paged for connection setup. During the connection setup the UE is requested to transmit early measurement report for cell 2. The UE shall send early measurement report to the PCell.

After receiving the requested early measurement report, the test equipment verifies the accuracy of measurement reported for Cell 2 meets the requirements in Section 10.X and test ends.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

6.6.10 to 6.6.14

6.6.15 Idle Mode inter-RAT CA/DC Measurements

6.6.15.0 Minimum conformance requirements

For a UE which supports *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16* the UE shall support the idle mode CA measurements on the serving cell, and carriers configured for idle mode CA/DC measurement reporting provided T331 has not expired, the serving cell is supporting idle mode CA/DC measurement reporting and the serving cell is in the validity area.

This subclause defines the requirements for the detected cell status for the idle mode CA/DC measurement when UE transitions from RRC Connected mode to Idle mode and after UE has entered Idle mode. The requirements are applicable to an NE-DC and NR carrier aggregation capable UE which has been configured with one or more of following, one or more SCells, one E-UTRAN PSCell or one or more downlink E-UTRAN SCells during the Connected mode and which supports *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16*. The requirements are applicable for SCell(s) and E-UTRAN FDD and TDD PSCell and SCells.

Upon releasing the connection and if the UE has been configured with idle mode CA measurement reporting, following requirements apply concerning the detected cells in Connected mode upon state transitioning to Idle mode and during Idle mode:

- A cell which is detected cell in Connected mode prior to connection release, shall remain detected after UE has entered Idle mode and during Idle mode, provided that the following conditions are met:
 - The UE has been provided with a list of cells and/or carrier frequencies for early measurement reporting by dedicated RRC signalling and
 - The detected cell is among the list of cells or on a carrier frequency provided for early measurement reporting, and
 - The UE is provided with a valid timer T331 by dedicated RRC signalling, and
 - The detected cell and SSBs remains detectable until UE reconnect to the network and transmits the early measurement report, and
 - The carrier frequency of the detected cell and the carrier frequency of the serving cell are among the supported band combination of the UE.

An inter-RAT E-UTRAN cell is considered detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in TS 36.133 [23] Annex B.1.1 and Annex B.1.2 for a corresponding Band. An inter-frequency cell is considered detectable according to the conditions in TS 38.133 [6] Annex B.1.2 and B.1.3 for a corresponding band. An SSB of an inter-frequency cell is considered detectable according to SSB_RP and SSB Ês/Iot defined in TS 38.133 [6] Annex B.1.2 and B.1.3 for a corresponding Band.

The UE shall measure the RSRP and RSRQ level of the serving cell and evaluate the cell selection criterion S defined in clause 4.2.2.2 and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements of the serving cell to higher layers, with measurement accuracy as specified in TS 38.133 [6] clauses 10.1.2B, 10.1.3B, 10.1.7B and 10.1.8B.

While T331 is running, the UE shall perform measurement on the configured inter-RAT carriers for idle mode CA/DC measurement reporting according to the UE measurement capability.

A UE which supports *idleInactiveEUTRA-MeasReport-r16* shall support idle mode DC measurements of:

- at least 7 E-UTRAN inter-RAT carriers which are also configured for E-UTRAN inter-RAT mobility measurements, and

- at least 1 E-UTRAN inter-RAT carrier which is not configured for E-UTRAN inter-RAT mobility measurements.

The UE shall be capable of monitoring a total of at least 7 inter-RAT carriers for idle mode CA/DC measurements comprising of carriers configured for inter-RAT mobility measurements and carriers not configured for inter-RAT mobility measurements.

For inter-RAT carriers configured for idle mode CA/DC measurements, if $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ the inter-RAT measurement requirements in TS 38.133 [6] clause 4.2.2.5 shall apply, where UE shall search for and measure inter-RAT layers configured for idle mode CA/DC measurements in preparation for possible reporting. If $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ the UE shall search for inter-RAT layers configured for idle mode CA/DC measurements at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in TS 38.133 [6] clause 4.2.2, where UE shall search for and measure inter-RAT layers configured for idle mode CA/DC measurements in preparation for possible reporting.

For overlapping inter-RAT carriers configured for idle mode CA/DC measurements, the UE shall be capable of performing RSRP and RSRQ measurements of the carriers, and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements of the carriers configured for idle mode CA/DC measurements to higher layers, with measurement accuracy as specified in TS 36.133 [23] clauses in 9.1.3B.3 and 9.1.6B.2, respectively.

The UE shall be able to report idle mode CA measurements when idle mode CA measurement reporting is requested by the network.

6.6.15.1 NR SA FR1 Idle Mode measurements of inter-RAT CA candidate cells for early reporting

Editor's note: This test case is incomplete. The following aspects are either missing or TBD

- Test case applicability is missing
- Cell configuration in Annex E is missing
- Test procedure
- Message contents
- TT analysis is missing
- Initial conditions and test requirements are contain []

6.6.15.1.1 Test purpose

The purpose of this test is to verify that the UE properly retains the detected cell status for the idle mode CA measurement when UE transitions from RRC Connected mode to Idle mode, when the UE has entered Idle mode. Additionally, test that the UE performs the required measurements on the serving cell and the configured inter-RAT carrier for idle mode measurement reporting. This test will partly verify the Idle mode CA measurements in TS 38.133 [6] clause 4.4. In the test, connected mode DRX configuration is not configured in either PCell or PSCell.

Additionally, the purpose of this test is to verify that the SS-RSRP, SS-RSRQ, RSRP and RSRQ measurement accuracy is within the specified limits. This test will verify the accuracy requirements in TS 38.133 [6] clauses 10.1.2B and 10.1.7B for intra-frequency measurements and clause 10.2.4 and 10.2.5 for the inter-RAT measurements.

6.6.15.1.2 Test applicability

This test applies to all types of NR UE release 16, supporting *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16*.

6.6.15.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.5.15.0.

The normative reference for this requirement is TS 38.133 [6] clauses 4.4, 10.1.2B, 10.1.7B, 10.2.4 and 10.2.5 and A.6.6.15

6.6.15.1.4 Test description

6.6.15.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.15.1.4.1-1.

Table 6.6.15.1.4.1-1: Supported test configurations

Test Case ID	Description				
6.6.15.1-1	FR1 FDD SSB SCS 15kHz BW 10MHz – LTE FDD 10MHz				
6.6.15.1-2	FR1 FDD SSB SCS 15kHz BW 10MHz – LTE TDD 10MHz				
6.6.15.1-3	FR1 TDD SSB SCS 30kHz BW 40MHz – LTE FDD 10MHz				
6.6.15.1-4	FR1 TDD SSB SCS 30kHz BW 40MHz – LTE TDD 10MHz				
Note 1: The UE is only	Note 1: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.6.15.1.4.1-2.

Table 6.6.15.1.4.1-2: Initial conditions for DL interruptions at switching between two uplink carriers in FDD-TDD CA

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	I in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1.				
Channel	As specified	d by the test configuration selected from Table 6.6.15.1.4.1-1.				
bandwidth						
Propagation	AWGN		As specified in Annex C.2.2			
conditions						
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.2				
Exceptions to						
connection						
diagram						

- 1. The general test parameter settings are set up according to Table 6.6.15.1.4.1-3.
- 2. Message contents are defined in clause 6.6.15.1.4.3.
- 3. The test scenario comprises of two NR Cells. (Cell 1 and Cell 2). Cell 1 is configured according to Annex C.1.2 and C.1.3.

Table 6.6.15.1.4.1-3: General test parameters for Idle Mode measurements of inter-frequency CA candidate cells for early reporting

Parameter	Unit	Value	Comment
RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	PCell on RF channel number 1 in FR1
PSCell		Cell 2	PSCell on RF channel number 2 in LTE
DRX		OFF	For both PCell and PSCell once configured
PRACH configuration in Cell 2		[PRACH_2CE]	PRACH configuration as specified in
			Clause A.3.16 in TS 36.133
CSI reporting periodicity and offset configuration for Cell 2	ms	2	
T1	S	[0.5]	During this time the PCell is known and PSCell is configured.
T2	S	[0.5]	PSCell access.
T3 + T4	s	[66]	During this time the UE is configured to perform inter-frequency measurements in idle mode on the PSCell carrier.
T5	S	[0.5]	UE is paged and connection is setup. Network requests measurement report from the UE.

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6.6.15.1.4.2 Test procedure

TBD

6.6.15.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.15.1.4.3-1: Common Exception messages for

Default Message Contents				
Common contents of system information				
blocks exceptions				

6.6.15.1.5 Test requirements

Table 6.6.15.1.5-1 defines the primary level settings including test tolerances for

 Table 6.6.15.1.5-1: Cell specific test parameters for NR cell for Idle Mode measurements of interfrequency CA candidate cells for early reporting

Parameter	Unit	Config					
		_			Cell 1		
			T1	T2	T3	T4	T5
AoA setup		1,2,3,4	N1/A	N1/A	N/A	_	N1/A
Assumption for UE beams Note 5 R: Rough		1,2,3,4	N/A	N/A	R	R	N/A
Frequency Range		1,2,3,4			FR1		
Duplex mode		1, 2			FDD		
		3, 4			TDD		
TDD Configuration		1,2			-		T .
1: TDDConf.1.1 2: TDDConf.2.1		3,4	1	1	2	2	1
BW _{channel}	MHz	1, 2	1	1	-	-	1
1: 10: $N_{RB,c} = 52$		3, 4	2	2	-	-	2
2: 40: $N_{RB,c} = 106$		4004					
Initial Downlink BWP configuration		1,2,3,4			DLBWP.0.1		
Initial Uplink BWP configuration Dedicated Downlink BWP		1,2,3,4 1,2,3,4	1	1	JLBWP.0.1		1
configuration 1: DLBWP.1.1		1,2,3,4	I		-	-	
Dedicated Uplink BWP		1,2,3,4	1	1	-	-	1
configuration 1: ULBWP.1.1		1,2,3,4	1		-	-	
PDSCH Reference Measurement	FDD	1,2	1	1	1	1	1
Channel	TDD	3,4	2	2	2	2	2
1: SR.1.1 FDD		-,.	_	_	_	_	
2: SR.2.1 TDD							
TRS configuration		1,2,3,4			-		
TCI state		1,2,3,4			-		
RMSI CORESET parameters	FDD	1,2		(CR.1.1 FDD		
	TDD	3,4			CR.2.1 TDD		
Dedicated CORESET parameters	FDD	1,2			CR.1.1 FDI		
	TDD	3,4			CR.2.1 TDI		
OCNG Patterns ^{Note1}		1,2,3,4	OP.1 defined in A.3.2.1				
SSB configuration		1,2			1		
1: SSB.1 FR1 2: SSB.2 FR1		3,4			2		
SMTC configuration		1,2,3,4			SMTC.2		
Correlation Matrix and Antenna		1,2,3,4			1x2 Low		
config		1,2,0,4					
EPRE ratio of PSS to SSS	dB	1,2,3,4	0	0	-	-	0
EPRE ratio of PBCH DMRS to		.,_,0, .	0	0	_	-	0
SSS			_				
EPRE ratio of PBCH to PBCH DMRS			0	0	-	-	0
EPRE ratio of PDCCH DMRS to SSS			0	0	-	-	0
EPRE ratio of PDCCH to PDCCH DMRS			0	0	-	-	0
EPRE ratio of PDSCH DMRS to SSS			0	0	-	-	0
EPRE ratio of PDSCH to PDSCH	1		0	0	-	-	0
EPRE ratio of OCNG DMRS to SSS			0	0	-	-	0
Noc Note2	dBm/ 15kHz	1,2 3,4	[-98]	[-98]	[-98]	[-98]	[-98]
N _{oc} ^{Note2}	dBm/SCS	1,2	[-98]	[-98]	[-98]	[-98]	[-98]
- <u>-</u> "		3,4	[-95]	[-95]	[-95]	[-95]	[-95]
Ê _s /l _{ot}	dB	1,2,3,4	[5]	[5]	[5]	[5]	[5]
Ê _s /N _{oc}	dB	1,2,3,4	[5]	[5]	[5]	[5]	[5]
SS-RSRP ^{Note3,4}	dBm/SCS	1,2	[-93]	[-93]	[-93]	[-93]	[-93]
	dBm/	3,4	[-90]	[-90]	[-90]	[-90]	[-90]
Io ^{Note3,4}	авт/ 9.36 MHz	1,2	[-63.85]	[-63.85]	-[-63.85]	-[- 63.85]	[-63.85]

	dBm/ 38.16 MHz	3,4	[-57.76]	[-57.76]	-[-57.76]	-[- 57.76]	[-57.76]
	dBm/SCS	1	-	-	[-14	40]	-
		2	-	-	[-1:	37]	-
Qrxlevmin		3	-	-	[TBD]	[TBD]	-
		4	-	-	[TBD]	[TBD]	-
Pcompensation	dB	1,2,3,4	-	-	0	0	-
Qhysts	dB	1,2,3,4	-	-	0	0	-
Qoffset _{s, n}	dB	1,2,3,4	-	-	0	0	-
Cell_selection_and_ reselection_quality_measurement		1,2,3,4			SS-RSRP		
Treselection	S	1,2,3,4		-	0)	-
SnonintrasearchP	dB	1,2,3,4		-	(TE	BD]	-
SnonintrasearchQ	dB	1,2,3,4		-	(TE	BD]	-
Thresh _{x, high}	dB	1,2,3,4		-	[4	8]	-
Thresh _{serving, low}	dB	1,2,3,4		-	[4	4]	-
Thresh _{x, low}	dB	1,2,3,4		-	[50]		-
Propagation Condition	dB	1,2,3,4		-	AW	GN	-

 Table 6.6.15.1.5-2: Cell specific test parameters for LTE cell for Idle Mode measurements of interfrequency CA candidate cells for early reporting

Parameter	Unit	Config	Test 1				
					Cell 2		
Frequency Range		1,2,3,4	T1	T2	T3 LTE	T4	T5
Duplex mode		1, 3			FDD		
		2, 4			TDD		
BW _{channel}	MHz	1,2,3,4	10	10	-	-	10
Measurement bandwidth	n_{PRB}	1,2,3,4	-	-	22-27	22-27	-
PDSCH Reference Measurement	FDD	1,3	1	1	-	-	1
Channel	TDD	2,4	2	2	-	-	2
1: R.1 FDD 2: R.1 TDD							
PDCCH/PCFICH/PHICH		1,3	1	1	-	-	1
Reference measurement channel		2,4	2	2	-	-	2
defined in A.3.1.2.1 and A.3.1.2.2							
in 36.133							
1: R.6 FDD 2: R.6 TDD							
OCNG Patterns defined in		1,3			1		
A.3.2.1.1 (OP.2 FDD) and		2,4			2		
A.3.2.1.2 (OP.2 TDD) in 36.133 1: OP.2 FDD							
2: OP.2 TDD							
Correlation Matrix and Antenna		1,2,3,4			1x2 Low		
config							
PBCH_RA	dB	1,2,3,4	N/A	N/A	0	0	N/A
PBCH_RB PSS_RA	-		N/A N/A	N/A N/A	0	0	N/A N/A
SSS_RA	1		N/A	N/A	0	0	N/A
PCFICH_RB			N/A	N/A	0	0	N/A
PHICH_RA			N/A	N/A	0	0	N/A
PHICH_RB			N/A	N/A	0	0	N/A
PDCCH_RA PDCCH_RB	-		N/A N/A	N/A N/A	0	0	N/A N/A
PDCCH_RB PDSCH_RA			N/A N/A	N/A N/A	0	0	N/A N/A
PDSCH_RB			N/A	N/A	0	0	N/A
OCNG_RA ^{Note 1}			N/A	N/A	0	0	N/A
OCNG_RB ^{Note 1}			N/A	N/A	0	0	N/A
Noc Note2	dBm/	1,2	[-98]	[-98]	[-98]	[-98]	[-98]
Ês/lot	15kHz	3,4	[5]	[5]	[2]	[0]	[5]
Ês/Noc	dB dB	1,2,3,4 1,2,3,4	[5] [5]	[5] [5]	[-3] [-3]	[8] [8]	[5] [5]
	dBm/SCS	1,2,3,4	[-93]	[-93]	[-101]	[-90]	[-93]
SS-RSRP ^{Note3,4}							
	dBm/	1,2, 3,	FFS	FFS	[FFS]	[FFS]	FFS
	9.36 MHz	4					
lo ^{Note3,4}							
	dBm/SCS	1	-	-	[-1	40]	-
	dDin/000	2	-	_		37]	_
Qrxlevmin		3	_	-	[TBD]	[TBD]	-
		4	-	-	[TBD]	[TBD]	
Beempergetien	dB		-	-			-
Pcompensation		1,2,3,4	-	-	0		-
Qhysts Qaffaat	dB	1,2,3,4	-	-	-	0	-
Qoffset _{s, n}	dB	1,2,3,4	0 0 - RSRP and RSRQ			-	
Cell_selection_and_ reselection_quality_measurement		1,2,3,4		RS	KP and RS	RQ	
Treselection	S	1,2,3,4		-		0	-
SnonintrasearchP	dB	1,2,3,4		-	ITI	3D]	-
SnonintrasearchQ	dB	1,2,3,4		-	-	3D]	-
Thresh _{x, high}	dB	1,2,3,4		-			-
		·,_, 0 , ·			L	-1	

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Thresh _{serving, low}	dB	1,2,3,4	-	[44]	-
Thresh _{x, low}	dB	1,2,3,4	-	[50]	-
Propagation Condition	dB	1,2,3,4	-	AWGN	-

During time durations T1 the UE shall start transmitting preamble on PSCell. During T2 the UE perform intrafrequency measurements on the PCell and the PSCell.

During the time-period T3 the connection is released, and UE enters idle mode. During the time period T3 and T4 the UE is camped in Idle mode and at T4 the signal level of cell 2 is changed. The UE shall not perform reselection. The UE shall perform Idle Mode CA measurement according to Section 4.4.

At the start of T5 the UE is paged for connection setup. During the connection setup the UE is requested to transmit early measurement report. The UE shall send early measurement report to the PCell including idle mode CA/DC measurement from cell 2.

After receiving the requested early measurement report, the test equipment verifies that the accuracy of measurement reported for serving Cell 1 and Cell 2 meets the requirements in Sections 10.1.2B and 10.1.7B and Sections 10.2.4 and 10.2.5, respectively and test ends.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

6.7 Measurement performance requirements

6.7.1 SS-RSRP

6.7.1.0 Minimum conformance requirements

6.7.1.0.1 Intra-frequency absolute SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.1.

6.7.1.0.2 Intra-frequency relative SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.2.

6.7.1.0.3 Inter-frequency absolute SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.3.

6.7.1.0.4 Inter-frequency relative SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.4.

6.7.1.1 Intra-frequency measurements

6.7.1.1.1 NR SA FR1 SS-RSRP absolute measurement accuracy

6.7.1.1.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.1.1.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.1.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.1.

6.7.1.1.1.4 Test description

6.7.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.1.1.4.1-1.

Table 6.7.1.1.1.4.1-1: NR SA FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description				
6.7.1.1.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD				
6.7.1.1.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD				
6.7.1.1.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD				
Note	Note: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.1.1.4.1-2.

Table 6.7.1.1.1.4.1-2: Initial conditions for SS-RSRP intra frequency absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel	A	As specified by the test configuration	n selected from Table 6.7.1.1.1.4.1-1.
bandwidth			
Propagation		AWGN	As specified in Annex C.2.2.
conditions			
Connection	TE Part	A.3.1.8.2 with n = 2 and $\varphi_1 = 5$	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5	
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to	- Without LT	Elink	
connection			
diagram			

- 1. Message contents are defined in clause 6.7.1.1.1.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in the same frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

6.7.1.1.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.1.1.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRP reported values in the periodic MeasurementReport. The SS-RSRP value of Cell 2 reported by the UE is compared to the expected SS-RSRP. If the value is outside the limits in Table 6.7.1.1.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.1.1.1.5-1 as appropriate and repeat steps 5-7.

6.7.1.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.1.1.1.4.3-1: Common Exception messages for NR SA FR1 SS-RSRP absolute measurement accuracy

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information	Table H.3.1-1
elements contents exceptions	Table H.3.1-2
	Table H.3.1-5
	Table H.3.1-7
Specific message contents exceptions for	Table H.3.1-3 with Condition SSB.1 FR1
Test Configuration 6.7.1.1.1-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for	Table H.3.1-3 with Condition SSB.1 FR1 and Synchronous cells
Test Configuration 6.7.1.1.1-2	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message contents exceptions for Test Configuration 6.7.1.1.1-3	Table H.3.1-3 with Condition SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.1.1.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRP Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL							
Information Element	Value/remark	Comment	Condition				
ReportConfigNR::= SEQUENCE {							
reportType CHOICE {							
periodical SEQUENCE {			PERIODICAL				
reportQuantityCell SEQUENCE {							
rsrq	false						
sinr	false						
}							
maxReportCells	2						
}							
}							
}							

6.7.1.1.1.5 Test requirement

Table 6.7.1.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.1.1.1.5-3 for test configuration 3.

Table 6.7.1.1.1.5-1: NR SA FR1 SS-RSRP measurement accuracy test parameters

Para	motor	Unit	Tes			st 2	Te	st 3	
Parameter			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
Physical cell ID SSB ARFCN			489 0 freq1		489	0	489	0	
	Config 1		freq1 freq1 freq1 freq1					Υ.	
Duplex mode	Config 2,3	_	TDD						
	Config 1		Not Applicable						
TDD configuration	Config 2		TDDConf.1.1						
	Config 3				TDDC	onf.2.1			
	Config 1				10: N _R	в,с = 52			
BW _{channel}	Config 2	MHz	10: N _{RB,c} = 52						
	Config 3				40: Nrb	_{a,c} = 106			
	Config 1				10: N _R	_{В,с} = 52			
BWP BW	Config 2				10: N _R	_{В,с} = 52			
	Config 3				40: N _{RE}	$_{\rm s,c} = 106$			
Downlink initial BWP of	configuration				DLBV	VP.0.1			
Downlink dedicated B	WP configuration				DLBV	VP.1.1			
Uplink initial BWP con	figuration				ULBV	VP.0.1			
Uplink dedicated BWF	^o configuration				ULBV	VP.1.1			
DRx Cycle		ms			Not Ap	plicable			
	Config 1		TRS.1.1 FDD		TRS.1. 1 FDD		TRS.1. 1 FDD		
TRS Configuration	Config 2		TRS.1.1 TDD	-	TRS.1. 1 TDD	-	TRS.1. 1 TDD	-	
	Config 3	_	TRS.1.2 TDD		TRS.1. 2 TDD		TRS.1. 2 TDD		
	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD		
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	SR.1.1 TDD	-	
	Config 3		SR2.1 TDD		SR2.1 TDD		SR2.1 TDD		
	Config 1		CR.1.1 FDD		CR.1.1 FDD		CR.1.1 FDD		
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD	-	CR.1.1 TDD	-	CR.1.1 TDD	-	
	Config 3		CR2.1 TDD		CR2.1 TDD		CR2.1 TDD		
	Config 1		CCR.1. 1 FDD		CCR.1. 1 FDD		CCR.1. 1 FDD		
Control Channel RMC	Config 2		CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	
	Config 3		CR2.1 TDD		CCR2. 1 TDD		CCR2.1 TDD		
	Config 1		SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	
SSB configuration	Config 2		SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	
	Config 3		SSB 2.FR1	SSB.2 FR1	SSB 2.FR1	SSB.2 FR1	SSB 2.FR1	SSB.2 FR1	
Time offset with Cell	Config 1	ms	-	3	-	3	-	3	
2	Config 2,3	μS	-	3	-	3	-	3	
SMTC Configuration	Config 1				SM	FC.2			

		Config 2,3				SM	ГC.1		
OCNG Patterns			OP.1						
PDSCH/PDCCH Config 1,2			15 kHz						
subcarrier			- kHz	30kHz					
	of PSS to SS								
	PRE ratio of PBCH DMRS to SSS PRE ratio of PBCH to PBCH DMRS PRE ratio of PDCCH DMRS to SSS		-						
			-						
			dB	0	0	0	0	0	0
	of PDCCH to	PDCCH DMRS	ив	0	0	0	0	0	0
	of PDSCH to		-						
		RS to SSS(Note 1)	-						
		DCNG DMRS (Note 1)							
	Config	Depending on band	dDm/151/h	-10	7.5	-8	38	-116 + Δ _{BG_offset}	
$N_{\scriptscriptstyle oc}$ Note2	1,2	group Depending on band	dBm/15Kh Z						
00	Config 3	group	2	N/A ^I	Note 6	-9	94	-116 + /	Δ BG_offset
$N_{\scriptscriptstyle oc}$ Note2	Config 1,2		dBm/SCS	-107.4		-8	38	Same as Noc/15kHz	
1 voc	Config 3	Depending on band group	dBiii/000	N/A ^I	Note 6	-9	91	-113 + .	$\Delta_{BG_{offset}}$
\hat{E}_{s}/I_{ot}			dB	1.88	-5.57	1.88	-5.57	0.09	-5.56
\hat{E}_{s}/N_{oc}			dB	6	1.4	6	1.4	3	-0.8
SS- RSRP ^{Not}	Config 1,2	Depending on band group	dBm/SOS	-101.5	 106.1	-82	-86.6	-113 + Δ _{BG_off} set	-116.8 + Δ _{BG_offs} et
e3	Config 3	Depending on band group	- dBm/SCS	N/A ^{Note} 6	N/A ^{Not} e 6	-85	-89.6	-110+ Δ _{BG_off} set	- 113.8+ Δ _{BG_offs} et
lo ^{Note3}	Config 1,2	Depending on band group	dBm/ 9.36MHz	-71.68 -52.18 -82.39		-82.39+	$\Delta_{\text{BG_offset}}$		
10	Config 3 Depending on band group		dBm/ 38.16MHz	N/A ^{Note 6}		-51.91		-76.12 + Δ _{BG_offset}	
Propagation condition		-			AW	'GN			
Antenna configuration						1:	(2		
Note 1:	OCNG shall	be used such that both		allocated a	and a con	stant tota	transmitt	ed power	spectral
Note 2:	Interference	chieved for all OFDM sy from other cells and no	oise sources no	-					over
	subcarriers	and time and shall be m	nodelled as AV	VGN of app	propriate p	power for	N_{oc} to b	e fulfilled.	
Note 3:		nd lo levels have been a meters themselves.	derived from o	ther param	neters for	informatic	on purpose	es. They a	ire not
Note 4:		ninimum requirements a	are specified as	ssuming in	dependen	it interfere	ence and r	noise at ea	ach
Note 5: Note 6:	$\Delta_{\text{BG_offset}}$ is c	defined in clause 3A.4, 1							

 $\Delta_{BG_{offset}}$ is defined in clause 3A.4, Table 3A.4.1-2. Subtest 1 is not used when testing with 30kHz SSB SCS. Note 6:

	Test 1	Test 2	Test 0	
Normal Conditions	All bands	All bands	Test 3	
			Bands NR_FDD_FR1_A,	34
			NR_TDD_FR1_A	
			Bands NR_FDD_FR1_B	34
			Bands NR_TDD_FR1_C	35
		60	Bands NR_FDD_FR1_D,	35
Lowest reported value (Cell 2)	44		NR_TDD_FR1_D	
			Bands NR_FDD_FR1_E,	36
			Bands NR_TDD_FR1_E	
			Bands NR_FDD_FR1_G	37
			Bands NR_FDD_FR1_H	37
			NR_FDD_FR1_A,	46
			NR_TDD_FR1_A	
			NR_FDD_FR1_B	46
			NR_TDD_FR1_C	47
Highest reported value (Cell 2)	56	79	NR_FDD_FR1_D,	47
		79	NR_TDD_FR1_D	
			NR_FDD_FR1_E,	48
			NR_TDD_FR1_E	
			NR_FDD_FR1_G	49
			NR_FDD_FR1_H	49
	T			
Extreme Conditions	Test 1	Test 2	Test 3	
Extreme Conditions	All bands	l est 2 All bands	Test 3	
Extreme Conditions			Bands NR_FDD_FR1_A,	29
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A	-
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	30
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	30 30
			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	30
Extreme Conditions	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 30 31
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 30
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E	30 30 31 31
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G	30 30 31 31 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	30 30 31 31 33 33 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	30 30 31 31 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	30 30 31 31 33 33 34 50
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	30 30 31 31 31 33 34 50 51
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	30 30 31 31 33 33 34 50 51 51
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D,	30 30 31 31 31 33 34 50 51
	All bands 40	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 30 31 31 31 33 34 50 51 51 52
Lowest reported value (Cell 2)	All bands 40	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 30 31 31 33 33 34 50 51 51
Lowest reported value (Cell 2)	All bands 40	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E,	30 30 31 31 31 33 34 50 51 51 52 52 52
Lowest reported value (Cell 2)	All bands 40	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E	30 30 31 31 31 33 34 50 51 51 52 52 52 52 53
Lowest reported value (Cell 2)	All bands 40 61	All bands 57 82	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	30 30 31 31 31 33 34 50 51 51 52 52 52

Table 6.7.1.1.1.5-2: SS-RSRP Intra frequency absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	Test 1	Test 2	Test 3	
	All bands	All bands	Bands NR_FDD_FR1_A,	37
			NR_TDD_FR1_A	01
			Bands NR_FDD_FR1_B	37
			Bands NR_TDD_FR1_C	38
Lowest reported value (Cell 2)			Bands NR_FDD_FR1_D,	38
	N/A	57	NR_TDD_FR1_D	
			Bands NR_FDD_FR1_E,	39
			Bands NR_TDD_FR1_E	
			Bands NR_FDD_FR1_G	40
			Bands NR_FDD_FR1_H	40
			Bands NR_FDD_FR1_A,	49
			NR_TDD_FR1_A	
			Bands NR_FDD_FR1_B	49
			Bands NR_TDD_FR1_C	50
Highest reported value (Cell 2)	N/A	76	Bands NR_FDD_FR1_D,	50
		70	NR_TDD_FR1_D	
			Bands NR_FDD_FR1_E,	51
			Bands NR_TDD_FR1_E	
			Bands NR_FDD_FR1_G	52
			Bands NR_FDD_FR1_H	52
	Test 1	Test 2		
Extreme Conditions			Test 3	
Extreme Conditions	All bands	All bands		32
Extreme Conditions			Bands NR_FDD_FR1_A,	32
Extreme Conditions				32
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A	-
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	33
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	33 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 33 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 33 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	33 33 34 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	33 33 34 34 35
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	33 33 34 34 35 36
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	33 33 34 34 35 36
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	33 33 34 34 35 36 53
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 33 34 34 34 35 36 53 54
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 33 34 34 34 35 36 53 54 54 54
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 33 34 34 34 35 36 53 54 54 54
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E,	33 33 34 34 34 35 36 53 54 54 54 55
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_E	33 33 34 34 34 35 36 53 53 54 54 55 55 55 55
Lowest reported value (Cell 2)	All bands N/A	All bands 54 79	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G	33 33 34 34 34 35 36 53 53 54 54 55 55

Table 6.7.1.1.1.5-3: SS-RSRP Intra frequency absolute accuracy requirements for the reported values for test configuration 3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.1.1.2 NR SA FR1 SS-RSRP relative measurement accuracy

6.7.1.1.2.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRP relative measurement accuracy is within the specified limits for all bands.

6.7.1.1.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.1.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.1.

est description

6.7.1.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.1.2.4.1-1.

Table 6.7.1.1.2.4.1-1: NR SA FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description
6.7.1.1.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.1.1.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.1.1.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note	The UE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.1.2.4.1-2.

Table 6.7.1.1.2.4.1-2: Initial conditions for SS-RSRP intra frequency relative accuracy in FR1

Parameter	Value		Comment				
Test environment			NC, TL/VL, TL/VH, TH/VL, TH/VH				As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	· · ·	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.				
Channel			selected from Table 6.7.1.1.2.4.1-1.				
bandwidth		·					
Propagation		AWGN	As specified in Annex C.2.2.				
conditions							
Connection	TE Part	A.3.1.8.2 with n = 2 and φ_1 = 5	As specified in TS 38.508-1 [14] Annex A.				
Diagram	2Rx	Hz					
	TE Part	A.3.1.8.5 with n = 2 and φ _{1,1} = 5					
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz					
	DUT Part	A.3.2.3.4					
	2Rx						
	DUT Part	A.3.2.5.2					
	4Rx						
Exceptions to	- Without LT	E link					
connection							
diagram							

- 1. Message contents are defined in clause 6.7.1.1.2.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in the same frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

6.7.1.1.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR* Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.1.1.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRP reported values of Cell 1 and Cell 2 in the periodic MeasurementReport. The SS-RSRP value of Cell 2 reported by the UE is compared to the reported SS-RSRP of Cell 1. If the resulting value is outside the limits in Table 6.7.1.1.2.5-2 or the UE fails to report the measurement value for Cell 1 or Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.

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8. Set the parameters according to each sub-test in Table 6.7.1.1.2.5-1 as appropriate and repeat steps 5-7.

Message contents are same as in clause 6.7.1.1.1.4.3.

6.7.1.1.2.5 Test requirement

Table 6.7.1.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.1.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.1.2.5-2.

Table 6.7.1.1.2.5-1: Same as Table 6.7.1.1.1.5-1 with the following exceptions:

Parameter		Unit	Tes	st 1	Test 2		Test 3		
	Falai	lieter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
$N_{_{oc}}$ Note2	Config 1,2	Depending on band group	dBm/15Kh	-1(06	-6	38	-116 + /	$\Delta_{BG_{offset}}$
IV oc	Config 3	Depending on band group	Z	N/A ^t	Note 6	-0	94	-116 + 4	$\Delta_{BG_{offset}}$
$N_{_{oc}}$ Note2	Config 1,2		dBm/SCS	Sam Noc/1		Same as Noc/15kHz		Same as Noc/15kHz	
I V oc	Config 3,6	Depending on band group	dbm/808	N/A ^t	Note 6	-6	91	-113 + /	∆BG_offset
\hat{E}_{s}/I_{ot}			dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
\hat{E}_s/N_{oc}			dB	6	2	6	2	3	0
SS- RSRP ^{Not}	Config 1,2	Depending on band group	dBm/909	-100	-104	-82	-86	-113 + Δ _{BG_off} set	-116 + Δ _{BG_offs} et
e3	Config 3	Depending on band group	dBm/SCS	N/A ^{Note} 6	N/A ^{Not} e 6	-85	-89	-110 + Δ _{BG_off} set	-113 + Δ _{BG_offs} et
Io ^{Note3}	Config 1,2	Depending on band group	dBm/ 9.36MHz	-70	.05	-52	.05	-82.20+	$\Delta_{BG_{offset}}$
	Config 3	Depending on band group	dBm/ 38.16MHz	N/A ^t	Note 6	-51	.77	-	93 + _offset

Table 6.7.1.1.2.5-2: SS-RSRP Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 8	RSRP_x - 8	RSRP_x - 7
Highest reported value (Cell 2)	RSRP_x - 1	RSRP_x - 1	RSRP_x + 1
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 8	RSRP_x - 8	RSRP_x - 7
Highest reported value (Cell 2)	RSRP_x - 1	RSRP_x - 1	RSRP_x + 1
RSRP_x is the reported value of	Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.1.2 Inter-frequency measurements

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6.7.1.2.1 NR SA FR1-FR1 SS-RSRP absolute measurement accuracy
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6.7.1.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.1.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.1.2.1.3	Minimum conformance requirements
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The minimum conformance requirements are specified in clause 6.7.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.2.

This test shall be tested using any of the test configurations in Table 6.7.1.2.1.4.1-1.

Table 6.7.1.2.1.4.1-1: NR SA FR1-FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description
6.7.1.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.1.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.1.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note	: The UE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.2.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	A	As specified in Annex E, Table E.4-1	and TS 38.508-1 [14] sclause 4.3.1.
Channel bandwidth	A	as specified by the test configuration	selected from Table 6.7.1.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and φ_1 = 5 Hz A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5 Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz A.3.2.3.4 A.3.2.5.2	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.1.2.1.4.1-2: Initial	conditions for SS-RSRP	inter frequency	v absolute accuracv i	n FR1

- 1. Message contents are defined in clause 6.7.1.2.1.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in a different FR1 frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

6.7.1.2.1.4.2 Test procedure

Same as in clause 6.7.1.1.1.4.2 but replacing Table 6.7.1.1.1.5-1 and 6.7.1.1.1.5-2 with 6.7.1.2.1.5-1 and 6.7.1.2.1.5-2, respectively.

6.7.1.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.1.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-RSRP absolute measurement accuracy

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0
Specific message contents exceptions for Test Configuration 6.7.1.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for Test Configuration 6.7.1.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message contents exceptions for Test Configuration 6.7.1.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.1.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRP Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with con	dition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigNR::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			PERIODICAL
reportQuantityCell SEQUENCE {			
rsrq	false		
sinr	false		
}			
maxReportCells	2		
}			
}			
}			

6.7.1.2.1.5 Test requirement

Table 6.7.1.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.2.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.1.2.1.5-3 for test configuration 3.

Table 6.7.1.2.1.5-1: SS-RSRP inter-frequency test parameters

-		Ocal	1124	Test	1	Tes	t 2	
-	arameter	Config	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
SSB ARFCN	N	1~3		freq1	freq2	freq1	freq2	
BW _{channel}		1 2	MHz	10: N _{RB,c}		10: NRB		
DVVchannel					10: N _{RB,c} = 52 40: N _{RB,c} = 106		10: N _{RB,c} = 52 40: N _{RB,c} = 106	
Gap pattern ID		3		0		0		
				FDD		FD		
Duplex mode		2				TD		
		3		TDD N/A		TD N//		
TDD configu	Iration	2		TDDCon		TDDCo		
-		3		TDDCon	nf.2.1	TDDCo	nf.2.1	
				SR.1.1 FDD		SR.1.1 FDD		
PDSCH Ref measureme		2		SR.1.1 TDD	-	SR.1.1 TDD	-	
		3		SR.2.1 TDD		SR.2.1 TDD		
		1		CR.1.1 FDD	-	CR.1.1 FDD	-	
RMSI CORE Channel	ESET Reference	2		CR.1.1 TDD	-	CR.1.1 TDD	-	
		3		CR.2.1 TDD	-	CR.2.1 TDD	-	
Dedicated C	ODESET	1		CCR.1.1 FDD	-	CCR.1.1 FDD CCR.1.1	-	
Reference C		2		CCR.1.1 TDD	-	TDD CCR.2.1	-	
		3		CCR.2.1 TDD	-	TDD	-	
CCD confirm	una ti a m	1		SSB.1 FR1 SSB.1 FR1 SSB.2 FR1		SSB.1 FR1 SSB.1 FR1 SSB.2 FR1		
SSB configu	Iration	2						
OCNG Patte	erns	1~3		000.2 M N		OP.1		
		1		TRS.1.1 FDD		TRS.1.1 FD		
TRS configu	Iration	2 3		TRS.1.1 TDD TRS.1.2 TDD		TRS.1.1 TD TRS.1.2 TD		
Initial BWP	Configuration	1~3		DLBWP.0.1 ULBWP.0.1		DLBWP.0.1 ULBWP.0.1		
Dedicated B	WP configuration	1~3		DLBWP.1.1 ULBWP.1.1		DLBWP.1.1 ULBWP.1.1		
0.470		1		SMTC.2		SMTC.2		
SMTC config	guration	2,3		SMTC.1		SMTC.1		
	between Cell 2	1	ms	3		3		
and Cell 3		2,3	μS	3	I	3		
EPRE ratio of	PSS to SSS PBCH DMRS to	-						
SSS								
	PBCH to PBCH							
DMRS EPRE ratio of	PDCCH DMRS to							
SSS								
EPRE ratio of DMRS	PDCCH to PDCCH	1~3	dB	0	0	0	0	
EPRE ratio of	EPRE ratio of PDSCH DMRS to			Ĩ			÷	
SSS EPRE ratio of PDSCH to PDSCH								
DMRS EPRE ratio of OCNG DMRS to		4						
SSS ^{Note 1}								
	OCNG to OCNG							
N_{oc} Note2	Depending on band group	1,2	dBm/15 kHz	-94.65	-94.65	(N_{oc} for Cell 2	-115+ Δ _{BG_offset}	
			NI IZ			+8dB) + Δ _{BG_offset}		

	Depending on					(N_{ac} for	-115+
N_{oc} Note2	band group	3	dBm/15	-96	-96		$\Delta_{BG_{offset}}$
1 V _{oc}		0	kHz	50	50	+8dB) +	
	Deneralizzation					$\Delta_{BG_{offset}}$	445.
	Depending on band group					($N_{_{oc}}$ for	-115+ Δ _{BG_offset}
	John G. S. Colp	1,2		-94.65	-94.65	Cell 2	-DO_0illaet
Note2			dBm/SS			+8dB) + ∆ _{BG offset}	
N_{oc} Note2	Depending on		B SCS			$(N_{oc}$ for	-
	band group	3		-93	-93	Cell 2	112.00+
		5		-93	-93	+8dB) +	$\Delta_{BG_{offset}}$
• /						$\Delta_{BG_{offset}}$	
\hat{E}_{s}/I_{ot}		1~3	dB	10	10	13	-3
	Depending on					(RSRP for Cell 2	-
	band group	1,2,		-84.65	-84.65	+25dB) +	118.00+
SS-			dBm/SC			∆BG_offset	$\Delta_{BG_{offset}}$
RSRP ^{Note3}	Depending on band group		S			(RSRP for Cell 2	- 115.00+
	bana group	3		-83	-83	+25dB) +	$\Delta_{BG_{offset}}$
						Δ _{BG_offset} (Io for	-85.28+
	Depending on	1,2	dBm/ 9.36MH	56.28	56.28	Channel 2	$\Delta_{BG_{offset}}$
	band group	1,2	2.30001	50.20	50.20	+19.75dB) + ∆ _{BG offset}	_
Io ^{Note3}			dBm/			(lo for	-79.19+
	Depending on	3	38.16M	-51.53	-51.53	Channel 2 +19.75dB)	Δ_{BG_offset}
	band group		Hz			+ $\Delta_{BG offset}$	
	\hat{E}_s/N_{oc}	1~3	dB	10	10	13	-3
	gation condition	1~3	-	AWG	N	AWO	GN
	a configuration			1x2		1x	
Note 1: 0	OCNG shall be used						
	ransmitted power spe						
	nterference from othe constant over subcarr						
			ne anu sha	ii be modelled	as Awgin		le power
	for N_{oc} to be fulfilled						
	RSRP and lo levels h				eters for in	ormation pur	poses.
They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference				nterference a	nd noise		
	at each receiver antenna port.						
		ion excludes support for band n51 and it is not required to run this test					
	on band n51 in this release of the specification.						
Note 6: A	bte 6: $\Delta_{BG_{offset}}$ is defined in clause 3A.4, Table 3A.4.1-2.						

Normal Conditions	Test 1	Test 2	
	All bands		
		Bands NR_FDD_FR1_A,	32
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	33
_owest reported value (Cell 2)	62	Bands NR_TDD_FR1_C	33
		Bands NR_FDD_FR1_D,	34
		NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	34
		NR_TDD_FR1_E	05
		Bands NR_FDD_FR1_G	35
		Bands NR_FDD_FR1_H	36
		Bands NR_FDD_FR1_A,	45
		NR_TDD_FR1_A	45
		Bands NR_FDD_FR1_B	45
		Bands NR_TDD_FR1_C	46
Highest reported value (Cell 2)	81	Bands NR_FDD_FR1_D,	46
3		NR_TDD_FR1_D	47
		Bands NR_FDD_FR1_E,	47
		NR_TDD_FR1_E	10
		Bands NR_FDD_FR1_G	48
		Bands NR_FDD_FR1_H	48
Extreme Conditions	Test 1 All bands	Test 2	
		Bands NR_FDD_FR1_A,	28
		NR_TDD_FR1_A	
		Bands NR FDD FR1 B	28
			28 29
		Bands NR_TDD_FR1_C	29
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	29
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	29 29
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	29 29
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	29 29 30
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	29 29 30 31
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	29 29 30 31 31
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	29 29 30 31 31
Lowest reported value (Cell 2)	59	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	29 29 30 <u>31</u> 31 49
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	29 29 30 <u>31</u> 31 49 50
Lowest reported value (Cell 2)	59 84	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	29 29 30 31 31 49 50 50
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	29 29 30 31 31 49 50 50
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	29 29 30 31 31 49 50 50 51
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	29 29 30 31 31 49 50 50 51 51
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	29 29 30 31 31 49 50 50 51

Table 6.7.1.2.1.5-2: SS-RSRP Inter frequency absolute accuracy requirements for the reported valuesfor test configurations 1, 2, 4 and 5

	Test 1		
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	35
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	36
		Bands NR_TDD_FR1_C	36
Lowest reported value (Call 2)	64	Bands NR_FDD_FR1_D,	37
Lowest reported value (Cell 2)	64	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	37
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	38
		Bands NR_FDD_FR1_H	39
		Bands NR_FDD_FR1_A,	48
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	48
		Bands NR_TDD_FR1_C	49
Highest reported value (Cell 2)	83	Bands NR_FDD_FR1_D,	49
ingriest reported value (Gen 2)	00	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	50
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	51
		Bands NR_FDD_FR1_H	51
Extreme Conditions	Test 1 All bands	Toot 2	
	All Dallus	Bands NR_FDD_FR1_A,	31
		Danus NIX_I DD_I IXI_A,	51
		NR TOD FR1 A	
		NR_TDD_FR1_A Bands NR_EDD_FR1_B	31
		Bands NR_FDD_FR1_B	31
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	32
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	-
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	32 32
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	32
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	32 32 33
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	32 32 33 33 34
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	32 32 33
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	32 32 33 33 34 34
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	32 32 33 33 34 34
Lowest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	32 32 33 33 34 34 52 53
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	32 32 33 33 34 34 52
Lowest reported value (Cell 2) Highest reported value (Cell 2)	61	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A, Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	32 32 33 33 34 34 52 53 53
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A, Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	32 32 33 33 34 34 52 53 53
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A, Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	32 32 33 33 34 34 52 53 53 53 54
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	32 32 33 33 34 34 52 53 53 53 54
		Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A, Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	32 32 32 33 34 52 53 53 54

Table 6.7.1.2.1.5-3: SS-RSRP Inter frequency absolute accuracy requirements for the reported values for test configurations 3 and 6

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.1.2.2 NR SA FR1-FR1 SS-RSRP relative measurement accuracy

6.7.1.2.2.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.1.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.1.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.2.

6.7.1.2.2.4 Test description

6.7.1.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.2.2.4.1-1.

Table 6.7.1.2.2.4.1-1: NR SA FR1-FR1 SS-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description			
6.7.1.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.1.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.1.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.2.2.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	as specified by the test configuration	n selected from Table 6.7.1.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and φ_1 = 5 Hz A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5 Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz A.3.2.3.4 A.3.2.5.2	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the	LTE link	

- 1. Message contents are defined in clause 6.7.1.2.2.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in a different FR1 frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

6.7.1.2.2.4.2 Test procedure

Same as in clause 6.7.1.1.2.4.2 but replacing Table 6.7.1.1.2.5-1 and 6.7.1.1.2.5-2 with 6.7.1.2.2.5-1 and 6.7.1.2.2.5-2, respectively.

6.7.1.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.1.2.1.4.3.

6.7.1.2.2.5 Test requirement

Table 6.7.1.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.2.2.5-2.

Table 6.7.1.2.2.5-1: same as Table 6.7.1.2.1.5-1

Table 6.7.1.2.2.5-2: SS-RSRP Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2				
	All bands	All bands				
Normal Conditions						
Lowest reported value (Cell 2)	SS-RSRP_x - 7	SS-RSRP_x - 31				
Highest reported value (Cell 2)	SS-RSRP_x + 7	SS-RSRP_x - 18				
Extreme Conditions						
Lowest reported value (Cell 2)	SS-RSRP_x - 9	SS-RSRP_x - 33				
Highest reported value (Cell 2) SS-RSRP_x + 9 SS-RSRP_x - 1						
SS-RSRP_x is the reported value	e of Cell 1					

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.2 SS-RSRQ

6.7.2.0 Minimum conformance requirements

6.7.2.0.1 Intra-frequency SS-RSRQ measurement accuracy requirements

Same as in clause 4.7.2.0.1.

6.7.2.0.2 Inter-frequency SS-RSRQ absolute measurement accuracy requirements

Same as in clause 4.7.2.0.2.

6.7.2.0.3 Inter-frequency SS-RSRQ relative measurement accuracy requirements

Same as in clause 4.7.2.0.3.

6.7.2.1 NR SA FR1 SS-RSRQ measurement accuracy

6.7.2.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRQ measurement accuracy is within the specified limits for all bands.

6.7.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.1.

6.7.2.1.4 Test description

6.7.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.2.1.4.1-1.

Table 6.7.2.1.4.1-1: NR SA FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description						
6.7.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD						
6.7.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD						
6.7.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD						
Note	Note: The UE is only required to be tested in one of the supported test configurations						

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth		As specified by the test configuration	n selected from Table 6.7.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part	A.3.1.8.2 with n = 2 and φ_1 = 5 Hz A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5 Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz A.3.2.3.4 A.3.2.5.2	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	4Rx - Without the	I ₽ LTE link	

Table 6.7.2.1.4.1-2: Initial conditions for SS-RSRQ intra frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.2.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.3.

6.7.2.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.2.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRQ reported values in the periodic MeasurementReport. The SS-RSRQ value of Cell 2 reported by the UE is compared to the expected SS-RSRQ. If the value is outside the limits in Table 6.7.2.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.2.1.5-1 as appropriate and repeat steps 5-7.

6.7.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.2.1.4.3-1: Common Exception messages for NR SA FR1 SS-RSRQ measurement accuracy

Default Message Contents						
Common contents of system information						
blocks exceptions						
Default RRC messages and information	Table H.3.1-1					
elements contents exceptions	Table H.3.1-2					
	Table H.3.1-5					
	Table H.3.1-7					
Specific message contents exceptions for	Table H.3.1-3 with Condition SSB.1 FR1					
Test Configuration 6.7.2.1-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2					
Specific message contents exceptions for	Table H.3.1-3 with Condition SSB.1 FR1 and Synchronous cells					
Test Configuration 6.7.2.1-2	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1					
Specific message contents exceptions for	Table H.3.1-3 with Condition SSB.2 FR1 and Synchronous cells					
Test Configuration 6.7.2.1-3	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1					

Table 6.7.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRQ Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL							
Information Element	Value/remark	Comment	Condition				
ReportConfigNR::= SEQUENCE {							
reportType CHOICE {							
periodical SEQUENCE {			PERIODICAL				
reportQuantityCell SEQUENCE {							
rsrp	false						
sinr	false						
}							
maxReportCells	2						
}							
}							
}							

6.7.2.1.5 Test requirement

Table 6.7.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRQ measurement report for each of the tests in Table 6.7.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.1.5-2.

Table 6.7.2.1.5-1: SS-RSRQ Intra frequency test parameters

Parameter		Unit	Test 1		Test 2		Test 3		
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
SSB ARFCN			freq1		freq1		freq1		
Duplex mode	Config 1				F	DD			
Duplex mode	Config 2,3				T	DD			
	Config 1				Not Ap	plicable			
TDD configuration	Config 2		TDDConf.1.1						
	Config 3				TDDC	onf.2.1			
	Config 1		10: N _{RB,c} = 52						
BW _{channel}	Config 2	MHz	MHz 10: N _{RB,c} = 52						
	Config 3				40: Nre	_{s,c} = 106			
	Initial DL BWP		DLBWP.0.1						
BWP configuration	Dedicated DL BWP		DLBWP.1.1						
BWP conliguration	Initial UL BWP		ULBWP.0.1						
Dedicated UL BWP			ULBWP.1.1						
DRX Cycle		ms	Not Applicable						
Config 1			SR.1.1 FDD	-	SR.1.1 FDD	-	SR.1.1 FDD	-	

DDOOLL				0044		SR.1.1		0044		
PDSCH Reference	<u>ne</u>	Config 2		SR.1.1 TDD		TDD		SR.1.1 TDD		
measure		Config 2		SR2.1		SR2.1		SR2.1		
channel		Config 3		TDD		TDD		TDD		
		Config 1		CR.1.1		CR.1.1		CR.1.1		
	RMSI CORESET			FDD CR.1.1		FDD CR.1.1		FDD CR.1.1		
Reference		Config 2		TDD	-	TDD	-	TDD		
Channel		Config 3		CR.2.1		CR.2.1		CR.2.1		
		-		TDD CCR.1.		TDD CCR.1.		TDD CCR.1.		
		Config 1		1 FDD		1 FDD		1 FDD		
Control	Channel	Config 2		CCR.1.	-	CCR.1.	-	CCR.1.	-	
RMC				1 TDD CCR.2.		1 TDD CCR.2.		1 TDD CCR.2.		
		Config 3		1 TDD		1 TDD		1 TDD		
		Config 1		TRS.1. 1 FDD		TRS.1.1 FDD		TRS.1. 1 FDD		
TDO ON	<i>c</i>	0		TRS.1.		TRS.1.1		TRS.1.		
TRS Cor	nfiguration	Config 2		1 TDD	-	TDD	-	1 TDD	-	
		Config 3		TRS.1. 2 TDD		TRS.1.2 TDD		TRS.1. 2 TDD		
OCNG P	atterns	1		2,00		OI	P.1	2,00		
SS-RSS	I-Measuren	nent				Not Ap	plicable			
	ffset with	Config 2, 3	μs	-	3	-	3	-	3	
Cell 1		Config 1	ms	-	3	-	3	-	3	
SMTC		Config 2, 3				SM				
configura	ation	Config 1					ГC.2			
SSB con	figuration	Config 1,2					1 FR1			
	-	Config 3		SSB.2 FR1						
PDSCH/		Config 1,2	kHz	15 kHz						
	er spacing	Config 3	KI IZ			301	кНz			
	io of PSS to		-			0	0	0		
		MRS to SSS							0	
		D PBCH DMRS		0						
		to PDCCH DMRS	dB		0					
		DMRS to SSS		Ũ	Ŭ	Ŭ	Ŭ	Ŭ	Ũ	
EPRE rat	io of PDSCH	to PDSCH								
		DMRS to SSS(Note 1)								
		o OCNG DMRS (Note 1)								
		Depending on band	dDres/4.51	-86.5		-1	01	-114+ $\Delta_{BG_{offset}}$		
N _{oc}	1,2	group Depending on band	dBm/15k Hz							
Note2	Config 3	group	112	-92.6		-		-114+ /	$\Delta_{BG_{offset}}$	
	Config	Depending on band			6 5		01	4441	A	
N_{oc}	1,2	group	dBm/SC	-8	6.5	-10	01	-114+2	$\Delta_{BG_{offset}}$	
Note2	Config 3	Depending on band	S	-8	9.6	-		-111+ Δ _{BG_offset}		
- A /-		group								
\hat{E}_{s}/I_{ot}			dB	-1	.76	-4	.7	-5.46	-5.46	
\hat{E}_s/N_o			dB	3	3	-2.9	-2.9	-4	-4	
\$1 - 0		Depending on band			-				-118+	
	Config	group		-83.5	-83.5	-103.9	-103.9	- 118+∆	-11o+ Δ _{BG_offse}	
SS-	1,2	9.000	dBm/SC	50.5	00.0	100.0	100.0	BG_offset	ΔBG_offse	
RSRP Note3		Depending on band	S					-115+	-115+	
Notes	Config 3	group		-86.6	-86.6	-	-	$\Delta_{BG_{offs}}$	$\Delta_{BG_{offse}}$	
	o Net-0							et	t	
SS-RSR		Denendling and the	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34	
	Config 1,2	Depending on band group	dBm/ 9.36MHz	-51	1.57	-7	0	-83.28+	Δ_{BG_offset}	
lo ^{Note3}	<u> </u>	Depending on band	dBm/	[
	Config 3	group	38.16M	-51	1.56		_	-76.67+	-76.67+ $\Delta_{BG_{offset}}$	
	gioup		Hz	01.00						
Propaga	tion condition	on	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN	

Antenna	configuration		1x2	1x2	1x2	1x2	1x2	1x2
Note 1:	 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. 							
Note 2:								
Note 3:	SS-RSRQ, SS-RSRP, and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							
Note 4:	SS-RSRQ, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.							
Note 5:								
Note 6:	Subtest 2 is not used when testing with 30kHz SSB SCS.							
Note 7:	The test configuration excludes in this release of the specification	•••	band n51	and it is no	t required	to run this	test on ba	ind n51

Table 6.7.2.1.5-2: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Condition	ons	
Lowest reported value (Cell 2)	SS-RSRQ_52	SS-RSRQ_46	SS-RSRQ_44
Highest reported value (Cell 2)	SS-RSRQ_62	SS-RSRQ_60	SS-RSRQ_59
	Extreme Condit	ions	
Lowest reported value (Cell 2)	SS-RSRQ_49	SS-RSRQ_45	SS-RSRQ_43
Highest reported value (Cell 2)	SS-RSRQ_65	SS-RSRQ_61	SS-RSRQ_60

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.2.2 Inter-Frequency SS-RSRQ measurement accuracy

6.7.2.2.1 NR SA FR1-FR1 SS-RSRQ absolute measurement accuracy

6.7.2.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRQ absolute measurement accuracy is within the specified limits for all bands.

6.7.2.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.2.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.2.1.

This test shall be tested using any of the test configurations in Table 6.7.2.2.1.4.1-1.

Table 6.7.2.2.1.4.1-1: NR SA FR1-FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description	
6.7.2.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD	
6.7.2.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD	
6.7.2.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD	
Note: The UE is only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.2.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	n selected from Table 6.7.2.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and φ_1 = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\varphi_{1,1} = 5$	
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.2.2.1.4.1-2: Initial conditions for SS-RSRQ inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.2.2.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the different frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.1.

6.7.2.2.1.4.2 Test procedure

Same as in clause 6.7.2.1.1.4.2 but replacing Table 6.7.2.1.1.5-1 and 6.7.2.1.1.5-2 with 6.7.2.2.1.5-1 and 6.7.2.2.1.5-2, respectively.

6.7.2.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.2.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-RSRQ absolute measurement accuracy

	Default Message Contents				
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

Table 6.7.2.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRQ Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL					
Information Element	Value/remark	Comment	Condition		
ReportConfigNR::= SEQUENCE {					
reportType CHOICE {					
periodical SEQUENCE {			PERIODICAL		
reportQuantityCell SEQUENCE {					
rsrp	false				
sinr	false				
}					
maxReportCells	2				
}					
}					
}					

6.7.2.2.1.5 Test requirement

Table 6.7.2.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.2.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.2.1.5-2.

Deveryoritar		11.14	Tes	Test 1		Test 2		Test 3	
Parameter		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
SSB ARFCN	O antia A		freq1 freq2 freq1 freq2 freq1 FDD					freq2	
Duplex mode	Config 1 Config 2,3	-			FL TD				
	Config 1				Not App				
TDD configuration	Config 2	_	TDDConf.1.1						
J. J	Config 3	-			TDDC				
	Config 1				10: Nre	_{s,c} = 52			
BW _{channel}	Config 2	MHz			10: Nre	a,c = 52			
	Config 3				40: N _{RB} ,	c = 106			
Gap pattern ID					C)			
	Initial DL BWP				DLBW	/P.0.1			
BWP configuration	Dedicated DL BWP				DLBW	/P.1.1			
DWF conliguration	Initial UL BWP				ULBW	/P.0.1			
	Dedicated UL BWP				ULBW	/P.1.1			
DRX Cycle		ms			Not App	olicable		-	
	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD		
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	SR.1.1 TDD	-	
	Config 3		SR2.1 TDD		SR2.1 TDD		SR2.1 TDD		
	Config 1		CR.1.1 FDD	-	R.1.1 FDD	-	CR.1.1 FDD		
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD		CR.1.1 TDD		CR.1.1 TDD		
	Config 3		CR2.1 TDD		CR2.1 TDD		CR2.1 TDD		
	Config 1		CCR.1. 1 FDD		CCR.1. 1 FDD		CCR.1. 1 FDD		
Dedicated CORESET Reference Channel	Config 2		CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	
	Config 3		CCR2.1 TDD		CCR2.1 TDD		CCR2. 1 TDD		
	Config 1		TRS.1. 1 FDD		TRS.1.1 FDD		TRS.1. 1 FDD		
TRS Configuration	Config 2		TRS.1. 1 TDD	-	TRS.1.1 TDD	-	TRS.1. 1 TDD	-	
	Config 3		TRS.1. 2 TDD		TRS.1.2 TDD		TRS.1. 2 TDD		

Table 6.7.2.2.1.5-1: SS-RSRQ Inter frequency test parameters

OCNG Pat	tterns					OF	? .1		
Time offect with Coll 1 Config 2, 3		μs	3						
Time offset with Cell 1 Config 2, 5		ms	3						
SMTC con	figuration	Config 2, 3				SMT			
SIVITE CON	ingulation	Config 1				SMT			
SSB confi	auration	Config 1,2				SSB.1			
	galation	Config 3				SSB.2	in FR1		
PDSCH/PI	ОССН	Config 1,2	kHz			15 k	κHz		
subcarrier	spacing	Config 3	K T Z			30 H	κHz		
EPRE ratio	of PSS to SSS	5							
EPRE ratio	of PBCH DMRS								
	of PBCH to PBC								
	of PDCCH DMR of PDCCH to PD		dB	0	0	0	0	0	0
	of PDCCH to PL		uв	0	0	0	0	0	0
	of PDSCH to PD								
EPRE ratio	of OCNG DMRS	S to SSS(Note 1)							
EPRE ratio	of OCNG to OC	NG DMRS (Note 1)							
		Depending on							-116
$N_{_{oc}}$ Note2	Config 1,2	band group	dBm/15kHz	-81.68	-81.68	-106	-106	-116 +	, +
00								$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
		Depending on						set -116+	set -116+
$N_{_{oc}}$ Note2	Config 3	band group	dBm/15kHz	-87.80	-87.80	-113	-113	$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
- ' 0C	e e i mg e	balla group		01.00	07.00			set	set
		Depending on							-116
	Config 1,2	band group		-81.68	-81.68	-106	-106	-116 +	+
Noto2	Coning 1,2			-01.00	-01.00	-100	-100	$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
$N_{\scriptscriptstyle oc}$ Note2			dBm/SCS					set	set
	O suffer O	Depending on		04.0	04.0	440	440	-113+	-113+
	Config 3	band group		-84.8	-84.8	-110	-110	$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$			dB	-1.75	-1.75	-1.75	-1.75	set 3	set -1.75
$\frac{\hat{E}_{s}/\hat{I}_{ot}}{\hat{E}_{s}/N_{oc}}$	\hat{E}_{s}/I_{ot}		dB	-1.75	-1.75	-1.75	-1.75	3	-1.75
s/ - ` oc		Depending on	ub					Ű	-
		band group							117.7
	Config 1,2			-83.43	-83.43	- 107.75	- 107.75	-113+	5+
SS-								$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
SS- RSRP ^{Not}			dBm/SCS					set	set
e3		Depending on	dB11/000						-
	0 " 0	band group		00.54	00.54	-	-	440	114.7
	Config 3			-86.54	-86.54	111.75	111.75	-110+	5+
								$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
								set	set
SS-RSRQ ^I	Note3		dB	-14.76	-14.76	-14.76	-14.76	-12.56	-14.76
		Depending on						-	-
	Config 1.0	band group		FA FA		75.00	75.00	83.28	85.83
	Config 1,2			-51.51	-51.51	-75.83	-75.83	+ ^~~ "	+
								$\Delta_{BG_{off}}$	$\Delta_{BG_{off}}$
lo ^{Note3}	<u> </u>	Depending on	dBm/Ch BW					set	set
		band group						77.19	79.73
	Config 3			-51.52	-51.52	-76.73	-76.73	+	+
								$\Delta_{BG_{off}}$	Δ_{BG_off}
								set	set
Propagatic	on condition		-	AWGN	AWG N	AWGN	AWGN	AWG N	AWG N
Antenna co	onfiguration			1x2	1x2	1x2	1x2	1x2	1x2
	unguration		1	172	172	172	172	172	172

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	SS-RSRQ, SS-RSRP, and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	SS-RSRQ, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	$\Delta_{BG_{offset}}$ is defined in clause 3A.4, Table 3A.4.1-2
Note 6:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Table 6.7.2.2.1.5-2: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Condi	tions	
Lowest reported value (Cell 2)	SS-RSRQ_52	SS-RSRQ_52	SS-RSRQ_52
Highest reported value (Cell 2)	SS-RSRQ_62	SS-RSRQ_62	SS-RSRQ_62
	Extreme Cond	tions	
Lowest reported value (Cell 2)	SS-RSRQ_49	SS-RSRQ_49	SS-RSRQ_49
Highest reported value (Cell 2)	SS-RSRQ_65	SS-RSRQ_65	SS-RSRQ_65

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.2.2.2 NR SA FR1-FR1 SS-RSRQ relative measurement accuracy

6.7.2.2.2.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRQ relative measurement accuracy is within the specified limits for all bands.

6.7.2.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.2.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.2.2.

6.7.2.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.2.2.2.4.1-1.

Table 6.7.2.2.2.4.1-1: NR SA FR1-FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description	
6.7.2.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD	
6.7.2.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD	
6.7.2.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD	
Note: The UE is only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.2.2.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	n selected from Table 6.7.2.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and ϕ_1 = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5	
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.2.2.2.4.1-2: Initial conditions for SS-RSRQ inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.2.2.2.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.1.

6.7.2.2.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.2.2.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRQ reported values in the periodic MeasurementReport. The SS-RSRQ value of Cell 2 reported by the UE is compared to the SS-RSRQ value of Cell 1 reported by the UE. If the difference between both values is outside the limits in Table 6.7.2.2.5-2 or the UE fails to report the measurement value for Cell 2 or Cell 1, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.2.2.2.5-1 as appropriate and repeat steps 5-7.

6.7.2.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.2.2.1.4.3.

6.7.2.2.2.5 Test requirement

Table 6.7.2.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRQ measurement report for each of the tests in Table 6.7.2.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.2.2.5-2.

Table 6.7.2.2.2.5-1: same as Table 6.7.2.2.1.5-1

Table 6.7.2.2.2.5-2: SS-RSRQ Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	SS-RSRQ_x - 7	SS-RSRQ_x - 7	SS-RSRQ_x - 11
Highest reported value (Cell 2)	SS-RSRQ_x + 7	SS-RSRQ_x + 7	SS-RSRQ_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	SS-RSRQ_x - 9	SS-RSRQ_x - 9	SS-RSRQ_x – 13
Highest reported value (Cell 2)	SS-RSRQ_x + 9	SS-RSRQ_x + 9	SS-RSRQ_x + 4
RSRQ_x is the reported value of	Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.3 SS-SINR

6.7.3.0 Minimum conformance requirements

6.7.3.0.1 Intra-frequency SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.1.

6.7.3.0.2 Inter-frequency absolute SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.2.

6.7.3.0.3 Inter-frequency relative SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.3.

6.7.3.1 NR SA FR1 SS-SINR measurement accuracy

6.7.3.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-SINR measurement accuracy is within the specified limits for all bands.

6.7.3.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

6.7.3.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.3.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.1.

6.7.3.1.4 Test description

6.7.3.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.1.4.1-1.

Table 6.7.3.1.4.1-1: NR SA FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description
6.7.3.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.3.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.3.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note: The UE is	only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth		As specified by the test configuratio	n selected from Table 6.7.3.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and ϕ_1 = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and φ _{1,1} = 5	
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to connection diagram	- Without the LTE link		

Table 6.7.3.1.4.1-2: Initial conditions for SS-SINR intra frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.3.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

6.7.3.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.3.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-SINR reported values in the periodic MeasurementReport. The SS-SINR value of Cell 2 reported by the UE is compared to the expected SS-SINR. If the value is outside the limits in Table 6.7.3.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.3.1.5-1 as appropriate and repeat steps 5-7.

6.7.3.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.3.1.4.3-1: Common Exception messages for NR SA FR1 SS-SINR measurement accuracy

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.1-1		
elements contents exceptions	Table H.3.1-2		
	Table H.3.1-5		
	Table H.3.1-7		
Specific message contents exceptions for	Table H.3.1-3 with Condition SS-SINR		
Test Configuration 6.7.3.1-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2		
Specific message contents exceptions for	Table H.3.1-3 with Condition Synchronous cells and SS-SINR		
Test Configuration 6.7.3.1-2	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		
Specific message contents exceptions for	Table H.3.1-3 with Condition Synchronous cells and SS-SINR		
Test Configuration 6.7.3.1-3	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.3.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-SINR Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 w	vith condition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigNR::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			PERIODICAL
reportQuantityCell SEQUENCE {			
rsrp	false		
rsrq	false		
sinr	true		
}			
maxReportCells	2		
}			
}			
}			

6.7.3.1.5 Test requirements

Table 6.7.3.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.3.1.5-2

Table 6.7.3.1.5-1: SS-SINR Intra	a frequency test parameters
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Parameter		Unit	Test 1		Test 2	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN			freq1 freq1		q1	
Duplex mode	Config 1			FI	DD	
Duplex mode	Config 2,3			TI	DD	
	Config 1		Not Applicable TDDConf.1.1			
TDD configuration	Config 2					
_	Config 3		TDDConf.2.1			
Downlink initial BWP co	nfiguration		DLBWP.0.1			
Downlink dedicated BW	P configuration		DLBWP.1.1			
Uplink initial BWP configuration			ULBWP.0.1			
Uplink dedicated BWP configuration			ULBWP.1.1			
DRX Cycle configuration		ms	Not Applicable			

		Config 1		TRS.1.1 FDD		TRS.1.1 FDD	
TRS configuration		Config 2		TRS.1.1 TDD	-	TRS.1.1 TDD	-
		Config 3		TRS.1.2 TDD		TRS.1.2 TDD	
		Config 1		SR.1.1 FDD		SR.1.1 FDD	
	Reference nent channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-
		Config 3		SR.2.1 TDD		SR2.1 TDD	
		Config 1		CR.1.1 FDD		CR.1.1 FDD	
RMSI COF Reference		Config 2		CR.1.1 TDD	-	CR.1.1 TDD	
		Config 3		CR.2.1 TDD		CR.2.1 TDD	
		Config 1		CCR.1. 1 FDD		CCR.1.1 FDD	
Dedicated Reference	CORESET Channel	Config 2		CCR.1. 1 TDD	-	CCR.1.1 TDD	-
		Config 3		CCR.2. 1 TDD		CCR.2.1 TDD	
OCNG Pat						P.1	
SS-RSSI-N	<i>Aeasurement</i>				Not Ap	plicable	
Time offse	t with Cell 1	Config 2, 3	μS	-	3	-	3
		Config 1	ms	-	3	-	3
SMTC con	figuration	Config 2, 3				TC.1	
	ingulation	Config 1				TC.2	
SSB config	nuration	Config 1,2				1 FR1	
SSP comi	guration	Config 3		SSB.2 FR1			
PDSCH/PI	DCCH	Config 1,2	1.1.1-		15		
subcarrier	spacing	Config 3	- kHz	30			
	of PSS to SSS						
	of PBCH DMRS	S to SSS					
EPRE ratio	of PBCH to PBC	CH DMRS					
EPRE ratio	of PDCCH DMF	RS to SSS					
	of PDCCH to PI		dB	0	0	0	0
	of PDSCH DMF						
	of PDSCH to PL		_				
		S to SSS(Note 1)	_				
	of OCNG to OC	NG DMRS (Note 1)				440.4	
$N_{_{oc}}$ Note2	ſ	Depending on band group	dBm/15kH z	-93		-116+ Δ	
N_{oc}	Config 1,2		dBm/SCS	-93	3.2	Same as 15k	
Note2	Config 3	Depending on band group	ubiii/000	-90	0.2	-113+ ∆	BG_offset
\hat{E}_{s}/I_{ot}		_	dB	0	-3.19	-5.46	-5.46
\hat{E}_{s}/N_{oc}			dB	4.54	2.66	-3.5	-3.5
		Depending on					-
SS- RSRP ^{Not}	Config 1,2	band group	– dBm/SCS	-88.46	-90.34	-119.5+ Δ _{BG_offset}	119.5+ Δ _{BG_offs} et
e3	Config 3	Depending on band group		-85.65	-87.53	-116.5+ Δ _{BG_offset}	- 116.5+ Δ _{BG_offs} et
SS-SINR N	ote3		dB	0	-3.19	-5.1	-5.1
Io ^{Note3}	Config 1,2	Depending on band group	dBm/ 9.36MHz		7.5	-85.28+ /	
10.1000	Config 3	Depending on band group	dBm/ 38.16MHz	-51	-51.59 -79.17+ Δ _B		$\Delta_{BG_{offset}}$
Propagatio	Propagation condition		-		AV	VGN	
			-			x2	
Antenna configuration		1	l				

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	SS-SINR, SS-RSRP, and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	SS-SINR, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Δ_{BG} offset is defined in clause 3A.4, Table 3A.4.1-2
Note 6:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification

Table 6.7.3.1.5-3: SS-SINR Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	SS-SINR_31	SS-SINR_28
Highest reported value (Cell 2)	SS-SINR_49	SS-SINR_45
Extreme Conditions		
Lowest reported value (Cell 2)	SS-SINR_30	SS-SINR_27
Highest reported value (Cell 2)	SS-SINR_50	SS-SINR_46

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.3.2 Inter-Frequency SS-SINR measurement accuracy

6.7.3.2.1 NR SA FR1-FR1 SS-SINR absolute measurement accuracy

6.7.3.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-SINR absolute measurement accuracy is within the specified limits for all bands.

6.7.3.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

6.7.3.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.2.1.

6.7.3.2.1.4 Test description

6.7.3.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.2.1.4.1-1.

Table 6.7.3.2.1.4.1-1: NR SA FR1-FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description
6.7.3.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.3.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.3.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note: The UE is only required to be tested in one of the supported test configurations	

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.2.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	As specified by the test configuration	n selected from Table 6.7.3.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and φ_1 = 5 Hz A.3.1.8.5 with n = 2 and $\varphi_{1,1}$ = 5 Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz A.3.2.3.4 A.3.2.5.2	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.3.2.1.4.1-2: Initial conditions for SS-SINR inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.3.2.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

6.7.3.2.1.4.2 Test procedure

Same as in clause 6.7.3.1.4.2 but replacing Table 6.7.3.1.5-1 and 6.7.3.1.5-2 with 6.7.3.2.1.5-1 and 6.7.3.2.1.5-2, respectively.

6.7.3.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.3.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-SINR absolute measurement accuracy

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0
Specific message contents exceptions for Test Configuration 6.7.3.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO and SS-SINRTable 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for Test Configuration 6.7.3.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, and Synchronous cells and SS-SINR Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message contents exceptions for Test Configuration 6.7.3.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, and Synchronous cells and SS-SINR Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.3.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-SINR Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL						
Information Element	Value/remark	Comment	Condition			
ReportConfigNR::= SEQUENCE {						
reportType CHOICE {						
periodical SEQUENCE {			PERIODICAL			
reportQuantityCell SEQUENCE {						
rsrp	false					
rsrq	false					
sinr	true					
}						
maxReportCells	2					
}						
}						
}						

6.7.3.2.1.5 Test requirements

Table 6.7.3.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.3.2.1.5-2.

Parameter		Unit	Tes		Tes			st 3
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN								freq2
Duplex mode	Config 1 Config 2,3					DC DC		
	Config 1					plicable		
TDD configuration	Config 2					onf.1.1		
-	Config 3		-		TDDC	onf.2.1		
Downlink initial BWP cor	figuration				DLBV	VP.0.1		
Downlink dedicated BWI	Configuration				DLBV	VP.1.1		
Uplink initial BWP config	uration				ULBV	VP.0.1		
Uplink dedicated BWP c	onfiguration				ULBV	VP.1.1		
DRX Cycle configuration		ms			Not Ap	plicable		
Gap pattern ID			0	-	0	-	0	-
	Config 1		TRS.1.1 FDD		TRS.1.1 FDD		TRS.1.1 FDD	
TRS configuration	Config 2		TRS.1.1 TDD	-	TRS.1.1 TDD	-	TRS.1.1 TDD	-
	Config 3		TRS.1.2 TDD		TRS.1.2 TDD		TRS.1.2 TDD	
	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD	
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	SR.1.1 TDD	-
	Config 3		SR.2.1 TDD		SR.2.1 TDD		SR.2.1 TDD	
	Config 1		CR.1.1 FDD		CR.1.1 FDD		CR.1.1 FDD	
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD	-	CR.1.1 TDD	-	CR.1.1 TDD	-
	Config 3		CR.2.1 TDD		CR.2.1 TDD		CR.2.1 TDD	

Table 6.7.3.2.1.5-1: SS-SINR Inter frequency test parameters

				CCR.1.		CCR.1.		CCR.1.	
Dedicated CORESET Reference Channel		Config 1		1 FDD	-	1 FDD		1 FDD	
		Config 2		CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-
		Config 3		CCR.2. 1 TDD		CCR.2. 1 TDD		CCR.2. 1 TDD	
OCNG Pa	tterns					0	P.1		
SS-RSSI-I	Measurement					Not Ap	plicable		
Time offer		Config 2, 3	μS	-	3	-	3	-	3
Time onse	et with Cell 1	Config 1	ms	-	3	-	3	-	3
0.470	r	Config 2, 3				SM	TC.1		
SMTC cor	figuration	Config 1				SM	TC.2		
		Config 1,2				SSB.	1 FR1		
SSB config	guration	Config 3				SSB.	2 FR1		
PDSCH/P	DCCH	Config 1,2					15		
subcarrier		Config 3	– kHz			3	30		
	of PSS to SSS								
	of PBCH DMRS of PBCH to PBC		_						
	of PDCCH DMF		_			0	0	0	0
EPRE ratio	of PDCCH to P	DCCH DMRS	dB	0	0				
	of PDSCH DMF		_						
		S to SSS(Note 1)	-						
		NG DMRS (Note 1)							
$N_{_{oc}}$ Note2	Config 1,2	Depending on band group	dBm/15k Hz	-88	-88	-108.5	-108.5	-119.5+ Δ _{BG_offse}	-119.5+ Δ _{BG_offse}
$N_{_{oc}}$ Note2		Config 1,2	dBm/SC S	-88	-88	-108.5	-108.5	Same as Noc for 15kHz	Same as Noc for 15kHz
	Config 3	Depending on band group		-85	-85	-105.5	-105.5	-116.5+ Δ _{BG_offse}	116.5+ Δ _{BG_offse}
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$			dB	-1.75	-1.75	20	20	-3.2	-3.2
\hat{E}_s/N_{oc}			dB	-1.75	-1.75	20	20	-3.2	-3.2
SS-	Config 1,2	Depending on band group	dBm/SC	-89.75	-89.75	-88.5	-88.5	-122.7+ Δ _{BG_offse}	-122.7+ Δ _{BG_offse}
RSRP ^{Not} e3	Config 3	Depending on band group	S	-86.75	-86.75	-85.5	-85.5	-119.7+ Δ _{BG_offse} t	-119.7+ Δ _{BG_offse} t
SS-S	INR Note3		dB	-1.75	-1.75	-1.75	-1.75	-3.2	-3.2
	Config 1,2	Depending on band group	dBm/ 9.36MHz	-57.83	-57.83	-60.5	-60.5	-89.85+ Δ _{BG_offse} t	-89.85+ Δ _{BG_offse} t
lo ^{Note3}	Config 3	Depending on band group	dBm/ 38.16MH z	-51.73	-51.73	-54.41	-54.41	-83.75+ Δ _{BG_offse}	-83.75+ Δ _{BG_offse} t

Propagat	Propagation condition		AWGN	
Antenna	configuration	-	1x2	
Note 1:	OCNG shall be used such that both density is achieved for all OFDM sy		ly allocated and a constant total transmitted power spectral	
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.				
Note 3:	SS-SINR, SS-RSRP, and lo levels l are not settable parameters themse		erived from other parameters for information purposes. They	
Note 4:	Note 4: SS-SINR, SS-RSRP minimum requirements are specified assuming independent interference and noise each receiver antenna port.		e specified assuming independent interference and noise at	
Note 5:	Dte 5: $\Delta_{BG_{offset}}$ is defined in clause 3A.4, Table 3A.4.1-2			
Note 6:	The test configuration excludes sup release of the specification	port for band	d n51 and it is not required to run this test on band n51 in this	

Table 6.7.3.2.1.5-2: SS-SINR Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Conditi	ons	
Lowest reported value (Cell 2)	SS-SINR_35	SS-SINR_79	SS-SINR_32
Highest reported value (Cell 2)	SS-SINR_51	SS-SINR_94	SS-SINR_49
	Extreme Condit	ions	
Lowest reported value (Cell 2)	SS-SINR_33	SS-SINR_77	SS-SINR_31
Highest reported value (Cell 2)	SS-SINR_53	SS-SINR_96	SS-SINR_50

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.3.2.2 NR SA FR1-FR1 SS-SINR relative measurement accuracy

6.7.3.2.2.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-SINR relative measurement accuracy is within the specified limits for all bands.

6.7.3.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

6.7.3.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.2.2.

6.7.3.2.2.4 Test description

6.7.3.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.2.2.4.1-1.

Table 6.7.3.2.2.4.1-1: NR SA FR1-FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description		
6.7.3.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.3.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.3.2.2-3 NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note	Note: The UE is only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.2.2.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	n selected from Table 6.7.3.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and ϕ_1 = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\varphi_{1,1} = 5$	
	4Rx	Hz, φ _{1,2} = 10 Hz, φ _{1,3} = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to	- Without the	LTE link	
connection			
diagram			

Table 6.7.3.2.2.4.1-2: Initial conditions for SS-SINR inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.3.2.2.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

6.7.3.2.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.3.2.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-SINR reported values in the periodic MeasurementReport. The SS- SINR value of Cell 2 reported by the UE is compared to the SS- SINR value of Cell 1 reported by the UE. If the difference between both values is outside the limits in Table 6.7.3.2.2.5-2 or the UE fails to report the measurement value for Cell 2 or Cell 1, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.3.2.2.5-1 as appropriate and repeat steps 5-7.

6.7.3.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.3.2.1.4.3.

6.7.3.2.2.5 Test requirements

Table 6.7.3.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.2.2.5-1 shall meet the corresponding relative accuracy requirements in Table 6.7.3.2.2.5-2

Table 6.7.3.2.2.2.5-1: same as Table 6.7.3.2.2.1.5-1

Table 6.7.3.2.2.5-2: SS-SINR Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	SS-SINR_x - 10	SS-SINR_x - 10	SS-SINR_x - 11
Highest reported value (Cell 2)	SS-SINR_x + 10	SS-SINR_x + 10	SS-SINR_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	SS-SINR_x - 12	SS-SINR_x - 12	SS-SINR_x - 12
Highest reported value (Cell 2)	SS-SINR_x + 12	SS-SINR_x + 12	SS-SINR_x + 12
RSRQ_x is the reported value of	Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.4 L1-RSRP

6.7.4.0 Minimum conformance requirements

6.7.4.0.1 SSB based absolute L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.1.

6.7.4.0.2 SSB based relative L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.2.

6.7.4.0.3 CSI-RS based absolute L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.3.

6.7.4.0.4 CSI-RS based relative L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.4.

6.7.4.1	SSB based L1-RSRP	measurements

6.7.4.1.1 NR SA FR1 SSB based L1-RSRP absolute measurement accuracy

6.7.4.1.1.1 Test purpose

The purpose of this test is to verify that the SSB based L1-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.4.1.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.4.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.1.

6.7.4.1.1.4 Test description

6.7.4.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.1.1.4.1-1.

Table 6.7.4.1.1.4.1-1: NR SA FR1 SSB based L1-RSRP absolute measurement accuracy supported test configurations

Test Case ID	Description			
6.7.4.1.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.4.1.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.4.1.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note: The UE is	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.1.1.4.1-2.

Table 6.7.4.1.1.4.1-2: Initial conditions for SSB based L1-RSRP absolute accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies			1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	n selected from Table 6.7.4.1.1.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.4.1.1.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. The connection setup is done according to the settings in Annex C.1.1.

6.7.4.1.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.1.1.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.1.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.1.1.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of SSB#0 and SSB#1 in the periodic L1-RSRP reports. If the value for both SSBs is within the limits in Table 6.7.4.1.1.5-2 or Table 6.7.4.1.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.1.1.5-1 as appropriate and repeat steps 3-5.

6.7.4.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.1.1.4.3-1: Common Except	messages NR SA SSB based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP		
elements contents exceptions	Table H.3.6-3 with conditions SSB and PERIODIC		
	Table H.3.5-8		
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.4.1.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

6.7.4.1.1.5 Test requirement

Table 6.7.4.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-3 for test configuration 3.

Table 6.7.4.1.1.5-1: L1-RSRP test parameters
--

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N _{RB,c} = 52	10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106	40: N _{RB,c} = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement channel	3		SR.2.1 TDD	SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD	CR.1.1 FDD
Channel	2		CR.1.1 TDD	CR.1.1 TDD
Channel	3		CR.2.1 TDD	CR.2.1 TDD
Dedicated CODESET	1		CCR.1.1 FDD	CCR.1.1 FDD
Dedicated CORESET Reference Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
	3		CCR.2.1 TDD	CCR.2.1 TDD
SSP configuration	1		SSB.3 FR1	SSB.3 FR1
SSB configuration	2		SSB.3 FR1	SSB.3 FR1

		3		SSB.4 FR1	SSB.4 FR1
OCNG Pa	atterns	1~3		000.411K1	OP.1
0011011		1		TRS.1.1 FDD	TRS.1.1 FDD
TRS configuration		2		TRS.1.1 TDD	TRS.1.1 TDD
		3		TRS.1.2 TDD	TRS.1.2 TDD
				DLBWP.0.1	DLBWP.0.1
Initial BW	P Configuration	1~3		ULBWP.0.1	ULBWP.0.1
				DLBWP.1.1	DLBWP.1.1
Dedicated	d BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1
SMTC co	onfiguration	1~3		SMTC.1	SMTC.1
reportCor	·	1~3		periodic	periodic
reportQua		1~3		ssb-Index-RSRP	ssb-Index-RSRP
	of reported RS	1~3		2	2
	P reporting period	1~3		slot80	slot80
EPRE ratio	of PSS to SSS			0.0100	0.0100
	o of PBCH DMRS to SSS				
	o of PBCH to PBCH DMRS				
	of PDCCH DMRS to SSS				
EPRE ratio	o of PDCCH to PDCCH				
-	o of PDSCH DMRS to SSS	1~3	dB	0	0
	of PDSCH to PDSCH		0.2	Ŭ	, i i i i i i i i i i i i i i i i i i i
DMRS					
	o of OCNG DMRS to				
SSS ^{Note 1}	(00)00 0000				
EPRE ratio	o of OCNG to OCNG				
Divirto					
N _{oc}		10		04.65	
Note2		1,2	dBm/15kHz	-94.65	-117+ $\Delta_{BG_{offset}}$
			-		
	Depending on	3		-96.00	117+ $\Delta_{BG_{offset}}$
	band group	1,2	dBm/SSB	-94.65	117-4-5-55
N _{oc}		1,2	SCS	-94.00	-117+ $\Delta_{BG_{offset}}$
Note2			000		
		3		-93.00	-114+ $\Delta_{BG_{offset}}$
\hat{E}_{s}/I_{ot}		1~3	dB	10	-2.2
					-119.2 +
SSB	Denending	1,2		-84.65	
RSRP	Depending on		dBm/SSB		$\Delta_{BG_{offset}}$
Note3	band group		SCS		-116.2 +
		3		-83.00	$\Delta_{BG_{offset}}$
	Depending of				
	Depending on	10	dBm/9.36	56.20	-87.00 +
	band group	1,2	MHz	-56.28	Δ_{BG_offset}
lo Note3					
		^	dBm/38.16	51 50	-80.90 +
		3	MHz	-51.53	$\Delta_{BG_{offset}}$
			1	1	_
\hat{F} / N		1~3	dB	10	-22
\hat{E}_s/N_{oc}		1~3	dB	10	-2.2
	c ion condition	1~3 1~3	dB	10 AWGN	-2.2 AWGN

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power
	for N_{oc} to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification

Table 6.7.4.1.1.5-2: L1-RSRP absolute accuracy requirements for the reported values for testconfigurations 1 and 2

	Test 1	Test 0	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	31
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	31
		Bands NR_TDD_FR1_C	32
Lowest reported value (Cell 1)	62	Bands NR_FDD_FR1_D,	32
Lowest reported value (Cell T)	02	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	33
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	34
		Bands NR_FDD_FR1_H	34
		Bands NR_FDD_FR1_A,	44
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	45
		Bands NR_TDD_FR1_C	45
Highest reported value (Cell 1)	82	Bands NR_FDD_FR1_D,	46
	02	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	46
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	47
		Bands NR_FDD_FR1_H	48
Extreme Conditions	Test 1	Test 2	
	All bands		
		Banda ND EDD ED1 A	20
		Bands NR_FDD_FR1_A,	30
		NR_TDD_FR1_A	
		NR_TDD_FR1_A Bands NR_FDD_FR1_B	30
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	30 31
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	30
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 31 31
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 31
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	30 31 31 32
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	30 31 31 32 33
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	30 31 31 32 33 33
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	30 31 31 32 33
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	30 31 31 32 33 33 45
Lowest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	30 31 31 32 33 33 45 46
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	30 31 31 32 33 33 45 46 46 46
Lowest reported value (Cell 1) Highest reported value (Cell 1)	61	NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_D, Bands NR_FDD_FR1_C	30 31 31 32 33 33 45 46
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 31 31 32 33 33 45 46 46 46 46 47
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 31 31 32 33 33 45 46 46 46
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	30 31 31 32 33 33 45 46 46 46 46 47
		NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 31 31 32 33 33 45 46 46 46 46 47 47

Normal Conditions	Test 1	Test 0	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	34
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	34
		Bands NR_TDD_FR1_C	35
Lowest reported value (Cell 1)	63	Bands NR_FDD_FR1_D,	35
Lowest reported value (Cell 1)	03	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	36
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	37
		Bands NR_FDD_FR1_H	37
		Bands NR_FDD_FR1_A,	47
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	48
		Bands NR_TDD_FR1_C	48
Highest reported value (Cell 1)	84	Bands NR_FDD_FR1_D,	49
	01	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	49
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	50
		Bands NR_FDD_FR1_H	51
Extreme Conditions	Test 1		
Extreme Conditions		Test 2	
	All bands		33
		Bands NR_FDD_FR1_A,	33
		Bands NR_FDD_FR1_A, NR_TDD_FR1_A	
		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 33 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	33
Lowest reported value (Cell 1)		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	33 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	33 34 34 35
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	33 34 34 35 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	33 34 34 35 36 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	33 34 34 35 36 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	33 34 34 35 36 36 48
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 34 34 35 36 36 48 49
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 34 34 35 36 36 48 49 49
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34 34 35 36 36 48 49 49
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 34 34 35 36 36 48 49 49 49 50
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	33 34 34 35 36 36 48 49 49 49 50 50 50 51
Lowest reported value (Cell 1)	All bands 62 85	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G	33 34 34 35 36 36 48 49 49 49 50 50 50 50 51 52

Table 6.7.4.1.1.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configuration 3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.4.1.2 NR SA FR1 SSB based L1-RSRP relative measurement accuracy

6.7.4.1.2.1 Test purpose

The purpose of this test is to verify that the SSB based L1-RSRP relative measurement accuracy is within the specified limits for all bands.

6.7.4.1.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.4.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.1.

6.7.4.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.1.2.4.1-1.

Table 6.7.4.1.2.4.1-1: NR SA FR1 SSB based L1-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description		
6.7.4.1.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.4.1.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.4.1.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD		
Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.1.2.4.1-2.

Table 6.7.4.1.2.4.1-2: Initial conditions for SSB based L1-RSRP relative accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	A	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuratior	n selected from Table 6.7.4.1.2.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.4.1.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. The connection setup is done according to the settings in Annex C.1.1.

6.7.4.1.2.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.1.2.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.1.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.1.2.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of SSB#0 and SSB#1 in the periodic L1-RSRP reports. The L1-RSRP value for SSB#1 is compared to the L1-RSRP value for SSB#0. If the difference is within the limits in Table 6.7.4.1.2.5-2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.

- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.1.2.5-1 as appropriate and repeat steps 3-5.

6.7.4.1.2.4.3 Message contents

Message contents are same as in Clause 6.7.4.1.1.4.3.

6.7.4.1.2.5 Test requirement

Table 6.7.4.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.1.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.1.2.5-2.

Table 6.7.4.1.2.5-1: Same as Table 6.7.4.1.1.5-1

Table 6.7.4.1.2.5-2: L1-RSRP relative accuracy requirements for the reported values

	Test 1	Test 2			
	All bands	All bands			
Normal Conditions					
Lowest reported value (Cell 1 SSB resource 1)	RSRP_x - 3	RSRP_x - 3			
Highest reported value (Cell 1 SSB resource 1)	RSRP_x + 3	RSRP_x + 3			
Extreme Conditions					
Lowest reported value (Cell 1 SSB resource 1))	RSRP_x - 4	RSRP_x - 4			
Highest reported value (Cell 1 SSB resource 1)	RSRP_x + 4	RSRP_x + 4			
RSRP_x is the reported value of	RSRP_x is the reported value of Cell 1 SSB resource 0				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.4.2 CSI-RS based L1-RSRP measurements

6.7.4.2.1 NR SA FR1 CSI-RS based L1-RSRP absolute measurement accuracy

6.7.4.2.1.1 Test purpose

The purpose of this test is to verify that the CSI-RS based L1-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.4.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.4.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.2.

6.7.4.2.1.4 Test description

6.7.4.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.2.1.4.1-1.

Table 6.7.4.2.1.4.1-1: NR SA FR1 CSI-RS based L1-RSRP absolute measurement accuracy supported test configurations

Test Case ID	Description			
6.7.4.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.4.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.4.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.2.1.4.1-2.

Table 6.7.4.2.1.4.1-2: Initial conditions for CSI-RS based L1-RSRP absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	ŀ	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	А	s specified by the test configuration	n selected from Table 6.7.4.2.1.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.4.2.1.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-RSRP measurements. The UE is configured to perform RLM and BFD measurement based on the SSB. The connection setup is done according to the settings in Annex C.1.1.

6.7.4.2.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.2.1.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.2.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.2.1.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. If the value for both CSI-RSs is within the limits in Table 6.7.4.2.1.5-2 or Table 6.7.4.2.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.2.1.5-1 as appropriate and repeat steps 3-5.

6.7.4.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.2.1.4.3-1: Common Exception messages EN-DC CSI-RS-based L1-RSRP measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and CSI-RSRP			
elements contents exceptions	Table H.3.6-3 with conditions CSI-RS and PERIODIC			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.4.2.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133					
Information Element	Value/remark	Comment	Condition		
RadioLinkMonitoringConfig ::= SEQUENCE {					
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry				
purpose	both	UE is configured to perform RLM and BFD based on the SSB.			
detectionResource CHOICE {					
ssb-Index	0				
}					
}					
}					

6.7.4.2.1.5 Test requirement

Table 6.7.4.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.2.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.4.2.1.5-3 for test configuration 3.

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N _{RB,c} = 52	10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106	40: N _{RB,c} = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement channel	3		SR.2.1 TDD	SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD	CR.1.1 FDD
Channel	2		CR.1.1 TDD	CR.1.1 TDD
Channel	3		CR.2.1 TDD	CR.2.1 TDD
Dedicated CORESET	1		CCR.1.1 FDD	CCR.1.1 FDD
Reference Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
Reference Ghannel	3		CCR.2.1 TDD	CCR.2.1 TDD
	1		SSB.3 FR1	SSB.3 FR1
SSB configuration	2		SSB.3 FR1	SSB.3 FR1
	3		SSB.4 FR1	SSB.4 FR1

OCNG Patterns TRS configuration Initial BWP Configuration Dedicated BWP configuration	1~3 1 2 3		OP.1 TRS.1.1 FDD TRS.1.1 TDD	OP.1 TRS.1.1 FDD TRS.1.1 TDD
Initial BWP Configuration Dedicated BWP configuration	2 3			
Initial BWP Configuration Dedicated BWP configuration	3	-		
Dedicated BWP configuration			TRS.1.2 TDD	TRS.1.2 TDD
Dedicated BWP configuration			DLBWP.0.1	DLBWP.0.1
Ĵ	1~3		ULBWP.0.1	ULBWP.0.1
Ĵ			DLBWP.1.1	DLBWP.1.1
	1~3		ULBWP.1.1	ULBWP.1.1
SMTC configuration	1~3		SMTC.1	SMTC.1
Chine configuration	1,4		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD
CSI-RS	2,5	-	CSI-RS 1.2 TDD	CSI-RS 1.2 TDD
	3,6	-	CSI-RS 2.2 TDD	CSI-RS 2.2 FDD
reportConfigType	1~3		periodic	periodic
reportQuantity	1~3		cri-RSRP	cri-RSRP
Number of reported RS	-		2	
	1~3			2
L1-RSRP reporting period EPRE ratio of PSS to SSS	1~3		slot80	slot80
EPRE ratio of PBCH DMRS to SSS				
EPRE ratio of PBCH to PBCH DMRS				
EPRE ratio of PDCCH DMRS to SSS				
EPRE ratio of PDCCH to PDCCH				
DMRS	4 0	JD	0	
EPRE ratio of PDSCH DMRS to SSS EPRE ratio of PDSCH to PDSCH	1~3	dB	0	0
DMRS				
EPRE ratio of OCNG DMRS to				
SSS ^{Note 1}				
EPRE ratio of OCNG to OCNG DMRS				
N _{oc} Note2	1,2	dBm/15kHz	-94.65	-117+ $\Delta_{BG_{offset}}$
Depending on	3	•	-96.00	117+ $\Delta_{BG_{offset}}$
band group	1,2	dBm/CSI- RS SCS	-94.65	-117+ $\Delta_{BG_{offset}}$
Note2	3		-93.00	-114+ $\Delta_{BG_{offset}}$
\hat{E}_{s}/I_{ot}	1~3	dB	10	-2.2
CSI- RSRP Depending on	1,2	dBm/CSI-	-84.65	-119.2 + Δ _{BG_offset}
Note3 band group	3	RS SCS	-83.00	-116.2 + Δ _{BG_offset}
Depending on band group	1,2	dBm/9.36 MHz	-56.28	-87.00 + Δ _{BG_offset}
IO Note3	3	dBm/38.16 MHz	-51.53	-80.90 + Δ _{BG_offset}
\hat{E}_s/N_{oc}	1~3	dB	10	-2.2
Propagation condition	1~3		AWGN	AWGN
-	1~3		1x2	1x2

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power
	for N_{oc} to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification

Table 6.7.4.2.1.5-2: Same as Table 6.7.4.1.1.5-2

Table 6.7.4.2.1.5-3: Same as Table 6.7.4.1.1.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.4.2.2 NR SA FR1 CSI-RS based L1-RSRP relative measurement accuracy

6.7.4.2.2.1 Test purpose

The purpose of this test is to verify that the CSI-RS based L1-RSRP relative measurement accuracy is within the specified limits for all bands.

6.7.4.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.4.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.2.

6.7.4.2.2.4 Test description

6.7.4.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.2.2.4.1-1.

Table 6.7.4.2.2.4.1-1: NR SA FR1 CSI-RS based L1-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description			
6.7.4.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.4.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.4.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.2.2.4.1-2.

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	1	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Д	s specified by the test configuration	n selected from Table 6.7.4.2.2.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
-	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram	N/A		

Table 6.7.4.2.2.4.1-2: Initial conditions for CSI-RS based L1-RSRP relative accuracy in FR1

- 1. Message contents are defined in clause 6.7.4.2.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-RSRP measurements. The UE is configured to perform RLM and BFD measurement based on the SSB. The connection setup is done according to the settings in Annex C.1.1.

6.7.4.2.2.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.2.2.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.2.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.2.2.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. The L1-RSRP value for CSI-RS #1 is compared to the L1-RSRP value for CSI-RS #0. If the difference is within the limits in Table 6.7.4.2.2.5-2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.2.2.5-1 as appropriate and repeat steps 3-5.

6.7.4.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.4.2.1.4.3.

6.7.4.2.2.5 Test requirement

Table 6.7.4.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.2.2.5-2.

Table 6.7.4.2.2.5-1: Same as Table 6.7.4.2.1.5-1

Table 6.7.4.2.2.5-2: Same as Table 6.7.4.1.2.5-2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.5 E-UTRAN RSRP

6.7.5.0 Minimum conformance requirements

6.7.5.0.1 E-UTRAN RSRP absolute accuracy

The measurement period of E-UTRA RSRP in RRC_CONNECTED state is specified in clause 9.4.2 and 9.4.3 of TS 38.133 [6].

The accuracy requirements of E-UTRA RSRP measurements in RRC_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RSRP Accuracy Requirements in clause 9.1.3 of TS 36.133 [23]:

The requirements for absolute accuracy of RSRP in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 6.7.5.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 of TS 36.133 [23] for a corresponding Band.

Accuracy			C	Conditions			
Normal	Extreme	tromo	lo ^{Note 1} range				
condition	condition	Ês/lot	E-UTRA operating band groups ^{Note 3}	Minimum Io		Maximum Io	
dB	dB	dB		dBm/15kHz ^{Note} 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
			FDD_B1, FDD_B2	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5	±9	≥-6 dB	FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	/A -70	
			FDD_N	-114.5	N/A	-70	
±8	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C,						
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3 of TS 36.133 [23].							
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].							

 Table 6.7.5.0.1-1: RSRP Inter frequency absolute accuracy

The reporting range and mapping specified for RSRP measurements in clause 9.1.4 of TS 36.133 [23] shall apply:

The reporting range of RSRP is defined from -156 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 6.7.5.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
RSRP17	RSRP< -156	dBm
RSRP16	-156 ≤ RSRP< -155	dBm
RSRP03	-143 ≤ RSRP< -142	dBm
RSRP02	-142 ≤ RSRP< -141	dBm
RSRP01	-141 ≤ RSRP< -140	dBm
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

Table 6.7.5.0.1-2: RSRP measurement report mapping

6.7.5.1 NR SA FR1 – E-UTRAN RSRP absolute measurement accuracy

6.7.5.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RSRP absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

6.7.5.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA.

6.7.5.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.5.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.5.1.

6.7.5.1.4 Test description

6.7.5.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.5.1.4.1-1.

Test Case ID	Description				
6.7.5.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD				
6.7.5.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD				
6.7.5.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD				
6.7.5.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD				
6.7.5.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD				
6.7.5.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD				
Note: The UE is	Note: The UE is only required to be tested in one of the supported test configurations				

Table 6.7.5.1.4.1-1: test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.5.1.4.1-2.

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified in Ar	nnex E, Table E.4-2 and TS	S 38.508-1 [14] clause 4.3.1.
Channel bandwidth	As specified by th	e test configuration selecte	ed from Table 6.7.5.1.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	TE Part 4Rx	A.3.1.7.3	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram	N/A		

Table 6.7.5.1.4.1-2: initial conditions

- 1. Message contents are defined in clause 6.7.5.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

6.7.5.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.5.1.5-1 and Table 6.7.5.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the RSRP reported values in the periodic MeasurementReport. The RSRP value of Cell 2 reported by the UE is compared to the expected RSRP. If the value is outside the limits in Table 6.7.5.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.5.1.5-2 as appropriate and repeat steps 5-7.
- 6.7.5.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.5.1.4.3-1: Common Exception messages

Default Message Contents				
Common contents of system information blocks exceptions				
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-RAT and GAP NEEDED Table H.3.1-3 Table H.3.1-3a Table H.3.1-7 with condition INTER-RAT Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Derivation path: Table H.3.1-2 with condition INTER-RAT	and GAP NEEDED		
Information Element	Value/Remark	Comment	Condition
measConfig ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE(SIZE	2 entries		
(1maxReportConfigId)) OF ReportConfigToAddMod {			
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigId	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigE-UTRA- DEFAULT(Periodical)	Table 6.7.5.1.4.3- 2	
}			
		anta o	
ReportConfigToAddMod[2] SEQUENCE {		entry 2	
reportConfigId	2		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.5.1.4.3- 1B	
}			
}			
}			
measIdToAddModList SEQUENCE (SIZE (1maxNrofMeasId)) OF MeasIdToAddMod {	2 entries		
MeasIdToAddMod[1] SEQUENCE {		entry 1	
measId	1		
measObjectId	2		
reportConfigId	1		
}			
MeasIdToAddMod[2] SEQUENCE {		entry 2	
measld	2	·	
measObjectId	2		
reportConfigId	2		
}			
}			
}			

Table 6.7.5.1.4.3-1A: MeasConfig (Test procedure step 3)

Table 6.7.5.1.4.3-1B: ReportConfigInterRAT-EVENT (Table 6.7.5.1.4.3-1A)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141 with condition EVENT_B1						
Information Element	Value/remark	Comment	Condition			
ReportConfigInterRAT ::= SEQUENCE {						
reportType CHOICE {						
eventTriggered SEQUENCE {						
eventId CHOICE {						
eventB1 SEQUENCE {						
b1-ThresholdEUTRA CHOICE {						
rsrp	97	Set threshold to - 44dBm to ensure measId 2 will never be triggered				
}						
}						
}						
}						
}						
}						

Derivation Path: 38.508-1 [14] Table 4.6.3-141 with Condition PERIODICAL						
Information Element	Value/remark	Comment	Condition			
ReportConfigInterRAT::= SEQUENCE {						
reportType CHOICE {						
periodical SEQUENCE {						
reportQuantityCell SEQUENCE {						
rsrq	false					
}						
maxReportCells	2					
}						
}						
}						

Table 6.7.5.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

6.7.5.1.5 Test requirement

Table 6.7.5.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.5.1.5-1 and 6.7.5.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.5.1.5-3.

Parameter		Unit	Cell 1			
NR RF channel number	Config 1 4		1 FDD			
Duplex mode	Config 1, 4 Config 2, 3, 5, 6		TDD			
	Config 1, 4		N/A			
TDD Configuration	Config 2, 5	-	TDDConf.1.1			
TDD Configuration	Config 3, 6	-	TDDConf.2.1			
	Config 1, 4		10: N _{RB,c} = 52 (FDD)			
BWchannel	Config 2, 5	MHz	$10: N_{RB,c} = 52 (TDD)$ 10: N _{RB,c} = 52 (TDD)			
	Config 3, 6	1011 12	$40: N_{RB,c} = 106 (TDD)$			
Gap pattern Id	Coning 5, 0		1000000000000000000000000000000000000			
	Config 1, 4		SR.1.1 FDD			
PDSCH reference measurement	Config 2, 5		SR.1.1 TDD			
channel	Config 3, 6		SR.2.1 TDD			
	Config 1, 4		CR.1.1 FDD			
RMSI CORSET reference channel	Config 2, 5	-	CR.1.1 TDD			
	Config 3, 6	-	CR.2.1 TDD			
	Config 1, 4		CCR.1.1 FDD			
Dedicated CORSET reference	Config 2, 5		CCR.1.1 FDD CCR.1.1 TDD			
channel	Config 2, 5		CCR.2.1 TDD			
	Config 3, 6 Config 1, 4	+ +	TRS.1.1 FDD			
CSI-BS for tracking		4 -	TRS.1.1 FDD TRS.1.1 TDD			
CSI-RS for tracking	Config 2, 5	4 -	TRS.1.1 TDD TRS.1.2 TDD			
	Config 3, 6 Initial DL BWP					
	Dedicated DL BWP		DLBWP.0.1 DLBWP.1.1			
BWP configurations						
-	Initial UL BWP		ULBWP.0.1			
OONIO Note1	Dedicated UL BWP		ULBWP.1.1			
OCNG pattern ^{Note1}			OP.1			
SMTC configuration			SMTC.1			
SSB configuration	Config 1, 2, 4, 5 Config 3, 6	-	SSB.1 FR1 SSB.2 FR1			
EPRE ratio of PSS to SSS	Coning 5, 6		330.2 FR I			
EPRE ratio of PBCH_DMRS to SSS		-				
EPRE ratio of PBCH to PBCH_DMRS		-				
EPRE ratio of PDCCH_DMRS to SS						
EPRE ratio of PDCCH to PDCCH_DI		dB	0			
EPRE ratio of PDSCH_DMRS to SS		uБ	0			
		-				
EPRE ratio of PDSCH to PDSCH_DM EPRE ratio of OCNG DMRS to SSS	//K0					
EPRE ratio of OCNG to OCNG DMR	<u></u>	-				
Noc ^{Note2}	5	dBm/15 kHz	-104			
	Config 1 2 4 5					
Noc ^{Note2}	Config 1, 2, 4, 5 Config 3, 6	dBm/SCS	<u>-104</u> -101			
Ês/Noc	50mg 5, 0	dB	17			
Es/Noc Ês/I _{ot} ^{Note3}		dB	17			
	Config 1, 2, 4, 5		-87			
SS-RSRP ^{Note3}	Config 3, 6	dBm/SCS	-84			
	Config 1, 2, 4, 5		-87			
SSB_RP ^{Note3}	Config 3, 6	dBm/SCS	-84			
	Config 1, 2, 4, 5	dBm/9.36 MHz	-58.96			
Io ^{Note3}	Config 3, 6	dBm/38.16 MHz	-58.96			
Propagation condition	Coning 5, 0		AWGN			
Antenna Configuration and Correlation	n Matrix		1x2			
		v allocated and a con				
 Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. 						
Note 3: Ê _s /I _{ot} , SS-RSRP, SSB_RP purposes. They are not se			r parameters for information			

Table 6.7.5.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RSRP test parameters

Table 6.7.5.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RSRP test parameters

Parar	neter	Unit		2	
			Test 1	Test 2	
E-UTRA RF channel numb				1	
Duplex mode	Config 1, 2, 3			D	
	Config 4, 5, 6			DD	
TDD special subframe	Config 1, 2, 3			/A	
configuration ^{Note1} Config 4, 5, 6				6	
TDD uplink-downlink	Config 1, 2, 3		N	/A	
configuration ^{Note1}	Config 4, 5, 6			1	
BW _{channel}		MHz	5 MHz: N	І кв,с = 25	
				N _{RB,c} = 50	
			20 MHz: N	I _{RB,c} = 100	
PDSCH parameters:				-	
DL Reference Measureme					
PCFICH/PDCCH/PHICH	Config 1, 2, 3			R.11 FDD	
parameters:				R.6 FDD	
DL Reference				R.10 FDD	
Measurement	Config 4, 5, 6			R.11 TDD	
Channel ^{Note2}				R.6 TDD	
			20 MHz:	R.10 TDD	
OCNG Patterns ^{Note2}	Config 1, 2, 3			P.19 FDD	
				OP.6 FDD	
				P.14 FDD	
	Config 4, 5, 6			P.10 TDD	
			-	OP.2 TDD	
			20 MHz: (OP.8 TDD	
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA			_		
PHICH_RB		dB	0		
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note3}					
OCNG_RB ^{Note3}				1	
Noc ^{Note4}	Depending on band	dBm/15kHz	-91.65	-117 + ∆ _{BG_offset}	
	group				
Ês/Noc		dB	10	-3.2	
Ês/lot ^{Note5}		dB	10	-3.2	
RSRP ^{Note5}	Depending on band	dBm/15kHz	-81.65	-120.2+ Δ _{BG_offset}	
	group		01.00		
SCH_RP ^{Note5}	Depending on band	dBm/15kHz	-81.65	-120.2+ Δ _{BG_offset}	
	group				
Io ^{Note5}	Depending on band	dBm/Ch BW	-53.45 +	-87.52+ Δ _{BG_offset} +	
	group		10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	
Propagation Condition				/GN	
Antenna Configuration and				x2	
	ne and uplink-downlink cor				
	DCNG patterns are specifi				
	used such that all cells are		d a constant total transm	itted power spectral	
	ved for all OFDM symbols				
Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.					
	CH_RP and lo levels have		n other parameters for inf	ormation purposes.	
	ttable parameters themse		(TO 00 (00 (00)		
	ing band groups are as de	tined in clause 3.5	of TS 36.133 [23].		
Note 7: Void					
Note 8: Void.					
Note 8: Void. Note 9: Void					
Note 8: Void. Note 9: Void Note 10: Void	band group is defined in	TO 26 704 2 100		1 0	

Normal Conditions	Test 1 All bands	Test 2				
_		FDD_A, TDD_A	14			
		FDD B	15			
		TDD_C	15			
Lowest reported value (Cell 2)	48	FDD_D, TDD_D	16			
		FDD_E, TDD_E	16			
		FDD_G	17			
		FDD_H	18			
		FDD_A, TDD_A	27			
		FDD_B	27			
		TDD_C	28			
Highest reported value (Cell 2)	70	FDD_D, TDD_D	28			
		FDD_E, TDD_E	29			
		FDD_G	30			
		FDD_H	30			
Extreme Conditions	Test 1	Test 2				
	All bands		4.4			
		FDD_A, TDD_A FDD_B	<u>11</u> 11			
	46	TDD_C	11			
Lowest reported value (Call 2)						
Lowest reported value (Cell 2)		FDD_D, TDD_D FDD_E, TDD_E	<u>12</u> 13			
		FDD_E, TDD_E	-			
		FDD_G FDD H	<u>14</u> 14			
		FDD_H FDD_A, TDD_A				
		FDD_A, TDD_A	<u> </u>			
		·	-			
High act reported value (Call 2)	72	TDD_C	<u>31</u> 32			
Highest reported value (Cell 2)	72	FDD_D, TDD_D	-			
		FDD_E, TDD_E	32			
		FDD_G	33			
		FDD_H	34			
Note 1: E-UTRA operating band groups are as defined in TS 36.521-3 [26] clause 3.5.1						

Table 6.7.5.1.5-3: SS-RSRP Intra frequency absolute accuracy requirements for the reported values

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.6 E-UTRAN RSRQ

6.7.6.0 Minimum conformance requirements

6.7.6.0.1 E-UTRAN RSRQ absolute accuracy

The measurement period of E-UTRA RSRQ in RRC_CONNECTED state is specified in clause 9.4.2 and 9.4.3 on TS 38.133 [6].

The accuracy requirements of E-UTRA RSRQ measurements in RRC_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RSRQ Accuracy Requirements in clause 9.1.6 of TS 36.133 [23]:

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 6.7.6.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 of TS 36.133 [23] for a corresponding Band

Accuracy			Conditior	IS			
			lo Note 1 range				
Normal condition	Extreme condition	Es/lot	E-UTRA operating band groups ^{Note 4}	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B1, FDD_B2	-120.5	-50		
	±4	±4 ≥-3 dB	FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2.5			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2		
NOTE 1: 1	o is assumed	to have const	ant EPRE across the bandwidth.				
NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the							
corresponding highest accuracy requirement.							
			sed by Δ >0, when applicable, as de	escribed in Sections B.	4.2 and B.4.3 of		
	S 36.133 [23]						
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].							

Table 6.7.6.0.1-1: RSRQ Inter frequency absolute accuracy

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The reporting range and mapping specified for RSRQ measurements in clause 9.1.7 of TS 36.133 [23] shall apply:

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 6.7.6.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value Measured quantity value		Unit	
RSRQ30	RSRQ < -34	dB	
RSRQ29	-34 ≤ RSRQ < -33.5	dB	
RSRQ02	-20.5 ≤ RSRQ < -20	dB	
RSRQ01	-20 ≤ RSRQ < -19.5	dB	
RSRQ_00	RSRQ < -19.5	dB	
RSRQ_01	-19.5 ≤ RSRQ < -19	dB	
RSRQ_02	-19 ≤ RSRQ < -18.5	dB	
RSRQ_32	-4 ≤ RSRQ < -3.5	dB	
RSRQ_33	-3.5 ≤ RSRQ < -3	dB	
RSRQ_34	-3 ≤ RSRQ	dB	
RSRQ_35	-3 ≤ RSRQ < -2.5	dB	
RSRQ_36	-2.5 ≤ RSRQ < -2	dB	
RSRQ_45	2 ≤ RSRQ < 2.5	dB	
RSRQ_46	2.5 ≤ RSRQ	dB	

 Table 6.7.6.0.1-2: RSRQ measurement report mapping

Note: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range.

6.7.6.1 NR SA FR1 – E-UTRAN RSRQ absolute measurement accuracy

6.7.6.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RSRQ absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

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6.7.6.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA.

6.7.6.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.6.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.6.1.

6.7.6.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.6.1.4.1-1.

Table 6.7.6.1.4.1-1: test configurations

Test Case ID	Description		
6.7.6.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD		
6.7.6.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD		
6.7.6.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD		
6.7.6.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD		
6.7.6.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD		
6.7.6.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD		
Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.6.1.4.1-2.

Table 6.7.6.1.4.1-2: initial conditions

Parameter	Value		Comment		
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified in Annex E, Table E.4-2 and TS 38.508-1 [14] clause 4.3.1.				
Channel bandwidth	As specified by the test configuration selected from Table 6.7.6.1.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection Diagram	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.		
	TE Part 4Rx	A.3.1.7.3			
	DUT Part 2Rx	A.3.2.3.4			
	DUT Part 4Rx	A.3.2.5.2	7		
Exceptions to connection diagram	N/A				

- 1. Message contents are defined in clause 6.7.6.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

6.7.6.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.6.1.5-1 and Table 6.7.6.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.

- 6. After 10s wait from Step 3, the SS shall check the RSRQ reported values in the periodic MeasurementReport. The RSRQ value of Cell 2 reported by the UE is compared to the expected RSRQ. If the value is outside the limits in Table 6.7.6.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.6.1.5-2 as appropriate and repeat steps 5-7.

6.7.6.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Default Message Contents			
Common contents of system information blocks exceptions			
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-RAT and GAP NEEDED Table H.3.1-3 Table H.3.1-3a Table H.3.1-7 with condition INTER-RAT Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.6.1.4.3-1A: MeasConfig (Test procedure step 3)

Derivation path: Table H.3.1-2 with condition INTER-RAT and GAP NEEDED						
Information Element	Value/Remark	Comment	Condition			
measConfig ::= SEQUENCE {						
reportConfigToAddModList SEQUENCE(SIZE	2 entries					
(1maxReportConfigId)) OF ReportConfigToAddMod {						
ReportConfigToAddMod[1] SEQUENCE {		entry 1				
reportConfigId	1					
reportConfig CHOICE {						
reportConfigInterRAT	ReportConfigE-UTRA- DEFAULT(Periodical)	Table 6.7.6.1.4.3- 2				
}						
}						
ReportConfigToAddMod[2] SEQUENCE {		entry 2				
reportConfigId	2					
reportConfig CHOICE {						
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.6.1.4.3- 1B				
}						
}						
}						
measIdToAddModList SEQUENCE (SIZE (1maxNrofMeasId)) OF MeasIdToAddMod {	2 entries					
MeasIdToAddMod[1] SEQUENCE {		entry 1				
measId	1					
measObjectId	2					
reportConfigId	1					
}						
MeasIdToAddMod[2] SEQUENCE {		entry 2				
measId	2					
measObjectId	2					
reportConfigId	2					
}						
}						
}						

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141	with condition EVENT_B1		
Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT ::= SEQUENCE {			
reportType CHOICE {			
eventTriggered SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-ThresholdEUTRA CHOICE {			
rsrq	34	Set threshold to - 3dB to ensure measId 2 will never be triggered	
}			
}			
}			
}			
}			
}			

Table 6.7.6.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			
reportQuantityCell SEQUENCE {			
rsrp	false		
}			
maxReportCells	2		
}			
}			
}			

6.7.6.1.5 Test requirement

Table 6.7.6.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.6.1.5-1 and 6.7.6.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.6.1.5-3.

Parameter		Unit	Cell 1	
NR RF channel number			1	
Duplex mode	Config 1, 4		FDD	
•	Config 2, 3, 5, 6		TDD	
	Config 1, 4			
TDD Configuration	Config 2, 5	-	TDDConf.1.1	
	Config 3, 6		TDDConf.2.1	
	Config 1, 4		10: $N_{RB,c} = 52 (FDD)$	
BWchannel	Config 2, 5	MHz	10: $N_{RB,c} = 52 (TDD)$	
Con nottorn Id	Config 3, 6		40: N _{RB,c} = 106 (TDD)	
Gap pattern Id	Config 1 1			
PDSCH reference measurement	Config 1, 4		SR.1.1 FDD	
channel	Config 2, 5		SR.1.1 TDD	
	Config 3, 6		SR.2.1 TDD	
	Config 1, 4		CR.1.1 FDD	
RMSI CORSET reference channel	Config 2, 5	-	CR.1.1 TDD	
	Config 3, 6		CR.2.1 TDD	
Dedicated CORSET reference	Config 1, 4		CCR.1.1 FDD	
channel	Config 2, 5	4 4	CCR.1.1 TDD	
	Config 3, 6		CCR.2.1 TDD	
	Config 1, 4	┥ ┝	TRS.1.1 FDD	
CSI-RS for tracking	Config 2, 5		TRS.1.1 TDD	
	Config 3, 6		TRS.1.2 TDD	
	Initial DL BWP		DLBWP.0.1	
BWP configurations	Dedicated DL BWP		DLBWP.1.1	
	Initial UL BWP		ULBWP.0.1	
No.	Dedicated UL BWP		ULBWP.1.1	
OCNG pattern ^{Note1}			OP.1	
SMTC configuration			SMTC.1	
SSB configuration	Config 1, 2, 4, 5 Config 3, 6		SSB.1 FR1 SSB.2 FR1	
EPRE ratio of PSS to SSS	Coning 5, 6		330.2 FRI	
EPRE ratio of PBCH_DMRS to SSS		-		
EPRE ratio of PBCH to PBCH_DMRS	2	-		
EPRE ratio of PDCCH_DMRS to SSS		-		
EPRE ratio of PDCCH to PDCCH_DMRS to SSC		dB	0	
EPRE ratio of PDSCH_DMRS to SSS		UD .	0	
		-		
EPRE ratio of PDSCH to PDSCH_DM EPRE ratio of OCNG DMRS to SSS	11K3	-		
EPRE ratio of OCNG to OCNG DMRS to SSS	-	-		
Noc ^{Note2}	5	dBm/15 kHz	-104	
	Config 1 2 4 5			
Noc ^{Note2}	Config 1, 2, 4, 5 Config 3, 6	dBm/SCS	<u>-104</u> -101	
Ê _s /N _{oc}		dB	17	
Ê _s /I _{ot} ^{Note3}		dB	17	
	Config 1, 2, 4, 5	-	-87	
SS-RSRP ^{Note3}	Config 3, 6	dBm/SCS	-84	
	Config 1, 2, 4, 5		-04 -87	
SSB_RP ^{Note3}	Config 3, 6	dBm/SCS	-84	
	Config 1, 2, 4, 5	dBm/9.36 MHz	-58.96	
Io ^{Note3} Config 1, 2, 4 Config 3, 6		dBm/38.16 MHz	-58.96	
Propagation condition			AWGN	
Antenna Configuration and Correlation Matrix			1x2	
		v allocated and a con		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2: Interference from other cel	Is and noise sources r	not specified in the te	st is assumed to be constant riate power for N_{oc} to be fulfilled.	
Note 3: Ê _s /I _{ot} , SS-RSRP, SSB_RP purposes. They are not se			r parameters for information	

Table 6.7.6.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RSRQ test parameters

Table 6.7.6.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RSRQ test parameters

Parameter	Unit		Cell 2	
		Test 1	Test 2	Test 3

E-UTRA RF channel num	per			1	
Duplex mode	Config 1, 2, 3			FDD	
Duplox mode	Config 4, 5, 6			TDD	
TDD special subframe	Config 1, 2, 3			N/A	
configuration ^{Note1}	Config 4, 5, 6			6	
TDD uplink-downlink	Config 1, 2, 3			0	
configuration ^{Note1}	Config 4, 5, 6	_		1	
BW _{channel}	00mg 4, 3, 0	MHz		<u>,</u> 5 MHz: N _{RB,c} = 25	
				$0 \text{ MHz: } N_{RB,c} = 5$	
				$0 \text{ MHz: } \mathbf{N}_{RB,c} = 0$	
PDSCH parameters:			2	U IVII IZ. INRB,c = I	0
DL Reference Measureme	ont ChannelNote2			-	
PCFICH/PDCCH/PHICH	Config 1, 2, 3			5 MHz: R.11 FDE)
parameters:	Conng 1, 2, 3			10 MHz: R.6 FDE	
DL Reference				0 MHz: R.10 FDI	
Measurement	Config 4, 5, 6	_		5 MHz: R.11 TDE	
Channel ^{Note2}	Conng 4, 5, 0			10 MHz: R.6 TDE	
Ghanner				0 MHz: R.10 TDL	
OCNG Patterns ^{Note2}	Config 1, 2, 3			MHz: OP.19 FD	
OCING Fallerins	Conng 1, 2, 3			0 MHz: OP.6 FD	
) MHz: OP.14 FC	
	Config 4, 5, 6	_		MHz: OP.10 TD	
	50mg 4, 5, 0			0 MHz: OP.10 TD	
				0 MHz: OP.8 TD	
PBCH_RA			2		<u>ل</u>
PBCH_RB		-			
PSS_RA		_			
SSS_RA		_			
PCFICH_RB		_			
		_			
PHICH_RA					
PHICH_RB		dB	0		
PDCCH_RA		_			
PDCCH_RB					
PDSCH_RA		_			
PDSCH_RB		_			
OCNG_RANote3		_			
OCNG_RB ^{Note3}					
Noc ^{Note4}	Depending on band	dBm/15kHz	-83	-104.70	-119.5+
	group				∆ _{BG_offset}
Ês/Noc		dB	-1.75	-3.2	-3.2
Ês/Iot ^{Note5}		dB	-1.75	-3.2	-3.2
RSRP ^{Note5}	Depending on band	dBm/15kHz	-84.75	-107.90	-122.7+
	group	S=11, 101(12	00		$\Delta_{BG_{offset}}$
RSRQ ^{Note5}	Depending on band	dB	-14.76	-15.69	-15.69
	group				
			-53 +	-75.22 +	-90.02+
lo ^{Note5}	Depending on band	dBm/Ch	10log(N _{RB,c}	10log(N _{RB,c}	$\Delta_{BG_{offset}}$ +
	group	BW	/50)	/50)	10log(N _{RB,c}
			· ,	,	/50)
Propagation Condition				AWGN	
Antenna Configuration and			··· · · · · · · · · · · · · · · · · ·	1x2	4 10 47
	he and uplink-downlink cor				
	OCNG patterns are specified				
	used such that all cells are		and a constant to	tal transmitted po	ower spectral
	ved for all OFDM symbols		مماليم والمعالم		nata at a c
	m other cells and noise so				
	time and shall be modelle				
	SRQ and lo levels have be	een derived from	other parameter	s for information	purposes. They
	parameters themselves.	fined in stars of	C .4 TO 00 400 1	2001	
	ing band groups are as de	ennea in clause 3	.5 OT IS 36.133	∠3].	
Note 7: Void					
Note 8: Void Note 9: Void					
Note 10: Void	E band group is defined in	TO 26 504 2 100			

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	4	0	0
Highest reported value (Cell 2)	16	16	16
Extreme Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	1	0	0
Highest reported value (Cell 2)	19	17	17

Table 6.7.6.1.5-3: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.7 E-UTRAN RS-SINR

6.7.7.0 Minimum conformance requirements

6.7.7.0.1 E-UTRAN RS-SINR absolute accuracy

The measurement period of E-UTRA RS-SINR in RRC_CONNECTED state is specified in clause 9.4.2 and 9.4.3 of TS 38.133 [6].

The accuracy requirements of E-UTRA RS-SINR measurements in RRC_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RS-SINR Accuracy Requirements in clause 9.1.17.3 of TS 36.133 [23]:

The reporting range and mapping for E-UTRA RS-SINR measurements shall be the same as specified for RS-SINR measurements in clause 9.1.17.1 of TS 36.133 [23]:

The requirements for absolute accuracy of intra-frequency RS-SINR in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 6.7.7.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.18 of TS 36.133 [23] for a corresponding Band.

Acc	uracy		Conditior	าร		
Normal	al Extreme 🔶		lo ^{Note 1} range			
condition	condition	Ês/lot	E-UTRA operating band groups ^{Note 4}	Minimum lo	Maximum Io	
dB	dB	dB		dBm/15kHz ^{Note 3}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
			FDD_B1, FDD_B2	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
		≥-3 dB ^{Note}	FDD_D	-119.5	-50	
±3.0	-3 () +/	≥-3 UD 1000	FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2	
NOTE 1:	OTE 1: Io is assumed to have constant EPRE across the bandwidth.					
NOTE 2:	E 2: The same bands and the same lo conditions for each band apply for this requirement as for the					
	corresponding highest accuracy requirement.					
	TS 36.133 [23].					
	OTE 4: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].					
NOTE 5:	The requirements apply for Ês/lot ≤ 25 dB.					

Table 6.7.7.0.1-1: Intra-frequency RS-SINR absolute accuracy

The reporting range of RS-SINR measurement is defined from -23 dB to 40 dB with 0.5 dB resolution.

The mapping of the measured quantity is defined in table 6.7.7.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 6.7.7.0.1-2: RS-SINR measurement report mapping

Reported Value	Measured Quantity Value	Unit
RS-SINR_000	RS-SINR < -23	dB
RS-SINR_001	-23 ≤ RS-SINR < -22.5	dB
RS-SINR_126	39.5 ≤ RS-SINR < 40	dB
RS-SINR_127	$40 \le RS-SINR$	dB

6.7.7.1 NR SA FR1 – E-UTRAN RS-SINR absolute measurement accuracy

6.7.7.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RS-SINR absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

6.7.7.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA and rs-SINR-MeasEUTRA.

6.7.7.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.7.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.7.1.

- 6.7.7.1.1.4 Test description
- 6.7.7.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.7.1.4.1-1.

Test Case ID	Description			
6.7.7.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD			
6.7.7.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD			
6.7.7.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD			
6.7.7.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD			
6.7.7.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD			
6.7.7.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD			
Note: The UE is	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.7.1.4.1-2.

Table 6.7.7.1.4.1-2: initial conditions

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified in An	nex E, Table E.4-2 and TS 38	.508-1 [14] clause 4.3.1.
Channel	As specified by the	e test configuration selected fr	om Table 6.7.7.1.4.1-1.
bandwidth			
Propagation	AWGN		As specified in Annex C.2.2.
conditions			
Connection	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	TE Part 4Rx	A.3.1.7.3	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram	N/A		

- 1. Message contents are defined in clause 6.7.7.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

6.7.7.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.7.1.5-1 and Table 6.7.7.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the RS-SINR reported values in the periodic MeasurementReport. The RS-SINR value of Cell 2 reported by the UE is compared to the expected RS-SINR. If the value is outside the limits in Table 6.7.7.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.7.1.5-2 as appropriate and repeat steps 5-7.

6.7.7.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

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Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.1-1			
elements contents exceptions	Table H.3.1-2 with condition INTER-RAT and GAP NEEDED			
	Table H.3.1-3			
	Table H.3.1-3a			
	Table H.3.1-7 with condition INTER-RAT			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.7.1.4.3-1: Common Exception messages

Table 6.7.7.1.4.3-1A: MeasConfig (Test procedure step 3)

Derivation path: Table H.3.1-2 with condition INTER-RAT	and GAP NEEDED		
Information Element	Value/Remark	Comment	Condition
measConfig ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE(SIZE	2 entries		
(1maxReportConfigId)) OF ReportConfigToAddMod {			
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigId	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigE-UTRA-	Table 6.7.7.1.4.3-	
	DEFAULT(Periodical)	2	
}			
		a na tana O	
ReportConfigToAddMod[2] SEQUENCE {		entry 2	
reportConfigId	2		
reportConfig CHOICE {		T 0 7 7 4 4 0	
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.7.1.4.3- 1B	
}			
}			
}			
measIdToAddModList SEQUENCE (SIZE	2 entries		
(1maxNrofMeasId)) OF MeasIdToAddMod {			
MeasIdToAddMod[1] SEQUENCE {		entry 1	
measId	1		
measObjectId	2		
reportConfigId	1		
}			
MeasIdToAddMod[2] SEQUENCE {		entry 2	
measId	2		
measObjectId	2		
reportConfigId	2		
}			
}			
}			

Table 6.7.7.1.4.3-1B: ReportConfigInterRAT-EVENT (Table 6.7.7.1.4.3-	1A)
--	-----

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141 v Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT ::= SEQUENCE {			
reportType CHOICE {			
eventTriggered SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-ThresholdEUTRA CHOICE {			
sinr	127	Set threshold to 40dB to ensure measId 2 will never be triggered	
}			
}			
}			
}			
}			
}			

Table 6.7.7.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

Derivation Path: 38.508-1 [14] Table 4.6.3-141 with Condition PERIODICAL			
Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			
reportQuantityCell SEQUENCE {			
rsrp	false		
rsrq	false		
sinr	true		
}			
maxReportCells	2		
}			
}			
}			

6.7.7.1.5 Test requirement

Table 6.7.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.7.1.5-1 and 6.7.7.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.7.1.5-3.

Parameter		Unit	Cell 1		
NR RF channel number			1		
Duplex mode	Config 1, 4		FDD		
Duplex mode	Config 2, 3, 5, 6		TDD		
	Config 1, 4		N/A		
TDD Configuration	Config 2, 5		TDDConf.1.1		
	Config 3, 6		TDDConf.2.1		
	Config 1, 4		10: N _{RB,c} = 52 (FDD)		
BWchannel	Config 2, 5	MHz	10: N _{RB,c} = 52 (TDD)		
	Config 3, 6		40: N _{RB,c} = 106 (TDD)		
Gap pattern Id			0		
PDSCH reference measurement	Config 1, 4	-	SR.1.1 FDD		
channel	Config 2, 5	-	SR.1.1 TDD		
	Config 3, 6		SR.2.1 TDD		
	Config 1, 4		CR.1.1 FDD		
RMSI CORSET reference channel	Config 2, 5	4	CR.1.1 TDD		
	Config 3, 6		CR.2.1 TDD		
Dedicated CORSET reference	Config 1, 4	_	CCR.1.1 FDD		
channel	Config 2, 5	_	CCR.1.1 TDD		
	Config 3, 6		CCR.2.1 TDD		
	Config 1, 4	_	TRS.1.1 FDD		
CSI-RS for tracking	Config 2, 5	-	TRS.1.1 TDD		
	Config 3, 6 Initial DL BWP		TRS.1.2 TDD DLBWP.0.1		
	Dedicated DL BWP		DLBWP.0.1 DLBWP.1.1		
BWP configurations	Initial UL BWP		ULBWP.0.1		
	Dedicated UL BWP				
OCNG pattern ^{Note1}	Dedicated UL BWP		ULBWP.1.1		
SMTC configuration			OP.1		
SMIC configuration	Config 1 2 1 E		SMTC.1 SSB.1 FR1		
SSB configuration	Config 1, 2, 4, 5 Config 3, 6				
Config 3, 6 SSB.2 FR1 EPRE ratio of PSS to SSS					
EPRE ratio of PBCH_DMRS to SSS					
EPRE ratio of PBCH to PBCH_DMRS		-			
EPRE ratio of PDCCH_DMRS to SSS		-			
EPRE ratio of PDCCH to PDCCH_DM		dB	0		
EPRE ratio of PDSCH_DMRS to SSS		42	0		
EPRE ratio of PDSCH to PDSCH_DM					
EPRE ratio of OCNG DMRS to SSS					
EPRE ratio of OCNG to OCNG DMRS	6				
N _{oc} ^{Note2}		dBm/15 kHz	-104		
	Config 1, 2, 4, 5		-104		
N _{oc} ^{Note2}	Config 3, 6	dBm/SCS	-101		
Ês/Noc	J J J J	dB	17		
Ês/Iot ^{Note3}		dB	17		
	Config 1, 2, 4, 5		-87		
SS-RSRP ^{Note3}	Config 3, 6	dBm/SCS	-84		
COD DDNote3	Config 1, 2, 4, 5	-ID (0000	-87		
SSB_RP ^{Note3}	Config 3, 6	dBm/SCS	-84		
L-Note3	Config 1, 2, 4, 5	dBm/9.36 MHz	-58.96		
lo ^{Note3} Config 3, 6		dBm/38.16 MHz	-52.87		
Propagation condition			AWGN		
Antenna Configuration and Correlation			1x2		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant					
over subcarriers and time a	ind shall be modelled	as AWGN of approp	riate power for N_{oc} to be fulfilled.		
Note 3: Ê _s /I _{ot} , SS-RSRP, SSB_RP purposes. They are not set			r parameters for information		

Table 6.7.7.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RS-SINR test parameters

Table 6.7.7.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RS-SINR test parameters

Paran	Unit	Cell 2			
		Test 1 Test 2 Test 3			
E-UTRA RF channel numb				1	
Duplex mode	Config 1, 2, 3			FDD	
	Config 4, 5, 6			TDD	
TDD special subframe	Config 1, 2, 3			N/A	
configuration ^{Note1}	Config 4, 5, 6			6	
TDD uplink-downlink	Config 1, 2, 3			N/A	
configuration ^{Note1}	Config 4, 5, 6			1	
BWchannel		MHz	5	5 MHz: NRB,c = 2	5
				0 MHz: NRB,c = {	
		2	0 MHz: N _{RB,c} = 10	00	
PDSCH parameters:				-	
DL Reference Measureme					
PCFICH/PDCCH/PHICH	Config 1, 2, 3			5 MHz: R.11 FDD	
parameters:				10 MHz: R.6 FDD	
DL Reference				20 MHz: R.10 FD	
Measurement	Config 4, 5, 6			5 MHz: R.11 TDD	
Channel ^{Note2}				10 MHz: R.6 TDD	
				20 MHz: R.10 TD	
OCNG Patterns ^{Note2}	Config 1, 2, 3			6 MHz: OP.19 FD	
				0 MHz: OP.6 FD	
				0 MHz: OP.14 FC	
	Config 4, 5, 6		-	MHz: OP.10 TD	-
			-	0 MHz: OP.2 TD	-
			2	20 MHz: OP.8 TD	D
PBCH_RA		_			
PBCH_RB					
PSS_RA		_			
SSS_RA					
PCFICH_RB		_			
PHICH_RA					
PHICH_RB		dB		0	
PDCCH_RA		_			
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note3}		_			
OCNG_RB ^{Note3}	Demonster				440 5
Noc1 ^{Note4}	Depending on band	dBm/15kHz	-88	-108.50	-119.5+
	group				Δ _{BG_offset}
CRS Ês/Noc1 CRS Ês/Iot ^{Note5}		dB	-1.75	20.0	-3.2
	Depending on here -	dB	-1.75	20.0	-3.2
RSRP ^{Note5}	Depending on band group	dBm/15kHz	-89.75	-88.50	-122.7+ Δ _{BG_offset}
RS-SINR ^{Note5}		dB	-1.75	20	-3.2
IO ^{Note5}	Depending on band group	dBm/Ch BW	-58.00 + 10log(N _{RB,c} /50)	-60.68 + 10log(N _{RB,c} /50)	-90.02+ Δ _{BG_offset} + 10log(N _{RB,c} /50)
Propagation Condition	·			AWGN	. ,
Antenna Configuration and	Correlation Matrix			1x2	

 Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively. Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over CRS subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled. Note 4a: Void Note 5: CRS Ê_s/I_{ot}, RSRP, RS-SINR and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23]. Note 8: Void Note 8: Void Note 9: Void Note 10: Void 	Note 1:	Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].
 density is achieved for all OFDM symbols. Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over CRS subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled. Note 4a: Void Note 5: CRS Ê_s/I_{ot}, RSRP, RS-SINR and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23]. Note 7: Void Note 8: Void Note 9: Void 	Note 2:	DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.
 Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over CRS subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled. Note 4a: Void Note 5: CRS Ê_s/I_{ot}, RSRP, RS-SINR and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23]. Note 7: Void Note 8: Void Note 9: Void 	Note 3:	, , , , , , , , , , , , , , , , , , , ,
 CRS subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled. Note 4a: Void Note 5: CRS Ê_s/I_{ot}, RSRP, RS-SINR and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23]. Note 7: Void Note 8: Void Note 9: Void 	Note 4:	
 Note 4a: Void Note 5: CRS Ê_s/I_{ot}, RSRP, RS-SINR and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23]. Note 7: Void Note 8: Void Note 9: Void 		
purposes. They are not settable parameters themselves.Note 6:E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].Note 7:VoidNote 8:VoidNote 9:Void	Note 4a:	
Note 6:E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].Note 7:VoidNote 8:VoidNote 9:Void	Note 5:	CRS Ê _s /I _{ot} , RSRP, RS-SINR and Io levels have been derived from other parameters for information
Note 7: Void Note 8: Void Note 9: Void		purposes. They are not settable parameters themselves.
Note 8: Void Note 9: Void	Note 6:	E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].
Note 9: Void	Note 7:	Void
	Note 8:	Void
Note 10: Void	Note 9:	Void
	Note 10:	Void
Note 11: $\Delta_{BG_{offset}}$ for LTE band group is defined in TS 36.521-3 [26] clause 3.5.1, Table 3.5.1-1A.	Note 11:	$\Delta_{BG_{offset}}$ for LTE band group is defined in TS 36.521-3 [26] clause 3.5.1, Table 3.5.1-1A.

Table 6.7.7.1.5-3: RS-SINR Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	35	79	32
Highest reported value (Cell 2)	51	94	49
Extreme Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	33	77	31
Highest reported value (Cell 2)	53	96	50

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.8

6.7.9 L1-SINR measurement for beam reporting

6.7.9.0 Minimum conformance requirements

6.7.9.0.1 Minimum conformance requirements for CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off

The UE shall be capable of performing L1-SINR measurements with the CSI-RS configured as CMR and no dedicated resource configured as IMR for L1-SINR computation, and the UE physical layer shall be capable of reporting L1-SINR measurement period of $T_{L1-SINR_Measurement_Period_CSI-RS_CMR_Only}$.

The value of $T_{L1-SINR_Measurement_Period_CSI-RS_CMR_Only}$ is defined in Table 6.7.9.0.1-1 for FR1 and in Table 6.7.9.0.1-2 for FR2, where

For the value of M,

- For periodic and semi-persistent CSI-RS resources as CMR, M=1 if higher layer parameter *timeRestrictionForChannelMeasurement* is configured, and M=3 otherwise;
- For aperiodic CSI-RS resources as CMR, M=1.

For the value of N in FR2

- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply if *qcl-InfoPeriodicCSI-RS* is configured for all the resources in the resource set and for each resource one RS has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N_{res_per_set}), where N_{res_per_set} is number of resources in the resource set. The requirements apply provided *qcl-InfoPeriodicCSI-RS* is configured for all resources in the resource set.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set and for each resource has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N_{res_per_set}), where N_{res_per_set} is number of resources in the resource set. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided *qcl-info* is configured for all resources in the resource set and for each resource has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=1. UE is not required to meet the accuracy requirements in clause 10.1.28.1 and 10.1.28.3 of TS 38.133 [6] if number of resources in the resource set is smaller than *maxNumberRxBeam*. The requirements apply provided *qcl-info* is configured for all resources in the resource set.

For the value of P in FR1,

- $P=\frac{1}{1-\frac{T_{CSI-RS}}{MRGP}}$, when in the monitored cell there are measurement gaps configured for intra-frequency, interfrequency or inter-RAT measurements, which are overlapping with some but not all occasions of the CSI-RS; and
- P=1 when in the monitored cell there are no measurement gaps overlapping with any occasion of the CSI-RS.

For the value of P in FR2,

- P=1, when CSI-RS is not overlapped with measurement gap and also not overlapped with SMTC occasion.
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{MRGP}}$, when CSI-RS is partially overlapped with measurement gap and CSI-RS is not overlapped with SMTC occasion (T_{CSI-RS} < MGRP)
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{T_{SMTCperiod}}}$, when CSI-RS is not overlapped with measurement gap and CSI-RS is partially overlapped with SMTC occasion (T_{CSI-RS} < T_{SMTCperiod}).
- P=3, when CSI-RS is not overlapped with measurement gap and CSI-RS is fully overlapped with SMTC occasion (T_{CSI-RS} = T_{SMTCperiod}).
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{MRGP} \frac{T_{CSI-RS}}{T_{SMTCperiod}}}$, when CSI-RS is partially overlapped with measurement gap and CSI-RS is partially

overlapped with SMTC occasion ($T_{CSI-RS} < T_{SMTCperiod}$) and SMTC occasion is not overlapped with measurement gap and

- $T_{SMTCperiod} \neq MGRP$ or
- $T_{SMTCperiod} = MGRP$ and $T_{CSI-RS} < 0.5*T_{SMTCperiod}$
- $P = \frac{3}{1 \frac{T_{CSI-RS}}{MRGP}}$, when CSI-RS is partially overlapped with measurement gap and CSI-RS is partially overlapped with SMTC occasion ($T_{CSI-RS} < T_{SMTCperiod}$) and SMTC occasion is not overlapped with measurement gap and

 $T_{SMTCperiod} = MGRP \text{ and } T_{CSI-RS} = 0.5*T_{SMTCperiod}$

- $P = \frac{1}{1 - \frac{T_{CSI-RS}}{\min(T_{SMTCperiod,MGRP})}}$, when CSI-RS is partially overlapped with measurement gap (T_{CSI-RS} < MGRP) and

CSI-RS is partially overlapped with SMTC occasion ($T_{CSI-RS} < T_{SMTCperiod}$) and SMTC occasion is partially or fully overlapped with measurement gap.

- $P = \frac{3}{1 - \frac{T_{CSI-RS}}{MRGP}}$, when CSI-RS is partially overlapped with measurement gap and CSI-RS is fully overlapped with

SMTC occasion ($T_{CSI-RS} = T_{SMTCperiod}$) and SMTC occasion is partially overlapped with measurement gap ($T_{SMTCperiod} < MGRP$)

Where:

 $T_{SMTCperiod}$ = the configured SMTC1 period or SMTC2 period if configured.

 T_{CSI-RS} = the periodicity of CSI-RS configured for L1-SINR measurement

If the high layer in TS 38.331 [2] signalling of *smtc2* is configured, $T_{SMTCperiod}$ corresponds to the value of higher layer parameter *smtc2*; Otherwise $T_{SMTCperiod}$ corresponds to the value of higher layer parameter *smtc1*.

Note: The overlap between CSI-RS for L1-SINR measurement and SMTC means that CSI-RS for L1-SINR measurement is within the SMTC window duration.

Longer evaluation period would be expected if the combination of CSI-RS, SMTC occasion and measurement gap configurations does not meet pervious conditions.

Table 6.7.9.0.1-1: Measurement period	T _{L1-SINR_Measurement_Period_CSI-RS_CMR_Only} for FR1
---------------------------------------	---

Conf	nfiguration TL1-SINR_Measurement_Period_CSI-RS_CMR_Only (ms)			
no	n-DRX	max(T _{Report} , ceil(M*P)*T _{CSI-RS})		
DRX cycle \leq 320ms max(T _{Report} , ceil(1.5*M*P)*max(T _{DRX} ,T _{CSI-RS}))				
DRX cy	cycle > 320ms ceil(M*P)*T _{DRX}			
Note 1:	T _{CSI-RS} is the	periodicity of CSI-RS configured for L1-SINR		
	measurement periodicity for	t. T _{DRX} is the DRX cycle length. T _{Report} is configured reporting.		
Note 2:	the requirements are applicable provided that the CSI-RS resource configured for L1-SINR measurement is transmitted with Density = 3.			

Table 6.7.9.0.1-2: Measurement period TL1-SINR_Measurement_Period_CSI-RS_CMR_Only for FR2

Conf	Difiguration TL1-SINR_Measurement_Period_CSI-RS_CMR_Only (MS)		
non-DRX		max(T _{Report} , ceil(M*P*N)*T _{CSI-RS})	
DRX cycle \leq 320ms max(T _{Report} , ceil(1.5*M*P*N)*max(T _{DRX} ,T _{CSI-RS}))			
DRX cy	DRX cycle > 320ms ceil(M*P*N)*T _{DRX}		
Note 1:	Tcsi-Rs is the	periodicity of CSI-RS configured for L1-SINR	
	measurement periodicity for	t. T _{DRX} is the DRX cycle length. T _{Report} is configured reporting.	
Note 2:		ents are applicable provided that the CSI-RS resource r L1-SINR measurement is transmitted with Density = 3.	

The accuracy requirements in Table 6.7.9.0.1-3 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.1 for a corresponding Band for each relevant CSI-RS based CMR.

- The bandwidth of CSI-RS as CMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of CSI-RS as CMR is equal to or better than the accuracy requirements in Table 6.7.9.0.1-3.

Table 6.7.9.0.1-3: L1-SINR absolute accuracy for CSI-RS based CMR only in FR1

Accuracy		Conditions							
Normal condition	Extreme condition	CSI-RS CMR Ês/lot	lo ^{Note 1} range						
			NR operating band groups Note 2		Minim	um lo		Maximum lo	
dB	dB dB			dBm / SCS _{CSI-RS}			dBm/BW	dBm/BW _{Channel}	
				SCS _{csi-rs} = 15 kHz	SCS _{CSI-} _{RS} = 30 kHz	SCS _{CSI-} RS = 60 kHz			
			NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50	
			NR_FDD_FR1_B	-120.5	-117.5	-114.5	N/A	-50	
			NR_TDD_FR1_C	-120	-117	-114	N/A	-50	
±5.5	±6.5	±6.5 ≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	-113.5	N/A	-50	
			NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50	
			NR_FDD_FR1_F	-118.5	-115.5	-112.5	N/A	-50	
			NR_FDD_FR1_G	-118	-115	-112	N/A	-50	
			NR_FDD_FR1_H	-117.5	-114.5	-111.5	N/A	-50	

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.1 and 10.1.27.1.

6.7.9.0.2 Minimum conformance requirements for SSB based CMR and dedicated IMR

The UE shall be capable of performing L1-SINR measurements with the SSB configured as CMR and dedicated resource configured as IMR for L1-SINR computation, in which the NZP-CSI-RS or CSI-IM resource configured as dedicated IMR shall be 1-to-1 mapped to SSB configured as CMR, with the same periodicity. The UE physical layer shall be capable of reporting L1-SINR measured over the measurement period of TLI-SINR Measurement Period SSB CMR IMR-

The requirements in this clause are not applicable if NZP-CSI-RS or CSI-IM resource configured as dedicated IMR is scheduled with different periodicity as SSB configured as CMR.

The value of TL1-SINR_Measurement_Period_SSB_CMR_IMR is defined in Table 6.7.9.0.2-1 for FR1 and in Table 6.7.9.0.2-2 for FR2, where

For the value of M

For periodic or semi-persistent NZP CSI-RS or CSI-IM resource as dedicated IMR, M=1 if the higher layer parameters timeRestrictionForChannelMeasurements and/or timeRestrictionForInterferenceMeasurements are configured, and M=3 otherwise;

For the value of N in FR2

N = 8.

P is defined as the maximum value between P_{CMR} and P_{IMR} , i.e., $P = max(P_{CMR}, P_{IMR})$, where

the value of P_{CMR} shall be derived in the same way as the value of P used for SSB based L1-RSRP measurement in clause 9.5.4.1 of TS 38.133 [6], in which the occasions and period of the SSB for CMR shall be used instead.

the value of P_{IMR} shall be derived in the same way as the value of P used for CSI-RS based L1-RSRP measurement in clause 9.5.4.2 of TS 38.133 [6], in which the occasions and period of the NZP CSI-RS for NZP-IMR or CSI-IM for ZP-IMR shall be used instead.

Longer evaluation period would be expected if the combination of SSB, SMTC occasion and measurement gap configurations does not meet pervious conditions.

For L1-SINR measurement with SSB as CMR and CSI-RS or CSI-IM as IMR, the requirement shall apply if the CSI-RS is configured as IMR with repetition field as "repetition = OFF" or CSI-IM is configured as IMR.

For L1-SINR measurement with SSB as CMR and CSI-RS/CSI-IM as IMR, no requirement shall apply if SSB occasions for CMR or CSI-RS/CSI-IM occasions for IMR are fully overlapped with the configured measurement gap

Table 6.7.9.0.2-1: Measurement period TL1-SINR_Measurement_Period_SSB_CMR_IMR for FR1

Conf	iguration	TL1-SINR_Measurement_Period_SSB_CMR_IMR (MS)				
no	n-DRX	max(T _{Report} , ceil(M*P)*T _{SSB})				
DRX cy	cle ≤ 320ms	max(T _{Report} , ceil(1.5*M*P)*max(T _{DRX} ,T _{SSB}))				
DRX cycle > 320ms		ceil(M*P)*T _{DRX}				
Note 1: Note 2:	configured for length. T _{Report} The requirem configured for	$T_{SSB} = ssb-periodicityServingCell is the periodicity of the SSB-Index configured for L1-SINR channel measurement. T_{DRX} is the DRX cycle length. T_{Report} is configured periodicity for reporting. The requirements are applicable provided that the CSI-RS resource configured for interference measurement shall be 1-to-1 mapped to SSB configured for channel measurement, with the same periodicity.$				

Table 6.7.9.0.2-2: Measurement period TL1-SINR_Measurement_Period_SSB_CMR_IMR for FR2

Configuration		TL1-SINR_Measurement_Period_SSB_CMR_IMR(MS)				
no	n-DRX	max(T _{Report} , ceil(M*P*N)*T _{SSB})				
DRX cy	cle < 320ms	max(T _{Report} , ceil(1.5*M*P*N)*max(T _{DRX} ,T _{SSB}))				
DRX cycle > 320ms		ceil(1.5*M*P*N)*T _{DRX}				
Note 1:	T _{SSB} = ssb-periodicityServingCell is the periodicity of the SSB-Index					
Note 2:	configured for L1-SINR measurement. T_{DRX} is the DRX cycle length. T_{Report} is configured periodicity for reporting. The requirements are applicable provided that the CSI-RS resource configured for interference measurement shall be 1-to-1 mapped to SSB configured for channel measurement, with the same periodicity.					

The accuracy requirements in Tables 6.7.9.0.2-3 and 6.7.9.0.2-4 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.2 for a corresponding Band for each relevant SSB based CMR and IMR.
- The bandwidth of NZP-IMR and ZP-IMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of NZP-IMR and ZP-IMR is equal to or better than the accuracy requirements in Tables 6.7.9.0.2-3 and 6.7.9.0.2-4.

Accuracy Conditions									
Normal condition	Extreme condition	SSB- CMR Ês/lot	NZP- IMR Ês/lot	lo ^{Note 1} range					
				NR operating band groups Note 2	Minimum	ю		Maximum lo	
dB	dB	dB	dB		dBm / SC	SSSB	dBm/BW _{Channel}	dBm/BW _{Channel}	
					SCS _{SSB} = 15 kHz	SCS _{SSB} = 30 kHz			
				NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	N/A	-50	
				NR_FDD_FR1_B	-120.5	-117.5	N/A	-50	
				NR_TDD_FR1_C	-120	-117	N/A	-50	
±4.0	±5.0	≥0	≥0	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	N/A	-50	
				NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	N/A	-50	
				NR_FDD_FR1_F	-118.5	-115.5	N/A	-50	
				NR_FDD_FR1_G	-118	-115	N/A	-50	
				NR_FDD_FR1_H	-117.5	-114.5	N/A	-50	
-				PRE across the bandw are as defined in clau					

Table 6.7.9.0.2-3: L1-SINR absolute accuracy for SSB based CMR and NZP-IMR in FR1

Table 6.7.9.0.2-4: L1-SINR absolute accuracy for SSB based CMR and ZP-IMR in FR1

Accuracy		Conditi	ons					
Normal Extrem condition		SSB- CMR Ês/lot	lo ^{Note 1} range					
			NR operating band groups Note 2	Minimum Io			Maximum lo	
dB	dB	dB		dBm / SCSsse	3	dBm/BW _{Channel}	dBm/BW _{Channel}	
				SCS _{SSB} = 15 kHz	SCS _{SSB} = 30 kHz			
			NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	N/A	-50	
			NR_FDD_FR1_B	-120.5	-117.5	N/A	-50	
			NR_TDD_FR1_C	-120	-117	N/A	-50	
±4.5	±5.5	≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	N/A	-50	
			NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	N/A	-50	
			NR_FDD_FR1_F	-118.5	-115.5	N/A	-50	
			NR_FDD_FR1_G	-118	-115	N/A	-50	
	1		NR FDD FR1 H	-117.5	-114.5	N/A	-50	

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.2 and 10.1.27.2.

6.7.9.0.3 Minimum conformance requirements for CSI-RS based CMR and dedicated IMR

The UE shall be capable of performing L1-SINR measurements with the CSI-RS resource configured as CMR and dedicated resource configured as IMR for L1-SINR computation, in which the NZP-CSI-RS or CSI-IM resource configured as dedicated IMR shall be 1-to-1 mapped to CSI-RS resource configured as CMR, with the same periodicity. The UE physical layer shall be capable of reporting L1-SINR measurem over the measurement period of T_{L1} . SINR_Measurement_Period_CSI-RS_CMR_IMR.

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The requirements in this clause are not applicable if NZP-CSI-RS or CSI-IM resource configured as dedicated IMR is scheduled with different periodicity as CSI-RS resource configured as CMR.

The value of $T_{L1-SINR_Measurement_Period_CSI-RS_CMR_IMR}$ is defined in Table 6.7.9.0.3-1 for FR1 and in Table 6.7.9.0.3-2 for FR2, where

For the value of M,

- M=1 shall be applied if
 - aperiodic NZP-CSI-RS as CMR or dedicated IMR, or
 - aperiodic CSI-IMR as dedicated IMR, or
 - periodic and semi-persistent NZP-CSI-RS as CMR or dedicated IMR and the higher layer parameters *timeRestrictionForChannelMeasurement* and/or *timeRestrictionForInterferenceMeasurements* are configured, or
 - periodic and semi-persistent CSI-IM as dedicated IMR and the higher layer parameters *timeRestrictionForChannelMeasurement* and/or *timeRestrictionForInterferenceMeasurements* are configured;
- M=3 otherwise.

For the value of N in FR2

- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply if *qcl-InfoPeriodicCSI-RS* is configured for all the resources in the resource set and for each resource one RS has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N_{res_per_set}), where N_{res_per_set} is number of resources in the resource set. The requirements apply provided *qcl-InfoPeriodicCSI-RS* is configured for all resources in the resource set.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set and for each resource has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter repetition set to ON, N=ceil(maxNumberRxBeam / Nres_per_set), where Nres_per_set is number of resources in the resource set. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided *qcl-info* is configured for all resources in the resource set and for each resource has QCL-TypeD with
 - SSB for L1-RSRP or L1-SINR measurement, or
 - another CSI-RS in resource set configured with repetition ON.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=1. UE is not required to meet the accuracy requirements in clause 10.1.28.1 and 10.1.28.3 of TS 38.133 [6] if number of resources in the resource set is smaller than *maxNumberRxBeam*. The requirements apply provided *qcl-info* is configured for all resources in the resource set.

P is defined as the maximum value between P_{CMR} and P_{IMR} , i.e., $P = max(P_{CMR}, P_{IMR})$, where

- The value of P_{CMR} and P_{IMR} shall be derived in the same way as the value of P used for CSI-RS based L1-RSRP measurement in clause 9.5.4.2 of TS 38.133 [6], in which the occasions and period of the CSI-RS for CMR and NZP CSI-RS for NZP-IMR or CSI-IM for ZP-IMR shall be used instead respectively.

Longer evaluation period would be expected if the combination of CSI-RS, SMTC occasion and measurement gap configurations does not meet pervious conditions.

For L1-SINR measurement with CSI-RS as CMR and CSI-RS as IMR, the requirement shall apply only if CSI-RS resources as CMR and IMR are configured with the same repetition field and the number of CSI-RS resources in the resource sets for CMR and IMR are same.

For L1-SINR measurement with CSI-RS as CMR and CSI-IM as IMR, the requirement shall apply only if the number of CSI-RS resources in the resource set for CMR and the number of CSI-IM resources in the resource set for IMR are same.

For L1-SINR measurement with CSI-RS as CMR and CSI-RS/CSI-IM as IMR, no requirement shall apply if CSI-RS occasions for CMR or CSI-RS/CSI-IM occasions for IMR are fully overlapped with the configured measurement gap.

Table 6.7.9.0.3-1: Measurement period TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR for FR1

Conf	iguration	TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR (MS)			
no	n-DRX	max(T _{Report} , ceil(M*P)*T _{CSI-RS})			
DRX cy	cle < 320ms	max(T _{Report} , ceil(1.5*M*P)*max(T _{DRX} ,T _{CSI-RS}))			
DRX cy	cle > 320ms	ceil(M*P)*T _{DRX}			
Note 1:	T _{CSI-RS} is the periodicity of CSI-RS configured for L1-SINR				
	measurement. T_{DRX} is the DRX cycle length. T_{Report} is configured periodicity for reporting.				
Note 2:	the requirements are applicable provided that the CSI-RS resource configured for L1-SINR measurement is transmitted with Density = 3.				
Note 3:	Configured for L1-SINR measurement is transmitted with Density = 3. The requirements are applicable provided that the CSI-RS resource configured for interference measurement shall be 1-to-1 mapped to CSI-RS configured for channel measurement, with the same periodicity.				

Table 6.7.9.0.3-2: Measurement period TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR for FR2

Conf	iguration	TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR (MS)			
nc	on-DRX	max(T _{Report} , ceil(M*P*N)*T _{CSI-RS})			
DRX cy	cle \leq 320ms	max(T _{Report} , ceil(1.5*M*P*N)*max(T _{DRX} ,T _{CSI-RS}))			
DRX cy	cle > 320ms	ceil(M*P*N)*T _{DRX}			
Note 1:	T _{CSI-RS} is the periodicity of CSI-RS configured for L1-SINR				
	measurement. T _{DRX} is the DRX cycle length. T _{Report} is configured				
	periodicity for reporting.				
Note 2:	the requirements are applicable provided that the CSI-RS resource configured for L1-SINR measurement is transmitted with Density = 3.				
Note 3:	Configured for L1-SINR measurement is transmitted with Density = 3. The requirements are applicable provided that the CSI-RS resource configured for interference measurement shall be 1-to-1 mapped to CSI-RS configured for channel measurement, with the same periodicity.				

The accuracy requirements in Tables 6.7.9.0.3-3 and 6.7.9.0.3-4 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.3 for a corresponding Band for each relevant CSI-RS based CMR and IMR.
- The bandwidth of CSI-RS as CMR, NZP-IMR and ZP-IMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of CSI-RS as CMR, NZP-IMR and ZP-IMR is equal to or better than the accuracy requirements in Tables 6.7.9.0.3-3 and 6.7.9.0.3-4.

Accu		Conditions							
Normal conditio n	Extreme conditio n	CSI- RS CMR Ês/lot	NZP- IMR Ês/lot	lo ^{Note 1} range					
				NR operating band groups ^{Note} 2		Mi	inimum le	D	Maximum lo
dB	dB	dB	dB		dB	m / SCS _{cs}	SI-RS	dBm/BW _{Channel}	dBm/BW _{Channel}
					SCSc s⊦rs = 15 kHz	SCS _{CSI-} RS = 30 kHz	SCSc si-rs = 60 kHz		
				NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50
				NR_FDD_FR1_B	- 120.5	-117.5	-114.5	N/A	-50
				NR_TDD_FR1_C	-120	-117	-114	N/A	-50
±4.0	±5.0	≥0	≥0	NR_FDD_FR1_D, NR_TDD_FR1_D	- 119.5	-116.5	-113.5	N/A	-50
				NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50
				NR_FDD_FR1_F	- 118.5	-115.5	-112.5	N/A	-50
				NR_FDD_FR1_G	-118	-115	-112	N/A	-50
				NR_FDD_FR1_H	- 117.5	-114.5	-111.5	N/A	-50
				EPRE across the band 1 are as defined in cla		2.			

Table 6.7.9.0.3-3: L1-SINR absolute accuracy for CSI-RS based CMR and NZP-IMR in FR1

Table 6.7.9.0.3-4: L1-SINR absolute accuracy for CSI-RS based CMR and ZP-IMR in FR1

e CSI-RS CMR Ês/lot dB	Io ^{Note 1} range NR operating band groups ^{Note 2}	Minimum dBm / SC SCS _{CSI-} _{RS} = 15 kHz	-	SCS _{CSI-}	dBm/BW _{Channel}	Maximum lo dBm/BW _{Channel}
dB	groups Note 2	dBm / SC SCS _{CSI-} Rs = 15	Scsi-rs SCScsi-		dBm/BW _{Channel}	
dB	NR FDD FR1 A.	SCS _{CSI-} RS = 15	SCS _{CSI-}		dBm/BW _{Channel}	dBm/BW _{Channel}
	NR_FDD_FR1_A.	rs = 15				
	NR_FDD_FR1_A,		kHz	кs = 60 kHz		
	NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50
	NR_FDD_FR1_B	-120.5	-117.5	-114.5	N/A	-50
	NR_TDD_FR1_C	-120	-117	-114	N/A	-50
≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	-113.5	N/A	-50
	NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50
	NR_FDD_FR1_F	-118.5	-115.5	-112.5	N/A	-50
	NR_FDD_FR1_G	-118	-115	-112	N/A	-50
	NR_FDD_FR1_H	-117.5	-114.5	-111.5	N/A	-50
	ned to have	NR_FDD_FR1_E, NR_TDD_FR1_E NR_FDD_FR1_F NR_FDD_FR1_G NR_FDD_FR1_H ned to have constant EPRE across th	NR_FDD_FR1_E, NR_TDD_FR1_E -119 NR_FDD_FR1_F -118.5 NR_FDD_FR1_G -118 NR_FDD_FR1_H -117.5 ned to have constant EPRE across the bandwidth	NR_FDD_FR1_E, NR_TDD_FR1_E -119 -116 NR_FDD_FR1_E -118.5 -115.5 NR_FDD_FR1_G -118 -115 NR_FDD_FR1_H -117.5 -114.5 ned to have constant EPRE across the bandwidth. -114.5	NR_FDD_FR1_E, NR_TDD_FR1_E -119 -116 -113 NR_FDD_FR1_F -118.5 -115.5 -112.5 NR_FDD_FR1_G -118 -115 -112 NR_FDD_FR1_H -117.5 -114.5 -111.5 ned to have constant EPRE across the bandwidth. -114.5 -111.5	NR_FDD_FR1_E, NR_TDD_FR1_E -119 -116 -113 N/A NR_FDD_FR1_F -118.5 -115.5 -112.5 N/A NR_FDD_FR1_G -118 -115 -112 N/A NR_FDD_FR1_H -117.5 -114.5 -111.5 N/A

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.3 and 10.1.27.3.

- 6.7.9.1 NR SA FR1 CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off L1-SINR measurement
- 6.7.9.1.1 NR SA FR1 CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off L1-SINR absolute measurement accuracy
- 6.7.9.1.1.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

6.7.9.1.1.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.1.

6.7.9.1.1.4 Test description

6.7.9.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.1.1.4.1-1.

Table 6.7.9.1.1.4.1-1: Applicable NR configurations for FR1 L1-SINR test with CSI-RS based CMR and no dedicated IMR configured

(Config	Description			
1		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode			
2		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode			
3		NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode			
Note:	Note: The UE is only required to be tested in one of the supported test configurations in each supported band				

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.1.1.4.1-2.

Table 6.7.9.1.1.4.1-2: Initial conditions for CSI-RS based L1-SINR absolute accuracy in FR1

Parameter		Value	Comment		
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	1	As specified in Annex E, Table E.4-	4-1 and TS 38.508-1 [14] clause 4.3.1.		
Channel bandwidth	А	s specified by the test configuration	n selected from Table 6.7.9.1.1.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.		
-	TE Part 4Rx	A.3.1.8.5 with n = 1			
	DUT Part 2Rx	A.3.2.3.4			
	DUT Part 4Rx	A.3.2.5.2			
Exceptions to connection diagram		N/A			

- 1. Message contents are defined in clause 6.7.9.1.1.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-SINR measurements. The UE is configured one CSI-RS resource set with two CSI-RS resources. UE is configured to perform RLM and BFD based on SSB

0 and 1. CSI-RS is not transmitted in the same OFDM symbols as SSB. The connection setup is done according to the settings in Annex C.1.1.

6.7.9.1.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.1.1.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.1.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.1.1.5-1.
- 3. The UE shall start sending L1-SINR report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. If the value for both CSI-RSs is within the limits in Table 6.7.9.1.1.5-2 or Table 6.7.9.1.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.1.1.5-1 as appropriate and repeat steps 3-5.

6.7.9.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.9.1.1.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents				
Common contents of system information blocks exceptions				
Default RRC messages and information	Table H.3.6A-1 with conditions PERIODIC and CSI-SINR			
elements contents exceptions	Table H.3.6A-2 with conditions CSI-RS and PERIODIC			
	Table H.3.6A-3 with condition PERIODIC			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.9.1.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSB.	
}			

6.7.9.1.1.5 Test requirement

Table 6.7.9.1.1.5-1 defines the primary level settings excluding test tolerances for all tests.

Each L1-SINR measurement report for each of the tests in Table 6.7.9.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.9.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.9.1.1.5-3 for test configuration 3.

	Parameter	Config	Unit	Test 1	Test 2
SSB GSCI	N	1~3		freq1	freq1
		1		FDD	FDD
Duplex mode		2		TDD	TDD
		3		TDD	TDD
		1		N/A	N/A
TDD Confi	iguration	2		TDDConf.1.1	TDDConf.1.1
	J	3		TDDConf.2.1	TDDConf.2.1
		1		10: N _{RB,c} = 52	10: N _{RB,c} = 52
BWchannel		2	MHz	10: N _{RB,c} = 52	10: N _{RB,c} = 52
		3		40: N _{RB,c} = 106	40: N _{RB,c} = 106
		1		SR.1.1 FDD	SR.1.1 FDD
PDSCH R		2		SR.1.1 TDD	SR.1.1 TDD
measurem	ient channel	3		SR.2.1 TDD	SR.2.1 TDD
		1		CR.1.1 FDD	CR.1.1 FDD
	RESET Reference	2		CR.1.1 TDD	CR.1.1 TDD
Channel		3		CR.2.1 TDD	CR.2.1 TDD
		1		CCR.1.1 FDD	CCR.1.1 FDD
	CORESET	2	1	CCR.1.1 TDD	CCR.1.1 TDD
Reference	Channel	3	4	CCR.2.1 TDD	CCR.2.1 TDD
		<u> </u>	}	SSB.1 FR1	SSB.1 FR1
SSP annt	auration	2	4		
SSB config	yurallon		-	SSB.1 FR1	SSB.1 FR1
00110 -		3	+	SSB.2 FR1	SSB.2 FR1
OCNG Pat	tterns	1~3		OP.1	OP.1
		1		TRS.1.1 FDD	TRS.1.1 FDD
TRS config	guration	2		TRS.1.1 TDD	TRS.1.1 TDD
		3		TRS.1.2 TDD	TRS.1.2 TDD
Initial BW/F	Configuration	1~3		DLBWP.0.1	DLBWP.0.1
	P Configuration	1~3		ULBWP.0.1	ULBWP.0.1
Dedicated	DMD configuration	4 0		DLBWP.1.1	DLBWP.1.1
Dedicated	BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1
SMTC con	nfiguration	1~3		SMTC.1	SMTC.1
	Ŭ	1		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD
CSI-RS		2		CSI-RS 1.2 TDD	CSI-RS 1.2 TDD
		3		CSI-RS 2.2 TDD	CSI-RS 2.2 FDD
reportConf	fiaType	1~3		periodic	periodic
reportQua		1~3		cri-SINR-r16	cri-SINR-r16
nrofReport		1~3		2	2
		1~3			slot80
	eporting period	1~3		slot80	510100
	o of PSS to SSS				
	o of PBCH DMRS to				
SSS					
	o of PBCH to PBCH				
DMRS					
	o of PDCCH DMRS to				
SSS					
EPRE ratio of PDCCH to		1			
EPRE ratio	o of PDCCH to	1~3		0	0
PDCCH D	MRS	1~3	dB	0	v
PDCCH D		1~3	dB	0	Ŭ
PDCCH D	MRS	1~3	dB	0	
PDCCH D EPRE ratio	MRS o of PDSCH DMRS to	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio	MRS o of PDSCH DMRS to o of PDSCH to	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D	MRS o of PDSCH DMRS to o of PDSCH to MRS	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio	MRS o of PDSCH DMRS to o of PDSCH to	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1}	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1}	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to o of OCNG to OCNG	1~3	dB	0	
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1} EPRE ratio DMRS ^{Note}	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to o of OCNG to OCNG	1~3		-94.65	-117+ Δ _{BG_offset}
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1} EPRE ratio DMRS ^{Note}	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to o of OCNG to OCNG		dB - dBm/15kHz		
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1} EPRE ratio DMRS ^{Note} <i>N_{oc}</i> ^{Note2}	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to o of OCNG to OCNG 1 Depending on	<u>1,2</u> 3	- dBm/15kHz	-94.65 -96.00	$-117+\Delta_{BG_offset}$ $-117+\Delta_{BG_offset}$
PDCCH D EPRE ratio SSS EPRE ratio PDSCH D EPRE ratio SSS ^{Note 1} EPRE ratio	MRS o of PDSCH DMRS to o of PDSCH to MRS o of OCNG DMRS to o of OCNG to OCNG	1,2		-94.65	-117+ Δ _{BG_offset}

Table 6.7.9.1.1.5-1: FR1 CSI-RS based L1-SINR test parameters

SSB Depending on		1,2	dBm/SSB	-84.65	-119.2 + Δ _{BG_offset}
Note3	band group	3	SCS	-83.00	-116.2 + Δ _{BG_offset}
lo Note3	Depending on band group		dBm/9.36 MHz	-56.28	-87.00 + Δ _{BG_offset}
		3	dBm/38.16 MHz	-51.53	-80.90 + Δ _{BG_offset}
\hat{E}_s/N_{oc}		1~3	dB	10	-2.2
Propagation condition		1~3		AWGN	AWGN
Antenna configuration		1~3		1x2	1x2
Note 1:	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2:					
	for N_{oc} to be fulfilled.				
Note 3:	8: RSRP and Io levels have been derived from other parameters for information purposes.				
Note 4:	They are not settable parameters themselves. RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.				
Note 5:					

Table 6.7.9.1.1.5-2: Same as Table Table 4.7.7.1.1.5-2

Table 6.7.9.1.1.5-3: Same as Table Table 4.7.7.1.1.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.9.1.2 NR SA FR1 CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off L1-SINR relative measurement accuracy

6.7.9.1.2.1 Test purpose

The purpose of this test is to verify that the L1-SINR relative measurement accuracy is within the specified limits.

6.7.9.1.2.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 4.7.7.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.4.7.7.1.

6.7.9.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.1.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.7.9.1.2.4.1-2.

Table 6.7.9.1.2.4.1-1: Applicable NR configurations for FR1 L1-SINR test with CSI-RS based CMR and no dedicated IMR configured

	Config	Description
1		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode
2		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode
3		NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	ŀ	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	As specified by the test configuration		n selected from Table 6.7.9.1.2.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

Table 6.7.9.1.2.4.1-2: Initial conditions for CSI-RS based L1-SINR absolute accuracy in FR1

- 1. Message contents are defined in clause 6.7.9.1.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-SINR measurements. The UE is configured one CSI-RS resource set with two CSI-RS resources. UE is configured to perform RLM and BFD based on SSB 0 and 1. CSI-RS is not transmitted in the same OFDM symbols as SSB. The connection setup is done according to the settings in Annex C.1.1.

6.7.9.1.2.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.1.2.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.1.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.1.1.5-1.
- 3. The UE shall start sending L1-SINR report including results of both CSI-RS#0 and CSI-RS #1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS #0 and CSI-RS #1 in the periodic L1-SINR reports. The L1-SINR value for CSI-RS #1 is compared to the L1-SINR value for CSI-RS #0. If the difference is within the limits in Table 6.7.9.1.2.5-2 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.1.1.5-1 as appropriate and repeat steps 3-5.

6.7.9.1.2.4.3 Message contents

Same message contents as described in section 6.7.9.1.1.4.3

6.7.9.1.2.5 Test requirement

Table 6.7.9.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-SINR measurement report for each of the tests in Table 6.7.9.1.2.5-1 shall meet the corresponding relative accuracy requirements in Table 6.7.9.1.2.5-2.

Table 6.7.9.1.2.5-1: Same as Table 4.7.7.1.2.5-1

Table 6.7.9.1.2.5-2: Same as Table 4.7.7.1.2.5-2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.9.2 NR SA FR1 SSB based CMR and dedicated IMR L1-SINR absolute measurement accuracy

6.7.9.2.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

6.7.9.2.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support for L1-SINR measurements on the NR PSCell.

6.7.9.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.2.

6.7.9.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.2.4.1-1.

Table 6.7.9.2.4.1-1: Applicable NR configurations for FR1 L1-SINR measurement test with SSB based CMR and CSI-RS based IMR

	Config	Description
1		NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
2		NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
3		NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.2.4.1-2.

Table 6.7.9.2.4.1-2: Initial conditions for SSB based and CSI-RS based L1-SINR absolute accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	1	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth		As specified by the test configuration	on selected from Table 6.7.9.2.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

1. Message contents are defined in clause 6.7.9.2.4.3.

2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured one SSB resource set with two SSB resources and one CSI-RS resource set with two CSI-RS resource. UE is configured to perform RLM and BFD measurement based on the SSB resources 0 and 1. UE is configured to perform L1-SINR measurement based on the SSBs as CMR and the CSI-RS resources as IMR. The connection setup is done according to the settings in Annex C.1.2 and C.1.3.

6.7.9.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to PSCell. The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.2.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.2.5-1. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall start sending L1-SINR report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of SSB#0+CSI-IM#0 and SSB#1+CSI-IM#1 in the periodic L1-RSRP reports. If the value for both SSB#0+CSI-IM#0 and SSB#1+CSI-IM#1 is within the limits in Table 6.7.9.2.5-2 and Table 6.7.9.2.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.2.5-1 as appropriate and repeat steps 3-5.

6.7.9.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.1.1.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.6A-1 with conditions PERIODIC and SS-SINR and CSI- RS_IMR Table H.3.6A-2 with conditions SSB and PERIODIC Table H.3.6A-3 with condition PERIODIC Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.4.1.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

6.7.9.2.5 Test requirement

Table 6.7.9.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.9.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.9.2.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.9.2.5-3 for test configuration 3.

Table 6.7.9.2.5-1: FR1 SSB based L1-SINR	<pre>test parameters</pre>
--	----------------------------

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N _{RB,c} = 52	10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106	40: N _{RB,c} = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
	3		SR.2.1 TDD	SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD	CR.1.1 FDD
Channel	2		CR.1.1 TDD	CR.1.1 TDD
Channel	3		CR.2.1 TDD	CR.2.1 TDD
Dedicated CORESET	1		CCR.1.1 FDD	CCR.1.1 FDD
Reference Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
	3		CCR.2.1 TDD	CCR.2.1 TDD
	1		SSB.3 FR1	SSB.3 FR1
SSB configuration	2		SSB.3 FR1	SSB.3 FR1
	3		SSB.4 FR1	SSB.4 FR1
	1		CSI-RS 1.1A FDD	CSI-RS 1.1A FDD
CSI-RS configuration	2		CSI-RS 1.1A TDD	CSI-RS 1.1A TDD
	3		CSI-RS 2.1A TDD	CSI-RS 2.1A TDD
OCNG Patterns	1~3		OP.1	OP.1
Initial BWP Configuration	1~3		DLBWP.0.1	DLBWP.0.1
initial BVVI Configuration	-		ULBWP.0.1	ULBWP.0.1
	1		TRS.1.1 FDD	TRS.1.1 FDD
TRS configuration	2		TRS.1.1 TDD	TRS.1.1 TDD
	3		TRS.1.2 TDD	TRS.1.2 TDD

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Dedicated	BWP configuration	1~3		DLBWP.1.1	DLBWP.1.1	
				ULBWP.1.1	ULBWP.1.1	
SMTC configuration reportConfigType		1~3 1~3		SMTC.1 periodic	SMTC.1 periodic	
	• • • •	1~5		ssb-Index-SINR-	ssb-Index-SINR-	
reportQua	-	1~3		r16	r16	
	f reported RS	1~3		2	2	
	reporting period	1~3		slot80	slot80	
	o of PSS to SSS					
SSS	o of PBCH DMRS to					
	o of PBCH to PBCH					
DMRS						
EPRE rati	o of PDCCH DMRS					
to SSS						
	o of PDCCH to			_		
PDCCH D		1~3	dB	0	0	
	o of PDSCH DMRS					
to SSS	o of PDSCH to					
PDSCH D						
	o of OCNG DMRS to					
SSS ^{Note 1}						
	o of OCNG to OCNG					
DMRS Note	9 1					
N_{oc} Note2		1,2	dBm/15kHz	-94.65	-117+ $\Delta_{BG_{offset}}$	
- ' <i>oc</i>	Depending on	3		-96.00	-117+ $\Delta_{BG_{offset}}$	
N_{oc} Note2	band group	1,2	dBm/SSB	-94.65	-117+ $\Delta_{BG_{offset}}$	
	oc		SCS	-93.00	-114+ $\Delta_{BG_{offset}}$	
\hat{E}_{s}/I_{ot}		1~3	dB	10	-2.2	
SSB	Depending on	1,2	dBm/SSB	-84.65	-119.2 + Δ _{BG_offset}	
RSRP Note3	band group	3	SCS	-83.00	-116.2 + $\Delta_{BG_{offset}}$	
	Depending on	1,2	dBm/9.36	-56.28	-87.00 + Δ _{BG_offset}	
lo Note3	band group	• ,=	MHz			
-		3	dBm/38.16	-51.53	-80.90 + $\Delta_{BG_{offset}}$	
Dropogoti	Propagation condition		MHz	AWGN	AWGN	
	configuration	1~3 1~3		1x2	1x2	
		-	th cells are fully a			
	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.					
Note 2:	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be					
	constant over subcarriers and time and shall be modelled as AWGN of appropriate power					
	for N_{oc} to be fulfilled.					
Note 3:	RSRP and lo levels ha		rived from other	parameters for inform	ation purposes.	
	They are not settable	parameters	themselves.			
Note 4:	RSRP minimum requir		specified assum	ing independent inter	ference and noise	
	at each receiver anten					
Note 5:	The test configuration			51 and it is not require	ed to run this test on	
	band n51 in this release	se of the spe	ecilication.			

Table 6.7.9.2.5-2: Same as Table 4.7.7.2.5-2

Table 6.7.9.2.5-3: Same as Table 4.7.7.2.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.9.3 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR measurement accuracy

6.7.9.3.1 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR absolute measurement accuracy

6.7.9.3.1.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

6.7.9.3.1.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.3.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.3.

6.7.9.3.1.4	Test description
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6.7.9.3.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.3.1.4.1-1.

Table 6.7.9.3.1.4.1-1: Applicable NR configurations for FR1 L1-SINR measurement test with CSI-RS based CMR and CSI-IM based IMR

	Config	Description
1		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode
2		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode
3		NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.3.1.4.1-2.

Table 6.7.9.3.1.4.1-2: Initial conditions for CSI-RS based CMR and CSI-IM based IMR absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	1	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	А	s specified by the test configuration	n selected from Table 6.7.9.3.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram	N/A		

1. Message contents are defined in clause 6.7.9.3.1.4.3.

2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based CMR and CSI-IM based IMR measurements. The UE is configured one CSI-RS resource set with two CSI-RS resources and one CSI-IM resource set with two CSI-IM resources. UE is configured to perform RLM and BFD based on SSB 0 and 1. CSI-RS is not transmitted in the same OFDM symbols as SSB. UE is configured to perform L1-SINR measurement based on the configured CSI-RS as CMR and CSI-IM as IMR. The connection setup is done according to the settings in Annex C.1.1.

6.7.9.3.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to PSCell. The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.3.1.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.3.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.3.1.5-1. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall start sending L1-SINR report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS#0+CSI-IM#0 and CSI-RS#1+CSI-IM#1 in the periodic L1-SINR reports. If the value for both CSI-RSs is within the limits in Table 6.7.9.3.1.5-2 and Table 6.7.9.3.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.3.1.5-1 as appropriate and repeat steps 3-5.

6.7.9.3.1.4.3 Message contents

Same message content as in subclause 6.7.9.1.4.3 with the following exception:

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.9.3.1.4.3-1: Common Exception messages NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6A-1 with conditions PERIODIC and CSI-SINR and CSI-			
elements contents exceptions	IM_IMR			
	Table H.3.6A-2 with conditions CSI-RS and PERIODIC			
	Table H.3.6A-3 with condition PERIODIC			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.9.3.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
}			

6.7.9.3.1.5 Test requirement

Table 6.7.9.3.1.5-1 defines the primary level settings including test tolerances for all tests.

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Each L1-SINR measurement report for each of the tests in Table 6.7.9.3.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.9.3.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.9.3.1.5-3 for test configuration 3.

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
122 Comgaration	3	-	TDDConf.2.1	TDDConf.2.1
	1		10: N _{RB,c} = 52	10: N _{RB,c} = 52
BW _{channel}	2	MHz	10: N _{RB,c} = 52	10: N _{RB,c} = 52
	3		40: N _{RB,c} = 106	40: N _{RB,c} = 106
	1		SR.1.1 FDD	SR.1.1 FDD
PDSCH Reference	2	-	SR.1.1 TDD	SR.1.1 TDD
measurement channel	3	-	SR.2.1 TDD	SR.2.1 TDD
	1		CR.1.1 FDD	CR.1.1 FDD
RMSI CORESET Reference	2	-		
Channel	3	-	CR.1.1 TDD CR.2.1 TDD	CR.1.1 TDD CR.2.1 TDD
Dedicated CORESET	1	-	CCR.1.1 FDD	CCR.1.1 FDD
Reference Channel	2	-	CCR.1.1 TDD	CCR.1.1 TDD
	3		CCR.2.1 TDD	CCR.2.1 TDD
	1	4	SSB.1 FR1	SSB.1 FR1
SSB configuration	2	4	SSB.1 FR1	SSB.1 FR1
	3		SSB.2 FR1	SSB.2 FR1
OCNG Patterns	1~3		OP.1	OP.1
	1		TRS.1.1 FDD	TRS.1.1 FDD
TRS configuration	2		TRS.1.1 TDD	TRS.1.1 TDD
	3		TRS.1.2 TDD	TRS.1.2 TDD
Initial DWD Configuration	4.0		DLBWP.0.1	DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1 DLBWP.1.1	ULBWP.0.1
Dedicated BWP configuration	1~3		ULBWP.1.1	DLBWP.1.1 ULBWP.1.1
SMTC configuration	1~3		SMTC.1	SMTC.1
	1		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD
CSI-RS	2		CSI-RS 1.2 TDD	CSI-RS 1.2 TDD
	3		CSI-RS 2.2 TDD	CSI-RS 2.2 FDD
reportConfigType	1~3		periodic	periodic
reportQuantity-r16	1~3		cri-SINR-r16	cri-SINR-r16
nrofReportedRS	1~3		2	2
L1-SINR reporting period	1~3		slot80	slot80
EPRE ratio of PSS to SSS	-			
EPRE ratio of PBCH DMRS to SSS	1			
EPRE ratio of PBCH to PBCH	1			
DMRS EPRE ratio of PDCCH DMRS	-			
to SSS				
EPRE ratio of PDCCH to PDCCH DMRS	1~3	dB	0	0
EPRE ratio of PDSCH DMRS				Ŭ
to SSS EPRE ratio of PDSCH to	-			
PDSCH DMRS EPRE ratio of OCNG DMRS to	-			
SSS ^{Note 1}				
EPRE ratio of OCNG to OCNG DMRS Note 1				
N _{oc} Note2 Depending on	1,2	dBm/15kHz	-94.65	-117+ Δ_{BG_offset}
band group	3		-96.00	-117+ $\Delta_{BG_{offset}}$

Table 6.7.9.3.5-1: FR1 CSI-RS based L1-SINR test parameters

$N_{_{ m \it OC}}$ Note2		1,2	dBm/SSB	-94.65	-117+ $\Delta_{BG_{offset}}$
l'oc		3	SCS	-93.00	-114+ $\Delta_{BG_{offset}}$
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		1~3	dB	10	-2.2
SSB	Depending on	1,2	dBm/SSB	-84.65	-119.2 + Δ _{BG_offset}
RSRP Note3	band group	3	SCS	-83.00	-116.2 +
	Depending on	1,2	dBm/9.36	-56.28	$\Delta_{BG_{offset}}$ -87.00 +
lo Note3	band group	- ;	MHz		Δ _{BG_offset}
		3	dBm/38.16 MHz	-51.53	-80.90 + Δ _{BG_offset}
\hat{E}_s/N_{oc}		1~3	dB	10	-2.2
Propagation condition		1~3		AWGN	AWGN
Antenna	configuration	1~3		1x2	1x2
Note 1:OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 2:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.					
Note 3:					
Note 4:	4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.				
Note 5:					

Table 6.7.9.3.5-2: Same as Table 4.7.7.3.5-2

Table 6.7.9.3.5-3: Same as Table 4.7.7.3.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.9.3.2 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR relative measurement accuracy

6.7.9.3.2.1 Test purpose

The purpose of this test is to verify that the L1-SINR relative measurement accuracy is within the specified limits.

6.7.9.3.2.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.3.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.7.9.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.3.

- 6.7.9.3.2.4 Test description
- 6.7.9.3.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.3.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.7.9.3.2.4.1-2.

Table 6.7.9.3.2.4.1-1: Applicable NR configurations for FR1 L1-SINR measurement test with CSI-RS based CMR and CSI-IM based IMR

Config	Config Description			
1	NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode			
2	NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode			
3	NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode			
Note: The UE is only required to be tested in one of the supported test configurations in each supported band				

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.3.2.4.1-2.

Table 6.7.9.3.2.4.1-2: Initial conditions for CSI-RS based CMR and CSI-IM based IMR absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	ŀ	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	А	s specified by the test configuration	n selected from Table 6.7.9.3.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.9.3.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based CMR and CSI-IM based IMR measurements. The UE is configured one CSI-RS resource set with two CSI-RS resources and one CSI-IM resource set with two CSI-IM resources. UE is configured to perform RLM and BFD based on SSB 0 and 1. CSI-RS is not transmitted in the same OFDM symbols as SSB. UE is configured to perform L1-SINR measurement based on the configured CSI-RS as CMR and CSI-IM as IMR. The connection setup is done according to the settings in Annex C.1.1.

6.7.9.3.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to PSCell. The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.3.2.4.1-2.

- 1. Ensure the UE is in state RRC_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.3.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.3.2.5-1.
- 3. The UE shall start sending L1-SINR report including results of both CSI-RS#0 and CSI-RS #1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS #0 and CSI-RS #1 in the periodic L1-SINR reports. The L1-SINR value for CSI-RS #1 is compared to the L1-SINR value for CSI-RS #0. If the difference is within the limits in Table 6.7.9.3.2.5-2 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.

6. Set the parameters according to each sub-test in Table 6.7.9.3.2.5-1 as appropriate and repeat steps 3-5.

6.7.9.3.2.4.3 Message contents

Same message contents as described in section 6.7.9.3.1.4.3

6.7.9.3.2.5 Test requirement

Table 6.7.9.3.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-SINR measurement report for each of the tests in Table 6.7.9.3.2.5-1 shall meet the corresponding relative accuracy requirements in Table 6.7.9.3.2.5-2.

Table 6.7.9.3.2.5-1: Same as Table 6.7.9.3.1.5-1

Table 6.7.9.3.2.5-2: Same as Table 4.7.7.3.2.5-2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.