**3GPP TSG-RAN WG4 Meeting #102-e *R4-2205868***

**Online, 21st Feb – 3rd Mar, 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **2257** | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Big CR on RRM requirements for FR2 Inter-band CA | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MCC, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_RF\_FR2\_req\_enh2-Core | | | | |  | ***Date:*** | | | 2022-3-2 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Big CR to merge the multiple endorsed draft CRs in RAN4#101bis-e and RAN4#102-e meeting for RRM requirements for FR2 Inter-band CA.   * draftCRs agreed in RAN4#101bis-e   + R4-2202587 DraftCR on interruption requirements for FR2 inter-band CA with CBM * draftCRs agreed in RAN4#102-e   + R4-2206838 draftCR on CBM inter-band FR2 DL CA   + R4-2206839 draftCR on MRTD for CBM inter-band FR2 DL CA   + R4-2206841 DraftCR on applicability rules for FR2 inter-band CA with CBM   + R4-2206842 Draft CR on scheduling restriction for FR2 inter-band DL CA for CBM UE   + R4-2206843 draftCR on measurement restriction for CBM inter-band FR2 DL CA   + R4-2206511 draftCR on UL gaps CBM inter-band FR2 DL CA | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The summary of change in each endorsed draft CRs are copied below.   * R4-2202587 DraftCR on interruption requirements for FR2 inter-band CA with CBM   + To add the interruption requirements for CBM based FR2 inter-band CA. * R4-2206838 draftCR on CBM inter-band FR2 DL CA   + Add the definition of related terms for FR2 RF enh WI (RF side introduce the definition in R4-2204789 in this meeting) * R4-2206839 draftCR on MRTD for CBM inter-band FR2 DL CA   + The MRTD requirements will be updated for CBM inter-band FR2 DL CA * R4-2206841 DraftCR on applicability rules for FR2 inter-band CA with CBM   + To introduce the applicability rules for CBM based FR2 inter-band CA. * R4-2206842 Draft CR on scheduling restriction for FR2 inter-band DL CA for CBM UE   + Introducing the scheduling restirction requirements for FR2 inter-band DL CA. * R4-2206843 draftCR on measurement restriction for CBM inter-band FR2 DL CA   + Measurement restriction requirements will be updated for CBM inter-band FR2 DL CA * R4-2206511 draftCR on UL gaps   + UL gaps for Tx power management will be added to section 9. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * R4-2202587:   + The interruptions for CBM based FR2 inter-band CA are not defined * R4-2206838: * Definition of related terms for FR2 RF enh WI are missing. * R4-2206839:   + The MRTD requirements for CBM inter-band FR2 DL CA are missing. * R4-2206841: * There may have misunderstanding on the requirements applied in CBM based FR2 inter-band CA operation. * R4-2206842:   + Scheduling restriction requirements for FR2 inter-band DL CA requirements will be missing in Rel-17 specifications. * R4-2206843:   + The measurement restriction requirements for CBM inter-band FR2 DL CA are missing. * R4-2206511:   + The UL gaps for CBM inter-band FR2 DL CA are missing are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | * R4-2202587: 8.2.1.2.3, 8.2.1.2.4, 8.2.2.2.1, 8.2.2.2.2, 8.2.3.2.3, 8.2.3.2.4 * R4-2206838: 3.1 * R4-2206839: 7.6.4 * R4-2206841: 3.6.x * R4-2206842: 9.2.5.3.3, 9.10.2.6.2, 8.1.7.3, 8.5.7.3, 8.5.8.3, 9.5.6.3, 9.8.6.3 * R4-2206843: 3.6.10 * R4-2206511: 9.1.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**< Start of change 1 (from R4-2206838) >**

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [11] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [11].

**Active DL BWP**: Active DL bandwidth part as defined in TS 38.213 [3].

**Beam management reference signal:** As defined in TS 38.101-2 [19].

**Blackbox Approach:** Testing methodology, in which the UE internal implementation of certain specific UE functionality involved in the test, is unknown.

**CBM (Common Beam Management):** As defined in TS 38.101-2 [19]**.**

**Control Resource Set:** As defined in TS 38.213 [3].

**DL BWP**: DL bandwidth part as defined in TS 38.213 [3].

**EN-DC**: E-UTRA-NR Dual Connectivity as defined in clause 4.1.2 of TS 37.340 [17].

**en-gNB**: As defined in TS 37.340 [17].

**FR1**: Frequency range 1 as defined in clause 5.1 of TS 38.104 [13].

**FR2**: Frequency range 2 as defined in clause 5.1 of TS 38.104 [13].

**gNB**: as defined in TS 38.300 [10].

**IBM(Independent Beam Management):** As defined in TS 38.101-2 [19].

**LMF**: as defined in TS 38.305 [22].

**Master Cell Group:** As defined in TS 38.331 [2].

**Multi-Radio Dual Connectivity:** Dual Connectivity between E-UTRA and NR nodes, or between two NR nodes, as defined in TS 37.340 [17].

**ng-eNB**: As defined in TS 38.300 [10].

**NE-DC**: NR-E-UTRA Dual Connectivity as defined in clause 4.1.3.2 of TS 37.340 [17].

**NGEN-DC**: NG-RAN E-UTRA-NR Dual Connectivity as defined in clause 4.1.3.1 of TS 37.340 [17].

**NR-DC**: NR-NR Dual Connectivity as defined in clause 4.1.3.3 of TS 37.340 [17].

**Primary Cell**: As defined in TS 38.331 [2].

**PRS resource instance:** An instance in time of a configured PRS resource as defined in TS 38.331 [2], which may or not overlap with a measurement gap occasion.

**Quasi Co-Location:** As defined in TS 38.214 [26].

**RLM-RS resource:** A resource out of the set of resources configured for RLM by higher layer parameter RLM-RS-List [2] as defined in TS 38.213 [3].

**SA operation mode**: Operation mode when the UE is configured with at least PCell and not any MR-DC.

**Secondary Cell**: As defined in TS 38.331 [2].

**Secondary Cell Group:** As defined in TS 38.331 [2].

**Serving Cell**: As defined in TS 38.331 [2].

**SMTC**: An SSB-based measurement timing configuration configured by *SSB-MeasurementTimingConfiguration* as specified in TS 38.331 [2].

**Special Cell:** As defined in TS 38.331 [2].

**SSB:** SS/PBCH block as defined in clause 7.8.3 of TS 38.211 [6].

**Timing Advance Group**: As defined in TS 38.331 [2].

**< End of change 1>**

**< Start of change 2 (from R4-2206843) >**

3.6.10 Applicability of requirements for measurement restrictions

The requirements for measurement restrictions in clause 8.1.2.3, 8.1.3.3, 8.5.2.3, 8.5.3.3, 8.5.5.3, 8.5.6.3, 9.5.5 and 9.8.5 are not applicable if the following condition is met:

- The network configures mixed numerology on two CCs if the UE does not have the capability of supporting simultaneous reception with different numerologies between the two CCs in DL.

The requirements for measurement restrictions for FR2 intra-band CA in clause 9.5.5.1, 9.5.5.2, 9.8.5.1, 9.8.5.2 and 9.8.5.3 are applicable for CBM capable UE configured with FR2 inter-band CA using CBM with the following assumption:

* UE performs RLM, BFD and CBD only on SpCell and L1-RSRP/SINR measurements only on serving cell(s) in the same band as the SpCell where BM-RS is configured.

**< End of change 2>**

**< Start of change 3 (from R4-2206841) >**

3.6.X1 Applicability for FR2 inter-band CA with CBM

For UE capable of common beam management, when FR2 inter-band carrier aggregation is performed, the requirements specified in this version of the specification apply when a CC in any one of the participating bands is configured with both an active UL BWP and beam management RS(s).

**< End of change 3>**

**< Start of change 4 (from R4-2206839) >**

### 7.6.4 Minimum Requirements for NR Carrier Aggregation

For intra-band CA, only co-located deployment is applied. For intra-band non-contiguous NR carrier aggregation, the UE shall be capable of handling at least a relative receive timing difference between slot timing of different carriers to be aggregated at the UE receiver as shown in Table 7.6.4-1 below.

Table 7.6.4-1: Maximum receive timing difference requirement for intra-band non-contiguous NR carrier aggregation

|  |  |
| --- | --- |
| Frequency Range | Maximum receive timing difference (µs) |
| FR1 | 31 |
| FR2 | 0.26 |
| Note 1: In the case of different SCS on different CCs, if the receive time difference exceeds the cyclic prefix length of that SCS, demodulation performance degradation is expected for the first symbol of the slot. | |

For inter-band NR carrier aggregation, the UE shall be capable of handling at least a relative receive timing difference between slot timing of all pairs of carriers to be aggregated at the UE receiver as shown in Table 7.6.4-2 below.

Table 7.6.4-2: Maximum receive timing difference requirement for inter-band NR carrier aggregation

|  |  |
| --- | --- |
| Frequency Range of the pair of carriers | Maximum receive timing difference (µs) |
| FR1 | 33 |
| FR2 | 8 note1 |
| FR2 | 3 note2 |
| Between FR1 and FR2 | 25 |
| Note1: This requirement applies to the UE capable of independent beam management for FR2 inter-band CA.  Note2: This requirement applies to the UE capable of common beam management for FR2 inter-band CA. If the receive time difference exceeds X of that SCS, demodulation performance degradation due to TCI state switch is expected for the first or the last symbol of the slot in the SCells of the other band, where X is defined in Table 7.6.4-3. This may result in performance degradation for the slot, where impacted symbols belong to, if PDCCH/PDSCH is scheduled in these symbols. | |

**Table 7.6.4-3: The Threshold X for FR2 inter-band CBM capable UE**

|  |  |
| --- | --- |
| Sub-carrier spacing in PCell (kHz) | X (us) |
| 60 | 0.898 |
| 120 | 0.354 |

**< End of change 4>**

**< Start of change 5 (from R4-2206842) >**

#### 8.1.7.3 Scheduling availability of UE performing radio link monitoring on FR2

The following scheduling restriction applies due to radio link monitoring on an FR2 serving PCell and/or PSCell.

- If the RLM-RS is CSI-RS which is type-D QCLed with active TCI state for PDCCH or PDSCH, and the CSI-RS is not in a CSI-RS resource set with repetition ON,

- There are no scheduling restrictions due to radio link monitoring based on the CSI-RS.

- Otherwise

- The UE is not expected to transmit PUCCH, PUSCH or SRS or receive PDCCH, PDSCH or CSI-RS for tracking or CSI-RS for CQI on RLM-RS symbols to be measured for radio link monitoring.

When intra-band carrier aggregation in FR2 is performed, the scheduling restrictions on FR2 serving PCell or PSCell applies to all serving cells in the same band on the symbols that fully or partially overlap with restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to radio link monitoring performed on FR2 serving PCell or PSCell applies to all cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cell(s) in the bands for the following cases, provided that UE is capable of independent beam management on this FR2 band pair:

- when performing radio link monitoring performed on FR2 serving PCell or PSCell in different bands,

- the UE is configured with same or different numerology between SSB on one FR2 band and data on the other FR2 band.

For FR2, if following conditions are met,

- UE has been notified about system information update through paging,

- The gap between UE’s reception of PDCCH that UE monitors in the Type2-PDCCH CSS set and that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2 slots,

For the SSB for RLM and CORESET for RMSI scheduling multiplexing patterns 3, UE is expected to receive the PDCCH that UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured for RLM; and

For the SSB for RLM and CORESET for RMSI scheduling multiplexing patterns 2, UE is expected to receive PDSCH that corresponds to the PDCCH that UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured for RLM.

**< End of change 5>**

**< Start of change 6 (from R4-2202587) >**

8.2.1.2.3 Interruptions at SCell addition/release

The requirements in this clause shall apply for the UE configured with PSCell.

When one E-UTRA SCell in MCG is added or released:

- the UE is allowed an interruption on any active serving cell in SCG:

- of up to X1 slot, if the active serving cell is not in the same band as any of the E-UTRA SCells being added or released, or

- of up to max{Y1 slot + TSMTC\_duration, 5ms} if the active serving cells are in the same band as any of the E-UTRA SCells being added or released, provided the cell specific reference signals from the active serving cells and the E-UTRA SCells being added or released are available in the same slot, where TSMTC\_duration is the longest SMTC duration among all above active serving cells in SCG;

Where X1 and Y1 are specified in Table 8.2.1.2.3-1.

When one SCell in SCG is added or released:

- the UE is allowed an interruption on any active serving cell in SCG:

- of up to X1 slot, if the active serving cell and the SCell being added or released are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X1 slot, if the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair

or

- of up to Y1 slot + TSMTC\_duration, if the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells in SCG and SCell being added in this FR2 band pair supported for common beam management when one SCell is added;

- the longest SMTC duration among all above active serving cells in this FR2 band pair supported for common beam management when one SCell is released.

- of up to Y1 slot + TSMTC\_duration if the active serving cells are in the same band as any of the SCells being added or released, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells in SCG and the SCell being added when one SCell is added;

- the longest SMTC duration among all above active serving cells in SCG when one SCell is released.

Where X1 and Y1 are specified in Table 8.2.1.2.3-2.

**Table 8.2.1.2.3-1: Interruption length X1 and Y1 at E-UTRA SCell addition/Release**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **NR Slot length** | **Interruption length X1 (slots)** | | **Interruption length Y1 (slots)** | |
|  | **(ms)** | **Sync** | **Async** | **Sync** | **Async** |
| 0 | 1 | 1 | 2 | 1 | 2 |
| 1 | 0.5 | 2 | 3 | 2 | 3 |
| 2 | 0.25 | 5 | | 4 | 5 |
| 3 | 0.125 | 9 | | N/A | - N/A |

**Table 8.2.1.2.3-2: Interruption length X1 and Y1 at SCell addition/Release**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X1 (slots)** | | **Interruption length Y1 (slots)** |
| 0 | 1 | 1 | | 1 |
| 1 | 0.5 | 2 | | 2 |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 4 | 4 |
|  |  | Either aggressor cell or victim cell is on FR1 | 5 |  |
| 3 | 0.125 | Aggressor cell is on FR2 | 8 | 8 |
|  |  | Aggressor cell is on FR1 | 9 |  |

8.2.1.2.4 Interruptions at SCell activation/deactivation

The requirements in this clause shall apply for the UE configured with PSCell and one SCell.

When one E-UTRA SCell in MCG is activated from deactivated or dormant state, or deactivated from activated or dormant state:

- the UE is allowed an interruption on any active serving cell in SCG:

- of up to X2 slot, if the active serving cell is not in the same band as any of the E-UTRA SCells being activated or deactivated, or

- of up to max{Y2 slot + TSMTC\_duration, 5ms} if the active serving cells are in the same band as any of the E-UTRA SCells being activated or deactivated, provided the cell specific reference signals from the active serving cells and the E-UTRA SCells being activated or deactivated are available in the same slot, where TSMTC\_duration is the longest SMTC duration among all above active serving cells in SCG.

Where X2 and Y2 are specified in Table 8.2.1.2.4-1.

When one SCell in SCG is activated or deactivated:

- an interruption on any serving cell in SCG:

- of up to X2 slot, if the active serving cell and the SCell being activated or deactivated are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X2 slot, if the active serving cells and the SCells being activated or deactivated are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair.

or

- of up to Y2 slot + TSMTC\_duration, if the active serving cells and the SCells being activated or deactivated are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells and SCell being activated in this FR2 band pair supported for common beam management when one SCell is activated.

- the longest SMTC duration among all above active serving cells in this FR2 band pair supported for common beam management when one SCell is deactivated.

- of up to Y2 slot + TSMTC\_duration if the active serving cells are in the same band as any of the SCells being activated or deactivated, provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells in SCG and the SCell being activated when one SCell is activated;

- the longest SMTC duration among all above active serving cells in SCG when one SCell is deactivated.

Where X2 and Y2 are specified in Table 8.2.1.2.4-2.

**Table 8.2.1.2.4-1: Interruption length X2 and Y2 at E-UTRA SCell activation/deactivation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **NR Slot length** | **nterruption length X2 (slots)** | | **Interruption length Y2 (slots)** | |
|  | **(ms)** | **Sync** | **Async** | **Sync** | **Async** |
| 0 | 1 | 1 | 2 | 1 | 2 |
| 1 | 0.5 | 1 | 2 | 1 | 2 |
| 2 | 0.25 | 3 | | 2 | 3 |
| 3 | 0.125 | 5 | | N/A | N/A |

**Table 8.2.1.2.4-2: Interruption length X2 and Y2 at SCell activation/deactivation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X2 (slots)** | | **Interruption length Y2 (slots)** |
| 0 | 1 | 1 | | 1 |
| 1 | 0.5 | 1 | | 1 |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 2 | 2 |
|  |  | Either aggressor cell or victim cell is on FR1 | 3 |  |
| 3 | 0.125 | Aggressor cell is on FR2 | 4 | 4 |
|  |  | Aggressor cell is on FR1 | 5 |  |

**< End of change 6>**

**< Start of change 7 (from R4-2202587) >**

8.2.2.2.1 Interruptions at SCell addition/release

When any number of SCells between one and 7 is added or released using the same *RRCConnectionReconfiguration* message as defined in TS 38.331 [2], the UE is allowed an interruption on any active serving cell during the RRC reconfiguration procedure as follows:

- an interruption on any active serving cell:

- of up to X1 slot, if the active serving cell and the SCell being added or released are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X1 slot, if the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair.

Where X1 is specified in Table 8.2.2.2.1-1.

or

- of up to the duration shown in table 8.2.2.2.1-2, if the active serving cells are in the same band as any of the SCells being added or released, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot.

- of up to the duration shown in table 8.2.2.2.1-3, if the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot.

**Table 8.2.2.2.1-1: Interruption length X1 for SCell addition/release for inter-band CA**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X1 (slots)** | |
| 0 | 1 | 1 | |
| 1 | 0.5 | 2 | |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 4 |
|  |  | Either aggressor cell or victim cell is on FR1 | 5 |
| 3 | 0.125 | Aggressor cell is on FR2 | 8 |
|  |  | Aggressor cell is on FR1 | 9 |

**Table 8.2.2.2.1-2: Interruption duration for SCell addition/release for intra-band CA**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length (slots)** |
| 0 | 1 | 1 + TSMTC\_duration \* |
| 1 | 0.5 | 2 + TSMTC\_duration \* |
| 2 | 0.25 | 4 + TSMTC\_duration \* |
| 3 | 0.125 | 8 + TSMTC\_duration \* |
| NOTE 1: TSMTC\_duration measured in subframes is  - the longest SMTC duration among all above active serving cells and the SCell being added when one SCell is added;  - the longest SMTC duration among all active serving cells in the same band when one SCell is released.  NOTE 2: is as defined in TS 38.211 [6]. | | |

**Table 8.2.2.2.1-3: Interruption duration for SCell addition/release for FR2 inter-band CA with CBM**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length (slots)** |
| 2 | 0.25 | 4 + TSMTC\_duration \* |
| 3 | 0.125 | 8 + TSMTC\_duration \* |
| NOTE 1: TSMTC\_duration measured in subframes is  - the longest SMTC duration among all above active serving cells and SCell being added in this FR2 band pair supported for common beam management when one SCell is added;  - the longest SMTC duration among all active serving cells in this FR2 band pair supported for common beam management when one SCell is released.  NOTE 2: is as defined in TS 38.211 [6]. | | |

8.2.2.2.2 Interruptions at SCell activation/deactivation

When an intra-band SCell is activated or deactivated as defined in TS 37.340 [17], the UE is allowed

- an interruption on any active serving cell:

- of up to X2 slot, if the active serving cell and the SCell being activated or deactivated are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X2 slot, if the active serving cell and the SCell being activated or deactivated are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair.

Where X2 is specified in Table 8.2.2.2.2-1.

or

- of up to the duration shown in table 8.2.2.2.2-2, if the active serving cells are in the same band as any of the SCells being activated or deactivated provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot.

- of up to the duration shown in table 8.2.2.2.2-3, if the active serving cell and the SCell being activated or deactivated are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot.**Table 8.2.2.2.2-1: Interruption length X2 for SCell activation/deactivation for inter-band CA**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X2 (slots)** | |
| 0 | 1 |  | 1 |
| 1 | 0.5 |  | 1 |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 2 |
|  |  | Either aggressor cell or victim cell is on FR1 | 3 |
| 3 | 0.125 | Aggressor cell is on FR2 | 4 |
|  |  | Aggressor cell is on FR1 | 5 |

**Table 8.2.2.2.2-2: Interruption duration for SCell activation/deactivation for intra-band CA**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length (slots)** |
| 0 | 1 | 1 + TSMTC\_duration \* |
| 1 | 0.5 | 1 + TSMTC\_duration \* |
| 2 | 0.25 | 2 + TSMTC\_duration \* |
| 3 | 0.125 | 4 + TSMTC\_duration \* |
| NOTE 1: TSMTC\_duration measured in subframes is  - the longest SMTC duration among all above active serving cells and the SCell being activated when one SCell is activated;  - the longest SMTC duration among all active serving cells in the same band when one SCell is deactivated.  NOTE 2: is as defined in TS 38.211 [6]. | | |

**Table 8.2.2.2.2-3: Interruption duration for SCell activation/deactivation for FR2 inter-band CA with CBM**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length (slots)** |
| 2 | 0.25 | 2 + TSMTC\_duration \* |
| 3 | 0.125 | 4 + TSMTC\_duration \* |
| NOTE 1: TSMTC\_duration measured in subframes is  - the longest SMTC duration among all above active serving cells and SCell being activated in this FR2 band pair supported for common beam management when one SCell is activated;  - the longest SMTC duration among all active serving cells in this FR2 band pair when one SCell is deactivated.  NOTE 2: is as defined in TS 38.211 [6]. | | |

**< End of change 7>**

**< Start of change 8 (from R4-2202587) >**

8.2.3.2.3 Interruptions at PSCell/SCell addition/release

The requirements in this clause shall apply for the UE configured with E-UTRA PSCell.

When one E-UTRA PSCell/SCell in SCG is added or released:

- the UE is allowed an interruption on any active serving cell in MCG:

- of up to X1 slots, if the active serving cell is not in the same band as any of the E-UTRA PSCell/SCells being added or released, or

- of up to max{Y1 slots + TSMTC\_duration, 5ms} if the active serving cells are in the same band as any of the E-UTRA PSCell/SCells being added or released, provided the cell specific reference signals from the active serving cells and the E-UTRA PSCell/SCells being added or released are available in the same slot, where TSMTC\_duration is the longest SMTC duration among all above activated serving cells in MCG;

Where X1 and Y1 are specified in Table 8.2.3.2.3-1.

When one SCell in MCG is added or released:

- the UE is allowed an interruption on any activated serving cell in MCG:

- of up to X1 slots, if the active serving cell and the SCell being added or released are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X1 slot, if the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair.

or

- of up to Y1 slots + TSMTC\_duration, the active serving cell and the SCell being added or released are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells and SCell being added in this FR2 band pair supported for common beam management when one SCell is added;

- the longest SMTC duration among all above active serving cells in this FR2 band pair supported for common beam management when one SCell is released.

- of up to Y1 slots + TSMTC\_duration if the active serving cells are in the same band as any of the SCells being added or released, provided the cell specific reference signals from the active serving cells and the SCells being added or released are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells in MCG and the SCell being added when one SCell is added;

- the longest SMTC duration among all above active serving cells in MCG when one SCell is released.

Where X1 and Y1 are specified in Table 8.2.3.2.3-2.

**Table 8.2.3.2.3-1: Interruption length X1 and Y1 at E-UTRA PSCell/SCell addition/release**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **NR Slot length** | **Interruption length X1 (slots)** | | **Interruption length Y1 (slots)** | |
|  | **(ms)** | **Sync** | **Async** | **Sync** | **Async** |
| 0 | 1 | 1 | 2 | 1 | 2 |
| 1 | 0.5 | 2 | 3 | 2 | 3 |
| 2 | 0.25 | 5 | | 4 | 5 |
| 3 | 0.125 | 9 | | N/A | N/A |

**Table 8.2.3.2.3-2: Interruption length X1 and Y1 at SCell addition/Release**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X1 (slots)** | | **Interruption length Y1 (slots)** |
| 0 | 1 | 1 | | 1 |
| 1 | 0.5 | 2 | | 2 |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 4 | 4 |
|  |  | Either aggressor cell or victim cell is on FR1 | 5 |  |
| 3 | 0.125 | Aggressor cell is on FR2 | 8 | 8 |
|  |  | Aggressor cell is on FR1 | 9 |  |

8.2.3.2.4 Interruptions at SCell activation/deactivation

The requirements in this clause shall apply for the UE configured with E-UTRA PSCell and one SCell.

When one E-UTRA SCell in SCG is activated from deactivated or dormant state, or deactivated from activated or dormant state:

- the UE is allowed an interruption on any active serving cell in MCG:

- of up to X2 slots, if the active serving cell and the SCell being activated or deactivated are in a FR1 band pair or in a FR1+FR2 band pair.

- of up to X2 slot, if the active serving cells and the SCells being activated or deactivated are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair.

or

- of up to max{Y2 slots + TSMTC\_duration, 5ms} if the active serving cells are in the same band as any of the E-UTRA SCells being activated or deactivated, provided the cell specific reference signals from the active serving cells and the E-UTRA SCells being activated or deactivated are available in the same slot, where TSMTC\_duration is the longest SMTC duration among all above active serving cells in MCG.

Where X2 and Y2 are specified in Table 8.2.3.2.4-1.

When one SCell in MCG is activated or deactivated:

- the UE is allowed an interruption on any serving cell in MCG:

- of up to X2 slots, if the active serving cell is not in the same band as any of the SCells being activated or deactivated, or

- of up to Y2 slots + TSMTC\_duration, the active serving cell and the SCell being activated or deactivated are in a FR2 band pair and UE is capable of common beam management on this FR2 band pair, provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells and SCell being activated in this FR2 band pair supported for common beam management when one SCell is activated;

- the longest SMTC duration among all above active serving cells in this FR2 band pair supported for common beam management when one SCell is deactivated.

- of up to Y2 slots + TSMTC\_duration if the active serving cells are in the same band as any of the SCells being activated or deactivated, provided the cell specific reference signals from the active serving cells and the SCells being activated or deactivated are available in the same slot, where, TSMTC\_duration is

- the longest SMTC duration among all above active serving cells in MCGand the SCell being activated when one SCell is activated;

- the longest SMTC duration among all above active serving cells in MCG when one SCell is deactivated.

Where X2 and Y2 are specified in Table 8.2.3.2.4-2.

**Table 8.2.3.2.4-1: Interruption length X2 and Y2 at E-UTRA SCell activation/deactivation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length X2 (slots)** | | **Interruption length Y2 (slots)** | |
|  |  | **Sync** | **Async** | **Sync** | **Async** |
| 0 | 1 | 1 | 2 | 1 | 2 |
| 1 | 0.5 | 1 | 2 | 1 | 2 |
| 2 | 0.25 | 3 | | 2 | 3 |
| 3 | 0.125 | 5 | | N/A | N/A |

**Table 8.2.3.2.4-2: Interruption length X2 and Y2 at SCell activation/deactivation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NR Slot length (ms) of victim cell** | **Interruption length X2 (slots)** | | **Interruption length Y2 (slots)** |
| 0 | 1 | 1 | | 1 |
| 1 | 0.5 | 1 | | 1 |
| 2 | 0.25 | Both aggressor cell and victim cell are on FR2 | 2 | 2 |
|  |  | Either aggressor cell or victim cell is on FR1 | 3 |  |
| 3 | 0.125 | Aggressor cell is on FR2 | 4 | 4 |
|  |  | Aggressor cell is on FR1 | 5 |  |

**< End of change 8>**

**< Start of change 9 (from R4-2206842) >**

#### 8.5.7.3 Scheduling availability of UE performing beam failure detection on FR2

The following scheduling restriction applies due to beam failure detection.

- For the case where no RSs are provided for BFD, or when CSI-RS is configured for BFD is explicitly configured and is type-D QCLed with active TCI state for PDCCH or PDSCH, and the CSI-RS is not in a CSI-RS resource set with repetition ON

- There are no scheduling restrictions due to beam failure detection performed based on the CSI-RS.

- Otherwise

- The UE is not expected to transmit PUCCH, PUSCH or SRS or receive PDCCH, PDSCH or CSI-RS for tracking or CSI-RS for CQI on BFD-RS resource symbols to be measured for beam failure detection.

When intra-band carrier aggregation in FR2 is performed, the scheduling restrictions on FR2 serving PCell or PSCell apply to all serving cells in the same band on the symbols that fully or partially overlap with restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to beam failure detection performed on FR2 serving PCell or PSCell apply to all serving cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cells in the bands due to beam failure detection performed on FR2 serving cell(s) in different band(s), provided that UE is capable of independent beam management on this FR2 band pair. Additionally, there is no scheduling restriction if the UE is configured with different numerology between SSB on one FR2 band and data on the other FR2 band provided the UE is configured for IBM operation for the band pair.

For FR2, if following conditions are met,

- UE has been notified about system information update through paging,

- The gap between UE’s reception of PDCCH that UE monitors in the Type2-PDCCH CSS set and that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2 slots,

For the SSB and CORESET for RMSI scheduling multiplexing patterns 3, UE is expected to receive the PDCCH that UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured for BFD mesurement; and

For the SSB and CORESET for RMSI scheduling multiplexing patterns 2, UE is expected to receive PDSCH that corresponds to the PDCCH that UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured for BFD mesurement.

**< End of change 9>**

**< Start of change 10 (from R4-2206842) >**

#### 8.5.8.3 Scheduling availability of UE performing L1-RSRP measurement on FR2

The following scheduling restriction applies due to candidate beam detection

- The UE is not expected to transmit PUCCH, PUSCH or SRS or receive PDCCH, PDSCH, CSI-RS for tracking or CSI-RS for CQI on reference symbols to be measured for candidate beam detection.

When intra-band carrier aggregation in FR2 is configured, the scheduling restrictions on to one serving cell apply to all serving cells in the same band on the symbols that fully or partially overlap with restricted symbols.

When inter-band carrier aggregation in FR2 is configured, the scheduling restrictions due to candidate beam detection performed on FR2 serving cell apply to all serving cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cells in the bands due to candidate beam detection performed on FR2 serving cell(s) in different band(s), provided that the FR2 serving cell(s) and the FR2 serving cell(s) for candidate beam detection are in a FR2 band pair and UE is capable of independent beam management on this FR2 band pair. Additionally, there is no scheduling restriction if the UE is configured with different numerology between SSB on one FR2 band and data on the other FR2 band provided the UE is configured for IBM operation for the band pair.

For FR2, if following conditions are met,

- UE has been notified about system information update through paging,

- The gap between UE’s reception of PDCCH that UE monitors in the Type2-PDCCH CSS set and that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2 slots,

For the SSB and CORESET for RMSI scheduling multiplexing patterns 3, UE is expected to receive the PDCCH that UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured for CBD mesurement; and

For the SSB and CORESET for RMSI scheduling multiplexing patterns 2, UE is expected to receive PDSCH that corresponds to the PDCCH that UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured for CBD mesurement.

**< End of change 10>**

**< Start of change 11 (from R4-2206511) >**

### **9.1.X2 UL gap for Tx power management**

The UL gap pattern are listed in Table 9.1.7 if UE supports the UL gap for Tx power management. UE shall support at least one of UL MGP#1 and UL MGP#3. All other UL MGPs are optional.

Table 9.1.7: UL Gap Pattern Configurations

|  |  |  |
| --- | --- | --- |
|  | UL Gap Length (UGL) [ms] | UL gap repetition periodicity (UGRP) [ms] |
| UL MGP #0 | 1.0 | 20 |
| UL MGP #1 | 1.0 | 40 |
| UL MGP #2 | 0.5 | 160 |
| UL MGP #3 | 0.125 when SCS of active UL BWP =120kHz  0.25 when SCS of active UL BWP =60kHz | 5 |

Uplink gap consists of succeeding static UL slot(s), defined by *nrofUplinkSlots* in one or more *TDD-UL-DL-Pattern* duration, starting from the first static UL slot of an UL gap repetition period. There can be DL slot and/or special slot but no static UL slot between two succeeding static UL slots within an UL gap repetition period. UGL is the aggregated length of UL slots used as UL gap within an UL gap repetition period.

During UL gaps, except for the signals used for random access procedure according to TS 38.321, CG-PUSCH (type 1 and 2) and PUCCH allocations for SR and LRR *[and for the signals used for other RAN4 agreed procedures]*, UE is not required to conduct transmission to the corresponding NR serving cells in FR2 single CC, intra-band CA. For inter-band FR2-FR2 CA/DC, UE may or may not be required to conduct transmission to the corresponding NR serving cells based on UE capability whether UL transmission within a gap is feasible.

**< End of change 11>**

**< Start of change 12 (from R4-2206842) >**

##### 9.2.5.3.3 Scheduling availability of UE performing measurements on FR2

The following scheduling restriction applies due to SS-RSRP or SS-SINR measurement on an FR2 intra-frequency cell

The UE is not expected to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/TRS/CSI-RS for CQI on SSB symbols to be measured, and on 1 data symbol before each consecutive SSB symbols to be measured and 1 data symbol after each consecutive SSB symbols to be measured within SMTC window duration (The signaling *deriveSSB\_IndexFromCell* is always enabled for FR2). If the high layer signalling of *smtc2*is configured in TS 38.331 [2], the SMTC periodicityfollows *smtc2*; Otherwise the SMTC periodicity follows *smtc1.*

The following scheduling restriction applies to SS-RSRQ measurement on an FR2 intra-frequency cell

- The UE is not expected to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/TRS/CSI-RS for CQI on SSB symbols to be measured, RSSI measurement symbols, and on 1 data symbol before each consecutive SSB to be measured/RSSI symbols and 1 data symbol after each consecutive SSB to be measured/RSSI symbols within SMTC window duration (The signaling *deriveSSB\_IndexFromCellc* is always enabled for FR2). If the high layer signalling of *smtc2*is configured in TS 38.331 [2], the SMTC periodicityfollows *smtc2*; Otherwise the SMTC periodicity follows *smtc1.*

When intra-band carrier aggregation in FR2 is performed, the scheduling restrictions due to a given serving cell should also apply to all other serving cells in the same band on the symbols that fully or partially overlap with aforementioned restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to SS-RSRP, SS-RSRQ or SS-SINR measurement on an FR2 intra-frequency cell should also apply to all serving cells in different band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cells in the bands due to SS-RSRP, SS-RSRQ or SS-SINR measurement on an FR2 intra-frequency cell in different bands, provided that UE is capable of independent beam management on this FR2 band pair. Additionally, there is no scheduling restriction if the UE is configured with different numerology between SSB on one FR2 band and data on the other FR2 band provided the UE is configured for IBM operation for the band pair.

If following conditions are met:

- The UE has been notified about system information update through paging,

- The gap between the UE’s reception of PDCCH that UE monitors in the Type 2-PDCCH CSS set that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2

For the SSB and CORESET for RMSI scheduling multiplexing patterns 3, the UE is expected to receive the PDCCH that the UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured; and

For the SSB and CORESET for RMSI scheduling multiplexing patterns 2, the UE is expected to receive PDSCH that corresponds to the PDCCH that the UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured.

**< End of change 12>**

**< Start of change 13 (from R4-2206842) >**

#### 9.5.6.3 Scheduling availability of UE performing L1-RSRP measurement on FR2

The following scheduling restriction applies due to L1-RSRP measurement.

- For the case where RS for L1-RSRP measurement is CSI-RS which is QCLed with active TCI state for PDCCH/PDSCH and not in a CSI-RS resource set with repetition ON, and N=1 applies as specified in clause 9.5.4.2

- There are no scheduling restrictions due to L1-RSRP measurement performed based on the CSI-RS.

- Otherwise

- The UE is not expected to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/CSI-RS for tracking/CSI-RS for CQI on

- symbols corresponding to the SSB indexes configured for L1-RSRP measurement, and/or

- symbols corresponding to the periodic CSI-RS resource configured for L1-RSRP measurement, and/or

- symbols corresponding to the semi-perssitent CSI-RS resource configured for L1-RSRP measurement when the resource is activated, and/or

- symbols corresponding to the aperiodic CSI-RS resource configured for L1-RSRP measurement when the reporting is triggered.

When intra-band carrier aggregation in FR2 is performed, the scheduling restrictions on serving cell where L1-RSRP measurement is performed apply to all serving cells in the band on the symbols that fully or partially overlap with restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to L1-RSRP measurement performed on FR2 serving cell apply to all serving cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cells in the bands due to L1-RSRP measurement performed on FR2 serving cell(s) in different band(s), provided that UE is capable of independent beam management on this FR2 band pair. Additionally, there is no scheduling restriction if the UE is configured with different numerology between SSB on one FR2 band and data on the other FR2 band provided the UE is configured for IBM operation for the band pair.

If following conditions are met,

- UE has been notified about system information update through paging,

- The gap between UE’s reception of PDCCH that UE monitors in the Type 2-PDCCH CSS set and that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2 slots,

For the SSB and CORESET for RMSI scheduling multiplexing patterns 3, UE is expected to receive the PDCCH that UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured for L1-RSRP measurement; and

For the SSB and CORESET for RMSI scheduling multiplexing patterns 2, UE is expected to receive PDSCH that corresponds to the PDCCH that UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured for L1-RSRP measurement.

**< End of change 13>**

**< Start of change 14 (from R4-2206842) >**

9.8.6.3 Scheduling availability of UE performing L1-SINR measurement on FR2

The following scheduling restriction applies due to L1-SINR measurement.

- For the cases of CSI-RS used for L1-SINR measurement of CSI-RS based CMR only case and CSI-RS based CMR plus CSI-RS based ZP-IMR/NZP-IMR case and CSI-RS based CMR plus ZP-IMR case, where CSI-RS is QCLed with active TCI state for PDCCH/PDSCH and not in a CSI-RS resource set with repetition ON, and N=1 applies as specified in clause 9.8.4

- There are no scheduling restrictions due to L1-SINR measurement performed based on the CSI-RS.

- Otherwise

- The UE is not expected to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/CSI-RS for tracking/CSI-RS for CQI on the CSI-RS for L1-RSRP measurement symbols to be measured for L1-SINR.

When intra-band carrier aggregation is performed, the scheduling restrictions on serving cell where L1-SINR measurement is performed apply to all serving cells in the band on the symbols that fully or partially overlap with restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to L1-SINR measurement performed on FR2 serving cell apply to all serving cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

If following conditions are met,

- UE has been notified about system information update through paging,

- The gap between UE’s reception of PDCCH that UE monitors in the Type 2-PDCCH CSS set and that notifies system information update, and the PDCCH that UE monitors in the Type0-PDCCH CSS set, is greater than 2 slots,

for the SSB and CORESET for RMSI scheduling multiplexing patterns 3, UE is expected to receive the PDCCH that UE monitors in the Type0-PDCCH CSS set, and the corresponding PDSCH, on SSB symbols to be measured for L1-SINR measurement; and

for the SSB and CORESET for RMSI scheduling multiplexing patterns 2, UE is expected to receive PDSCH that corresponds to the PDCCH that UE monitors in the Type0-PDCCH CSS set, on SSB symbols to be measured for L1-SINR measurement.

**< End of change 14>**

**< Start of change 15 (from R4-2206842) >**

##### 9.10.2.6.2 Scheduling availability of UE performing CSI-RS based measurements in FR2

When the UE performs CSI-RS based intra-frequency measurements for L3 mobility management in FR2, the following restrictions apply.

- The UE is not expected to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/TRS/CSI-RS for CQI on the configured CSI-RS symbol within the configured slot as indicated in *slotConfig* of the corresponding CSI-RS resource to be measured for mobility.

When intra-band carrier aggregation in FR2 is performed, the scheduling restrictions due to a given serving cell should also apply to all other serving cells in the same band on the symbols that fully or partially overlap with aforementioned restricted symbols.

When inter-band carrier aggregation in FR2 is performed, the scheduling restrictions due to CSI-RSRP, CSI-RSRQ or CSI-SINR measurement on an FR2 intra-frequency cell should also apply to all serving cells in different FR2 band on the symbols that fully or partially overlap with the aforementioned restricted symbols, provided that UE is capable of common beam management on this FR2 band pair.

When inter-band carrier aggregation in FR2 is performed, there are no scheduling restrictions on FR2 serving cells in the bands due to CSI-RSRP, CSI-RSRQ or CSI-SINR measurement on an FR2 intra-frequency cell in different bands, provided that UE is capable of independent beam management on this FR2 band pair.

**< End of change 15>**