**3GPP TSG-RAN WG4 Meeting #116 *R4-2509269***

**Bengaluru , IN, 25th – 29th Aug, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **5732** | **rev** | **-** | **Current version:** | **17.18.1** |  |
|  | | | | | | | | |
| *For* ***HE******LP*** *on using this form: comprehensive instructions can be found at  http://www.3gpp.org/Change-Requests.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | (NR\_NTN\_solutions-Perf) CR on perf requirements of Rel-17 NR NTN | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_solutions-Perf | | | | |  | ***Date:*** | | | 2025-08-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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. | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The representation of UE position in test cases for NTN needs to be revised and the definition needs to be clarified. | | | | | | | | |
| ***T*** | |  | | | | | | | | |
| ***Summary of change:*** | | * Revise the representation of UE position from (N,S,H) to (L,B,H). * Further clarify the definition of UE position and notes in test cases for NTN in related clauses | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The definition of UE position and notes in test cases for NTN would be not clear. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.14.2.1.1.2, A.14.2.1.2.2, A.14.2.1.3.2, A.14.2.1.4.2, A.14.2.1.5.2, A.14.2.1.6.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

##### A.14.2.1.1.2 Test Parameters

The test scenario comprises of 1 NR FDD carrier and 2 cells as given in table A.14.2.1.1.2-1, A.14.2.1.1.2-2, and A.14.2.1.1.2-3. Both handover delay and interruption length are tested.

The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2. During T1, the UE is configured to measure intra-frequency neighbour cell with Event A3 report.

Starting T2, cell 2 becomes detectable and offset better than cell 1. The RRC message implying handover to cell 2 shall be sent to the UE during period T2, after the UE has reported Event A3. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.14.2.1.1.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.1.2-2: General test parameters Intra-frequency SAN handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| RF Channel Number | |  | 1 | One NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) | |  | [(0, 0, 0)] | Set by any pre-configured means.  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |

Table A.14.2.1.1.2-3: Cell specific test parameters for Intra frequency SAN handover test case

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | | Cell 2 | | |
| T1 | T2 | T3 | T1 | T2 | T3 |
| Satellite information | | Config 1 |  | SSC.1 | | | NSC.1 | | |
|  | | Config 2 |  | SSC.2 | | | NSC.2 | | |
| NR RF Channel Number | | Config 1,2 |  | 1 | | | 1 | | |
| BWchannel | | MHz | 10: NRB,c = 52 | | | 10: NRB,c = 52 | | |
| BWP BW | | MHz | 10: NRB,c = 52 | | | 10: NRB,c = 52 | | |
| TACommon | | Config 1,2 | s | 0 | | | 0 | | |
| TACommonDrift | | s | 0 | | | 0 | | |
| TACommonDriftVariation | | s | 0 | | | 0 | | |
| Koffset | | Config 1 | ms | 239 | | | 239 | | |
|  | | Config 2 | 4 | | | 4 | | |
| Kmac | | Config 1,2 | ms | 0 | | | 0 | | |
| DRx Cycle | | ms | Not Applicable | | | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | | | |
| OCNG Patterns | |  | OP.1 | | | | | |
| SMTC Configuration | |  | SMTC.1 | | | | | |
| SSB Configuration | |  | SSB.1 FR1 | | | | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | | | |
| BWP configuration | Initial DL BWP | Config 1,2 |  | DLBWP.0.1 | | | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | | | |
| EPRE ratio of PSS to SSS | | Config 1,2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1,2 | dBm/ 15kHz | -98 | | | | | |
| Note2 | | dBm/ SCS | -98 | | | | | |
|  | | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 |
|  | | dB | 8 | 8 | 8 | -Infinity | 11 | 11 |
| SSB\_RP | | dBm/ SCS | -90 | -90 | -90 | -Infinity | -87 | -87 |
| IoNote3 | | dBm/ 9.36MHz | -61.41 | -57.06 | -57.06 | -61.41 | -57.06 | -57.06 |
| Propagation condition | | - | AWGN | | | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | |

##### A.14.2.1.2.2 Test Parameters

The test scenario comprises of 2 NR FDD carriers and one cell on each carrier as given in table A.14.2.1.2.2-1, A.14.2.1.2.2-2 and A.14.2.1.2.2-3. Both handover delay and interruption length are tested.

The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. During T1, the UE is configured to measure inter frequency neighbour cell with Event A3 report and Gap Pattern 0 is configured in the test case.

Starting T2, cell 2 becomes detectable and offset better than cell 1. The RRC message implying handover to cell 2 shall be sent to the UE during period T2, after the UE has reported Event A3. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.14.2.1.2.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.2.2-2: General test parameters Inter-frequency SAN handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| RF Channel Number | |  | 1, 2 | Two NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 |  |
|  | Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) | |  | (0, 0, 0) | Set by any pre-configured means  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| Gap Pattern Id | |  | 0 |  |
| Measurement gap offset | |  | 9 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |

Table A.14.2.1.2.2-3: Cell specific test parameters for Inter frequency SAN handover test case

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | | Cell 2 | | | |
| T1 | T2 | T3 | T1 | | T2 | T3 |
| Satellite information | | Config 1 |  | SSC.1 | | | NSC.1 | | | |
|  | | Config 2 |  | SSC.2 | | | NSC.2 | | | |
| NR RF Channel Number | | Config 1,2 |  | 1 | | | 2 | | | |
| BWchannel | | MHz | 10: NRB,c = 52 | | | 10: NRB,c = 52 | | | |
| BWP BW | | MHz | 10: NRB,c = 52 | | | 10: NRB,c = 52 | | | |
| TACommon | | Config 1,2 | s | 0 | | | 0 | | | |
| TACommonDrift | | s | 0 | | | 0 | | | |
| TACommonDriftVariation | | s | 0 | | | 0 | | | |
| Koffset | | Config 1 | ms | 239 | | | 239 | | | |
|  | | Config 2 | 4 | | | 4 | | | |
| Kmac | | Config 1,2 | ms | 0 | | | 0 | | | |
| DRx Cycle | | ms | Not Applicable | | | | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | | | | |
| OCNG Patterns | |  | OP.1 | | | | | | |
| SMTC Configuration | |  | SMTC.2 | | | | SMTC.5 | | |
| SSB Configuration | |  | SSB.1 FR1 | | | | SSB.5 FR1 | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | | | | |
| BWP configuration | Initial DL BWP | Config 1,2 |  | DLBWP.0.1 | | | | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | | | | |
| EPRE ratio of PSS to SSS | | Config 1,2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1,2 | dBm/ 15kHz | -98 | | | | | | |
| Note2 | | dBm/ SCS | -98 | | | | | | |
|  | | dB | 4 | 4 | 4 | -Infinity | | 9 | 9 |
|  | | dB | 4 | 4 | 4 | -Infinity | | 9 | 9 |
| SSB\_RP | | dBm/ SCS | -94 | -94 | -94 | -Infinity | | -89 | -89 |
| IoNote3 | | dBm/ 9.36MHz | -64.59 | -64.59 | -64.59 | -70.05 | | -60.53 | -60.53 |
| Propagation condition | | - | AWGN | | | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | |

##### A.14.2.1.3.2 Test Parameters

The test scenario comprises of 1 NR FDD carrier and 2 cells as given in table A.14.2.1.3.2-1, and A.14.2.1.3.2-2. Both handover delay and interruption length are tested.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Immediately before the start of T1, the UE is configured to measure intra-frequency neighbour cell with a time-based handover trigger to Cell 2 with Event CondEvent T1 shall be sent to UE.

Starting T2, cell 2 becomes detectable and offset better than cell 1 and time condition event t1-Threshold-r17 is fulfilled.

Table A.14.2.1.3.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.3.2-2: General test parameters for Intra-frequency SAN time-based conditional handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| RF Channel Number | |  | 1 | One NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 | FDD duplex mode cell |
|  | Neighbouring cell |  | Cell 2 | FDD duplex mode cell |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) | |  | [(0, 0, 0)] | Set by any pre-configured means.  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| t1-Threshold-r17.condEventT1-r17 | | s | T1 | Entering condition at start of T2 (end of T1) |
| duration-r17.condEventT1-r17 | | slot | 1000 | Give 1s search duration |
| A3-Offset in condition | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤ 2 |  |

Table A.14.2.1.3.2-3: Cell specific test parameters for Intra-frequency SAN time-based conditional handover from FR1 to FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information | | Config 1 |  | SSC.1 | | NSC.1 | |
|  | | Config 2 |  | SSC.2 | | NSC.2 | |
| NR RF Channel Number | | Config 1,2 |  | 1 | | 1 | |
| BWchannel | |  | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| BWP BW | |  | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| TACommon | | Config 1,2 | s | 0 | | 0 | |
| TACommonDrift | |  | s | 0 | | 0 | |
| TACommonDriftVariation | |  | s | 0 | | 0 | |
| Koffset | | Config 1 | ms | 239 | | 239 | |
|  | | Config 2 | ms | 4 | | 4 | |
| Kmac | | Config 1,2 | ms | 0 | | 0 | |
| DRX Cycle | | ms | Not Applicable | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | |
| OCNG Patterns | |  | OP.1 | | | |
| SMTC Configuration | |  | SMTC.1 | | | |
| SSB Configuration | |  | SSB.1 FR1 | | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | |
| BWP configuration | Initial DL BWP | Config 1,2 |  | DLBWP.0.1 | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | |
| EPRE ratio of PSS to SSS | | Config 1,2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1,2 | dBm/ 15kHz | -98 | | | |
| Note2 | | dBm/ SCS | -98 | | | |
|  | | dB | 8 | -3.3 | -Infinity | 2.36 |
|  | | dB | 8 | 8 | -Infinity | 11 |
| SSB\_RP | | dBm/ SCS | -90 | -90 | -Infinity | -87 |
| IoNote3 | | dBm/ 9.36MHz | -61.41 | -57.06 | -61.41 | -57.06 |
| Propagation condition | | - | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.4.2 Test Parameters

The test scenario comprises of 2 NR FDD carrier and one cell on each carrier as given in table A.14.2.1.4.2-1, and A.14.2.1.4.2-2. Both handover delay and interruption length are tested.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Immediately before the start of T1, the UE is configured to measure inter-frequency neighbour cell with Gap pattern ID gp0 and time-based handover trigger to Cell 2 with Event CondEvent T1.

Starting T2, cell 2 becomes detectable and offset better than cell 1 and after 1000ms of T2, time condition event t1-Threshold-r17 is fulfilled.

Table A.14.2.1.4.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.4.2-2: General test parameters for Inter-frequency SAN time-based conditional handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| RF Channel Number | |  | 1, 2 | Two NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 | FDD duplex mode cell |
|  | Neighbouring cell |  | Cell 2 | FDD duplex mode cell |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) | |  | [(0, 0, 0)] | Set by any pre-configured means.  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| t1-Threshold-r17.condEventT1-r17 | | s | T1+1 | Entering condition 1000ms after the start of T2 |
| duration-r17.condEventT1-r17 | | slot | 1000 | Give 1s search duration |
| Gap Pattern Id | |  | 0 |  |
| Measurement gap offset | |  | 9 |  |
| A3-Offset in condition | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤ 2 |  |

Table A.14.2.1.4.2-3: Cell specific test parameters for Inter-frequency SAN time-based conditional handover from FR1 to FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information | | Config 1 |  | SSC.1 | | NSC.1 | |
|  | | Config 2 |  | SSC.2 | | NSC.2 | |
| NR RF Channel Number | | Config 1, 2 |  | 1 | | 2 | |
| BWchannel | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| BWP BW | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| TACommon | | Config 1, 2 | s | 0 | | 0 | |
| TACommonDrift | | s | 0 | | 0 | |
| TACommonDriftVariation | | s | 0 | | 0 | |
| Koffset | | Config 1 | ms | 239 | | 239 | |
|  | | Config 2 | ms | 4 | | 4 | |
| Kmac | | Config 1, 2 | ms | 0 | | 0 | |
| DRX Cycle | | ms | Not Applicable | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | |
| OCNG Patterns | |  | OP.1 | | | |
| SMTC Configuration | |  | SMTC.2 | | SMTC.5 | |
| SSB Configuration | |  | SSB.1 FR1 | | SSB.5 FR1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | |
| BWP configuration | Initial DL BWP | Config 1, 2 |  | DLBWP.0.1 | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | |
| EPRE ratio of PSS to SSS | | Config 1, 2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1, 2 | dBm/ 15kHz | -98 | | | |
| Note2 | | dBm/ SCS | -98 | | | |
|  | | dB | 4 | 4 | -Infinity | 9 |
|  | | dB | 4 | 4 | -Infinity | 9 |
| SSB\_RP | | dBm/ SCS | -94 | -94 | -Infinity | -89 |
| IoNote3 | | dBm/ 9.36MHz | -64.59 | -64.59 | -70.05 | -60.53 |
| Propagation condition | | - | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.5.2 Test Parameters

The test scenario comprises of 1 NR FDD carrier and 2 cells as given in table A.14.2.1.5.2-1, and A.14.2.1.5.2-2. Both handover delay and interruption length are tested.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2. During T1, the UE is configured to measure intra-frequency neighbour cell. The RRC message implying distance-based handover to cell 2 with Event D1 shall be sent to UE, at a time earlier than TRRC (10ms) before the beginning of T2.

Starting T2, cell 2 becomes detectable and offset better than cell 1 and location condition event condEventD1-r17 is fulfilled.

Table A.14.2.1.5.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.5.2-2: General test parameters for Intra-frequency SAN distance-based conditional handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| RF Channel Number | |  | 1 | One NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 | FDD duplex mode cell |
|  | Neighbouring cell |  | Cell 2 | FDD duplex mode cell |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) at T1 start | |  | (0, 0, 0) | Set by any pre-configured means  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| UE moving speed | | km/h | (108, 0, 0) | Set by any pre-configured means |
| referenceLocation1-r17.condEventD1-r17 | | m | (-700, 0, 0) | Reference location for serving cell |
| referenceLocation2-r17.condEventD1-r17 | | m | (1300, 0, 0) | Reference location for target cell |
| distanceThreshFromReference1-r17.condEventD1-r17 | | 50m | 20 | D1-1 Location condition is fulfilled at T2 |
| distanceThreshFromReference2-r17.condEventD1-r17 | | 50m | 20 | D1-2 Location condition is fulfilled at T2 |
| hysteresis-r17.condEventD1-r17 | | 10m | 0 |  |
| timeToTrigger-r17.condEventD1-r17 | | s | 0 |  |
| A3-Offset in condition | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 12 |  |
| T2 | | s | ≤ 6 |  |

Table A.14.2.1.5.2-3: Cell specific test parameters for Intra-frequency SAN distance-based conditional handover from FR1 to FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information | | Config 1 |  | SSC.1 | | NSC.1 | |
|  | | Config 2 |  | SSC.2 | | NSC.2 | |
| NR RF Channel Number | | Config 1, 2 |  | 1 | | 1 | |
| BWchannel | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| BWP BW | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| TACommon | | Config 1, 2 | s | 0 | | 0 | |
| TACommonDrift | | s | 0 | | 0 | |
| TACommonDriftVariation | | s | 0 | | 0 | |
| Koffset | | Config 1 | ms | 239 | | 239 | |
|  | | Config 2 | ms | 4 | | 4 | |
| Kmac | | Config 1, 2 | ms | 0 | | 0 | |
| DRX Cycle | | ms | Not Applicable | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | |
| OCNG Patterns | |  | OP.1 | | | |
| SMTC Configuration | |  | SMTC.1 | | | |
| SSB Configuration | |  | SSB.1 FR1 | | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | |
| BWP configuration | Initial DL BWP | Config 1, 2 |  | DLBWP.0.1 | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | |
| EPRE ratio of PSS to SSS | | Config 1, 2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1, 2 | dBm/ 15kHz | -98 | | | |
| Note2 | | dBm/ SCS | -98 | | | |
|  | | dB | 8 | -3.3 | -Infinity | 2.36 |
|  | | dB | 8 | 8 | -Infinity | 11 |
| SSB\_RP | | dBm/ SCS | -90 | -90 | -Infinity | -87 |
| IoNote3 | | dBm/ 9.36MHz | -61.41 | -57.06 | -61.41 | -57.06 |
| Propagation condition | | - | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.6.2 Test Parameters

The test scenario comprises of 2 NR FDD carrier and one cell on each carrier as given in table A.14.2.1.6.2-1, and A.14.2.1.6.2-2. Both handover delay and interruption length are tested.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2. During T1, the UE is configured to measure inter-frequency neighbour cell and Gap pattern ID gp0. The RRC message implying distance-based handover to cell 2 with Event D1 shall be sent to UE, at a time earlier than TRRC (10ms) before the beginning of T2.

Starting T2, cell 2 becomes detectable and offset better than cell 1 and after 11670ms of T2, location condition event condEventD1-r17 is fulfilled.

Table A.14.2.1.6.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| 2 | NGSO, NR FDD, 15kHz SSB SCS, 10 MHz BW |
| Note: If UE supports both NGSO and GSO, the GSO-based test cases can be skipped if the UE passes NGSO-based test cases. | |

Table A.14.2.1.6.2-2: General test parameters for Inter -frequency SAN distance-based conditional handover from FR1 to FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| RF Channel Number | |  | 1, 2 | Two NR NTN satellite RF channel |
| Initial conditions | Active cell |  | Cell 1 | FDD duplex mode cell |
|  | Neighbouring cell |  | Cell 2 | FDD duplex mode cell |
| Final condition | Active cell |  | Cell 2 |  |
| UE position (L,B, H) at T1 start | |  | (0, 0, 0) | Set by any pre-configured means  (L,B,H) is Geodetic coordinate, where L is latitude, B is longitude, and H is height. |
| UE moving speed | | km/h | (108, 0, 0) | Set by any pre-configured means |
| referenceLocation1-r17.condEventD1-r17 | | m | (-700, 0, 0) | Reference location for serving cell |
| referenceLocation2-r17.condEventD1-r17 | | m | (1300, 0, 0) | Reference location for target cell |
| distanceThreshFromReference1-r17.condEventD1-r17 | | 50m | 20 | D1-1 Location condition is fulfilled at T2 |
| distanceThreshFromReference2-r17.condEventD1-r17 | | 50m | 20 | D1-2 Location condition is fulfilled at T2 |
| hysteresis-r17.condEventD1-r17 | | 10m | 0 |  |
| timeToTrigger-r17.condEventD1-r17 | | s | 0 |  |
| Gap Pattern Id | |  | 0 |  |
| Measurement gap offset | |  | 9 |  |
| A3-Offset in condition | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 1 |  |
| T2 | | s | 12 |  |

Table A.14.2.1.6.2-3: Cell specific test parameters for Inter-frequency SAN distance-based conditional handover from FR1 to FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Test configuration | Unit | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information | | Config 1 |  | SSC.1 | | NSC.1 | |
|  | | Config 2 |  | SSC.2 | | NSC.2 | |
| NR RF Channel Number | | Config 1, 2 |  | 1 | | 2 | |
| BWchannel | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| BWP BW | | MHz | 10: NRB,c = 52 | | 10: NRB,c = 52 | |
| TACommon | | Config 1, 2 | s | 0 | | 0 | |
| TACommonDrift | | s | 0 | | 0 | |
| TACommonDriftVariation | | s | 0 | | 0 | |
| Koffset | | Config 1 | ms | 239 | | 239 | |
|  | | Config 2 | ms | 4 | | 4 | |
| Kmac | | Config 1, 2 | ms | 0 | | 0 | |
| DRX Cycle | | ms | Not Applicable | | | |
| PDSCH Reference measurement channel | |  | SR.1.1 FDD | | | |
| CORESET Reference Channel | |  | CR.1.1 FDD | | | |
| TRS configuration | |  | TRS.1.1 FDD | | | |
| OCNG Patterns | |  | OP.1 | | | |
| SMTC Configuration | |  | SMTC.2 | | SMTC.5 | |
| SSB Configuration | |  | SSB.1 FR1 | | SSB.5 FR1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 15 kHz | | | |
| PUCCH/PUSCH subcarrier spacing | | kHz | 15 kHz | | | |
| PRACH configuration | |  | FR1 PRACH configuration 1 | | | |
| BWP configuration | Initial DL BWP | Config 1, 2 |  | DLBWP.0.1 | | | |
| Dedicated DL BWP |  | DLBWP.1.1 | | | |
| Initial UL BWP |  | ULBWP.0.1 | | | |
| Dedicated UL BWP |  | ULBWP.1.1 | | | |
| EPRE ratio of PSS to SSS | | Config 1, 2 | 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 | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |
| Note2 | | Config 1, 2 | dBm/ 15kHz | -98 | | | |
| Note2 | | dBm/ SCS | -98 | | | |
|  | | dB | 4 | 4 | -Infinity | 9 |
|  | | dB | 4 | 4 | -Infinity | 9 |
| SSB\_RP | | dBm/ SCS | -94 | -94 | -Infinity | -89 |
| IoNote3 | | dBm/ 9.36MHz | -64.59 | -64.59 | -70.05 | -60.53 |
| Propagation condition | | - | 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

<End of Change 1>