**T3GPP TSG-RAN WG4 Meeting#98-bis-e *R4-2105716***

**E-meeting, Apr 12th – Apr 20th, 2021**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **DraftCR** | **rev** | **1** | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Draft TC NR-U Handover test cases | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | RAN4 | | | | | | | | | |
| ***Source to TSG:*** | Nokia | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | New test cases for NR-U with CCA handover are being introduced. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | New test cases for NR-U with CCA handover are being introduced:  A.11.2.1.6 Inter-frequency handover from FR1 carrier under CCA to FR1; known target cell  A.11.2.1.7 Inter-frequency handover from FR1 carrier under CCA to FR1; unknown target cell  A.12.2.1.1 E-UTRAN - NR with CCA handover  Changes compared to the first version are highlighted. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The listed test cases that were agreed to be introduced for NR-U will not be in the spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Revision of R4-2106576 | | | | | | | | |

<< Unchanged sections omitted>>

#### A.11.2.1.6 Inter-frequency handover from FR1 carrier under CCA to FR1; known target cell

##### A.11.2.1.6.1 Test Purpose and Environment

This test is to verify the requirement for the NR with CCA FR1-NR FR1 handover requirements specified in clause 6.1.1.2.

##### A.11.2.1.6.2 Test Parameters

Supported test configurations are shown in table A.11.2.1.6.2-1. Both handover delay and interruption length are tested by using the parameters in table A.11.2.1.6.2-2, and A.11.2.1.6.2-3.

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.

NR with CCA shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.11.2.1.6.2-1: Handover from NR with CCA FR1 to NR FR1 test configuration

|  |  |
| --- | --- |
| Config | Description |
| 1 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.11.2.1.6.2-2: General test parameters handover from NR with CCA FR1 to NR FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial conditions | Active cell |  | Cell 1 | NR cell with CCA |
|  | Neighbouring cell |  | Cell 2 | NR cell |
| Final condition | Active cell |  | Cell 2 |  |
| DL CCA model | |  | As specified in clause A.3.20.2.1 |  |
| UL CCA model | |  | As specified in clause A.3.20.2.2 |  |
| 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.11.2.1.6.2-3: Cell specific test parameters for NR with CCA FR1 – NR FR1 handover test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | | Unit | Test | Cell 1 | | | Cell 2 | | |
|  | | | |  | configuration | T1 | T2 | T3 | T1 | T2 | T3 |
| NR RF Channel Number | | | |  | 1,2,3 | 1 | | | 2 | | |
| Duplex mode | | | |  | 1 | TDD | | | FDD | | |
|  | | | |  | 2 | TDD | | | TDD | | |
|  | | | |  | 3 | TDD | | | TDD | | |
| TDD configuration | | | |  | 1 | TDDConf.1.1 CCA | | | Not Applicable | | |
|  | | | |  | 2 | TDDConf.1.1 CCA | | | TDDConf.1.1 | | |
|  | | | |  | 3 | TDDConf.1.1 CCA | | | TDDConf.2.1 | | |
| BWchannel | | | | MHz | 1 | 40: NRB,c = 106 | | | 10: NRB,c = 52 | | |
|  | | | |  | 2 | 40: NRB,c = 106 | | | 10: NRB,c = 52 | | |
|  | | | |  | 3 | 40: NRB,c = 106 | | | 40: NRB,c = 106 | | |
| BWP BW | | | | MHz | 1 | 40: NRB,c = 106 | | | 10: NRB,c = 52 | | |
|  | | | |  | 2 | 40: NRB,c = 106 | | | 10: NRB,c = 52 | | |
|  | | | |  | 3 | 40: NRB,c = 106 | | | 40: NRB,c = 106 | | |
| DRX Cycle | | | | ms | 1,2,3 | Not Applicable | | | | | |
| PDSCH Reference measurement channel | | | |  | 1 | SR.1.1 CCA | | | SR.1.1 FDD | | |
|  | | | |  | 2 | SR.1.1 CCA | | | SR.1.1 TDD | | |
|  | | | |  | 3 | SR.1.1 CCA | | | SR2.1 TDD | | |
| CORESET Reference Channel | | | |  | 1 | CR2.1 TDD | | | CR.1.1 FDD | | |
|  | | | |  | 2 | CR2.1 TDD | | | CR.1.1 TDD | | |
|  | | | |  | 3 | CR2.1 TDD | | | CR2.1 TDD | | |
| TRS configuration | | | |  | 1 | TRS.1.2 TDD | | | TRS.1.1 FDD | | |
|  | | | |  | 2 | TRS.1.2 TDD | | | TRS.1.1 TDD | | |
|  | | | |  | 3 | TRS.1.2 TDD | | | TRS.1.2 TDD | | |
| OCNG Patterns | | | |  |  | OP.1 | | | | | |
| SMTC Configuration | | | |  |  | SMTC.1 | | | | | |
| SSB Configuration | | Semi-static channel access | |  | 1,2 | SSB.1 CCA  (As defined in A.3.10A ) | | | SSB.1 FR1 | | |
| Dynamic channel access | |  |  | SSB.2 CCA  (As defined in A.3.10A ) | | |  | | |
|  | | Semi-static channel access | |  | 3 | SSB.1 CCA  (As defined in A.3.10A ) | | | SSB.2 FR1 | | |
|  | | Dynamic channel access | |  |  | SSB.2 CCA  (As defined in A.3.10A ) | | |  | | |
| DBT window configuration | | | |  |  | As defined in A.3.21.1 | | | Not applicable | | |
| PDSCH/PDCCH subcarrier spacing | | | | kHz | 1,2 | 30 kHz | | | 15 kHz | | |
|  | | | |  | 3 | 30 kHz | | | 30 kHz | | |
| PUCCH/PUSCH subcarrier spacing | | | | kHz | 1,2 | 30 kHz | | | 15 kHz | | |
|  | | | |  | 3 | 30 kHz | | | 30 kHz | | |
| PRACH configuration | | | |  |  | TBD | | | FR1 PRACH configuration 1 | | |
| BWP configuration | | Initial DL BWP | |  | 1,2,3 | DLBWP.0.1 | | | | | |
|  | | Dedicated DL BWP | |  | 1,2,3 | DLBWP.1.1 | | | | | |
|  | | Initial UL BWP | |  | 1,2,3 | ULBWP.0.1 | | | | | |
|  | | Dedicated UL BWP | |  | 1,2,3 | ULBWP.1.1 | | | | | |
| EPRE ratio of PSS to SSS | | | | dB | 1,2,3 | 0 | | | | | |
| EPRE ratio of PBCH DMRS to SSS | | | | 1,2,3 |
| EPRE ratio of PBCH to PBCH DMRS | | | | 1,2,3 |
| EPRE ratio of PDCCH DMRS to SSS | | | | 1,2,3 |
| EPRE ratio of PDCCH to PDCCH DMRS | | | | 1,2,3 |
| EPRE ratio of PDSCH DMRS to SSS | | | | 1,2,3 |
| EPRE ratio of PDSCH to PDSCH | | | | 1,2,3 |
| EPRE ratio of OCNG DMRS to SSSNote1 | | | | 1,2,3 |
| EPRE ratio of OCNG to OCNG DMRSNote1 | | | | 1,2,3 |
| Note2 | | | | dBm/SCS | 1,2 | [-101] | | | -98 | | |
|  | | | |  | 3 | [-101] | | | -95 | | |
|  | | | | dB | 1,2,3 | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 |
|  | | | | dB | 1,2,3 | 8 | 8 | 8 | -Infinity | 11 | 11 |
| SSB\_RP | Config 1 | | | dBm/SCS | 1,2,3 | -90 | -90 | -90 | -Infinity | -87 | -87 |
| IoNote3 | Config 1 | | | dBm/  9.36MHz | 1,2,3 | -61.41 | -57.06 | -57.06 | -61.41 | -57.06 | -57.06 |
| Propagation condition | | | | - | 1,2,3 | 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.11.2.1.6.3 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 112 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 10 ms and is specified in clause 12 in TS 38.331 [2].

Tinterrupt = 102 ms in the test. Tinterrupt is defined in clause 6.1.1.2.2.

This gives a total of 112 ms.

#### A.11.2.1.7 Inter-frequency handover from FR1 carrier under CCA to FR1; unknown target cell

##### A.11.2.1.7.1 Test Purpose and Environment

This test is to verify the requirement for the NR with CCA FR1-NR FR1 handover requirements specified in clause 6.1.1.2.

##### A.11.2.1.7.2 Test Parameters

Supported test configurations are shown in table A.11.2.1.7.2-1. Both handover delay and interruption length are tested by using the parameters in table A.11.2.1.7.2-2, and A.12.2.1.7.2-3.

The test scenario comprises of two carriers and one cell on each carrier. Cell 1 is the NR with CCA cell and Cell 2 is an NR neighbour cell. No gap patterns are configured in the test case. 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 does not have any timing information of cell 2.

Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.11.2.1.7.2-1: Handover from NR with CCA FR1 to NR FR1 test configuration

|  |  |
| --- | --- |
| Config | Description |
| 1 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | Source cell: NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode  Target cell: NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.11.2.1.7.2-2: General test parameters handover from NR with CCA FR1 to NR FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial conditions | Active cell |  | Cell 1 | NR cell with CCA |
|  | Neighbouring cell |  | Cell 2 | NR cell |
| Final condition | Active cell |  | Cell 2 |  |
| DL CCA model | |  | As specified in clause A.3.20.2.1 |  |
| UL CCA model | |  | As specified in clause A.3.20.2.2 |  |
| 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 |  |

Table A.11.2.1.7.2-3: Cell specific test parameters for NR with CCA FR1 – NR FR1 handover test case

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 1 | | Cell 2 | |
|  |  |  | T1 | T2 | T1 | T2 |
| NR RF Channel Number |  | 1, 2, 3 | 1 | | 2 | |
| Duplex mode |  | 1 | TDD | | FDD | |
|  | 2 | TDD | | TDD | |
|  | 3 | TDD | | TDD | |
| CCA model |  | 1, 2, 3 | TBD | | N/A | |
| TDD configuration |  | 1 | TDDConf.1.1 CCA | | Not Applicable | |
|  | 2 | TDDConf.1.1 CCA | | TDDConf.1.1 | |
|  | 3 | TDDConf.1.1 CCA | | TDDConf.2.1 | |
| BWchannel | MHz | 1 | 40: NRB,c = 106 | | 10: NRB,c = 52 | |
| 2 | 40: NRB,c = 106 | | 10: NRB,c = 52 | |
| 3 | 40: NRB,c = 106 | | 40: NRB,c = 106 | |
| BWP BW | MHz | 1 | 40: NRB,c = 106 | | 10: NRB,c = 52 | |
| 2 | 40: NRB,c = 106 | | 10: NRB,c = 52 | |
| 3 | 40: NRB,c = 106 | | 40: NRB,c = 106 | |
| DRX Cycle | ms |  | Not Applicable | | | |
| PDSCH Reference measurement channel |  | 1 | SR.1.1 CCA | | SR.1.1 FDD | |
|  | 2 | SR.1.1 CCA | | SR.1.1 TDD | |
|  | 3 | SR.1.1 CCA | | SR2.1 TDD | |
| CORESET Reference Channel |  | 1 | CR2.1 TDD | | CR.1.1 FDD | |
|  | 2 | CR2.1 TDD | | CR.1.1 TDD | |
|  | 3 | CR2.1 TDD | | CR2.1 TDD | |
| TRS configuration |  | 1 | TRS.1.2 TDD | | TRS.1.1 FDD | |
|  | 2 | TRS.1.2 TDD | | TRS.1.1 TDD | |
|  | 3 | TRS.1.2 TDD | | TRS.1.2 TDD | |
| OCNG Patterns |  | 1, 2, 3 | OP.1 | | | |
| SMTC Configuration |  | 1, 2, 3 | SMTC.1 | | | |
| DBT window configuration |  | 1, 2, 3 | As defined in A.3.21.1 | | N/A | |
| SSB configuration | Semi-static channel access | 1,2 | SSB.1 CCA  (As defined in A.3.10A ) | | SSB.1 FR1 | |
| Dynamic channel access |  | SSB.2 CCA  (As defined in A.3.10A ) | |
| Semi-static channel access | 3 | SSB.1 CCA  (As defined in A.3.10A ) | | SSB.2 FR1 | |
| Dynamic channel access |  | SSB.2 CCA  (As defined in A.3.10A ) | |
| ssb-PositionQCL |  |  | [1] | | N/A | |
| PDSCH/PDCCH subcarrier spacing | kHz | 1 | 30 kHz | | 15 kHz | |
| 2 | 30 kHz | | 15 kHz | |
| 3 | 30 kHz | | 30 kHz | |
| PUCCH/PUSCH subcarrier spacing | kHz | 1 | 30 kHz | | 15 kHz | |
| 2 | 30 kHz | | 15 kHz | |
| 3 | 30 kHz | | 30 kHz | |
| PRACH configuration |  | 1,2,3 | FR1 PRACH configuration 1 | | | |
| BWP configuration | Initial DL BWP | 1,2,3 | DLBWP.0.1 | | | |
| Dedicated DL BWP | 1,2,3 | DLBWP.1.1 | | | |
| Initial UL BWP | 1,2,3 | ULBWP.0.1 | | | |
| Dedicated UL BWP | 1,2,3 | ULBWP.1.1 | | | |
| EPRE ratio of PSS to SSS | dB | 1,2,3 | 0 | | | |
| EPRE ratio of PBCH DMRS to SSS | 1,2,3 |
| EPRE ratio of PBCH to PBCH DMRS | 1,2,3 |
| EPRE ratio of PDCCH DMRS to SSS | 1,2,3 |
| EPRE ratio of PDCCH to PDCCH DMRS | 1,2,3 |
| EPRE ratio of PDSCH DMRS to SSS | 1,2,3 |
| EPRE ratio of PDSCH to PDSCH | 1,2,3 |
| EPRE ratio of OCNG DMRS to SSSNote1 | 1,2,3 |
| EPRE ratio of OCNG to OCNG DMRSNote1 | 1,2,3 |
| Note2 | dBm/SCS | 1,2,3 | [-101] | | -98 | |
|  | [-101] | | -95 | |
|  | dB | 1,2,3 | -Infinity | 5 | 4 | 4 |
|  | dB | 1,2,3 | -Infinity | 5 | 4 | 4 |
| SSB\_RP | dBm/SCS | 1,2,3 | -Infinity | -93 | -94 | -94 |
|  | -Infinity | -90 | -91 | -91 |
| IoNote3 | dBm/  9.36MHz | 1,2,3 | -70.05 | -63.85 | -64.59 | -64.59 |
|  | dBm/  38.16MHz | 1,2,3 | -63.94 | -57.75 | -58.49 | -58.49 |
| Propagation condition | - | 1,2,3 | 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.11.2.1.7.3 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 132 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 10 ms and is specified in clause 12 in TS 38.331 [2].

Tinterrupt = 122 ms in the test. Tinterrupt is defined in clause 6.1.1.2.2.

This gives a total of 132 ms.

<< Unchanged sections omitted>>

## A.12.2 RRC\_CONNECTED state mobility

### A.12.2.1 Handover

#### A.12.2.1.1 E-UTRAN - NR with CCA handover

##### A.12.2.1.1.1 Test Purpose and Environment

This test shall verify the E-UTRAN to NR FR1 handover requirements specified in clause 5.3.4A in TS 36.133 [15].

The test comprises of one E-UTRA carrier and one NR carrier with CCA. There are two cells and one cell on each carrier. Cell 1 is the E-UTRAN cell and Cell 2 is an inter-RAT NR neighbour cell with CCA.

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 does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 of TS 36.133 [15] is configured before T2 begins to enable inter-RAT frequency monitoring. A RRC message implying handover shall be sent to the UE during period T2 after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain Cell 2 as the target cell.

Supported test configurations are shown in table A.12.2.1.1-1. General test parameters are provided in Table A.12.2.1.1-2. Cell specific test parameters for Cell 1 and Cell 2 are provided in Tables A.12.2.1.1-3 and A.12.2.1.1-4 respectively.

Table A.12.2.1.1-1: Supported test configurations for E-UTRAN inter-RAT NR handover

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | LTE FDD, NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.12.2.1.1-2: General test parameters for E-UTRAN inter-RAT NR handover

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| NR RF Channel Number | |  | 1 | 1 NR carrier frequency with CCA is used in the test |
| LTE RF Channel Number | |  | 2 | 1 E-UTRAN carrier frequency is used in the test |
| Initial conditions | Active cell |  | Cell 1 | E-UTRAN cell |
| Neighbouring cell |  | Cell 2 | NR cell with CCA |
| Final condition | Active cell |  | Cell 2 |  |
| DL CCA model | |  | As specified in clause A.3.20.2.1 |  |
| UL CCA model | |  | As specified in clause A.3.20.2.2 |  |
| NR measurement quantity | |  | SS-RSRP |  |
| E-UTRAN measurement quantity | |  | RSRP |  |
| b2-Threshold1 | | dBm | -84 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2NR | | dBm | As specified in Table A.12.2.1.1-4 | Absolute NR SS-RSRP threshold for event B2 |
| Hysteresis | | dB | 0 |  |
| TimeToTrigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  | OFF | Non-DRX test |
| Access Barring Information | | - | Not sent | No additional delays in random access procedure |
| Time offset between cells | |  | 3 ms | Asynchronous cells |
| Gap pattern configuration Id | |  | 0 | As specified in Table 8.1.2.1-1 started before T2 starts [15] |
| T1 | | s | [5] |  |
| T2 | | s | [£5] |  |
| T3 | | s | [1] |  |

Table A.12.2.1.1-3: Cell specific test parameters for E-UTRAN inter-RAT NR handover with CCA (Cell 1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 1 | | |
| T1 | T2 | T3 |
| RF channel number |  | 1, 2 | 2 | | |
| Duplex mode |  | 1 | FDD | | |
|  |  | 2 | TDD | | |
| TDD special subframe configurationNote1 |  | 1, 2 | 6 | | |
| TDD uplink-downlink configurationNote1 |  | 1, 2 | 1 | | |
| BWchannel | MHz | 1, 2 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | | |
| PRACH ConfigurationNote2 |  | 1 | 4 | | |
| 2 | 53 | | |
| PDSCH parameters:  DL Reference Measurement ChannelNote3 |  | 1 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | | |
| 2 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote3 |  | 1 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | | |
| 2 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | | |
| OCNG PatternsNote3 |  | 1 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | | |
| 2 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | | |
| PBCH\_RA | dB | 1, 2 | 0 | | |
| PBCH\_RB |
| PSS\_RA |
| SSS\_RA |
| PCFICH\_RB |
| PHICH\_RA |
| PHICH\_RB |
| PDCCH\_RA |
| PDCCH\_RB |
| PDSCH\_RA |
| PDSCH\_RB |
| OCNG\_RANote4 |
| OCNG\_RBNote4 |
| NocNote5 | dBm/15kHz | 1, 2 | -98 | | |
| Ês/Noc | dB | 1, 2 | 7 | 7 | 7 |
| Ês/IotNote6 | dB | 1, 2 | 7 | 7 | 7 |
| RSRPNote6 | dBm/15kHz | 1, 2 | -91 | -91 | -91 |
| SCH\_RPNote6 | dBm/15kHz | 1, 2 | -91 | -91 | -91 |
| IoNote6 | dBm/9MHz | 1, 2 | -62.43 | -62.43 | -62.43 |
| Propagation Condition |  | 1, 2 | AWGN | | |
| Antenna Configuration and Correlation Matrix Note7 |  | 1, 2 | 1x2 Low | | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  Note 2: PRACH configurations are specified in table 5.7.1-2 and table 5.7.1-3 in TS 36.211 [23].  Note 3: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [15] respectively.  Note 4: 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 5: 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.  Note 6: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 7: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [25]. | | | | | |

Table A.12.2.1.1-4: Cell specific test parameters E-UTRAN inter-RAT NR with CCA handover (Cell 2)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Configuration | Cell 2 | | |
|  | T1 | T2 | T3 |
| RF channel number | | |  | 1, 2 | 1 | | |
| DL CCA probability PCCA\_DL | | |  |  | TBD | | |
| UL CCA probability PCCA\_UL | | |  |  | TBD | | |
| Duplex mode | | |  | 1, 2 | TDD | | |
| TDD Configuration | | |  | 1, 2 | TDDConf.1.1 CCA | | |
| BWchannel | | | MHz | 1, 2 | 40: NRB,c = 106 (TDD) | | |
| PDSCH reference measurement channel | | |  | 1, 2 | SR.1.1 CCA | | |
| CORESET reference channel | | |  | 1, 2 | CR.1.1 CCA | | |
| PRACH configuration | | |  | 1, 2 | TBD | | |
| OCNG patternNote1 | | |  | 1, 2 | OP.1 | | |
| BWP | Initial DL BWP | |  | 1, 2 | DLBWP.0.1 | | |
| Dedicated DL BWP | | DLBWP.1.1 | | |
| Initial UL BWP | | ULBWP.0.1 | | |
| Dedicated UL BWP | | ULBWP.1.1 | | |
| SMTC configuration | | |  | 1, 2 | SMTC.1 | | |
| SSB configuration | | Semi-static channel access |  | 1, 2 | SSB.1 CCA | | |
|  | | Dynamic channel access |  | 1, 2 | SSB.2 CCA | | |
| DBT window configuration | | |  |  | As defined in A.3.21.1 | | |
| b2-Threshold2NR | | | dBm | 1 | -105 | | |
| 2 | -103 | | |
| EPRE ratio of PSS to SSS | | | dB | 1, 2 | 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 SSS | | |
| EPRE ratio of OCNG to OCNG DMRS | | |
| *Noc*Note2 | | | dBm/15 KHz | 1, 2 | [-104] | | |
| *Noc*Note2 | | | dBm/SCS | 1, 2 | [-101] | | |
| Ês/Noc | | | dB | 1, 2 | -inifinit | 0 | 0 |
| Ês/IotNote3 | | | dB | 1, 2 | -inifinit | 0 | 0 |
| SS-RSRPNote3 | | | dBm/SCS | 1, 2 | -inifinit | -95 | -95 |
| IoNote3 | | | dBm/38.16 MHz | 1, 2 | -63.96 | -60.94 | -60.94 |
| Propagation condition | | |  | 1, 2 | AWGN | | |
| Antenna Configuration and Correlation Matrix | | |  | 1, 2 | 1x2 Low | | |
| 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 *Noc* to be fulfilled.  Note 3: Ês/Iot, SS-RSRP, and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.12.2.1.1.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than TBD ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 50 ms and is specified in TS36.331.

Tinterrupt = 62 + ( L1´ + L3) \* SMTC periodicity ms in the test; Tinterrupt is defined in TS36.133 clause 5.3.4A.3.

L1´ is the number of SMTC occasions not available at the UE during the inter-RAT detection period.

[L3 is the number of consecutive SSB to PRACH occasion association periods during which no PRACH occasion is available for PRACH transmission due to UL CCA failure. L3 = 0 for Type 2C UL channel access procedure as defined in TS 37.213 [57].]

This gives a total of 112 ms + L1´ + L3.

<< Unchanged sections omitted>>