3GPP TSG-RAN WG4 Meeting # 104-e R4-2214733

Electronic Meeting, Aug. 15 – Aug. 26, 2022

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **-** | **rev** | **1** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** | TC for NR SA to EN-DC Handover with PSCell using CCA with known target PSCell | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_RRM\_enh2- Perf | | | | |  | ***Date:*** | | | 2022-08-26 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TC for HO with PSCell when PSCell is in CCA shall be introdcued to test the core requirements of the feature. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce the test case for Handover with PSCell when PSCell is in CCA from NR SA to EN-DC with known target PSCell. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The test case for HO with PSCell will be missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.11.2.1.xn | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | R4-2213953 | | | | | | | | |

### <Start of Change 1>

A.11.2.1.xn Handover with PSCell from NR SA to EN-DC with known target PSCell using CCA

A.11.2.1.xn.1 Test Purpose and Environment

The purpose of this set of tests is to verify that the UE can make correct SA inter-RAT handover from NR to E-UTRAN with FR1 PSCell addition when operating in standalone (SA) operation with PCell in FR1, for the case where the PSCell is known to the UE at the time of addition and SMTC of target known PSCell is not present in *RRCConnectionReconfiguration*. This test shall verify delay requirements of inter-RAT handover from NR to E-UTRAN and FR1 PSCell carrier with CCA addition as specified in clause 6.1.5.

The test comprises of two NR cells and one E-UTRA cell. Cell 1 is the NR PCell, Cell 2 is an inter-RAT E-UTRAN neighbour cell and Cell 3 is the target NR PSCell, which is on CCA, on radio channel 1 in FR1, radio channel 2 in E-UTRAN and radio channel 3 in FR1 with CCA, respectively.

In this test, inter-RAT handover from NR to E-UTRAN and FR1 PSCell addition are performed in parallel processing. The test consists of successive time periods for inter-RAT handover with time durations of T1, T2 and T3 respectively, and successive time periods for FR1 PSCell addition with time durations of T1’, T2’, T3’and T4’ respectively.

At the start of time duration T1, the UE does not have any timing information of Cell 2, and the UE is only monitoring Cell 1. During T1, only Cell1 is known to the UE.

Before the start of T2 or T2’, the test system shall send measurement control information including measurement gap configuration and event-triggered reporting configuration with event B2 for neighbour Cell 2 and event B1 for Cell 3. Gap pattern configuration with id #0 as specified in Table 9.1.2-1 is configured before T2 or T2’ begins.

Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. 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.

During T3, the UE shall carry out random access (i.e., transmit the PRACH) towards the Cell 2. Reception by the test system of the PRACH preamble defines the end of T3.

Starting T2’, the Cell 3 (PSCell-to-be) on radio channel 3 becomes known to the UE at the time of addition. Therefore, during T2’ the UE shall report Event B1. After receiving the Event B1, the test system shall send a RRC message to the UE to release the measurement gaps. The test system shall send a RRC message to the UE to add PSCell (Cell 3) on radio channel 3. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2’, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell 3) is received at the UE antenna connector defines the start of period T3’.

During T3’, the UE shall carry out random access (i.e., transmit the PRACH) towards the Cell 3. Reception by the test system of the PRACH preamble defines the start of period T4’.

During T4’, the UE shall send periodic CSI reports in PSCell and the test system shall observe the periodic reporting of CSI for PSCell.

Supported test configurations are shown in table A.11.2.1.xn.1-1. General test parameters are provided in Table A.11.2.1.xn.1-2. Cell specific test parameters for NR Cell 1, E-UTRAN PCell Cell 2 are provided in Tables A.11.2.1.xn.1-3, A.11.2.1.xn.1-4 and A.11.2.1.xn-5 respectively. Table A.11.2.1.xn.1-5 provides General test parameters for NR FR1 PSCell carrier with CCA addition, and Table A.11.2.1.xn.1-6 provides Cell specific test parameters for PSCell addition of FR1 carrier under CCA.

**Table A.11.2.1.xn.1-1: Supported test configurations for SA inter-RAT E-UTRAN handover with FR1 PSCell addition tests**

|  |  |  |
| --- | --- | --- |
| Config | Description | |
|  | NR PCell and EUTRA PCell | NR PSCell on CCA |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD, LTE FDD, | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD, LTE FDD |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD, LTE FDD |
| 4 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD, LTE TDD |
| 5 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD, LTE TDD |
| 6 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD, LTE TDD |
| Note: The UE is only required to be tested in one of the supported test configurations depending on the UE capability | | |

**Table A.11.2.1.xn.1-2: General test parameters for SA inter-RAT E-UTRAN handover with FR1 PSCell addition**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | | **Unit** | **Value** | **Comment** |
| NR RF Channel Number | | |  | 1, 3 | 2 NR carrier frequency 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 | NR cell |
|  | Neighbouring cell | |  | Cell 2, 3 | E-UTRAN cell and NR cell in FR1 |
| Final condition | Active Pcell | |  | Cell 2 | E-UTRAN cell |
| Active PSCell | |  | Cell 3 | NR cell in FR1 |
| NR measurement quantity | | |  | SS-RSRP |  |
| E-UTRAN measurement quantity | | |  | RSRP |  |
| Event B1 | | Hysteresis | dB | 0 | Hysteresis for evaluation of event B1. |
| Threshold RSRP | dBm | -93 | Actual RSRP threshold for event B1. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin. |
| Time to Trigger | S | 0 |  |
| Event B2 | | Threshold1 | dBm | As specified in Table A.6.3.1.4-3 | Absolute NR SS-RSRP threshold for event B2 |
| Threshold2EUTRAN | dBm | -98 | Absolute E-UTRAN 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 cell 1 and cell 2 | | |  | 3 ms | Asynchronous cells |
| Measurement Gap pattern ID | | |  | 0 | As specified in Table 9.1.2-1 |
| T1/T1’ | | | s | 1 | During this time only Cell 1 is known to UE. |
| T2 | | | s | ≤5 | During this time the UE shall identify Cell 2 and report event B2. |
| T3 | | | s | 1 | During this time the UE handovers to Cell 2. |
| T2’ | | | s | ≤ 5 | During this time the UE shall identify Cell 3 and report event B1. |
| T3’ | | | s | ≥ Tinterrupt | During this time the UE adds the PSCell (Cell 3). |
| T4’ | | | s | ≤ 1 | During this time the UE sends CSI reports for PSCell (Cell 3). |

**Table A.11.2.1.xn.1-3: Cell specific test parameters for SA inter-RAT E-UTRA handover with FR1 PSCell addition (NR Cell 1)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Configuration** | **Cell 1** | | |
|  | |  |  | **T1** | **T2** | **T3** |
| RF channel number | |  | 1, 2, 3, 4, 5, 6 | 1 | | |
| Duplex mode | |  | 1, 4 | FDD | | |
|  | |  | 2, 3, 5, 6 | TDD | | |
| TDD Configuration | |  | 2, 5 | TDDConf.1.1 | | |
|  | |  | 3, 6 | TDDConf.2.1 | | |
| BWchannel | | MHz | 1, 4 | 10: NRB,c = 52 (FDD) | | |
|  | |  | 2, 5 | 10: NRB,c = 52 (TDD) | | |
|  | |  | 3, 6 | 40: NRB,c = 106 (TDD) | | |
| PDSCH reference measurement channel | |  | 1, 4 | SR.1.1 FDD | | |
|  | |  | 2, 5 | SR.1.1 TDD | | |
|  | |  | 3, 6 | SR.2.1 TDD | | |
| CORSET reference channel | |  | 1, 4 | CR.1.1 FDD | | |
|  | |  | 2, 5 | CR.1.1 TDD | | |
|  | |  | 3, 6 | CR.2.1 TDD | | |
| TRS configuration | |  | 1, 4 | TRS.1.1 FDD | | |
|  | |  | 2, 5 | TRS.1.1 TDD | | |
|  | |  | 3, 6 | TRS.1.2 TDD | | |
| OCNG patternNote1 | |  | 1, 2, 3, 4, 5, 6 | OP.1 | | |
| BWP | Initial DL BWP |  | 1, 2, 3, 4, 5, 6 | 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, 3, 4, 5, 6 | SMTC.1 | | |
| SSB configuration | |  | 1, 2, 4, 5 | SSB.1 FR1 | | |
|  | |  | 3, 6 | SSB.2 FR1 | | |
| b2-Threshold1 | | dBm | 1, 2, 4, 5 | -96 | | |
|  | |  | 3, 6 | -93 | | |
| EPRE ratio of PSS to SSS | | dB | 1, 2, 3, 4, 5, 6 | 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, 3, 4, 5, 6 | -100 | -104 | -100 |
| *Noc*Note2 | | dBm/SCS | 1, 2, 4, 5 | -100 | -104 | -100 |
|  | |  | 3, 6 | -97 | -101 | -97 |
| Ês/Noc | | dB | 1, 2, 3, 4, 5, 6 | 12 | 0 | -4 |
| Ês/IotNote3 | | dB | 1, 2, 3, 4, 5, 6 | 12 | 0 | -4 |
| SS-RSRPNote3 | | dBm/SCS | 1, 2, 4, 5 | -88 | -104 | -104 |
|  | |  | 3, 6 | -85 | -101 | -101 |
| IoNote3 | | dBm/9.36 MHz | 1, 2, 4, 5 | -59.78 | -73.04 | -70.59 |
|  | | dBm/38.16 MHz | 3, 6 | -53.68 | -66.9448 | -64.49 |
| Propagation condition | |  | 1, 2, 3, 4, 5, 6 | AWGN | | |
| Antenna Configuration and Correlation Matrix | |  | 1, 2, 3, 4, 5, 6 | 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. | | | | | | |

**Table A.11.2.1.xn.1-4: Cell specific test parameters for SA inter-RAT E-UTRA handover with FR1 PSCell addition (E-UTRA Cell 2)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Configuration** | **Cell 2** | | |
|  |  |  | **T1** | **T2** | **T3** |
| RF channel number |  | 1, 2, 3, 4, 5, 6 | 2 | | |
| Duplex mode |  | 1, 2, 3 | FDD | | |
| 4, 5, 6 | TDD | | |
| TDD special subframe configurationNote1 |  | 4, 5, 6 | 6 | | |
| TDD uplink-downlink configurationNote1 |  | 4, 5, 6 | 1 | | |
| BWchannel | MHz | 1, 2, 3, 4, 5, 6 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | | |
| PRACH ConfigurationNote2 |  | 1, 2, 3 | 4 | | |
|  |  | 4, 5, 6 | 53 | | |
| PDSCH parameters:  DL Reference Measurement ChannelNote3 |  | 1, 2, 3 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | | |
|  |  | 4, 5, 6 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote3 |  | 1, 2, 3 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | | |
|  |  | 4, 5, 6 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | | |
| OCNG PatternsNote3 |  | 1, 2, 3 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | | |
|  |  | 4, 5, 6 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | | |
| PBCH\_RA | dB | 1, 2, 3, 4, 5, 6 | 0 | | |
| PBCH\_RB |  |  |  | | |
| PSS\_RA |  |  |  | | |
| SSS\_RA |  |  |  | | |
| PCFICH\_RB |  |  |  | | |
| PHICH\_RA |  |  |  | | |
| PHICH\_RB |  |  |  | | |
| PDCCH\_RA |  |  |  | | |
| PDCCH\_RB |  |  |  | | |
| PDSCH\_RA |  |  |  | | |
| PDSCH\_RB |  |  |  | | |
| OCNG\_RANote4 |  |  |  | | |
| OCNG\_RBNote4 |  |  |  | | |
| NocNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -98 | | |
| Ês/Noc | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 8 | 78 |
| Ês/IotNote6 | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 78 | 78 |
| RSRPNote6 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -90 | -90 |
| SCH\_RPNote6 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -90 | -90 |
| IoNote6 | dBm/9MHz | 1, 2, 3, 4, 5, 6 | -67.21  +10log(NRB,c/100) | -58.57  +10log(NRB,c/100) | -58.57  +10log(NRB,c/100) |
| Propagation Condition |  | 1, 2, 3, 4, 5, 6 | AWGN | | |
| Antenna Configuration and Correlation Matrix Note7 |  | 1, 2, 3, 4, 5, 6 | 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.11.2.1.xn.1-5: General test parameters for NR FR1 PSCell carrier with CCA addition

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Neighbouring cell |  | Cell 3 | On the carrier under CCA |
| Final condition | Active cell |  | Cell 3 | On the carrier under CCA |
| DL CCA model | Dynamic channel accessNote 1, 3 |  | As specified in clause A.3.20.2.1 |  |
| Semi-static channel access Note 2, 3 |
| UL CCA model | Dynamic channel access Note 1, 3 |  | As specified in clause A.3.20.2.2 |  |
| Semi-static channel access Note 2,3 |
| 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 |
| T304 | | ms | 500 |  |
| LCCA\_DL | |  | 5 |  |
| WCCA\_DL | | ms | T304 |  |
| LCCA\_UL | |  | 5 |  |
| WCCA\_UL | | ms | T304 |  |
| T1’ | | s | 5 |  |
| T2’ | | s | ≤ 5 |  |
| T3’ | | s | ≥ Tinterrupt | Tinterrupt is defined in clause 6.1B.1.2 |
| T4’ | | s | ≤ 1 |  |
| NOTE 1: For a UE supporting dynamic channel access and network configuring dynamic channel occupancy.  NOTE 2: For a UE supporting semi-static channel access and network configuring semi-static channel occupancy.  NOTE 3: For a UE supporting both semi-static and dynamic channel access, the UE can be tested under dynamic channel occupancy only. | | | | |

Table A.11.2.1.xn.1-6: Cell specific test parameters for PSCell addition of FR1 carrier under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Cell 3 | | | |
|  | | |  | T1’ | T2’ | T3’ | T4’ |
| NR RF Channel Number | | |  | 1 | | | |
| PCCA\_DL for dynamic channel access Note 4,6 | | | - | PCCA\_DL\_1=0.75  PCCA\_DL\_2=0.75 | | | |
| PCCA\_DL for semi-static channel access Note 5,6 | | | - | PCCA\_DL=0.9375 | | | |
| PCCA\_UL for dynamic channel access Note 4,6 | | | - | 0.75 | | | |
| PCCA\_UL for semi-static channel access Note 5,6 | | | - | 0.87 | | | |
| TDD configuration | | Config 1, 2, 3, 4, 5, 6 |  | TDDConf.1.1 CCA | | | |
| BWchannel | | Config 1, 2, 3, 4, 5, 6 |  | 40: NRB,c = 106 | | | |
| BWP BW | | Config 1, 2, 3, 4, 5, 6 |  | 40: NRB,c = 106 | | | |
| DRX Cycle | | | ms | Not Applicable | | | |
| PDSCH Reference | | Config 1, 2, 3, 4, 5, 6 |  | SR.1.1 CCA | | | |
| CORESET Reference Channel | | Config 1, 2, 3, 4, 5, 6 |  | CR.1.1 CCA | | | |
| Dedicated CORESET RMC configuration | | Config 1, 2, 3, 4, 5, 6 |  | CCR.1.1 CCA | | | |
| TRS configuration | | Config 1, 2, 3, 4, 5, 6 |  | TRS.1.1 TDD | | | |
| OCNG Patterns | | |  | OP.1 | | | |
| SMTC Configuration | | |  | SMTC.1 | | | |
| DBT window configuration | | Config 1, 2, 3, 4, 5, 6 |  | DBT.1 | | | |
| SSB configuration for semi-static channel accessNote 4, 6 | | Config 1, 2, 3, 4, 5, 6 |  | SSB.1 CCA | | | |
| SSB configuration for dynamic channel accessNote 5, 6 | | Config 1, 2, 3, 4, 5, 6 |  | SSB.2 CCA | | | |
| ssb-PositionQCL | | Config 1, 2, 3, 4, 5, 6 |  | 1 | | | |
| PDSCH/PDCCH subcarrier spacing | | Config 1, 2, 3, 4, 5, 6 | kHz | 30 kHz | | | |
| PUCCH/PUSCH subcarrier spacing | | Config 1, 2, 3, 4, 5, 6 | kHz | 30 kHz | | | |
| PRACH configuration | | |  | FR1 PRACH configuration 1 under CCA | | | |
| BWP configuration | | Initial DL BWP |  | 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 | | | 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 | | | dBm/15kHz | -98 | | | |
| Note2 | Config 1, 2, 3, 4, 5, 6 | | dBm/SCS | -95 | | | |
|  | | | dB | -∞ | 2.36 | 2.36 | 2.36 |
|  | | | dB | -∞ | 11 | 11 | 11 |
| SSB\_RP | Config 1, 2, 3, 4, 5, 6 | | dBm/SCS | -∞ | -84 | -84 | -84 |
| IoNote3 | Config 1, 2, 3, 4, 5, 6 | | dBm/  38.16MHz | -55.31 | -50.96 | -50.96 | -50.96 |
| 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.  Note 4: For UE supporting semi-static channel access and network configuring semi-static channel occupancy.  Note 5: For UE supporting dynamic channel access and network configuring dynamic channel occupancy.  Note 6: For a UE supporting both semi-static and dynamic channel access, the UE can be tested under dynamic channel occupancy only. | | | | | | | |

A.11.2.1.xn.2 Test Requirements

In this test, the UE shall start to transmit the PRACH to E-UTRA Cell 2 less than 55 ms Note1 from the beginning of time period T3.

The above test requirements shall be fulfilled in order of T1, T2, T3 for the observed inter-RAT handover delay from NR to E-UTRAN to be counted as correct, and in order of T1, T2‘, T3‘, T4‘ for the observed PSCell addition delay to be counted as correct.

The rate of correct handovers and correct PSCell addition delay during repeated tests shall be at least 90%.

NOTE1: The handover delay can be expressed as specified in clause 6.1.5.2:

DHOwithPSCell\_PCell = RRC procedure delay + Tinterrupt,

Where RRC procedure delay = 50 ms, and

Tinterrupt = Tsearch\_HO + TIU + Tprocessing is defined in clause 6.1.5.2.1, where

Tsearch = 0 ms

TIU = 10 ms,

Tprocessing = 25ms

DHOwithPSCell\_PCell is equal to 85ms.

The UE shall transmit the PRACH to PSCell no later than DHOwithPSCell\_PSCell from the start of T3’. The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4’. The UE shall periodically send CSI reports for PSCell after the UE has sent first CQI report with non-zero CQI index during T4.

The PSCell addition delay can be expressed as follows as specified in clause 6.1.5.5.3:

DHOwithPSCell\_PSCell = TRRC\_delay + Tprocessing + Tsearch\_PCell + Tsearch\_PSCell + T∆ + TIU\_PSCell + 2 ms

Where:

TRRC\_delay = 20 ms

Tprocessing = 25ms

Tsearch\_PCell = 0

Tsearch\_PSCell = 0T∆ = (1+ L2) \*20 ms.

TIU\_PSCell = (1+ L3) \*10 + 10 ms

L2 is the number of SMTC occasions not available at the UE during the time tracking period where L2 ≤ LCCA\_DL, and 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, where L3 ≤ LCCA\_UL. L3 = 0 for Type 2C UL channel access procedure as defined in TS 37.213 [33]. The interruption time considering the potential extensions caused by L1,L2, L3 and by the UL CCA failure detection/recovery mechanism is limited by the T304 timer. The UE behaviour at the T304 timer expiry is detailed in TS 38.331 [2].Test equipment should make sure that LCCA\_DL and LCCA\_UL are not exceeded during a test by monitoring the number of CCA failures and preventing additional CCA failures from happening after LCCA\_DL or LCCA\_UL is reached.

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

### <End of Change 1>