**3GPP TSG-RAN4 Meeting #94-e *R4-2002863***

**Online, 24th February – 6th March 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** | **0241** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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 |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Maintenance on the UE BW for n92 and n94 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_FDD\_bands\_varduplex-Core | | | | |  | ***Date:*** | | | 2020-02-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In table 5.3.5-1 of TS 38101.1, for band n92 and n94 15/20MHz UE bandwidth is only applicable for DL, which is not correct. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Delete note 3 for n92 and n94. Correct REFSENS UL configurations for n92 and n94. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Symmetric UE bandwidth 15/20MHz between DL and UL is not supported on n92 and n94. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 Change1>>**

### 5.3.5 UE channel bandwidth per operating band

The requirements in this specification apply to the combination of channel bandwidths, SCS and operating bands shown in Table 5.3.5-1. The transmission bandwidth configuration in Table 5.3.2-1 shall be supported for each of the specified channel bandwidths. The channel bandwidths are specified for both the TX and RX path.

Table 5.3.5-1 Channel bandwidths for each NR band

|  |  | | NR band / SCS / UE Channel bandwidth | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR Band | SCS  kHz | 5 MHz | | 101,2 MHz | 152 MHz | 202 MHz | 252 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70 MHz | 80 MHz | 90 MHz | 100 MHz |
| n1 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n2 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n5 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n7 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n8 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | 15 | Yes | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | 15 | Yes | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | 15 | Yes | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n25 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n28 | 15 | Yes | | Yes | Yes | Yes7 |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes7 |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n29 | 15 | Yes | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | 15 | Yes | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | 15 | Yes | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n38 | 15 | Yes | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| n39 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n40 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n41 | 15 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n48 | 15 | Yes5 | | Yes | Yes | Yes |  |  | Yes | Yes6 |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| 60 |  | | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| n50 | 15 | Yes | | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes3 |  |  |
| 60 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes3 |  |  |
| n51 | 15 | Yes | |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n65 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n66 | 15 | Yes | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| n70 | 15 | Yes | | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
| n71 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n75 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n76 | 15 | Yes | |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| n78 | 15 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| n79 | 15 |  | |  |  |  |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | |  |  |  |  |  | Yes | Yes | Yes |  | Yes |  | Yes |
| 60 |  | |  |  |  |  |  | Yes | Yes | Yes |  | Yes |  | Yes |
| n80 | 15 | Yes | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n81 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n82 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n83 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n84 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n86 | 15 | Yes | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| 60 |  | | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| n89 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n90 | 15 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n91 | 15 | Yes | | Yes8 |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | 15 | Yes | | Yes8 |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | 15 | Yes | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| n95 | 15 | Yes | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 60 |  | | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: 90% spectrum utilization may not be achieved for 30kHz SCS.  NOTE 2: 90% spectrum utilization may not be achieved for 60kHz SCS.  NOTE 3: This UE channel bandwidth is applicable only to downlink.  NOTE 4: This UE channel bandwidth is optional in this release of the specification.  NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.  NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration.  NOTE 7: For the 20 MHz bandwidth, the minimum requirements are specified for NR UL carrier frequencies confined to either 713-723 MHz or 728-738 MHz.  NOTE 8: This UE channel bandwidth is applicable only to uplink. | | | | | | | | | | | | | | | |

## **<<End of Change1>>**

## **<<Start of Change2>>**

### 7.3.2 Reference sensitivity power level

The throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A.2.3.2, A3.2 and A.3.3 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.2-1 and Table 7.3.2-2.

Table 7.3.2-1: Two antenna port reference sensitivity QPSK PREFSENS

|  | Operating band / SCS / Channel bandwidth / Duplex-mode | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | | SCS kHz | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | 25  MHz (dBm) | 30 MHz (dBm) | 40  MHz (dBm) | 50  MHz (dBm) | 60  MHz (dBm) | 70  MHz (dBm) | 80  MHz (dBm) | 90  MHz (dBm) | 100 MHz (dBm) | Duplex Mode |
| n1 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -97.1 | -95.1 | -94.0 |  |  |  |  |  |  |  |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 |  |  |  |  |  |  |  |  |  |
| n2 | | 15 | -98.0 | -94.8 | -93.0 | -91.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -95.1 | -93.1 | -92.0 |  |  |  |  |  |  |  |  |  |
| 60 |  | -95.5 | -93.4 | -92.2 |  |  |  |  |  |  |  |  |  |
| n3 | | 15 | -97.0 | -93.8 | -92.0 | -90.8 | -89.7 | -88.9 |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 | -92.1 | -91.0 | -89.8 | -89.0 |  |  |  |  |  |  |  |
| 60 |  | -94.5 | -92.4 | -91.2 | -90.0 | -89.1 |  |  |  |  |  |  |  |
| n5 | | 15 | -98.0 | -94.8 | -93.0 | -86.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -95.1 | -93.1 | -88.6 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n71 | | 15 | -98.0 | -94.8 | -93.0 | -91.8 | -90.7 | -89.9 | -88.6 | -81.5 |  |  |  |  |  | FDD |
| 30 |  | -95.1 | -93.1 | -92.0 | -90.8 | -90.0 | -88.7 | -81.5 |  |  |  |  |  |
| 60 |  | -95.5 | -93.4 | -92.2 | -91.0 | -90.1 | -88.9 | -81.5 |  |  |  |  |  |
| n8 | | 15 | -97.0 | -93.8 | -91.4 | -85.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 | -91.7 | -87.2 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | | 15 | -97.0 | -93.8 | -84.0 |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 | -84.1 |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | | 15 | -97.0 | -93.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | | 15 | -100.0 | -96.8 | -95.0 |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -97.1 | -95.1 |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | | 15 | -97.0 | -93.8 | -91.0 | -89.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 | -91.1 | -90.0 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n25 | | 15 | -96.5 | -93.3 | -91.5 | -90.3 | -89.3 | -82.2 | -79.5 |  |  |  |  |  |  | FDD |
| 30 |  | -93.6 | -91.6 | -90.5 | -89.4 | -82.3 | -79.6 |  |  |  |  |  |  |
| 60 |  | -94.0 | -91.9 | -90.7 | -89.6 | -82.4 | -79.7 |  |  |  |  |  |  |
| n28 | | 15 | -98.5 | -95.5 | -93.5 | -90.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -95.6 | -93.6 | -91.0 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | | 15 | -99.0 | -95.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -96.1 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | | 15 | -100.0 | -96.8 | -95.0 |  |  |  |  |  |  |  |  |  |  | TDD |
| 30 |  | -97.1 | -95.1 |  |  |  |  |  |  |  |  |  |  |
| 60 |  | -97.5 | -95.4 |  |  |  |  |  |  |  |  |  |  |
| n381 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  |  | -90.6 |  |  |  |  |  |  | TDD |
| 30 |  | -97.1 | -95.1 | -94.0 |  |  | -90.7 |  |  |  |  |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 |  |  | -90.9 |  |  |  |  |  |  |
| n39 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 |  |  |  |  |  |  | TDD |
| 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 |  |  |  |  |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 |  |  |  |  |  |  |
| n40 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 | -89.6 |  |  |  |  |  | TDD |
| 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 | -89.7 | -88.9 |  | -87.6 |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 | -89.8 | -89.1 |  | -87.6 |  |  |
| n411 | | 15 |  | -94.8 | -93.0 | -91.8 |  | -89.9 | -88.6 | -87.6 |  |  |  |  |  | TDD |
| 30 |  | -95.1 | -93.1 | -92.0 |  | -90.0 | -88.7 | -87.7 | -86.9 |  | -85.6 | -85.1 | -84.7 |
| 60 |  | -95.5 | -93.4 | -92.2 |  | -90.1 | -88.9 | -87.8 | -87.1 |  | -85.6 | -85.1 | -84.7 |
| n481 | | 15 | -99 | -95.8 | -94.0 | -92.7 |  |  | -89.6 | -88.65 |  |  |  |  |  | TDD |
| 30 |  | -96.1 | -94.1 | -92.9 |  |  | -89.7 | -88.75 | -87.95 |  | -86.65 | -86.15 | -85.65 |
| 60 |  | -96.5 | -94.4 | -93.1 |  |  | -89.9 | -88.85 | -88.05 |  | -86.75 | -86.25 | -85.75 |
| n50 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  | -91.9 | -90.6 | -89.6 |  |  |  |  |  | TDD |
| 30 |  | -97.1 | -95.1 | -94.0 |  | -92.0 | -90.7 | -89.7 | -88.9 |  | -87.6 |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 |  | -92.1 | -90.9 | -89.8 | -89.1 |  | -87.6 |  |  |
| n51 | | 15 | -100.0 |  |  |  |  |  |  |  |  |  |  |  |  | TDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n65 | | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -96.6 | -94.6 | -93.5 |  |  |  |  |  |  |  |  |  |
| 60 |  | -97.0 | -94.9 | -93.7 |  |  |  |  |  |  |  |  |  |
| n66 | | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |  | -90.1 |  |  |  |  |  |  | FDD |
| 30 |  | -96.6 | -94.6 | -93.5 |  |  | -90.2 |  |  |  |  |  |  |
| 60 |  | -97.0 | -94.9 | -93.7 |  |  | -90.4 |  |  |  |  |  |  |
| n70 | | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -97.1 | -95.1 | -94.0 | -92.8 |  |  |  |  |  |  |  |  |
| 60 |  | -97.5 | -95.4 | -94.2 | -93.0 |  |  |  |  |  |  |  |  |
| n71 | | 15 | -97.2 | -94.0 | -91.6 | -86.0 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.3 | -91.9 | -87.4 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | | 15 | -99.53 | -96.33 | -94.53 | -89.33 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -96.63 | -94.63 | -89.53 |  |  |  |  |  |  |  |  |  |
| 60 |  | -97.03 | -94.93 | -89.63 |  |  |  |  |  |  |  |  |  |
| n771,4 | | 15 |  | -95.3 | -93.5 | -92.2 | -91.2 | -90.4 | -89.1 | -88.1 |  |  |  |  |  | TDD |
| 30 |  | -95.6 | -93.6 | -92.4 | -91.3 | -90.5 | -89.2 | -88.2 | -87.4 | -86.7 | -86.1 | -85.6 | -85.1 |
| 60 |  | -96.0 | -93.9 | -92.6 | -91.5 | -90.6 | -89.4 | -88.3 | -87.5 | -86.8 | -86.2 | -85.7 | -85.2 |
| n781 | | 15 |  | -95.8 | -94.0 | -92.7 | -91.7 | -90.9 | -89.6 | -88.6 |  |  |  |  |  | TDD |
| 30 |  | -96.1 | -94.1 | -92.9 | -91.8 | -91 | -89.7 | -88.7 | -87.9 | -87.2 | -86.6 | -86.1 | -85.6 |
| 60 |  | -96.5 | -94.4 | -93.1 | -92 | -91.1 | -89.9 | -88.8 | -88.0 | -87.3 | -86.7 | -86.2 | -85.7 |
| n791 | | 15 |  |  |  |  |  |  | -89.6 | -88.6 |  |  |  |  |  | TDD |
| 30 |  |  |  |  |  |  | -89.7 | -88.7 | -87.9 |  | -86.6 |  | -85.6 |
| 60 |  |  |  |  |  |  | -89.9 | -88.8 | -88.0 |  | -86.7 |  | -85.7 |
| n91 | | 15 | -100 |  |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | | 15 | -100 | -96.8 | -95.0 | -93.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -97.1 | -95.1 | -94.0 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | | 15 | -100 |  |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | | 15 | -100 | -96.8 | -95.0 | -93.8 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -97.1 | -95.1 | -94.0 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: Four Rx antenna ports shall be the baseline for this operating band except for two Rx vehicular UE.  NOTE 2: The transmitter shall be set to PUMAX as defined in clause 6.2.4  NOTE 3: The requirement is modified by -0.5 dB when the assigned NR channel bandwidth is confined within 1475.9 - 1510.9 MHz.  NOTE 4: The requirement is modified by -0.5 dB when the assigned UE channel bandwidth is confined within 3300 - 3800 MHz.  NOTE 5: For these bandwidths, the minimum requirements are restricted to operation when carrier is configured as a downlink carrier part of CA configuration | | | | | | | | | | | | | | | | |

For UE(s) equipped with 4 Rx antenna ports, reference sensitivity for 2Rx antenna ports in Table 7.3.2-1 shall be modified by the amount given in ΔRIB,4R in Table 7.3.2-2 for the applicable operating bands.

Table 7.3.2-2: Four antenna port reference sensitivity allowance ΔRIB,4R

|  |  |
| --- | --- |
| Operating band | ΔRIB,4R (dB) |
| n28, n71 | -2.71 |
| n1, n2, n3, n40, n7, n34, n38, n39, n41, n66, n70 | -2.7 |
| n48, n77, n78, n79 | -2.2 |
| NOTE 1: 4 Rx operation is targeted for FWA form factor | |

The reference receive sensitivity (REFSENS) requirement specified in Table 7.3.2-1 and Table 7.3.2-2 shall be met with uplink transmission bandwidth less than or equal to that specified in Table 7.3.2-3.

Table 7.3.2-3: Uplink configuration for reference sensitivity

|  | Operating band / SCS / Channel bandwidth / Duplex mode | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | | SCS kHz | 5  MHz | 10  MHz | 15  MHz | 20  MHz | 25 MHz | 30 MHz | 40  MHz | 50  MHz | 60  MHz | 70  MHz | 80  MHz | 90  MHz | 100 MHz | Duplex Mode |
| n1 | | 15 | 25 | 501 | 751 | 1001 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 361 | 501 |  |  |  |  |  |  |  |  |  |
| 60 |  | 101 | 18 | 24 |  |  |  |  |  |  |  |  |  |
| n2 | | 15 | 25 | 501 | 501 | 501 |  |  |  |  |  |  |  |  |  | FDD |
| 30 | 101 | 24 | 241 | 241 |  |  |  |  |  |  |  |  |  |
| 60 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| n3 | | 15 | 25 | 501 | 501 | 501 | 501 | 501 |  |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 241 | 241 | 241 | 241 |  |  |  |  |  |  |  |
| 60 |  | 101 | 101 | 101 | 101 | 101 |  |  |  |  |  |  |  |
| n5 | | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n7 | | 15 | 25 | 501 | 751 | 751 | 721 | 641 | 451 | 451 |  |  |  |  |  | FDD |
| 30 |  | 24 | 361 | 361 | 361 | 321 | 201 | 201 |  |  |  |  |  |
| 60 |  | 101 | 18 | 181 | 181 | 161 | 101 | 101 |  |  |  |  |  |
| n8 | | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | | 15 | 201 | 201 | 201 |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | | 15 | 201 | 201 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | | 15 | 25 | 251 | 251 |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | | 15 | 25 | 201 | 202 | 202 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 102 | 102 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n25 | | 15 | 25 | 501 | 501 | 501 | 501 | 481 | 401 |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 241 | 241 | 241 | 241 | 201 |  |  |  |  |  |  |
| 60 |  | 101 | 101 | 101 | 101 | 101 | 101 |  |  |  |  |  |  |
| n28 | | 15 | 25 | 251 | 251 | 251 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | | 15 | 201 | 201 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | | 15 | 25 | 50 | 75 |  |  |  |  |  |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 |  |  |  |  |  |  |  |  |  |  |
| 60 |  | 10 | 18 |  |  |  |  |  |  |  |  |  |  |
| n38 | | 15 | 25 | 50 | 75 | 100 |  |  | 216 |  |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 |  |  | 100 |  |  |  |  |  |  |
| 60 |  | 10 | 18 | 24 |  |  | 50 |  |  |  |  |  |  |
| n39 | | 15 | 25 | 50 | 75 | 100 | 128 | 160 | 216 |  |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 | 64 | 75 | 100 |  |  |  |  |  |  |
| 60 |  | 10 | 18 | 24 | 30 | 36 | 50 |  |  |  |  |  |  |
| n40 | | 15 | 25 | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 |  | 216 |  |  |
| 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 |  | 100 |  |  |
| n41 | | 15 |  | 50 | 75 | 100 |  | 160 | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 |  | 75 | 100 | 128 | 162 |  | 216 | 243 | 270 |
| 60 |  | 10 | 18 | 24 |  | 36 | 50 | 64 | 75 |  | 100 | 120 | 135 |
| n48 | | 15 | 25 | 50 | 75 | 100 |  |  | 216 |  |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 |  |  | 100 |  |  |  |  |  |  |
| 60 |  | 10 | 18 | 24 |  |  | 50 |  |  |  |  |  |  |
| n50 | | 15 | 25 | 50 | 75 | 100 |  | 160 | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 |  | 75 | 100 | 128 | 162 |  | NOTE 3 |  |  |
| 60 |  | 10 | 18 | 24 |  | 36 | 50 | 64 | 75 |  | NOTE 3 |  |  |
| n51 | | 15 | 25 |  |  |  |  |  |  |  |  |  |  |  |  | TDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n65 | | 15 | 25 | 501 | 751 | 1001 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 361 | 501 |  |  |  |  |  |  |  |  |  |
| 60 |  | 101 | 18 | 24 |  |  |  |  |  |  |  |  |  |
| n66 | | 15 | 25 | 501 | 751 | 1001 |  |  | 216 |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 361 | 501 |  |  | 1001 |  |  |  |  |  |  |
| 60 |  | 101 | 18 | 24 |  |  | 501 |  |  |  |  |  |  |
| n70 | | 15 | 25 | 501 | 751 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 24 | 361 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  |
| 60 |  | 101 | 18 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  |
| n71 | | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | | 15 | 25 | 251 | 251 | 251 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  | 51 | 51 | 51 |  |  |  |  |  |  |  |  |  |
| n77 | | 15 |  | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 | 180 | 216 | 243 | 270 |
| 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 | 90 | 100 | 120 | 135 |
| n78 | | 15 |  | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 | 180 | 216 | 243 | 270 |
| 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 | 90 | 100 | 120 | 135 |
| n79 | | 15 |  |  |  |  |  |  | 216 | 270 |  |  |  |  |  | TDD |
| 30 |  |  |  |  |  |  | 100 | 128 | 162 |  | 216 |  | 270 |
| 60 |  |  |  |  |  |  | 50 | 64 | 75 |  | 100 |  | 135 |
| n91 | | 15 | 254 | 201,4 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | | 15 | 25 | 201 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | | 15 | 254 | 251,4 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.3.2-1).  NOTE 2: For Band 20; for 15 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16; for 30 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 6 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 8; for 60 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 3 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 4;  NOTE 3: For DL channel bandwidths that do not have symmetric UL channel bandwidth, highest valid UL configuration with lowest TX-RX separation (Table 5.4.4-1) shall be used.  NOTE 4: For band n91 and n93, largest supported UL bandwidth configuration shall be used. | | | | | | | | | | | | | | | | |

Unless given by Table 7.3.2-4, the minimum requirements specified in Tables 7.3.2-1 and 7.3.2-2 shall be verified with the network signalling value NS\_01 (Table 6.2.3-1) configured.

Table 7.3.2-4: Network signaling value for reference sensitivity

|  |  |
| --- | --- |
| Operating band | Network Signalling value |
| n2 | NS\_03 |
| n12 | NS\_06 |
| n14 | NS\_06 |
| n25 | NS\_03 |
| n30 | NS\_21 |
| n48 | NS\_27 |
| n66 | NS\_03 |
| n70 | NS\_03 |
| n71 | NS\_35 |

## **<<End of Change2>>**