**3GPP TSG-RAN4 WG4 Meeting #112 *rev-***

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| *CR-Form-v12.3* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.101-1** | **CR** |  | **rev** | **1** | **Current version:** | **18.6.0** |  |
|  |
| *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:***  |  PC3 |
|  |  |
| ***Source to WG:*** | Skyworks Solutions, Inc., Qualcomm Inc., Nokia. |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_CADC\_R18\_2BDL\_xBUL-Core |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *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 canbe 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | Principles were agreed in R4-2406701, R4-2410651 and discussed in R4-2413063. |
|  |  |
| ***Summary of change:*** | * Removed “UL” from the title of clause 7.3A.4 since this clause captures both the UL harmonic and the Rx mixing MSD requirements.
* Removed near-miss MSD test points for combinations which are already affected by direct-hit interference.
* Removed RBstart=0 from the UL RB Allocation column.
* Note 1:
	+ clarified that this note is specific to direct-hit MSD test points.
	+ added the RBstart requirements using an equation which ensures the UL RBs are centered within the UL carrier (see reason for change references).
* Note 2: clarified that bands affected by UL2/DL1 direct hit interference may also be affected by near-miss for which the MSD is not specified.
* Note 6: Based on n109 agreements, changed near-miss requirements to 10MHz frequency separation.Near-miss MSD levels are corrected accordingly based on R4-2413063.
* CA\_n2-n48: removed direct-hit test points.

All other MSD corrections are implemented according to R4-2413063. |
|  |  |
| ***Consequences if not approved:*** | Several errors and inconsistencies remain erroneous these MSD tables. |
|  |  |
| ***Clauses affected:*** | 7.3A.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS38.521  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | This is a revision of R4-2413019. |

**---Start of changes---**

7.3A.4 Reference sensitivity exceptions due to harmonic interference for CA

Sensitivity degradation is allowed for different combinations of UL configurations and DL channel bandwidths if a band in frequency range 1 is impacted by UL harmonic interference from another band which belongs to NR band in frequency range 1 of the same downlink CA configuration. Reference sensitivity exceptions and uplink/downlink configurations due to UL harmonic from a PC3 aggressor NR UL band for either single band uplink or PC3 or PC2 CA are specified in Table 7.3A.4-1. For these exceptions, only the listed test points in Table 7.3A.4-1 are needed to be tested.

**Table 7.3A.4-1: Reference sensitivity exceptions and uplink/downlink configurations due to UL harmonic from a PC3 aggressor NR UL band for NR DL CA FR1**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **UL band** | **DL band** | **UL BW** | **SCS of UL band** | **UL RB Allocation** | **DL BW** | **MSD** | **UL/DL fc condition** | **UL/DL harmonic order** |
| **(MHz)** | **(kHz)** | **LCRB** | **(MHz)** | **(dB)** |
| n1 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n1 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| n2 | n48 | 5 | 15 | 25  | 5 | 8.1 | NOTE 6 | UL2/DL1near-miss |
| n2 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n2 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n2 | n78 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n2 | n78 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n3 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n3 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n3 | n78 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n3 | n78 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n5 | n411 | 5 | 15 | 8  | 10 | 10.3 | NOTE 3 | UL3/DL1direct-hit |
| n5 | n778 | 5 | 15 | 6  | 10 | 10.5 | NOTE 4 | UL4/DL1direct-hit |
| n5 | n778 | 5 | 15 | 6  | 100 | 2.9 | NOTE 4 | UL4/DL1direct-hit |
| n5 | n778 | 5 | 15 | 6  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n5 | n778 | 5 | 15 | 6  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n5 | n78 | 5 | 15 | 6  | 10 | 10.5 | NOTE 4 | UL4/DL1direct-hit |
| n5 | n78 | 5 | 15 | 6  | 100 | 2.9 | NOTE 4 | UL4/DL1direct-hit |
| n7 | n79 | 5 | 15 | 25  | 10 | 9.3 | NOTE 6 | UL2/DL1near-miss |
| n8 | n313 | N/A | N/A | N/A | N/A | N/A | NOTE 2 | UL2/DL1direct-hit |
| n8 | n7 | 5 | 15 | 8  | 5 | 10 | NOTE 3 | UL3/DL1direct-hit |
| n8 | n7 | 5 | 15 | 8  | 50 | 1.1 | NOTE 3 | UL3/DL1direct-hit |
| n8 | n41 | 5 | 15 | 8  | 10 | 13 | NOTE 3 | UL3/DL1direct-hit |
| n8 | n41 | 5 | 15 | 8  | 100 | 4.5 | NOTE 3 | UL3/DL1direct-hit |
| n8 | n77 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n8 | n77 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n8 | n78 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n8 | n78 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n8 | n79 | 5 | 15 | 5  | 10 | 12.0 | NOTE 5 | UL5/DL1direct-hit |
| n8 | n79 | 5 | 15 | 5  | 100 | 3.8 | NOTE 5 | UL5/DL1direct-hit |
| n12 | n48 | 5 | 15 | 5  | 5 | 13 | NOTE 5 | UL5/DL1direct-hit |
| n12 | n48 | 5 | 15 | 5  | 40 | 3.3 | NOTE 5 | UL5/DL1direct-hit |
| n12 | n66 | 5 | 15 | 8  | 5 | 10 | NOTE 3 | UL3/DL1direct-hit |
| n12 | n66 | 5 | 15 | 8  | 40 | 3.1 | NOTE 3 | UL3/DL1direct-hit |
| n12 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n12 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n12 | n781 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n13 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n13 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n14 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n14 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n18 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n18 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n18 | n78 | 5 | 15 | 5 | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n20 | n78 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n20 | n78 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n24 | n778 | 5 | 15 | 12  | 10 | N/A | NOTE 2 | UL2/DL1direct-hit |
| n25 | n48 | 5 | 15 | 25  | 5 | 8.1 | NOTE 6 | UL2/DL1near-miss |
| n25 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n25 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n25 | n78 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n25 | n78 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n26 | n778 | 5 | 15 | 6  | 10 | N/A | NOTE 4 | UL4/DL1direct-hit |
| n26 | n778 | 5 | 15 | 5  | 10 | N/A | NOTE 5 | UL5/DL1direct-hit |
| n26 | n78 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n26 | n78 | 5 | 15 | 6  | 100 | 3 | NOTE 4 | UL4/DL1direct-hit |
| n28 | n1 | 5 | 15 | 8  | 5 | 10.2 | NOTE 3 | UL3/DL1direct-hit |
| n28 | n1 | 5 | 15 | 8  | 50 | 2.6 | NOTE 3 | UL3/DL1direct-hit |
| n28 | n50 | 5 | 15 | 12  | 5 | 28.1 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n50 | 5 | 15 | 12  | 80 | 15.8 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n74 | 5 | 15 | 12  | 5 | 28.1 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n74 | 5 | 15 | 12  | 20 | 18 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n75 | 5 | 15 | 12  | 5 | 28.1 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n75 | 5 | 15 | 12  | 50 | 17.9 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n28 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n28 | n78 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n28 | n78 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n28 | n94 | 5 | 15 | 12  | 5 | 28.1 | NOTE 2 | UL2/DL1direct-hit |
| n28 | n94 | 5 | 15 | 12  | 20 | 21.9 | NOTE 2 | UL2/DL1direct-hit |
| n66 | n48 | 5 | 15 | 12  | 5 | 27.1 | NOTE 2 | UL2/DL1direct-hit |
| n66 | n48 | 5 | 15 | 12  | 1007 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n66 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n66 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n66 | n78 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n66 | n78 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n70 | n77 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n70 | n77 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n70 | n78 | 5 | 15 | 12  | 10 | 23.9 | NOTE 2 | UL2/DL1direct-hit |
| n70 | n78 | 5 | 15 | 12  | 100 | 13.8 | NOTE 2 | UL2/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n71 | n210 | 5 | 15 | 8  | 5 | 1.7 | NOTE 6 | UL3/DL1near-miss |
| n71 | n71 | 5 | 15 | 6  | 5 | 14.6 | NOTE 4 | UL4/DL1direct-hit |
| n71 | n2511 | 5 | 15 | 8  | 5 | 6.9 | NOTE 3 | UL3/DL1direct-hit |
|  |  |  |  |  |  |  |  |  |
| n71 | n41 | 5 | 15 | 6 | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n71 | n41 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n71 | n70 | 5 | 15 | 8  | 5 | 9.9 | NOTE 3 | UL3/DL1direct-hit |
| n71 | n70 | 5 | 15 | 8  | 25 | 4.1 | NOTE 3 | UL3/DL1direct-hit |
| n71 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n71 | n78 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n78 | n104 | 10 | 15 | 12  | 20 | 37.5 | NOTE 2 | UL2/DL1direct-hit |
| n85 | n66 | 5 | 15 | 8  | 5 | 10 | NOTE 3 | UL3/DL1direct-hit |
| n85 | n66 | 5 | 15 | 8  | 40 | 3.1 | NOTE 3 | UL3/DL1direct-hit |
| n85 | n77 | 5 | 15 | 5  | 10 | 10.4 | NOTE 5 | UL5/DL1direct-hit |
| n85 | n77 | 5 | 15 | 5  | 100 | 2.9 | NOTE 5 | UL5/DL1direct-hit |
| n92 | n78 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n92 | n78 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n94 | n78 | 5 | 15 | 6  | 10 | 10.8 | NOTE 4 | UL4/DL1direct-hit |
| n94 | n78 | 5 | 15 | 6  | 100 | 3.1 | NOTE 4 | UL4/DL1direct-hit |
| n105 | n7 | 5 | 15 | 8  | 5 | 18 | NOTE 3 | UL3/DL1direct-hit |
| n105 | n78 | 5 | 15 | 5  | 10 | 11.8 | NOTE 5 | UL5/DL1direct-hit |
| NOTE 1: The direct-hit requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) band for which the 2nd / 3rd / 4th / 5th transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band. The requirements should be verified using RBstart = floor((NRB-LCRB)/2), where floor(x) is the greatest integer less than or equal to x, and where the UL parameters NRB and LCRB are respectively, the transmission bandwidth configuration and the number of RB’s for the specified UL band channel bandwidth and the UL band subcarrier spacing.NOTE 2: The requirements should be verified for UL NR ARFCN of the aggressor (lower) band (superscript LB) such that in MHz and  with carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the lower band. This DL band may be affected by near-miss interference for which the MSD is not specified.NOTE 3: The requirements should be verified for UL NR ARFCN of the aggressor (lower) band (superscript LB) such that  in MHz and  with the carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the low band.NOTE 4: The requirements should be verified for UL NR-ARFCN of the aggressor (lower) band (superscript LB) such that in MHz and  with carrier frequency in the victim (higher) band in MHz and  the channel bandwidth configured in the lower band.NOTE 5: The requirements should be verified for UL NR-ARFCN of the aggressor (lower) band (superscript LB) such that in MHz and  with carrier frequency in the victim (higher) band in MHz and  the channel bandwidth configured in the lower band.NOTE 6: The near-miss requirements are only applicable when direct-hit requirements do not apply. These requirements should be verified for downlink channel bandwidths no larger than 10 MHz and with a carrier frequency at MHz offset from  in the victim (higher band) with , whereandare the channel bandwidths configured in the aggressor (lower) and victim (higher) bands in MHz, respectively.NOTE 7: For these bandwidths, the minimum requirements are restricted to operation when carrier is configured as a downlink carrier part of CA configuration.NOTE 8: For a UE which supports this band combination only when the Band n77 frequency range restriction defined in NOTE 12 of Table 5.2-1 applies, the MSD test point(s) cannot be verified for the band combination and the test point(s) can be skipped.NOTE 9: Void.NOTE 10: These requirements apply when the upper edge frequency of the 5 MHz uplink channel in Band n71 is located at 668 MHz and the downlink channel in Band n2 is located with its upper edge at 1990 MHz.NOTE 11: These requirements apply when the upper edge frequency of the 5 MHz uplink channel in Band n71 is located at 668 MHz and the downlink channel in Band n25 is located with its upper edge at 1995 MHz.NOTE 12: Void.NOTE 13: No requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the low band for which the 2nd transmitter harmonic is within the downlink transmission bandwidth of the high band. The reference sensitivity for all active downlink component carriers is only verified when this is not the case (the requirements specified in clause 7.3.2 apply unless otherwise specified). |

**---End of changes---**