**3GPP TSG-RAN WG4 Meeting # 112 R4-2412804**

**Maastricht, Netherland, 19th – 23rd August, 2024**

**Agenda item:** 5.1

**Source:** Moderator (Meta Ireland)

**Title:** Topic summary for [112][102] R18\_UERF\_maintenance\_Part1

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of the topic summary discussion (e.g. list of treated agenda items) and provide some guidelines for the topic discussion lists if necessary.*

In the [112][102] R18\_UERF\_maintanance\_Part1, RAN4 treat the contributions for Rel-18 maintenance for LTE and NR which were already closed WIs in Rel-18.

Candidate targets are listed as follows.

* Topic #1: Maintenance of Spectrum related WIs in Rel-18 (Agenda Item 5.2)
  + Sub-Topic 1-1: NR NTN\_LS band (2 Tdocs)
  + Sub-Topic 1-2: Correction on NR FDD band\_ ULn28\_DLn75\_n76 (3 Tdocs)
  + Sub-Topic 1-3: LTE\_NR DC band combinations (4 Tdocs)
  + Sub-Topic 1-4: NR single carrier/ NR CA band combinations UE (13 Tdocs)
  + Sub-Topic 1-5: IoT NTN\_FDD LS bands (3 Tdocs)
  + Sub-Topic 1-6: NR\_FR1\_lessthan\_5MHz\_BW (2 Tdoc)
  + Sub-Topic 1-7: Correction on High power UE related Topics (9 Tdocs)
  + Sub-Topic 1-8: Adding ETSI TC RT in TS38.101-1 (1 Tdoc)
  + Sub-Topic 1-9: NR-U 6GHz unlicensed bands (1 Tdoc) R4-241995
  + Sub-Topic 1-10: Correction on REFSENS & MSD (7 Tdocs)
  + Sub-Topic 1-11: Correction on Rx Harmonic mixing related topics (8 Tocs)
* Topic #2: Maintenance of NR channel raster enhancements (Agenda Item 5.3)
  + Sub-Topic 2-1: NR Channel raster enhancement for TN (1 Tdocs)
  + Sub-Topic 2-2: NR Channel raster enhancement for NTN (1 Tdocs)
  + Sub-Topic 2-3: NR channel raster capability for RedCap (3 Tdocs)
* Topic #3: Maintenance of Low NR band 4Rx for handheld UE and 3Tx for inter-band UL CA and EN-DC (Agenda Item 5.4)
  + Sub-Topic 3-1: Correction on the configured Tx Power (1 Tdoc)
  + Sub-Topic 3-2: Power class indication of DC combinations (1 Tdoc)
* Topic #4: Maintenance of Further RF requirements enhancement for NR and EN-DC in FR1 (Agenda Item 5.9.1)
  + Sub-Topic 4-1: 4Tx power degradation for SRS antenna switching (5 Tdocs)
* Topic #5: Maintenance of NR RF requirements enhancement for FR2\_Phase3 (Agenda Item 5.10.1)
  + Sub-Topic 5-1: Correction of MPR requirements for 256QAM (1 Tdoc)
* Topic #6: Maintenance of NB-IoT/eMTC core requirements for LTE NTN (Agenda Item 5.12.1)
  + Sub-Topic 6-1: Correction on LTE NTN UE emission requirements (2 Tdocs)
  + Sub-Topic 6-2: Correction on MOP and MPR requirements (2 Tdocs)

# Topic #1: Maintenance of Spectrum related WIs in Rel-18

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2411138](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411138.zip) (CR) Cat. F  No NWM flagging | Apple, Globalstar | Title: (NR\_NTN\_LSband-Core) Correction of NS\_05N in band n254  **This is a CR (Cat. F) for TS38.101-5 in Rel-18**  Reason: The NS\_05N 5MHz channel features two A-MPR regions, A1 and A3, as captured in TR 38.741 Table 6.2.1.3a-3. However, the A-MPR region A3 was incorrectly implemented in Table 6.2.1.3a-3 and later copied with an error to TS 38.101-5.  **Proposal:** Update Table 6.2.3.4-1 for A-MPR of NS\_05N for NTN UE to correct RB\_start is changed from ‘<= 3.6’ to ‘>=3.6’ and LCRB is changed from ‘>0.36’ to ‘>0’  Table 6.2.3.4-1: A-MPR regions for NS\_05N   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Channel BW | Carrier Center Frequency | RB\_start\*12\*SCS (MHz) | LCRB\*12\*SCS (MHz) | A-MPR | | 5MHz | 1622.4 < fc <= 1624 | >= 3.6 | > 0 | A3 | |  | >= 2.88 | A1 | | 10MHz | 1615 <= fc < 1620.1 | <= 1.8 | <= 5.04 | A4 | | <= 1.8 | > 5.04 | A5 | | > 7.2 | > 0 | A6 | | > 1.8 | >= 2.88 | A2 | | 1620.1 <= fc <= 1621.5 |  | <= 7.2 | A6 | | <= 0.36 | <= 0.36 | A1 | | > 7.2 | > 0 | A6 | | 15MHz | all | <= 3.6 | <= 5.04 | A4 | | <= 3.6 | > 5.04 | A5 | | > 10.44 |  | A6 | | > 3.6 | >= 4.32 | A2 | |
| [R4-2411139](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411139.zip) (CR) Cat. F  No NWM flagging | Apple, Globalstar | Title: (NR\_NTN\_LSband-Core) Correction of NS\_05N in band n254  **This is a CR (Cat. F) for TR38.741 in Rel-18**  Reason: The NS\_05N 5MHz channel features two A-MPR regions, A1 and A3, as captured in TR 38.741 Table 6.2.1.3a-3. However, RB region A3 was incorrectly implemented in Table 6.2.1.3a-3.  **Proposal:** Update Table 6.2.1.3a-3 for A-MPR of NS\_05N for NTN UE to correct RB\_start is changed from ‘<= 3.6’ to ‘>=3.6’ and LCRB is changed from ‘>0.36’ to ‘>0’  Table 6.2.1.3a-3: A-MPR values for NS\_05N (ETSI upper sub-range)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Channel BW | Carrier Center Frequency | RB\_start\*12\*SCS (MHz) | LCRB\*12\*SCS (MHz) | A-MPR | | 5MHz | 1622.4 < fc <= 1624 | >= 3.6 | > 0 | A3 | |  | >= 2.88 | A1 | | 10MHz | 1615 <= fc < 1620.1 | <= 1.8 | <= 5.04 | A4 | | <= 1.8 | > 5.04 | A5 | | > 7.2 | > 0 | A6 | | > 1.8 | >= 2.88 | A2 | | 1620.1 <= fc <= 1621.5 |  | <= 7.2 | A6 | | <= 0.36 | <= 0.36 | A1 | | > 7.2 | > 0 | A6 | | 15MHz | all | <= 3.6 | <= 5.04 | A4 | | <= 3.6 | > 5.04 | A5 | | > 10.44 |  | A6 | | > 3.6 | >= 4.32 | A2 | |
| [R4-2411221](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411221.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: (NR\_FDD\_ULn28\_DLn75\_n76) CR to 38.101-1 on Channel raster for Band n109  **This is a CR (Cat. F) for TS38.101-1 in Rel-18**  Reason: The uplink channel raster entries for band n109 is incorrect. The last NREF number for the uplink (703 – 733 MHz) should be:  NREF = (733 – 0) MHz / 5 kHz = 146600.  **Proposal:** for n109 band, change the uplink channel raster range to 140600 – <20> – **146600**.  Table 5.4.2.3-1: Applicable NR-ARFCN per operating band |
| [R4-2411222](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411222.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: (NR\_FDD\_ULn28\_DLn75\_n76) CR to 38.104 on Channel raster for Band n109  **This is a CR (Cat. F) for TS38.104 in Rel-18**  Reason: The uplink channel raster entries for band n109 is incorrect. The last NREF number for the uplink (703 – 733 MHz) should be:  NREF = (733 – 0) MHz / 5 kHz = 146600.  **Proposal:** for n109 band, change the uplink channel raster range to 140600 – <20> – **146600**.  Table 5.4.2.3-1: Applicable NR-ARFCN per *operating band* in FR1 |
| [R4-2413203](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413203.zip) (CR) Cat. F  Flagging by Nokia | Nokia | Title: [NR\_FDD\_ULn28\_DLn75\_n76] CR to TS 38.141-1 with correction to co-existence requirement for Band n109  **This is a CR (Cat. F) for TS38.141-1 v18.6.0 in Rel-18**  Reason: Co-existence requirement for Band n109 included with wrong UL frequency range in TS38.141-1.  **Proposal:** Correction of UL frequency range for band n109 in Table .  **Table 6.6.5.5.1.3-1: BS spurious emissions limits for BS for co-existence with systems operating in other frequency bands** |
| [R4-2411325](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411325.zip) (CR) Cat. F  Flagging by SKW and ZTE | Samsung, KDDI Corporation | Title: (DC\_R18\_2BLTE\_1BNR\_3DL2UL-Core) Rel-18 Cat F CR for TS 38.101-3 to add PC3 MSD  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  Reason: Current PC3 MSD is “N/A” for DC\_1A-18A\_n77A and DC\_3A-18A\_n77A.  **Proposal:** Add PC3 MSD 3.5dB by IMD5 for DC\_1A-18A\_n77A and 15.7dB by IMD3 for DC\_3A-18A\_n77 in TS38.101-3.  **Table 7.3B.2.3.5.2-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)** |
| [R4-2411832](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411832.zip) (CR) Cat. F  Flagging by Apple and CHTTL | ZTE Corporation, Sanechips | Title: (DC\_R18\_1BLTE\_1BNR\_2DL2UL-Core) CR for TS 38.101-3 on uplink configurations for two bands EN-DC including FR2 (R18)  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** The uplink configurations are missing for the following band combinations.   * DC\_1A\_n257(2G) * DC\_7A\_n257(2G)   **Proposal:** Add the missing uplink configurations for the above mentioned EN-DC band combinations in TS38.101-3.  Table 5.5B.5.1-1: Inter-band EN-DC configurations including FR2 (two bands) |
| [R4-2412047](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412047.zip) (CR) Cat. F  No NWM flagging | CHTTL | Title: (DC\_R18\_1BLTE\_1BNR\_yDL2UL) CR for TR 37.718-11-11: Update on terms, symbols and abbreviations  **This is a CR (Cat. F) for TR37.718-11-11 in Rel-18**  **Reason:** The content of section “Definitions of terms, symbols and abbreviations” is missing. Based on the offline discussion with MCC, we provide this CR to complete these sections.  **Proposal:** Complete the following sections for TR 37.718-11-11.   * Section 3.1 Terms * Section 3.2 Symbols * Section 3.3 Abbreviations |
| [R4-2412347](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412347.zip) (CR) Cat. F  Flagging by SKW and ZTE | Huawei, HiSilicon | Title: (DC\_R18\_2BLTE\_1BNR\_3DL2UL) CR to TS 38.101-3 Rel18 Removal of Unnecessary NE-DC Requirements  **This is a CR (Cat. F) for TS38.101-3 in Rel-18**  **Reason:** NE-DC requirements are similar to EN-DC (unless specified otherwise) some unnecessary requirements have been specified. With this CR we plan to remove them and replace some of them with general statements.  NOTE: In the last meeting the CR R4-2410647 was agreed in RAN4, however it was rejected in RAN-P because of a typo in the cover page  **Proposal:** clean up of the unnecessary NE-DC requirements in TS38.101-3.   * The same contents were resubmitted to update CR cover page. |
| [R4-2411833](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411833.zip) (CR) Cat. F  No NWM flagging | ZTE Corporation, Sanechips | Title: NR\_CADC\_R18\_3BDL\_xBUL-Core) CR for TS 38.101-1 on UE configured power relaxation for special component bands (R18)  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** For allowed maximum configured ouput power relaxation, the component bands which are special bands such as SDL bands, immediately close band, band combination with overlapping band, non-zero values are not allowed for such bands in the delta TIB tables. If uplink is not supported on a constituted band of the DC/CA band combination, "N/A" is used when deriving the delta TIB requirements for that constituted band of the band combination. Furthermore, the note for CA\_n39-n40-n41 in Table 6.2A.4.2.4-1 is missing for UE supporting inter-band CA with simultaneous Rx/Tx capability.  **Proposal:** Correct the delta TIB values for the band combinations with component SDL band and immediately close band and update note number with ‘Note 10’ for CA\_n39-n40-n41 in Table 6.2A.4.2.4-1 in TS38.101-1.   * NOTE 10: The requirements only apply for UE supporting inter-band carrier aggregation with simultaneous Rx/Tx capability   Please check the detail updated contents in the CR |
| [R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR 38.101-1 correcting the table for NR operating bands in FR1  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Correcting the table for NR operating bands in Table 5.2-1 in TS38.101-1.  **Proposal:** Remove double definition of n100 and adding back the removed n102. |
| [R4-2412375](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412375.zip) (CR) Cat. F  Flagging by SKW and Qualcomm | Ericsson | Title: CR 38.101-1 correcting 2 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Correcting 2 bands NR CA configuration tables in Table 5.5A.3.1-1a, Table 5.5A.3.1-1d and Table 5.5A.3.1-1n in TS38.101-1.  **Proposal:**  - Removing extra n77 row for CA\_n1A-n77(3A)  - Correcting n66 reference for CA\_n5B-n66B  - Correcting n77 reference for CA\_n77(2A)-n79A.  **Please check the detail updated contents in the CR** |
| [R4-2412376](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR CR 38.101-3 correcting 2 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** Correcting 2 bands NR CA configuration Table 5.5A.1.1-1k in TS38.101-3.  **Proposal:** Remove extra “0” in BCS column for  CA\_n48(A-B)-n263K  CA\_n48(A-B)-n263L  CA\_n48(A-B)-n263M  CA\_n48C-n263I  CA\_n48(4A)-n263H  **Please check the detail updated contents in the CR** |
| [R4-2412377](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR 38.101-1 correcting 3 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Correcting 3 bands NR CA configuration tables in Table 5.5A.3.2-1a in TS38.101-1.  **Proposal:**  - Remove double definition of CA\_n1A-n77(2A)-n79A  - Correcting n78 reference for CA\_n3A-n7B-n78C  - Correcting n78 reference for CA\_n3B-n7A-n78C  - Changing “.” to “,” for CA\_n3A-n8A-n39A  - Correcting n78 reference for CA\_n3B-n26A-n78C  - Changing “.” to “,” for CA\_n3A-n39A-n41A  - Changing “.” to “,” for CA\_n3A-n39A-n79A  - Correcting n78 reference for CA\_n7B-n28A-n78C.  **Please check the detail updated contents in the CR** |
| [R4-2412378](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412378.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR 38.101-3 correcting 3 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** Correcting 3 bands NR CA configuration tables in Table 5.5A.1.2-1b in TS38.101-3.  **Proposal:** Changing from CA\_7B to CA\_n7B for CA\_n7B-n26A-n258A, CA\_n7B-n26A-n258B up until CA\_n7B-n26A-n258R10 in Table 5.5A.1.2-1b.  **Please check the detail updated contents in the CR** |
| [R4-2412379](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412379.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR 38.101-1 correcting 4 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Correcting 4 bands NR CA configuration tables in Table 5.5A.3.3-1a in TS38.101-1.  **Proposal:**  - Correcting n78 reference as CA\_n78C\_BCS1 for CA\_n1A-n3A-n28A-n78C  - Removing extra A in CA\_n3A(2A)-n7A-n8A-n78A  - Remove double definition of CA\_n3B-n7A-n28A-n78C.  **Please check the detail updated contents in the CR** |
| [R4-2412380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412380.zip) (CR) Cat. F  No NWM flagging | Ericsson | Title: CR 38.101-3 correcting 4 bands NR CA configuration tables  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** Correcting 4 bands NR CA configuration tables in Table 5.5A.1.3-1a in TS38.101-3.  **Proposal:** Changing BCS from “o” to “0” for CA\_n1A-n3A-n79A-n257H in Table 5.5A.1.3-1a.  **Please check the detail updated contents in the CR** |
| [R4-2412882](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip) (Draft CR) Cat. F  Flagging by Samsung, CHTTL and SKW | Huawei, HiSilicon | Title: (NR\_CADC\_R18\_yBDL\_xBUL)draft CR for TS38.101-1 to clarify single UL configuration for NR CA  **This is a draft CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Correct a typo and rephrase the sentence for better readability on single UL configurations for NR CA band combinations in the current specification TS38.101-1.   * Bullet 1：Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination can be configured as a single uplink carrier, * Bullet 2：Unless otherwise noted, all of the valid downlink constituent bands can be configured as a single uplink carrier * Bullet 3：If an uplink CA configuration is supported, its fallback single uplink is also supported.   The first and second bullet is about Uplink CA configuration entries with "-." The third bullet is about multi uplink carriers. However, the current wording does not show that the second bullet is about Uplink CA configuration entries with "-." Therefore, the second and third bullet seem to be repeated. By merging the first and second bullet can eliminate the ambiguity.  **Proposal:** Correct a typo “restrictred” to “restricted”.  In the CA configuration tables of clause 5.5A.1 and clause 5.5A.2:  - Unless otherwise noted, Uplink CA configuration entries with "-" mean single uplink carrier is valid for downlink intra-band CA,  In the CA configuration tables of clause 5.5A.3:  - Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier,  - If an uplink CA configuration is specified, it means that any valid constituent single uplink carrier and UL CA configuration of the downlink inter-band CA combination is specified. |
| [R4-2412883](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412883.zip) (Draft CR) Cat. F  Flagging by Samsung, CHTTL and SKW | Huawei, HiSilicon | Title: (NR\_CADC\_R18\_yBDL\_xBUL)draft CR for TS38.101-2 to clarify single UL configuration for NR CA  **This is a draft CR (Cat. F) for TS38.101-2 v18.6.0 in Rel-18**  **Reason:** Rephrase the sentence for better readability on single UL configurations for NR CA band combinations in the current specification TS38.101-2.   * Bullet 1：Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination can be configured as a single uplink carrier, * Bullet 2：Unless otherwise noted, all of the valid downlink constituent bands can be configured as a single uplink carrier * Bullet 3：If an uplink CA configuration is supported, its fallback single uplink is also supported.   The first and second bullet is about Uplink CA configuration entries with "-." The third bullet is about multi uplink carriers. However, the current wording does not show that the second bullet is about Uplink CA configuration entries with "-." Therefore, the second and third bullet seem to be repeated. By merging the first and second bullet can eliminate the ambiguity.  **Proposal:** Merge two bullets into one for better readability on single UL configurations for NR CA band combinations.  In the CA configuration tables of clause 5.5A.1 and clause 5.5A.2:  - Unless otherwise noted, Uplink CA configuration entries with "-" mean single uplink carrier is valid for downlink intra-band CA,  In the CA configuration tables of clause 5.5A.3:  - Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier,  -If an uplink CA configuration is supportedspecified, its fallback single uplink is also supportedit means that any valid constituent single carrier and UL CA configuration of the down link inter-band CA combinations is specified. |
| [R4-2412884](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412884.zip) (Draft CR) Cat. F  Flagging by Samsung, CHTTL and SKW | Huawei, HiSilicon | Title: (NR\_CADC\_R18\_yBDL\_xBUL)draft CR for TS38.101-3 to clarify single UL configuration for NR CA  **This is a draft CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** Rephrase the sentence for better readability on single UL configurations for NR CA band combinations in the current specification TS38.101-3.   * Bullet 1：Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination can be configured as a single uplink carrier, * Bullet 2：Unless otherwise noted, all of the valid downlink constituent bands can be configured as a single uplink carrier * Bullet 3：If an uplink CA configuration is supported, its fallback single uplink is also supported.   The first and second bullet is about Uplink CA configuration entries with "-." The third bullet is about multi uplink carriers. However, the current wording does not show that the second bullet is about Uplink CA configuration entries with "-." Therefore, the second and third bullet seem to be repeated. By merging the first and second bullet can eliminate the ambiguity.  **Proposal:** Merge two bullets into one for better readability on single UL configurations for NR CA band combinations.  In the CA configuration tables of clause 5.5A.1.0:   * Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier, * If an uplink CA configuration is specified, it means that any valid constituent single uplink carrier and UL CA configuration of the downlink inter-band CA combination is specified. |
| [R4-2413053](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413053.zip) (CR) Cat. F  No NWM flagging | Skyworks Solutions Inc. | Title: CR to TS 38.101-1 Rel-18 Corrections to ACLR for CA\_NC\_NS\_100  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Corrections on the contents based on the agreed in WF R4-2403824 and discussed in R4-2400372.  **Proposal:** Add the following corrections to core requirements of sub-clause Clause 6.5A.2.4.2.4   * For 10<=Wgap < 20MHz: only the UTRA ACLR1 requirement applies is the gap * For Wgap >= 20MHz: both the UTRA ACLR1 and the UTRA ACLR2 requirements apply is the gap.   6.5A.2.4.2.4 UTRA ACLR for Intra-band non-contiguous CA  For intra-band non-contiguous carrier aggregation, UTRA adjacent channel leakage power ratio (UTRAACLR) is the ratio of the sum of the filtered mean power centred on each assigned channel frequency to the filtered mean power centred on an adjacent(s) UTRA channel frequency. In case the gap bandwidth Wgap between 2 uplink CCs is smaller than 10MHz then no UTRA ACLR requirement is set for the gap. In case Wgap is greater than or equal to 10MHz but less than 20MHz, then only the first UTRAACLR (UTRAACLR1) requirement applies in the gap. In case Wgap is greater than or equal to 20MHz, then both the first and the second UTRAACLR (UTRAACLR1 and UTRAACLR2) requirements apply in the gap. Each assigned NR channel power is measured with rectangular filters with measurement bandwidths specified in Table 6.5.2.4.1-1 and adjacent UTRA channel power is measured with a RRC filter with roll-off factor = 0.22 and bandwidth of 3.84 MHz. If the measured adjacent channel power is greater than –50dBm then the UTRAACLR1 and UTRAACLR2 shall be higher than the value specified in Table 6.5A.2.4.2.4-1. |
| [R4-2413399](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413399.zip) (CR) Cat. F  Flagging by Huawei, Nokia and QC. | Skyworks Solutions Inc. | Title: CR to R18 38101-1 to add 35MHz CBW to NS\_35 definition  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Moderator note: There was no any changed marks in Cat. F CR. Need to revise the CR in 2nd round regardless of any feedback from interested companies.**  **Reason:** 35MHZ is defined for the additional NS\_35 SEM and its related A-MPR but missing in NS table.  **Proposal:** Addition of 35MHZ CBW for n71 band for PC1 in Table 6.2.3.1-1. |
| [R4-2411542](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411542.zip) (CR) Cat. D  Flagging by Huawei and Qualcomm | Mediatek India | Title: (IoT\_NTN\_FDD\_LS\_band) CR to 36.102 for IoT-NTN UE RF requirements (Rel-18)  **This is a CR (Cat. D editorial modification) for TS36.102 v18.5.0 in Rel-18**  **Reason:** In TS 36.102 Table 6.5A.4.4.5-1, the table name should be updated to be applicable for both NS\_04N and NS\_05N.Also, need to update the requirement in subclause 6.5A.4.4.6 which is incorrect.  **Proposal:** The table name of Table 6. 5A.4.4.5-1 is updated as “Additional out-of-band requirements are for the NS\_04N and NS\_05N”. Also, add “Table 6.5A.4.4.5-1” instead of “6.5A.4.4.5-1” in subclause, 6.5A.4.4.6.  Table 6.5A.4.4.5-1: Additional out-of-band requirements for "NS\_04N" and "NS\_05N"   |  |  |  |  | | --- | --- | --- | --- | | Frequency band  (MHz) | Channel bandwidth / Spectrum emission limit1 (dBm) | Measurement bandwidth | NOTE | | BWchannel | | 1559 ≤ f ≤ 1605 | -40 | 1MHz | Averaged over any 2 millisecond active transmission interval | | 1605 ≤ f ≤ 1610 | -40 + 60/5 (f-1605) | 1MHz | |  |  |  |  | | 1628.5 ≤ f ≤ 1631.5 | -30 | 30kHz |  | | 1631.5 ≤ f ≤ 1636.5 | -30 | 100kHz |  | | 1636.5 ≤ f ≤ 1646.5 | -30 | 300kHz |  | | 1646.5 ≤ f ≤ 1666.5 | -30 | 1MHz |  | | 1666.5 ≤ f ≤ 2200 | -30 | 3MHz |  | | NOTE: The EIRP requirement in regulation is converted to conducted requirement using a 0dBi antenna. | | | |  **6.5A.4.4.6 Minimum requirement (network signalled value "NS\_05N")** When "NS\_05N" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5A.4.4.5-1 where BWchannel equals to 1.4MHz. This requirement also applies for the frequency ranges that are less than FOOB (MHz) in Table 6.5A.4.2-1 from the edge of the channel bandwidth. |
| [R4-2411543](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411543.zip) (CR) Cat. F  Flagging by Huawei and Qualcomm | Mediatek India | Title: (IoT\_NTN\_FDD\_LS\_band) CR to 36.102 for IoT-NTN UE RF Multi-Tones A-MPR requirements (Rel-18)  **This is a CR (Cat. F) for TS36.102 v18.5.0 in Rel-18**  **Reason:** NS\_04N/NS\_05N A-MPR values are TBD in TS 36.102 Table 6.2B.3-1. For NS\_04N/NS\_05N, it is observed the 3/6/12 Tones allocation A-MPR values for band 254 (L+S band) were indicated in TR 36.764. These A-MPR values need to be updated into TS 36.102.  **Proposal:** In TS 36.102 Table 6.2B.3-1, the NS\_04N/NS\_05N A-MPR values for 3/6/12 Tones operation for IoT-NTN band 254 (L+S band) are updated based on TR 36.764. |
| [R4-2411544](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411544.zip) (CR) Cat. F  Flagging by Huawei, Apple and QC | Mediatek India | Title: (IoT\_NTN\_FDD\_LS\_band) CR to 36.102 for IoT-NTN UE RF 1-Tone A-MPR requirements (Rel-18)  **This is a CR (Cat. F) for TS36.102 v18.5.0 in Rel-18**  **Reason:** The 1-Tone allocation A-MPR values for band 254 is not analyzed for NS\_04N/NS\_05N. To provide the evaluated result is necessary for Cat-M1 and Cat-NB1/NB2 UE. Based on evalaution, no NS\_04N/NS\_05N A-MPR for Cat-M1. But NS\_04N/NS\_05N A-MPR for Cat-NB1/NB2 is needed.  **Proposal:** In subclause 6.2B.3 in TS36.102, regarding Cat-NB1/NB2 UE, the missing 1-Tone allocation A-MPR values for band 254 for NS\_04N/NS\_05N is further updated based on simulation results. |
| [R4-2411834](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411834.zip) (CR) Cat. F  Flagging by Nokia and SKW | ZTE, Sanechips | Title: (NR\_FR1\_lessthan\_5MHz\_BW-Core) CR for TS 38.101-1 on narrow band blocking for 3MHz channel bandwidth  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** The power of unwanted DL signal Puw(CW) -55dBm is missing for narrow band blocking when channel bandwidth is 3MHz.  **Proposal:** Add Puw(CW) for narrow band blocking when channel bandwidth is 3MHz. update the editorial correction in TS38.101-1. |
| [R4-2413212](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413212.zip) (CR) Cat. F  No NWM flagging | Keysight Technologies UK Ltd, Nokia | Title: 3MHz channel bandwidth optional for frequency bands n31 and n72  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** the NR\_FR1 lessthan 5MHz BWs was defined as optional and applicable only to Rel-18 and onwards. Additionally, two UE capabilities were defined in 3GPP TS 38.306 associated to this bandwidth: *support-3MHz-ChannelBW-r18* and *support-12PRB-CORESET0-r18* that allow the device to indicate whether it supports the functionality. However, when NR frequency bands n31 and n72 were introduced in 3GPP TS 38.01-1 through R4-2319591, the support of 3 MHz channel bandwidth for these bands was defined as mandatory.  **Proposal: Add Note 4** for n31 and n72 tosupport 3 MHz channel bandwidth as optional in TS38.101-1 v18.6.0. |
| [R4-2411928](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411928.zip) (CR) Cat. F for Rel-17  Flagging by CHTTL and QC | ZTE Corporation, Sanechips | Title: (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove superscript NOTE 6 for PC2 TDD-TDD inter-band CA  **This is a Formal CR (Cat. F) for TS38.101-1 v17.14.0 in Rel-17**  **Reason:** In the Table 6.2A.1.3-1, NOTE 6 is describe as:  *NOTE 6: The UE supports PC3 within NR FDD band, and supports either PC3 or PC2 within NR TDD band.*  it is clearly for PC2 FDD-TDD inter-band CA since only PC3 FDD is supported in a PC2 FDD-TDD inter-band CA. For PC2 TDD-TDD inter-band CA, each TDD band can be PC3 or PC2.  **Proposal:** Remove the superscript **note 6** for PC2 inter-band TDD-TDD CA band combination in the Table 6.2A.1.3-1.  There are different PC2 TDD-TDD inter-band CA combinations between Rel-17 and Rel-18. |
| [R4-2411929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411929.zip) (CR) Cat. F for Rel-18  Flagging by CHTTL and QC | ZTE Corporation, Sanechips | Title: (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove superscript NOTE 6 for PC2 TDD-TDD inter-band CA  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** In the Table 6.2A.1.3-1, NOTE 6 is describe as:  *NOTE 6: The UE supports PC3 within NR FDD band, and supports either PC3 or PC2 within NR TDD band.*  it is clearly for PC2 FDD-TDD inter-band CA since only PC3 FDD is supported in a PC2 FDD-TDD inter-band CA. For PC2 TDD-TDD inter-band CA, each TDD band can be PC3 or PC2.  **Proposal:** Remove the superscript **note 6** for PC2 inter-band TDD-TDD CA band combination.  There are different PC2 TDD-TDD inter-band CA combinations between Rel-17 and Rel-18. |
| [R4-2413128](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip) (CR) Cat. F  No NWM flagging | BT plc | Title: (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18 ) CR to TS 38.101-1 for missing HPUE TDD configurations  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** TPs listed (R4-2410544, R4-2409351, R4-2409346 and R4-2409350) in the tdocs were approved and included in the technical report TR 38.899 (R4-2409642); however, the necessary CRs weren’t added into the technical specifications TS 38.101-1.  **Proposal:** Add PC2 CA\_n3A-n78(2A), CA\_n1A-n3A-n78(2A), CA\_n3A-n28A-n78(2A) and CA\_n7A-n28A-n78A in TS38.101-1 based on the areed TPs.  **Please check the detail updated contents in the CR** |
| [R4-2413150](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip) (CR) Cat. F  No NWM flagging | BT plc | Title: (HPUE\_FR1\_FDD\_NR\_CADC\_R18 ) CR to TS 38.101-1 for missing HPUE FDD configurations  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** TPs listed (R4-2410554) in the tdocs were approved and included in the technical report TR 38.850 (R4-2410768); however, the necessary CRs weren’t added into the technical specifications TS 38.101-1.  **Proposal:** Add PC2 to the n7 uplink of CA\_n7A-n78A in TS38.101-1 based on the areed TP.  **Please check the detail updated contents in the CR** |
| [R4-2413294](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip) (CR) Cat. F  No NWM flagging | T-Mobile USA | Title: (HPUE\_FR1\_FDD\_NR\_CADC\_R18-Core) CR for TR38.850: Corrections for CA\_n71A-n77A PC2 n71  **This is a Formal CR (Cat. F) for TR38.850 v18.0.0 in Rel-18**  **Reason:** The TP failed to include n71 in the uplink configuration in Table 5.5A.3.1-1, which resulted in this being missing in the Big CR.  **Proposal:** Add n718 in the uplink configuration in Table 5.5A.3.1-1 in TR38.850.  Table 5.5A.3.1-1: NR CA configurations and bandwidth combinations sets defined for inter-band CA (two bands)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | NR CA configuration | Uplink CA configuration or single uplink carrier10 | NR Band | Channel bandwidth (MHz) (NOTE 3) | Bandwidth combination set | | CA\_n71A-n77A | n718  n778, 9  CA\_n71A-n77A8 | n71 | 5, 10, 15, 20 | 0 | |  |  | n77 | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 |  | |  |  | n71 | n71 channel bandwidths in Table 5.3.5-1 | 4 and 5 | |  |  | n77 | n77 channel bandwidths in Table 5.3.5-1 |  |   NOTE 8: Minimum requirements for Power Class 2 are applicable for this uplink combination with 1Tx antenna connector in each band or single uplink carrier with up to 2Tx antenna connectors in this downlink/uplink combination  NOTE 10: Only single uplink carriers with power class other than PC3 are listed. |
| [R4-2413295](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413295.zip) (CR) Cat. F  No NWM flagging | T-Mobile USA | Title: (HPUE\_FR1\_FDD\_NR\_CADC\_R18-Core) CR for 38.101-1: Corrections for CA\_n71A-n77A PC2 n71  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** The agreed TP failed to include n71 in the uplink configuration in Table 5.5A.3.1-1, which resulted in this being missing in the Big CR.  **Proposal:** Add n718 in the uplink column for DL CA\_n71A-n77A in Table 5.5A.3.1-1n in TS38.101-1. |
| [R4-2413296](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413296.zip) (CR) Cat. F  No NWM flagging | T-Mobile USA | Title: (HPUE\_NR\_FR1\_FDD) CR for 38.101-1 NS\_06 corrections  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** NS\_06 in Table 6.2.3.1-1 had an error in that 3 and 15 MHz were listed in the row for n13 and the table was more complicated as needed.  **Proposal:** Moved n13 to a row with n14 where only 5 and 10 MHz are indicated and added sentences about PC3 and PC1 to 6.2.3.32 so that Table 6.2.3.1-1 can be simplified. Also removed Note 11 from n71 in Table 6.2.3.1-1. |
| [R4-2413297](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413297.zip) (CR) Cat. F  Flagging by Huawei and CHTTL | T-Mobile USA | Title: (CA and HPUE) CR for 38.101-1: Various corrections for CA and HPUE  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Several errors related to CA and HPUE were found in version 18.6.0 of 38.101-1, including.  **Proposal:**   1. CA\_n25(3A) BCS4 and 5 only covered 2 BW columns 2. CA\_n1A-n77(2A) had a line missing in the UL column 3. CA\_n2A-n71A and CA\_n2(2A)-n71A had an extraneous “-“ in the uplink column 4. CA\_n2(2A)-n77C had some inappropriate dahsed lines in the first two columns 5. CA\_n3A-n78(2A) had a red “8” for UL n78 6. The UL configurations for CA\_n25A-n41A had accidentally been added to CA\_n25(2A)-n38A when the CR was implemented 7. Also, CA\_n25A-n41A had superscript 13,14 in the first column 8. CA\_n25A-n41C-n66(2A)-n71A UL CA\_n66A-n71A was listed as CA\_n66A-n71 9. A line was missing below CA\_n41A-n66(2A)-n71A-n77A 10. n48 was in the wrong order in Table 7.3A.4-1a 11. Many bands were out of order in Table 7.3A.4-2a and Table 7.3A.4-2b 12. n77 was out of order in Table 7.3A.4-4c   **Please check the detail updated contents in the CR** |
| [R4-2411994](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411994.zip) (CR) Cat. F  No NWM flagging | Nokia | Title: CR 38.101-1 addition of ETSI TC RT based on ECC Decision(20)02 reference to NB blocking  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Addition of ETSI TC RT based on ECC Decision(20)02 reference to NB blocking as it was forgotten from CR R4-2410724. Editorial correction of current notes.  **Proposal:** Addition of ETSI TC RT based on ECC Decision(20)02 reference to NB blocking. Space added to existing note in Table 7.6.2-2: In-band blocking, Table 7.6.3-2: Out of-band blocking and add the same Note in Table 7.6.4-2: Narrow band blocking.  NOTE: For bands n100 and n101, additional requirements for wideband cab-radio receiver are specified by ETSI TC RT based on ECC Decision (20)02 [19]. |
| [R4-2411995](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip) (CR) Cat. F  The CR will be merged in CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)) | Nokia | Title: CR 38.101-1 re-establishment of n102 operating band information  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** n102 operating band for NR-U in European band information has vanished in TS38.101-1 v18.6.0.  **Proposal:** Information re-established to add n102. |
| [R4-2412613](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412613.zip) Discussion paper | Qualcomm France | Title: About issue in current PC2 MSD specification  **This is a discussion paper to treat PC2 MSD requirements in TS38.101-1.**  **Observation 1**: Recent change in PC2 Cross-band and Harmonic Mixing tables inadvertently removed MSD from all TX Diversity combinations where aggressor is TDD band so current table format with separate 1TX and 2TX tables is not correct.  **Observation 2**: In future there will be also PC2 UL harmonic cases for TDD aggressor so current table format with separate 1TX and 2TX tables are not optimal.  Table 7.3A.6-1a: Reference sensitivity exceptions (MSD) and uplink/downlink configurations due to cross band isolation from a PC2 aggressor NR UL band for NR CA FR1   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | UL band | DL band | UL Fc | UL BW | SCS of UL band | UL RB Allocation | DL Fc | DL BW | MSD | Cross-band  Interference  source | | (MHz) | (MHz) | (kHz) | LCRB | (MHz) | (MHz) | (dB) | | n25 | n66 | 1890 | 40 | 15 | 50 (RBstart=176) | 2112.5 | 5 | 0.84 | >ACLR2 | | n25 | n66 | 1890 | 40 | 15 | 50 (RBstart=176) | 2112.5 | 5 | 1.15 | >ACLR2 | | NOTE 1: Applicable only when harmonic mixing MSD for this combination is not applied.  NOTE 2: Void.  NOTE 3: The requirements only apply for UEs supporting inter-band carrier aggregation with simultaneous Rx/Tx capability. Simultaneous Rx/Tx capability does not apply for UEs supporting band n78 with a n77 implementation.  NOTE 4: Applicable to UE supporting PC2 with single Tx.  NOTE 5: Applicable to UE supporting PC2 with dual Tx. | | | | | | | | | | |   **Proposal 1**: Revert back to single PC2 MSD tables for Cross-band, UL Harmonic, and Harmonic mixing, and to use notes as shown above to distinguish 1TX and 2TX FDD aggressor cases. |
| [R4-2412625](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412625.zip) (CR) Cat. F  No NWM flagging | Qualcomm France | Title: CR Adding missing MSD for CA\_n2A-n66A and for CA\_n25A-n66A PC3 in TS38.101-1  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Cross-band MSD for CA\_n2A-n66A and for CA\_n25A-n66A were added into R16 and R17, but R18 was not included in Big CR even R4-2408848 was endorsed in RAN4#111.  **Proposal:** Adding cross-band MSD for n2 and n25 DL with 40MHz UL in Table 7.3A.6-1 according to R4-2408848. |
| [R4-2413024](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413024.zip) (CR) Cat. F  [R4-2413025](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413025.zip) (CR) Cat. A for Rel-16  No NWM flagging | Skyworks Solutions Inc. | Title: Cat F CR to TS 38.101-1 Rel-15 REFSENS Corrections  **This is a Formal CR (Cat. F) for TS38.101-1 v15.26.0 as TEI15**  **Reason:** SCS 60 kHz does not apply to Band n20.  **Proposal:** In Table 7.3.2-3 for uplink configuration for REFSENS, deleted text related to SCS 60kHz from NOTE 2 for Band n20. |
| [R4-2413032](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413032.zip) (CR) Cat. F  No NWM flagging | Skyworks Solutions Inc. | Title: Cat F CR to TS 38.101-1 Rel-17 REFSENS Corrections  **This is a Formal CR (Cat. F) for TS38.101-1 v17.14.0 as TEI17**  **Reason:** SCS 60 kHz does not apply to Band n20. Also, brackets should be removed for the Band n66 45MHz CBW uplink RB allocations.  **Proposal:** On top of deletion of the text related to SCS 60kHz in R4-2413024, request to remove square brackets for band n66 45MHz CBW RB allocations as follow |
| [R4-2413034](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413034.zip) (CR) Cat. F  Flagging by SKW | Skyworks Solutions Inc. | Title: Cat F CR to TS 38.101-1 Rel-18 REFSENS Corrections  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0**  **Reason:** SCS 60 kHz does not apply to Band n20. Brackets should be removed for the Band n66 45MHz CBW uplink RB allocations. Also, Band n109 UL RB configuration requirements are mis-aligned.  **Proposal:** On top of deletion of the text related to SCS 60kHz and removed square brackets in Band n66, request to shift the band n109 UL RB allocation to the appropriate position in Table 7.3.2-3 as follow |
| [R4-2413035](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413035.zip) (CR) Cat. F  Flagging by CHTTL | Skyworks Solutions Inc., T-Mobile USA, Murata Manufacturing Corp., Qualcomm Inc. | Title: CR to TS 38.101-1 Rel-18 Intra-band CA REFSENS corrections  **This is a Formal CR (Cat. F) for TS38.101-1 v18.6.0**  **Reason:** PC2 FDD REFSENS requirements need to be introduced and the MSD table format was agreed in WF R4-2406683.  **Proposal:**   1. Changes to Symbols: as agreed in WF R4-2403628. 2. Changes to core requirements:  * 7.3A.2.1: clarified PC3 applicability based on WF R4-2403628. * 7.3A.2.1: Added clarifications for PC2 applicability based on WF R4-2406683. * 7.3A.2.2: clarified PC3 applicability based on WF R4-2403628 and aligned text with clause 7.3A.2.1 for consistency.  1. Changes to REFSENS Tables:  * Changed the title of Table 7.3A.2.1-1 to clarify these are PC3 requirements and to bring consistency with other table titles * PC3 one uplink carrier requirements were meant to be introduced in Table 7.3A.2.1-2, but this table was voided in 18.6.0. These requirements are captured in new Table 7.3A.2.1-1a * Aligned the title of PC2 Table 7.3A.2.1-3 with other tables for consistency * Table 7.3A.2.2-1:   + Changed title to clarify PC3 applicability and align text with table 7.3A.2.1-1   + Added the missing term “SCC” to the title of column ΔRIBNC, * Changed the title of Table 7.3A.2.2-2 to align with the title of Table 7.3A.2.1-1.   **Please check the detail updated contents in the CR** |
| [R4-2413060](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413060.zip) (CR) Cat. F  Flagging by CHTTL and ZTE | Skyworks Solutions Inc. | Title: CR to TS 38.101-1 Rel-18 Dual-UL IMD corrections  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** some typos need to be corrected and a test point is missing for CA\_n18-n41. A test point is specified for PC2.  In the PC2 table, typos correction is needed and   * for CA\_n8\_n77: two test points are specified with contradictory MSD requirements. * for CA\_n41-n77: band n77 IMD9 MSD is missing.   **Proposal:** update contents in Table 7.3A.5-1 for PC3 UE and Table 7.3A.5-1a for PC2 UE.  **Table 7.3A.5-1: 2DL/2UL inter-band Reference sensitivity QPSK PREFSENS and uplink/downlink configurations for PC3 CA**        **Table 7.3A.5-1a: 2DL/2UL inter-band Reference sensitivity QPSK PREFSENS and uplink/downlink configurations for PC2 CA** |
| [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) Discussion paper | Qualcomm France | Title: About RX mixing clean-up  **This is a discussion paper to treat harmonic mixing problem in MSD tables in TS38.101-1 & TS38.101-3.**  To ensure the harmonic centre frequency meets the direct hit collision with the DL carrier centre frequency, companies are invited to share their views on the following options at the next meeting  **Proposal 1**: Use option 1 for “RBstart=0”  **Proposal 2**: Use the following rules to specify UL RB allocation and RB start for UL harmonic and RX mixing cases.   * LCRB\_UL=Floor(NRB\_DL/UL harmonic order) * RBstart=Floor((NRB\_UL-LCRB\_UL)/2)   **Proposal 3**: UL RB allocation is listed in MSD table, and RBstart is described in a note in equation format. |
| [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) Discussion paper | Skyworks Solutions Inc. | Title: Companion to CR on harmonic MSD clean-up  **This is a discussion paper to treat harmonic mixing problem in MSD tables in TS38.101-1 & TS38.101-3.**  To ensure the harmonic centre frequency meets the direct hit collision with the DL carrier centre frequency, companies are invited to share their views on the following options at the next meeting.  **Proposal 1**: To resolve the issues with RBstart=0 [3], an alternative solution is proposed which removes RBstart=0 from all UL harmonic MSD tables (NR-CA and EN-DC). To ensure UL RBs are centered in the middle of the UL carrier, an equation that defines RBstart is added to the NOTE 1 of TS 38.101-1 Table 7.3A.4-1. It is also proposed to clarify that Note 1 is specific to the definition of direct-hit harmonic MSD test points. See Figure 1 – CR [3].  **Proposal 2**: Consider adopting the corrected the PC3 band n7 MSD for CA\_n7-n105 as follow:    **Proposal 3**: To account respectively for 1.5dB and 1dB increase of the H5 level, consider adopting the corrected band n78 10MHz PC3 MSD for CA\_n78-n105 and band 42 5MHz MSD for DC\_42\_n28 as follow:  A close-up of a sign  Description automatically generatedA white sheet with black text  Description automatically generated  **Proposal 4**: Remove the direct-hit MSD test points from TS 38.101-1 for CA\_n2-n48 and from TS 38.101-3 for DC\_2\_n48, DC\_48\_n2.  **Proposal 5**: Adopt the following new test conditions for near-miss MSD test points.   1. Near-miss MSD test points are specified only for UL2/DL1 harmonic interference and only when the band combination does not meet the direct-hit criteria. 2. For near-miss MSD test points, the MSD is specified with;    1. UL CBW = 5MHz    2. UL LCRB = 25RB (fully allocated)    3. The Note 6 of Table 7.3A.4-1/ Note 6 of TS 38.101-3 Table 7.3B.2.3.1-1 is modified as:   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.  **Proposal 6**: To account for new near-miss test conditions (proposal 5), consider adopting the corrected band n48 5MHz PC3 near-miss MSD for CA\_n2-n48 and for DC\_2\_n48, DC\_48\_n2 as follow:      **Proposal 7**: To account for new near-miss test conditions (proposal 5), consider adopting the corrected band n79 10MHz PC3 near-miss MSD for CA\_n7-n79 as follow. The same correction is proposed for DC\_7\_n79 in CR [3].    **Proposal 8**: Consider adopting the following MSD test point corrections for PC3 CA\_n2\_n71 and CA\_n25-n71 and their EN-DC counter parts.    **Proposal 9**: Consider adopting the PC3 UL2/DL1 MSD of **Table 15** for CA\_n28-n50, CA\_n28-n74, CA\_n28-n75, CA\_n28-n94. Similar changes are ported for their EN-DC counterparts.  **Table 15** PC3 MSD corrections for CA\_n28-n50, CA\_n28-n74, CA\_n28-n75, CA\_n28-n94.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **UL band** | **DL band** | **Test point #** | **UL BW (MHz)** | **SCS of UL band (kHz)** | **Rel. 18.6.0  UL RB Allocation Lcrb** | **DL BW (MHz)** | **Rel 18.6.0 MSD (dB)** | **UL/DL harmonic order** | | n28 | n50 | 1 | 5 | 15 | 12 ~~(RBstart=0)~~ | 5 | 28.1 ~~23~~ | UL2/DL1 direct-hit | | n28 | n50 | 2 | 5 | 15 | 12 ~~(RBstart=0)~~ | 80 | 15.8 ~~10.8~~ | | n28 | n74 | 1 | 5 | 15 | 12 ~~(RBstart=0)~~ | 5 | 28.1 ~~23.1~~ | | n28 | n74 | 2 | 5 | 15 | 12 ~~(RBstart=0)~~ | 20 | 18.0 ~~16.8~~ | | n28 | n75 | 1 | 5 | 15 | 12 ~~(RBstart=0)~~ | 5 | 28.1 | | n28 | n75 | 2 | 5 | 15 | 12 ~~(RBstart=0)~~ | 50 | 17.9 ~~18.7~~ | | n28 | n94 | 1 | 5 | 15 | 12 ~~(RBstart=0)~~ | 5 | 28.1 | | n28 | n94 | 2 | 5 | 15 | 12 ~~(RBstart=0)~~ | **50** | 17.9 ~~18.7~~ |   **Proposal 10**: Consider adopting the PC2 MSD requirements corrections captured in **Table 17** . If replacing “Void” can not be agreed, we may consider revising this CR during the meeting to insert additional footnotes.  **Table 17** Corrections for NR-CA PC2 MSD requirements and merge of Table 7.3A.4-2a and Table 7.3A.4-2b. |
| [R4-2412621](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412621.zip) (CR) Cat. F  Flagging by Huawei, SKW and ZTE | Qualcomm France | Title: CR for EN-DC Harmonic Mixing clean-up PC3 in TS38.101-3  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** R4-2405453 was agreed in RAN4#110bis, which proposed a set of principles to clean-up RX mixing specification  **Proposal:** PC3 Harmonic mixing MSD table 7.3B.2.3.2-1 are modified according to principles agreed in R4-2405453 and in R4-2410651. Additionally, RBstart for each combination is now described in Note and removed each RBstart =0. |
| [R4-2412622](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412622.zip) (CR) Cat. F  Flagging by Huawei and ZTE | Qualcomm France | Title: CR for EN-DC Harmonic Mixing clean-up PC2 in TS38.101-3  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** R4-2405453 was agreed in RAN4#110bis, which proposed a set of principles to clean-up RX mixing specification  **Proposal:** PC2 Harmonic mixing MSD table 7.3B.2.3.2-1a are modified according to principles agreed in R4-2405453 and in R4-2410651. Additionally, RBstart for each combination is now described in Note and removed each RBstart =0. |
| [R4-2412623](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412623.zip) (CR) Cat. F  Flagging by Huawei and SKW | Qualcomm France | Title: CR for NR CA Harmonic Mixing clean-up PC3 PC5 in TS38.101-1  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** R4-2405453 was agreed in RAN4#110bis, which proposed a set of principles to clean-up RX mixing specification  **Proposal:** PC3, and PC5 Harmonic mixing MSD table 7.3A.4-4 and Table 7.3A.4-4d in TS38.101-1 are modified according to principles agreed in R4-2405453 and in R4-2410651. SCS, and respective BW for some aggressors is corrected to 15kHz. Additionally, RBstart for each combination is now described in Note. UL BW for CA\_n7-n26A is corrected to be same as in EN-DC.   * For PC3 NR CA UE MSD due to harmonic mixing problem, add Note 13 as follow:      * For PC5 NR CA UE MSD due to harmonic mixing problem, add Note 8 as follow: |
| [R4-2412926](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412926.zip) (CR) Cat. F  Flagging by Huawei, SKW and CHTTL | Qualcomm France | Title: CR for NR CA Harmonic Mixing clean-up PC2 PC1.5 in TS38.101-1  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** R4-2405453 was agreed in RAN4#110bis, which proposed a set of principles to clean-up RX mixing specification  **Proposal:** PC2, and PC1.5 Harmonic mixing MSD table 7.3A.4-4a-1 and table 7.3A.4-4a-2 for PC2 and table 7.3A.4-4b for PC1.5 are modified according to principles agreed in R4-2405453 and in R4-2410651. SCS, and respective BW for some aggressors is corrected to 15kHz. Additionally, RBstart for each combination is now described in Note   * For PC2 NR CA UE MSD due to harmonic mixing problem without TxD, add Note 12 as follow:      * For PC2 NR CA UE MSD due to harmonic mixing problem with TxD, add Note 12 as follow:      * For PC1.5 NR CA UE MSD due to harmonic mixing problem, add Notes as follow: |
| [R4-2413019](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413019.zip) (CR) Cat. F  Flagging by Huawei, CHTTL and Nokia | Skyworks Solutions Inc. | Title: CR to TS 38.101-1 Rel-18 NR CA Uplink Harmonic clean-up PC3  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Principles were agreed in R4-2406701, R4-2410651 and discussed in R4-2413063.  **Proposal:**   * 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.  **Please check the detail updated contents in the CR.** |
| [R4-2413022](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413022.zip) (CR) Cat. F  Flagging by Huawei and Nokia | Skyworks Solutions Inc. | Title: CR to TS 38.101-1 Rel-18 NR CA Uplink Harmonic clean-up PC2  **This is a CR (Cat. F) for TS38.101-1 v18.6.0 in Rel-18**  **Reason:** Principles were agreed in R4-2406701, R4-2410651 and discussed in R4-2413063.  **Proposal:**   * Removed “UL” from clause 7.3A.4 title since this clause includes both UL harmonic and Rx mixing MSD requirements. * Modified PC2 UL harmonic MSD test points according to principles agreed in R4-2406701 and based on corrected PC3 MSD. Corrections less than 0.5dB are not implemented.   Merged PC2 UL harmonic MSD tables according to WF R4-2403628.  **Please check the detail updated contents in the CR.** |
| [R4-2413023](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413023.zip) (CR) Cat. F  Flagging by Huawei and Nokia | Skyworks Solutions Inc. | Title: CR to TS 38.101-3 Rel-18 EN-DC Uplink Harmonic clean-up  **This is a CR (Cat. F) for TS38.101-3 v18.6.0 in Rel-18**  **Reason:** Principles were agreed in R4-2406701, R4-2410651 and discussed in R4-2413063.  **Proposal:**   * Modified UL harmonic MSD test points R4-2413063.   **Please check the detail updated contents in the CR.** |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1

*Sub-topic description:* **NR NTN\_LS band**

*Open issues and candidate options before meeting:*

**Issue 1-1-1:** CRs ([R4-2411138](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411138.zip), [R4-2411139](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411139.zip)) for Correction of NS\_05N in band n254 in TS38.101-5 and TR38.741

* Proposals
  + Option 1: Update A-MPR Table of NS\_05N for NTN UE to correct RB\_start is changed from ‘<= 3.6’ to ‘>=3.6’ and LCRB is changed from ‘>0.36’ to ‘>0’ are acdeptable in band n254.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + The CR ([R4-2411138](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411138.zip) for TS38.101-5) and CR ([R4-2411139](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411139.zip) for TR38.741) are agreeable.

### Sub-topic 1-2

*Sub-topic description:* **Correction on NR FDD band\_ ULn28\_DLn75\_n76**

*Open issues and candidate options before meeting:*

**Issue 1-2-1:** CR ([R4-2411221](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411221.zip), [R4-2411222](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411222.zip)) for updating of channel raster for Band n109 in TS38.101-1 & TS38.104

* Proposals
  + Option 1: The last NREF number for the uplink (703 – 733 MHz) should be:

NREF = (733 – 0) MHz / 5 kHz = 146600.

* NWM comments:
  + No NWM flagging.
* Recommended WF
  + The CR ([R4-2411221](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411221.zip), [R4-2411222](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411222.zip)) for TS38.101-1 & TS38.104 are agreeable.

**Issue 1-2-2:** CR ([R4-2413203](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413203.zip)) for correction to co-existence requirement for Band n109 in TS38.141-1

* Proposals
  + Option 1: RAN4 need to update the coexistence requirements in Table 6.6.5.5.1.3-1 to protect 703-733 MHz with -49dBm emission limits.
* NWM comments:
  + Flagging by Nokia to the own CR
    - Revision is needed to correct title and correct [ ] to ( ) - Issue highlighted by RAN4 Chair.
* Recommended WF
  + **CR (**[**R4-2413203**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413203.zip)**) can be revised** to update the Title of CR. Contents are fine to all.

### Sub-topic 1-3

*Sub-topic description:* **LTE\_NR DC band combinations**

*Open issues and candidate options before meeting:*

**Issue 1-3-1:** CR ([R4-2411325](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411325.zip)) to define PC3 MSD for DC\_1A-18A\_n77A and DC\_3A-18A\_n77 in TS38.101-3.

* Proposals
  + Option 1: RAN4 can define PC3 MSD 3.5dB by IMD5 for DC\_1A-18A\_n77A and 15.7dB by IMD3 for DC\_3A-18A\_n77 in TS38.101-3.
  + Option 2: TBA.
* NWM comments:
  + Flagging by SKW and ZTE as below
    - SKW: The test point introduced for DC\_1-18\_n77 is equally applicable to DC\_1-18\_n78. Consider merging the entries for both band combinations or at least mirroring the test point into DC\_1-18\_n78.
    - ZTE: what the reason why the MSD is only defined for DC\_1A-18A\_n77A, but not for DC\_1A-18A\_n78A?
* Recommended WF
  + **CR (**[**R4-2411325**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411325.zip)**) can be revised** to merge both DC\_1-18\_n77 and DC\_1-18\_n78 to equally apply the PC3 MSD 3.5dB.

**Issue 1-3-2:** CR ([R4-2411832](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411832.zip)) to add the missing UL configurations for DC\_1A\_n257(2G) and DC\_7A\_n257(2G) DC combinations in TS38.101-3

* Proposals
  + Option 1: Add additional UL configuration with DC\_1A\_n257(A-G) for DC\_1A\_n257(2G) and DC\_7A\_n257(A-G) for DC\_7A\_n257(2G).
  + Option 2: TBA.
* NWM comments:
  + Flagging by Apple and CHTTL as below
    - Apple: The CR content changes do not align with the "Reason for change" in the cover sheet.
    - CHTTL: The added content is not aligned with the cover page, and these new added configurations are marked as transferred to Rel.19 in the status report, please further check.
* Recommended WF
  + **CR (**[**R4-2411832**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411832.zip)**) can be postponed** to next RAN4 meeting.

**Issue 1-3-3:** CR ([R4-2412047](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412047.zip)) to update term, symbols and abbreviations in TR38.718-11-11 v18.0.0

* Proposals
  + Option 1: RAN4 can update the terms, symbols and abbreviations in TR38.718-11-11.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412047](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412047.zip)) for TR38.718-11-11 can be agreeable

**Issue 1-3-4:** CR ([R4-2412347](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412347.zip)) to remove the unnecessary contents for NE-DC in TS38.101-3

* Proposals
  + Option 1: RAN4 can resubmitted the agreed contents in R4-2410647 for NE-DC UE RF requirements. **Only cover sheet is updated from the previous agreed CR (R4-2410647).**
* NWM comments:
  + Flagging by SKW and ZTE as below
    - SKW: Adding the sentence "The requirements for EN-DC applies for NE-DC unless otherwise specified." in clause 6.1 and 7.1 is not needed since it is already specified in clause 4.2.
    - ZTE: We think there is no problem to list requirments in different subclauses even the requirements for EN-DC applies for NE-DC unless otherwise specified. No changes are needed
* Recommended WF
  + **CR (**[**R4-2412347**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412347.zip)**) in TS38.101-3 can be revised** to remove the sentence "The requirements for EN-DC applies for NE-DC unless otherwise specified." in clause 6.1 and 7.1.

### Sub-topic 1-4

*Sub-topic description:* **NR** **single carrier/NR CA band combinations UE**

*Open issues and candidate options before meeting:*

**Issue 1-4-1:** CR ([R4-2411833](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411833.zip)) to update Delta Tib and related Note for configured Tx power requirements for NR CA UE in TS38.101-1

* Proposals
  + Option 1: If uplink is not supported on a constituted band of the DC/CA band combination, "N/A" is used when deriving the delta TIB requirements for that constituted band of the band combination. Also update note number with ‘Note 10’ for CA\_n39-n40-n41.
  + Option 2: TBA.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2411833](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411833.zip)) can be agreeable.

**Issue 1-4-2:** CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)) to remove the duplicate NR band n100 and revive NR band n102 in Table 5.2-1 in TS38.101-1

* Proposals
  + Option 1: Follow CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)) to remove n100 without note 21 and revive n102 in Table 5.2-1
  + Option 2: Nokia CR ([R4-2411995](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip)) only propose to reestablish n102 in Table 5.2-1
* NWM comments:
  + No flagging on the CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip))
* Recommended WF
  + CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)) can be agreeable and CR ([R4-2411995](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip)) will be merged in the agreed CR.

**Issue 1-4-3:** CR ([R4-2412375](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412375.zip)) to correct 2 bands NR CA configuration tables in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2412375](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 2 bands NR CA configurations in Table 5.5A.3.1-1a, Table 5.5A.3.1-1d and Table 5.5A.3.1-1n.
* NWM comments:
  + Flagging by SKW and Qualcomm as below
    - SKW: What is the reason for removing uplink CA\_n77(2A) BCS0 in the 4th column since it is listed as a valid Uplink configuration in the 2nd column?
    - QC: CA\_n1A-n77(3A), if n77(2A) BCS is removed, then doesn't UL CA for n77(2A) become ambiguous?
* Recommended WF
  + **Need to treat online session to clarify the reason** to remove n77(2A) BCS0 of the CA\_n1A-n77(3A) configuration, then CR ([R4-2412375](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412375.zip)) status can be decided.

**Issue 1-4-4:** CR ([R4-2412376](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) to correct 2 bands NR CA configuration tables in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2412376](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 2 bands NR CA configuration Table 5.5A.1.1-1k in TS38.101-3.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412376](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) can be agreeable.

**Issue 1-4-5:** CR ([R4-2412377](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip)) to correct 3 bands NR CA configuration table 5.5A.3.2-1a in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2412377](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 3 bands NR CA configuration table 5.5A.3.2-1a in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412377](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip)) can be agreeable.

**Issue 1-4-6:** CR ([R4-2412378](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip)) to correct 3 bands NR CA configuration table 5.5A.1.2-1b in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2412378](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 3 bands NR CA configuration table 5.5A.1.2-1b in TS38.101-3.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412378](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412378.zip)) can be agreeable.

**Issue 1-4-7:** CR ([R4-2412379](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip)) to correct 4 bands NR CA configuration table 5.5A.3.3-1a in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2412379](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 4 bands NR CA configuration table 5.5A.3.3-1a in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412379](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412379.zip)) can be agreeable.

**Issue 1-4-8:** CR ([R4-2412380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412377.zip)) to correct 4 bands NR CA configuration table 5.5A.1.3-1a in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2412380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412376.zip)) RAN4 can correct 4 bands NR CA configuration table 5.5A.1.3-1a in TS38.101-3.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412380.zip)) can be agreeable.

**Issue 1-4-9:** Draft CR ([R4-2412882](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) to clarify single UL configuration for NR CA in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2412882](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) RAN4 can agree as follow updates in 5.5A.0 general part in TS38.101-1

- Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier,

- If an uplink CA configuration is specified, it means that any valid constituent single uplink carrier and UL CA configuration of the downlink inter-band CA combination is specified.

* NWM comments:
  + Flagging by Samsung, CHTTL and SKW
    - Samsung: need more offline discussion
    - CHTTL: we feel like configured is better here. Our understanding is the 1st and 2nd sentence are expressing slightly different meanings that 1st only focus on the meaning of “-”, the second one also covers others. And the last sentence become confusing after the revision.
    - SKW: Need to further discuss. In our view, there is no need to bring these corrections. The original CR that we co-signed used the term "valid configuration" rather than "specified configuration" because the goal was to remove any ambiguity about what the "-" meant in these tables. Also, the agreed text "can be configured" seems more appropriate than "is specified" because clause 5.5A.3 defines the supported (or valid) Configurations for inter-band CA, i.e. it defines which DL or which UL configuration(s) are supported.
* Recommended WF
  + **Draft CR (**[R4-2412882](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)**) can be treated in online session** to solve Samsung, CHTTL and SKW concerning points.

**Issue 1-4-10:** Draft CR ([R4-2412883](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) to clarify single UL configuration for NR CA in TS38.101-2

* Proposals
  + Option 1: Based on CR ([R4-2412883](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) RAN4 can agree as follow updates in 5.5A Configurations for CA in TS38.101-2

- Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier,

- If an uplink CA configuration is specified, its fallback single uplink is also supported it means that any valid constituent single uplink carrier and UL CA configuration of the downlink inter-band CA combination is specified.

* NWM comments:
  + Flagging by Samsung, CHTTL as below
    - Samsung: need more offline discussion
    - CHTTL: we feel like configured is better here. Our understanding is the 1st and 2nd sentence are expressing slightly different meanings that 1st only focus on the meaning of “-”, the second one also covers others. And the last sentence become confusing after the revision.
* Recommended WF
  + **Draft CR (**[R4-2412883](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)**) can be treated in online session** to solve Samsung and CHTTL concerning points.

**Issue 1-4-11:** Draft CR ([R4-2412884](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) to clarify single UL configuration for NR CA in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2412884](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)) RAN4 can agree as follow updates in 5.5A.1.0 general part in TS38.101-3
* Unless otherwise noted, Uplink CA configuration entries with "-" mean that any valid constituent band of the downlink inter-band CA combination is specified as a single uplink carrier,
* If an uplink CA configuration is specified, it means that any valid constituent single uplink carrier and UL CA configuration of the downlink inter-band CA combination is specified.
* NWM comments:
  + Flagging by Samsung, CHTTL as below
    - Samsung: need more offline discussion
    - CHTTL: we feel like configured is better here. Our understanding is the 1st and 2nd sentence are expressing slightly different meanings that 1st only focus on the meaning of “-”, the second one also covers others. And the last sentence become confusing after the revision.
    - SKW: Need to further discuss. In our view, there is no need to bring these corrections. The original CR that we co-signed used the term "valid configuration" rather than "specified configuration" because the goal was to remove any ambiguity about what the "-" meant in these tables. Also, the agreed text "can be configured" seems more appropriate than "is specified" because clause 5.5A.3 defines the supported (or valid) Configurations for inter-band CA, i.e. it defines which DL or which UL configuration(s) are supported.
* Recommended WF
  + **Draft CR (**[R4-2412884](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412882.zip)**) can be treated in online session** to solve Samsung, CHTTL and SKW concerning points.

**Issue 1-4-12:** CR ([R4-2413053](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413053.zip)) to correct of ACLR for NR CA\_NC\_NS\_100 in TS38.101-1

* Proposals
  + Option 1: Based on WF(R4-2403824), RAN4 can update how to apply the UTRA ACLR requirements in TS38.101-1.
  + For 10<=Wgap < 20MHz: only the UTRA ACLR1 requirement applies is the gap
  + For Wgap >= 20MHz: both the UTRA ACLR1 and the UTRA ACLR2 requirements apply is the gap.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413053](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413053.zip)) can be agreeable.

**Issue 1-4-13:** CR ([R4-2413399](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413399.zip)) to add 35MHz CBW for NS\_35 in TS38.101-1

* Proposals
  + Option 1: RAN4 can add 35MHz CVW in n71 with NS\_35 in Table 6.2.3.1-1 in TS38.101-1.
* NWM comments:
  + Flagging by Huawei, Nokia and Qualcomm as below
    - HW: There were no change marks in the CR, but the revised CR in draft folder is OK.
    - Nokia: No track changes
    - Qualcomm: No tracked changes so what is being changed?
* Recommended WF
  + Moderator Note: **There were not any change marks in the CR and need to revise the CR** to add 35MHz CBW in n71 band with NS\_35. Hence, SKW already shared the revised CR in Draft folder in [112][102]. **The revised CR in draft folder can be agreeable.**

### Sub-topic 1-5

*Sub-topic description:* **IoT NTN\_FDD LS bands**

*Open issues and candidate options before meeting:*

**Issue 1-5-1:** CR ([R4-2411542](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411542.zip)) to 36.102 for IoT-NTN UE RF requirements

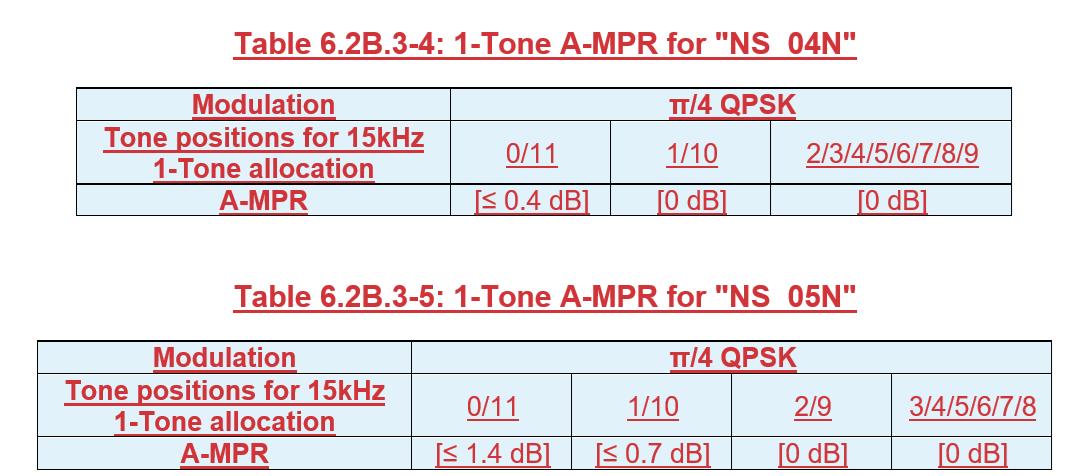
* Proposals
  + Option 1: The additional out-of-band requirements in Table 6.5A.4.4.5-1 in TS36.102 should be applied to both NS\_04N and NS\_05N. Also, need to update the requirement in subclause 6.5A.4.4.6 which is incorrect.
  + Option 2: TBA.
* NWM comments:
  + Flagging by Huawei and QC as below
    - HW: ME on the coversheet should be selected. And can Cat D be used?
    - QC: The table should be introduced to NS\_05 section as it is confusing to have NS\_05 requirements under NS\_04 clause
* Recommended WF
  + **CR (**[**R4-2411542**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411542.zip)**) can be revised** to use CR Cat.F instead of Cat.D since the incorrected additional in-band requirements for "NS\_05N should be updated in own clause 6.5A.4.4.6 as mentioned Qualcomm. Also, CR cover sheet should be denoted and selected with ME.

**Issue 1-5-2:** CR ([R4-2411543](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411543.zip)) to 36.102 for the NS\_04N/NS\_05N A-MPR requirements.

* Proposals
  + Option 1: Based on A-MPR values in TR36.764, RAN4 can define NS\_04N/NS\_05N A-MPR requirements with 3/6/12 Tones operation for IoT-NTN band 254 (L+S band).
* NWM comments:
  + Flagging by Huawei and QC as below
    - HW: The applicable power class should be specified, probably PC3 only. Additionally, ME on the coversheet should be selected.
    - QC: The A-MPR values need further checking: the requirement is more stringent than e.g. the FCC mask but A-MPR is very small. Would be good to clarify e.g. PA calibration and I-Q impairment levels which resulted in this conclusion
* Recommended WF
  + **CR (**[**R4-2411543**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411543.zip)**) in TS36.102 can be postponed** to collect more A-MPR results and need to indicate the applicable power class in clause 6.2B.3 and update cover sheet to denoted and selected with ME.

**Issue 1-5-3:** CR ([R4-2411544](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411544.zip)) to 36.102 for the NS\_04N/NS\_05N A-MPR requirements with 1-Tone allocation

* Proposals
  + Option 1: RAN4 can define NS\_04N/NS\_05N A-MPR requirements with 1-Tone allocation for IoT-NTN band 254 (L+S band) as follow



* + Option 2: TBA.
* NWM comments:
  + Flagging by Huawei, Apple and QC as below
    - HW: Single-tone is important for coverage. Need more evidence to confirm if the proposed A-MPR is needed. And the modulation format should be QPSK not pi/4 QPSK. The applicable power class should be specified, probably PC3 only. Additionally, ME on the coversheet should be selected.
    - Apple: There is currently no MPR defined for single tone operation. This should be introduced before A-MPR.
    - QC: More information needed on the evaluation assumptions before agreeing conclusions
* Recommended WF
  + **CR (**[**R4-2411544**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411544.zip)**) can be postponed to** encourage to collect MPR/A-MPR requirements for single Tone from interested companies. Based on the MPR requirements, RAN4 can define the A-MPR requirements in upcoming RAN4 meeting from the interested companies’s evidence for single Tone.

### Sub-topic 1-6

*Sub-topic description*: **NR\_FR1\_lessthan\_5MHz\_BW**

*Open issues and candidate options before meeting:*

**Issue 1-6-1:** CR ([R4-2411834](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411834.zip)) for TS 38.101-1 on narrow band blocking for 3MHz channel bandwidth

* Proposals
  + Option 1: Based on CR ([R4-2411834](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411834.zip)), RAN4 update the power of unwanted DL signal Puw(CW) with -55dBm is missing for narrow band blocking for 3MHz CBW.
  + Option 2: TBA.
* NWM comments:
  + Flagging by Nokia and SKW. Based on comments by nwm flagging, ZTE updated and shared the revised CR in draft folder
    - Nokia & SKW: better to merge cell in Table than add another -55
* Recommended WF
  + **CR (**[**R4-2411834**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411834.zip)**) can be revised** to merge cell to use -55dBm for narrow band blocking for 3MHz CBW. **The revised CR in draft folder can be agreeable.**

**Issue 1-6-2:** CR ([R4-2413212](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413212.zip)) for TS38.101-1 for 3MHz channel bandwidth optional supporting for bands n31 and n72

* Proposals
  + Option 1: Based on CR ([R4-2413212](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413212.zip)), RAN4 add the **Note 4** for n31 and n72 tosupport 3 MHz channel bandwidth as optional in TS38.101-1.
  + Option 2: TBA.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413212](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413212.zip)) can be agreeable.

### Sub-topic 1-7

*Sub-topic description*: **Correction on High power UE related Topics**

*Open issues and candidate options before meeting:*

**Issue 1-7-1**: CR ([R4-2411928](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411928.zip), [R4-2411929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411929.zip)) to remove superscript NOTE 6 for PC2 TDD-TDD inter-band CA in TS38.101-1

* Proposals
  + Option 1: Based on CR([R4-2411928](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411928.zip), [R4-2411929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411929.zip)), RAN4 can remove Note 6 for PC2 TDD-TDD inter-band CA band combinations in Table 6.2A.1.3-1 in TS38.101-1 for both Rel-17 and Rel-18.
  + Option 2: TBA
* NWM comments:
  + Flagging by CHTTL and QC as below
    - CHTTL: the note 6 also mentions TDD band can be PC3 or PC2, cannot understand why note 6 need to be removed from TDD-TDD
    - QC: There should probably be a new note for TDD-TDD saying "UE supports either PC3 or PC2 within NR TDD band"?
* Recommended WF
  + **CR (**[**R4-2411929**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411929.zip) **for Rel-18 &** [[**R4-2411928**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411928.zip)](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408803.zip) **for Rel-17) can be further discussed in online session** . As Moderator perspective, these two CRs contents can be agreeable to remove TDD-TDD band combinations since Note 6 would be applicable to FDD-TDD band combinations only. Also, RAN4 can add new Note for TDD-TDD band combinations. Also RAN4 can agree two individual CR for Rel-17 and Rel-18 with Cat.F since there are different PC2 TDD-TDD inter-band CA combinations between Rel-17 and Rel-18.

**Issue 1-7-2**: CR ([R4-2413128](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip)) to add missing HPUE for TDD configurations in TS38.101-1

* Proposals
  + Option 1: Based on agreed TPs (R4-2410544, R4-2409351, R4-2409346 and R4-2409350) in TR38.899, RAN4 add PC2 CA\_n3A-n78(2A), CA\_n1A-n3A-n78(2A), CA\_n3A-n28A-n78(2A) and CA\_n7A-n28A-n78A in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413128](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip)) can be agreeable.

**Issue 1-7-3**: CR ([R4-2413150](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip)) to add missing HPUE for TDD configurations in TS38.101-1

* Proposals
  + Option 1: Based on agreed TP (R4-2410554) in TR38.850, RAN4 add PC2 to the n7 uplink of CA\_n7A-n78A in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413150](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413128.zip)) can be agreeable.

**Issue 1-7-4**: CR ([R4-2413294](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)) to add n718 in the uplink configuration for CA\_n71A-n77A in Table 5.5A.3.1-1 in TR38.850.

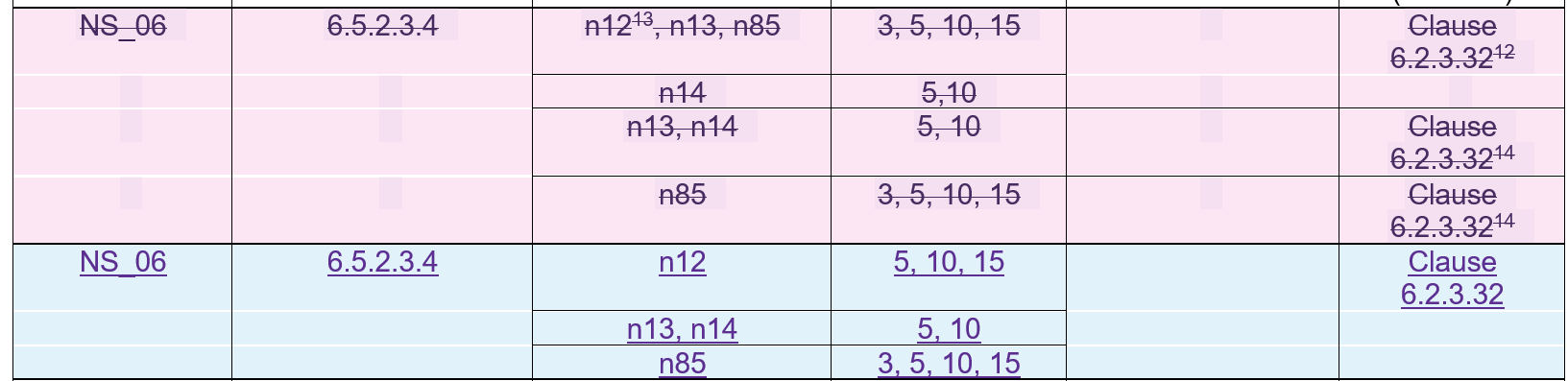
* Proposals
  + Option 1: RAN4 can add n71 in the uplink configuration for CA\_n71A-n77A in Table 5.5A.3.1-1 in TR38.850.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413294](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)) can be agreeable.

**Issue 1-7-5**: CR ([R4-2413295](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)) to add n718 in the uplink configuration for CA\_n71A-n77A in TS38.101-1.

* Proposals
  + Option 1: RAN4 can add Add n718 in the uplink column for DL CA\_n71A-n77A in Table 5.5A.3.1-1n in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413295](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413295.zip)) can be agreeable.

**Issue 1-7-6**: CR ([R4-2413296](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)) to update NS\_06 in TS38.101-1.

* Proposals
  + Option 1: Due to error in NS\_06 for n13 which were listed in that 3 and 15 MHz. RAN4 need to update as follow and update Note 11~14 as Void



* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413296](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413296.zip)) can be agreeable

**Issue 1-7-7**: CR ([R4-2413297](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)) for various corrections for CA and HPUE in TS38.101-1.

* Proposals
  + Option 1: The following contents are updated in CR ([R4-2413297](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip))
  + CA\_n25(3A) BCS4 and 5 only covered 2 BW columns
  + CA\_n1A-n77(2A) had a line missing in the UL column
  + CA\_n2A-n71A and CA\_n2(2A)-n71A had an extraneous “-“ in the uplink column
  + CA\_n2(2A)-n77C had some inappropriate dahsed lines in the first two columns
  + CA\_n3A-n78(2A) had a red “8” for UL n78
  + The UL configurations for CA\_n25A-n41A had accidentally been added to CA\_n25(2A)-n38A when the CR was implemented
  + Also, CA\_n25A-n41A had superscript 13,14 in the first column
  + CA\_n25A-n41C-n66(2A)-n71A UL CA\_n66A-n71A was listed as CA\_n66A-n71
  + A line was missing below CA\_n41A-n66(2A)-n71A-n77A
  + n48 was in the wrong order in Table 7.3A.4-1a
  + Many bands were out of order in Table 7.3A.4-2a and Table 7.3A.4-2b
  + n77 was out of order in Table 7.3A.4-4c
* NWM comments:
  + Flagging by Huawei and CHTTL as below
    - HW: MSD part must be treated by either Sky CR or QC. Otherwise, the secretary will see a problem or need a similar CR in the next meeting.
    - CHTTL: The changes for CA\_n2A-n71A & CA\_n2(2A)-n71A seems different from the big CR R4-2321864? And should n8 n41 ref execption to be before n8 n79?
* Recommended WF
  + Moderator recommendation: The HW flagging is not technical concerning. It is related to the procedure to treat MSD CR. Based on CHTTL comment, **CR (**[**R4-2413297**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413294.zip)**)** **should be clarified for the different MSD requirements from the big CR R4-2321864.**

### Sub-topic 1-8

*Sub-topic description*: **Adding ETSI TC RT in TS38.101-1**

*Open issues and candidate options before meeting:*

**Issue 1-8-1:** CR ([R4-2411994](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411994.zip)) for TS38.101-1: addition of ETSI TC RT based on ECC Decision(20)02 reference to NB blocking

* Proposals
  + Option 1: Based on CR ([R4-2411994](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411994.zip)), RAN4 update of ETSI TC RT based on ECC Decision(20)02 reference to NB blocking. Space added to existing note in Table 7.6.2-2: In-band blocking, Table 7.6.3-2: Out of-band blocking and add the same Note in Table 7.6.4-2: Narrow band blocking in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2411994](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411994.zip)) can be agreeable.

### Sub-topic 1-9

*Sub-topic description*: **NR-U 6GHz unlicensed bands**

*Open issues and candidate options before meeting:*

**Issue 1-9-1:** CR ([R4-2411995](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip)) to reestablish NR band n102 in Table 5.2-1 in TS38.101-1.

This topic is related to **Issue 1-4-2**

* Proposals
  + Option 1: Follow CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)) to remove n100 without note 21 and revive n102 in Table 5.2-1
  + Option 2: Nokia CR ([R4-2411995](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip)) only propose to reestablish n102 in Table 5.2-1
* NWM comments:
  + TBA
* Recommended WF
  + Moderator recommendation: **Ericsson CR (**[**R4-2412374**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)**) will cover this topic** in this RAN4 meeting and The CR ([R4-2411995](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112/Docs/R4-2411995.zip)) will be merged in CR ([R4-2412374](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412374.zip)).

.

### Sub-topic 1-10

*Sub-topic description*: **Correction** **on REFSENS & MSD**

*Open issues and candidate options before meeting:*

**Issue 1-10-1:** Discussion paper ([R4-2412613](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412613.zip), Qualcomm) for PC2 FDD MSD Correction Format to distinguish single Tx and dual Tx

* Proposals
  + Option 1: RAN4 revert back to single PC2 MSD tables for Cross-band, UL Harmonic, and Harmonic mixing, and to use notes to distinguish 1TX and 2TX FDD aggressor cases.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| UL band | DL band | UL Fc | UL BW | SCS of UL band | UL RB Allocation | DL Fc | DL BW | MSD | Cross-band  Interference  source |
| (MHz) | (MHz) | (kHz) | LCRB | (MHz) | (MHz) | (dB) |
| n25 | n66 | 1890 | 40 | 15 | 50 (RBstart=176) | 2112.5 | 5 | 0.84 | >ACLR2 |
| n25 | n66 | 1890 | 40 | 15 | 50 (RBstart=176) | 2112.5 | 5 | 1.15 | >ACLR2 |
| NOTE 1: Applicable only when harmonic mixing MSD for this combination is not applied.  NOTE 2: Void.  NOTE 3: The requirements only apply for UEs supporting inter-band carrier aggregation with simultaneous Rx/Tx capability. Simultaneous Rx/Tx capability does not apply for UEs supporting band n78 with a n77 implementation.  NOTE 4: Applicable to UE supporting PC2 with single Tx.  NOTE 5: Applicable to UE supporting PC2 with dual Tx. | | | | | | | | | | |

* + Option 2: Keep the agreements of MSD table format in WF (R4-2403628) & R4-2413063.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **UL band** | **DL band** | **UL BW** | **SCS of UL band** | **UL RB Allocation** | **DL BW** | **MSDX** | **MSDY** | **UL/DL fc condition** | **UL/DL harmonic order** |
| **(MHz)** | **(kHz)** | **LCRB** | **(MHz)** | **(dB)** | **(dB)** |
| n3 | n78 | 5 | 15 | 12 | 10 | 27.1 | 32.3 | NOTE 2 | UL2/DL1  direct-hit |
| n3 | n78 | 5 | 15 | 12 | 100 | 16.6 | 20.8 | NOTE 2 | UL2/DL1  direct-hit |
| NOTE 2: The requirements should be verified for UL NR-ARFCN of the aggressor (high) band (superscript HB) such that in MHz and  with carrier frequency in the victim (lower) band in MHz and  the channel bandwidth configured in the higher band.  NOTE X: Applicable to UE supporting PC2 with single Tx.  NOTE Y: Applicable to UE supporting PC2 with dual Tx. | | | | | | | | | |

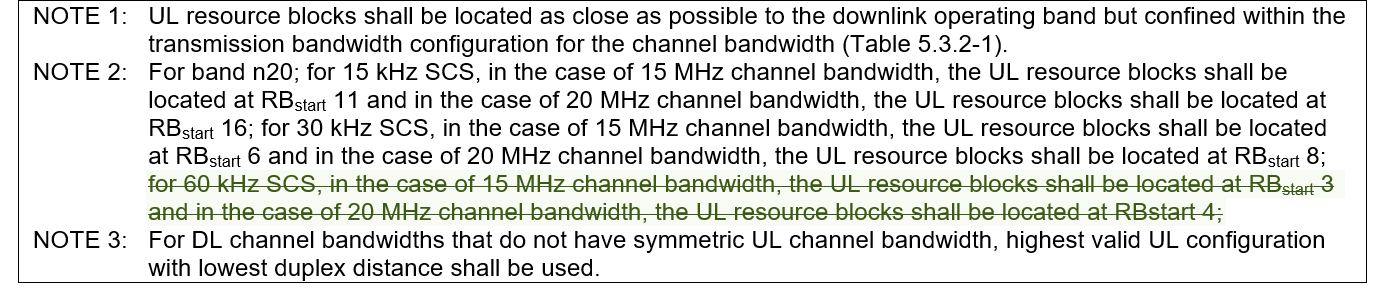
* Recommended WF
  + Moderator recommend: Option 2 can be used based on agreed WF.

**Issue 1-10-2:** CR ([R4-2412625](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412625.zip)) on TS38.101-1: Add missing MSD for CA\_n2A-n66A and for CA\_n25A-n66A PC3

* Proposals
  + Option 1: Based on CR ([R4-2412625](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412625.zip)), RAN4 update the missing MSD corrections in TS38.101-1.
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2412625](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412625.zip)) can be agreeable.

**Issue 1-10-3:** CR ([R4-2413024](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413024.zip)) on TS38.101-1 in Rel-15: REFSENS corrections for SCS 60 kHz to Band n20

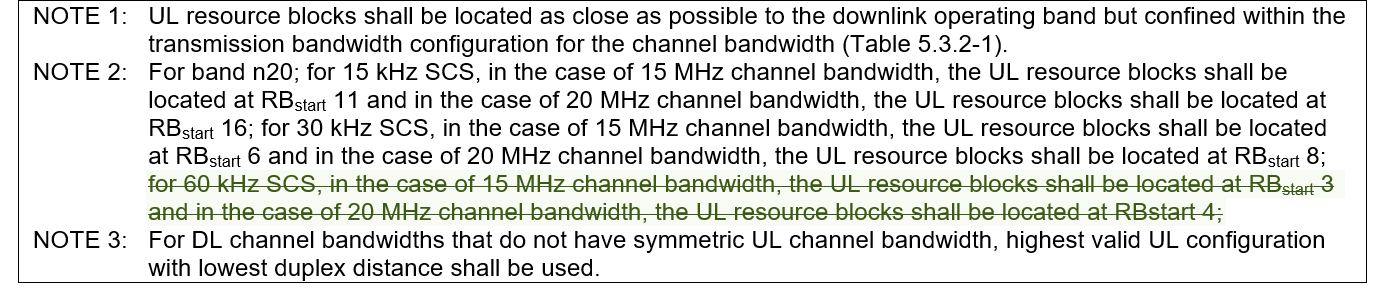
* Proposals
  + Option 1: RAN4 can delete text related to SCS 60kHz from NOTE 2 for Band n20.

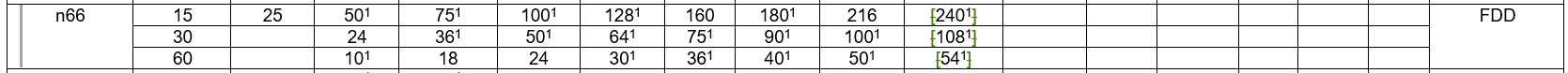
.

* NWM comments:
  + No NWM flagging.
* Recommended WF
  + Both Rel-15 Cat. F CR ([R4-2413024](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413024.zip)) and **Rel-16 Cat. A CR (**[**R4-2413025**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413025.zip)**) can revised to** add correct WI code with TEI15.

**Issue 1-10-4:** CR ([R4-2413032](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413032.zip)) on TS38.101-1 in Rel-17: REFSENS corrections for SCS 60 kHz to Band n20

* Proposals
  + Option 1: RAN4 can delete text related to SCS 60kHz from NOTE 2 for Band n20. Also, remove square brackets for band n66 45MHz CBW RB allocations as follow

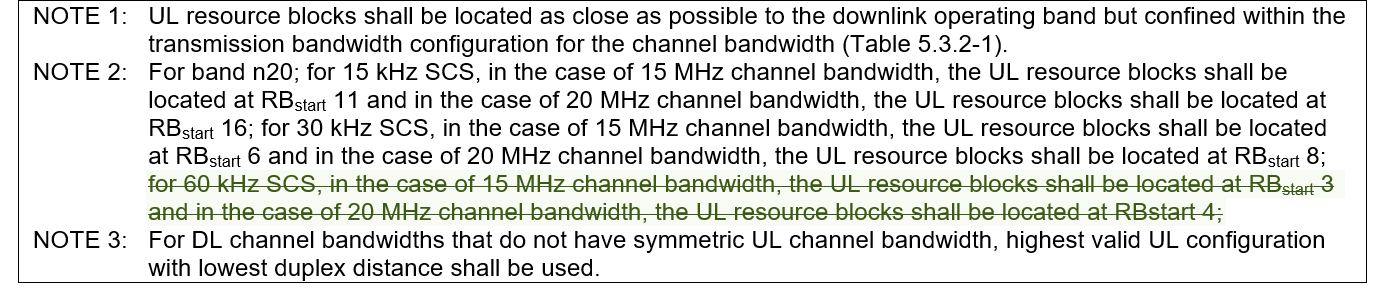
P1.

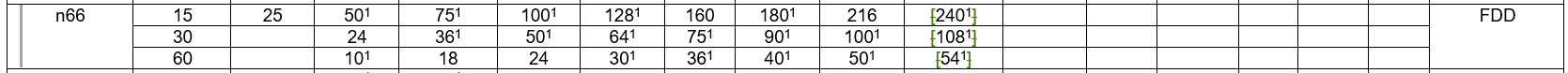
P2. 

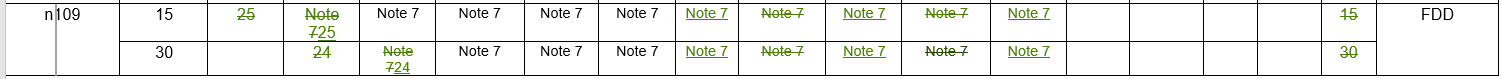
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2413032](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413032.zip)) Cat.F as TEI-17 can be agreeable.

**Issue 1-10-5:** CR ([R4-2413034](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413034.zip)) on TS38.101-1 in Rel-18: REFSENS corrections for SCS 60 kHz to Band n20

* Proposals
  + Option 1: RAN4 can delete text related to SCS 60kHz from NOTE 2 for Band n20 and remove square brackets for band n66 45MHz CBW RB allocations. Also, request to shift the band n109 UL RB allocation to the appropriate position in Table 7.3.2-3 as follow

P1.

P2. 

P3. 

* NWM comments:
  + Flagging by SKW to the own CR as below
    - CR need to revise to correct WI code and R-16 Cat A CR also needed which is missing.
* Recommended WF
  + **CR (**[**R4-2413034**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413034.zip)**) can be revised** to add correct WI code in Rel-18 and **Rel-16 Cat.A CR (R4-2413025) also needed**.

**Issue 1-10-6:** CR ([R4-2413035](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413034.zip)) on TS38.101-1 in Rel-18: PC2/PC3 intra-band CA REFSENS corrections

* Proposals
  + Option 1: Based on agreed WF(R4-2406683, R4-2403628), RAN4 update the following corrections

1. Changes to Symbols: as agreed in WF R4-2403628.
2. Changes to core requirements:

* 7.3A.2.1: clarified PC3 applicability based on WF R4-2403628.
* 7.3A.2.1: Added clarifications for PC2 applicability based on WF R4-2406683.
* 7.3A.2.2: clarified PC3 applicability based on WF R4-2403628 and aligned text with clause 7.3A.2.1 for consistency.

1. Changes to REFSENS Tables:

* Changed the title of Table 7.3A.2.1-1 to clarify these are PC3 requirements and to bring consistency with other table titles
* PC3 one uplink carrier requirements were meant to be introduced in Table 7.3A.2.1-2, but this table was voided in 18.6.0. These requirements are captured in new Table 7.3A.2.1-1a
* Aligned the title of PC2 Table 7.3A.2.1-3 with other tables for consistency
* Table 7.3A.2.2-1:
  + Changed title to clarify PC3 applicability and align text with table 7.3A.2.1-1
  + Added the missing term “SCC” to the title of column ΔRIBNC,
* Changed the title of Table 7.3A.2.2-2 to align with the title of Table 7.3A.2.1-1.
* NWM comments:
  + Flagging by CHTTL as below
    - CHTTL: Table 7.3A.2.1-3 is for contiguous CA but delta RIBNC is used? And would like to clarify, the further changes in 7.3A.2.1 seems specifically for n71B, for other contiguous CA with single UL, the delta R IBC is 0?
* Recommended WF
  + **Need to treat online session for this CR**. **CR (**[**R4-2413035**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413034.zip)**) can be revised** to clarify the delta RIBNC for intra-band contiguous CA and need to clarify for n71B with single UL, for other contiguous CA with single UL, the delta RIBC is 0?

**Issue 1-10-7:** CR ([R4-2413060](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413060.zip)) to TS 38.101-1 Rel-18 Dual-UL IMD corrections

* Proposals
  + Option 1: Based on CR ([R4-2413060](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413060.zip)), RAN4 update the following corrections

1. Update contents in Table 7.3A.5-1 for PC3 UE and Table 7.3A.5-1a for PC2 UE.
2. Some typos need to be corrected and a test point is missing for CA\_n18-n41.
3. In the PC2 table, typos correction is needed and
   * + for CA\_n8\_n77: two test points are specified with contradictory MSD requirements.
     + for CA\_n41-n77: band n77 IMD9 MSD is missing.

* NWM comments:
* Flagging by CHTTL and ZTE as below
  + - CHTTL: minor typo CA\_n18\_n41? 🡪 should be CA\_n18-n41 in Table 7.3A.5-1:
    - ZTE: There is a TP for R19 TR38719-02-01 n18-n41 in R4-2412850 in this meeting, but the MSD proposed in the R19 TP is different with the R18 CR.
* Recommended WF
  + **CR (**[**R4-2413060**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413060.zip)**) can be revised** to remove the proposed MSD for CA\_n18-n41 in Table 7.3A.5-1 since RAN4 already captured the MSD with 24.3 dB by IMD3 of CA\_n18-n41 as follow
  + **The existing MSD requirements in n18 DL band by IMD3 of dual uplink CA\_n18-n41 in TS38.101-1 v18.6.0**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA\_n18-n41 | n18 | 820 | 5 | 25 | 865 | 24.6 | FDD | IMD3 |
|  | n41 | 2505 | 5 | 25 | 2505 | N/A | TDD | N/A |

* + If proponent to revise the MSD level for CA\_n18-n41, then use the latest TS38.101-1 v18.6.0 in Table 7.3A.5-1.

### Sub-topic 1-11

*Sub-topic description*: **Correction on Rx Harmonic mixing related topics**

*Open issues and candidate options before meeting:*

**Issue 1-11-1:** Discussion paper ([R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW)) on “RBstart position” for harmonic/harmonic mixing clean up:

* Proposals
  + Option 1: Use “RBstart =0” to ensure that the non-fully allocated RBs are centered in the middle of the UL channel for MSD due to the harmonic mixing problem.
  + Option 2: Based on SKW paper ([R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip)), removes RBstart=0 from all UL harmonic MSD tables (NR-CA and EN-DC). To ensure UL RBs are centered in the middle of the UL carrier, an equation that defines RBstart is added to the NOTE 1 of TS 38.101-1 Table 7.3A.4-1.
* Recommended WF
  + **Need further discussion in Online session.**

**Issue 1-11-2:** Discussion paper ([R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW)) on LCRB allocation for harmonic/harmonic mixing clean up:

* Proposals
  + Option 1: Use the following rules to specify UL RB allocation and RB start for UL harmonic and RX mixing cases.
    - LCRB\_UL=Floor(NRB\_DL/UL harmonic order)
    - RBstart=Floor((NRB\_UL-LCRB\_UL)/2)
  + Option 2: Keep the agreements RAN4 recommends that UL Lcrb are corrected as follows for SCS 15kHz / SCS 30kHz respectively:
    - For UL2/DLx test point, LCRB=12RB / 6RB
    - For UL3/DLx test point, LCRB=8RB / 4RB
    - For UL4/DLx test point, LCRB=6RB / 3RB
    - For UL5/DLx test point, LCRB=5RB / 2RB
    - Additionally, for UL Rx harmonic mixing UL1/DLx, Lcrb=25RB / 12RB
  + Option 3: consider case by case LCRB for each CA/DC combinations.
    - LCRB =8 for PC3 CA\_n7-n105 to derive MSD of band n7
    - LCRB =5 for PC3 CA\_n78-n105 to derive MSD of band n78
    - LCRB =5 for PC3 DC\_42-n28 to derive MSD of band 42
  + Option 4: Other option is not precluded
* Recommended WF
  + **Need further discussion in Online session**. Detail test points can be treated in CR ([R4-2413023](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413023.zip))

**Issue 1-11-3:** Discussion paper ([R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW)) on Direct hit harmonic test case:

* Proposals
  + Option 1: Update Note 1 as follow:
    - 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. These requirements shall be verified with UL RB Allocation RBstart = floor((NRB-LCRB)/2), where floor(x) is the greatest integer less than or equal to x, and NRB is the maximum number of RBs for a given channel bandwidth and sub-carrier spacing defined in TS 38.101-1 Table 5.3.2-1.
  + Option 2: Other option is not precluded
* Recommended WF
  + **Need further discussion in Online session**.

**Issue 1-11-4:** Discussion paper ([R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW)) on Direct hit harmonic test points for CA\_n2-n48 in TS38.101-1 and DC\_2\_n48, DC\_48\_n2 in TS38.101-3:

* Proposals
  + Option 1: Removed the test point since these band combinations do not meet the Note 1 direct-hit criteria of TS 38.101-1 Table 7.3A.4-1. These band combinations are affected only by near-miss harmonic MSD as shown in Figure 9 in [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip).
  + Option 2: Other option is not precluded
* Recommended WF
  + **Need further discussion in Online session**. Detail test points can be treated in CR ([R4-2413023](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413023.zip))

**Issue 1-11-5:** Discussion paper ([R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW)) on General principle for the near-miss MSD test points:

* Proposals
  + Option 1: Adopt the following new test conditions for near-miss MSD test points.
    - Near-miss MSD test points are specified only for UL2/DL1 harmonic interference and only when the band combination does not meet the direct-hit criteria.
    - For near-miss MSD test points, the MSD is specified with;
      * UL CBW = 5MHz
      * UL LCRB = 25RB (fully allocated)
      * The Note 6 of Table 7.3A.4-1/ Note 6 of TS 38.101-3 Table 7.3B.2.3.1-1 is modified as:

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.

* + Option 2: Other option is not precluded
* Recommended WF
  + **Need further discussion in Online session**. Detail test points can be treated in CR ([R4-2413023](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413023.zip))

**Issue 1-11-6:** CR ([[R4-2412621](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412621.zip)](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip)) on PC3 EN-DC harmonic mixing clean-up in TS38.101-3

* Proposals
  + Option 1: Update the MSD test points in Table 7.3B.2.3.2-1 due to receiver harmonic mixing for EN-DC in NR FR1
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei, SKW and ZTE as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - SKW: Minor correction: Lcrb should be specified to 6 for UL4/DLx test points.
    - ZTE: it seems this CR is not based on the latest specification. For the new added NOTE 13~16, the valid MSD test point should be guarantee, i.e. the equation such as 'Ful\_low+BW/2<=Ful <= FUL-BW/2' should be added, similar with existing NOTE 2/4/8
* Recommended WF
  + **Need to treat in online session to** how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW). Also need to update LCRB is 6 RBs for UL4/DLx test points and reflect ZTE comments.

**Issue 1-11-7:** CR ([R4-2412622](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412622.zip)) on PC2 EN-DC harmonic mixing clean-up in TS38.101-3

* Proposals
  + Option 1: Update the MSD test points of PC2 UE in Table 7.3B.2.3.2-1a due to receiver harmonic mixing for EN-DC in NR FR1
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei and ZTE as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - ZTE: it seems this CR is not based on the latest specification. For the new added NOTE 13~16, the valid MSD test point should be guarantee, i.e. the equation such as 'Ful\_low+BW/2<=Ful <= FUL-BW/2' should be added, similar with existing NOTE 2/4/8
* Recommended WF
  + **Need to treat in online session to** how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW). Also need to update or clarify the ZTE comments.

**Issue 1-11-8:** CR ([R4-2412623](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412623.zip)) on PC3 PC5 NR CA harmonic mixing clean-up in TS38.101-1

* Proposals
  + Option 1: Update the PC3 and PC5 Harmonic mixing MSD table 7.3A.4-4 and Table 7.3A.4-4d in TS38.101-1 due to receiver harmonic mixing for NR CA in NR FR1
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei and SKW as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - SKW: Minor correction: Lcrb should be specified to 6 for UL4/DLx test points.
* Recommended WF
  + **Need to treat in online session to** how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW). Also need to update LCRB is 6 RBs for UL4/DLx test points.

**Issue 1-11-9:** CR ([R4-2412926](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412926.zip)) on PC1.5 PC2 NR CA harmonic mixing clean-up in TS38.101-1

* Proposals
  + Option 1: Update the PC2 and PC1.5 Harmonic mixing MSD table 7.3A.4-4a-1 and table 7.3A.4-4a-2 for PC2 and table 7.3A.4-4b for PC1.5 are modified due to receiver harmonic mixing for NR CA in NR FR1
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei, SKW and CHTTL as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - SKW: Minor correction: Lcrb should be specified to 6 for UL4/DLx test points.
    - CHTTL: Why some of the 2nd test points are removed?
* Recommended WF
  + **Need to treat in online session to** clarify the CHTTL concerning points and how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW). Also need to update LCRB is 6 RBs for UL4/DLx test points by SKW comment.

**Issue 1-11-10:** CR ([R4-2413019](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413019.zip)) on PC3 NR CA Uplink Harmonic clean-up in TS38.101-1

* Proposals
  + Option 1: Update the following contents for MSD tables of PC3 NR CA UE due to harmonic problem.
    - 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.
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei, CHTTL and Nokia as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - CHTTL: Would like to discuss do we really need to remove the existing near miss test points or the principle applies for future combos, concerning impact to R5?
    - Reply from SKW for CHTTL question: The motivation for **removing the near-miss MSD test points in case direct-hit collision occurs was discussed at RAN4 #111 and approved in WF R4-2410651**. We can further discuss offline.
    - Nokia: It may be okay with this update but since the MSD values for "near-miss" are increasing for a large number of combinations perhaps some time is needed to check all of these.
* Recommended WF
  + **Need to treat in online session to** clarify the CHTTL concerning points to remove the near miss test points and how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW).

**Issue 1-11-11:** CR ([R4-2413022](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413022.zip)) on PC2 NR CA Uplink Harmonic clean-up in TS38.101-1

* Proposals
  + Option 1: Update the following contents for MSD tables of PC2 NR CA UE due to harmonic problem.
    - Removed “UL” from clause 7.3A.4 title since this clause includes both UL harmonic and Rx mixing MSD requirements.
    - Modified PC2 UL harmonic MSD test points according to principles agreed in R4-2406701 and based on corrected PC3 MSD. Corrections less than 0.5dB are not implemented.
      * + Merged PC2 UL harmonic MSD tables according to WF R4-2403628
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei and Nokia as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - Nokia: It may be okay with this update but since the MSD values for "near-miss" are increasing for a large number of combinations perhaps some time is needed to check all of these.
* Recommended WF
  + **Need to treat in online session to** how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW).

**Issue 1-11-12:** CR ([R4-2413023](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413023.zip)) on EN-DC Uplink Harmonic clean-up in TS38.101-3

* Proposals
  + Option 1: Update the EN-DC MSD test points based on discussion paper ([R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip))
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Huawei and Nokia as below
    - HW:
      * How to treat this depends on R4-2412620 (QC) and also R4-2413063 (SKY). At least LCRB\_UL in this CR doesnt follow the proposal 2 in their discussion paper.
      * New test cases should be discussed separately, e.g. DC\_3\_n26 (there is no such MSD for CA\_3-26, but it works well in the real market.), DC\_39\_n41 (cross band isolation can cover).
    - Nokia: It may be okay with this update but since the MSD values for "near-miss" are increasing for a large number of combinations perhaps some time is needed to check all of these.
* Recommended WF
  + **Need to treat in online session to** how to apply the general approach for harmonic/harmonic mixing problems based on discussion papers from [R4-2412620](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412620.zip) (QC) & [R4-2413063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413063.zip) (SKW).

# Topic #2: Maintenance of NR channel raster enhancements

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2411140](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411140.zip) (CR) Cat. F  Flagging by Huawei | Apple, T-Mobile, Telus | Title: Clarification for the enhanced channel raster and carrier aggregation  **This is a CR (Cat. F) for TS38.101-1 to use 10kHz channel raster for both single carrier and CA operation.**  **Reason:** In last RAN4 meeting, the enhanced channel raster does not change the nominal channel spacing. However, it was not clarified whether enhanced channel raster can be used with carrier aggregation. This CR clarifies that the 10kHz raster can be used with carrier aggregation using the same nominal channel spacing.  **Proposal:** It is clarified that the existing nominal channel spacing is applicable to both 100kHz and 10kHz channel rasters in Clause 5.4.1.1. 5.4.1 Channel spacing5.4.1.1 Channel spacing for adjacent NR carriers The spacing between carriers will depend on the deployment scenario, the size of the frequency block available and the channel bandwidths. The nominal channel spacing between two adjacent NR carriers is defined as following:  - For NR operating bands with 100 kHz or 10 kHz channel raster,  Nominal Channel spacing = (BWChannel(1) + BWChannel(2))/2 |
| [R4-2411670](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411670.zip) (Discussion) | Ericsson | Title: Mandated support of the enhanced channel raster by RedCap UEs from Rel-17 (including Draft LS to RAN2)  **This is a discussion paper for the RedCap UE capability signalling of enhanced channel raster**  **Observation 1: mandated support of the enhanced channel raster for all RedCap UE from Rel-17 is the only feasible solution if performance degradation and less efficient spectrum utilization for all UEs in a cell wider than 20 MHz supporting RedCap UEs are to be avoided.**  **Observation 2: upgrade of non-RedCap UEs supporting a maximum CHBW of 20 MHz and restricted to the 100 kHz channel raster, if any in the field, appears more viable than specific network configurations for support of RedCap UEs that imply degraded performance and less efficient spectrum utilization for all UEs required just because of a small volume of non-supporting legacy UEs.**  **Proposal 1: support of the enhanced channel raster is mandated for all RedCap UEs from Rel-17, eRedCap UEs from Rel-18. For RedCap UEs, specify the enhanced channel raster for applicable bands in the Rel-17 and Rel-18 versions of 38.101-1 as essential corrections.**  **Proposal 2: make RAN2 aware of these essential corrections by an LS as per the draft attached below.** |
| [R4-2411944](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411944.zip) (Discussion) | Nokia | Title: Enhanced channel raster UE capability  **This is a discussion paper for enhanced channel raster how to apply in specification since it is still FFS whether RedCap and/or eRedCap UEs are mandated to support Enhanced channel raster for more bands than the normal UEs.**  ***Observation 1: It was not discussed in Rel-17 RedCap WI whether the UE specific channel bandwidth is signaled from the network to explicitly indicate the position of the filter bandwidth when the system bandwidth (SIB1) is wider than 20 MHz***  ***Proposal 1: It is proposed to agree at least one configuration that can support the legacy 20 MHz RedCap UE in 25 MHz SIB1 bandwidth.***  ***Proposal 2: It is proposed to remove the line with ‘FFS’ from the Feature list #28 NR\_channel\_raster\_enh.*** |
| [R4-2413273](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip) (Discussion) | Huawei | Title: RedCap UE capability for enhanced channel raster  **This is a discussion paper for enhanced channel raster to support new 10kHz raster for RedCap UEs as follow**  it is not possible to assume this new feature can be mandate for the Rel-17 commercial Redcap UEs. Hence it is unfortunately that it has to be an optional feature for Rel-17.  **Option 1**: it is proposed to remove FFS for RedCap UE in the RAN4 feature list, i.e. the same UE capability framework as MBB UEs is applicable for Redcap UEs.  **Option 2:** the enhanced channel raster is mandatory for RedCap UE from Rel-18 and it is optional for Rel-17.  **Proposal: it is proposed to further discuss the two options and make a decision at RAN4#112** |
| [R4-2411875](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411875.zip) (CR) Cat. F  No NWM flagging | ZTE Corporation, Sanechips | Title: (NR\_channel\_raster\_enh-Core) CR to TS38.108 Supporting enhanced channel raster for band n254  **This is a CR (Cat. F) for TS38.101-8 for NTN UE to support 10kHz channel raster in NR NTN band n254.**  **Reason:** Band n254 can support enhanced channel raster in TS 38.101-5. However, n254 does not support enhanced channel raster in current spec, which does not align with TS 38.101-5.  **Proposal:** Add n254 to support enhanced channel raster in Table 5.4.2.3-2 in TS38.108. |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 2-1

*Sub-topic description:* **NR Channel raster enhancement in TN**

*Open issues and candidate options before meeting:*

**Issue 2-1-1:** CR ([R4-2411140](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411140.zip)) for enhanced channel raster for CA operation in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2411140](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411140.zip), Apple), add to the 10kHz enahnced channel raster in clause 5.4.1.1 using the norminal channel spacing for normal NR UE and CA UE.

**5.4.1.1 Channel spacing for adjacent NR carriers**

* + - For NR operating bands with 100 kHz or 10 kHz channel raster,

Nominal Channel spacing = (BWChannel(1) + BWChannel(2))/2

* + Option 2: Keep the existing contents in clause 5.4.1.1
* NWM comments:
  + Flagging by Huawei as below
    - HW: The change is ok but the change on channel spacing for CA (sub clause 5.4A.1) is missing.
* Recommended WF
  + **Need further discussion in online session** whether the Apple’s approach is correct way or not.

### Sub-topic 2-2

*Sub-topic description:* **NR Channel raster enhancement for NTN**

*Open issues and candidate options before meeting:*

**Issue 2-2-1:** CR ([R4-2411875](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411875.zip)) for enhanced channel raster in n254 in TS38.108

* Proposals
  + Option 1: Based on CR ([R4-2411875](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411875.zip), ZTE), add to the 10kHz enahnced channel raster in Table 5.4.2.3-2 in TS38.108
  + Option 2: Other option is not precluded
* NWM comments:
  + No NWM flagging.
* Recommended WF
  + CR ([R4-2411875](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411875.zip)) can be agreeable.

### Sub-topic 2-3

*Sub-topic description:* **NR channel raster capability for RedCap**

*Open issues and candidate options before meeting:*

**Previous RAN4 agreements for capability signalling of enhance channel raster**

1. **For TN and NTN (based on the agreed UE feature list and WF)**

**- Mandatory with capability signaling for all Rel-18 UEs for certain bands as defined in 38.101-1 and 38.101-5.**

**- Should be early implementable from Rel-16.**

1. **For Redcap**

**- For Rel-18, at least support enhanced channel raster as mandatory feature for Redcap UEs in the same set of NR operating bands for eMBB UEs. FFS on other NR bands.**

**- For Rel-17, FFS**

**Issue 2-3-1:** How to apply the enhanced channel raster for the (e)RedCap UE and RedCap operating bands?

* Proposals
  + Option 1: Based on discussion paper ([R4-2413273](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip) (Huawei) & [R4-2411944](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411944.zip) (Nokia)), RAN4 only support the enhanced channel raster as optional feature for Redcap UEs from Rel-17 with capability signalling.
  + Option 2: Based on discussion paper ([R4-2411670](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411670.zip), Ericsson), RAN4 can support of the enhanced channel raster is mandated for all RedCap UEs from Rel-17, eRedCap UEs from Rel-18.
* Recommended WF
  + **Need further discussion in online session**.

**Issue 2-3-2:** Which RB size/CBW location of RB configuration option should be supported for (e)RedCap UE to support enhanced channel raster for wider CBW (i.e. 25MHz) in gNB?

* Proposals
  + Option 1: Based on discussion paper ([R4-2411944](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411944.zip), Nokia), at least one configuration that can support the legacy 20 MHz RedCap UE in 25 MHz SIB1 bandwidth.
    - 1) The SIB1 carrierBandwidth is placed on the 100 kHz channel raster, no UE specific CHBW is signaled, but a BWP of 106 RBs is configured off the 100 kHz channel raster.
    - 2) The SIB1 carrierBandwidth is placed 10 kHz above the 100 kHz channel raster, no UE specific CHBW is signaled, and a BWP of 106 RBs is configured on the 100 kHz channel raster. (Due to NR's asymmetric subcarrier distribution, an upshift of the carrier frequency by up to one subcarrier spacing is compatible with the minimum guard band requirement.)
    - 3) The SIB1 carrierBandwidth is placed 10 kHz above the 100 kHz channel raster, and a UE specific CHBW and a BWP of 106 RBs, respectively, are configured on the 100 kHz channel raster.
  + Option 2: Based on discussion paper ([R4-2411670](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411670.zip), Ericsson), all cases are raised system performance degradations. Hence RAN4 shall support of the enhanced channel raster is mandated for all RedCap UEs which would be inform to RAN2 for these essential corrections by an LS.
  + Option3: Other option is not precluded.
* Recommended WF
  + **Need further discussion in online session**.

**Issue 2-3-3:** Update UE feature lists of the enhance channel raster for RedCap UEs

* Proposals
  + Option 1: Based on discussion paper ([R4-2413273](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip) (Huawei) & [R4-2411944](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411944.zip) (Nokia)), RAN4 remove “FFS for RedCap”.
  + Option 2: According to the decision of the above issue 2-3-1 and issue 2-3-2, the final UE feature lists will be updated.
  + Option3: Other option is not precluded.
* Recommended WF
  + **Need further discussion in online session**.

# Topic #3: Maintenance of Low NR band 4Rx for handheld UE and 3Tx for inter-band UL CA and EN-DC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2412596](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412596.zip) (CR) Cat. F  Flagging by Apple | CHTTL | Title: (4Rx\_low\_NR\_band\_handheld\_3Tx\_NR\_CA\_ENDC) Correction on configured output power of 3Tx EN-DC including UL MIMO and Tx diversity  **This is a CR (Cat. F) for TS38.101-3 to update the configured output power of 3Tx EN-DC including UL MIMO and Tx diversity.**  **Reason:** it mentions that the requirements in 6.2B.4.1.3 apply except the MPR and A-MPR for the NR component carrier if with UL MIMO configured or Tx diversity case. However, the PPowerClass,EN-DC & ∆PPowerClass,EN-DC also need to be referred to the 3Tx related sections instead of refering to section 6.2B.  **Proposal:** Adding descriptions for PPowerClass,EN-DC & ∆PPowerClass,EN-DC under the sections 6.2H.4.1.3, providing the correct reference for the configured output power of 3Tx EN-DC.  6.2H.4.1.3 Inter-band EN-DC with UL MIMO within FR1  For inter-band EN-DC with UL MIMO in one NR band, the requirements in clause 6.2B.4.1.3 apply except that:  - PPowerClass,EN-DC is the maximum UE power specified in Table 6.2H.1.3-1 without taking into account the tolerance;  - If the NR component carrier is configured with UL MIMO, the MPRc and A-MPRc are specified in clause 6.2D.2 and clause 6.2D.3 of [2] respectively.  - ∆PPowerClass,EN-DC :  – For a power class 2 capable UE, it is 3dB when the requirements of default power class are applied as specified in sub-clause 6.2H.1.3, otherwise ΔPPowerClass, CA = 0 dB;  6.2L.4.1.3 Inter-band EN-DC with Tx Diversity within FR1  For inter-band EN-DC with Tx Diversity in one NR band, the requirements in clause 6.2B.4.1.3 apply except that:  - PPowerClass,EN-DC is the maximum UE power specified in Table 6.2L.1.3-1 without taking into account the tolerance;  - If the NR component carrier is configured with Tx Diversity, the MPRc and A-MPRc are specified in clause 6.2G.2 and clause 6.2G.3 of [2] respectively.  - ∆PPowerClass,EN-DC :  – For a power class 2 capable UE, it is 3dB when the requirements of default power class are applied as specified in sub-clause 6.2L.1.3, otherwise ΔPPowerClass, CA = 0 dB; |
| [R4-2413127](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip) (CR) Cat. F  Flagging by Samsung and CHTTL | Huawei, HiSilicon | Title: Clean up of power class indication for DC configurations  **This is a CR (Cat. F) for TS38.101-3 to remove super script Note 23 in some 3Tx EN-DC band combinations.**  **Reason:** Note 23 indicated for some EN-DC configurations means that the minimum requirements for PC2 are applicable for this uplink EN-DC configuration, however, the superscipts also marked for the first column. No clear rule for power class relevant superscript for the 1st column, which is not supposed to have such superscript.  **Proposal:** Remove superscripts of note 23 in first colum in the table for some band combination configurations, as the superscripts are power class relevant. |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 3-1

*Sub-topic description:* **Correction on the configured Tx Power for 3Tx EN-DC UE**

*Open issues and candidate options before meeting:*

**Issue 3-1-1:** CR ([R4-2412596](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412596.zip)) to update the 3Tx EN-DC UE configured Tx power related issues for UL-MIMO and Tx diversity are activated cases in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2412596](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412596.zip)), update the contents in the UE configured Tx power for 3Tx EN-DC UE with UL-MIMO and Tx diversity.
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Apple as below
    - Apple: How critical to include the delta PPowerClass part if it has never been used by UE in the field? This part would always cause the confusion that the power back-off would be double-counted as it combines with default power class with delta PPowerClass = 3dB which is a total of 6dB reduction
* Recommended WF
  + **Need further online discussion** how to capture the 3Tx EN-DC UE configured Tx power related issues for UL-MIMO and Tx diversity.

### Sub-topic 3-2

*Sub-topic description:* **NR Power class indication of 3Tx EN-DC UE combinations**

*Open issues and candidate options before meeting:*

**Issue 3-2-1:** CR ([R4-2413127](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip)) for power class indication of 3Tx EN-DC UE in TS38.101-3

* Proposals
  + Option 1: Based on CR ([R4-2413127](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip)), remove super script of Note 23 in the EN-DC configuration.
  + Option 2: Other option is not precluded
* NWM comments:
  + Flagging by Samsung and CHTTL as below
    - Samsung: Same as Rel-17 HW clean up CR. This has been discussed previously in basket WI but no agreement in the end. For EN-DC, the note is added for both UL and DL because the bands with different configurations are in the same row, such as DC\_2A\_n77A and DC\_2A\_n77C, while in NR spec they are in different rows, and the HPUE note is added based on request just like NR-CA. In addition, Note 21 for DC\_XA-YA can be omitted because of Note 22. We are ok to re-organize the table with same way as for NR-CA.
    - CHTTL: This change will make the spec not aligned with the Rel.18 WID.
* Recommended WF
  + **CR (**[**R4-2413127**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413273.zip)**) can be postponed.** Need to clear the concerning points from Samsung and CHTTL firstly.

# Topic #4: Maintenance of Further RF requirements enhancement for NR and EN-DC in FR1

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2411235](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411235.zip) (Discussion) | Huawei, HiSilicon | Title: Delta Ppowerclass and Delta TRxSRS for 4Tx  **This is a discussion paper for Delta Ppowerclass and Delta TRxSRS for 4Tx antenna switching.**  **Observation 1**: The solution in [3] is UE implementation oriented and allows the UE to achieve the best performance possible, while it theoretically gives the UE more chances to perform Antenna Virtualization than the solution in [4].  **Observation 2**: The solution in [4] is more oriented to prevent the UE from performing AV than the solution in [3] at the cost of achieving the best possible performance, while it still cannot perfectly prevent the UE from performing AV.  **Observation 3**: At least 38.101-1 shall need specific values for ΔPPowerClass depending on configured SRS AS (AS) patterns. Otherwise, UE with 4Tx is not allowed to perform SRS AS other than t4ry.  **Proposal 1**: For 4Tx SRS AS related requirements, apply an approach of PC2 2Tx. Then, refine the requirements later if needed.  **Proposal 2**: Apply following ΔPPowerClass values in accordance with configured SRS AS pattern(s) if the UE indicates txDiversity4Tx-r18 as shown in Table 2.2-1.  Table 2.2-1: Relationship between ΔPPowerClass and configured AS pattern for UE with *txDiversity4Tx-r18*    **Observation 4**: For PC2 2Tx with ΔPPowerClass and without *txDiversity-r16*, even if a UE implements 26 dBm x 2 PA configuration, additional 3 dB relaxation is allowed on top of a case that ΔPPowerClass = 3 dB or PC2 with *txDiversity-r16*.  **Observation 5**: For PC1.5 4Tx, in accordance with the principle of Observation 4, 23 dBm x 4 and 26 dBm x 2 + 23 dBm x 2 PA configurations are considered to derive relaxation value, since if both configurations are considered into 38.101-1, 26 dBm x 4 PA configuration is automatically covered.  **Observation 6**: For PC1.5 UE supporting 4Tx configured with t1ry, if ΔPPowerClass = 3 dB and the UE doesn’t not indicate *txDiversity4Tx-r18*, ΔTRxSRS shall be increased by 3 dB from the 2nd SRS port transmission compared to ΔTRxSRS for PC1.5 UE indicating *txDiversity4Tx-r18* or its ΔPPowerClass = 6 dB.  **Observation 7**: For PC2 UE supporting 2Tx configured with t2ry, ΔTRxSRS for a UE implementing 26 dBm + 23 dBm or 26 dBm x 2 PA configuration, i.e., ΔPPowerClass = 0 dB and no *txDiversity-r16* indication is the same as that for a UE implementing 23 dBm x 2 PA configuration, i.e., indicating *txDiversity-16* or ΔPPowerClass = 0 dB. This is because any PA pairs can achieve PC2 during performing the AS pattern.  **Observation 8**: When a PC1.5 UE supporting 4Tx is configured with t2r4 SRS AS pattern, the UE’s ΔPPowerClass = 0 dB and the UE doesn’t indicate *txDiversity4Tx-r18*, ΔTRxSRS for SRS port pair transmission from the 2nd up to 4th port pair should be increased by 3 dB compared to ΔTRxSRS for a case that the UE’s ΔPPowerClass = 3 dB and the UE indicates *txDiversity4Tx-r18*  **Proposal 3**: Specify the requirements related to SRS AS for PC1.5 4Tx without *txDiversity4Tx-r18* indication based on the Observation 4 – 8. |
| [R4-2412089](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412089.zip) (Discussion) | vivo | Title: On 4Tx power degradation for SRS antenna switching  **This is a discussion paper for Delta Ppowerclass and Delta TRxSRS for 4Tx antenna switching.**  In last RAN4 meeting, the following options are discussed but no consensus how to solve the 4TxΔPPowerClass issues.   * *Proposal 1: Do not define new ΔPPowerClass requirements for 4Tx to restrict the architectures or power in SRS antenna switching, and to refine the wording of current requirements to insure only appliable for 2Tx. (vivo)* * *Proposal 2: For 4 Tx architectures defined in Rel-18 use a 26 dBm PA to perform SRS transmission. If for a given architecture only a 23 dBm PA is available for SRS transmission, then limit SRS antenna switching to t4ry. (Qualcomm)* * *Proposal 3: (Huawei)*   + *Proposal 3-1: Do not make ΔTRxSRS include PA ability, i.e., decouple ΔPPowerClass and ΔTRxSRS*   + *Proposal 3-2: Do not lower PCMAX\_H,f,c depending on the number of SRS ports in each SRS transmission occasion due to variation of PA configurations*   + *Proposal 3-3: Apply ΔPPowerClass to only PCMAX\_L,f,c as exception in case of SRS antenna switching as follows.*   + *Proposal 3-4: Remove following texts and similar from the specification if Proposal 3 is agreed.* * *Proposal 4: (Ericsson):*   + *Proposal 1: To address the power limitation issue for SRS transmissions for AS for UEs equipped with 4 Tx chains, avoid combining ΔPPowerClass and ΔTRxSRS requirements since those two have a different nature and introduce uncertainty at the gNB and thus degrade the channel estimation accuracy.*   + *Proposal 2: We propose that different values should be applicable for ΔPPowerClass as a function of the indicated AS capability:*     - *For ‘t4ry’ AS capability, ΔPPowerClass = 0 dB.*     - *For ‘t2ry’ and similar AS capabilities, ΔPPowerClass = 3 dB.*     - *For ‘t1ry’ and similar AS capabilities, ΔPPowerClass = 6 dB.*   + *Proposal 3: Let the UE report the appropriate ΔPPowerClass depending on its PA configuration. That would allow reporting a different ΔPPowerClass for different SRS ports.*   **Proposal: Discuss the previous proposals and options, based on the pros and cons analysis, if certain option can be agreed.** |
| [R4-2413357](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413357.zip) (Discussion) | Ericsson | Title: (NR\_ENDC\_RF\_FR1\_enh2-Core) On DeltaP\_PowerClass for SRS AS for 4Tx  **This is a discussion paper for Delta Ppowerclass and Delta TRxSRS for 4Tx antenna switching.**  **Proposal 1:** To address the power limitation issue for SRS transmissions for AS for UEs equipped with 4 Tx chains ΔPPowerClass should be used, just as in 2Tx case. Avoid combining ΔPPowerClass and ΔTRxSRS requirements since those two have a different nature and introduce uncertainty at the gNB and thus degrade the channel estimation accuracy.  **Proposal 2:** We propose that different values should be applicable for ΔPPowerClass as a function of the indicated AS capability:   * For ‘t4ry’ AS capability, ΔPPowerClass = 0 dB. * For ‘t2ry’ and similar AS capabilities, ΔPPowerClass = 3 dB. * For ‘t1ry’ and similar AS capabilities, ΔPPowerClass = 6 dB.   **Proposal 3:** A simple way to improve both the channel estimation accuracy and the SRS transmission power is to introduce reporting of ΔPPowerClass, which would not induce too large specification changes.  **Proposal 4:** If introducing of reporting to solve this issue is agreeable to all companies, the discussion could be merged with the ongoing one on the SRS insertion loss imbalance reporting in Rel-19 WI on “UE RF enhancements for NR FR1/FR2 and EN-DC, Phase 4”, topic “6Rx for handheld and FWA UE”, since the same solution could solve both issues. |
| [R4-2411236](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411236.zip) (CR) Cat. F  Flagging by Ericsson and Qualcomm | Huawei, HiSilicon | Title: Introduction of Delta TRxSRS for 4Tx in TS38.101-1  **This is a CR (Cat. F) for TS38.101-1 to provide PC1.5 4Tx UE with suitable ∆PPowerClass and ∆TRxSRS to perform SRS antenna switching.**  **Reason**: To introduce ∆PPowerClass and ∆TRxSRS for 4Tx SRS antenna switching.  **Proposal**:   * For PC1.5 UE with *txDiversity4Tx-r18* capability, if the UE is configured with SRS resources corresponding to t1ry, t2ry, or t4ry, ∆PPowerClass is 6 dB, 3 dB, or 0 dB, respectively. * For PC1.5 UE without *txDiversity4Tx-r18* capability, apply an approach used to develop ∆PPowerClass and ∆TRxSRS for PC2 with 2Tx to those for PC1.5 with 4Tx |
| [R4-2413358](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413358.zip) (CR) Cat. F  Flagging by Qualcomm | Ericsson | Title: (NR\_ENDC\_RF\_FR1\_enh2-Core) CR to 38.101-1 Rel-18: DeltaP\_PowerClass correction for SRS AS for 4Tx  **This is a CR (Cat. F) for TS38.101-1 to provide PC1.5 4Tx UE with suitable ∆PPowerClass for 4Tx SRS antenna switching.**  **Reason**: The current ΔPPowerClass for SRS AS is specified only for the UEs equipped with 2 Tx chains. Its definition needs to be extended to also cover UEs equipped with 4 Tx chains.  **Proposal**: ΔPPowerClass definition for SRS AS is extended to also cover the UEs equipped with 4 Tx chains, where the applicable value is a function of the indicated AS capability:   * For ‘t4ry’ AS capability, ΔPPowerClass = 0 dB. * For ‘t2ry’ and similar AS capabilities, ΔPPowerClass = 3 dB. * For ‘t1ry’ and similar AS capabilities, ΔPPowerClass = 6 dB. |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 4-1

*Sub-topic description:* **4Tx power degradation for SRS antenna switching**

*Open issues and candidate options before meeting:*

**Issue 4-1-1:** How to define the 4Tx ΔPPowerClass or ΔTRxSRS for 4Tx SRS antenna switching

* Proposals
  + Option 1: The candidate options to solve the 4TxΔPPowerClass issues are considered to make a consensus based on the pros and cons analysis. (vivo)
  + Option 2: Specify the requirements related to SRS AS for PC1.5 4Tx without *txDiversity4Tx-r18* indication according to the configured SRS AS pattern as follow (HW)

텍스트, 스크린샷, 폰트, 번호이(가) 표시된 사진

자동 생성된 설명

* + Option 3: To address the power limitation issue for SRS transmissions for AS for UEs equipped with 4 Tx chains ΔPPowerClass should be used, just as in 2Tx case. Avoid combining ΔPPowerClass and ΔTRxSRS requirements since those two have a different nature and introduce uncertainty at the gNB and thus degrade the channel estimation accuracy. (Ericsson)
    - The different values should be applicable for ΔPPowerClass as a function of the indicated AS capability:
      * For ‘t4ry’ AS capability, ΔPPowerClass = 0 dB.
      * For ‘t2ry’ and similar AS capabilities, ΔPPowerClass = 3 dB.
      * For ‘t1ry’ and similar AS capabilities, ΔPPowerClass = 6 dB.
  + Option 4: Other option is not precluded
* Recommended WF
  + **Need further discussion on online session**

**Issue 4-1-2:** CR ([R4-2411236](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411236.zip)) TS38.101-1: 4Tx ΔPPowerClass or ΔTRxSRS for 4Tx SRS antenna switching

* Proposals
  + Option 1: RAN4 can define the 4Tx SRS antenna switching requirements as follow
    - For PC1.5 UE with *txDiversity4Tx-r18* capability, if the UE is configured with SRS resources corresponding to t1ry, t2ry, or t4ry, ∆PPowerClass is 6 dB, 3 dB, or 0 dB, respectively.
    - For PC1.5 UE without *txDiversity4Tx-r18* capability, apply an approach used to develop ∆PPowerClass and ∆TRxSRS for PC2 with 2Tx to those for PC1.5 with 4Tx
* NWM comments:
  + Flagging by Ericsson and Qualcomm as below
    - Ericsson: as discussed offline, we do not support combining DeltaP\_PowerClass and DeltaT\_RxSRS to solve this issue, we prefer to only use DeltaP\_PowerClass.
    - QC: as discussed, we think that this paper needs further offline discussion. First the issues that are common to this CR and R4-2413358 have to be identified, and then further discussion is needed on the issues on which they differ.
* Recommended WF
  + **RAN4 can treat other CR (**[**R4-2413358**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413358.zip)**) for ΔPPowerClass definition firstly in Issue 4-1-3**. Based on the decision of CR ([R4-2413358](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413358.zip)) for ΔPPowerClass definition, RAN4 will further discuss the CR ([R4-2411236](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411236.zip)) to define ΔTRxSRS or not.

**Issue 4-1-3:** CR ([R4-2413358](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413358.zip)) TS38.101-1: 4Tx ΔPPowerClass for 4Tx SRS antenna switching

* Proposals
  + Option 1: RAN4 can define the 4Tx SRS antenna switching requirements as follow
    - ΔPPowerClass definition for SRS AS is extended to also cover the UEs equipped with 4 Tx chains, where the applicable value is a function of the indicated AS capability:
      * For ‘t4ry’ AS capability, ΔPPowerClass = 0 dB.
      * For ‘t2ry’ and similar AS capabilities, ΔPPowerClass = 3 dB.
      * For ‘t1ry’ and similar AS capabilities, ΔPPowerClass = 6 dB.
* NWM comments:
  + Flagging by Qualcomm as below
    - QC: as discussed offline, we do not support excluding the 4X26dBm architecture from sounding at the highest power possible.
* Recommended WF
  + **Need further discussion in online session** for the detail CR contents.

# Topic #5: Maintenance of NR RF requirements enhancement for FR2\_Phase3

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2411232](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411236.zip) (CR) Cat. F  Flagging by QC, Nokia, Ericsson and ZTE | Huawei, HiSilicon | Title: CR to TS 38.101-2: correction of MPR for 256QAM  **This is a CR (Cat. F) for TS38.101-2 to correct MPR requirements for 256QAM.**  **Reason**: MPR for high order modulation scheme is determined by EVM rather than spectrum related requirements, e.g. ACLR, SEM. However, the MPR for DFT-s-OFDM has different values for outer and inner RB allocations, which does not reflect the intrinsic root cause of MPR for high order modulation, especially for 256QAM.  **Proposal**: Align the MPR of inner RB allocation with that for outer RB allocation for 256QAM |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

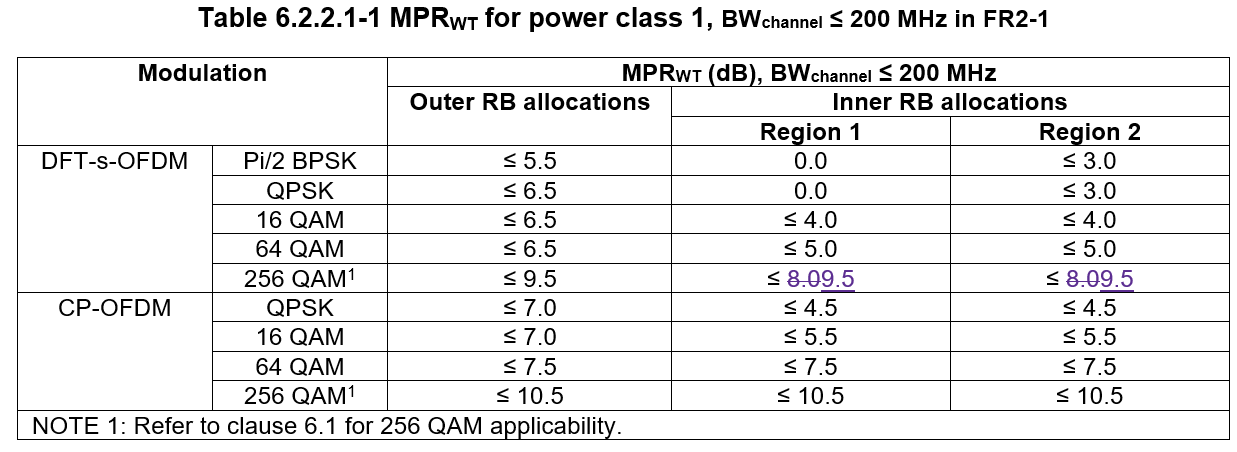
### Sub-topic 5-1

*Sub-topic description***: Correction of MPR requirements for 256QAM**

*Open issues and candidate options before meeting:*

**Issue 5-1-1:** CR ([R4-2411232](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411232.zip)) TS38.101-2: Correction of MPR for 256QAM for DFT-s-OFDM waveform

* Proposals
  + Option 1: RAN4 can update the MPR requirements for 256QAM in DFT-s-OFDM waveformas follow



* NWM comments:
  + Flagging by QC, Nokia, Ericsson and ZTE as below
    - QC: The EVM-limited MPR for PC1 is 8.0 dB, i.e. the smaller of the candidate values. Further MPR (9.5 vs 8.0) is needed for outer waveforms for compliance with SEM.
    - Nokia: If there is an error it is that the MPR for EDGE is too much. Inner MPR is sufficient for EVM. We can change Edge MPR to 9.5 --> 8.
    - Ericsson: MPR requirement has been discussed in length in this WI and it was agreed to be 3dB higher than the MPR for 64QAM based both on MPR simulation campaign results and to allow a decent dynamic range for EIRP.
    - ZTE: As Ericssion mentioned, for 256QAM MPR, there was agreement that 3dB higher than the MPR for 64QAM.
* Recommended WF
  + **CR (**[**R4-2411232**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2411232.zip)**) can be postponed.** Proponent shall clear the clarification points from interested companies first to update the MPR requirements for 256QAM at FR2.

# Topic #6: Maintenance of NB-IoT/eMTC core requirements for LTE NTN

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2412096](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412096.zip) (CR) Cat. F  Flagging by Nokia | vivo | Title: Correction of MOP requirements on sTTI for NTN Category M1 in TS36.102  **This is a CR (Cat. F) for TS36.102 to correct MOP requirements for NTN category M1 UE.**  **Reason**: The sentence “The period of measurement shall be at least on sub frame (1ms)” is in contradication with Table 6.2A.1-2 for MOP in which the measurement period is defined for different cases.  **Proposal**: Delete the sentence “The period of measurement shall be at least on sub frame (1ms)” in clause 6.2A.1 in TS36.102 6.2A.1 UE maximum output power for category M1 The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth.  Table 6.2A.1-1: UE Power Class   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | EUTRA band | Class 2  (dBm) | Tolerance  (dB) | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) | | 256 |  |  | 23 | +/-2 | 20 | +/-2 | | 255 |  |  | 23 | +/-2 | 20 | +/-2 | | 254 |  |  | 23 | +/-2 | 20 | +/-2 | | 253 |  |  | 23 | +/-2 | 20 | +/-2 | | NOTE 1: PPowerClass is the maximum UE power specified without taking into account the tolerance. | | | | | | | |
| [R4-2412097](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412097.zip) (CR) Cat. F  Flagging by Qualcomm | vivo | Title: Refinements of arrangement of Additional SEM and additional spurious emission in TS36.102  **This is a CR (Cat. F) for TS36.102 to refine of the arrangement of Additional SEM and additional spurious emission.**  **Reason**: The additional SEM and addition spurious emisssion requirements are mixed together, some requiremnts allocation is different from NR NTN. Some duplication are remains.  **Proposal**: Move additional SEM requirements from spurious emissions part to a-SEM sections. For some have overlapping with spurious emission (such as NS\_04N,05N), the alignment with NR NTN spec is considered. Duplicate requirments are combined in TS36.102  **Please check the detail contents in the CR** |
| [R4-2412098](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412098.zip) (CR) Cat. F  Flagging by CHTTL and Apple | vivo | Title: Correct the MPR requirements for NTN Category NB1 and NB2 in TS36.102  **This is a CR (Cat. F) for TS36.102 to correct the MPR requirements for NTN Category NB1 and NB2.**  **Reason**: Currently for category NB1 and NB2, single tone allocation is a valid configuration. However, in MPR definition, there is no requirements defined for this case, which may lead to different interpretation, and not aligned with ususal understanding.  **Proposal**: Adding single tone configuration MPR requirements as “N/A” to cllearnly indicate that No MPR is applied in this case |
| [R4-2413131](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413131.zip) (CR) Cat. F  Flagging by Huawei | Qualcomm | Title: CR to TS 36.102: B255 emissions  **This is a CR (Cat. F) for TS36.102 to correct the emission limits for B255.**  **Reason**: Requirements from ETSI EN 301 681 were left out from TS 36.102 due to ETSI LS response that 3GPP NTN technology is not considered yet. It was found out that ITU-R M.1480 specifies corresponding limits, i.e. these emissions limits are not relevant only for Europe..  **Proposal**: Emission requirements closest to B255 lower edge are added. A restriction on usage of the lowest channel in B255 is added to allow meeting the emission requirements as follow 5.2B Operating bands for category NB1 and NB2 Category NB1 and NB2 UE are designed to operate in the E-UTRA satellite access operating bands defined in Table 5.2-1.  Category NB1 and NB2 UE operate in HD-FDD duplex mode.  For operation in Band 255, only channels positions which guarantee at least 200 kHz guard band from RF channel edge to the lower limit of the band shall be used.  Table 6.5A.4.3-1: Requirements for spurious emissions for UE co-existence |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 6-1

*Sub-topic description***: Correction on LTE NTN UE emission requirements**

*Open issues and candidate options before meeting:*

**Issue 6-1-1:** CR ([R4-2412097](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412097.zip)) TS36.102: Arrangement of Additional SEM and additional spurious emission

* Proposals
  + Option 1: RAN4 can update the Additional SEM and additional spurious emission for NS\_02N, NS\_03N, NS\_04N and NS\_05N.
* NWM comments:
  + Flagging by Qualcomm as below
    - QC: Some of the SEM-like requirements extend beyond the OOB region. This was handled in spurious emissions by noting that the requirement applies also closer than deltaFoob. If they are moved the SEM-section similar clarification on application also further then deltaFoob is needed to remove any ambiguity from the spec
    - Vivo reply to QC: There are some cases that are mixed together, however, current misalignment also exist between IoT and NR, so still propose to do some refinements. Details can be discussed.
* Recommended WF
  + **Need further discussion in online session**.

**Issue 6-1-2:** CR ([R4-2413131](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2413131.zip)) TS36.102: B255 emissions

* Proposals
  + Option 1: RAN4 can update the Emission requirements closest to B255 low edge.
* NWM comments:
  + Flagging by Huawei as below
    - HW: Why do we need to add this channel position restriction for Band 255. How about the other bands? In addition, it's very strange to add this channel position restriction in operating band clause
* Recommended WF
  + **Need further discussion in online session.**

*based on companies’ contributions.*

### Sub-topic 6-2

*Sub-topic description***: Correction on MOP and MPR Requirements** **in TS36.102**

*Open issues and candidate options before meeting:*

**Issue 6-2-1:** CR ([R4-2412096](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412096.zip)) TS36.102: MOP requirements on sTTI for NTN Category M1

* Proposals
  + Option 1: RAN4 can update the MOP requirements on sTTI for NTN Category M1.
* NWM comments:
  + Flagging by Nokia, but Nokia did not share the detail reason for the objections.
* Recommended WF
  + **Need further discussion in online session.**

**Issue 6-2-2:** CR ([R4-2412098](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412098.zip)) TS36.102: MPR requirements for NTN Category NB1 and NB2

* Proposals
  + Option 1: RAN4 can update the MPR requirements for NTN Category NB1 and NB2.
* NWM comments:
  + Flagging by CHTTL and Apple as below
    - CHTTL: should it be 0 instead of N/A in MPR Table 6.2B.2-1 for single tone configuration.
    - Apple: If no A-MPR is applied then the value should be 0 instead of N/A. However, is there analysis/simulations done to justify 0dB MPR for single tone operation?
    - Vivo reply to CHTTL and Apple: It is reused from NB-IoT, similar discussion in [101];
* Recommended WF
  + **CR (**[**R4-2412098**](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_112/Docs/R4-2412098.zip)**) can be agreeable** based on vivo reply to solve the concerning points.

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