**3GPP T****SG-RAN WG4 Meeting #116 R4-251xxxx**

**Bengaluru, India, 25th – 29th August, 2025**

**Title:** Topic summary for [116][102] R17\_UERF\_maintenance

**Source:** Moderator (MediaTek)

**Agenda item:** 4.1.1

**Document for:** Information

# Introduction

This is the summary for Rel-17 maintenance under agenda 4.2.2 and a few moved Tdocs i.e., R4-25xxxxx, R4-25xxxxx and R4-25xxxxx from other AI to AI 4.2.2.

Candidate targets are listed as follows.

* Topic #1: Maintenance of UE RF requirements in Rel-17 (Agenda Item 4.2.2)
	+ Sub-Topic 1-1: NR RedCap UE in TS38.101-1 (9 Tdocs)
	+ Sub-Topic 1-2: NR intra-band uplink CA in TS38.101-1 (3 Tdocs)
	+ Sub-Topic 1-3: NR inter-band CA in TS38.101-1 (13 Tdocs)
	+ Sub-Topic 1-4: NR Inter-band NR DC in TS38.101-3 (3 Tdocs)
	+ Sub-Topic 1-5: NR RAIL\_EU\_900MHz RF in TS38.101-1 (3 Tdocs)
	+ Sub-Topic 1-6: NR NTN in TS38.101-5 and TR38.863 (18 Tdocs)
	+ Sub-Topic 1-7: FDD PC2 RMC in TS38.101-1 (4 Tdocs)
	+ Sub-Topic 1-8: NR System parameters and RF requirements in single carrier (11 Tdocs)
		- Channel raster in TS38.101-1 (3 Tdocs)
		- 7.5kHz shift in TS38.307 (1 Tdocs)
		- n104 Tx Requirements in TS38.101-1 (7 Tdocs)
	+ Sub-Topic 1-9: Other maintenance CRs (7 Tdocs)
		- Higher harmonic exceptions for UE co-existence for both LTE and NR single carrier (4 Tdocs)
		- UL/DL bandwidths on overlapping NR SUL and NR bands in TS38.101-1 (3 Tdocs)

# Topic #1: Maintenance of UE RF requirements in Rel-17

## Contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2509116](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509116.zip)(Discussion paper) | Murata | Title: DeltaR\_1R for PC3 RedCapActual ΔR1R as a function of the interference correlation at RX ports 1 and 2

|  |  |  |  |
| --- | --- | --- | --- |
|  | ΔR1R (High correlation) |  | ΔR1R (No correlation) |
| Band | 15 MHz | 20 MHz |  | 15 MHz | 20 MHz |
| n5 |  | 3.3 |  |  | 5.6 |
| n8 |  | 3.3 |  | 3.4 | 5.6 |
| n12 | 3.8 | N/A |  | 6.3 | N/A |
| n20 |  |  |  | 3.6 | 3.6 |
| n26 |  | 3.1 |  |  | 5.1 |
| n28 |  |  |  |  | 4.0 |
| n71 |  | 3.3 |  | 3.4 | 5.6 |
| n74 |  | 3.1 |  |  | 5.3 |
| n85 | 3.8 | N/A |  | 6.3 | N/A |
| n105 |  | 3.1 |  | 3.4 | 5.3 |

**Observation 1:** The expected change in ΔR1R is less than 0.8dB in the worst-case scenario when the interfering data streams arriving at the 2RX ports from a single TX source are correlated.**Observation 2:** SinceR17 devices have been deployed, there is a concern that the introduction to devices with less conforming standards can degrade the network. LTE bands B71, B20, B28, B74 have used larger channel BWs since release 15 with existing ΔR1R.**Observation 3:** REFSENS has been derived using MRC combining with varying degrees of interference correlation from various companies. The benefit of the increased ΔR1R depends on how the absolute 2RX REFSENS was derived. **Proposal 1:** Because ofobservation 1, 2, and 3,further measurement investigation at both the UE level and network level is requiredto justify any ΔR1R increase for PC3 RedCap. |
| [R4-2509561](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509561.zip)(Discussion paper) | Apple, SKWS | Title: (NR\_redcap-Core) Corrections on RedCap UE PC3 FDD band 1Rx REFSENS***Proposal****: Capture the ΔR1R* *values in the table below as exceptions to the requirements in Table 7.3I.2-1 in TS 38.101-1 for RedCap UE single antenna port reference sensitivity allowance.*

|  |  |  |
| --- | --- | --- |
| Band | 15 MHz | 20 MHz |
| n5 |  | 5.6 |
| n8 | 3.4 | 5.6 |
| n12 | 6.3 | N/A |
| n20 | 3.6 | 3.6 |
| n26 |  | 5.0 |
| n28 |  | 4.0 |
| n71 | 3.4 | 5.6 |
| n74 |  | 5.2 |
| n85 | 6.3 | N/A |
| n105 | 3.4 | 5.2 |

 |
| [R4-2510307](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510307.zip)(Discussion paper) | Nokia | Title: (NR\_redcap-Core) Discussion on PC3 1Rx RedCap REFSENS[Proposal 1: Agree to change the 1Rx delta to be band dependent only from Release 19 and onwards.](file:///C%3A%5CUsers%5Cmtk34810%5CAppData%5CLocal%5CTemp%5C2618b59e-b197-44fb-b517-c9aa61a68565_R4-2510307.zip.565%5C%28NR_redcap-Core%29%20Discussion%20on%20PC3%201Rx%20RedCap%20REFSENS.docx#_Toc206174539)[Proposal 2: Agree to reuse the ΔR1R for n8, n20 and n28 from TS 36.101.](file:///C%3A%5CUsers%5Cmtk34810%5CAppData%5CLocal%5CTemp%5C2618b59e-b197-44fb-b517-c9aa61a68565_R4-2510307.zip.565%5C%28NR_redcap-Core%29%20Discussion%20on%20PC3%201Rx%20RedCap%20REFSENS.docx#_Toc206174541)[Proposal 3: 1Rx REFSENS relaxation should be based on measured or simulated performance taking into account the RAN5 test configuration.](file:///C%3A%5CUsers%5Cmtk34810%5CAppData%5CLocal%5CTemp%5C2618b59e-b197-44fb-b517-c9aa61a68565_R4-2510307.zip.565%5C%28NR_redcap-Core%29%20Discussion%20on%20PC3%201Rx%20RedCap%20REFSENS.docx#_Toc206174543)[Proposal 4: Agree to the 1Rx relaxation numbers presented in the accompanying CR R4-2510308](file:///C%3A%5CUsers%5Cmtk34810%5CAppData%5CLocal%5CTemp%5C2618b59e-b197-44fb-b517-c9aa61a68565_R4-2510307.zip.565%5C%28NR_redcap-Core%29%20Discussion%20on%20PC3%201Rx%20RedCap%20REFSENS.docx#_Toc206174544) Table 7.3I.2-1a: Single antenna port reference sensitivity allowance ΔR1R exceptions

|  |  |
| --- | --- |
| Operating band | Channel bandwidth (MHz) |
| 10 MHz | 15 MHz | 20 MHz |
| n5 | 3.0 | 3.0 | 3.5 |
| n8 | 2.5 | 3.0 | 3.5 |
| n12 | 3.1 | 3.0 | N/A |
| n20 | 2.5 | 3.0 | 3.0 |
| n26 | 3.3 | 3.3 | 3.5 |
| n28 | 2.5 | 2.5 | 2.5 |
| n71 | 3.0 | 3.1 | 3.5 |
| n74 | 3.0 | 3.1 | 3.5 |
| n85 | 3.1 | 3.5 | N/A |
| n105 | 3.0 | 3.0 | 3.5 |

 |
| [R4-2509562](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509562.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Apple, SKWS | CR Title: (NR\_redcap-Core) CR to 38.101-1 on corrections for RedCap UE PC3 FDD band 1Rx REFSENS* **Reason for changes:** When RedCap UE was first introduced in Rel-17, the FDD band REFSENS for 1Rx as compared to that for 2Rx in principle should be evaluated on a per band basis. However, considering that there were more than 40 NR bands to be defined for FR1 RedCap UE, RAN4 took a shortcut by leveraging the approach taken for LTE category 1bis UE to apply a constant allowance ΔR1R between 1Rx and 2Rx for all NR bands and all channel bandwidths up to 20 MHz which had overlooked and underestimated the Tx noise impact to 1Rx REFSENS for certain FDD bands at 15 MHz and 20 MHz
* **Summary of changes:** Add Table 7.3I.2-1a in clause 7.3I.2 as exceptions for ΔR1R requirements as specified in Table 7.3I.2-1

|  |  |
| --- | --- |
|  | Channel bandwidth / ΔR1R (dB) |
| Operating band | 15 MHz | 20 MHz |
| n5  |  | 5.6 |
| n8  | 3.4  | 5.6 |
| n12  | 6.3 | N/A |
| n20 | 3.6 | 3.6 |
| n26 |  | 5.0 |
| n28 |  | 4.0 |
| n71 | 3.4 | 5.6 |
| n74 |  | 5.2 |
| n85 | 6.3 | N/A |
| n105 | 3.4 | 5.2 |
| NOTE: Empty value means that the ΔR1R allowance specified in Table 7.3I.2-1 applies. |

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| R4-2509563(Formal Cat-A CR of R4-2509562 for TS38.101-1 in Rel-18) | Apple, SKWS | CR Title: (NR\_redcap-Core) CR to 38.101-1 on corrections for RedCap UE PC3 FDD band 1Rx REFSENS (Rel-18) |
| R4-2509564(Formal Cat-A CR of R4-2509562 for TS38.101-1 in Rel-19) | Apple, SKWS | CR Title: (NR\_redcap-Core) CR to 38.101-1 on corrections for RedCap UE PC3 FDD band 1Rx REFSENS (Rel-19) |
| [R4-2511389](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511389.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Qualcomm | CR Title: (NR\_redcap-Core) CR to TS 38.101-1: OOB blocking for RedCap UEs* **Reason for changes:** UEs supporting both n20 and n28 in CA have an exception in OOB blocking which enables a reduced complexity triplexer implementation. This same relaxation would help reduce complexity of RedCap UE RF front-end
* **Summary of changes:** Allow an exception for RedCap UE OOB blocking when RedCap UE supports both n20 and n28

7.6I Blocking characteristics for RedCapRequirements in clauses 7.6.1 to 7.6.4 apply for a RedCap UE. In addition, for a RedCap UE supporting both band n20 and band n28, the out-of-band blocking requirements for Band n20 and Band n28 specified in clause 7.6.3 apply with FDL\_low given by Band n28 and FDL\_high by Band n20. |
| R4-2511390(Formal Cat-A CR of R4-2511389 for TS38.101-1 in Rel-18) | Qualcomm | CR Title: (NR\_redcap-Core) CR to TS 38.101-1: OOB blocking for RedCap UEs (Rel-18) |
| R4-2511391(Formal Cat-A CR of R4-2511389 for TS38.101-1 in Rel-19) | Qualcomm | CR Title: (NR\_redcap-Core) CR to TS 38.101-1: OOB blocking for RedCap UEs (Rel-19) |
| [R4-2511372](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511372.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | CATT | CR Title: CR for TS 38.101-1 to clarify the power class for intra-band UL CA (R17)* **Reason for changes:** The UE may report different power class capabilities between *ue-PowerClass* / *ue-PowerClass-v1610* and *powerClass* / *powerClass-v1610* for an intra-band contiguous or non-contigous UL CA, e.g. 29dBm per band *ue-PowerClass* / *ue-PowerClass-v1610* with a 26dBm per BC *powerClass* / *powerClass-v1610* for the same band as UL intra-band CA is implemented more difficultly than UL single carrier. Currently, the configured power class Pcmax,c for intra-band UL CA is refered to the definition of general clause 6.2.4. It’s better to clarify the definition of parameter Ppowerclass under intra-band UL CA in order to reduce the ambiguities.
* **Summary of changes:** To clarify how to apply the Ppowerclass under intra-band UL CA as what we did for MPRc and A-MPRc

 6.2A.4.1.1 Configured transmitted power for Intra-band contiguous CAThe configured maximum output power PCMAX,*c* on serving cell *c* shall be set as specified in clause 6.2.4, but with the following definitions for some parameters. MPRc = MPR and A-MPRc = A-MPR with MPR and A-MPR as determined by subclause 6.2A.2 and 6.2A.3, respectively. PPowerClass is the maximum UE power specified in Table 6.2.1-1 and in Table 6.2F.1-1 for shared spectrum access operation reported by the smaller one between *ue-PowerClass* / *ue-PowerClass-v1610* and *powerClass* / *powerClass-v1610* without taking into account the tolerance. 6.2A.4.1.2 Configured transmitted power for Intra-band non-contiguous CAThe configured maximum output power PCMAX,*c* on serving cell *c* shall be set as specified in subclause 6.2.4, but with the following definitions for some parameters. MPRc = MPR and A-MPRc = A-MPR with MPR and A-MPR as determined by subclause 6.2A.2 and 6.2A.3, respectively. PPowerClass is the maximum UE power specified in Table 6.2.1-1 and in Table 6.2F.1-1 for shared spectrum access operation reported by the smaller one between *ue-PowerClass* / *ue-PowerClass-v1610* and *powerClass* / *powerClass-v1610* without taking into account the tolerance. |
| R4-2509257(Formal Cat-A CR of R4-2511372 for TS38.101-1 in Rel-18) | CATT | CR Title: CR for TS 38.101-1 to clarify the power class for intra-band UL CA (R18) |
| R4-2509258(Formal Cat-A CR of R4-2511372 for TS38.101-1 in Rel-19) | CATT | CR Title: CR for TS 38.101-1 to clarify the power class for intra-band UL CA (R19) |
| [R4-2509552](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509552.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Apple | CR Title: CR to 38.101-1 Rel-17 Band Combination Bug Fixes CATF* **Reason for changes:** In carrier aggregation, a UE can fall back from a parent configuration to a lower order fallback. Issues with missing downlink fallbacks have been discussed in previous releases. Similarly, if uplink configurations of a parent are missing from the fallbacks, the UL fallbacks must also be fully specified in the standards matching the parent’s uplink capability. Failing to address all required uplink configurations can prevent the implementation of higher-level combinations.

**Summary of changes:** Introducing missing fallbacks for the following downlink CA combinations:* CA\_n7A-n79A
* CA\_n40A-n77C
* CA\_n41A-n78(2A)
* CA\_n1A-n28A-n40B
* CA\_n1A-n40B-n78A
* CA\_n7(2A)-n25A-n78A
* CA\_n7A-n25(2A)-n78A
* CA\_n7(2A)-n25(2A)-n78A
* CA\_n7(2A)-n25A-n78(2A)
* CA\_n7A-n25(2A)-n78(2A)
* CA\_n7(2A)-n25(2A)-n78(2A)
* CA\_n28A-n40B-n78A
* CA\_n28A-n41A-n78(2A)
* CA\_n1A-n5A-n7A-n78A
 |
| R4-2509553(Formal Cat-A CR for TS38.101-1 in Rel-18) | Apple | CR Title: CR to 38.101-1 Rel-17 Band Combination Bug Fixes CATA Rel-18 |
| R4-2509554(Formal Cat-A CR for TS38.101-1 in Rel-18) | Apple | CR Title: CR to 38.101-1 Rel-17 Band Combination Bug Fixes CATA Rel-19 |
| [R4-2509862](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509862.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1 - TS 38.101-1* **Reason for changes:** Several changes are needed:

There is an error in Table 7.3A.1-1: (5, 12) should be corrected to (5, 10). The RB allocation for DFT-s-OFDM is “*the closest number lower or equal to CP-OFDM maximum RB allocation satisfying the following equation, partial RB allocations shall also conform to this equation :* $Number of RB= 2^{X}×3^{Y}×5^{Z}$” as written in TR TR38.817-01. The corresponding CP-OFDM value in Table 5.3.2-1 being 11 RBs, 10 is the closest value being lower or equal satisfying that equation.The RB values in Table 7.3A.1-1 are not given for all the channel bandwidths defined in Table 5.3.2-1 that are relevant to n41, n77, n78, n79. CHBWs>50MHz are also relevant as for example in Table 7.3.2-1b or in Table 7.3A.6-1. A note is added in order to indicate how to proceed to determine the other values.* **Summary of changes:** In Table 7.3A.1-1:

- Change (5, 12) to (5,10).- Addition of a note: “*NOTE 1: The values for other channel bandwidths can be determined using the CP-OFDM values from Table 5.3.2-1. The corresponding RB allocations for DFT-s-OFDM as defined in the present table, should be equal to the closest integer number lower or equal to the corresponding (same SCS and bandwidth) CP-OFDM maximum RB allocation satisfying the following equation:* $Number of RBs= 2^{X}×3^{Y}×5^{Z}$ *(where X, Y and Z are non-negative integers)*”. |
| R4-2509863(Formal Cat-A CR of R4-2509862 for TS38.101-1 in Rel-18) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1 - TS 38.101-1 |
| R4-2509864(Formal Cat-A CR of R4-2509862 for TS38.101-1 in Rel-19) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1 - TS 38.101-1 |
| [R4-2509871](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509871.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1* **Reason for changes:** A change is needed:

According to Table 5.4.4-1, the TX-RX separation (duplex distance) for n2 and n66 is 80 MHz and 400 MHz, respectively.However, in Table 7.3A.5-2, the TX-RX separations for the following requirements do not align with the above definitions.CA\_n2-n5-n30, the duplex distance used for n2 is 89 MHz while it should be 80 MHz.CA\_n2-n48-n66, the duplex distance used for n66 is 420 MHz while it should be 400 MHz.UL Fc should be prioritized over DL Fc because it is the Tx signals that intermodulate and fall in a victim Rx channel. Therefore, the following DL Fc (not victim Rx channel) should be changed:[CA\_n2-n5-n30] n2 DL Fc -> 1950 MHz (The victim of the IMD4 is n5 DL Fc = 880MHz).[CA\_n2-n48-n66] n66 DL Fc -> 2170 MHz (The victim of the IMD2 is n48 DL Fc = 3625MHz).* **Summary of changes:** In Table 7.3A.5-2:

- For CA\_n2-n5-n30, change n2 DL Fc from 1959 MHz to 1950 MHz.- For CA\_n2-n48-n66, change n66 DL Fc from 2190 MHz to 2170 MHz.  |
| [R4-2509872](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509872.zip)(Formal Cat-F CR for TS38.101-1 in Rel-18) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1* **Reason for changes:** A change is needed:

Same as above in R4-2509871* **Summary of changes: In Table 7.3A.5-2:**

- For CA\_n2-n5-n30, change n2 DL Fc from 1959 MHz to 1950 MHz.- For CA\_n2-n48-n66, change n66 DL Fc from 2190 MHz to 2170 MHz.- For CA\_n25-n41-n66, change n66 DL Fc from 2195 MHz to 2175 MHz. It has to be noted that some cells could be merged (see comment below in the corresponding rows, MS Word does not allow to mark such a change). |
| [R4-2509873](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509873.zip)(Formal Cat-F CR for TS38.101-1 in Rel-19) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1* **Reason for changes:** A change is needed:

Same as above in R4-2509871* **Summary of changes:** In Table 7.3A.5-2:

- For CA\_n2-n5-n30, change n2 DL Fc from 1959 MHz to 1950 MHz.- For CA\_n2-n48-n66, change n66 DL Fc from 2190 MHz to 2170 MHz.- For CA\_n2-n66-n77, change n66 DL Fc from 2195 MHz to 2175 MHz. It has to be noted that some cells could be merged (see comment below in the corresponding rows, MS Word does not allow to mark such a change).- For CA\_n25-n41-n66, change n66 DL Fc from 2195 MHz to 2175 MHz. It has to be noted that some cells could be merged (see comment below in the corresponding rows, MS Word does not allow to mark such a change). It has to be noted that some cells could be merged (see comment below in the corresponding rows, MS Word does not allow to mark such a change). |
| [R4-2509874](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509874.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Anritsu Limited | CR Title: (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct n78 UL BW used in some REFSENS exceptions in clause 7.3A.4 - TS 38.101-1* **Reason for changes:** There is a typo in Table 7.3A.4-4: 510 (MHz) is written instead of 10 (MHz) for the UL BW for the two rows: UL band=n78 and DL band=n5 & n8.
* **Summary of changes:** In Table 7.3A.4-4 for UL band=n78 and DL band=n5 & n8, change 510 to 10.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| n78 | n5 | 10 | 15 | 25 (RBstart=0) | 5 | 5.7 | NOTE 8 | UL1/DL4 |
| n78 | n8 | 10 | 15 | 25 (RBstart=0) | 5 | 5.7 | NOTE 8 | UL1/DL4 |

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| [R4-2510929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510929.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | ZTE, Sanechips | CR Title: (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove the footnote for the HPUE band combination* **Reason for changes:** The Notes as listed below aims to use a general description for the tolerance when the constitute band is confined within 4MHz of FUL\_low and FUL\_high
	+ NOTE 2: An uplink CA configuration in which at least one of the bands has NOTE 3 in Table 6.2.1-1 is allowed to reduce the lower tolerance limit by 1.5 dB when the transmission bandwidths of at least one of the bands is confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high - 4 MHz and FUL\_high.
* Therefore, there is no need to mark the footnote 2 for the HPUE NR CA configurations case by case, otherwise, mixed guidance would be existed in the table.
* **Summary of changes:** remove the footnote 2 for the HPUE NR CA configurations.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA\_n25A-n41A |  |  | 266 | +2/-3 | 23 | +2/-3 |  |  |

 |
| R4-2510930(Formal Cat-A CR of R4-2510929 for TS38.101-1 in Rel-18) | ZTE, Sanechips | CR Title: (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove the footnote for the HPUE band combination |
| R4-2510931(Formal Cat-A CR of R4-2510929 for TS38.101-1 in Rel-19) | ZTE, Sanechips | CR Title: (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove the footnote for the HPUE band combination |
| [R4-2509865](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509865.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Anritsu Limited | CR Title: (DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3B.1 - TS 38.101-3* **Reason for changes:** There is an error in Table 7.3B.1-1: (5, 12) should be corrected to (5, 10). The RB allocation for DFT-s-OFDM is “the closest number lower or equal to CP-OFDM maximum RB allocation satisfying the following equation, partial RB allocations shall also conform to this equation : $Number of RB= 2^{X}×3^{Y}×5^{Z}$” as written in TR TR38.817-01. The corresponding CP-OFDM value in Table 5.3.2-1 being 11 RBs, 10 is the closest value being lower or equal satisfying that equation.
* The RB values in Table 7.3B.1-1 are not given for all the channel bandwidths defined in Table 5.3.2-1 of TS 38.101-1 that are relevant to n41, n77, n78, n79. CHBWs>50MHz are also relevant as for example in Table 7.3B.2.3.4-1 of TS38.101-3. A note is added in order to indicate how to proceed to determine the other values.
* **Summary of changes:**

- Change (5, 12) to (5,10).- Addition of a note: “*NOTE 1: The values for other channel bandwidths can be determined using the CP-OFDM values from Table 5.3.2-1. The corresponding RB allocations for DFT-s-OFDM as defined in the present table, should be equal to the closest integer number lower or equal to the corresponding (same SCS and bandwidth) CP-OFDM maximum RB allocation satisfying the following equation:* $Number of RBs= 2^{X}×3^{Y}×5^{Z}$ *(where X, Y and Z are non-negative integers)*”. |
| R4-2509866(Formal Cat-A CR of R4-2509865 for TS38.101-1 in Rel-18) | Anritsu Limited | CR Title: (DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3B.1 - TS 38.101-3 |
| R4-2509867(Formal Cat-A CR of R4-2509865 for TS38.101-1 in Rel-19) | Anritsu Limited | CR Title: (DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3B.1 - TS 38.101-3 |
| [R4-2510408](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510408.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Qualcomm, Union Inter. Chemins de Fer, Vodafone | CR Title: (NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.101-1: Annex M corrections for FRMCS operation* **Reason for changes:** In RAN4#110, Annex M in TS 38.101-1 was introduced (agreed CR in R4-2403694) to adress the impact of post connector antenna gain at the UE side for band n100 and n101 FRMCS operation. However, the current text in Annex M is not clear and requires further clarification regarding 1) conversion from conducted to radiated limits, and 2) ensure correct scaling of the UE unwanted and spurious emissions to account for the post connector antenna gain.
* **Summary of changes:** Further clarify how to account for post connector antenna gain compensation at the UE for FRMCS operation

1) In 3.2 Symbols, add PEIRP as follow  PEIRP UE Effective Isotropic Radiated Power (EIRP)2) In clause 6.1 General part, updated as followNOTE: For FRMCS (Future Railway Mobile Communication System) operation in bands n100 and n101, if a post chipset unit antenna connector gain Gn100post connector or Gn101post connector is declared for the UE, conversion between conducted and radiated Transmitter requirements follows the principles described in Annex M. 3) Update annex MM.1 FRMCS operating bandsDue to large form factor of the FRMCS (Future Railway Mobile Communication System) rooftop mounted cab-radio unit, UE in bands n100 and n101 can have external antenna placed far away from the chipset unit. In this case, the effective antenna gain is a UE specific condition. This effective antenna gain includes the feeding loss of all components after the chipset unit antenna connector and the peak directional gain of the external antenna and hence will be called the post connector gain Gn100post connector and Gn101post connector for band n100 and n101, respectively. Note that 3GPP specifications mandate UE manufacturer declarations.If external antenna is not used, the value of 0dBi will be used. If external antenna is used, the UE EIRP PEIRP shall be computed as the summation of the UE maximum conducted output power specified in Table 6.2.1-1 and the declared Gn100post connector or Gn101post connector for band n100 and n101, respectively. The radiated UE out of band and spurious emissions shall be computed by the summation of the conducted limits specified in clauses 6.5.2 and 6.5.3, and the declared Gn100post connector or Gn101post connector for band n100 and n101, respectively. |
| R4-2510409(Formal Cat-A CR of R4-2510408 for TS38.101-1 in Rel-18) | Qualcomm, Union Inter. Chemins de Fer, Vodafone | CR Title: (NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.101-1: Annex M corrections for FRMCS operation |
| R4-2510410(Formal Cat-A CR of R4-2510408 for TS38.101-1 in Rel-19) | Qualcomm, Union Inter. Chemins de Fer, Vodafone | CR Title: (NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.101-1: Annex M corrections for FRMCS operation |
| [R4-2509512](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509512.zip)(Formal Cat-F CR for TS38.101-5 in Rel-17) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification to the spurious emission domain for the UE co-existence* **Reason for Changes:** When TS 38.101-5 was created back in Rel-17, the wording in sub-clause 6.5.3.2 was taken from the Rel-17 version of TS 38.101-1. Later on TS 38.101-1 sub-clause 6.5.3.2 was further claririfed on the applicability of the spurious emissions, but the corresponding change was not applied to TS 38.101-5.
* **Summary of Cganges:** The wording in sub-clause 6.5.3.2 is aligned with the same wording in sub-clause 6.5.3.2 of TS 38.101-1.

This clause specifies the requirements for NR NTN satellite bands for UE coexistence with protected bands. Unless otherwise stated, the spurious emission for UE co-existence apply for the frequency ranges that are more than FOOB (MHz) in Table 6.5.3.1-1 from the edge of the channel bandwidth. |
| [R4-2509513](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509513.zip)(Formal Cat-A CR for TS38.101-5 in Rel-18) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification to the spurious emission domain for the UE co-existence |
| [R4-2509514](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509514.zip)(Formal Cat-A CR for TS38.101-5 in Rel-19) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification to the spurious emission domain for the UE co-existence |
| [R4-2509515](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509515.zip)(Formal Cat-F CR for TR38.863 in Rel-17) | Apple | CR Title: (NR\_NTN\_solutions-Core) Correction of the NR NTN band n256 REFSENS values* **Reason for Changes:** NTN band n256 REFSENS values were corrected in TS 38.101-5, but the corresponding changes were not introduced into this TR
* **Summary of Changes:** Align REFSENS for n256 with TS38.101-5

Table 7.4.3.2.2-1: Two antenna port reference sensitivity QPSK REFSENS

| **Operating band / SCS / Channel bandwidth / Duplex-mode** |
| --- |
| **NTN satellite band #** | **SCS kHz** | **5****MHz(dBm)** | **10****MHz(dBm)** | **15****MHz(dBm)** | **20****MHz(dBm)** | **Duplex Mode** |
|  | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  |
| n255 | 30 |  | -97.1 | -95.1 | -94.0 | FDD |
|  | 60 |  | -97.5 | -95.4 | -94.2 |  |
|  | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |
| n256 | 30 |  | -96.6 | -94.6 | -93.5 | FDD |
|  | 60 |  | -97 | -94.9 | -93.7 |  |

 |
| [R4-2509516](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509516.zip)(Formal Cat-A CR for TR38.863 in Rel-18) | Apple | CR Title: (NR\_NTN\_solutions-Core) Correction of the NR NTN band n256 REFSENS values |
| [R4-2509517](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509517.zip)(Formal Cat-A CR for TR38.863 in Rel-19) | Apple | CR Title: (NR\_NTN\_solutions-Core) Correction of the NR NTN band n256 REFSENS values |
| [R4-2509518](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509518.zip)(Formal Cat-F CR for TS38.101-5 in Rel-17) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements* **Reason for Changes:** It has been assumed that NTN band n256 can support different duplexer filters. Thus, to avoid constraining a UE to a specific filter implementation the corresponding clarifications should be added.
* **Summary of Changes:** In Table 7.6.3-2, NOTE1 is voided

Table 7.6.3-2: Out of-band blocking for NR satellite bands with FDL\_high < 2700 MHz and FUL\_high < 2700 MHz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -30 | -15 |
| n255 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15or15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60or60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85orFDL\_high + 85 ≤ f≤ 12750 |
| n256 | Finterferer (CW) | MHz | -100 < f – FDL\_low < -15or15 < f – FDL\_high < 60 | -145 < f – FDL\_low ≤ -100or60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 145orFDL\_high + 85 ≤ f≤ 12750 |
| NOTE 1: void NOTE 2: voidNOTE 3: voidNOTE 4: void |

 |
| [R4-2509519](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509519.zip)(Formal Cat-A CR for TS38.101-5 in Rel-18) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |
| [R4-2509520](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509520.zip)(Formal Cat-A CR for TS38.101-5 in Rel-19) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |
| [R4-2509521](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509521.zip)(Formal Cat-F CR for TR38.863 in Rel-17) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements* **Reason for Changes:** It has been assumed that NTN band n256 can support different duplexer filters. Thus, to avoid constraining a UE to a specific filter implementation the corresponding clarifications should be added.
* **Summary of Changes:**

 7.4.3.2.5 Blocking characteristicsFor blocking characteristics, it is agreed, the same requirements as for NR TN UEs are applicable, and therefore reused. For NR satellite band n255, OOBB requirements of n24 are reused. For n256, it is assumed to keep UE implementation freedom with different options (e.g., reusing n65 duplexer or dedicated 30MHz duplexer). |
| [R4-2509522](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509522.zip)(Formal Cat-A CR for TR38.863 in Rel-18) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |
| [R4-2509523](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509523.zip)(Formal Cat-A CR for TR38.863 in Rel-19) | Apple | CR Title: (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |
| [R4-2509868](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509868.zip)(Formal Cat-F CR for TS38.101-5 in Rel-17) | Anritsu Limited | CR Title: (NR\_NTN\_solutions-Core) CR to update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs* **Reason for Changes**: RMCs for FR1-NTN TRx testing with 30kHz SCS are not defined in TS 38.101-5, as well as the maximum throughput values for the fixed reference channels for receiver requirements for 15kHz SCS
* **Summary of Changes:**

1) Adding the section A.3.4.1.1A Fixed reference channels for SCS 30kHz FR1-NTN and its associated tables.2) Adding the FR1-NTN FDD active uplink slots for 30kHz SCS for both NGSO (in Table A.2.1-1) and GSO (in Table A.2.1-2).Table A.2.1-1: FR1-NTN FDD active uplink slots for NGSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 0,1,2,3,4,5,8,9 in every frame |
| 30 kHz | 0,1,2,3,4,5,6,7,8,9,34,35,36,37,38,39 in every 2 frames |
| 60 kHz |  |
| NOTE 1: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 2: Assuming K2 is 2, CellSpecificKoffset is 14 |

The active uplink slots for FR1-NTN FDD configurations for GSO are specified in Table A.2.1-2. FR1-NTN FDD slot patterns defined for reference sensitivity tests will be used for FR1-NTN FDD UL RMCs, unless otherwise stated.Table A.2.1-2: FR1-NTN FDD active uplink slots for GSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 262,263,264,265,266,267,268,269, 272,273,274, 275, 276, 277, 278, 279 in every 32 frames |
| 30 kHz | 522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537 in every 32 frames |
| 60 kHz |  |
| NOTE 1: The active slots are counted from the 0th slot in the 1st frame of the periodicity.NOTE 2: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 3: Assuming K2 is 2, CellSpecificKoffset is 258 |

3) Adding the max throughput values for the fixed reference channels for receiver requirements (SCS 15kHz, FDD)) for NGSO QPSK (Table A.3.4.1.1-1), NGSO 64QAM (Table A.3.4.1.1-2), GSO QPSK (Table A.3.4.1.1-3), NGSO 64QAM (Table A.3.4.1.1-4).4) Replacing “radio frame” by just “frame”.5) Replacing FFS by a blank in both Table A.2.1-1 and Table A.2.1-2.6) Adding a placeholder for the section A.3.4.1.1B Fixed reference channels for SCS 60kHz FR1-NTN. |
| [R4-2509869](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509869.zip)(Formal Cat-F CR for TS38.101-5 in Rel-18) | Anritsu Limited | CR Title: (NR\_NTN\_solutions-Core) CR to update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs* **Reason for Changes**: RMCs for FR1-NTN TRx testing with 30kHz SCS are not defined in TS 38.101-5, as well as the maximum throughput values for the fixed reference channels for receiver requirements for 15kHz SCS
* **Summary of Changes:**

1) Adding the section A.3.4.1.1A Fixed reference channels for SCS 30kHz FR1-NTN and its associated tables.2) Adding the FR1-NTN FDD active uplink slots for 30kHz SCS for both NGSO (in Table A.2.1-1) and GSO (in Table A.2.1-2).DL3) Adding the max throughput values for the fixed reference channels for receiver requirements (SCS 15kHz, FDD)) for NGSO QPSK (Table A.3.4.1.1-1), NGSO 64QAM (Table A.3.4.1.1-2), GSO QPSK (Table A.3.4.1.1-3), NGSO 64QAM (Table A.3.4.1.1-4).4) Replacing “radio frame” by just “frame”.5) Adding a placeholder for the section A.3.4.1.1B Fixed reference channels for SCS 60kHz FR1-NTN. |
| [R4-2509870](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509870.zip)(Formal Cat-A CR for TS38.101-5 in Rel-19) | Anritsu Limited | CR Title: (NR\_NTN\_solutions-Core) CR to update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs |
| [R4-2510350](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509868.zip)(Formal Cat-F CR for TS38.101-5 in Rel-17) | ZTE | CR Title: (NR\_NTN\_solutions-Core) CR to TS38.101-5 Corrections on Rx requirement* **Reason for Changes:** The note that power shall be rounded to the next higher 0.5dB value is for channel bandwidths larger than 20MHz with the equation 10log10(BWChannel /20) for ACS, blocking and spurious requirement. However, the maximum channel bandwidth is 20MHz for FR1-NTN in current spec and no such equation defined in **ACS, blocking and spurious requirement**.
* **Summary of Changes:** Delete the unnecessary note that power shall be rounded to the next higher 0.5dB value
 |
| R4-2510351(Formal Cat-A CR for TS38.101-5 in Rel-18) | ZTE | CR Title: (NR\_NTN\_solutions-Core) CR to TS38.101-5 Corrections on Rx requirement |
| R4-2510352(Formal Cat-A CR for TS38.101-5 in Rel-19) | ZTE | CR Title: (NR\_NTN\_solutions-Core) CR to TS38.101-5 Corrections on Rx requirement |
| [R4-2511381](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511381.zip)(Discussion paper) | Qualcomm | Title: (NR\_PC2\_UE\_FDD-Core) PC2 FDD reference measurement channel**Observation 1: Default duty cycle of 50% has been specified for all PC2 UEs, and applies equally for TDD and FDD**Observation 2: Missing PC2 FDD RMC with up to 50% leads in unintended UE behavior in conformance testing, and PC2 requirements may not be properly verified.Observation 3: Adding a new RMC for PC2 FDD enables testing to be done aligned with PC2 FDD requirements.**Proposal 1: Specify a new RMC for PC2 FDD with up to 50% duty cycle.** |
| [R4-2511382](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511382.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Qualcomm | CR Title: (NR\_PC2\_UE\_FDD-Core) CR to TS 38.101-1: Addition of missing RMC* **Reason for changes:** Currently, all uplink RMCs for FDD use 100% UL duty cycle. This can result in UE reducing it’s output power to PC3 power level during testing of emissions and MSD, effectively not verifying PC2 performance as intended. A restriction to UL duty cycle for PC2 FDD is needed.
* **Summary of changes:** Active UL slots for PC2 FDD are added to Annex 2. Clarification is included for Rx requirements to ensure measurements are performed when UL transmissions is active.
1. In Clause 7, add NOTE: For FDD bands requirements shall be verified during active UL transmission, unless otherwise stated.
2. Add Annex 2 as below

The active uplink slots for FDD PC2 are specified in Table A.2.1-6.Table A.2.1-6: Active uplink slots per radio frame for PC2 FDD

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 6 to 9 |
| 30 kHz | 12 to 19 |
| 60 kHz | 24 to 39 |

NOTE: To allow flexibility for signal configuration for PC2 FDD, e.g. PUCCH and SRS may be transmitted also during other slots as long as UL duty cycle in a radio frame does not exceed 50%.  |
| R4-2511383(Formal Cat-A CR for TS38.101-1 in Rel-18) | Qualcomm | CR Title: (NR\_PC2\_UE\_FDD-Core) CR to TS 38.101-1: Addition of missing RMC |
| R4-2511384(Formal Cat-A CR for TS38.101-1 in Rel-19) | Qualcomm | CR Title: (NR\_PC2\_UE\_FDD-Core) CR to TS 38.101-1: Addition of missing RMC |
| [R4-2509263](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509263.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | CATT | CR Title: CR to 38.101-1: Editorial change on channel raster entries* **Reason for Changes**: There is an editorial error on channel raster entries for frequency bands with two or more ΔFRaster when implementing the CR.
* **Summary of Changes**:

In frequency bands with two or more ΔFRaster: For 15 kHz and 30 kHz channel raster, the higher ΔFRaster applies to channels using only the SCS that is equal to or larger than the higher ΔFRaster and SSB SCS is equal to the higher ∆FRaster. |
| R4-2509264(Formal Cat-A CR for TS38.101-1 in Rel-18) | CATT | CR Title: CR to 38.101-1: Editorial change on channel raster entries |
| R4-2509265(Formal Cat-A CR for TS38.101-1 in Rel-19) | CATT | CR Title: CR to 38.101-1: Editorial change on channel raster entries |
| [R4-2509266](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509266.zip)(Formal Cat-F CR for TS38.307 in Rel-17) | CATT | CR Title: CR to 38.307: Editorial change on UL 7.5KHz shift* **Reason for Changes:** There are some editorial errors for UL 7.5KHz shift for TDD band n40:

UL 7.5KHz shift for TDD band n40 should be one separate chapter and the table number for UL 7.5KHz shift for band n40 is wrong.* **Summary of Changes:**

5.6 UL 7.5KHz shift for TDD band n40Requirements for a Rel-17 UE for UL 7.5KHz shift for TDD band n40 within FR1 compared to TS 38.101-1 of Rel-17 [2] are introduced via this clause. For Band n40, UL shift is only applicable to uplink transmissions using a 15 kHz SCS.Table 5.6-1: UL 7.5KHz shift for band n40 in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feature | DL/UL | Duplex-mode | Releaseindependent from | requirements to be fulfilled(see 38.307 of the REL in which the configuration was introduced) |
| 7.5KHz UL shift for band n40 in FR1 | UL | TDD | Rel-15 | Table B.4.7-1 |

 |
| [R4-2510200](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510200.zip)(Discussion paper) | Huawei | MPR reduction for upper 6GHz by ACLR relaxation**Observation 1**: TR 38.921 for FS\_NR\_IMT\_param agreed to specify not 30 dB, but rather 26 dB ACLR for the 6.425~7.125 GHz frequency range assuming UE PC3, while it has not been incorporated into TS38.101-1.**Observation 2**: 4 dB ACLR relaxation would enable MPR to be reduced by 0.5~1.0 dB for QPSK and 16QAM for DFT-s-OFDM and those for CP-OFDM, respectively.**Observation 3**: There would not be any deployments for n104. Hence, no NBC issue is found to introduce ACLR of 26 dB from release 17.**Observation 4**: For single carrier operation of n104 and intra band contiguous UL CA of n104C, the impacted requirements are ACLR of 30 dB, which must be replaced with 26 dB and corresponding MPR. For inter-band UL CA including n104, i.e., CA\_n78-n104, MSD value for cross band isolation due to interference from n104 must be revisited.**Proposal: Introduce a relaxed ACLR of 26 dB for PC3 n104, n104C and BCs including n104 together with reduced MPRs for n104 and n104C, respectively and a new MSD value for CA\_n78-n104 from R17 and beyond.** |
| [R4-2510201](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510201.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Huawei | CR Title: (NR\_6GHz-Core) CR to TS 38.101-1: Correct the Tx requirements for n104* **Reason for Changes:** Correct the Tx requirements for n104 to the align with co-existence study agreement in Rel-17.
* **Summary of Changes:** Change the ACLR requirement for n104. Change the MPR requirement for n104 single carrier with updated ACLR.

Table 6.2.2-1a Maximum power reduction (MPR) for power class 3 for Band n104

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK w/ Rel-15 DMRS | ≤ 3.51 | ≤ 1.21 | ≤ 0.21 |
|  |  | ≤ 0.52,3 | ≤ 0.52 | 02,4 |
|  | Pi/2 BPSK w Pi/2 BPSK DMRS | ≤ 0.52,3 |  02 | 02,4 |
|  | QPSK | ≤ 0.5 | 05 |
|  | 16 QAM | ≤ 1 | ≤ 0.5 |
|  | 64 QAM | ≤ 2.5 |
|  | 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 2 | ≤ 0.5 |
|  | 16 QAM | ≤ 2 | ≤ 1 |
|  | 64 QAM | ≤ 3.5 |
|  | 256 QAM | ≤ 6.5 |
| NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78, n79 and n104. The reference power of 0 dB MPR is 26 dBm.NOTE 2: Applicable for conditions where note 1 does not apply.NOTE 3: For a UE indicating support for UE capability *powerBoosting-pi2BPSK-QPSK-r18* or *powerBoosting-pi2BPSK-QPSK-Modified-r18* and if the IE *powerBoostPi2BPSK-r18* is set to 1, the reference power is increased by [ΔPPowerBoost - ΔPPowerClass] NOTE 4: For a UE indicating support for UE capability *powerBoosting-pi2BPSK-QPSK-r18* or *powerBoosting-pi2BPSK-QPSK-Modified-r18* and if the IE *powerBoostQPSK-r18* is set to 1, the reference power is increased by [ΔPPowerBoost - ΔPPowerClass] |

**Table 6.5.2.4.1-3: NR ACLR requirement for NR band n104**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Power class 1** | **Power class 1.5** | **Power class 2** | **Power class 3** |
| **NR ACLR** | - | - | - | 26 dB |

 |
| R4-2510202(Formal Cat-A CR for TS38.101-1 in Rel-18) | Huawei | CR Title: (NR\_6GHz-Core) CR to TS 38.101-1: Correct the Tx requirements for n104 |
| R4-2510203(Formal Cat-A CR for TS38.101-1 in Rel-19) | Huawei | CR Title: (NR\_6GHz-Core) CR to TS 38.101-1: Correct the Tx requirements for n104 |
| [R4-2511300](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511300.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Huawei, HiSilicon, Ericsson, ZTE, Samsung, CATT, Nokia | CR Title: (NR\_6GHz-Core) CR to 38.101-1 correction on the band definition for n104* **Reason for Changes:** NOTE 18 was justified back in the time when the band 104 was introudced based on the request from RCC and in the absence of IMT identification. Since we have IMT identification of 6425-7125MHz from WRC-23, the note should be removed as it gives the impression that the condition for this band has to be defined country by country rather than following the conditions defined in ITU.
* **Summary of Changes:** Note 18 in Table 5.2-1 is removed.

|  |  |  |  |
| --- | --- | --- | --- |
| n10417 | 6425 MHz – 7125 MHz | 6425 MHz – 7125 MHz | TDD |

NOTE 18: Void |
| R4-2511301(Formal Cat-A CR for TS38.101-1 in Rel-18) | Huawei, HiSilicon, Ericsson, ZTE, Samsung, CATT, Nokia | CR Title: (NR\_6GHz-Core) CR to 38.101-1 correction on the band definition for n104 |
| R4-2511302(Formal Cat-A CR for TS38.101-1 in Rel-19) | Huawei, HiSilicon, Ericsson, ZTE, Samsung, CATT, Nokia | CR Title: (NR\_6GHz-Core) CR to 38.101-1 correction on the band definition for n104 |
| [R4-2510276](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510276.zip)(Discussion paper) | vivo | Title: (NR\_newRAT-Core, LTE-RF) Discussion on addition of higher harmonic exceptions for UE co-existence requirements**Observation 1**: There is an exception for harmonics in UE co-existence requirements.**Observation 2:** In early days, the exception for harmonics were updated when new higher frequency band was introduced.**Observation 3:** The update of the harmonics note did not continual in LTE and NR even new higher order of harmonics emerge with the introduction of higher frequency band.**Observation 4**: Neglecting the problem would bring unnecessary complexity for UE implementation.**Proposal: Adding 6th harmonics in the Note 2 of UE co-existence requirements, and change the applicability of certain band to cover this case.** |
| [R4-2510277](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510276.zip)(Formal Cat-F CR for TS36.101 in Rel-17) | vivo | CR Title : (LTE-RF) Addition of higher harmonic exceptions for UE co-existence requirements in TS36.101* **Reason for Changes:** The possible 6th harmonics for some lower bands (e.g. band 8/28 etc) could be overlapping with n79 and may also apply the exception. However, this note was never updated for a long time, and was directly reused from LTE for NR without even remove the square brackets of [5th]. For certain band e.g. band 28/n28, the 6th harmonics might fall into n79, and Note 2 is also needed for the UE protection.
* **Summary of Changes :** Adding 6th harmonics in the Note 2 of UE co-existence requirements. Change the applicability of band n79 in the band 28 UE-coexistence

 |
| R4-2510278(Formal Cat-A CR for TS36.101 in Rel-18) | vivo | CR Title : (LTE-RF) Addition of higher harmonic exceptions for UE co-existence requirements in TS36.101 |
| [R4-2510279](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510279.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | vivo | CR Title : (NR\_newRAT-Core) Addition of higher harmonic exceptions for UE co-existence requirements* **Reason for Changes:** The possible 6th harmonics for some lower bands (e.g. band 8/28 etc) could be overlapping with n79 and may also apply the exception. However, this note was never updated for a long time, and was directly reused from LTE for NR without even remove the square brackets of [5th]. For certain band e.g. band 28/n28, the 6th harmonics might fall into n79, and Note 2 is also needed for the UE protection.
* **Summary of Changes :** Adding 6th harmonics in the Note 2 of UE co-existence requirements. Change the applicability of band n79 in the band 28 UE-coexistence

 |
| R4-2510280(Formal Cat-A CR for TS38.101-1 in Rel-18) | vivo | CR Title : (NR\_newRAT-Core) Addition of higher harmonic exceptions for UE co-existence requirements |
| R4-2510281(Formal Cat-A CR for TS38.101-1 in Rel-19) | vivo | CR Title : (NR\_newRAT-Core) Addition of higher harmonic exceptions for UE co-existence requirements |
| [R4-2511063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511063.zip)(Formal Cat-F CR for TS38.101-1 in Rel-17) | Qualcomm, Huawei, HiSilicon | CR Title: CR on clarification of UL/DL bandwidths on overlapping NR SUL and NR bands* **Reason for Changes:** n28-n83, n1-n84, n3-n80, and n8-n81 are overlapping bands, so it is important to clarify that channel bandwidths are symmetrical unless otherwise specified, and in addition for n28-n83 that channels are confined within lowest 30MHz or within highest 30MHz
* **Summary of Changes:** Adding notes to section 5.2C.4. Intention of the notes is to make the specification more clear.

 |
| R4-2511064(Formal Cat-A CR for TS38.101-1 in Rel-18) | Qualcomm, Huawei, HiSilicon | CR Title: CR on clarification of UL/DL bandwidths on overlapping NR SUL and NR bands |
| R4-2511065(Formal Cat-A CR for TS38.101-1 in Rel-19) | Qualcomm, Huawei, HiSilicon | CR Title: CR on clarification of UL/DL bandwidths on overlapping NR SUL and NR bands |
|  |  |  |

## Open issues summary

### Sub-topic 1-1: NR RedCap UE in TS38.101-1

**Issue 1-1-1: Discussion how to derive ΔR**1R **from 2Rx REFSENS for RedCap UE in TS38.101-1**

**Proposal 1 (**[R4-2509116](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509116.zip)**, Murata):**

* Consider a function of the interference correlation at RX ports 1 and 2. The delta values are shown in the Table between high correlation interference and no correlation interference cases.

|  |  |  |  |
| --- | --- | --- | --- |
|  | ΔR1R (High correlation) |  | ΔR1R (No correlation) |
| Band | 15 MHz | 20 MHz |  | 15 MHz | 20 MHz |
| n5 |  | 3.3 |  |  | 5.6 |
| n8 |  | 3.3 |  | 3.4 | 5.6 |
| n12 | 3.8 | N/A |  | 6.3 | N/A |
| n20 |  |  |  | 3.6 | 3.6 |
| n26 |  | 3.1 |  |  | 5.1 |
| n28 |  |  |  |  | 4.0 |
| n71 |  | 3.3 |  | 3.4 | 5.6 |
| n74 |  | 3.1 |  |  | 5.3 |
| n85 | 3.8 | N/A |  | 6.3 | N/A |
| n105 |  | 3.1 |  | 3.4 | 5.3 |

**Proposal 2: (**[R4-2509561](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509561.zip), **Apple, SKWS):**

* Capture the *ΔR1R* values in the table below as exceptions to the requirements in Table 7.3I.2-1 in TS 38.101-1 for RedCap UE single antenna UE.

|  |  |  |
| --- | --- | --- |
| Band | 15 MHz | 20 MHz |
| n5 |  | 5.6 |
| n8 | 3.4 | 5.6 |
| n12 | 6.3 | N/A |
| n20 | 3.6 | 3.6 |
| n26 |  | 5.0 |
| n28 |  | 4.0 |
| n71 | 3.4 | 5.6 |
| n74 |  | 5.2 |
| n85 | 6.3 | N/A |
| n105 | 3.4 | 5.2 |

**Proposal 3: (**[R4-2510307](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510307.zip)**, Nokia):**

* Specify the *ΔR1R* values in the table below as exceptions to the requirements in Table 7.3I.2-1 in TS 38.101-1 for RedCap UE single antenna UE.

|  |  |
| --- | --- |
| Operating band | Channel bandwidth (MHz) |
| 10 MHz | 15 MHz | 20 MHz |
| n5 | 3.0 | 3.0 | 3.5 |
| n8 | 2.5 | 3.0 | 3.5 |
| n12 | 3.1 | 3.0 | N/A |
| n20 | 2.5 | 3.0 | 3.0 |
| n26 | 3.3 | 3.3 | 3.5 |
| n28 | 2.5 | 2.5 | 2.5 |
| n71 | 3.0 | 3.1 | 3.5 |
| n74 | 3.0 | 3.1 | 3.5 |
| n85 | 3.1 | 3.5 | N/A |
| n105 | 3.0 | 3.0 | 3.5 |

**Recommended WF:**  **TBD based on NWM flagging process.**

**Issue 1-1-2: From which release shall be applied to update ΔR**1R **for RedCap UE?**

**Proposal 1 (**[R4-2510307](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510307.zip)**, Nokia):**

* RAN4 can agree to change the 1Rx delta to be band dependent only from Release 19 and onwards.

**Proposal 2: (**[R4-2509562](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509562.zip)**, Apple, SKWS):**

* The updated **ΔR**1Rfor RedCap UE can be applied from Rel-17.

**Recommended WF:**  **TBD based on NWM flagging process.**

**Issue 1-1-3: CR on exception of OOBB of RedCap UE**

**Proposal 1 (**[R4-2511389](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511389.zip)**, Qualcomm):**

* RAN4 can allow the OOBB exception when the RedCap UE is implemented by triplexer to support both n20 and n28 bands.

**7.6I Blocking characteristics for RedCap**

Requirements in clauses 7.6.1 to 7.6.4 apply for a RedCap UE. In addition, for a RedCap UE supporting both band n20 and band n28, the out-of-band blocking requirements for Band n20 and Band n28 specified in clause 7.6.3 apply with FDL\_low given by Band n28 and FDL\_high by Band n20.

**Proposal 2:**

* Other options are not precluded.

**Recommended WF:**  **TBD based on NWM flagging process.**

### Sub-topic 1-2: NR intra-band uplink CA in TS38.101-1

**Issue 1-2-1: CR on the updated MPRc and A-MPRc for intra-band contiguous CA in clause 6.2A.4.1.1**

**Proposal 1 (**[R4-2511372](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511372.zip), **CATT):**

* Update the Configured Tx power for intra-band contiguous CA as follow

**6.2A.4.1.1 Configured transmitted power for Intra-band contiguous CA**

The configured maximum output power PCMAX,*c* on serving cell *c* shall be set as specified in clause 6.2.4, but with the following definitions for some parameters.

 MPRc = MPR and A-MPRc = A-MPR with MPR and A-MPR as determined by subclause 6.2A.2 and 6.2A.3, respectively.

 PPowerClass is the maximum UE power specified in Table 6.2.1-1 and in Table 6.2F.1-1 for shared spectrum access operation reported by the smaller one between *ue-PowerClass* / *ue-PowerClass-v1610* and *powerClass* / *powerClass-v1610* without taking into account the tolerance.

**Recommended WF: TBD based on NWM flagging process.**

**Issue 1-2-2: CR on the updated MPRc and A-MPRc for intra-band non-contiguous CA in clause 6.2A.4.1.2**

**Proposal 1 (**[R4-2511372](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511372.zip), **CATT):**

* Update the Configured Tx power for intra-band non-contiguous CA as follow

**6.2A.4.1.2 Configured transmitted power for Intra-band non-contiguous CA**

The configured maximum output power PCMAX,*c* on serving cell *c* shall be set as specified in subclause 6.2.4, but with the following definitions for some parameters.

 MPRc = MPR and A-MPRc = A-MPR with MPR and A-MPR as determined by subclause 6.2A.2 and 6.2A.3, respectively.

 PPowerClass is the maximum UE power specified in Table 6.2.1-1 and in Table 6.2F.1-1 for shared spectrum access operation reported by the smaller one between *ue-PowerClass* / *ue-PowerClass-v1610* and *powerClass* / *powerClass-v1610* without taking into account the tolerance.

**Recommended WF: TBD based on NWM flagging process.**

### Sub-topic 1-3: NR inter-band CA in TS38.101-1

**Issue 1-3-1: CR on the Introducing missing fallbacks for the following Uplink CA combinations**

**Proposal 1 (**[R4-2509552](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509552.zip), **Apple):**

* Update the missing uplink CA combinations in the following CA band combinations
* CA\_n7A-n79A
* CA\_n40A-n77C
* CA\_n41A-n78(2A)
* CA\_n1A-n28A-n40B
* CA\_n1A-n40B-n78A
* CA\_n7(2A)-n25A-n78A
* CA\_n7A-n25(2A)-n78A
* CA\_n7(2A)-n25(2A)-n78A
* CA\_n7(2A)-n25A-n78(2A)
* CA\_n7A-n25(2A)-n78(2A)
* CA\_n7(2A)-n25(2A)-n78(2A)
* CA\_n28A-n40B-n78A
* CA\_n28A-n41A-n78(2A)
* CA\_n1A-n5A-n7A-n78A

**Recommended WF: TBD based on NWM flagging process.**

**Issue 1-3-2: CR on the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1**

**Proposal 1 (**[R4-2509862](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509862.zip), **Anritsu):**

* Update the applicable RB size of SCS 30kHz and Add Note 1 as following



**Recommended WF: TBD based on NWM flagging process.**

**Issue 1-3-3: CR on the updated DL fc for MSD test configuration in clause 7.3A.5**

**Proposal 1 (**[R4-2509871](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509871.zip), **Anritsu):**

* Update the updated DL fc for MSD test configuration as following
* CA\_n2-n5-n30, the duplex distance used for n2 is 89 MHz while it should be 80 MHz.
* CA\_n2-n48-n66, the duplex distance used for n66 is 420 MHz while it should be 400 MHz.
* UL Fc should be prioritized over DL Fc because it is the Tx signals that intermodulate and fall in a victim Rx channel. Therefore, the following DL Fc (not victim Rx channel) should be changed:
* [CA\_n2-n5-n30] n2 DL Fc -> 1950 MHz (The victim of the IMD4 is n5 DL Fc = 880MHz).
* [CA\_n2-n48-n66] n66 DL Fc -> 2170 MHz (The victim of the IMD2 is n48 DL Fc = 3625MHz).

**Recommended WF: TBD based on NWM flagging process.**

**Issue 1-3-4: CR on update n78 UL BW for REFSENS exceptions in clause 7.3A.4**

**Proposal 1 (**[R4-2509874](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509874.zip), **Anritsu):**

* Update the n78 UL BW used in some REFSENS exceptions in clause 7.3A.4 as following

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

| **UL band** | **DL band** | **UL BW** | **SCS of UL band** | **UL RB Allocation** | **DL BW** | **MSD** | **UL/DL fc condition** | **UL/DL harmonic order** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(MHz)** | **(kHz)** | **LCRB** | **(MHz)** | **(dB)** |
| n78 | n5 | 10 | 15 | 25 (RBstart=0) | 5 | 5.7 | NOTE 8 | UL1/DL4 |
| n78 | n8 | 10 | 15 | 25 (RBstart=0) | 5 | 5.7 | NOTE 8 | UL1/DL4 |

**Recommended WF: TBD based on NWM flagging process.**

**Issue 1-3-5: CR on remove the note for the High power UE in the power class Table 6.2A.1.3-1**

**Proposal 1 (**[R4-2510929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510929.zip), **Anritsu):**

* Remove footnote 2 in Table 6.2A.1.3-1. The exception will be applied when the condition is satisfy regardless of individual CA combinations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Uplink CA Configuration | Class 1 (dBm)  | Tolerance (dB)  | Class 2 (dBm) | Tolerance(dB)  | Class 3 (dBm) | Tolerance (dB)  | Class 5 (dBm) | Tolerance (dB) |
| CA\_n25A-n41A |  |  | 266 | +2/-3 | 23 | +2/-3 |  |  |

**Recommended WF: TBD based on NWM flagging process.**

### Sub-topic 1-4: NR Inter-band NR DC in TS38.101-3

**Issue 1-4-1: CR on the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1**

**Proposal 1 (**[R4-2509865](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509865.zip), **Anritsu):**

* Update the applicable RB size of SCS 30kHz and Add Note 1 as following

Table 7.3B.1-1: Equivalent substitution relationship between for NR bands different SCS UL test configuration



**Recommended WF: TBD based on NWM flagging process.**

### Sub-topic 1-5: NR RAIL\_EU\_900MHz RF in TS38.101-1

**Issue 1-5-1: CR on update for post connector antenna gain compensation at the UE Future Railway Mobile Communication Ssystem (FRMCS) operation**

**Proposal 1: (**[R4-2510408](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510408.zip)**, Qualcomm, Union Inter. Chemins de Fer, Vodafone):**

* Update Note in Clause 6.1 General part

NOTE: For FRMCS (Future Railway Mobile Communication System) operation in bands n100 and n101, if a post chipset unit antenna connector gain Gn100post connector or Gn101post connector is declared for the UE, conversion between conducted and radiated Transmitter requirements follows the principles described in Annex M.

* Update Annex M as follow

M.1 FRMCS operating bands

Due to large form factor of the FRMCS (Future Railway Mobile Communication System) rooftop mounted cab-radio unit, UE in bands n100 and n101 can have external antenna placed far away from the chipset unit. In this case, the effective antenna gain is a UE specific condition. This effective antenna gain includes the feeding loss of all components after the chipset unit antenna connector and the peak directional gain of the external antenna and hence will be called the post connector gain Gn100post connector and Gn101post connector for band n100 and n101, respectively. Note that 3GPP specifications mandate UE manufacturer declarations.

If external antenna is not used, the value of 0dBi will be used. If external antenna is used, the UE EIRP PEIRP shall be computed as the summation of the UE maximum conducted output power specified in Table 6.2.1-1 and the declared Gn100post connector or Gn101post connector for band n100 and n101, respectively. The radiated UE out of band and spurious emissions shall be computed by the summation of the conducted limits specified in clauses 6.5.2 and 6.5.3, and the declared Gn100post connector or Gn101post connector for band n100 and n101, respectively.

**Recommended WF: TBD based on NWM flagging process**.

### Sub-topic 1-6: NR NTN in TS38.101-5 and TR38.863

**Issue 1-6-1: CR on Clarification to the spurious emission domain for the UE co-existence in TS38.101-5**

**Proposal 1: (**[R4-2509512](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509512.zip)**, Apple):**

* The wording for Spurious emission for NTN UE in sub-clause 6.5.3.2 is aligned with the same wording in sub-clause 6.5.3.2 of TS 38.101-1 (TN).

**6.5.3.2 Spurious emissions for UE co-existence**

This clause specifies the requirements for NR NTN satellite bands for UE coexistence with protected bands. Unless otherwise stated, the spurious emission for UE co-existence apply for the frequency ranges that are more than FOOB (MHz) in Table 6.5.3.1-1 from the edge of the channel bandwidth.

**Recommended WF: Agreeable**.

**Issue 1-6-2: CR on Correction of the NR NTN band n256 REFSENS values in TR38.863**

**Proposal 1: (**[R4-2509515](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509515.zip)**, Apple):**

* The REFSENS requirements for n256 band UE will be aligned the REFSENS with TS38.101-5.

Table 7.4.3.2.2-1: Two antenna port reference sensitivity QPSK REFSENS

| **Operating band / SCS / Channel bandwidth / Duplex-mode** |
| --- |
| **NTN satellite band #** | **SCS kHz** | **5****MHz(dBm)** | **10****MHz(dBm)** | **15****MHz(dBm)** | **20****MHz(dBm)** | **Duplex Mode** |
|  | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  |
| n255 | 30 |  | -97.1 | -95.1 | -94.0 | FDD |
|  | 60 |  | -97.5 | -95.4 | -94.2 |  |
|  | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |
| n256 | 30 |  | -96.6 | -94.6 | -93.5 | FDD |
|  | 60 |  | -97 | -94.9 | -93.7 |  |

**Recommended WF: Agreeable**.

**Issue 1-6-3: CR on Correction of the OOBB for n256 in TS38.101-5**

**Proposal 1: (**[R4-2509518](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509518.zip)**, Apple):**

* The NTN band n256 can support different duplexer filters. Thus, to avoid constraining a UE to a specific filter implementation the corresponding clarifications should be added.

Table 7.6.3-2: Out of-band blocking for NR satellite bands with FDL\_high < 2700 MHz and FUL\_high < 2700 MHz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -30 | -15 |
| n255 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15or15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60or60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85orFDL\_high + 85 ≤ f≤ 12750 |
| n256 | Finterferer (CW) | MHz | -100 < f – FDL\_low < -15or15 < f – FDL\_high < 60 | -145 < f – FDL\_low ≤ -100or60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 145orFDL\_high + 85 ≤ f≤ 12750 |
| NOTE 1: void NOTE 2: voidNOTE 3: voidNOTE 4: void |

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-6-4: CR on Clarification of the NR NTN band n256 OOBB in TR38.863**

**Proposal 1: (**[R4-2509521](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509521.zip)**, Apple):**

* The NTN band n256 can support different duplexer filters. Thus, to avoid constraining a UE to a specific filter implementation the corresponding clarifications should be added.

**7.4.3.2.5 Blocking characteristics**

For blocking characteristics, it is agreed, the same requirements as for NR TN UEs are applicable, and therefore reused. For NR satellite band n255, OOBB requirements of n24 are reused. For n256, it is assumed to keep UE implementation freedom with different options (e.g., reusing n65 duplexer or dedicated 30MHz duplexer).

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-6-5: CR on update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs in TS38.101-5 R17**

**Proposal 1: (**[R4-2509868](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509868.zip)**, Anritsu):**

* Active uplink slots and RMCs for FR1-NTN TRx testing with 30kHz SCS are updated in Table A.2.1-1 and A.2.1-2.
* Table A.2.1-1: FR1-NTN FDD active uplink slots for NGSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 0,1,2,3,4,5,8,9 in every frame |
| 30 kHz | 0,1,2,3,4,5,6,7,8,9,34,35,36,37,38,39 in every 2 frames |
| 60 kHz |  |
| NOTE 1: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 2: Assuming K2 is 2, CellSpecificKoffset is 14 |

* Table A.2.1-2: FR1-NTN FDD active uplink slots for GSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 262,263,264,265,266,267,268,269, 272,273,274, 275, 276, 277, 278, 279 in every 32 frames |
| 30 kHz | 522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537 in every 32 frames |
| 60 kHz |  |
| NOTE 1: The active slots are counted from the 0th slot in the 1st frame of the periodicity.NOTE 2: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 3: Assuming K2 is 2, CellSpecificKoffset is 258 |

* Adding the section A.3.4.1.1A Fixed reference channels for SCS 30kHz FR1-NTN and its associated tables.

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-6-6: CR on update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs in TS38.101-5 R18**

**Proposal 1: (**[R4-2509869](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509869.zip)**, Anritsu):**

* Cat.F CR to add active uplink slots and RMCs for FR1-NTN TRx testing with 30kHz SCS are updated in Table A.2.1-1 and A.2.1-2.
* Table A.2.1-1: FR1-NTN FDD active uplink slots for NGSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 0,1,2,3,4,5,8,9 in every frame |
| 30 kHz | 0,1,2,3,4,5,6,7,8,9,34,35,36,37,38,39 in every 2 frames |
| 60 kHz |  |
| NOTE 1: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 2: Assuming K2 is 2, CellSpecificKoffset is 14 |

* Table A.2.1-2: FR1-NTN FDD active uplink slots for GSO

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 262,263,264,265,266,267,268,269, 272,273,274, 275, 276, 277, 278, 279 in every 32 frames |
| 30 kHz | 522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537 in every 32 frames |
| 60 kHz |  |
| NOTE 1: The active slots are counted from the 0th slot in the 1st frame of the periodicity.NOTE 2: Due to lack of HARQ processes for PUSCH and considering CellSpecificKoffset, all Uplink slots cannot be activated for NTN.NOTE 3: Assuming K2 is 2, CellSpecificKoffset is 258 |

* Adding the section A.3.4.1.1A Fixed reference channels for SCS 30kHz FR1-NTN and its associated tables.

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-6-7: CR on Correction of NTN Rx requirements in TS38.101-5**

**Proposal 1: (**[R4-2510350](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510350.zip)**, ZTE):**

* Remove the Note for ceiling of the interference power with 0.5dB since there is no CBW larger than 20MHz with the equation 10log10(BWChannel /20) for ACS, blocking and spurious requirements.
* In ACS requirements, propose to remove as follow
* In Blocking requirements, propose to remove as follow
* In spurious emission requirements, propose to remove as follow

**Recommended WF: TBD based on NWM flagging process**.

### Sub-topic 1-7: FDD PC2 RMC in TS38.101-1

**Issue 1-7-1: Updating of RMC channel for PC2 FDD UE in TS38.101-1**

**Proposal 1: (**[R4-2511381](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511381.zip)**, Qualcomm): Default duty cycle of 50% has been specified for all PC2 UEs, and applies equally for TDD and FDD as following evidences**

* The signaling parameter *maxUplinkDutyCycle-PC2-FR1* is specified with no differentiation for TDD and FDD in TS 38.306



* FDD PC2 UE shall follow the restriction of dutycycle with 50% as mentioned in TS38.101-1.

****

**Recommended WF: TBD based on online discussion and NWM flagging on the corresponding CR**.

**Issue 1-7-2: CR on Updating of RMC channel for PC2 FDD UE in TS38.101-1**

**Proposal 1: (**[R4-2511382](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511382.zip)**, Qualcomm): Specify the active uplionk slots for PC2 UE in FDD bands**

* In Clause 7, add

NOTE: For FDD bands requirements shall be verified during active UL transmission, unless otherwise stated.

* Add Annex 2 as below

The active uplink slots for FDD PC2 are specified in Table A.2.1-6.

Table A.2.1-6: Active uplink slots per radio frame for PC2 FDD

|  |  |
| --- | --- |
| SCS | Active Uplink slots |
| 15 kHz | 6 to 9 |
| 30 kHz | 12 to 19 |
| 60 kHz | 24 to 39 |

NOTE: To allow flexibility for signal configuration for PC2 FDD, e.g. PUCCH and SRS may be transmitted also during other slots as long as UL duty cycle in a radio frame does not exceed 50%.

**Recommended WF: TBD based on NWM flagging process**.

### Sub-topic 1-8: NR System parameters and RF requirements in single carrier

**Issue 1-8-1: CR on Channel raster in TS38.101-1**

**Proposal 1: (**[R4-2509263](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509263.zip)**, CATT): update the editorial correction of channel raster in Clause 5.4.2.3**

**5.4.2.3 Channel raster entries for each operating band**

The RF channel positions on the channel raster in each NR operating band are given through the applicable NR-ARFCN in Table 5.4.2.3‑1, using the channel raster to resource element mapping in clause 5.4.2.2.

For NR operating bands with 100 kHz channel raster, ΔFRaster = 20 × ΔFGlobal. In this case every 20th NR-ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster in Table 5.4.2.3‑1 is given as <20>.

For NR operating bands with 15 kHz channel raster below 3GHz, ΔFRaster = *I* × ΔFGlobal, where *I ϵ {3,6}*. Every *Ith* NR‑ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster in Table 5.4.2.3‑1 is given as < *I* >.

For NR operating bands with 15 kHz channel raster above 3GHz, ΔFRaster = *I* × ΔFGlobal, where *I ϵ {1,2}.* Every *Ith* NR‑ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster in Table 5.4.2.3-1 is given as <*I*>.

In frequency bands with two or more ΔFRaster: For 15 kHz and 30 kHz channel raster, the higher ΔFRaster applies to channels using only the SCS that is equal to or larger than the higher ΔFRaster and SSB SCS is equal to the higher ∆FRaster.

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-8-2: CR on Editorial change on UL 7.5KHz shift raster in TS38.307**

**Proposal 1: (**[R4-2509266](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509266.zip)**, CATT): update the editorial change on UL 7.5KHz shift raster in Clause 5.6**

**5.6 UL 7.5KHz shift for TDD band n40**

Requirements for a Rel-17 UE for UL 7.5KHz shift for TDD band n40 within FR1 compared to TS 38.101-1 of Rel-17 [2] are introduced via this clause. For Band n40, UL shift is only applicable to uplink transmissions using a 15 kHz SCS.

Table 5.6-1: UL 7.5KHz shift for band n40 in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feature | DL/UL | Duplex-mode | Releaseindependent from | requirements to be fulfilled(see 38.307 of the REL in which the configuration was introduced) |
| 7.5KHz UL shift for band n40 in FR1 | UL | TDD | Rel-15 | Table B.4.7-1 |

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-8-3: Discuss on ACLR relaxation in n104, n104C and BCs including n104 from Rel-17**

**Proposal 1: (**[R4-2510200](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510200.zip)**, Huawei):** Introduce a relaxed ACLR of 26 dB for PC3 n104, n104C and BCs including n104 together with reduced MPRs for n104 and n104C, respectively and a new MSD value for CA\_n78-n104 from R17 and beyond.

**Proposal 2:** This is not small scope to treat as maintenance. Need to further discuss how to relax ACLR for n104 operating bands based on RAN level guidance.

**Recommended WF: TBD based on online discussion**.

**Issue 1-8-4: CR on ACLR relaxation in n104 in TS38.101-1 Rel-17**

**Proposal 1: (**[R4-2510201](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510201.zip)**, Huawei):** Correct the Tx requirements for n104 to the align with co-existence study agreement in Rel-17.

**Table 6.5.2.4.1-3: NR ACLR requirement for NR band n104**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Power class 1** | **Power class 1.5** | **Power class 2** | **Power class 3** |
| **NR ACLR** | - | - | - | 26 dB |

**Proposal 2:** This is relaxed the current ACLR requirements in TS38.101-1. Need more input from interested companies.

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-8-5: CR on MPR relaxation in n104 in TS38.101-1 Rel-17**

**Proposal 1: (**[R4-2510201](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510201.zip)**, Huawei):** Updated MPR requirements based on the relaxed ACLR with 26dBc.

Table 6.2.2-1a Maximum power reduction (MPR) for power class 3 for Band n104

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK w/ Rel-15 DMRS | ≤ 3.51 | ≤ 1.21 | ≤ 0.21 |
|  |  | ≤ 0.52,3 | ≤ 0.52 | 02,4 |
|  | Pi/2 BPSK w Pi/2 BPSK DMRS | ≤ 0.52,3 |  02 | 02,4 |
|  | QPSK | ≤ 0.5 | 05 |
|  | 16 QAM | ≤ 1 | ≤ 0.5 |
|  | 64 QAM | ≤ 2.5 |
|  | 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 2 | ≤ 0.5 |
|  | 16 QAM | ≤ 2 | ≤ 1 |
|  | 64 QAM | ≤ 3.5 |
|  | 256 QAM | ≤ 6.5 |

**Proposal 2:** Need more input from interested companies.

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-8-6: CR on the band definition for n104 in TS38.101-1**

**Proposal 1: (**[R4-2511300](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511300.zip)**, Huawei):** Note 18 in Table 5.2-1 is removed since 3GPP have IMT identification of 6425-7125MHz from WRC-23.

NOTE 18: Void

**Recommended WF: TBD based on NWM flagging process**.

### Sub-topic 1-9: Other maintenance CRs

**Issue 1-9-1: Higher harmonic exceptions for UE co-existence for both LTE and NR single carrier**

**Proposal 1: (**[R4-2510276](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510276.zip)**, vivo):**

* Adding 6th harmonics in the Note 2 of UE co-existence requirements, and change the applicability of certain band to cover this case.

**Proposal 2:** Keep the current specification up to 5th harmonic order**.**

**Recommended WF: TBD based on online session discussion**.

**Issue 1-9-2: CR on Higher harmonic exceptions for UE co-existence in TS36.101**

**Proposal 1: (**[R4-2510277](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510277.zip)**, vivo):**

* Add 6th harmonics in the Note 2 of UE co-existence requirements in TS36.101.

Table 6.6.3.2-1: Requirements

|  |  |
| --- | --- |
| E-UTRA Band | Spurious emission  |
| Protected band | Frequency range (MHz) | Maximum Level (dBm) | MBW (MHz) | NOTE |
| <unchanged part omitted> |
| 28 | E-UTRA Band 1, 4, 22, 32, 42, 43, 50, 51, 65, 66, 73, 74, 75, 76NR Band n77, n78, n79, n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 1 | FDL\_low | - | FDL\_high | -50 | 1 | 19, 25 |
| E-UTRA Band 2, 3, 5, 7, 8, 18, 19, 20, 25, 26, 27, 31, 34, 38, 40, 41, 52, 72, 87, 88 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 | 19, 24 |
| Frequency range | 470 | - | 694 | -42 | 8 | 15, 35 |
| Frequency range | 470 | - | 710 | -26.2 | 6 | 34 |
| Frequency range | 662 | - | 694 | -26.2 | 6 | 15 |
| Frequency range | 758 | - | 773 | -32 | 1 | 15 |
| Frequency range | 773 | - | 803 | -50 | 1 |  |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8, 19 |
| <unchanged part omitted> |
| NOTE 1: FDL\_low and FDL\_high refer to each E-UTRA frequency band specified in Table 5.5-1NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd, 4th, 5th or 6th harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x LCRB x 180kHz), where N is 2, 3, 4, 5, 6 for the 2nd, 3rd, 4th, or 6th harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.NOTE 3: N/ANOTE 4: N/A<unchanged part omitted> |

**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-9-3: CR on Higher harmonic exceptions for UE co-existence in TS38.101-1**

**Proposal 1: (**[R4-2510279](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510279.zip)**, vivo):**

* Add 6th harmonics in the Note 2 of UE co-existence requirements in TS38.101-1.



**Recommended WF: TBD based on NWM flagging process**.

**Issue 1-9-4: CR on UL/DL bandwidths on the overlapping NR SUL and NR bands in TS38.101-1**

**Proposal 1: (**[R4-2511063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510279.zip)**, Qualcomm, Huawei):**

* Adding note 3 and 4 to section 5.2C.4. Intention of the notes is to make the specification more clear in TS38.101-1.
* NOTE 3: Unless otherwise stated, the SUL channel bandwidth is symmetrical with the DL bandwidth of its associated NR band that shares the same UL frequency range.
* NOTE 4: Channels for both n28 and n83 are confined either to lowest 30MHz or to highest 30MHz of the band.



# CRs for 38.101-1 (45)

## CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc** | **Company** | **Title** | **Recommend** |
| [R4-2511372](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511372.zip) (Rel-17)Cat-AR4-2509257 (Rel-18)R4-2509258 (Rel-19) | CATT | CR for TS 38.101-1 to clarify the power class for intra-band UL CA (R17) |  |
| [R4-2509263](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509263.zip) (Rel-17)Cat.AR4-2509264 (Rel-18)R4-2509265 (Rel-19) | CATT | CR to 38.101-1: Editorial change on channel raster entries |  |
| [R4-2509552](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509552.zip) (Rel-17)Cat.AR4-2509553 (Rel-18)R4-2509554 (Rel-19) | Apple | CR to 38.101-1 Rel-17 Band Combination Bug Fixes CATF |  |
| [R4-2509562](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509562.zip) (Rel-17)Cat.AR4-2509563 (Rel-18)R4-2509564 (Rel-19) | Apple,SKWS | (NR\_redcap-Core) CR to 38.101-1 on corrections for RedCap UE PC3 FDD band 1Rx REFSENS |  |
| [R4-2509862](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509862.zip) (Rel-17)Cat.AR4-2509863 (Rel-18)R4-2509864 (Rel-19) | Anritsu Limited | (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3A.1 - TS 38.101-1 |  |
| [R4-2509871](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509871.zip) (Rel-17) | Anritsu Limited | (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1 |  |
| [R4-2509872](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509872.zip) (Rel-18) | Anritsu Limited | (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1 |  |
| [R4-2509873](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509873.zip) (Rel-19) | Anritsu Limited | (NR\_CADC\_R17\_3BDL\_2BUL-Core) CR to correct DL Fc in some REFSENS exceptions not respecting default duplex distance in clause 7.3A.5 - TS 38.101-1 |  |
| [R4-2509874](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509874.zip) (Rel-17) | Anritsu Limited | (NR\_CADC\_R17\_2BDL\_xBUL-Core) CR to correct n78 UL BW used in some REFSENS exceptions in clause 7.3A.4 - TS 38.101-1 |  |
| [R4-2510201](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510201.zip) (Rel-17)Cat.AR4-2510202 (Rel-18)R4-2510203 (Rel-19) | Huawei | (NR\_6GHz-Core) CR to TS 38.101-1: Correct the Tx requirements for n104 |  |
| [R4-2510277](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510277.zip) (Rel-17)Cat.AR4-2510278 (Rel-18) | vivo | (LTE-RF) Addition of higher harmonic exceptions for UE co-existence requirements |  |
| [R4-2510279](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510279.zip) (Rel-17)Cat.AR4-2510280 (Rel-18)R4-2510281 (Rel-19) | vivo | (NR\_newRAT-Core) Addition of higher harmonic exceptions for UE co-existence requirements |  |
| [R4-2510408](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510408.zip) (Rel-17)Cat.AR4-2510409 (Rel-18)R4-2510410 (Rel-19) | Qualcomm, Union Inter. Chemins de Fer, Vodafone | (NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.101-1: Annex M corrections for FRMCS operation |  |
| [R4-2510929](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510929.zip) (Rel-17)Cat.AR4-2510930 (Rel-18) | Anritsu | (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove the footnote for the HPUE band combination |  |
| [R4-2510931](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510931.zip) (Rel-19) | Anritsu | (NR\_PC2\_CA\_R17\_2BDL\_2BUL) Remove the footnote for the HPUE band combination |  |
| [R4-2511063](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510279.zip) (Rel-17)Cat.AR4-2511064 (Rel-18)R4-2511065 (Rel-19) | Qualcomm, Huawei | CR on clarification of UL/DL bandwidths on overlapping NR SUL and NR bands |  |
| [R4-2511300](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511300.zip) (Rel-17)Cat.AR4-2511301 (Rel-18)R4-2511302 (Rel-19) | Huawei, HiSilicon, Ericsson, ZTE, Samsung, CATT, Nokia | (NR\_6GHz-Core) CR to 38.101-1 correction on the band definition for n104 |  |
| [R4-2511382](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511382.zip) (Rel-17)Cat.AR4-2511383 (Rel-18)R4-2511384 (Rel-19) | Qualcomm, Nokia, Huawei | (NR\_PC2\_UE\_FDD-Core) CR to TS 38.101-1: Addition of missing RMC |  |
| [R4-2511389](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2511389.zip) (Rel-17)Cat.AR4-2511390 (Rel-18)R4-2511391 (Rel-19) | Qualcomm | (NR\_redcap-Core) CR to TS 38.101-1: OOB blocking for RedCap UEs |  |
|  |  |  |  |
|  |  |  |  |

# CRs for 38.101-3 (3)

## CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc**  | **Company** | **Title/Comments** | **Recommendation** |
| [R4-2509865](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509865.zip) (Rel-17)CAT-A:R4-2509866 (Rel-18)R4-2509867 (Rel-19) | Anritsu Limited | (DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core) CR to correct and clarify the applicable RB allocations for 30kHz SCS when UE testing in clause 7.3B.1 - TS 38.101-3 |  |
|  |  |  |  |

# CRs for 38.101-5 (12)

## CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc**  | **Company** | **Title/Comments** | **Recommendation** |
| [R4-2509512](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509512.zip) (Rel-17)CAT-A:R4-2509513 (Rel-18)R4-2509514 (Rel-19) | Apple | (NR\_NTN\_solutions-Core) Clarification to the spurious emission domain for the UE co-existence |  |
| [R4-2509518](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509512.zip) (Rel-17)CAT-A:R4-2509519 (Rel-18)R4-2509520 (Rel-19) | Apple | (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |  |
| [R4-2509868](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509868.zip) (Rel-17) | Anritsu | (NR\_NTN\_solutions-Core) CR to update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs |  |
| [R4-2509869](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509869.zip) (Rel-18)Cat.A:R4-2509870 (Rel-19) | Anritsu | (NR\_NTN\_solutions-Core) CR to update RMCs for FR1-NTN TRx testing with 15kHz and 30kHz SCSs |  |
| [R4-2510350](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2510350.zip) (Rel-17)Cat.AR4-2510351 (Rel-18)R4-2510352 (Rel-19) | ZTE | (NR\_NTN\_solutions-Core) CR to TS38.101-5 Corrections on Rx requirement |  |
|  |  |  |  |

# CRs for 38.863 (6)

## CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc** | **Company** | **Title/Comments** | **Recommend** |
| [R4-2509515](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509515.zip) (Rel-17)CAT-A:R4-2509516 (Rel-18)R4-2509517 (Rel-19) | Apple | (NR\_NTN\_solutions-Core) Correction of the NR NTN band n256 REFSENS values in TR38.863 |  |
| [R4-2509521](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509521.zip) (Rel-17)CAT-A:R4-2509522 (Rel-18)R4-2509523 (Rel-19) | Apple | (NR\_NTN\_solutions-Core) Clarification of the NR NTN band n256 out-of-band blocking requirements |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# CRs for others (1)

## CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc** | **Company** | **Title/Comments** | **Recommend** |
| [R4-2509266](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_116/Docs/R4-2509266.zip) (Rel-17) | CATT | CR to 38.307: Editorial change on UL 7.5KHz shift |  |
|  |  |  |  |
|  |  |  |  |