**3GPP TSG-RAN WG4 Meeting # 107 R4-2309985**

**Incheon, KR, May 22nd – May 26th , 2023**

**Agenda item:** 5.1

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [107][102] R17\_spectrum\_maintenance

**Document for:** Information

# Introduction

This document is a summary of the proposals made in the contributions submitted under AI 5.1 for the RAN4 #107 meeting.

# Topic #1: Power class ambiguity for the MSD calculation with bands n46 and n96.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2308118**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308118.zip) | LG Electronics France | **Proposal 1:** Clarify which power class was used to analyse the Table 7.3A.4-4 and Table 7.3A.6-1 for the shared spectrum aggressor bands n46 and n96.  **Proposal 2:** Depending on the outcome of Proposal 1, follow the proposals below.  **- Case 1**: If n46 and n96 were considered as PC3.  ■**Proposal 2a**: Keep the existing UL PC3 aggressor MSD table, and define a new UL PC5 aggressor MSD table and MSD values for inter-band CA related with n46 and n96.  - **Case 2**: If n46 and n96 were considered as PC5.  ■**Proposal 2b**: Define a new PC5 UL aggressor MSD table and move the n46 and n96 MSD from the current PC3 UL aggressor MSD table to the new PC5 UL aggressor MSD table. |

## Open issues summary

### Sub-topic 1-1

*Sub-topic description:* The MSD requirements for the band combination n78 and n46/n96 are already defined in TS38.101-1, but it’s unclear which power class was considered for the bands n46 and n96 in the Table 7.3A.4-4 and Table 7.3A.6-1 (TS 38.101-1). Indeed NR-U is supported by only power class 5, but the MSD values for inter-band CA which aggressor band is shared spectrum band, are captured in Table 7.3A.4-4 and Table 7.3A.6-1 which power class 3 is aggressor band.

**Issue 1-1: n46 and n96 power class for the MSD requirements in TS 38.101-1**

* Proposals: Which power class was used to analyse the Table 7.3A.4-4 and Table 7.3A.6-1 (TS 38.101-1) for the shared spectrum aggressor bands n46 and n96
  + Option 1: PC3
  + Option 2: PC5
* Recommended WF
  + TBA

### Sub-topic 1-2

*Sub-topic description* Pending on issue 1-1, one of the following alternatives should be considered.

**Issue 1-2: Actions to be taken based on issue 1-1 agreement**

* Proposals: Pending on the agreement on issue 1-1, the following actions are proposed:

If the conclusion of issue 1-1 is PC3:

* Keep the existing UL PC3 aggressor MSD table, and define a new UL PC5 aggressor MSD table and MSD values for inter-band CA related with n46 and n96.

If the conclusion of issue 1-1 is PC5:

* Define a new PC5 UL aggressor MSD table and move the n46 and n96 MSD from the current PC3 UL aggressor MSD table to the new PC5 UL aggressor MSD table
  + Agree
  + Disagree
* Recommended WF
  + TBA

# Topic #2: Power class indication in TS 38.101-1

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2309265**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309265.zip) | Qualcomm Inc. | **Observation 1: Specification should be unambiguous and give a clear guideline which are the minimum requirements by default and how UE capabilities affect them. This is not the status currently.**  **Observation 2: *powerClass, powerClass-v1610* conveys the powerClass for band combination, and for individual bands Tx power cannot be higher than ue-PowerClass. Therefore, for a band in a band combination, power class is min(ue-PowerClass, powerClass).**  **Observation 3: If *ue-PowerClassPerBandPerBC-r17* is absent, UE does not have a need to indicate support for lower power class for individual bands in a band combination.**  **Observation 4: A case where introduction of higher power class for single carrier operation automatically propagates to all DL CA configurations needs to be avoided as need for MSD may not be verified. An exception to this is TDD intra-band DL CA where there is no need for MSD.**  **Proposal 1: Specify in clause 6.2A that**   * **By default UE shall meet the power class indicated by *ue-PowerClass* for each NR band of the CA configuration** * **Power class of a band in band combination cannot be higher than the power class of the band combination, i.e. for a band in band combination power class min(*ue-PowerClass*, *PowerClass*) applies. If PowerClass is not indicated default power class applies to the band combination.** * ***ue-PowerClassPerBandPerBC-r17* can be used to indicate lower power class for a band in band combination than given by the earlier rules. This does not change the power class of the band combination, i.e. *PowerClass*. If *ue-PowerClassPerBandPerBC-r17* is not signalled the earlier rules apply.**   **Proposal 2: Indicate in clause 5.5A the bands within CA configuration for which MSD has been evaluated in the basket work.** |

## Open issues summary

### Sub-topic 2-1

*Sub-topic description:* Based on the explanation of the RRC parameters given in R4-2309265, the following are proposed to be clarified in TS 38.101-1

**Issue 2-1: power class clarifications in clause 6.2A – TS 38.101-1**

Proposals: Specify in clause 6.2A that

* By default UE shall meet the power class indicated by *ue-PowerClass* for each NR band of the CA configuration
* Power class of a band in band combination cannot be higher than the power class of the band combination, i.e. for a band in band combination power class min(*ue-PowerClass*, *PowerClass*) applies. If PowerClass is not indicated default power class applies to the band combination.
* ***ue-PowerClassPerBandPerBC-r17* can be used to indicate lower power class for a band in band combination than given by the earlier rules. This does not change the power class of the band combination, i.e. *PowerClass*. If *ue-PowerClassPerBandPerBC-r17* is not signalled the earlier rules apply.**
  + Agree
  + Disagree
* Recommended WF
  + TBA

### Sub-topic 2-2

**Issue 2-2: power class clarifications in clause 5.5A – TS 38.101-1**

* Proposals: **Indicate in clause 5.5A the bands within CA configuration for which MSD has been evaluated in the basket work.**
  + Agree
  + Disagree
* Recommended WF
  + TBA

# Topic #3: CRs or Draft CRs

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2309696**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309696.zip) | GLOBALSTAR Inc. | CR to TS 38.104  Addition of 30 KHz SCS for Sync Raster for Band n53 |
| [**R4-2309698**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309698.zip) | GLOBALSTAR Inc. | CR to TS 38.101-1  Addition of 30 KHz SCS for Sync Raster for Band n53 |
| [**R4-2308548**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308548.zip) | Ericsson | CR to TS 38.104 - Maintenance related to bands n100 and n101 – Rel17 |
| R4-2308549 | Ericsson | CR to TS 38.104 - Maintenance related to bands n100 and n101 - Rel18 cat A |
| [**R4-2308550**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308550.zip) | Ericsson | CR to TS 38.141-1 - Maintenance related to bands n100 and n101- Rel17 |
| R4-2308551 | Ericsson | CR to TS 38.141-1 - Maintenance related to bands n100 and n101 – Rel18 cat A |
| [**R4-2308552**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308552.zip) | Ericsson | CR to TS 38.141-2 - Maintenance related to bands n100 and n101 – Rel17 |
| R4-2308553 | Ericsson | CR to TS 38.141-2 - Maintenance related to bands n100 and n101 – Rel18 cat A |
| [**R4-2309550**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309550.zip) | Ericsson | CR to TR 38.853 - clarification on the limits specified from ECC EIRP limits for band n100 |
| [**R4-2309561**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309561.zip) | Ericsson | CR to TR 38.852 - clarification on the limits specified from ECC EIRP limits for band n101 |

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2309306**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309306.zip) | Huawei,HiSilicon | CR on R18 TS38.101-1 Modification on the PC2 and PC1.5 note on the CA configuration with UL single carrier |
| [**R4-2307045**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2307045.zip) | AT&T | CR on Corrections due to Missing Implementation of Previously Agreed Category A CR |
| [**R4-2307097**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2307097.zip) | Facebook Japan K.K. | CR TS 36.101: Correction to point the Void Tables in Rel-17 |
| R4-2307098 | Facebook Japan K.K. | CR TS 36.101: Correction to point the Void Tables in Rel-18 - cat A |
| [**R4-2307547**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2307547.zip) | Huawei, HiSilicon | CR for TS 38.101-1 to modify the errors in table 7.6.4-1 due to the introduction of equation-based method (R17) |
| R4-2307548 | Huawei, HiSilicon | CR for TS 38.101-1 to modify the errors in table 7.6.4-1 due to the introduction of equation-based method (R18) - cat A |
| [**R4-2307549**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2307549.zip) | Huawei, HiSilicon | CR for TS 38.101-1 to modify the errors for SUL\_n78A-n80A configuration (R17) |
| R4-2307550 | Huawei, HiSilicon | CR for TS 38.101-1 to modify the errors for SUL\_n78A-n80A configuration (R18) - cat A |
| [**R4-2308117**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308117.zip) | LG Electronics | CR on MSD for shared spectrum band |
| [**R4-2308152**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308152.zip) | ZTE Corporation | CR to TS38.101-3: Add missing DC\_8A\_n79A-n258A |
| R4-2308153 | ZTE Corporation | CR to TS38.101-3: Add missing DC\_8A\_n79A-n258A - cat A |
| [**R4-2309016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309016.zip) | Xiaomi | CR to 38.101-1: add the missing additional spurious emissions for CA\_n5B |
| R4-2309017 | Xiaomi | CR to 38.101-1 add the missing additional spurious emissions for CA\_n5B - cat A |
| [**R4-2309085**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309085.zip) | Apple | CR for 38.101-1: Single SUL CA combination notation modifications |
| [**R4-2309258**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309258.zip) | Qualcomm Inc. | CR to 38.101-1 Rel-17 Cat F, Missing MSD correction |
| R4-2309259 | Qualcomm Inc. | CR to 38.101-1 Rel-18 Cat A, Missing MSD correction - cat A |
| [**R4-2309260**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309260.zip) | Qualcomm Inc. | CR to 38.101-1 Rel-18 Cat F, Modification on the PC2 and PC1.5 note on the CA configuration with UL single carrier |
| [**R4-2309266**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309266.zip) | Qualcomm Inc. | CR to 38.101-1 Rel-17 Cat F Powerclass indication |
| R4-2309267 | Qualcomm Inc. | CR to 38.101-1 Rel-18 Cat A Powerclass indication - cat A |
| [**R4-2309421**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309421.zip) | Verizon, Ericsson, Samsung | CR to TS 38.101-1 (Rel-17): Alignment of PC2 uplink/downlink frequency locations to PC3 in configuration |
| R4-2309434 | Verizon, Ericsson, Samsung | CR to TS 38.101-1 (Rel-18): Alignment of PC2 uplink/downlink frequency locations to PC3 in configuration - cat A |
| [**R4-2309447**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309447.zip) | CMCC | CR to TS 38.101-1 on PC2 for adding note to CA\_n77C and CA\_n78C |
| [**R4-2309458**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309458.zip) | Verizon, Ericsson, Samsung | CR to TS 38.101-1 (Rel-17): Correction of an invalid channel bandwidth in 3DL/2UL inter-band reference sensitivity testing for both PC3 and PC2 |
| R4-2309462 | Verizon, Ericsson, Samsung | CR to TS 38.101-1 (Rel-18): Correction of an invalid channel bandwidth in 3DL/2UL inter-band reference sensitivity testing for both PC3 and PC2 - cat A |
| [**R4-2308150**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308150.zip) | ZTE Corporation, Vivo, CHTTL, Samsung | CR to TS38.101-1: Generalize the increase higher power limit requirements for current CA band combinations |
| R4-2308151 | ZTE Corporation, Vivo, CHTTL, Samsung | CR to TS38.101-1: Generalize the increase higher power limit requirements for current CA band combinations - cat A |
| [**R4-2308246**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308246.zip) | Vivo, ZTE Corporation, Samsung, CHTTL | CR to TS 38.101-3 – Rel17  Generalize the increase higher power limit requirements for current EN-DC band combinations |
| [**R4-2308247**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2308247.zip) | Vivo, ZTE Corporation, Samsung, CHTTL | CR to TS 38.101-3 – Rel18  Generalize the increase higher power limit requirements for current EN-DC band combinations |
| [**R4-2309001**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309001.zip) | Google Inc. | CR for corrections on Rel-17 band combinations in TS36.101 |
| [**R4-2309024**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309024.zip) | Google Inc. | CR for corrections on Rel-18 band combinations in TS36.101 |
| [**R4-2309025**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309025.zip) | Google Inc. | CR for corrections on Rel-17 band combinations in TS38.101-1 |
| R4-2309027 | Google Inc. | CR for corrections on Rel-18 band combinations in TS38.101-1 - cat A |
| [**R4-2309030**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309030.zip) | Google Inc. | CR for corrections on Rel-17 band combinations in TS38.101-3 |
| R4-2309032 | Google Inc. | CR for corrections on Rel-18 band combinations in TS38.101-3 - cat A |
| [**R4-2309034**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309034.zip) | Google Inc. | CR for corrections on missing BCS for Rel-17 FR1+FR2 CA band combinations in TS38.101-3 |
| R4-2309036 | Google Inc. | CR for corrections on missing BCS for Rel-18 FR1+FR2 CA band combinations in TS38.101-3 - cat A |
| [**R4-2309039**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309039.zip) | Google Inc. | CR for corrections on Rel-17 NE-DC band combinations in TS38.101-3 |
| R4-2309040 | Google Inc. | CR for corrections on Rel-18 NE-DC band combinations - cat A |
| [**R4-2309044**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_107/Docs/R4-2309044.zip) | Google Inc. | CR for corrections on Rel-17 inter-band NR-DC band combinations in TS38.101-3 |