3GPP TSG-RAN WG4 Meeting # 111 R4-2405263

**Fukuoka, Japan, 20th – 24th May 2024**

**Agenda item:** 6.17

**Source:** Moderator (China Telecom)

**Title:** Topic summary for [111][112] HPUE\_Basket\_inter-CA\_SUL

**Document for:** Information

# Introduction

*List of candidate target of discussions for this topic.*

* *PC2 and PC1.5 indications in BC configuration tables*
* *TPs and draft CRs.*

# Topic #1: HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18

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

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Proposals / Observations** | **Company** |
| R4-2407088 | On PC2 and PC1.5 indications in BC configuration tables | Apple |
| R4-2407089 | CR for 38.101-1 to add general text descriptions on higher power class(es) applicability for higher order band combinations | Apple |
| R4-2407169 | TP for TR38.899 to add new HP-NRCA combinations for FR1 | SoftBank Corp. |
| R4-2407171 | Draft CR for TS38.101-1 to add new HP-NRCA combinations for FR1 | SoftBank Corp. |
| R4-2407211 | TP for TR38.899 to add new HP-NRCA 1-77-79 with 2UL | SoftBank Corp., LG Electronics |
| R4-2407703 | (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18) CR for 38.101-1: Corrections for missing PC2 CA\_n41C and MOP Table | T-Mobile USA |
| R4-2407705 | Draft CR for 38.101-1: T-Mobile USA HPUE Combinations | T-Mobile USA |
| R4-2407948 | (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18) TP for TR 38.899 to introduce PC2 and PC1.5 CA\_n3A-n40A | CMCC, Murata Manufacturing Co Ltd., ZTE Corporation |
| R4-2408458 | draft CR 38.101-1 adding CA\_n77(2A) PC2 UL to CA\_n5A-n25A-n77(3A) | Ericsson, Bell Mobility, TELUS |
| R4-2408863 | Draft CR for NR CA Harmonic Mixing clean-up PC2 PC1.5 | Qualcomm France |
| R4-2409167 | Draft CR 38.101-1 Rel-18 Correction of the MSD values for CA\_n18A-n77A PC2 | KDDI, Samsung, LGE, Murata, Skyworks |
| R4-2409238 | Draft CR 38.101-1 Rel-18 for adding some high power NR CA band combinations | KDDI Corporation |
| R4-2409239 | TP for adding UL CA\_n77(2A) to HPUE CA\_n3-n41-n77(2A) for TR 38.899 | KDDI , Samsung, Qualcomm |
| R4-2409298 | TP for adding UL CA\_n77(2A) to HPUE CA\_n28-n41-n77(2A) for TR 38.899 | KDDI Corporation |
| R4-2409299 | Revised WID for HPUE\_NR\_CADC\_SUL\_R18 RAN4#111 | China Telecom |
| R4-2409300 | Big CR to 38.101-1 new combinations for Rel-18 NR HPUE Inter-band | China Telecom |
| R4-2409346 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n1-n3-n78 | Ericsson, BT plc |
| R4-2409347 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n1-n7-n78 | Ericsson, BT plc |
| R4-2409348 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n1-n28-n78 | Ericsson, BT plc |
| R4-2409349 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n3-n7-n78 | Ericsson, BT plc |
| R4-2409350 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n3-n28-n78 | Ericsson, BT plc |
| R4-2409351 | TP for 38.899 to add PC2 and PC1.5 UL to CA\_n7-n28-n78 | Ericsson, BT plc |
| R4-2409352 | TP for 38.899 to add CA\_n78(2A) PC2 UL to CA\_n1A-n78(2A) | Ericsson, BT plc |
| R4-2409353 | TP for 38.899 to add CA\_n78(2A) PC2 UL to CA\_n3A-n78(2A) | Ericsson, BT plc |
| R4-2409354 | TP for 38.899 to add CA\_n78(2A) PC2 UL to CA\_n28A-n78(2A) | Ericsson, BT plc |
| R4-2409361 | draftCR 38.101-1 to add PC2 and PC1.5 UL to NR CA with 2DL and 3DL combinations | Ericsson, Telstra |
| R4-2409421 | Draft CR for NR CA Uplink Harmonic clean-up PC2 | Skyworks Solutions Inc. |
| R4-2409642 | TR for High power UE for FR1 NR inter-band CA/DC or NR SUL band combination with y (1<y<=6) bands DL and x (x=1, 2) bands UL and power class m (m<3) and high power on TDD band(s) | Huawei, HiSilicon, China Telecom |
| R4-2408809 | [HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18] HPUE indications for higher order DL configurations | Qualcomm Inc. |

## Open issues summary

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

### Sub-topic 1: PC2 and PC1.5 indications in BC configuration tables

*Open issues and candidate options before meeting:*

**Issue 1-1: General text descriptions on the rules of higher power class(es) applicability for higher order band combinations in TS 38.101-1**

***Proposal 1*:** discuss the following contents added in TS 38.101-1

* **Option1:** discuss the following contents added in TS 38.101-1(R4-2407089, Apple):

### 5.5A.0 General

...

By default, power class 3 is applicable for the CA configurations listed in the following clauses. The applicability of higher power class(es) is explicitly indicated in the CA configuration tables in clauses 5.5A.1, 5.5A.2 and 5.5A.3. ***For inter-band CA configurations in clause 5.5A.3, the applicability of higher power class(es) for higher order band combinations is based on the following rules:***

* ***For configuration with intra-band CA in the DL, the inter-band UL CA configuration can apply the same higher power class(es) as with the configuration composed of the same bands without intra-band CA in the DL.***
* ***For configuration with intra-band CA in the DL, the higher power class(es) apply for single UL or intra-band UL CA when the same higher power class(es) are specified for all its fallback configurations including single band.***
* ***For configuration with 3 or more DL bands and without intra-band CA in the DL, the higher power class(es) apply for single UL when the same higher power class(es) are specified for all its fallback configurations.***
* ***For configuration with 4 or more DL bands and without intra-band CA in the DL, the higher power class(es) apply for inter-band UL CA configuration when the same higher power class(es) are specified for all its fallback configurations.***
* **Option2:** discuss the following contents added in TS 38.101-1(R4-2408809, Qualcomm):

#### 5.5A.3.0 General

For the NR inter-band CA configurations in sub-clause 5.5A.3, when the capability [*BandCombination-UplinkTxSwitch-r18*] is present, three or four bands can be configured in the uplink with simultaneous uplink transmission on up to two bands, and the corresponding inter-band CA requirements with uplink assigned to one or two bands shall apply. For each uplink band pair in the NR inter-band CA configurations, according to the capability [*uplinkTxSwitchingOptionForBandPair*],

…

***For inter-band CA configurations with 1 UL band and 3 or more DL bands, PC2 and/or PC1.5 can be supported even when no applicability note is present, if all fallback CA configurations with 1 UL band and 2 DL bands have been specified and the corresponding PC2 and/or PC1.5 applicability notes are present for the fallback combinations.***

***For inter-band CA configurations with 2 UL bands and 4 or more DL bands, PC2 can be supported even when no applicability note is present, if all fallback CA configurations with 2 UL bands and 3 DL bands have been specified and the corresponding PC2 applicability notes are present for the fallback combinations.***

***If an inter-band CA configuration with PC2 and/or PC1.5 support has been specified and enabled with an applicability note, the same power class can be supported for specified configurations with same UL and DL bands and with additional intra-band DL carriers even when PC2 and/or PC1.5 applicability note is not present for these higher order DL configurations.***

***Proposal 2:*** RAN4 shall keep continuing the work to add explicit indications of HPUE support independent of these proposals being agreed.

Huawei: we think we also have comments on the wording. We can work offline. Current approach uses the notes to indicate the capability, which will be used for HPUE WI.

CHTTL: Similar as comments for EN-DC WI, the key issue is that there is no additional MSD needed. The wording needs be soften. Similar as Huawei, we can further refine the wording.

Ericsson: We would agree with this. This is only applicability only for RAN4 spec. It does not mean gNB has to check the table to figure out whether UE is capable of supporting. We should specify the note that it should not prevent UE vendor to report high power for higher order combinations.

### Sub-topic 2: TPs and Darft CRs

**Issue 2-1: TPs and Draft CRs.**

* Proposal:
* Recommended WF: go through CRs one by one