**3GPP TSG-RAN WG4 Meeting #110bis R4-2405491**

**Changsha, China, 15th – 19th April 2024**

**Source:** Ericsson

**Title:** TP for TR 38.718-03-01: to include band combination CA\_n8A-n40A-n77A and CA\_n8A-n40A-n77(2A)

**Agenda item:**  5.11.2

**Document for:** Approval

# 1. Introduction

A text proposal for TR 38.718-03-01to add CA\_n8A-n40A-n77A and CA\_n8A-n40A-n77(2A) configuration as specified in WID [1].

# 2. Text Proposal

---Start of changes---

## 5.x CA\_n8A-n40A-n77A

### 5.x.1 Common for 1 band UL and 2 bands UL CA

#### 5.x.1.1 Operating bands for CA

Table 5.x.1.1-1: Inter-band CA operating bands involving FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| NR Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| n8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

#### 5.x.1.2 Channel bandwidths per operating band for CA

Table 5.x.1.2-1: Supported bandwidths per CA band combination of band n8+n40+n77

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NR CA configuration | Uplink CA configuration or single uplink carrier | NR Band | Channel bandwidth (MHz) | Bandwidth combination set |
| CA\_n8A-n40A-n77A | CA\_n8A-n40A  CA\_n8A-n77A  CA\_n40A-n77A | n8 | n8 channel bandwidths in Table 5.3.5-1 | 4 and 5 |
|  |  | n40 | n40 channel bandwidths in Table 5.3.5-1 |  |
|  |  | n77 | n77 channel bandwidths in Table 5.3.5-1 |  |
| CA\_n8A-n40A-n77(2A) | CA\_n8A-n40A  CA\_n8A-n77A  CA\_n40A-n77A | n8 | n8 channel bandwidths in Table 5.3.5-1 | 4 and 5 |
|  |  | n40 | n40 channel bandwidths in Table 5.3.5-1 |  |
|  |  | n77 | CA\_n77(2A)\_BCS 4 and 5 |  |

#### 5.x.1.3 ∆TIB,c and ∆RIB,c values

For CA\_n8-n40-n77, the ΔTIB,c and ΔRIB,c values for CA\_n8-n40, CA\_n8-n77 and CA\_n40-n77 are reused and are given in the tables below.

Table 5.x.1.3-1: ΔTIB,c due to NR CA (three bands)

|  |  |  |  |
| --- | --- | --- | --- |
| **Inter-band CA combination** | **ΔTIB,c for NR bands (dB)8** | | |
| **Component band in order of bands in configuration9** | | |
| CA\_n8-n40-n77 | 0.6 | 0.3 | 0.8 |
| NOTE 8: “-” denotes ΔTIB,c = 0.  NOTE 9: The component band order in the configuration should be listed by the order of NR bands, such as for CA\_n1-n3-n5 the band order from left to right is n1, n3 and n5. | | | |

Table 5.x.1.3-2: ΔRIB,c due to NR CA (three bands)

|  |  |  |  |
| --- | --- | --- | --- |
| **Inter-band CA combination** | **ΔRIB,c for NR bands (dB)9** | | |
| **Component band in order of bands in configuration10** | | |
| CA\_n8-n40-n77 | 0.2 | 0.4 | 0.5 |
| NOTE 9: “-” denotes ΔRIB,c = 0.  NOTE 10: The component band order in the configuration should be listed by the order of NR bands, such as for CA\_n1-n3-n8 the band order from left to right is n1, n3 and n8. | | | |

### 5.x.2 Specific for 2 bands UL CA

#### 5.x.2.1 UE co-existence studies

UE co-existence has been already studied for 2DL/1UL fallback combinations: CA n8-n40, CA\_n8-n77 and CA\_n40-n77 and the impact of harmonic interference has been clarified. The own Rx impact of the 3rd band is shown as the followings:

– 2nd and 3rd order IMD generated by dual uplink of Band n8 + Band n40 may fall into own Rx of Band n77.

– 2nd , 3rd and 5th order IMD generated by dual uplink of Band n40 + Band n77 may fall into own Rx of Band n8.

– 2nd and 3rd order IMD generated by dual uplink of Band n8 + Band n77 may fall into own Rx of Band n40.

#### 5.x.2.2 REFSENS requirements

Table 5.x.2.2-1 lists the MSD required for the cases that IMD interference fall into the own 3rd Rx frequency band. The MSD values for CA\_n8-n40-n78 and CA\_n5-n30-n77 are reused.

Table 5.x.2.2-1: MSD for the CA configuration

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Band / Channel bandwidth / NRB / Duplex mode | | | | | | | | |
| NR CA band combination | NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  CLRB | DL Fc (MHz) | MSD  (dB) | Duplex mode | Source of IMD |
| CA\_n8-n40-n77 | n8 | N/A | 5 | N/A | 950 | 30.5 | FDD | IMD21 |
|  | n40 | 2380 | 5 | 25 | 2380 | N/A | TDD | N/A |
|  | n77 | 3330 | 10 | 50 | 3330 | N/A | TDD | N/A |
|  | n8 | N/A | 5 | N/A | 935 | 19.8 | FDD | IMD31 |
|  | n40 | 2320 | 5 | 25 | 2320 | N/A | TDD | N/A |
|  | n77 | 3705 | 10 | 50 | 3705 | N/A | TDD | N/A |
|  | n8 | 910 | 5 | 25 | 955 | N/A | FDD | N/A |
|  | n40 | N/A | 5 | N/A | 2395 | 28 | TDD | IMD2 |
|  | n77 | 3305 | 10 | 50 | 3305 | N/A | TDD | N/A |
|  | n8 | 910 | 5 | 25 | 955 | N/A | FDD | N/A |
|  | n40 | N/A | 5 | N/A | 2330 | 13.2 | TDD | IMD3 |
|  | n77 | 4150 | 10 | 50 | 4150 | N/A | TDD | N/A |
|  | n8 | 910 | 5 | 25 | 955 | N/A | FDD | N/A |
|  | n40 | 2395 | 5 | 25 | 2395 | N/A | TDD | N/A |
|  | n77 | N/A | 10 | N/A | 3305 | 28.8 | TDD | IMD2 |
|  | n8 | 910 | 5 | 25 | 955 | N/A | FDD | N/A |
|  | n40 | 2310 | 5 | 25 | 2310 | N/A | TDD | N/A |
|  | n77 | N/A | 10 | N/A | 4130 | 16.1 | TDD | IMD3 |
| NOTE 1: This band is subject to IMD5 also which MSD is not specified. | | | | | | | | |

---End of changes---

# Reference

[1] RP-240166, Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for 3 bands DL with x bands UL (x=1,2), ZTE