3GPP TSG-RAN WG4 Meeting # 102-e R4-2205257

Electronic Meeting, 21 February– 3 March, 2022

**Source:** Huawei, HiSilicon

**Title:** TP for TR 38.717-02-01 CA\_n1A-n38A and CA\_n1(2A)-n38A

**Agenda item:** 9.8.2

**Document for:** Approval

# 1 Background

This contribution provides text proposal on the NR CA band combination CA\_n1A-n38A as defined in New WID on NR Inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1,2) RP-212887 [1].

# 2 Text Proposal

##### ---Start of changes---

## 6.X CA\_n1-n38

### 6.X.1 Common for 1 band UL and 2 bands UL CA

#### 6.X.1.1 Operating bands for CA

Table 6.X.1.1-1: CA band combination CA\_n1A-n74A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NR CA Band Combination** | **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** | | |
| CA\_n1-n38 | n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n38 | 2570 MHz | – | 2620 MHz | 2570 MHz | – | 2620 MHz | TDD |
|  | | | | | | | | |

#### 6.X.1.2 Channel bandwidths per operating band for CA

Table 6.X.1.2-1: Supported bandwidths per CA band combination CA\_n1A-n74A

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR CA configuration | Uplink CA configuration | NR Band | Channel bandwidth (MHz) (NOTE 3) | | | | | | | | | | | | | Bandwidth combination set |
|  |  |  | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |  |
| CA\_n1A-n38A | - | n1 | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 |  |  |  |  |  | 0 |
|  |  | n38 | 5 | 10 | 15 | 20 | 25 | 30 | 40 |  |  |  |  |  |  |  |
| CA\_n1(2A)-n38A | - | n1 | See CA\_n1(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 | | | | | | | | | | | | | 0 |
|  |  | n38 | 5 | 10 | 15 | 20 | 25 | 30 | 40 |  |  |  |  |  |  |  |

#### 6.X.1.3 UE Co-existence studies

Table 6.X.1.3-1/2 summarizes frequency ranges where harmonics and/or harmonics mixing occur for CA\_n1-n38.

**Table 6.X.1.3-1: Impact of UL/DL Harmonic**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **2nd Harmonic** | | **3rd Harmonic** | | **4th Harmonic** | |
| **Band** | **UL Low Band Edge** | UL High Band Edge | DL Low Band Edge | DL High Band Edge | UL Low Band Edge | UL High Band Edge | UL Low Band Edge | UL High Band Edge | UL Low Band Edge | UL High Band Edge |
| n1 | 1920 | 1980 | 2110 | 2170 | 3840 | 3960 | 5760 | 5940 | 7680 | 7920 |
| n38 | 2570 | 2620 | 2570 | 2620 | 5140 | 5240 | 7710 | 7860 | 10280 | 10480 |

Based on above table, there is no harmonic interference issue.

**Table 6.X.1.3-2: Impact of UL/DL Harmonic mixing**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **2nd Harmonic** | | **3rd Harmonic** | | **4th Harmonic** | |
| **Band** | **UL Low Band Edge** | UL High Band Edge | DL Low Band Edge | DL High Band Edge | DL Low Band Edge | DL High Band Edge | DL Low Band Edge | DL High Band Edge | DL Low Band Edge | DL High Band Edge |
| n1 | 1920 | 1980 | 2110 | 2170 | 4220 | 4340 | 6330 | 6510 | 8440 | 8680 |
| n38 | 2570 | 2620 | 2570 | 2620 | 5140 | 5240 | 7710 | 7860 | 10280 | 10480 |

Based on above table, there is no harmonic mixing issue.

#### 6.X.1.4 ∆TIB and ∆RIB values

For CA\_n1-n38, the ∆TIB,c and ∆RIB,c values are given in the tables below which refer to TS 38.101-1 CA\_n1-n41.

Table 6.X.1.4-1: ΔTIB,c

| Inter-band CA Configuration | NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| CA\_n1-n38 | n1 | 0.5 |
| n38 | 0.5 |
|  | | |

Table 6.X.1.4-2: ΔRIB

| Inter-band CA Configuration | NR Band | ΔRIB [dB] |
| --- | --- | --- |
| CA\_n1-n38 | n1 | 0 |
| n38 | 0 |
|  | | |

#### 6.X.1.5 REFSENS requirements

Refering to the MSD for DC\_38\_n1, the REFSENS exceptions can be specified as below.

Table 6.X.1.5-1: Reference sensitivity exceptions (MSD) due to cross band isolation from a PC3 aggressor NR UL band for NR CA FR1 for either PC3 or PC2 CA

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR Band / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | |
| UL band | DL band | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 30 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 70  MHz  (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) |
| n1 | n38 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 |  |  |  |  |  |  |
| n38 | n1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |  |  |  |  |  |

Table 6.X.1.5-2: Uplink configuration for reference sensitivity exceptions due to cross band isolation for NR CA FR1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR Band / SCS / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | |
| UL band | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70  MHz | 80 MHz | 90 MHz | 100 MHz |
| n1 | n38 | 15 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |  |  |  |  |  |  |
| n38 | n1 | 15 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |  |  |  |  |  |

#### 6.X.1.6 OOB blocking exception requirements

There is no OOB blocking exception requirement for CA\_n1-n38.

##### ---End of changes---

# Reference

[1] RP-212887, “Revised WID on Rel-17 NR Inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1,2)”, ZTE Corporation