**3GPP TSG-RAN WG4 Meeting # 111 R4-2408382**

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

Source: ZTE Corporation, Sanechips

Title: TP for TR38.718-03-01\_3DL\_xUL CA\_n8A-n39A-n40A

Agenda Item: 6.11.2

Document for: Approval

# **Introduction**

3DL/2UL CA\_n8A-n39A-n40A\_BCS 4 and 5 have already been included in the revised basket WID, the fallbacks were already completed.

This contribution provides a text proposal to introduce 3DL/2UL CA\_n8A-n39A-n40A\_BCS 4 and 5 in TR38.718-03-01,

# **Reference**

[1] TR38.718-03-01,Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for3 bands DL with x bands UL (x=1,2),v0.8.0

# Text Proposal

**----- Start of TP -----**

## 5.x n8A-n39A-n40A

### 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 CA Band** | **NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| CA\_n8-n39-n40 | n8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n39 | 1880 MHz | – | 1920 MHz | 1880 MHz | – | 1920 MHz | TDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 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-n39-n40

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NR CA configuration | Uplink CA configuration or single uplink carrier | NR Band | Channel bandwidth (MHz) | Bandwidth combination set |
| CA\_n8A-n39A-n40A | CA\_n8A-n39A  CA\_n8A-n40A  CA\_n39A-n40A | n8 | See n8 channel bandwidths in Table 5.3.5-1 | 4 and 5 |
|  |  | n39 | See n39 channel bandwidths in Table 5.3.5-1 |  |
|  |  | n40 | See n40 channel bandwidths in Table 5.3.5-1 |  |

#### 5.x.1.3 ∆TIB,c and ∆RIB,c values

For CA\_n8-n39-n40, the ΔTIB,c and ΔRIB,c values are proposed to be the same with DC\_8\_n39-n40, which are defined in the following tables:

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-n39-n40 | 0.3 | 0.3 | 0.3 |
| 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-n39-n40 | - | - | - |
| 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

The co-existence for the fallback 2DL/2UL of CA\_n8A-n39A, CA\_n8A-n40A and CA\_n39A-n40A have already been analyzed. In terms of the co-existence studies of corresponding fallbacks, it can be observed:

No IMD issue caused by n8+n39 fall into the its own band n40 Rx;

IMD5 issue caused by n8+n40 fall into the its own band n39 Rx;

IMD4 and IMD5 issue caused by n39+n40 fall into the its own band n8 Rx.

#### 5.x.2.2 REFSENS requirements

Based on co-existence studies additional MSD is needed to be defined, shown in table 5.x.2.2-1., where MSD4 requirements are reused form DC\_n28-n39-n40.

Table 5.x.2.2-1: 3DL/2UL interband Reference sensitivity QPSK PREFSENS and uplink/downlink configurations

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| NR CA Configuration | NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| CA\_n8-n39-n40 | n8 | N/A | 5 | N/A | 940 | 8.6 | IMD4 |
|  | n39 | 1920 | 5 | 25 | 1920 | N/A | N/A |
|  | n40 | 2370 | 5 | 25 | 2370 | N/A | N/A |
|  | n8 | N/A | 5 | N/A | 950 | 4.3 | IMD5 |
|  | n39 | 1910 | 5 | 25 | 1910 | N/A | N/A |
|  | n40 | 2390 | 5 | 25 | 2390 | N/A | N/A |
|  | n8 | 905 | 5 | 25 | 950 | N/A | N/A |
|  | n39 | N/A | 5 | N/A | 1905 | 3.5 | IMD5 |
|  | n40 | 2310 | 5 | 25 | 2310 | N/A | N/A |

**----- End of TP -----**