**3GPP TSG-RAN WG4 Meeting # 116-bis R4-2514223**

**Prague Meeting, Oct. 13th – Oct. 17th, 2025**

**Title: TP to TR 38.719-03-01 CA\_n1-n20-n75**

**Source: Nokia, BT PLC**

**Agenda item: 5.3.3**

**Document for: Approval**

# 1 Introduction

This is a TP to TR 38.719-03-01 to add CA\_n1-n20-n75. The fallback CA\_n20A-n75A, has been submitted in same meeting as R4-2514221.

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## 5.x CA\_n1-n20-n75

### 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: CA band combination constituent bands definition

|  |  |  |  |
| --- | --- | --- | --- |
| 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 |
| n1 | 1920 MHz - 1980 MHz | 2110 MHz - 2170 MHz | FDD |
| n20 | 832 MHz - 862 MHz | 791 MHz - 821 MHz | FDD |
| n75 | - | 1432 MHz - 1517 MHz | SDL |

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

Table 5.x.1.2-1: Supported bandwidths per CA band combination

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CA operating/channel bandwidth (MHz) | | | | |
| NR CA configuration | Uplink CA configuration or single uplink carrier | NR Band | Channel bandwidth (MHz) | Bandwidth combination set |
| CA\_n1A-n20A-n75A | CA\_n1A-n20A | n1 | n1 channel bandwidths in Table 5.3.5-1 | 4 and 5 |
|  |  | n20 | n20 channel bandwidths in Table 5.3.5-1 |  |
|  |  | n75 | n75 channel bandwidths in Table 5.3.5-1 |  |

#### 5.x.1.3 ∆TIB,c and ∆RIB,c values

For CA\_n1-n20-n75, the ΔTIB,c and ΔRIB,c values 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)\* | | |
| Component band in order of bands in configuration\*\* | | |
| CA\_n1-n20-n75 | - | 0.2 | N/A |
| NOTE \*: “-” denotes ΔTIB,c = 0. NOTE \*\*: 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)\* | | |
| Component band in order of bands in configuration\*\* | | |
| CA\_n1-n20-n75 | 0.3 | 0.6 | 0.6 |
| NOTE \*: “-” denotes ΔRIB,c = 0. NOTE \*\*: 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

##### 5.x.2.1.1 Co-existence studies for 2UL band with 1CC per band

Table 5.x.2.1.1-1 provides the two UL bands with one CC per band IMD interference analysis for CA\_n1A-n20A-n75A with UL CA\_n1A-n20A.

**Table 5.x.2.1.1-1: Two UL bands IMD analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 1058 - 1148 | | 2752 - 2842 | |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 2978 - 3128 | | 196 - 316 | |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 4672 - 4822 | | 3584 - 3704 | |
| Two-tone 4th order IMD products | |3\*fx\_low –1\* fy\_high| | |3\*fx\_high – 1\*fy\_low| | |3\*fy\_low – 1\*fx\_high| | |3\*fy\_high – 1\*fx\_low| |
| IMD frequency limits (MHz) | 4898 - 5108 | | 516 - 666 | |
| Two-tone 4th order IMD products | |2\*fx\_low –2\* fy\_high| | |2\*fx\_high –2\* fy\_low| |  | |
| IMD frequency limits (MHz) | 2116 - 2296 | |
| Two-tone 4th order IMD products | |3\*fx\_low +1\* fy\_low| | |3\*fx\_high + 1\*fy\_high| | |3\*fy\_low + 1\*fx\_low| | |3\*fy\_high + 1\*fx\_high| |
| IMD frequency limits (MHz) | 6592 - 6802 | | 4416 - 4566 | |
| Two-tone 4th order IMD products | |2\*fx\_low +2\* fy\_low| | |2\*fx\_high +2\* fy\_high| |  | |
| IMD frequency limits (MHz) | 5504 - 5684 | |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 1348 - 1528 | | 6818 - 7088 | |
| Two-tone 5th order IMD products | |2\*fx\_low - 3\*fy\_high| | |2\*fx\_high - 3\*fy\_low| | |2\*fy\_low - 3\*fx\_high| | |2\*fy\_high -3\*fx\_low| |
| IMD frequency limits (MHz) | 1254 - 1464 | | 4036 - 4276 | |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 5248 - 5428 | | 8512 - 8782 | |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 6336 - 6546 | | 7424 - 7664 | |
| NOTE : For each IMD item, when two bound values before taking absolute have different signs, the relevant IMD range shall be set such that (1) the lower bound is 0 and (2) the upper bound is the bigger value of the two after taking absolute. The lowest even order and lowest odd order IMD MSDs shall be considered. | | | | |

##### There is IMD5 in n75.

#### 5.x.2.2 REFSENS requirements

The MSD requirements are found in Table 5.x.2.2-1.

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Band / Channel bandwidth / NRB / Duplex mode | | | | | | | | Source of IMD |
| NR CA band combination | NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | Duplex mode |  |
| CA\_n1-n20-n75 | n1 | 1950 | 5 | 25 | 2140 | N/A | FDD | N/A |
|  | n20 | 856 | 5 | 25 | 815 | N/A | FDD | N/A |
|  | n75 | N/A | 5 | N/A | 1474 | 4.0 | SDL | IMD5 |

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