**3GPP T****SG-RAN WG4 Meeting#99 Rev. 1 of R4-2110705**

**E-meeting, 19th – 27th May, 2021**

**Title: TP to TR 38.717-03-01: Addition of CA\_n2-n14-n77**

**Source: Nokia, AT&T**

**Agenda item: 8.11.2**

**Document for: Approval**

# Introduction

This is a TP into TR 38.717-03-01 to introduce CA\_n2-n14-n77.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of TP \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 6.x CA\_n2-n14-n77

6.x.1 Operating bands for CA

Table 6.x.1-1: 3DL Inter-band CA operating 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\_n2-n14-n77 | n2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n14 | 788 MHz | – | 798 MHz | 758 MHz | – | 768 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

6.x.2 Channel bandwidths per operating band for CA

Table 6.x.2-1: Supported channel bandwidths per CA configuration for 3DL inter-band CA

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NR CA Configuration** | **UL Config** | **NR Band** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **BCS** |
|  |  | n2 | 5 | 10 | 15 | 20 |  |  |  |  |  |  |  |  |  |  |
| CA\_n2-n14-n77 | - | n14 | 5 | 10 |  |  |  |  |  |  |  |  |  |  |  | 0 |
|  |  | n77 |  | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |  |

6.x.3 Co-existence studies

Table 6.x.3-1 summarizes frequency ranges where harmonics occur due to 3DL bands CA with 1 UL. There is 2nd HAM from n2 UL to n77 DL. MSD is already defined for this in 38.101-1.

Table 6.x.3-1: Harmonic Interference for 3DLs/1UL

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **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** |
| **2** | 1850 | 1910 | 1930 | 1990 | 3700 | 3820 | 5550 | 5730 | 7400 | 7640 |
| **14** | 788 | 798 | 758 | 768 | 1576 | 1596 | 2364 | 2394 | 3152 | 3192 |
| **77** | 3300 | 4200 | 3300 | 4200 | 6600 | 8400 | 9900 | 12600 | 13200 | 16800 |

Table 6.x.3-2 gives harmonic mixing issue for the 3DL bands CA with 1 UL. There is 2nd HAM from n2 UL to n77 DL. MSD is already defined for this in 38.101-1.

Table 6.x.3-2 Harmonic mixing for 3DLs/1UL

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **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** |
| **2** | 1850 | 1910 | 1930 | 1990 | 3860 | 3980 | 5790 | 5970 | 7720 | 7960 |
| **14** | 788 | 798 | 758 | 768 | 1516 | 1536 | 2274 | 2304 | 3032 | 3072 |
| **77** | 3300 | 4200 | 3300 | 4200 | 6600 | 8400 | 9900 | 12600 | 13200 | 16800 |

For single uplink, the UE coexistence is already considered for these bands in TS 38.101-1.

6.x.4 ∆TIB,c and ∆RIB,c values

It is proposed to re-use ΔTIB,c and ΔRIB,c  values from DC\_13-n77 and CA\_n2-n77.

Table 6.x.4-1: ΔTIB,c for 3DL aggregation

| **Inter-band CA Configuration** | **NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| CA\_n2-n14-n77 | n2 | 0.5 |
| n14 | 0.3 |
| n77 | 0.8 |

Table 6.x.4-2: ΔRIB,c for 3DL aggregation

| **Inter-band CA Configuration** | **NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| CA\_n2-n14-n77 | n2 | 0.2 |
| n14 | 0.2 |
| n77 | 0.5 |

6.x.5 REFSENS requirements

Compared to its fallback modes, there are no additional MSD requirements for this band combination.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of TP \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*