**3GPP TSG-RAN WG4 Meeting #104-e R4-2213090**

**Electronic Meeting, 15 August – 26 August 2022**

**Source:** Ericsson, Verizon

**Title:** TP for TR 36.718-02-01: CA\_13-48

**Agenda item:**  12.1.3.2

**Document for:** Approval

1. Introduction

This contribution is a text proposal for TR 36.718-02-01 to add dual UL for existing CA\_13-48 according to the request in [1].

# 2. Reference

1. RP-221831, New WID: Rel-18 LTE Advanced Carrier Aggregation for x bands (x<= 6) DL with y bands (y=1, 2) UL, Huawei, HiSilicon

3. Text Proposal

---Start of changes---

5.3.x CA\_13-48

5.3.x.1 Channel bandwidths per operating band for CA

**Table 5.3.x.1-1: E-UTRA CA configurations and bandwidth combination sets**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA CA configuration / Bandwidth combination set** | | | | | | | | | | |
| **E-UTRA CA Configuration** | **Uplink CA configurations** | **E-UTRA Bands** | **1.4 MHz** | **3 MHz** | **5 MHz** | **10 MHz** | **15 MHz** | **20 MHz** | **Maximum aggregated bandwidth**  **[MHz]** | **Bandwidth combination set** |
| CA\_13A-48A | CA\_13A-48A | 13 |  |  | Yes | Yes |  |  | 30 | 0 |
| 48 |  |  | Yes | Yes | Yes | Yes |
| CA\_13A-48C | CA\_13A-48A | 13 |  |  | Yes | Yes |  |  | 50 | 0 |
| 48 | See CA\_48C Bandwidth Combination Set 0 in Table 5.6A.1-1 | | | | | |
| CA\_13A-48D | CA\_13A-48A | 13 |  |  | Yes | Yes |  |  | 70 | 0 |
| 48 | See CA\_48D Bandwidth Combination Set 0 in Table 5.6A.1-1 | | | | | |

5.3.x.2 Co-existence studies

For 2UL / 2DL own receiver desensitization study 2nd and 3rd order harmonics and 2nd, 3rd, 4th and 5th order intermodulation products were calculated and presented in Table 5.3.x.2-1.

**Table 5.3.x.2-1: Harmonic and IMD analysis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **UE UL carriers** | | | **fx\_low** | | | **fx\_high** | | | **fy\_low** | | | **fy\_high** |
| UL frequency (MHz) | | 777 | | | 787 | | | 3550 | | | 3700 | |
| 2nd harmonics frequency limits | | | 2\*fx\_low | | | 2\*fx\_high | | | 2\* fy\_low | | | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz) | 1554 | | | 1574 | | | 7100 | | | 7400 | | |
| 3rd harmonics frequency limits | | | 3\*fx\_low | | | 3\*fx\_high | | | 3\* fy\_low | | | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | | | 2331 | | | 2361 | | | 10650 | | | 11100 |
| Two tone 2nd order IMD products | | | |fy\_high – fx\_low| | | | |fy\_low – fx\_high| | | | |fy\_low + fx\_low| | | | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | | | 2923 | | | 2763 | | | 4327 | | | 4487 |
| Two-tone 3rd order IMD products | | | |fy\_high – 2\*fx\_low| | | | |fy\_low – 2\*fx\_high| | | | |2\*fy\_low – fx\_high| | | | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | | | 2146 | | | 1976 | | | 6313 | | | 6623 |
| 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) | | | 5104 | | | 5274 | | | 7877 | | | 8187 |
| Two-tone 4th order IMD products | | | |2\*fx\_low –2\* fy\_high| | | | |2\*fx\_high – 2\*fy\_low| | | | |2\*fx\_low +2\* fy\_low| | | | |2\*fx\_high +2\* fy\_high| |
| IMD frequency limits (MHz) | | | 5846 | | | 5526 | | | 8654 | | | 8974 |
| 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) | | | 1369 | | | 1189 | | | 9863 | | | 10323 |
| 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) | | | 5881 | | | 6061 | | | 11427 | | | 11887 |
| 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) | | | 14023 | | | 13413 | | | 402 | | | 592 |
| 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) | | | 14977 | | | 15587 | | | 6658 | | | 6848 |
| 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) | | | 9546 | | | 9076 | | | 4739 | | | 5069 |
| 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) | | | 12204 | | | 12674 | | | 9431 | | | 9761 |

Based on analysis on above table, there is no IMD issue for this combination.

**Table 5.3.x.2-2: Requirements for uplink inter-band carrier aggregation (two bands)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA CA Configuration** | **Spurious emission** | | | | | | |
| **Protected band** | **Frequency range (MHz)** | | | **Maximum Level (dBm)** | **MBW (MHz)** | **NOTE** |
| CA\_13-48 | E-UTRA Band 2, 4, 5, 12, 13, 17, 25, 26, 29, 41, 50, 51, 66, 70, 71, 74, 85, 103 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA band 24, 30 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA band 14 | FDL\_low | - | FDL\_high | -50 | 1 | 3 |
| NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd, 4th [or 5th] harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x LCRB x 180kHz), where N is 2, 3, 4, [5] for the 2nd, 3rd, 4th [or 5th] harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.  NOTE 3: These requirements also apply for the frequency ranges that are less than FOOB (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 from the edge of the aggregated channel bandwidth. | | | | | | | |

5.3.x.3 ∆TIB and ∆RIB values

Already included in TS 36.101.

5.3.x.4 REFSENS requirements

Based on analysis of 5.3.x.2, there are no additional MSD requirements for this combination.

---End of changes---