**3GPP TSG-RAN WG4 Meeting #94bis-e R4-200xxxx**

**Online, 20th April-30th April, 2020**

**Source:** Samsung, KDDI

**Title:** TP for TR 36.716-03-02: CA\_1A-18A-41A and CA\_1A-18A-41C

**Agenda item:**  5.6.3

**Document for:** Approval

1. Introduction

This contribution is a text proposal for TR 36.716-03-02 to include CA\_1A-18A-41A and CA\_1A-18A-41C according to the request in [1].

# 2. Reference

1. RP-200510, Revised WID on Rel-16 LTE inter-band Carrier Aggregation for x bands DL (x= 3, 4, 5) with 2 bands UL.

3. Text Proposal

**<Start of Text Proposal>**

## 6.x LTE-A inter-band CA: Band 1 and Band 18 and Band 41 DL with 2 bands UL

### 6.x.1 List of specific combination issues

#### 6.x.1.1 Channel bandwidth per operating band for CA

Table 6.x.1.1-1: CA configurations under study

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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\_1A-18A-41A | CA\_1A-18A  CA\_1A-41A  CA\_18A-41A | 1 |  |  | Yes | Yes | Yes | Yes | 55 | 0 |
| 18 |  |  | Yes | Yes | Yes |  |
| 41 |  |  | Yes | Yes | Yes | Yes |
| CA\_1A-18A-41C | CA\_1A-18A  CA\_1A-41A  CA\_1A-41C  CA\_18A-41A  CA\_18A-41C | 1 |  |  | Yes | Yes | Yes | Yes | 75 | 0 |
| 18 |  |  | Yes | Yes | Yes |  |
| 41 | See CA\_41C Bandwidth Combination Set 1 in Table 5.6A.1-1 | | | | | |

### 6.x.2 Co-existence studies

Co-existence studies of CA\_1-18-41 already covered in the constituent fall-back modes, the harmonic mixing issue and IMD issues for this band combination are as below list:

- B41 uplink frequency may fall into the 3rd harmonic position of Band18 Rx

- 5th order IMDs generated by dual uplink of band 1 and band 41 maybe fall into the Rx of band 18, Since B18 only was used in Japan, considering Operator’s spectrum, there is no IMD impact to Band 18.

### 6.x.3 MSD

Table 6.x.3-1 and Table 6.x.3-2 show the MSD due to harmonic mixing issue and IMD issue separately.

Table 6.x.3-1: Reference sensitivity for carrier aggregation QPSK PREFSENS, CA (exceptions due to harmonic mixing issue)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | | |
| EUTRA CA Configuration | EUTRA band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex mode |
| CA\_1A-18A-41A19  CA\_1A-18A-41C19 | 41 |  |  | N/A | N/A | N/A | N/A | TDD |
| NOTE 19: No requirements apply for the case that there is at least one individual RE within the uplink transmission bandwidth of the relative higher band and when the frequency range of relative higher band’s uplink channel bandwidth or uplink 1st adjacent channel bandwidth is fully or partially overlapped with the 3 times of the frequency range of the relative lower band’s downlink channel bandwidth. The reference sensitivity is only verified when this is not the case (the requirements specified in clause 7.3.1 apply). | | | | | | | | |

Table6.x.3-2: 3DL/2UL interband Reference sensitivity QPSK PREFSENS and uplink/downlink configurations

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band / Channel bandwidth / NRB / Duplex mode | | | | | | | | | | Source of IMD |
| EUTRA CA | EUTRA CA | EUTRA band | UL Fc | UL BW | UL | DL Fc | DL BW | MSD | Duplex mode |
| DL Configuration | UL Configuration | (MHz) | (MHz) | CLRB | (MHz) | (MHz) | (dB) |
| CA\_1A-18A-41A  CA\_1A-18A-41C | CA\_1A-41A | 1 | N/A | N/A | N/A | N/A | N/A | N/A | FDD | N/A |
| 41 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18 | N/A | N/A | N/A | N/A | N/A | N/A1 | IMD5 |
| Note1: no MSD requirement apply, when the uplink channel in B41 is located at the frequency range of 2595MHz-2645MHz. | | | | | | | | | | |

### 6.x.4 ΔTIB,c and ΔRIB,c values

The ΔTIB,c and ΔRIB,c values of CA\_1-18-41 are given in the tables below, based on the values of its consistent 2 Bands fallback mode.

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

|  |  |  |
| --- | --- | --- |
| Inter-band CA Configuration | E-UTRA Band | ΔTIB,c [dB] |
| CA\_1-18-41 | 1 | 0.5 |
| 18 | 0.3 |
| 41 | 0.5 |

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

|  |  |  |
| --- | --- | --- |
| Inter-band CA Configuration | E-UTRA Band | ΔRIB,c [dB] |
| CA\_1-18-41 | 1 | 0 |
| 18 | 0 |
| 41 | 0 |

<End of Text Proposal>