**3GPP TSG-RAN4 Meeting #100-e *R4-2115138***

**Electronic Meeting, August 16, 2021 - August 27, 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.716-21-21** | **CR** | **0001** | **rev** |  | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CR 37.716-21-21: Addition of missing lower order fallbacks (Rel-16) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MCC | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | DC\_R16\_xBLTE\_2BNR\_yDL2UL-Core | | | | |  | ***Date:*** | | | 2021-08-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | These configurations have relating higher order configurations already in REL16 specs. This CR captures necessary analysis into the TR.  DC\_3A\_n7A-n28A  DC\_3C\_n7A-n28A  DC\_3A\_n7A-n78(2A)  DC\_3C\_n7A-n78(2A) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Missing lower order fallbacks are added. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Lower order fallbacks are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.67 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 6.67 DC\_3\_n7-n28

6.67.1 Operating bands for DC

**Table 6.67.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and 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** | | |
| DC\_3\_n7-n28 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | TDD |

6.67.2 Channel bandwidths per operating band for DC

**Table 6.67.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Subcarrier spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25 MHz** | **30 MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **80**  **MHz** | **90 MHz** | **100 MHz** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A\_n7A-n28A | DC\_3A\_n7A  DC\_3A\_n28A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  | 90 |
| n7 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |
| DC\_3C\_n7A-n28A | DC\_3A\_n7A  DC\_3A\_n28A  DC\_3C\_n7A  DC\_3C\_n28A | 3 | 15 | See CA\_3C in Table 5.6A.1-1 in TS 36.101 | | | | | | | | | | | | 110 |
| n7 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |

6.67.3 Co-existence studies

The harmonics and intermodulation products analysis for 2UL bands 3 and 7 with 3DL bands 3, 7 and 28 is presented in clause 6.11.1.2 in TR 36.879-13.

The harmonics and intermodulation products analysis for 2UL bands 3 and 28 with 3DL bands 3, 7 and 28 is presented in clause 6.21.1.2 in TR 36.715-00-02.

Based on the above studies,

- 2nd order IMD generated by dual uplink of Band 3 + Band n7 may fall into own Rx of band n28

- 3rd order IMD generated by dual uplink of Band 3 + Band n28 may fall into own Rx of band n7

6.67.4 ∆TIB and ∆RIB values

For DC\_3\_n7-n28, the ΔTIB,c and ΔRIB values can be based on E-UTRA CA\_3-7-28 given in the tables below.

**Table 6.67.4-1: ΔTIB,c**

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3\_n7-n28 | 3 | 0.5 |
| n7 | 0.5 |
| n28 | 0.3 |

**Table 6.67.4-2: ΔRIB**

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3\_n7-n28 | 3 | 0 |
| n7 | 0 |
| n28 | 0 |

6.67.5 MSD

Table 6.67.5-1 lists the MSD for DC\_3A\_n7A-n28A which is reused from E-UTRA 3DL/2UL CA\_3A\_7A-28A in TS 36.101. The MSD values were previously derived in clause 6.11.1.4 in TR 36.879-13 and clause 6.21.1.4 in TR 36.715-00-02.

**Table 6.67.5-1: MSD for the DC configuration**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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) |
| DC\_3A\_n7A-n28A  DC\_3C\_n7A-n28A | DC\_3A\_n7A  DC\_3C\_n7A | 3 | 1747 | 5 | 25 | 1842 | 5 | N/A | FDD | N/A |
| n7 | 2543 | 5 | 25 | 2663 | 5 | N/A | N/A |
| n28 | 741 | 5 | 25 | 796.0 | 5 | 20.0 | IMD2 |
| DC\_3A-n28A  DC\_3C-n28A | 3 | 1712.5 | 5 | 25 | 1807.5 | 5 | N/A | FDD | N/A |
| n7 | 2562 | 5 | 25 | 2682 | 5 | 17.0 | IMD3 |
| n28 | 743 | 5 | 25 | 798 | 5 | N/A | N/A |

## 6.x DC\_3A\_n7A-n78(2A) and DC\_3C\_n7A-n78(2A)

### 6.x.1 Operating bands for DC

Table 6.10.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band | E-UTRA and 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 | | |
| DC\_3A\_n7A-n78(2A)  DC\_3C\_n7A-n78(2A) | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.x.2 Channel bandwidths per operating band for DC

Table 6.x.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | DC operating / channel bandwidth [MHz] | | | | | | | | | | | | | | | |
| E-UTRA and NR DC Configuration | UL Configuration | E-UTRA and NR Band | SCS (kHz) | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 | 90 | 100 | Maximum aggregated bandwidth  [MHz] |
| DC\_3A\_n7A-n78(2A) | DC\_3A\_n7A  DC\_3A\_n78A | 3 | See CA\_3A in Table 5.6A.1-1 in TS 36.101 | | | | | | | | | | | | | 260 |
| n7 | See CA\_n7A-n78(2A) in Table 5.5A.3.1-1 TS 38.101-1 | | | | | | | | | | | | |
| n78 |
| DC\_3C\_n7A-n78(2A) | DC\_3C\_n7A  DC\_3A\_n7A  DC\_3C\_n78A  DC\_3A\_n78A | 3 | See CA\_3C in Table 5.6A.1-1 in TS 36.101 | | | | | | | | | | | | | 290 |
| n7 | See CA\_n7A-n78(2A) in Table 5.5A.3.1-1 TS 38.101-1 | | | | | | | | | | | | |
| n78 |

### 6.x.3 Co-existence studies

Co-existence studies of Band 3 + Band n7 + Band n78 already have been captured in current specification for DC\_3A\_n7A-n78A.

### 6.x.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB values can reuse the same requirement for DC\_3A\_n7A-n78A.

### 6.x.5 MSD

The MSD requirement can reuse the same requirement for DC\_3A\_n7A-n78A.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*