**3GPP TSG-RAN4 Meeting #99-e *R4-2107811***

**Online, , 19th May 2021 - 27th May 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-3** | **CR** |  | **rev** | 2 | **Current version:** | **17.1.0** |  |
|  | | | | | | | | |
| *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:*** | Draft CR for 38.101-1: Introduction of DC\_(n)71AA\_BCS2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | T-Mobile USA, Skyworks Solutions | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core | | | | |  | ***Date:*** | | | 2021-05-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | Up to 35 MHz of aggregated spectrum is needed for DC\_(n)71AA | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adds BCS2 for DC\_(n)71AA. MSD changes need to be added | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | DC\_(n)71AA BCS2 is not included in specs, and 35 MHz of agregated spectrum cannot be supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3B.1.2, 5.5B.2, 7.3B.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS/TR 38.521-3 CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev 1 adds the new test points in Table 7.3B.2.1-1  Rev 2 modifies Note 6 in Table 5.3B.1.2-1 as follows: Bandwidth Combination Set 2 only applies to intra-band EN-DC with uplink in n71 but not Band 71, and paired with another E-UTRA band ~~without both bands of the intra-band combination in the uplink~~. | | | | | | | | |

<First changed section>

#### 5.3B.1.2 BCS for Intra-band contiguous EN-DC

For intra-band contiguous EN-DC, an EN-DC configuration is a single operating band supporting an intra-band contiguous EN-DC bandwidth class.

Bandwidth combination sets for intra-band contiguous EN-DC are specified in Table 5.3B.1.2-1. The EN-DC configurations and bandwidth combination sets in Table 5.3B.1.2-1 also apply to higher order EN-DC combinations that include inter-band and intra-band EN-DC on the downlink and inter-band EN-DC on the uplink. If no BCS is reported in the UE capabilities for an intra-band combination the default is that the UE supports BCS0.

Table 5.3B.1.2-1: EN-DC configurations and bandwidth combination sets defined for intra-band contiguous EN-DC

| E-UTRA – NR configuration / Bandwidth combination set | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Downlink  EN-DC configuration | Uplink EN-DC configurations | Component carriers in order of increasing carrier frequency | | | Maximum aggregated  bandwidth (MHz) | Bandwidth combination set |
|  |  | Channel bandwidths for E-UTRA carrier (MHz) | Channel bandwidths for NR carrier (MHz) | Channel bandwidths for E-UTRA carrier (MHz) |  |  |
| DC\_(n)5AA | DC\_(n)5AA4 | 5, 10 | 5, 10, 15, 20 |  | 25 | 0 |
|  |  |  | 5, 10, 15, 20 | 5, 10 |  |  |
| DC\_(n)12AA | DC\_(n)12AA4 | 5, 10 | 5, 10 |  | 15 | 0 |
|  |  |  | 5, 10 | 5, 10 |  |  |
| DC\_(n)38AA | DC\_(n)38AA4 | 5, 10, 15, 20 | 5, 10, 15, 20, 40 |  | 50 | 0 |
|  |  |  | 5, 10, 15, 20, 40 | 5, 10, 15, 20 |  |  |
| DC\_(n)41AA | DC\_(n)41AA | 20 | 40, 60, 80,100 |  | 120 | 0 |
|  |  |  | 40, 60, 80,100 | 20 |  |  |
|  |  | 20 | 40, 50, 60, 80,100 |  | 120 | 1 |
|  |  |  | 40, 50, 60, 80,100 | 20 |  |  |
|  |  | 20 | 10, 20, 30, 40, 50, 60, 80,100 |  | 120 | 2 |
|  |  |  | 10, 20, 30, 40, 50, 60, 80,100 | 20 |  |  |
|  |  | 10 | 20, 30, 40, 50, 60, 80,100 |  |  |  |
|  |  |  | 20, 30, 40, 50, 60, 80,100 | 10 |  |  |
| DC\_(n)41AB | DC\_(n)41AA,  DC\_41A\_n41A | 10 | 20+20 |  | 70 | 0 |
|  |  |  | 20+20 | 10 |  |  |
|  |  | 20 | 10+20 |  |  |  |
|  |  |  | 10+20 | 20 |  |  |
|  |  | 20 | 20+30 |  |  |  |
|  |  |  | 20+30 | 20 |  |  |
| DC\_(n)41CA | DC\_(n)41AA, DC\_41A\_n41A2 | 20+20 | 40, 60, 80,100 |  | 140 | 0 |
|  |  |  | 40, 60, 80,100 | 20+20 |  |  |
|  |  | 20+20 | 40, 50, 60, 80,100 |  | 140 | 1 |
|  |  |  | 40, 50, 60, 80,100 | 20+20 |  |  |
|  |  | 20+20 | 10, 20, 30, 40, 50, 60, 80,100 |  | 140 | 2 |
|  |  |  | 10, 20, 30, 40, 50, 60, 80,100 | 20+20 |  |  |
|  |  | 10+20 | 10, 20, 30, 40, 50, 60, 80,100 |  |  |  |
|  |  |  | 10, 20, 30, 40, 50, 60, 80,100 | 10+20 |  |  |
| DC\_(n)41DA | DC\_(n)41AA, DC\_41A\_n41A2 | 20+20+20 | 40, 60, 80,100 |  | 160 | 0 |
|  |  |  | 40, 60, 80,100 | 20+20+20 |  |  |
|  |  | 20+20+20 | 40, 50, 60, 80,100 |  | 160 | 1 |
|  |  |  | 40, 50, 60, 80,100 | 20+20+20 |  |  |
|  |  | 20+20+20 | 30, 40, 50, 60, 80,100 |  | 160 | 2 |
|  |  |  | 30, 40, 50, 60, 80,100 | 20+20+20 |  |  |
|  |  | 20+20+15 | 30, 40, 50, 60, 80,100 |  |  |  |
|  |  |  | 30, 40, 50, 60, 80,100 | 20+20+15 |  |  |
| DC\_(n)48AA5 | DC\_(n)48AA4 | 5, 10, 15, 20 | 5, 10, 15, 20, 40 |  | 60 | 0 |
|  |  |  | 5, 10, 15, 20, 40 | 5, 10, 15, 20 |  |  |
| DC\_(n)48CA5 | DC\_(n)48AA4  DC\_48A\_n48A4 | See CA\_48C Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-1 | 5, 10, 15, 20, 40 |  | 80 | 0 |
|  |  |  | 5, 10, 15, 20, 40 | See CA\_48C Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-1 |  |  |
| DC\_(n)48DA5 | DC\_(n)48AA4  DC\_48A\_n48A4 | See CA\_48D Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-1 | 5, 10, 15, 20, 40 |  | 100 | 0 |
|  |  |  | 5, 10, 15, 20, 40 | See CA\_48D Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-1 |  |  |
| DC\_(n)71AA | DC\_(n)71AA3 | 15 | 5 |  | 20 | 0 |
|  |  | 10 | 5, 10 |  |  |  |
|  |  | 5 | 5, 10, 15 |  |  |  |
|  |  |  | 5 | 15 |  |  |
|  |  |  | 5, 10 | 10 |  |  |
|  |  |  | 5, 10, 15 | 5 |  |  |
|  |  | 5 | 5, 10, 15, 20 |  | 253 | 1 |
|  |  | 10 | 5, 10, 15 |  |  |  |
|  |  | 15 | 5, 10 |  |  |  |
|  |  |  | 5, 10, 15, 20 | 5 |  |  |
|  |  |  | 5, 10, 15 | 10 |  |  |
|  |  |  | 5, 10 | 15 |  |  |
|  | - | 5 | 5, 10, 15, 20 |  | 356 | 2 |
|  |  | 10 | 10, 15, 20 |  |  |  |
|  |  | 15 | 15, 20 |  |  |  |
|  |  |  | 5, 10, 15, 20 | 5 |  |  |
|  |  |  | 10, 15, 20 | 10 |  |  |
|  |  |  | 15, 20 | 15 |  |  |
| NOTE 1: Void  NOTE 2: Void  NOTE 3: For maximum DL aggregated bandwidth of 25 MHz the asymmetric UL and DL channel bandwidth combination of Table 5.3.6-1 in TS 38.101-1 [2] is used with a maximum UL contiguous aggregated bandwidth of 20 MHz. Furthermore, a restriction is imposed on bandwidth combinations so that only a subset of BCS1 is allowed to be used on the uplink, and this subset is equivalent to BCS0.  NOTE 4: Only single switched UL is supported.  NOTE 5: The minimum requirements only apply for non-simultaneous Tx/Rx between all carriers.  NOTE 6: Bandwidth Combination Set 2 only applies to intra-band EN-DC with uplink in n71 but not Band 71, and paired with another E-UTRA band. | | | | | | |

<Next changed section>

### 5.5B.2 Intra-band contiguous EN-DC

Table 5.5B.2-1: Intra-band contiguous EN-DC configurations

|  |  |  |
| --- | --- | --- |
| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | Single UL allowed |
| DC\_(n)5AA | DC\_(n)5AA6 | Yes6 |
| DC\_(n)12AA | DC\_(n)12AA6 | Yes6 |
| DC\_(n)38AA5 | DC\_(n)38AA6 | Yes6 |
| DC\_(n)41AA5  DC\_(n)41AB5  DC\_(n)41CA5  DC\_(n)41DA5 | DC\_(n)41AA | Yes3 |
| DC\_(n)41AB5  DC\_(n)41CA5  DC\_(n)41DA5 | DC\_41A\_n41A | Yes3 |
| DC\_(n)48AA5 | DC\_(n)48AA6 | Yes6 |
| DC\_(n)48CA5 | DC\_(n)48AA6  DC\_48A\_n48A6 | Yes6 |
| DC\_(n)48DA5 | DC\_(n)48AA6  DC\_48A\_n48A6 | Yes6 |
| DC\_(n)71AA2 | DC\_(n)71AA | No4 |
| NOTE 1: Uplink EN-DC configurations are the configurations supported by the present release of specifications.  NOTE 2: Requirements in this specification apply for NR SCS of 15 kHz only.  NOTE 3: Single UL allowed due to potential emission issues, not self-interference.  NOTE 4: For UE(s) supporting dynamic power sharing it is mandatory to do dual simultaneous UL. For UE(s) not supporting dynamic power sharing single UL is allowed. Uplink DC\_(n)71AA is not applicable to BCS2.  NOTE 5: The minimum requirements only apply for non-simultaneous Tx/Rx between all carriers.  NOTE 6: Only single switched UL is supported | | |

<Next changed section>

### 7.3B.2 Reference sensitivity for DC

#### 7.3B.2.1 Intra-band contiguous EN-DC

For intra-band contiguous EN-DC configurations, the reference sensitivity power level REFSENS is the minimum mean power applied to each one of the UE antenna ports at which the throughput for the carrier(s) of the E-UTRA and NR CGs shall meet or exceed the requirements for the specified E-UTRA and NR reference measurement channels. The reference sensitivity requirements apply with all uplink carriers and all downlink carriers active for EN-DC configuration and Uplink EN-DC configuration listed in Table 5.5B.2-1 and Table 5.5B.3-1, as supported by the UE. For EN-DC configurations where uplink is not available in either the MCG or the SCG or for EN-DC configurations where the UE only supports single uplink operation, reference sensitivity requirements apply with single uplink transmission. The downlink carrier(s) from the cell group with uplink shall be configured closer to the uplink operating band than any of the downlink carriers from the cell group without uplink.

Sensitivity degradation is allowed for Intra-band contiguous EN-DC configurations listed in Table 7.3B.2.1-1 the reference sensitivity is defined only for the specific uplink and downlink test points which are specified in Table 7.3B.2.1-1 and E-UTRA and NR single carrier requriements do not apply.

Table 7.3B.2.1-1: Reference sensitivity (MSD) for intra-band contiguous EN-DC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC configuration / channel allocations /MSD | | | | | | | |
| EN-DC configuration | E-UTRA/NR band | FC (UL)  (MHz) | Channel bandwidth  (MHz) | UL  allocation (LCRB) | FC (DL)  (MHz) | MSD  (dB) | Duplex mode |
| DC\_(n)5AA | 5 | 826.5 | 5 | N/A | 871.5 | 5.2 | FDD |
|  | n5 | 839 | 20 | 20 (RBend = 105) | 884 | 0 |  |
| DC\_(n)5AA | 5 | 829 | 10 | N/A | 874 | 5.2 |  |
|  | n5 | 841.5 | 15 | 20 (RBend = 78) | 886.5 | 0 |  |
| DC\_(n)5AA | 5 | 844 | 10 | 25 (RBend = 49) | 889 | 0 |  |
|  | n5 | 831.5 | 15 | N/A | 876.5 | 3.1 |  |
| DC\_(n)5AA | 5 | 831.5 | 5 | N/A | 876.5 | 5.2 |  |
|  | n5 | 841.5 | 15 | 20 (RBend = 78) | 886.5 | 0 |  |
| DC\_(n)5AA | 5 | 846.5 | 5 | 25 | 891.5 | 0 |  |
|  | n5 | 836.5 | 15 | N/A | 881.5 | 1 |  |
| DC\_(n)5AA | 5 | 834 | 10 | N/A | 879 | 1.5 |  |
|  | n5 | 844 | 10 | 25 (RBend = 51) | 889 | 0 |  |
| DC\_(n)5AA | 5 | 844 | 10 | 25 (RBend = 49) | 889 | 0 |  |
|  | n5 | 834 | 10 | N/A | 879 | 1.4 |  |
| DC\_(n)12AA | 12 | 703.5 | 5 | N/A | 733.5 | 4.5 | FDD |
|  | n12 | 711 | 10 | 20 (RBend = 51) | 741 | 0 |  |
| DC\_(n)12AA | 12 | 711 | 10 | 20 (RBend = 49) | 741 | 0 |  |
|  | n12 | 703.5 | 5 | N/A | 733.5 | 4.5 |  |
| DC\_(n)71AA | 71 | 665.5 | 5 | 5 (RBend =24) | 619.5 | 0 | FDD |
|  | n71 | 675.5 | 15 | 15 (RBstart = 0) | 629.5 | 1.8 |  |
| DC\_(n)71AA | 71 | 670.5 | 15 | 15 (RBend = 74) | 624.5 | 0 |  |
|  | n71 | 680.5 | 5 | 5 (RBstart = 0) | 634.5 | 1.6 |  |
| DC\_(n)71AA | 71 | 668 | 10 | 10 (RBend = 49) | 622 | 0 |  |
|  | n71 | 678 | 10 | 10 (RBstart = 0) | 632 | 1.7 |  |
| DC\_(n)71AA | 71 | 668 | 10 | 10 (RBstart = 0) | 622 | 17.2 |  |
|  | n71 | 678 | 10 | 10 (RBend = 51) | 632 | 29.4 |  |
| DC\_(n)71AA | 71 | 665.5 | 5 | 5 (RBend =24) | 619.5 | 0 | FDD |
|  | n71 | 675.5 | 151 | 15 (RBstart = 0) | 6321 | 2.5 |  |
| DC\_(n)71AA | 71 | 670.5 | 15 | 15 (RBend = 74) | 624.5 | 0 |  |
|  | n71 | 680.5 | 51 | 5 (RBstart = 0) | 6371 | 2.2 |  |
| DC\_(n)71AA | 71 | 668 | 10 | 10 (RBend = 49) | 622 | 0 |  |
|  | n71 | 678 | 101 | 10 (RBstart = 0) | 634.51 | 2.5 |  |
| DC\_(n)71AA | 71 | 668 | 10 | 10 (RBstart = 0) | 622 | 17.2 |  |
|  | n71 | 678 | 101 | 10 (RBend = 51) | 634.51 | 29.1 |  |
| DC\_(n)71AAx | 71 | N/A | 10 | N/A | 642.0 | [21.3] | FDD |
|  | n71 | 673.0 | 20 | [5 (RBstart = 0)] | 627.0 | [0] |  |
| DC\_(n)71AAx | 71 | N/A | 15 | N/A | 639.5 | [5.4] |  |
|  | n71 | 670.5 | 15 | [5 (RBstart = 0)] | 624.5 | [0] |  |
| DC\_(n)71AAy | 71 | 680.5 | 5 | N/A | 639.5 | [6.8] |  |
|  | n71 | 670.5 | 151 | [5 (RBstart = 2)] | 627.0 | [0] |  |
| DC\_(n)71AAz | 71 | 680.5 | 5 | N/A | 634.5 | [6.4] |  |
|  | n71 | 670.5 | 15 | [5 (RBstart = 0) | 624.5 | [0] |  |
| NOTE 1: In accordance to BCS1, the NR uplink bandwidth is specified as in this table, but the corresponding NR downlink bandwidth is 5 MHz larger.  NOTE 2: The transmitters powers shall be set to PUMAX, as defined in TS 38.101-1 [2], TS 38.101-2 [3], and TS 36.101 [4], with additional limits on configured maximum output power for the uplink according to clause 6.2B.4.  NOTE x: Applicable only to BCS 2.  NOTE y: Applicable only to BCS 1.  NOTE z: Applicable only to BCS 0. | | | | | | | |

<End of changes>