**3GPP TSG-RAN WG2 Meeting #113 Electronic R2-2101913**

**Online, 24 Jan –05 Feb, 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **38.306** | **CR** |  **0524** | **rev** | **1** | **Current version:** | **15.12.0** |  |
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| *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:***  | Clarification on single uplink operation capability report |
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| ***Source to WG:*** | Huawei, HiSilicon, Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2021-02-01 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *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 canbe 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)* |
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| ***Reason for change:*** | During Rel-15 EN-DC discussions, the single UL operation was introduced to allow UE to cope with inter-modulation issues for certain band combinations under certain conditions, which are defined in TS38.101-3. That is, the UE was still required to support dual UL transmissions in the BC when those conditions were not valid. However, RAN4 has (during Rel-16 timeline) introduced some band combinations where single UL is the only specified operation mode (e.g. intra-band non-contiguous EN-DC such as DC\_66A\_n66A or intra-band contiguous EN-DC such as DC\_71AA).RAN plenary has discussed the report of singleUL-Transmission capability for band combination where dual uplink is not supported and a LS[RP-202932] is sent from RAN plenary and the following examples are listed:Case 1: the UE reports *DC\_****2A****\_7A\_66A\_****n66A*** (i.e. UL allowed in 2A and n66A), singleUL-Transmission is not required to be reportedCase 2: the UE reports *DC\_2A\_7A\_****66A****\_****n66A*** (i.e. UL allowed in 66A and n66A), singleUL-Transmission is required to be reportedCase 3: the UE reports DC 66A\_n66A, singleUL-Transmission is required to be reportedRAN2 is asked to “check if any specification clarification is needed to ensure there is no inter-operability issue between the UE side and network side, considering the report of singleUL-Transmission as described in RP-202622”Therefore, RAN2 spec needs to explicitly clarify that singleUL-Transmission capability is required to be reported for a BC where only single UL transmission is allowed in RAN4 specs. |
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| ***Summary of change:*** | 1. singleUL-Transmission capability is mandated to be reported for a BC where only single UL transmission where single UL is the only specified operation mode
2. for UEs already in the field, if singleUL-Transmission field is not included in a BC where only single switched UL transmission is allowed, the network may ignore the BC.

**Impact analysis**Impacted 5G architecture options:SA, (NG)EN-DC, NE-DC, NR-DC**Impacted functionality:**Single uplink transmission**Inter-operability:**1. If the network is implemented according to the CR and the UE is not, the UE may report a BC where only single UL transmission is allowed without singleUL-Transmission capability, the network may consider such BC as invalid BC and ignore such a BC.2. If the UE is implemented according to the CR and the network is not, there is no compability issue |
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| ***Consequences if not approved:*** | It is not so clear on how network interprets an inconsistent capability reported if singleUL-Transmission capability is not reported for a BC where only single UL transmission is allowed in RAN4 specs and mandated to report, the network may consider such BC as invalid BC or may provide a configuration that is not consistent with UE capabilities. |
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| ***Clauses affected:*** | 4.2.7.9 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

#### 4.2.7.9 *MRDC-Parameters*

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***asyncIntraBandENDC***Indicates whether the UE supports asynchronous FDD-FDD intra-band (NG)EN-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If asynchronous FDD-FDD intra-band (NG)EN-DC is not supported, the UE supports only synchronous FDD-FDD intra-band (NG)EN-DC. | BC | No | FDD only | FR1 only |
| ***dualPA-Architecture***For an intra-band band combination, this field indicates the support of dual PAs. If absent in an intra-band band combination, the UE supports single PA for all the ULs in the intra-band band combination. For other band combinations, this field is not applicable. | BC | No | N/A | N/A |
| ***dynamicPowerSharingENDC***Indicates whether the UE supports dynamic (NG)EN-DC power sharing between NR FR1 carriers and the LTE carriers. If the UE supports this capability the UE supports the dynamic power sharing behaviour as specified in clause 7 of TS 38.213 [11]. | BC | Yes | N/A | FR1 only |
| ***dynamicPowerSharingNEDC***Indicates whether the UE supports dynamic NE-DC power sharing between NR FR1 carriers and the LTE carriers. If the UE supports this capability, the UE supports the dynamic power sharing behavior as specified in clause 7 of TS 38.213 [11]. | BC | Yes | N/A | FR1 only |
| ***intraBandENDC-Support***Indicates whether the UE supports intra-band (NG)EN-DC with only non-contiguous spectrum, or with both contiguous and non-contiguous spectrum for the (NG)EN-DC combination as specified in TS 38.101-3 [4].If the UE does not include this field for an intra-band (NG)EN-DC combination the UE only supports the contiguous spectrum for the intra-band (NG)EN-DC combination. | BC | No | N/A | N/A |
| ***interBandContiguousMRDC***Indicates for an inter-band (NG)EN-DC/NE-DC combination, where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band (as specified in Table 5.5B.4.1-1 of TS 38.101-3 [4]), that the UE supports intra-band contiguous (NG)EN-DC/NE-DC requirements (see TS 38.101-3 [4]). If the field is absent for such an inter-band (NG)EN-DC/NE-DC combination, the UE supports intra-band non-contiguous (NG)EN-DC/NE-DC requirements. | BC | CY | N/A | N/A |
| ***simultaneousRxTxInterBandENDC***Indicates whether the UE supports simultaneous transmission and reception in TDD-TDD and TDD-FDD inter-band (NG)EN-DC/NE-DC. It is mandatory for certain TDD-FDD and TDD-TDD band combinations defined in TS 38.101-3 [4]. | BC | CY | N/A | N/A |
| ***asyncIntraBandENDC***Indicates whether the UE supports asynchronous FDD-FDD intra-band (NG)EN-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If asynchronous FDD-FDD intra-band (NG)EN-DC is not supported, the UE supports only synchronous FDD-FDD intra-band (NG)EN-DC. | BC | No | FDD only | FR1 only |
| ***singleUL-Transmission***Indicates that the UE does not support simultaneous UL transmissions as defined in TS 38.101-3 [4]. The UE may only include this field for certain band combinations defined in TS 38.101-3 [4]. If included for a particular band combination, the field applies to all fallback band combinations of this band combination that are defined in TS 38.101-3 [4] as being allowed to include this field and does not apply to any other fallback band combinations defined in TS 38.101-3 [4].The UE shall include this field for band combinations for which single UL transmission is specified in TS 38.101-3 [4] if the UE supports UL on the carriers where only single UL is specified. | BC | No | N/A | N/A |
| ***spCellPlacement***Indicates whether the UE supports a SpCell on FR1-FDD, FR1-TDD and/or FR2-TDD depending on which additional SCells of other frequency range(s) / duplex mode(s) are configured. It is applicable to SCG of (NG)EN-DC and MCG of NE-DC, where UL is configured on more than one of FR1-FDD, FR1-TDD and FR2-TDD in a cell group. If not included, the UE supports SpCell on any serving cell with UL in supported band combinations. | UE | No | N/A | N/A |
| ***tdm-Pattern***Indicates whether the UE supports the *tdm-PatternConfig* for *single UL-transmission* associated functionality, as specified in TS 36.331 [17]. Support is conditionally mandatory in (NG)EN-DC for UEs that do not support dynamicPowerSharingENDC and for UEs that indicate single UL transmission for any (NG)EN-DC BC. Support is conditionally mandatory in NE-DC for UEs that do not support dynamicPowerSharingNEDC and for UEs that indicate single UL transmission for any NE-DC BC. The feature is optional otherwise. | BC | CY | N/A | FR1 only |
| ***ul-SharingEUTRA-NR***Indicates whether the UE supports (NG)EN-DC/NE-DC with EUTRA-NR coexistence in UL sharing via TDM only, FDM only, or both TDM and FDM from UE perspective as specified in TS 38.101-3 [4]. | BC | No | N/A | FR1 only |