**3GPP TSG RAN WG1 #118 R1-240xxxx**

**Maastricht, NL, August 19th – 23rd, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.214** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **18.3.0** |  |
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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 | **X** | Core Network |  |

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| ***Title:*** | Corrections on Rel-18 UL Tx switching with two configured bands | | | | | | | | | |
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| ***Source to WG:*** | Moderator (NTT DOCOMO), Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | RAN1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_MC\_enh-Core | | | | |  | ***Date:*** | | | 23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | 8 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | Capture in TS 38.214 the following RAN2 and RAN1 agreements of configuring two bands uplink switching by Rel-18 configuration signaling.   |  | | --- | | R1-2400007/R2-2313959:  For Rel-18 UL Tx switching, RAN2 achieved the following agreements in RAN2 #124 meeting:   * RAN2 confirms that Rel-18 signalling can configure 2 bands UL Tx switching for a band pair that the UE supports according to the Rel-18 band pair list UE capability, in which case the network and UE assume the capability reported for R18 UL Tx switching is used. RAN2 respectfully asks RAN4 and RAN1 to take this into account, and feedback to RAN2 in case there is any concern. |  |  | | --- | | R1-2401776:  RAN1 confirms that the first RAN2 agreement in the LS R1-2400007/R2-2313959 has no issue from RAN1 perspective, except for a case where Rel-18 UL Tx switching is configured with band combination {A, B} to a UE reporting support of UL Tx switching for band combination {A, B, C} /{A, B, C, D} and no UL-MIMO on band A nor band B. For the case, RAN1 continues to discuss it. |  |  | | --- | | R1-2407505:  For the case concerned in R1-2401776, RAN1 made following agreements at RAN1#118 meeting.  Agreement   * Agree the CR in R1-2406993. * Introduce following capability for the support of fallback to 1T-1T UL Tx switching when just 2 bands configured.   + FG name     - Support of 2-band configuration of 1T-1T UL Tx switching by using Rel-18 UL Tx switching configurations   + Component     - Support of 2-band configuration of 1T-1T UL Tx switching by using Rel-18 UL Tx switching configurations   + Prerequisite     - “switchedUL” is reported via uplinkTxSwitchingOptionForBandPair   + Consequence if the feature is not supported by the UE     - UE is not expected to be configured with 1T-1T UL Tx switching when just 2 bands configured (band A and B) by using Rel-18 UL Tx switching configurations   + Type     - Per band pair per BC   + Note     - The new capability is only needed for a band pair where the UE reports no UL-MIMO on both bands.     - For a band pair for which the UE separately indicated UL CA support without UL Tx switching, the new capability is not expected to be reported as supported.   + Mandatory or optional     - Optional with capability signaling   Agreement   * Send LS to inform RAN2 about the above agreement. | | | | | | | | | |
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| ***Summary of change:*** | | Replace the phrase of “with 3 or 4 uplink bands” with “with 2, 3 or 4 uplink bands” | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete specification on uplink Tx switching with two configured bands. | | | | | | | | |
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| ***Clauses affected:*** | | 6.1.6, 6.1.6.2.2 | | | | | | | | |
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|  | | **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 ... | | |
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| ***Other comments:*** | | **Isolated impact analysis:**  This CR has no isolated impact on network and UE behavior. | | | | | | | | |
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| ***This CR's revision history:*** | | This is the first version of this CR. | | | | | | | | |

6.1.6 Uplink switching

The UE may omit uplink transmission during the uplink switching gap if the conditions defined in this clause are met and the UE is configured with *uplinkTxSwitching* or *uplinkTxSwitchingMoreBands*. The switching gap is indicated by UE capability *uplinkTxSwitchingPeriod2T2T* if *uplinkTxSwitching-2T-Mode* is configured, and *uplinkTxSwitchingPeriod* otherwise in clauses 6.1.6.1, 6.1.6.2.0, 6.1.6.3, and is determined based on higher layer parameter *switchingPeriodConfigForBandPair* in clause 6.1.6.2.2 for uplink switching configured with 2, 3 or 4 uplink bands if *UplinkTxSwitchingMoreBands* is configured:

- If a UE indicated a capability for uplink switching with *BandCombination-UplinkTxSwitch* for a band combination, and if it is for that band combination

- Configured with a MCG using E-UTRA radio access and with a SCG using NR radio access (EN-DC), or

- Configured with uplink carrier aggregation, or

- Configured in a serving cell with two uplink carriers with higher layer parameter *supplementaryUplink*.

The conditions under which the switching gap may be present are defined for each of the cases in clauses 6.1.6.1, 6.1.6.2, and 6.1.6.3 respectively.

< Unchanged parts are omitted >

6.1.6.2.2 Uplink switching with 3 or 4 uplink bands

For a UE indicating a capability for uplink switching with *BandCombination-UplinkTxSwitch* for a band combination, and if it is for that band combination configured with uplink carrier aggregation with 2, 3 or 4 bands, the behaviour in subclause 6.1.6.2.0 applies when the two bands involved in the uplink switching belong to different uplink serving cells with the parameters *uplinkTxSwitching*, *uplinkTxSwitchingOption* and *uplinkTxSwitching-2T-Mode* beingreplaced by *UplinkTxSwitchingMoreBands, switchingOptionConfigForBandPair* and *switching2T-Mode,* respectively, and the behaviour in subclause 6.1.6.3 with the parameter *uplinkTxSwitching* being replaced by *UplinkTxSwitchingMoreBands* applies when the two bands involved in the uplink switching belong to one uplink serving cell, with the following exceptions:

- If more than two bands are involved in the determination of one uplink switching and if on any two of the bands the UE is configured with *switchingOptionConfigForBandPair* set to 'dualUL',

< Unchanged parts are omitted >