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

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.213** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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| ***Title:*** | Correction on the TDD configuration in the LTM candidate cell | | | | | | | | | |
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| ***Source to WG:*** | Moderator (Fujitsu), Qualcomm, Ericsson, Nokia | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_Mob\_enh2-Core | | | | |  | ***Date:*** | | | 2024-08-21 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | With Rel-18 LTM candidate cell configuration (*LTM-Candidate*), a UE can be configured with PRACH resources (*EarlyUL-SyncConfig*) for early UL synchronization to the candidate cell. The configuration parameters include PRACH occasions, preamble subcarrier spacing, preamble root sequence, etc.  According to Section 8.1 in TS 38.213, for TDD operation, validation of eligible PRACH occasions for SSB-to-RO mapping requires a TDD pattern configuration of the cell. However, in the current LTM candidate cell configuration, the TDD pattern of the LTM candidate cell is not provided. Although the UE may parse the full RRC reconfiguration message of the candidate cell to obtain the TDD pattern configuration, it is not a viable option for LTM.  Hence, to complete the early UL synchronization feature in LTM, the TDD pattern configuration of the LTM candidate cell should be provided in the LTM configuration. More details can be found in our companion contribution R1-2407010. | | | | | | | | |
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| ***Summary of change:*** | | Add TDD pattern configuration parameter in the LTM candidate cell configuration and clarify the procedure for valid PRACH occasion determination. | | | | | | | | |
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| ***Consequences if not approved:*** | | In TDD operation, UE cannot determine valid PRACH occasions for early UL sync to LTM candidate cells. | | | | | | | | |
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| ***Clauses affected:*** | | 8.1 and 21 | | | | | | | | |
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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 | | | | | | | | |

## 8.1 Random access preamble

## <Unchanged text omitted>

For unpaired spectrum,

- if a UE is not provided *tdd-UL-DL-ConfigurationCommon* and *ltm-tdd-UL-DL-ConfigurationCommon*, a PRACH occasion in a PRACH slot is valid if it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last SS/PBCH block reception symbol, where is provided in Table 8.1-2 and, if *channelAccessMode* = "*semiStatic*" is provided, does not overlap with a set of consecutive symbols before the start of a next channel occupancy time where the UE does not transmit [15, TS 37.213].

- the candidate SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon*, as described in clause 4.1, or by *ssb-PositionsInBurst* in *LTM-SSB-Config* for each of the candidate cells configured by *LTM-Config*

- If a UE is provided *tdd-UL-DL-ConfigurationCommon* or *ltm-tdd-UL-DL-ConfigurationCommon*, a PRACH occasion in a PRACH slot is valid if

- it is within UL symbols, or

- it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last downlink symbol and at least symbols after a last SS/PBCH block symbol, where is provided in Table 8.1-2, and if *channelAccessMode* = "*semiStatic*" is provided, does not overlap with a set of consecutive symbols before the start of a next channel occupancy time where there shall not be any transmissions, as described in [15, TS 37.213]

- the candidate SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon*, as described in clause 4.1, or by *ssb-PositionsInBurst* in *LTM-SSB-Config* for each of the candidate cells configured by *LTM-Config*.

## <Unchanged text omitted>

21 L1/L2-triggered mobility procedures

## <Unchanged text omitted>

A UE can be provided configurations, by *EarlyUL-SyncConfig*, for PRACH transmission parameters for each of the candidate cells. If the UE is also provided *ltm-tdd-UL-DL-ConfigurationCommon* for each of the candidate cells, the UE determines valid PRACH occasions on the candidate cell as described in Clause 8.1. The UE can be triggered a PRACH transmission on a candidate cell by a PDCCH order that the UE receives on a serving cell and includes an indication of the candidate cell for the PRACH transmission [4, TS 38.212]. If the serving cell and the candidate cell operate in a same frequency range and the UE would have transmissions that overlap in time, or when a gap between a first or last symbol of a PRACH transmission to the candidate cell is less than 𝑁 symbols from a last or first symbol, respectively, of an UL transmission to the serving cell, where is defined in Clause 8.1, the UE

## <Unchanged text omitted>