**3GPP TSG RAN WG1 #119 R1-241xxxx**

**Orlando, US, November 18th – 22nd, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.4.0** |  |
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| *For* [***HELP***](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:***  | Draft CR on LTM TA command application time |
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| ***Source to WG:*** | Mediatek |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** | NR\_mob\_enh2-Core |  | ***Date:*** | 2024-11-21 |
|  |  |  |  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | For a timing advance command provided in a cell switch command, there is ambiguity regarding the specified application time. It is unclear whether the TA should be applied based on legacy TA calculation or by the 1st uplink transmission to target cell after cell switch. |
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| ***Summary of change:*** | 1. An exception is added in section 4.2 for a TA command received in a cell switch command.
2. A wording is added in section 21 to clarify that the TA is applied for the 1st uplink transmission to target cell after an LTM cell switch.
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| ***Consequences if not approved:*** | The TA command application time provided in a cell switch command has ambiguity. |
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| ***Clauses affected:*** | 4.2, 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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\* Unchanged parts are omitted \*\*\*

## 4.2 Transmission timing adjustments

\*\*\* Unchanged parts are omitted \*\*\*

For a timing advance command received on uplink slot $n$, except for a timing advance command received in a cell switch command, and for a transmission other than a PUSCH scheduled by a RAR UL grant or a fallbackRAR UL grant as described in clause 8.2A or 8.3, or a PUCCH with HARQ-ACK information in response to a successRAR as described in clause 8.2A, the corresponding adjustment of the uplink transmission timing applies from the beginning of uplink slot $n+k+1+2^{μ}∙K\_{offset}$ where $k=\left⌈N\_{slot}^{subframe, μ}∙{\left(N\_{T,1}+N\_{T,2}+N\_{TA,max}+0.5\right)}/{T\_{sf}}\right⌉$, $N\_{T,1}$ is a time duration in msec of $N\_{1}$ symbols corresponding to a PDSCH processing time for UE processing capability 1 when additional PDSCH DM-RS is configured, $N\_{T,2}$ is a time duration in msec of $N\_{2}$ symbols corresponding to a PUSCH preparation time for UE processing capability 1 [6, TS 38.214], $N\_{TA,max}$ is the maximum timing advance value in msec that can be provided by a TA command field of 12 bits, $N\_{slot}^{subframe, μ}$ is the number of slots per subframe, $T\_{sf}$ is the subframe duration of 1 msec, and $K\_{offset}=K\_{cell,offset}-K\_{UE,offset}$, where $K\_{cell,offset}$ is provided by *cellSpecificKoffset* and $K\_{UE,offset}$ is provided by a Differential Koffset MAC CE command [11, TS 38.321]; otherwise, if not respectively provided, $K\_{cell,offset}=0$ or $K\_{UE,offset}=0$. $N\_{1}$ and $N\_{2}$ are determined with respect to the minimum SCS among the SCSs of all configured UL BWPs for all uplink carriers in the TAG and of all configured DL BWPs for the corresponding downlink carriers. For $μ=0$, the UE assumes $N\_{1,0}=14$ [6, TS 38.214]. Slot $n$ and $N\_{slot}^{subframe, μ}$ are determined with respect to the minimum SCS among the SCSs of all configured UL BWPs for all uplink carriers in the TAG. $N\_{TA,max}$ is determined with respect to the minimum SCS among the SCSs of all configured UL BWPs for all uplink carriers in the TAG and for all configured initial UL BWPs provided by *initialUplinkBWP*. The uplink slot $n$ is the last slot among uplink slot(s) overlapping with the slot(s) of PDSCH reception assuming $T\_{TA}=0$, where the PDSCH provides the timing advance command and $T\_{TA}$ is defined in [4, TS 38.211].

\*\*\* Unchanged parts are omitted \*\*\*

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21 L1/L2-triggered mobility procedures

\*\*\* Unchanged parts are omitted \*\*\*

A UE can be provided by a LTM Cell Switch Command MAC CE in a PDSCH reception on the serving cell [11, TS 38.321] a TCI state ID and/or an UL TCI state ID indicating a *CandidateTCI-State* and/or *CandidateTCI-UL-State* from *ltm-DL-OrJointTCI-StateToAddModList* and/or *ltm-UL-TCI-StateToAddModList* [6, TS 38.214] and a timing advance command for applicable receptions or transmissions on a candidate cell from the number of candidate cells. The UE may assume that DM-RS antenna ports for PDCCH receptions and for PDSCH receptions are quasi co-located with the SS/PBCH block or the TRS in the TCI state with respect to quasi co-location 'typeA' and 'typeD' properties, when applicable. The UE does not expect to be indicated quasi co-location 'typeA' properties when a SS/PBCH block is configured as a source RS of the TCI state. The UE applies the *CandidateTCI-State* and/or *CandidateTCI-UL-State,* and the timing advance command, if indicated by the MAC CE, no later than $T\_{LTM-RRC-processing}+T\_{LTM-processing}+T\_{first-RS}+T\_{RS-proc}+3 msec$ after the last symbol of a PUCCH or PUSCH with HARQ-ACK information for the PDSCH providing the MAC CE, where $T\_{LTM-RRC-processing}$, $T\_{LTM-processing}$, $T\_{first-RS}$, and $T\_{RS-proc}$ are defined in [10, TS 38.133]*.* For RACH-based LTM cell switch [19, TS 38.300], the UE applies the *CandidateTCI-State* for receptions on the candidate cell, and applies a spatial domain filter corresponding to the *CandidateTCI-State* or the *CandidateTCI-UL-State* for transmissions on the candidate cell, that are after the completion of the random access procedure associated with the PRACH transmission on the candidate cell and before a new TCI state is indicated for the candidate cell. For RACH-less LTM cell switch [19, TS 38.300], the UE applies the *CandidateTCI-State* for receptions on the candidate cell and applies a spatial domain filter corresponding to the *CandidateTCI-State* or the *CandidateTCI-UL-State* for transmissions on the candidate cell before a new TCI state is indicated for the candidate cell.

\*\*\* Unchanged parts are omitted \*\*\*