**3GPP TSG-RAN4 Meeting # 116 *R4-2510728***

**Bangalore, India, 25 Aug - 29 Aug, 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **draftCR** | **rev** | **–** | **Current version:** | **19.1.0** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <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 on PL-RS switching delay for R19 LB-CA |
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| ***Source to WG:*** | ZTE Corporation, Sanechips |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_LBCA\_Sw-Core |  | ***Date:*** | 2025-08-06 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-19 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | The switching pattern is introduced in low band CA between the FDD PCell and SDL SCell through semi-static RRC signaling. UE could Rx and Tx at the FDD PCell during the ON duration of PCell in the switching pattern. For the PL-RS switching in legacy, during the whole procedure, UE needs to perform 5 samples of measurement for the target PL-RS in known case to track the AGC, sync, etc. In the case of low band CA, for the PL-RS switching in FDD PCell, the UE measurement during the PL-RS switching procedure is same as that in legacy, but some measurement extension is needed as long as the measurement occasion is not available due to collision with the switching pattern.The relevant requirements need to be captured into Clause 8.14x of 38.133. |
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| ***Summary of change:*** |  Capture all relevant requirements of the PL-RS switching in FDD PCell in the case of switching pattern is configured for low band CA. |
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| ***Consequences if not approved:*** | The impact of the switching pattern on the PL-RS switching in FDD PCell is absent. |
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| ***Clauses affected:*** | 8.14.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.533 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

# <Start of Change #1>

### 8.14.3 MAC-CE based pathloss reference signal switch delay

The requirements in this clause apply for a UE to update a pathloss reference signal by MAC-CE for PUCCH, PUSCH, semi-persistent SRS and aperiodic SRS.

If the target pathloss reference signal is known, upon receiving PDSCH carrying MAC-CE activation in slot n, UE shall be able to apply the target pathloss reference signal of the serving cell on which pathloss reference signal switch occurs no later than the slot *n* + $T\_{HARQ}$+$3N\_{slot}^{subframe,µ} + NM∗$ $\left⌈\frac{ 5∗T\_{target\\_PL−RS} + 2 ms}{NR slot lengtℎ}\right⌉$. For a UE supporting LB-CA via switching and the pathloss reference signal of PCell is to be updated, UE shall be able to apply the target pathloss reference signal of the PCell on which pathloss reference signal switch occurs no later than the slot *n* + $\_{}$+$\_{}^{}$ $\left⌈\frac{\_{}}{}\right⌉$.The UE shall be able to apply old pathloss reference signals until the slot n + $T\_{HARQ}$+ $3N\_{slot}^{subframe,µ}$. Where

- $T\_{HARQ}$ is the timing between pathloss reference MAC-CE activation command and acknowledgement as specified in TS 38.321 [7].

- NM= 1, if the target PL-RS is not maintained by the UE, 0 otherwise.

In FR2, if the target pathloss reference signal is SSB, the requirements in this clause shall apply when the target pathloss reference signal is maintained by the UE.

- $T\_{target\\_PL−RS}$ is the periodicity of the target pathloss reference signal which would be SSB or NZP CSI-RS.

- PL-RS is maintained provided:

- There are no more than 4 different RS activated as PL-RS per serving cell among all active spatial relations for PUSCH/PUCCH/SRS transmissions.

- The target pathloss reference signal remains detectable during TCI state switching period

- SNR of the target pathloss reference signal≥-3 dB

- The associated SSBs with the target pathloss reference signal remain detectable during the TCI state switching period.

 - SNR of the associated SSB ≥-3 dB

- Kp\_LB is the scaling factor for the pathloss reference signal of PCell to be measured for LB\_CA via switching. Kp\_LB = Ntotal / Navailable, where Navailable and Ntotal are calculated as follows:

For a window W of duration max($\_{}$, Pswitch-pattern), where Pswitch-pattern is the periodicity of the switching pattern for LB CA via switching configured by RRC signaling, and starting from the beginning of any PL-RS occasion$\_{}$:

- Ntotal is the total number of target PL-RS occasions within the window W, including those overlapped and non-overlapped with the duration of PCell to be measured based on the switching pattern ,and

- Navailable is the number of target PL-RS occasions that are overlapped with the duration of PCell to be measured based on the switching pattern within the window W.

 No requirements apply when Navailable = 0 due to fully non-overlapping between PL-RS occasions and the duration of PCell to be measured based on the switching pattern within the window W.

NOTE: longer application time is expected if measurement sample is not available due to measurement gap, DRX or other UE activities.

NOTE: longer application time is expected if the pathloss reference signal is unknown.

# <End of Change #1>