**3GPP TSG-RAN WG4 Meeting#104-e *REV\_R4-2212775***

**Electronic meeting, 15 – 26 August 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.101-2** | **CR** | **0486** | **rev** | **1** | **Current version:** | **17.6.0** |  |
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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:*** | Amendment of the requirement on TX power management | | | | | | | | | |
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| ***Source to WG:*** | Ericsson, Sony | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2022-08-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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)* | |
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| ***Reason for change:*** | | Add a mimimum requirement for TX power management to ensure that the UE increases its output power if the UL duty cycle is decreased. This should be met irrespective of the support and configuration of UL gaps. | | | | | | | | |
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| ***Summary of change:*** | | Clause 6.2.5: the difference between the power class (measured EIRP at Z = 10% UL duty cycle) and the maximum EIRP measured at a tentative Z= 50% duty cycle should be greater than   * the reported P-MPR (the lower limit of the range) at the higher duty cycle if MPE reporting is supported and configured * 1 dB (the smallest granularity of Pcmax and thus P-MPR reporting in any PHR format) * 0 dB if the P-bit is zero at the higher duty cycle Z   There is no tolerance (other than the test tolerance for conformance). The requirement is averaged over 4 s (typical MPE averaging period).  Clarification of the P-MPR setting for the UL gap minimum requirement. | | | | | | | | |
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| ***Consequences if not approved:*** | | The behavior of the UE output power upon a reduced duty cycle is not verified. | | | | | | | | |
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| ***Clauses affected:*** | | 6.2.5 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | | . | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | | R1: correction of the requirement on P-MPR indication for the UL gap test. For the additional test, the RMC of the UL gap test is used. | | | | | | | | |

*< start of changes >*

### 6.2.5 Requirements for for TX power management

The difference of the measured peak EIRP PUMAX,f,c\_GAP\_ON when UL gap for TX power management is configured and activated, and the measured peak EIRP PUMAX,f,c\_GAP\_OFF when UL gap is not configured or de-activated, shall meet the following requirement:

PUMAX,f,c\_GAP\_ON - PUMAX,f,c\_GAP\_OFF max((EIRPmeas\_peak – 23) + 10 \* log10(Z/20), 3)dB

where EIRPmeas\_peak  is the measured UE peak EIRP with zero MPR/A-MPR/P-MPR as specified in clause 6.2.1 for the corresponding power class, and Z% is duty cycle of the reference measurement channel. PUMAX,f,c\_GAP\_ONshall be measured outside of the UL gap symbol(s)*.* The period of measurement shall be at least 4s. The requirement is verified with the test metric of EIRP (Link=TX beam peak direction, Meas=Link angle) and in the test Z is set to 20 when maxUplinkDutyCycle-FR2 is less than 20 or not reported, and should be larger than maxUplinkDutyCycle-FR2 when maxUplinkDutyCycle-FR2 is equal to or greater than 20. The reference measurement channel is specified in Annex A.2.3.

When UL gap for Tx power management is configured and activated, the reported P-MPRf,c shall be less than 3dB at the duty cycle Z of the reference measurement channel. When UL gap for Tx power management is not configured and activated at the duty cycle Z of the reference measurement channel, UE shall set the P bit in PHR to 1 in the test when PHR is configured.

The following minimum requirement shall be met for all UEs

PUMAX,f,c – PUMAX,f,c,Z ≥ P-MPRL

as averaged over [4 s] with a fixed MCS, where PUMAX,f,c is the power class as specified in 6.2.1 and PUMAX,f,c,Z the corresponding EIRP measured at the UL duty cycle Z of the reference measurement channel used for the above UL gap minimum requirement. If the P-bit is set to 1 at the said uplink duty cycle Z, then P-MPRL is the lower limit of the reported P-MPR in dB when *MPE-Reporting-FR2* is supported and configured, P-MPRL = 1 dB otherwise. If the P-bit is set to 0 at the said uplink duty cycle Z, then P-MPRL = 0 dB. The P-bit shall not be set for a duty cycle Z = 10%. The RMC specified in Annex 2.3 shall be used for measurement of the PUMAX,f,c,Z.

*< end of changes >*