**3GPP T****SG-RAN WG4 Meeting #111 R4-2408714**

**Fukuoka, Japan, 20th** – **24th May, 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** | **2309** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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 |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Big CR TS 38.101-1 High-power UE operation for fixed-wireless/vehicle-mounted use cases in NR bands | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NR\_HPUE\_FWVM\_R18-Core | | | | |  | ***Date:*** | | | 2024-05-30 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Addition of PC1 operation for bands n25, n40 and n66. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Relevant table updated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | PC1 operation for bands n25, n40 and n66 is not possible. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.521-1 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 6.2.1 UE maximum output power

The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth of NR carrier unless otherwise stated. The period of measurement shall be at least one sub frame (1ms).

Table 6.2.1-1: UE Power Class

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR  band | Class 1 (dBm) | Tolerance (dB) | Class 1.5 (dBm) | Tolerance (dB) | Class 2 (dBm) | Tolerance (dB) | Class 3 (dBm) | Tolerance (dB) |
| n1 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n2 |  |  |  |  | 26 | +2/-33 | 23 | ±23 |
| n3 |  |  |  |  | 26 | +2/-33 | 23 | ±23 |
| n5 |  |  |  |  |  |  | 23 | ±2 |
| n7 | 316 | +2/-3 |  |  |  |  | 23 | ±23 |
| n8 |  |  |  |  | 26 | +2/-33 | 23 | ±23 |
| n12 |  |  |  |  |  |  | 23 | ±23 |
| n13 |  |  |  |  |  |  | 23 | ±2 |
| n14 | 316 | +2/-3 |  |  | 26 | +2/-3 | 23 | ±2 |
| n18 |  |  |  |  |  |  | 23 | ±2 |
| n20 |  |  |  |  |  |  | 23 | ±23 |
| n24 |  |  |  |  |  |  | 23 | +2/-33 |
| n25 | 316 | +2/-3 |  |  | 26 | +2/-33 | 23 | ±23 |
| n26 |  |  |  |  |  |  | 23 | ±23 |
| n28 |  |  |  |  |  |  | 23 | +2/-2.5 |
| n30 |  |  |  |  |  |  | 23 | ±2 |
| n31 | 316 | +2/-3 |  |  |  |  | 23 | ±2 |
| n34 |  |  | 295 | +2/-3 | 26 | +2/-3 | 23 | ±2 |
| n38 |  |  |  |  |  |  | 23 | ±2 |
| n39 |  |  | 295 | +2/-3 | 26 | +2/-3 | 23 | ±2 |
| n40 | 316 | +2/-3 | 295 | +2/-3 | 26 | +2/-3 | 23 | ±2 |
| n41 | 316 | +2/-3 | 295 | +2/-33 | 26 | +2/-33 | 23 | ±23 |
| n47 |  |  |  |  |  |  | 23 | ±2 |
| n48 |  |  |  |  |  |  | 23 | +2/-3 |
| n50 |  |  |  |  |  |  | 23 | ±2 |
| n51 |  |  |  |  |  |  | 23 | ±2 |
| n53 |  |  |  |  |  |  | 23 | ±2 |
| n54 |  |  |  |  |  |  | 23 | ±2 |
| n65 |  |  |  |  |  |  | 23 | ±2 |
| n66 | 316 | +2/-3 |  |  | 26 | +2/-3 | 23 | ±2 |
| n70 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n71 | 316 | +2/-3 |  |  | 26 | +2/-3 | 23 | +2/-2.5 |
| n72 | 316 | +2/-3 |  |  |  |  | 23 | ±2 |
| n74 |  |  |  |  |  |  | 23 | ±2 |
| n77 | 316 | +2/-3 | 295 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| n78 | 316 | +2/-3 | 295 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| n79 |  |  | 295 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| n80 |  |  |  |  | 26 | +2/-33 | 23 | ±23 |
| n81 |  |  |  |  |  |  | 23 | ±2 |
| n82 |  |  |  |  |  |  | 23 | ±2 |
| n83 |  |  |  |  |  |  | 23 | +2/-2.5 |
| n84 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n85 | 316 | +2/-3 |  |  |  |  | 23 | ±23 |
| n86 |  |  |  |  |  |  | 23 | ±2 |
| n89 |  |  |  |  |  |  | 23 | ±2 |
| n91 |  |  |  |  |  |  | 23 | ±23, 4 |
| n92 |  |  |  |  |  |  | 23 | ±23, 4 |
| n93 |  |  |  |  |  |  | 23 | ±23, 4 |
| n94 |  |  |  |  |  |  | 23 | ±23, 4 |
| n95 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n97 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n98 |  |  |  |  | 26 | +2/-3 | 23 | ±2 |
| n99 |  |  |  |  |  |  | 23 | +2/-33 |
| n100 | 316 | +2/-3 |  |  |  |  | 23 | ±2 |
| n101 | 316 | +2/-3 |  |  |  |  | 23 | ±2 |
| n104 |  |  |  |  | 26 | +2/-3 | 23 | +2/-3 |
| n105 |  |  |  |  |  |  | 23 | +2/-2.5 |
| n106 |  |  |  |  |  |  | 23 | ±2 |
| n109 |  |  |  |  |  |  | 23 | ±23, 4 |
| NOTE 1: PPowerClass is the maximum UE power specified without taking into account the tolerance  NOTE 2: Powerclass 3 is default power class unless otherwise stated  NOTE 3: Refers to the transmission bandwidths confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high – 4 MHz and FUL\_high, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB.  NOTE 4: The maximum output power requirement is relaxed by reducing the lower tolerance limit by 0.3 dB  NOTE 5: Achieved via dual Tx  NOTE 6: Generally, PC1 UE is not targeted for smartphone form factor. The UE power class 1 requirements for Band n14 are applicable for public safety scenario only. | | | | | | | | |

If a UE supports a different power class than the default UE power class for the band and the supported power class enables the higher maximum output power than that of the default power class:

- if the field of UE capability *maxUplinkDutyCycle-PC2-FR1* is absent and the field of UE capability *maxUplinkDutyCycle-PC1dot5-MPE-FR1* is absent and the percentage of uplink symbols transmitted in a certain evaluation period is larger than 50% (The exact evaluation period is no less than one radio frame); or

- if the field of UE capability *maxUplinkDutyCycle-PC2-FR1* is not absent and the percentage of uplink symbols transmitted in a certain evaluation period is larger than *maxUplinkDutyCycle-PC2-FR1* as defined in TS 38.306 (The exact evaluation period is no less than one radio frame); or

- if the field of UE capability *maxUplinkDutyCycle-PC1dot5-MPE-FR1* is not absent and half the percentage of uplink symbols transmitted in a certain evaluation period is larger than *maxUplinkDutyCycle-PC1dot5-MPE-FR1* as defined in TS 38.306 (The exact evaluation period is no less than one radio frame); or

- if the IE P-Max as defined in TS 38.331 [7] is provided and set to the maximum output power of the default power class or lower;

- shall apply all requirements for the default power class to the supported power class and set the configured transmitted power as specified in clause 6.2.4;

- else if the UE does not support a power class with higher maximum output power than PC2; or

- if the field of UE capability *maxUplinkDutyCycle-PC2-FR1* is absent and the field of UE capability *maxUplinkDutyCycle-PC1dot5-MPE-FR1* is absent and the percentage of uplink symbols transmitted in a certain evaluation period is larger than 25% (The exact evaluation period is no less than one radio frame); or

- if the field of UE capability *maxUplinkDutyCycle-PC2-FR1* is not absent and the percentage of uplink symbols transmitted in a certain evaluation period is larger than 0.5\**maxUplinkDutyCycle-PC2-FR1* (The exact evaluation period is no less than one radio frame); or

- if the field of UE capability *maxUplinkDutyCycle-PC1dot5-MPE-FR1* is not absent and the percentage of uplink symbols transmitted in a certain evaluation period is larger than *maxUplinkDutyCycle-PC1dot5-MPE-FR1* as defined in TS 38.306 (The exact evaluation period is no less than one radio frame); or

- if the IE P-Max as defined in TS 38.331 [7] is provided and set to the maximum output power of the power class 2 or lower;

- shall apply all requirements for power class 2 to the supported power class and set the configured transmitted power as specified in clause 6.2.4;

- else shall apply all requirements for the supported power class and set the configured transmitted power as specified in clause 6.2.4.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*