**3GPP TSG-RAN WG4 Meeting # 102-e *R4-2207468***

**Electronic Meeting, February 21 – March 3, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.141** | **CR** | **XXXX** | **rev** | **-** | **Current version:** | **15.15.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Big CR for TS 36.141 Maintenance (Rel-15, CAT F) | | | | | | | | | |
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| ***Source to WG:*** | MCC, Samsung | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI15 | | | | |  | ***Date:*** | | | 2022-03-03 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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:*** | | This big CR merges endorsed draf CR to TS36.141 in RAN4#102-e. The reason for change in endorsed draft CR is copied below:  R4-2207312: In RAN4#101e, corrections of NOTE for OBUE requirement tables for NR specs were agreed. Similar corections are required for LTE specs. | | | | | | | | |
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| ***Summary of change:*** | | The summary of change in endorsed draft CR is copied as below:  R4-2207312: Added clarification text in NOTE in tables for OBUE requirements. | | | | | | | | |
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| ***Consequences if not approved:*** | | The consequences if not approved for endorsed draft CR are coppied as below.  R4-2207312: Without the clarification text, how to derive “cumulative sum” is not clear when measurement bandwidthes are different. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.6.3.5.2E, 6.6.3.5.2F, 6.6.3.5.2H | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS36.104CRxxxx | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Start of change 1>**

##### 6.6.3.5.2E Minimum requirements for stand-alone NB-IoT Wide Area BS

For stand-alone NB-IoT BS in E-UTRA bands ≤3GHz, emissions shall not exceed the maximum levels specified in Tables 6.6.3.5.2E-1.

Table 6.6.3.5.2E-1: Stand-alone NB-IoT BS operating band unwanted emission limits (E-UTRA bands ≤3GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2, 3, 4) | Measurement bandwidth (Note 6) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| 0.15 MHz ≤ Δf < 0.2 MHz | 0.165 MHz ≤ f\_offset < 0.215 MHz | -12.5 dBm | 30 kHz |
| 0.2 MHz ≤ Δf < 1 MHz | 0.215 MHz ≤ f\_offset < 1.015 MHz |  | 30 kHz |
| (Note 8) | 1.015 MHz ≤ f\_offset < 1.5 MHz | -24.5 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤  min(Δfmax, 10 MHz) | 1.5 MHz ≤ f\_offset < min(f\_offsetmax, 10.5 MHz) | -11.5 dBm | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -15 dBm (Note 9) | 1 MHz |
| NOTE 1: The limits in this table only apply for operation with a standalone NB-IoT carrier adjacent to the Base Station RF Bandwidth edge.  NOTE 2: For a BS supporting non-contiguous spectrum operation within any operating band the minimum requirement within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For a BS supporting multi-band operation with Inter RF Bandwidth gap < 20MHz the minimum requirement within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 4: In case the carrier adjacent to the RF bandwidth edge is a standalone NB-IoT carrier, the value of X = PNB-IoTcarrier – 43, where PNB-IoTcarrier is the power level of the standalone NB-IoT carrier adjacent to the RF bandwidth edge. In other cases, X = 0.  NOTE 5: For BS that only support E-UTRA and NB-IoT multi-carrier operation, the requirements in this table do not apply to an E-UTRA BS from Release 8, which is upgraded to support E-UTRA and NB-IoT multi-carrier operation, where the upgrade does not affect existing RF parts of the radio unit related to the requirements in this table. In this case, the requirements in clauses 6.6.3.5.1 and 6.6.3.5.2 shall apply. | | | |

##### 6.6.3.5.2F Minimum requirements for stand-alone NB-IoT Local Area BS

For stand-alone NB-IoT BS in E-UTRA bands ≤3GHz, emissions shall not exceed the maximum levels specified in Table 6.6.3.5.2F-1.

Table 6.6.3.5.2F-1: Stand-alone NB-IoT BS operating band unwanted emission limits (E-UTRA bands ≤3GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2, 3, 4) | Measurement bandwidth (Note 6) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.16 MHz | 0.065 MHz ≤ f\_offset < 0.175 MHz |  | 30 kHz |
| 0.16 MHz ≤ Δf < 5 MHz  (Note 8) | 0.175 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -35.5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -37 dBm (Note 9) | 100 kHz |
| NOTE 1: The limits in this table only apply for operation with a standalone NB-IoT carrier adjacent to the Base Station RF Bandwidth edge.  NOTE 2: For a BS supporting non-contiguous spectrum operation within any operating band the minimum requirement within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For a BS supporting multi-band operation with Inter RF Bandwidth gap < 20MHz the minimum requirement within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 4: In case the carrier adjacent to the RF bandwidth edge is a standalone NB-IoT carrier, the value of X = PNB-IoTcarrier – 24, where PNB-IoTcarrier is the power level of the standalone NB-IoT carrier adjacent to the RF bandwidth edge. In other cases, X = 0. | | | |

##### 6.6.3.5.2G Minimum requirements for stand-alone NB-IoT Home BS

For stand-alone NB-IoT BS in E-UTRA bands ≤3GHz, emissions shall not exceed the maximum levels specified in Table 6.6.3.5.2G-1.

Table 6.6.3.5.2G-1: Stand-alone NB-IoT BS operating band unwanted emission limits (E-UTRA bands ≤3GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 6) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.16 MHz | 0.065 MHz ≤ f\_offset < 0.175 MHz |  | 30 kHz |
| 0.16 MHz ≤ Δf < 5 MHz  (Note 8) | 0.175 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -39.5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -41 dBm (Note 9) | 100 kHz |
| NOTE 1: The limits in this table only apply for operation with a standalone NB-IoT carrier adjacent to the Base Station RF Bandwidth edge.  NOTE 2: In case the carrier adjacent to the RF bandwidth edge is a standalone NB-IoT carrier, the value of X = PNB-IoTcarrier – 20, where PNB-IoTcarrier is the power level of the standalone NB-IoT carrier adjacent to the RF bandwidth edge. In other cases, X = 0. | | | |

##### 6.6.3.5.2H Minimum requirements for stand-alone NB-IoT Medium Range BS

For stand-alone NB-IoT BS in E-UTRA bands ≤3GHz, emissions shall not exceed the maximum levels specified in Tables 6.6.3.5.2H-1 and 6.6.3.5.2H-2.

Table 6.6.3.5.2H-1: Stand-alone NB-IoT BS operating band unwanted emission limits (E-UTRA bands ≤3GHz), BS maximum output power 31 < Prated,c ≤ 38 dBm

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2, 3, 4) | Measurement bandwidth (Note 6) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| 0.15 MHz ≤ Δf < 0.6 MHz (Note 1) | 0.165MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (Note 8) | 1.015MHz ≤ f\_offset < 1.5 MHz | Prated,c – 63.5 dB | 30 kHz |
| 1 MHz ≤ Δf ≤ 2.8 MHz | 1.5 MHz ≤ f\_offset < 3.3 MHz | Prated,c – 50.5 dB | 1 MHz |
| 2.8 MHz ≤ Δf ≤ 5 MHz | 3.3 MHz ≤ f\_offset < 5.5 MHz | min(Prated,c – 50.5 dB, -13.5dBm) | 1 MHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.5 MHz ≤ f\_offset < min(10.5 MHz, f\_offsetmax) | Prated,c – 54.5 dB | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | Prated,c -56dB (Note 9) | 1 MHz |
| NOTE 1: The limits in this table only apply for operation with a standalone NB-IoT carrier adjacent to the Base Station RF Bandwidth edge.  NOTE 2: For a BS supporting non-contiguous spectrum operation within any operating band the minimum requirement within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For a BS supporting multi-band operation with Inter RF Bandwidth gap < 20MHz the minimum requirement within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth. | | | |

Table 6.6.3.5.2H-2: Stand-alone NB-IoT BS operating band unwanted emission limits (E-UTRA bands ≤3GHz), BS maximum output power Prated,c ≤ 31 dBm

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (Note 1, 2, 3, 4)** | **Measurement bandwidth (Note 6)** |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| 0.15 MHz ≤ Δf < 0.6 MHz (Note 1) | 0.165MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (Note 8) | 1.015MHz ≤ f\_offset < 1.5 MHz | -32.5 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤ 5 MHz | 1.5 MHz ≤ f\_offset < 5.5 MHz | -19.5 dBm | 1 MHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.5 MHz ≤ f\_offset < min(10.5 MHz, f\_offsetmax) | -23.5 dBm | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -25 dBm (Note 9) | 1 MHz |
| NOTE 1: The limits in this table only apply for operation with a standalone NB-IoT carrier adjacent to the Base Station RF Bandwidth edge.  NOTE 2: For a BS supporting non-contiguous spectrum operation within any operating band the minimum requirement within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For a BS supporting multi-band operation with Inter RF Bandwidth gap < 20MHz the minimum requirement within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 4: In case the carrier adjacent to the RF bandwidth edge is a standalone NB-IoT carrier, the value of X = PNB-IoTcarrier – 31, where PNB-IoTcarrier is the power level of the standalone NB-IoT carrier adjacent to the RF bandwidth edge. In other cases, X = 0. | | | |

**<End of change 1>**