**3GPP TSG-RAN WG4 Meeting #99-e *R4-2108480***

**19 – 27 May, 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **0937** | **rev** | **1** | **Current version:** | **15.13.0** |  |
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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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | CR to TS 37.104: Regional requirements for band 41 and n41 in Japan, Rel-15 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | NEC, SoftBank Corp., KDDI Corporation, Nokia | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2021-05-11 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In RAN4#98, CRs to be aligned with BWA system in Japan were agreed for 36 and 38 series. This is to update the 37 series for the corresponding changes. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updated the regional requirements list.  Added regional requirements for rated output power for Band 41.  Added text to indicate emission limits may be applied to the sum of the emission power over all antenna connectors for Band 41.  Updated additional BS spurious emissions limits for Band 41.  Deleted the additional OBUE limits for Band 41.  Updated the intermodulation requirements for Band 41. | | | | | | | | |
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| ***Consequences if not approved:*** | | Regional specifications in Japan do not meet 3GPP specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.4, 6.2.2, 6.6.1.3.1, 6.6.2.4.6, 6.7.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS37.141 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**[Start of change]**

## 4.4 Regional requirements

Some requirements in the present document may only apply in certain regions either as optional requirements, or set by local and regional regulation as mandatory requirements. It is normally not stated in the 3GPP specifications under what exact circumstances that the requirements apply, since this is defined by local or regional regulation.

Table 4.4-1 lists all requirements in the present specification that may be applied differently in different regions. There are additional single-RAT regional requirements that may apply. These are referenced from the present specification, but listed in the specification for the RATs concerned [2][3][4][5][17].

Table 4.4-1: List of regional requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Clause number | Requirement | | Comments | |
| 4.5 | Operating bands and Band Categories | | Some bands may be applied regionally. | |
| 6.2.2 | Base station output power | | These requirements apply in Japan for a BS operating in band 34 and Band 41. | |
| 6.6.5.3 | Transmitter spurious emissions | | For BS operating in Band 41 in Japan, the spurious emissions limits shall be applied to the sum of the emission power over all *antenna connectors* | |
| 6.6.1.1 | Mandatory requirements (spurious emissions) | | Category A limits are mandatory for regions where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [2] apply. Category B limits are mandatory for regions where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [2] apply. | |
| 6.6.1.3 | Additional spurious emissions requirements | | These requirements may be applied for the protection of system operating in frequency ranges other than the MSR BS operating band. | |
| 6.6.1.3 | Additional spurious emissions requirements | | In addition to the requirements in subclauses 6.6.1.1, 6.6.1.2 and 6.6.1.3, the BS may have to comply with the applicable emission limits established by FCC Title 47 [8], when deployed in regions where those limits are applied, and under the conditions declared by the manufacturer. | |
| 6.6.1.4 | Co-location (spurious emissions) | | These requirements may be applied for the protection of other BS receivers when a BS operating in another frequency band is co-located with an MSR BS. | |
| 6.6.2.1 | Operating band unwanted emissions | | For BS operating in Band 41 in Japan, the operating band unwanted emissions limits shall be applied to the sum of the emission power over all *antenna connectors.* | |
| 6.6.2.4.1 | Additional requirement (Operating band unwanted emissions) | | In addition to the requirements in subclauses 6.6.2.1 and 6.6.2.2, the BS may have to comply with the applicable emission limits established by FCC Title 47 [8], when deployed in regions where those limits are applied and under the conditions declared by the manufacturer. | |
| 6.6.2.4.2 | Unsynchronized operation for BC3 (Operating band unwanted emissions) | | The requirements for unsynchronized TDD co-existence may apply regionally. | |
| 6.6.2.4.3 | Protection of DTT (Operating band unwanted emissions) | | The requirements for protection of DTT may apply regionally. | |
| 6.6.2.4.4 | Co-existence with services in adjacent frequency bands (Operating band unwanted emissions) | | This regional requirement may be applied for the protection of systems operating in frequency bands adjacent to band 1 as defined in clause 4.5, in geographic areas in which both an adjacent band service and UTRA and/or E‑UTRA are deployed. | |
| 6.6.2.4.7 | Additional band 32 unwanted emissions | These requirements may apply in certain regions | |
| 6.6.3 | Occupied bandwidth | | The requirement may be applied regionally. There may also be regional requirements to declare the Occupied bandwidth according to the definition. | |
| 6.7.4 | Additional requirements | | These requirements may apply in certain regions. | |
| 7.5.2 | Co-location requirement (blocking) | | These requirements may be applied for the protection of the BS receiver when a BS operating in another frequency band is co-located with an MSR BS. | |

**[Unaffected Portions Skipped]**

### 6.2.2 Additional requirement (regional)

For Band 34 operation in Japan, the rated E-UTRA output power declared by the manufacturer shall be less than or equal to the values specified in Table 6.2.2-1.

Table 6.2.2-1: Regional requirements for Band 34 for rated output power declared by the manufacturer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth BWChannel [MHz] | 1.4 | 3 | 5 | 10 | 15 | 20 |
| Maximum output power [W] | N/A | N/A | 20 | 40 | 60 | N/A |

For Band 41 E-UTRA operation in Japan, the rated output power per BS declared by the manufacturer shall be less than or equal to the values specified in Table 6.2.2-2.

Table 6.2.2-2: Regional requirements for Band 41 for rated output power declared by the manufacturer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth BWChannel [MHz] | 1.4 | 3 | 5 | 10 | 15 | 20 |
| Maximum output power [W] | N/A | N/A | N/A | 20 | N/A | 40 |

For Band 41 NR operation in Japan, the sum of Prated,c,AC over all *antenna connectors* declared by the manufacturer shall be equal to or less than 20 W per 10 MHz bandwidth.

**[Unaffected Portions Skipped]**

The following requirement may apply to BS operating in Band 41 in certain regions. This requirement is also applicable at the frequency range from ΔfOBUE below the lowest frequency of the BS downlink operating band up to ΔfOBUE above the highest frequency of the BS downlink operating band.

For Band 41 NR operation in Japan, the operating band unwanted emissions limits shall be applied to the sum of the emission power over all *antenna connectors.*

The power of any spurious emission shall not exceed:

Table 6.6.1.3.1-3: Additional BS Spurious emissions limits for BS operating in Band 41

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 2505MHz – 2535MHz | -42dBm | 1 MHz |  |
| NOTE: This requirement applies for carriers allocated within 2545-2645 MHz. | | | |

**[Unaffected Portions Skipped]**

#### 6.6.2.1 General minimum requirement for Band Categories 1 and 3

For a Wide Area BS operating in Band Category 1 or Band Category 3 the requirement applies outside the Base Station RF Bandwidth edges. In addition, for a Wide Area BS operating in non-contiguous spectrum, it applies inside any sub-block gap. In addition, for a Wide Area BS operating in multiple bands, the requirements apply inside any Inter RF Bandwidth gap.

For a Medium Range BS operating in Band Category 1 the requirement applies outside the Base Station RF Bandwidth edges. In addition, for a Medium Range BS operating in non-contiguous spectrum, it applies inside any sub-block gap. In addition, for a Medium Range BS operating in multiple bands, the requirements apply inside any Inter RF Bandwidth gap.

For a Local Area BS operating in Band Category 1 the requirement applies outside the Base Station RF Bandwidth edges. In addition, for a Local Area BS operating in non-contiguous spectrum, it applies inside any sub-block gap. In addition, for a Local Area BS operating in multiple bands, the requirements apply inside any Inter RF Bandwidth gap.

Outside the Base Station RF Bandwidth edges, emissions shall not exceed the maximum levels specified in Tables 6.6.2.1-1 to 6.6.2.1-4 below, where:

- Δf is the separation between the Base Station RF Bandwidth edge frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the Base Station RF Bandwidth edge frequency and the centre of the measuring filter.

- f\_offsetmax is the offset to the frequency ΔfOBUE outside the downlink operating band.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a BS operating in multiple bands, inside any Inter RF Bandwidth gaps with Wgap < 2\*ΔfOBUE, emissions shall not exceed the cumulative sum of the minimum requirements specified at the Base Station RF Bandwidth edges on each side of the Inter-RF Bandwidth gap. The minimum requirement for Base Station RF Bandwidth edge is specified in Table 6.6.2.1-1 to 6.6.2.1-4 below, where in this case:

- Δf is the separation between the Base Station RF Bandwidth edge frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the Base Station RF Bandwidth edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the inter Base Station RF Bandwidth gap minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For BS capable of multi-band operation where multiple bands are mapped on the same antenna connector, the operating band unwanted emission limits apply also in a supported operating band without any carriers transmitted, in the case where there are carriers transmitted in other operating band(s). In this case where there is no carrier transmitted in an operating band, the operating band unwanted emission limit, as defined in the tables of the present subclause for the largest frequency offset (Δfmax), of a band where there is no carrier transmitted shall apply from ΔfOBUE below the lowest frequency, up to ΔfOBUE above the highest frequency of the supported downlink operating band without any carrier transmitted. And no cumulative limits are applied in the inter-band gap between a supported downlink band with carrier(s) transmitted and a supported downlink band without any carrier transmitted.

Inside any sub-block gap for a BS operating in non-contiguous spectrum, emissions shall not exceed the cumulative sum of the minimum requirements specified for the adjacent sub blocks on each side of the sub block gap. The minimum requirement for each sub block is specified in Tables 6.6.2.1-1 to 6.6.2.1-4 below, where in this case:

- Δf is the separation between the sub block edge frequency and the nominal -3 dB point of the measuring filter closest to the sub block edge.

- f\_offset is the separation between the sub block edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the sub block gap bandwidth minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For Band 41 NR operation in Japan, the operating band unwanted emissions limits shall be applied to the sum of the emission power over all *antenna connectors.*

Applicability of Wide Area operating band unwanted emission requirements in Tables 6.6.2.1-1, 6.6.2.1-1b and 6.6.2.1-1c is specified in Table 6.6.2.1-0.

**[Unaffected Portions Skipped]**

##### 6.6.2.4.6 Void

Table 6.6.2.4.6-1: Void



**[Unaffected Portions Skipped]**

#### 6.6.4.6 NR minimum requirement

For NR, the minimum requirements shall apply outside the Base Station RF Bandwidth or Radio Bandwidth whatever the type of transmitter considered (single carrier or multi-carrier) and for all transmission modes foreseen by the manufacturer's specification.

For a BS operating in non-contiguous spectrum, the ACLR requirement shall apply in *sub-block gaps* for the frequency ranges defined in table 6.6.4.6-2a, while the CACLR requirement shall apply in *sub-block gaps* for the frequency ranges defined in table 6.6.4.4-1.

For BS operating in multiple bands, where multiple bands are mapped onto the same *antenna connector*, the ACLR requirement shall apply in *Inter RF Bandwidth gaps* for the frequency ranges defined in table 6.6.4.6-2a, while the CACLR requirement in subclause 6.6.4.4 shall apply in *Inter RF Bandwidth gaps* for the frequency ranges defined in table 6.6.4.4-1.

The requirement shall apply during the *transmitter ON period*. The ACLR is defined with a square filter of bandwidth equal to the transmission bandwidth configuration of the transmitted signal (BWConfig) centred on the assigned channel frequency and a filter centred on the adjacent channel frequency according to the tables below.

The ACLR absolute *limit* in table 6.6.4.6-2 or the ACLR (CACLR) *limit* in table 6.6.4.6-1, 6.6.4.6-2a or 6.6.4.4-1, whichever is less stringent, shall apply for each *antenna connector*.

For operation in paired and unpaired spectrum, the ACLR shall be higher than the value specified in table 6.6.4.6‑1.

For Band 41 NR operation in Japan, absolute ACLR limits shall be applied to the sum of the absolute ACLR power over all *antenna connectors*.

**[Unaffected Portions Skipped]**

### 6.7.4 Additional requirements

In certain regions the following requirement may apply. For BS E-UTRA single-RAT operating in Band 41, the transmitter intermodulation level shall not exceed the maximum levels specified in Table 6.6.1.3.1-3 and Table 6.6.4.1-2 with a square filter in the first adjacent channel, in the presence of an interfering signal according to Table 6.7.4‑1.

Table 6.7.4-1 Interfering and wanted signals for the additional transmitter intermodulation requirement for Band 41

|  |  |
| --- | --- |
| Parameter | Value |
| Wanted signal | E-UTRA single carrier (NOTE) |
| Interfering signal type | E-UTRA signal of the same channel bandwidth as the wanted signal |
| Interfering signal level | Rated total output power in the operating band – 30dB |
| Interfering signal centre frequency offset from the lower/upper centre frequency of the wanted signal | ± BWChannel  ± 2 x BWChannel |
| NOTE: This requirement applies for 10 or 20 MHz E-UTRA carriers allocated within 2545-2645 MHz. | |

**[End of change]**