**3GPP TSG-RAN WG4 Meeting #116-bis R4-2514033**

**Prague, CZ, 13th – 17th October 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **37.141** | **CR** |  **-** | **rev** |  **1** | **Current version:** | **19.1.0** |  |
|  |
| *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 |  | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | (TEI19-BDaT\_simp\_improvement) draftCR to TS 37.141: spec structure simplification for co-location/co-existence requirements |
|  |  |
| ***Source to WG:*** | ZTE Corporation |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | TEI19 |  | ***Date:*** | 2025-10-03 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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)* |
|  |  |
| ***Reason for change:*** | According to the RAN task, the spec structure simplification for transmitter spurious emission in subclause 6.6.1.5.5, 6.6.1.5.6 and 7.5.5.2 |
|  |  |
| ***Summary of change:*** | The table is simplified to include the general requirement level and exceptions.  |
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| ***Consequences if not approved:*** | If not approved, the specification cannot be improved as requested by RAN task. |
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| ***Clauses affected:*** | 6.6.1.5.5, 6.6.1.5.6, 7.5.5.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*<Start of the change>*

##### 6.6.1.5.5 Additional spurious emission requirements

These requirements may be applied for the protection of system operating in frequency ranges other than the BS downlink operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the BS, or they may be set by local or regional regulation as a mandatory requirement for an operating band. It is in some cases not stated in the present document whether a requirement is mandatory or under what exact circumstances that a limit applies, since this is set by local or regional regulation. An overview of regional requirements in the present document is given in clause 4.4.

Some requirements may apply for the protection of specific equipment (UE, MS and/or BS) or equipment operating in specific systems (GSM/EDGE, CDMA, UTRA, E-UTRA, NR, etc.) as listed below. The power of any spurious emission shall not exceed the limits of Table 6.6.1.5.5-1 for a BS where requirements for co-existence with the system listed in the first column apply. For BS capable of multi-band operation, the exclusions and conditions in the Table 6.6.1.5.5-1 apply for each supported operating band. For BS capable of multi-band operation where multiple bands are mapped on separate antenna connectors, the exclusions and conditions in the Table 6.6.1.5.5-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.5.5-1: BS Spurious emissions limits for co-existence with systems operating in other frequency bands

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| System type to co-exist with (Note 8) | Frequency range for co-existence requirement (MHz) (Note 9) | *Basic limits* (dBm) | Measurement bandwidth | Notes |
| --- | --- | --- | --- | --- |
| GSM850 or CDMA850 | 869 – 894 | -57 | 100 kHz | Note 1, Note 3 |
| 824 – 849 | -61 |
| GSM900 | 921 – 960 | -57 |
| 876 – 915 | -61 |
| DCS1800 | 1805 – 1880 | -47 |
| 1710 – 1785 | -61 |
| PCS1900 | 1930 – 1990 | -47 |
| 1850 – 1910 | -61 |
| UTRA, E-UTRA or NR | Frequency range of downlink *operating band* of the BS to co-exist with | -52 | 1 MHz | Note 1, Note 3 |
| Frequency range of uplink *operating band* of the BS to co-exist with | -49 | Note 1, Note 3, Note 5, Note 6, Note 7 |

NOTE 1: As defined in the scope for spurious emissions in this clause, except for the cases where the noted requirements apply to a BS operating in Band 25, Band 27, Band 28 or Band 29, the co-existence requirements in Table 6.6.1.5.5-1 do not apply for the 10 MHz frequency range immediately outside the downlink operating band (see Tables 4.4-1 and 4.4-2). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.6.1.5.5-1 assumes that two operating bands, where the frequency ranges in Table 4.4-1 or Table 4.4-2 would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-existence requirements may apply that are not covered by the 3GPP specifications.

NOTE 3: For the protection of DCS1800, UTRA Band III, E-UTRA Band 3 or NR Band n3 in China, the frequency ranges of the downlink and uplink protection requirements are 1805 – 1850 MHz and 1710 – 1755 MHz respectively.

NOTE 4: TDD base stations deployed in the same geographical area, that are synchronized and use the same or adjacent operating bands can transmit without additional co-existence requirements. For unsynchronized base stations(except in Band 46), special co-existence requirements may apply that are not covered by the 3GPP specifications.

NOTE 5: For Band 28 BS, specific solutions may be required to fulfil the spurious emissions limits for BS for co-existence with Band 27 UL operating band, where requirement applies 4 MHz above the Band n28 downlink operating band.

NOTE 6: For Band 29 BS, specific solutions may be required to fulfil the spurious emissions limits for BS for co-existence with UTRA Band XII or E-UTRA Band 12 or NR Band n12 UL operating band or E-UTRA Band 17 UL operating band or E-UTRA Band 85 UL operating band, where requirement applies 1 MHz below the Band n29 downlink operating band.

NOTE 7: For NR Band n67 BS, specific solutions may be required to fulfil the spurious emissions limits for NR BS co-existence with E-UTRA Band 28 or NR Band n28 UL operating band or NR Band n83 UL operating band, where requirement applies for 703 MHz to 736 MHz.

NOTE 8: Does not apply for co-existence with standalone downlink bands (SDO) defined in TS 36.104 [5], table 5.5-1.

NOTE 9: Frequency range of UTRA, E-UTRA and NR bands, as described in TS 25.104 [3] clause 5.2, TS 36.104 [5] clause 5.5 and TS 38.104 [27] clause 5.2, respectively.

The following requirement may be applied for the protection of PHS. This requirement is also applicable at specified frequencies falling between ΔfOBUE below the lowest BS transmitter frequency of the downlink operating band and ΔfOBUE above the highest BS transmitter frequency of the downlink operating band.

The power of any spurious emission shall not exceed:

Table 6.6.1.5.5-2: BS Spurious emissions limits for BS for co-existence with PHS

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 1884.5 ‑ 1915.7 MHz | -41 dBm | 300 kHz | Applicable for co-existence with PHS system operating in 1884.5-1915.7MHz  |
| NOTE: The requirement is not applicable in China. |

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, the additional BS spurious 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 6.6.1.5.5-3: Additional BS Spurious emissions limits for BS operating in Band 41

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

In addition to the requirements in clauses 6.6.1.5.1 to 6.6.1.5.4 and above in the present clause, 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.

The following requirement may apply to BS operating in Band 30 in certain regions. This requirement is also applicable at the frequency range from 10 MHz below the lowest frequency of the BS downlink operating band up to 10 MHz above the highest frequency of the BS downlink operating band.

The power of any spurious emission shall not exceed:

Table 6.6.1.5.5-4: Additional BS Spurious emissions limits for Band 30

|  |  |  |  |
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| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 2200MHz – 2345MHz | -45dBm | 1 MHz |  |
| 2362.5MHz – 2365MHz | -25dBm | 1 MHz |  |
| 2365MHz – 2367.5MHz | -40dBm | 1 MHz |  |
| 2367.5MHz – 2370MHz | -42dBm | 1 MHz |  |
| 2370MHz – 2395MHz | -45dBm | 1 MHz |  |

In certain regions the following requirement may apply to E-UTRA BS operating in Band 45. Emissions shall not exceed the maximum levels specified in Table 6.6.1.5.5-5.

Table 6.6.1.5.5-5: Emissions limits for protection of adjacent band services

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| Operating Band | Filter centre frequency, Ffilter  | Maximum Level [dBm] | Measurement Bandwidth |
|  | Ffilter = 1467.5 | -20 | 1 MHz |
|  | Ffilter = 1468.5 | -23 | 1 MHz |
| 45 | Ffilter = 1469.5 | -26 | 1 MHz |
|  | Ffilter = 1470.5 | -33 | 1 MHz |
|  | Ffilter = 1471.5 | -40 | 1 MHz |
|  | 1472.5 MHz ≤ Ffilter ≤ 1491.5 MHz | -47 | 1 MHz |

The following requirement may apply to E-UTRA BS operating in Band 48 in certain regions. The power of any spurious emission shall not exceed:

Table 6.6.1.5.5-6: Additional BS Spurious emissions limits for Band 48

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| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 3530MHz – 3720MHz | -25dBm | 1 MHz | Applicable 10MHz from the assigned channel edge  |
| 3100MHz – 3530MHz3720MHz – 4200MHz | -40dBm | 1 MHz |  |

The following requirement may also apply to BS operating in Band 54 in certain regions. The level of emissions in the 1541 – 1650 MHz band, measured in measurement bandwidth according to Table 6.6.1.5.5-7 shall not exceed the maximum emission levels PEM,B54,a, PEM,B54,b, PEM,B54,c, PEM,B54,d, PEM,B54,e and PEM,B54,f declared by the manufacturer.

Table 6.6.1.5.5-7: Declared Band 54 emissions levels for protection of the 1541-1650 MHz band

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| --- | --- | --- | --- | --- |
| Operating Band | Frequency range | Declared emission level (dBW) (Measurement bandwidth = 1 MHz) | Declared emission level (dBW) of discrete emissions of less than 700 Hz bandwidth(Measurement bandwidth = 1 kHz) | Declared emission level (dBW) of discrete emissions of less than 2 kHz bandwidth(Measurement bandwidth = 1 kHz) |
| 54 | 1541 - 1559 MHz  | PEM,B54,a |  | PEM,B54,f |
|  | 1559 - 1610 MHz | PEM,B54,b | PEM,B54,d |  |
|  | 1610 - 1650 MHz | PEM,B54,c | PEM,B54,e |  |

Note: The regional requirements specified in attachment to the FCC reference document, 0007135419, are defined in terms of EIRP (effective isotropic radiated power), which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The EIRP level is calculated using: PEIRP = PE + Gant where PE denotes the BS unwanted emission level at the antenna connector, Gant equals the BS antenna gain minus feeder loss. The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement.

*<Next of the change>*

##### 6.6.1.5.6 Co-location with other Base Stations

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850, CDMA850, UTRA FDD, UTRA TDD, E-UTRA and/or NR BS are co-located with a BS.

The requirements assume a 30 dB coupling loss between transmitter and receiver and are based on co-location with base stations of the same class.

The power of any spurious emission shall not exceed the limits of Table 6.6.1.5.6-1 for a BS where requirements for co-location with a BS type listed in the second column apply, depending on the declared Base Station class. For BS capable of multi-band operation, the exclusions and conditions in the Table 6.6.1.5.6-1 apply for each supported operating band. For BS capable of multi-band operation where multiple bands are mapped on separate antenna connectors, the exclusions and conditions in the Table 6.6.1.5.6-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.5.6-1: BS Spurious emissions limits for BS co-located with another BS

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| Frequency range of uplink operating band of the | System type to co-locate with(Note 4) | *Basic limits* (dBm/100kHz) (Note 1) |
| co-located BS (MHz) (Note 5) | WA BS | MR BS | LA BS |
| 824 – 849 | GSM850 or CDMA850 | -98 | -91 | -70 |
| 876 – 915 | GSM900 | -98 | -91 | -70 |
| 1710 – 1785 | DCS1800  | -98 | -91 | -80 |
| 1850 – 1910 | PCS1900 | -98 | -91 | -80 |
| 49, 51/n51, n91, n93 | E-UTRA or NR | N/A | N/A | -88 |
| 46/n46, 53/n53 | E-UTRA or NR | N/A | -91 | -88 |
| n100, n101 | NR | -96 | N/A | N/A |
| n96, n102 | NR | N/A | -90 | -87 |
| n104 | NR | -95 | -90 | -87 |
| Other *operating band* | UTRA, E-UTRA or NR | -96 | -91 | -88 |

NOTE 1: As defined in the scope for spurious emissions in this clause, the co-location requirements in Table 6.6.1.5.6-1 do not apply for the ΔfOBUE frequency range immediately outside the BS transmit frequency range of a downlink operating band (see Tables 4.4-1 and 4.4-2). The current state-of-the-art technology does not allow a single generic solution for co-location with other system on adjacent frequencies for 30 dB BS-BS minimum coupling loss. However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR 25.942 [14].

NOTE 2: Table 6.6.1.5.6-1 assumes that two operating bands, where the corresponding BS transmit and receive frequency ranges in Table 4.4-1 or Table 4.4-2 would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-location requirements may apply that are not covered by the 3GPP specifications.

NOTE 3: Co-located TDD Base Stations that are synchronized and using the same or adjacent operating band can transmit without special co-locations requirements. For unsynchronized Base Stations, special co-location requirements may apply that are not covered by the 3GPP specifications.

NOTE 4: Does not apply for co-location with V2X operation defined in TS 36.104 [5], table 5.5-1.

NOTE 5: Frequency range of UTRA, E-UTRA and NR bands, as described in TS 25.104 [3] clause 5.2, TS 36.104 [5] clause 5.5 and TS 38.104 [27] clause 5.2, respectively.

*<Next of the change>*

#### 7.5.5.2 Co-location test requirements

This additional blocking requirement may be applied for the protection of BS receivers when NR, E-UTRA, UTRA, CDMA or GSM/EDGE BS operating in a different frequency band are co-located with a BS.

The requirements in this clause assume a 30 dB coupling loss between the interfering transmitter and the BS receiver and are based on co-location with base stations of the same class.

For a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.5.5.2-1, the following requirements shall be met:

- For any measured E-UTRA carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [5], clause 7.2.

- For any measured UTRA FDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.104 [3], clause 7.2.

- For any measured UTRA TDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.105 [4], clause 7.2.

- For any measured GSM/EDGE carrier, the conditions are specified in TS 45.005 [6], Annex P.2.1.

- For any measured NB-IoT carrier (standalone or operating in E-UTRA in-band/guard band), the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [5], clause 7.2.

- For any measured NB-IoT carrier (operating in NR in-band), the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 38.104 [27], clause 7.2.

- For any measured NR carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 38.104 [27], clause 7.2.

Table 7.5.5.2-1: Blocking requirement for co-location with BS in other frequency bands

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| Frequency range of interfering signal | Wanted signal mean power (dBm) | Interfering signal mean power for WA BS (dBm) | Interfering signal mean power for MR BS (dBm) | Interfering signal mean power for LA BS (dBm) | Type of interfering signal |
| --- | --- | --- | --- | --- | --- |
| Frequency range of co-located downlink *operating band* | PREFSENS + x dB(Note 1) | +16 | +8 | -6 | CW carrier |
| NOTE 1: PREFSENS depends on the RAT, the BS class and the channel bandwidth, see subclause 7.2.  "x" is equal to 3 in case of GSM/EDGE wanted signal and equal to 6 in case of NR or UTRA or E-UTRA or NB-IoT wanted signals.NOTE 2: Except for a BS operating in Band 13, these requirements do not apply when the interfering signal falls within any of the supported uplink operating band or in the ΔfOOB immediately outside any of the supported uplink operating band.For a BS operating in band 13 the requirements do not apply when the interfering signal falls within the frequency range 768-797 MHz.NOTE 3: Some combinations of bands may not be possible to co-site based on the requirements above. The current state-of-the-art technology does not allow a single generic solution for co-location of UTRA TDD or E-UTRA TDD or NR TDD with E-UTRA FDD or NR FDD on adjacent frequencies for 30dB BS-BS minimum coupling loss. However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR 25.942 [7].NOTE 4: In China, the blocking requirement for co-location with DCS1800 and Band III BS is only applicable in the frequency range 1805-1850MHz.NOTE 5: For a BS operating in band 11, 21, 74, the requirement for co-location with Band 32 applies for interfering signal within the frequency range 1475.9-1495.9 MHz.NOTE 6: Co-located TDD base stations that are synchronized and using the same or adjacent operating band can receive without special co-location requirements. For unsynchronized base stations, special co-location requirements may apply that are not covered by the 3GPP specifications.NOTE 7: For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. |

*<End of the change>*