**3GPP TSG-RAN WG4 Meeting #116 *R4-251zzzz***

**Bengaluru, India, 25th – 29th August 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **36.141** | **CR** | **14zz** | **rev** | **-** | **Current version:** | **19.0.0** |  |
|  |
| *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:***  | (TEI19-BDaT\_simp\_improvement) CR to 36.141 on framework simplification for co-location/co-existence requirements |
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| ***Source to WG:*** | Nokia |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | TEI19 |  | ***Date:*** | 2025-10-15 |
|  |  |  |  |  |
| ***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:*** | Simplification for co-location/co-existence requirements. |
|  |  |
| ***Summary of change:*** | Relevant Clauses are updated. |
|  |  |
| ***Consequences if not approved:*** | Existing requirements to be updated whenever new band is introduced. |
|  |  |
| ***Clauses affected:*** | 2, 6.6.4.5.4, 6.6.4.5.5, 7.6.5.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS 36.104 CR 50zz |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ... |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **< START OF CHANGE >** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications.

[2] 3GPP TS 36 104: "E-UTRA Base Station (BS) radio transmission and reception".

[3] ITU-R Recommendation M.1545, "Measurement uncertainty as it applies to test limits for the terrestrial component of International Mobile Telecommunications-2000".

[4] ITU-R recommendation SM.328: "Spectra and bandwidth of emissions".

[5] ITU-R recommendation SM.329: "Unwanted emissions in the spurious domain ".

[6] IEC 60721-3-3 (2002): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weather protected locations".

[7] IEC 60721-3-4 (1995): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations".

[8] IEC 60068-2-1 (2007): "Environmental testing - Part 2: Tests. Tests A: Cold".

[9] IEC 60068-2-2 (2007): "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[10] IEC 60068-2-6 (2007): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)".

[11] 3GPP TR 25.942: "RF system scenarios".

[12] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".

[13] 3GPP TS 36.212: "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".

[14] 3GPP TR 36.942: "E-UTRA RF system scenarios".

[15] 3GPP TS 25.104: " Base Station (BS) radio transmission and Reception (FDD)".

[16] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".

[17] 3GPP TS 25.141: "Base Station (BS) conformance testing (FDD)".

[18] 3GPP TS 37.141: " E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) conformance testing".

[19] CEPT ECC Decision (13)03, "The harmonised use of the frequency band 1452-1492 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL)".

[20] CEPT ECC Decision (17)06, "The harmonised use of the frequency bands 1427-1452 MHz and 1492-1518 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL)".

[21] 3GPP TS 38.104: "NR Base Station (BS) radio transmission and reception".

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.6.4.5.4 Co-existence with other systems in the same geographical area

6.6.4.5.4.1 Void

These requirements may be applied for the protection of system operating in frequency ranges other than the E-UTRA or NB-IoT BS operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the E-UTRA BS, or they may be set by local or regional regulation as a mandatory requirement for an E-UTRA 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 4.3.

Some requirements may apply for the protection of specific equipment (UE, MS and/or BS) or equipment operating in specific systems (GSM, CDMA, UTRA, E-UTRA, NR, etc.) as listed below. The power of any spurious emission shall not exceed the limits of Table 6.6.4.5.4-1 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 6.6.4.5.4-1 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 6.6.4.5.4-1 apply for the operating band supported at that antenna connector.

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| Table 6.6.4.5.4-1: BS Spurious emissions limits for E-UTRA BS for co-existence with systems operating in other frequency bands |  |  |  |  |
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| System type to co-exist with (NOTE 7) | Frequency range for co-existence requirement (MHz) (NOTE 8) | *Basic limits* (dBm) | Measurement bandwidth | Notes |
| --- | --- | --- | --- | --- |
| GSM850 or CDMA850 | 869 – 894 | -57 | 100kHz | NOTE 1 |
| 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 | 1MHz | NOTE 1 |
| Frequency range of uplink *operating band* of the BS to co-exist with | -49 | NOTE 1, NOTE 4, NOTE 5, NOTE 6 |

Additional co-existence requirements in Table 6.6.4.5.4-1-1a may apply for some regions.

Table 6.6.4.5.4-1a: BS Spurious emissions limits for E-UTRA BS for co-existence with systems operating in Band 46

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| System type for E-UTRA to co-exist with | Frequency range for co-existence requirement | Maximum Level | Measurement Bandwidth | Note |
| E-UTRA Band 46a | 5150 - 5250 MHz | -40 dBm | 1 MHz | This is only applicable to E-UTRA BS operating in Band 46c or 46d. |
| E-UTRA Band 46b | 5250 - 5350 MHz | -40 dBm | 1 MHz | This is only applicable to E-UTRA BS operating in Band 46c or 46d. |
| E-UTRA Band 46c | 5470 - 5725 MHz | -40 dBm | 1 MHz | This is only applicable to E-UTRA BS operating in Band 46a or 46b. |
| E-UTRA Band 46d | 5725 - 5925 MHz | -40 dBm | 1 MHz | This is only applicable to E-UTRA BS operating in Band 46a or 46b. |
| NOTE 1: This requirement may apply to E-UTRA BS operating in certain regions. |

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 6.6.4.5.4-1 do not apply for the 10 MHz frequency range immediately outside the downlink operating band (see Table 5.5-1). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.6.4.5.4-1 assumes that two operating bands, where the frequency ranges in Table 5.5-1 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: 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 4: For E-UTRA Band 28 BS, specific solutions may be required to fulfil the spurious emissions limits for E-UTRA BS for co-existence with E-UTRA Band 27 UL operating band, where requirement applies 4 MHz above the E-UTRA Band 28 downlink operating band.

NOTE 5: For E-UTRA Band 29 BS, specific solutions may be required to fulfil the spurious emissions limits for E-UTRA BS for co-existence with UTRA Band XII or E-UTRA Band 12 UL operating band, E-UTRA Band 17 UL operating band or E-UTRA Band 85 UL operating band, where requirement applies 1 MHz below the E-UTRA Band 29 downlink operating band.

NOTE 6: For E-UTRA Band 67 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 7: Does not apply for co-existence with standalone downlink bands (SDO) defined in TS 36.104 [2], table 5.5-1.

NOTE 8: Frequency range of UTRA, E-UTRA and NR bands, as described in TS 25.104 [15] clause 5.2, TS 36.104 [2] clause 5.5 and TS 38.104 [21] clause 5.2, respectively.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.6.4.5.5 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 an E-UTRA or NB-IoT 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 6.6.4.5.5-4 where requirements for co-location with a BS type listed in the second column apply. For BS capable of multi-band operation, the exclusions and conditions in the Table 6.6.4.5.5-4 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 6.6.4.5.5-4 apply for the operating band supported at that antenna connector.

Table 6.6.4.5.5-1: Void

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Table 6.6.4.5.5-2: Void

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Table 6.6.4.5.5-4: 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 6.6.4.5.5-1 do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of a downlink *operating band* (see table 5.5-1). The current state-of-the-art technology does not allow a single generic solution for co-location with other system 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 [11].

NOTE 2: Table 6.6.4.5.5-1 assumes that two *operating bands*, where the corresponding eNode B transmit and receive frequency ranges in Table 5.3-1 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 [2], table 5.5-1.

NOTE 5: Frequency range of UTRA, E-UTRA and NR bands, as described in TS 25.104 [15] clause 5.2, TS 36.104 [2] clause 5.5 and TS 38.104 [21] clause 5.2, respectively.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 7.6.5.2 Co-location with other base stations

This additional blocking requirement may be applied for the protection of E-UTRA BS or NB-IoT receivers when GSM, CMDA, UTRA, NR or E-UTRA BS operating in a different frequency band are co-located with an E-UTRA or NB-IoT BS. The requirement is applicable to all channel bandwidths supported by the E-UTRA BS.

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

For each measured E-UTRA carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.6-6. The reference measurement channel for the wanted signal is specified in Tables 7.2-1, 7.2-2 and 7.2-4 for each channel bandwidth and further specified in Annex A.

For each measured NB-IoT carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.6-6. The reference measurement channel for the wanted signal is specified in Tables 7.2-5 for each channel sub-carrier spacing option and further specified in Annex A.

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Table 7.6-6: Blocking performance requirement for E-UTRA and NB-IoT BS when co-located with BS in other frequency bands.

| 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 +6dB(Note 1) | +16 | +8 | x (Note 2) | CW carrier |
| NOTE 1: PREFSENS is related to the channel bandwidth and specified in TS 36.104 [2] subclause 7.2.1.NOTE 2: x = -7 dBm for NR BS co-located with Pico GSM850 or Pico CDMA850x = -4 dBm for NR BS co-located with Pico DCS1800 or Pico PCS1900x = -6 dBm for NR BS co-located with UTRA bands or E-UTRA bands or NR bandsNOTE 3: 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 4: 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 [11].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 CHANGE >** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*