**3GPP TSG-RAN WG4 Meeting #116 *R4-2511663***

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **37.104** | **CR** | **1027** | **rev** | **1** | **Current version:** | **19.0.0** |  |
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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:*** | (TEI19-BDaT\_simp\_improvement) CR to 37.104 on framework simplification for co-location/co-existence requirements | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
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| ***Work item code:*** | TEI19 | | | | |  | ***Date:*** | | | 2025-08-27 |
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| ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | Simplification for co-location/co-existence requirements. | | | | | | | | |
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| ***Summary of change:*** | | Relevant Clauses are updated. | | | | | | | | |
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| ***Consequences if not approved:*** | | Existing requirements to be updated whenever new band is introduced. | | | | | | | | |
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| ***Clauses affected:*** | | 6.6.1.3.1, 6.6.1.4.1, 7.5.2 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 37.141 CR 1099 | | |
| ***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 >** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.6.1.3.1 Minimum Requirement

The power of any spurious emission shall not exceed the limits of Table 6.6.1.3.1-1 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 Note column of Table 6.6.1.3.1-1 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 Note column of Table 6.6.1.3.1-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.3.1-1: BS Spurious emissions limits for co-existence with systems operating in other frequency bands

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

NOTE 1: As defined in the scope for spurious emissions in this subclause, except for the cases where the noted requirements apply to a BS operating in Band 25(note for band 25 is missing, need to addd?), Band 27, Band 28 or Band 29, or n67, the co-existence requirements in Table 6.6.1.3.1-1 do not apply for the frequency range extending 10 MHz immediately outside the downlink operating band (see Tables 4.5-1 and 4.5-2). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.6.1.3.1-1 assumes that two operating bands, where the frequency ranges in Table 4.5-1 or Table 4.5-2 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 29 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, table 5.5-1.

NOTE 9: Frequency range of UTRA, E-UTRA and NR bands, as described in TS 25.104, TS 36.104 and TS 38.104.

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

##### 6.6.1.4.1 Minimum Requirement

The power of any spurious emission shall not exceed the limits of Table 6.6.1.4.1-1 for a BS where requirements for co-location with a BS type listed in the first column apply, depending on the declared Base Station class. For BS capable of multi-band operation, the exclusions and conditions in the Note column of Table 6.6.1.4.1-1 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 Note column of Table 6.6.1.4.1-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.4.1-1: 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 | *Basic limits* (dBm/100kHz) | | | Notes |
| co-located BS | WA BS | MR BS | LA BS |
| 824 - 849 MHz | GSM850 or CDMA850 | -98 | -91 | -70 | NOTE 1 |
| 876 - 915 MHz | GSM900 | -98 | -91 | -70 |
| 1710 - 1785 MHz | DCS1800 | -98 | -91 | -80 |
| 1850 - 1910 MHz | PCS1900 | -98 | -91 | -80 |
| UL frequency range of n51, n91, n93 | NR | N/A | N/A | -88 |
| UL frequency range of n53 | NR | N/A | -91 | -88 |
| UL frequency range of n100, n101 | NR | -96 | N/A | N/A |
| UL frequency range of n96, n102 | NR | N/A | -90 | -87 |
| UL frequency range of n104 | NR | -95 | -90 | -87 |
| Frequency range of uplink *operating band* of the co-located BS | Other (NOTE 4, 5) | -96 | -91 | -88 |

NOTE 1: As defined in the scope for spurious emissions in this subclause, the co-location requirements in Table 6.6.1.4.1-1 do not apply for the ΔfOBUE frequency range immediately outside the BS transmit frequency range of a downlink operating band (see Tables 4.5-1 and 4.5-2). 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 [7].

NOTE 2: Table 6.6.1.4.1-1 assumes that two operating bands, where the corresponding BS transmit and receive frequency ranges in Table 4.5-1 or Table 4.5-2 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, table 5.5-1.

NOTE 5: UTRA, E-UTRA, NR as described in TS 25.104, TS 36.104 and TS 38.104.

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

### 7.5.2 Co-location minimum requirement

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

The requirements in this subclause 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 7.5.2-1, the following requirements shall be met:

- For any E-UTRA carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any UTRA FDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.104 [2], subclause 7.2.

- For any UTRA TDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.105 [3], subclause 7.2.

- For any GSM/EDGE carrier, the conditions are specified in TS 45.005 [5], Annex P.2.1.

- For any NB-IoT carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any NR carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 38.104 [17], subclause 7.2.

Table 7.5.2-1: Blocking requirement for co-location 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 + 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. | | | | | |

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