**3GPP TSG-WG4 Meeting # 99-e *R4-2108743***

**Electronic Meeting, 19th - 27th May 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.141-2** | **CR** | **0344** | **rev** | **1** | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *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:*** | CR on TS 38.141-2: Introduction of NR-U co-existence requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Perf | | | | |  | ***Date:*** | | | 2021-05-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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:*** | | Tx spurious emissions limits for co-existence and co-location with NR-U operation in bands 46 and 96 are not complete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce the limits | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Co-existence and co-location with NR-U is not included in tx spurious emissions for BS Type 1-O | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.1.2.2, 4.1.2.3, 6.2.1, 6.7.5.4.5.1, 6.7.5.5.5.1, 7.2.5.2, A.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Added measurement uncertainties, the statement about regional conditions, EIS levels and FRC tables | | | | | | | | |

------------start of changed section ----------

#### 4.1.2.2 Measurement of transmitter

The maximum OTA Test System uncertainty for OTA transmitter tests minimum requirements are given in tables 4.1.2.2-1 and 4.1.2.2-2. Details for derivation of OTA Test System uncertainty are given in corresponding clauses in TR 37.941 [29].

Table 4.1.2.2-1: Maximum OTA Test System uncertainty for FR1 OTA transmitter tests

| Clause | Maximum OTA Test System uncertainty |
| --- | --- |
| 6.2 Radiated transmit power | Normal condition:  ±1.1 dB, f ≤ 3 GHz  ±1.3 dB, 3 GHz < f ≤ 6 GHz  [±1.3 dB for bands n46 and n96] |
|  | Extreme condition:  ±2.5 dB, f ≤ 3 GHz  ±2.6 dB, 3 GHz < f ≤ 6 GHz  [±2.6 dB for bands n46 and n96] |
| 6.3 OTA base station output power | ±1.4 dB, f ≤ 3.0 GHz  ±1.5 dB, 3.0 GHz < f ≤ 4.2 GHz  ±1.5 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 6.4.2 OTA RE power control dynamic range | N/A |
| 6.4.3 OTA total power dynamic range | ±0.4 dB |
| 6.5.1 OTA transmitter OFF power | ±3.4 dB, f ≤ 3.0 GHz  ±3.6 dB, 3.0 GHz < f ≤ 6 GHz  (NOTE 1) |
| 6.5.2 OTA transmitter transient period | N/A |
| 6.6.2 OTA frequency error | ±12 Hz |
| 6.6.3 OTA modulation quality | ±1 % |
| 6.6.4 OTA time alignment error | ±25 ns |
| 6.7.2 OTA occupied bandwidth | ±100 kHz, BWChannel 5 MHz, 10 MHz  ±300 kHz, BWChannel 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz, 50 MHz  ±600 kHz, BWChannel 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz |
| 6.7.3 OTA ACLR/CACLR | f ≤ 3.0 GHz  ±1 dB, BW ≤ 20MHz  ±1 dB, BW > 20MHz  3.0 GHz < f ≤ 6.0 GHz  ±1.2 dB, BW ≤ 20MHz  ±1.2 dB, BW > 20MHz  Absolute power ±2.2 dB, f ≤ 3.0 GHz  Absolute power ±2.7 dB, 3.0 GHz < f ≤ 4.2 GHz  Absolute power ±2.7 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 6.7.4 OTA operating band unwanted emissions | Absolute power ±1.8 dB, f ≤ 3.0 GHz  Absolute power ±2 dB, 3.0 GHz < f ≤ 4.2 GHz  Absolute power ±2 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 6.7.5.2 OTA transmitter spurious emissions, mandatory requirements | ±2.3 dB, 30 MHz < f ≤ 6 GHz  ±4.2 dB, 6 GHz < f ≤ 26 GHz |
| 6.7.5.3 OTA transmitter spurious emissions, protection of BS receiver | ±3.1 dB, f ≤ 3 GHz  ±3.3 dB, 3 GHz < f ≤ 4.2 GHz  ±3.4, 4.2 GHz < f ≤ 6 GHz  (NOTE 1) |
| 6.7.5.4 OTA transmitter spurious emissions, additional spurious emissions requirements | ±2.6 dB, f ≤ 3 GHz  ±3.0, 3 GHz < f ≤ 4.2 GHz  ±3.5, 4.2 GHz < f ≤ 6 GHz |
| 6.7.5.5 OTA transmitter spurious emissions, co-location | ±3.1 dB, f ≤ 3 GHz  ±3.3 dB, 3 GHz < f ≤ 4.2 GHz  ±3.4, 4.2 GHz < f ≤ 6 GHz  (NOTE 1) |
| 6.8 OTA transmitter intermodulation | The value below applies only to the interfering signal and is unrelated to the measurement uncertainty of the tests in6.7.3 (ACLR), 6.7.4 (OBUE) and 6.7.5 (spurious emissions) which have to be carried out in the presence of the interferer.  ±3.2 dB, f ≤ 3.0 GHz  ±3.4 dB, 3.0 GHz < f ≤ 4.2 GHz  ±3.5 dB, 4.2 GHz < f ≤ 6 GHz  (NOTE 1) |
| NOTE 1: Fulfilling the criteria for CLTA selection and placement in clause 4.12 is deemed sufficient for the test purposes. When these criteria are met, the measurement uncertainty related to the selection of the co-location test antenna and its alignment as specified in the appropriate measurement uncertainty budget in TR 37.941 [29] shall be used for evaluating the test system uncertainty.  NOTE 2: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

Table 4.1.2.2-2: Maximum OTA Test System uncertainty for FR2 OTA transmitter tests

|  |  |
| --- | --- |
| Clause | Maximum OTA Test System uncertainty |
| 6.2 Radiated transmit power | Normal condition:  ±1.7 dB (24.25 – 29.5 GHz)  ±2.0 dB (37 – 43.5 GHz) |
|  | Extreme condition:  ±3.1 dB (24.25 – 29.5 GHz)  ±3.3 dB (37 – 43.5 GHz) |
| 6.3 OTA base station output power | ±2.1 dB (24.25 – 29.5 GHz)  ±2.4 dB (37 – 43.5 GHz) |
| 6.4.2 OTA RE power control dynamic range | N/A |
| 6.4.3 OTA total power dynamic range | ±0.4 dB |
| 6.5.1 OTA transmitter OFF power | ±2.9 dB (24.25 – 29.5 GHz)  ±3.3 dB (37 – 43.5 GHz) |
| 6.5.2 OTA transmitter transient period | N/A |
| 6.6.2 OTA frequency error | ±12 Hz |
| 6.6.3 OTA modulation quality | 1% |
| 6.6.4 OTA time alignment error | ±25 ns |
| 6.7.2 OTA occupied bandwidth | 600 kHz |
| 6.7.3 OTA ACLR | Relative ACLR:  ±2.3 dB (24.25 – 29.5 GHz)  ±2.6 dB (37 – 43.5 GHz)  Absolute ACLR:  ±2.7 dB (24.25 – 29.5 GHz)  ±2.7 dB (37 – 43.5 GHz) |
| 6.7.4 OTA operating band unwanted emissions | ±2.7 dB (24.25 – 29.5 GHz)  ±2.7 dB (37 – 43.5 GHz) |
| 6.7.5.2 OTA transmitter spurious emissions, mandatory requirements | ±2.3 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| 6.7.5.4 OTA transmitter spurious emissions, additional requirements | ±2.3 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| NOTE: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

#### 4.1.2.3 Measurement of receiver

The maximum OTA Test System uncertainty for OTA receiver tests minimum requirements are given in tables 4.1.2.3-1 and 4.1.2.3-2. Details for derivation of OTA Test System uncertainty are given in corresponding clauses in TR 37.941 [29].

Table 4.1.2.3-1: Maximum OTA Test System uncertainty for FR1 OTA receiver tests

|  |  |
| --- | --- |
| Clause | Maximum OTA Test System uncertainty |
| 7.2 OTA sensitivity | ±1.3 dB, f ≤ 3.0 GHz  ±1.4 dB, 3.0 GHz < f ≤ 4.2 GHz  ±1.6 dB, 4.2 GHz < f ≤ 6.0 GHz  [±1.6 dB for bands n46 and n96] |
| 7.3 OTA reference sensitivity level | ±1.3 dB, f ≤ 3.0 GHz  ±1.4 dB, 3.0 GHz < f ≤ 4.2 GHz  ±1.6 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 7.4 OTA dynamic range | ±0.3 dB |
| 7.5.1 OTA adjacent channel selectivity | ±1.7 dB, f ≤ 3.0 GHz  ±2.1 dB, 3.0 GHz < f ≤ 4.2 GHz  ±2.4 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 7.5.2 In-band blocking (General) | ±1.9 dB, f ≤ 3.0 GHz  ±2.2 dB, 3.0 GHz < f ≤ 4.2 GHz  ±2.5 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 7.5.2 In-band blocking (Narrowband) | ±1.7 dB, f ≤ 3.0 GHz  ±2.1 dB, 3.0 GHz < f ≤ 4.2 GHz  ±2.4 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 7.6 OTA out-of-band blocking (General) | fwanted ≤ 3.0 GHz:  ±2.0 dB, finterferer ≤ 3.0 GHz  ±2.1 dB, 3.0 GHz < finterferer ≤ 6.0 GHz  ±3.5 dB, 6.0 GHz < finterferer ≤ 12.75 GHz  3 GHz < fwanted ≤ 4.2 GHz:  ±2.0 dB, finterferer ≤ 3.0 GHz  ±2.1 dB, 3.0 GHz < finterferer ≤ 6.0 GHz  ±3.6 dB, 6.0 GHz < finterferer ≤ 12.75 GHz  4.2 GHz < fwanted ≤ 6.0 GHz:  ±2.2 dB, finterferer ≤ 3.0 GHz  ±2.3 dB, 3.0 GHz < finterferer ≤ 6.0 GHz  ±3.6 dB, 6.0 GHz < finterferer ≤ 12.75 GHz |
| 7.6 OTA out-of-band blocking (Co-location)  (NOTE 1) | fwanted ≤ 3.0 GHz:  ±3.4 dB, finterferer ≤ 3.0 GHz  ±3.5 dB, 3.0 GHz < finterferer ≤ 4.2 GHz  ±3.7 dB, 4.2 GHz < finterferer ≤ 6.0 GHz  3 GHz < fwanted ≤ 4.2 GHz:  ±3.5 dB, finterferer ≤ 3.0 GHz  ±3.6 dB, 3.0 GHz < finterferer ≤ 4.2 GHz  ±3.7 dB, 4.2 GHz < finterferer ≤ 6.0 GHz  4.2 GHz < fwanted ≤ 6.0 GHz:  ±3.6 dB, finterferer ≤ 3.0 GHz  ±3.7 dB, 3.0 GHz < finterferer ≤ 4.2 GHz  ±3.8 dB, 4.2 GHz < finterferer ≤ 6.0 GHz |
| 7.7 OTA receiver spurious emissions | ±2.5 dB, 30 MHz ≤ f ≤ 6.0 GHz  ±4.2 dB, 6.0 GHz < f ≤ 26 GHz |
| 7.8 OTA receiver intermodulation | ±2.0 dB, f ≤ 3.0 GHz  ±2.6 dB, 3.0 GHz < f ≤ 4.2 GHz  ±3.2 dB, 4.2 GHz < f ≤ 6.0 GHz |
| 7.9 OTA in-channel selectivity | ±1.7 dB, f ≤ 3.0 GHz  ±2.1 dB, 3.0 GHz < f ≤ 4.2 GHz  ±2.4 dB, 4.2 GHz < f ≤ 6.0 GHz |
| NOTE 1: Fulfilling the criteria for CLTA selection and placement in clause 4.12 is deemed sufficient for the test purposes. When these criteria are met, the measurement uncertainty related to the selection of the co-location test antenna and its alignment as specified in the appropriate measurement uncertainty budget in TR 37.941 [29], shall be used for evaluating the test system uncertainty.  NOTE 2: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

Table 4.1.2.3-2: Maximum OTA Test System uncertainty for FR2 OTA receiver tests

|  |  |
| --- | --- |
| Clause | Maximum OTA Test System uncertainty |
| 7.3 OTA reference sensitivity level | ±2.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±2.4 dB, 37 GHz < f ≤ 43.5 GHz |
| 7.5.1 OTA adjacent channel selectivity | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ 43.5 GHz |
| 7.5.2 In-band blocking (General) | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ 43.5 GHz |
| 7.6 OTA out-of-band blocking | ±4.1 dB |
| 7.7 OTA receiver spurious emissions | ±2.5 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| 7.8 OTA receiver intermodulation | ±3.9 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.9 dB, 37 GHz < f ≤ 43.5 GHz |
| 7.9 OTA in-channel selectivity | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ 43.5 GHz |
| NOTE: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

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------------start of changed section ----------

### 6.2.1 Definition and applicability

Radiated transmit power is defined as the EIRP level for a declared beam at a specific *beam peak direction*.

For each declared beam, the requirement is based on declarations captured in clause 4.6 for a beam identifier (D.3), *reference beam direction pair* (D.8), *rated beam EIRP* (D.11) at the beam's reference direction pair, *OTA peak directions set* (D.9), the *beam direction pairs* at the maximum steering directions (D.10) and their associated *rated beam EIRP* and *beamwidth(s)* for reference *beam direction pair* and maximum steering directions(D.12).

For a declared beam identifier and *beam direction pair*, the *rated beam EIRP* level is the maximum power that the BS is declared to radiate at the associated *beam peak direction* during the *transmitter ON period*.

For each *beam peak direction* associated with a *beam direction pair* within the *OTA peak directions set*, a specific *rated beam EIRP* level may be claimed. Any claimed value shall be met within the accuracy requirement as described below. *Rated beam EIRP* is only required to be declared for the *beam direction pairs* subject to conformance testing as detailed in clause 6.2.4.1.

NOTE 1: The *OTA peak directions set* for a beam is the complete continuous or discrete set of all *beam direction* for which the EIRP accuracy is intended to be achieved for the beam.

NOTE 2: A beam direction pair consists of a beam centre direction and an associated beam peak direction.

NOTE 3: A declared EIRP value is a value provided by the manufacturer for verification according to the conformance specification declaration requirements, whereas a claimed EIRP value is provided by the manufacturer to the equipment user for normal operation of the equipment and is not subject to formal conformance testing.

For *operating bands* where the supported *fractional bandwidth* (FBW) is larger than 6%, two rated carrier EIRP may be declared by manufacturer:

- Prated,c,FBWlow for lower supported frequency range, and

- Prated,c,FBWhigh for higher supported frequency range.

For frequencies in between FFBWlow and FFBWhigh the rated carrier EIRP is:

- Prated,c,FBWlow, for the carrier whose carrier frequency is within frequency range FFBWlow ≤ f < (FFBWlow +FFBWhigh) / 2,

- Prated,c,FBWhigh, for the carrier whose carrier frequency is within frequency range (FFBWlow +FFBWhigh) / 2 ≤ f ≤FFBWhigh.

Radiated transmit power is directional requirement applicable to BS type 1-H, BS type 1-O and BS type 2-O.

For BS Type 1-H, for operation with shared spectrum channel access operation, the BS may have to comply with the applicable BS power limits established regionally, when deployed in regions where those limits apply and under the conditions declared by the manufacturer.

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------------start of changed section ----------

### 6.2.5 Test requirement

For each declared conformance *beam direction pair*, the EIRP measurement results in clause 6.2.4.2 shall remain within the values provided in table 6.2.5-1, relative to the manufacturer's declared rated beam EIRP (D.11) value:

Table 6.2.5-1: Test requirement for radiated transmit power

|  |  |  |
| --- | --- | --- |
|  | Normal test environment | Extreme test environment |
| BS type 1-H | f ≤ 3 GHz: ± 3.3 dB | N/A |
|  | 3 GHz < f ≤ 6 GHz: ± 3.5 dB  For bands n46 and n76: [± 3.5 dB] |  |
| BS type 1-O | f  ≤ 3 GHz: ± 3.3 dB | f  ≤ 3 GHz: ± 5.2 dB |
|  | 3 GHz < f ≤ 6 GHz: ± 3.5 dB | 3 GHz < f ≤ 4.2 GHz: ± 5.3 dB |
|  |  | 4.2 GHz < f ≤ 6 GHz: ± 5.3 dB |
| BS type 2-O | 24.15 GHz < f ≤ 29.5 GHz: ± 5.1 dB  37 GHz < f ≤ 43.5 GHz: ± 5.4 dB  … | 24.15 GHz < f ≤ 29.5 GHz: ± 7.6 dB  37 GHz < f ≤ 43.5 GHz: ± 7.8 dB |

------------end of changed section ----------

------------start of changed section ----------

##### 6.7.5.4.5 Test requirement

6.7.5.4.5.1 Test requirement for *BS type 1-O*

The power of any spurious emission shall not exceed the test limits in table 6.7.5.4.5-1 for a BS where requirements for co-existence with the system listed in the first column apply. For a *multi-band RIB*, the exclusions and conditions in the Note column of table 6.7.5.4.5-1 apply for each supported *operating band*.

Table 6.7.5.4.5-1: BS spurious emissions test limits for BS for co-existence with systems operating in other frequency bands

| System type for NR to co-exist with | Frequency range for co-existence requirement | Test limit | Measurement bandwidth | Notes |
| --- | --- | --- | --- | --- |
| GSM900 | 921 – 960 MHz | -45.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n8. |
|  | 876 – 915 MHz | -49.4 dBm | 100 kHz | For the frequency range 880-915 MHz, this requirement does not apply to BS operating in band n8, since it is already covered by the requirement in clause 6.7.5.3. |
| DCS1800 | 1805 – 1880 MHz | -35.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n3. |
|  | 1710 – 1785 MHz | -49.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n3, since it is already covered by the requirement in clause 6.7.5.3. |
| PCS1900 | 1930 – 1990 MHz | -35.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n2, n25 or band n70. |
|  | 1850 – 1910 MHz | -49.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n2 or n25 since it is already covered by the requirement in clause 6.7.5.3. |
| GSM850 or CDMA850 | 869 – 894 MHz | -45.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n5 or n26. |
|  | 824 – 849 MHz | -49.4 dBm | 100 kHz | This requirement does not apply to BS operating in band n5 or n26, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band I or | 2110 – 2170 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n1 or n65. |
| E-UTRA Band 1 or NR Band n1 | 1920 – 1980 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n1 or n65, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band II or | 1930 – 1990 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n2 or n70. |
| E-UTRA Band 2 or NR Band n2 | 1850 – 1910 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n2, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band III or | 1805 – 1880 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n3. |
| E-UTRA Band 3 or NR Band n3 | 1710 – 1785 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n3, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band IV or | 2110 – 2155 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66. |
| E-UTRA Band 4 | 1710 – 1755 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band V or | 869 – 894 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n5 or n26. |
| E-UTRA Band 5 or NR Band n5 | 824 – 849 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n5 or n26, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band VI, XIX | 860 – 890 MHz | -40.4 dBm | 1 MHz |  |
| or E-UTRA Band 6, 18, | 815 – 830 MHz | -37.4 dBm | 1 MHz |  |
| 19 | 830 – 845 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band VII or | 2620 – 2690 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n7. |
| E-UTRA Band 7 or NR Band n7 | 2500 – 2570 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n7, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band VIII or | 925 – 960 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n8. |
| E-UTRA Band 8 or NR Band n8 | 880 – 915 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n8, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band IX or | 1844.9 – 1879.9 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n3. |
| E-UTRA Band 9 | 1749.9 – 1784.9 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n3, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band X or | 2110 – 2170 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66 |
| E-UTRA Band 10 | 1710 – 1770 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band XI or XXI or | 1475.9 – 1510.9 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n74 or n75. |
| E-UTRA Band 11 or | 1427.9 – 1447.9 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n51, n74, n75 or n76. |
| 21 | 1447.9 – 1462.9 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n74 or n75. |
| UTRA FDD Band XII or | 729 – 746 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n12. |
| E-UTRA Band 12 or NR Band n12 | 699 – 716 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n12, since it is already covered by the requirement in clause 6.7.5.3.  For NR BS operating in n29, it applies 1 MHz below the Band n29 downlink operating band (Note 5). |
| UTRA FDD Band XIII or | 746 – 756 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 13 | 777 – 787 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XIV or | 758 – 768 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n14. |
| E-UTRA Band 14 or NR Band n14 | 788 – 798 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n14, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 17 | 734 – 746 MHz | -40.4 dBm | 1 MHz |  |
|  | 704 – 716 MHz | -37.4 dBm | 1 MHz | For NR BS operating in n29, it applies 1 MHz below the Band n29 downlink operating band (Note 5). |
| UTRA FDD Band XX or | 791 – 821 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n20 or n28. |
| E-UTRA Band 20 or NR Band n20 | 832 – 862 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n20, since it is already covered by the requirement in clause 6.7.5.3. |
| UTRA FDD Band XXII or | 3510 – 3590 MHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78. |
| E-UTRA Band 22 | 3410 – 3490 MHz | -37 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78. |
| E-UTRA Band 24 | 1525 – 1559 MHz | -40.4 dBm | 1 MHz |  |
|  | 1626.5 – 1660.5 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XXV or | 1930 – 1995 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n2, n25 or n70. |
| E-UTRA Band 25 or NR band n25 | 1850 – 1915 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n25 since it is already covered by the requirement in clause 6.7.5.3. For BS operating in Band n2, it applies for 1910 MHz to 1915 MHz, while the rest is covered in clause 6.7.5.3. |
| UTRA FDD Band XXVI or | 859 – 894 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n5 or n26. |
| E-UTRA Band 26 or NR Band n26 | 814 – 849 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n26 since it is already covered by the requirement in clause 6.7.5.3. For BS operating in Band n5, it applies for 814 MHz to 824 MHz, while the rest is covered in clause 6.7.5.3. |
| E-UTRA Band 27 | 852 – 869 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n5. |
|  | 807 – 824 MHz | -37.4 dBm | 1 MHz | This requirement also applies to BS operating in Band n28, starting 4 MHz above the Band n28 downlink *operating band* (Note 5). |
| E-UTRA Band 28 or | 758 – 803 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n20 or n28. |
| NR Band n28 | 703 – 748 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n28, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 29 or NR Band n29 | 717 – 728 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n29. |
| E-UTRA Band 30 or | 2350 – 2360 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n30. |
| NR Band n30 | 2305 – 2315 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n30, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 31 | 462.5 -467.5 MHz | -40.4 dBm | 1 MHz |  |
|  | 452.5 -457.5 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD band XXXII or E-UTRA band 32 | 1452 – 1496 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n74 or n75. |
| UTRA TDD Band a) or E-UTRA Band 33 | 1900 – 1920 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band a) or E-UTRA Band 34 or NR band n34 | 2010 – 2025 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n34. |
| UTRA TDD Band b) or E-UTRA Band 35 | 1850 – 1910 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band b) or E-UTRA Band 36 | 1930 – 1990 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n2 or n25. |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 – 1930 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570 – 2620 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n38. |
| UTRA TDD Band f) or E-UTRA Band 39 or NR band n39 | 1880 – 1920MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n39. |
| UTRA TDD Band e) or E-UTRA Band 40 or NR Band n40 | 2300 – 2400MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Bands n30 or n40. |
| E-UTRA Band 41 or NR Band n41 | 2496 – 2690 MHz | -40.4 dBm | 1 MHz | This is not applicable to BS operating in Band n41. |
| E-UTRA Band 42 | 3400 – 3600 MHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78. |
| E-UTRA Band 43 | 3600 – 3800 MHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78. |
| E-UTRA Band 44 | 703 – 803 MHz | -40.4 dBm | 1 MHz | This is not applicable to BS operating in Band n28. |
| E-UTRA Band 45 | 1447 – 1467 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 46 or NR Band n46 | 5150 – 5925 MHz | -39.5 dBm | 1 MHz | This is not applicable to BS operating in Band n46 or n96. |
| E-UTRA Band 47 | 5855 – 5925 MHz | -39.5 dBm | 1 MHz |  |
| E-UTRA Band 48 | 3550 – 3700 MHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78. |
| E-UTRA Band 50 or NR Band n50 | 1432 – 1517 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n51, n74, n75 or n76. |
| E-UTRA Band 51 or NR Band n51 | 1427 – 1432 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n51, n75 or n76. |
| E-UTRA Band 53 or NR Band n53 | 2483.5 - 2495 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n41 or n90. |
| E-UTRA Band 65 or | 2110 – 2200 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n1 or n65. |
| NR Band n65 | 1920 – 2010 MHz | -37.4 dBm | 1 MHz | For BS operating in Band n1, it applies for 1980 MHz to 2010 MHz, while the rest is covered in clause 6.7.5.3.  This requirement does not apply to BS operating in band n65, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 66 or | 2110 – 2200 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66. |
| NR Band n66 | 1710 – 1780 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n66, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 67 | 738 – 758 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n28. |
| E-UTRA Band 68 | 753 -783 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n28. |
|  | 698-728 MHz | -37.4 dBm | 1 MHz | For BS operating in Band n28, this requirement applies between 698 MHz and 703 MHz, while the rest is covered in clause 6.7.5.3. |
| E-UTRA Band 69 | 2570 – 2620 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n38. |
| E-UTRA Band 70 or | 1995 – 2020 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n2, n25 or n70 |
| NR Band n70 | 1695 – 1710 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n70, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 71 or | 617 – 652 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n71 |
| NR Band n71 | 663 – 698 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n71, since it is already covered by the requirement in clause 6.7.5.3. |
| E-UTRA Band 72 | 461 – 466 MHz | -40.4 dBm | 1 MHz |  |
|  | 451 – 456 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 74 or | 1475 – 1518 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n74 or n75. |
| NR Band n74 | 1427 – 1470 MHz | -37.4 dBm | 1MHz | This requirement does not apply to BS operating in Band n50, n51, n74, n75 or n76. |
| E-UTRA Band 75 or NR Band n75 | 1432 – 1517 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n51, n74, n75 or n76. |
| E-UTRA Band 76 or NR Band n76 | 1427 – 1432 MHz | -40.4 dBm | 1 MHz | This requirement does not apply to BS operating in Band n50, n51, n75 or n76. |
| NR Band n77 | 3.3 – 4.2 GHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78 |
| NR Band n78 | 3.3 – 3.8 GHz | -40 dBm | 1 MHz | This requirement does not apply to BS operating in Band n77 or n78 |
| NR Band n79 | 4.4 – 5.0 GHz | -39.5 dBm | 1 MHz | This requirement does not apply to BS operating in Band n79 |
| NR Band n89 | 824 – 849 MHz | -37.4 dBm | 1 MHz | This requirement does not apply to BS operating in band n5, since it is already covered by the requirement in clause 6.7.5.3. |
| NR Band n95 | 2010 – 2025 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n96 | 5925 – 7125 MHz | -39.5 dBm | 1 MHz | This requirement does not apply to BS operating in Band n46 or n96. |

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 n28, the co-existence requirements in 6.7.5.4.5-1 do not apply for the ΔfOBUE frequency range immediately outside the downlink *operating band* (see TS 38.104 [2], table 5.2-1). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.7.5.4.5-1 assumes that two *operating bands*, where the frequency ranges in TS 38.104 [2] table 5.2-1 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, special co-existence requirements may apply that are not covered by the 3GPP specifications.

NOTE 4: For NR Band n28 BS, specific solutions may be required to fulfil the spurious emissions limits for BS for co-existence with E-UTRA Band 27 UL *operating band*.

NOTE 5: For NR Band n29 BS, specific solutions may be required to fulfil the spurious emissions limits for NR BS for co-existence with UTRA Band XII, E-UTRA Band 12 or NR Band n12 UL operating band, E-UTRA Band 17 UL operating band.

------------end of changed section ----------

------------start of changed section ----------

##### 6.7.5.5.5 Test requirements

6.7.5.5.5.1 Test requirement for *BS type 1-O*

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 co-location with base stations of the same class.

NOTE: For co-location with UTRA, the requirements are based on co-location with UTRA FDD or TDD base stations.

This requirement is a co-location requirement as defined in clause 4.9, in TS 38.104 [2], the power levels are specified at the CLTAoutput.

The output of the CLTA of any spurious emission shall not exceed the test limit in table 6.7.5.5.5.1-1.

For a *multi-band RIB*, the exclusions and conditions in the notes column of table 6.7.5.5.5.1-1 apply for each supported operating band.

Table 6.7.5.5.5.1-1: *BS type 1-O* OTA spurious emissions limits for BS co-located with another BS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of co-located BS | Frequency range for | Test limit | | | Measurement | Note |
|  | co-location requirement | WA BS | MR BS | LA BS | bandwidth |  |
| GSM900 | 876-915 MHz | -115.9 dBm | -108.9 dBm | -87.9 dBm | 100 kHz |  |
| DCS1800 | 1710 – 1785 MHz | -115.9 dBm | -108.9 dBm | --97.9 dBm | 100 kHz |  |
| PCS1900 | 1850 – 1910 MHz | -115.9 dBm | -108.9 dBm | --97.9 dBm | 100 kHz |  |
| GSM850 or CDMA850 | 824 – 849 MHz | -115.9 dBm | -108.9 dBm | -87.9 dBm | 100 kHz |  |
| UTRA FDD Band I or E-UTRA Band 1 or NR Band n1 | 1920 – 1980 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band II or E-UTRA Band 2 or NR Band n2 | 1850 – 1910 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band III or E-UTRA Band 3 or NR Band n3 | 1710 – 1785 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band IV or E-UTRA Band 4 | 1710 – 1755 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band V or E-UTRA Band 5 or NR Band n5 | 824 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VI, XIX or E-UTRA Band 6, 19 | 830 – 845 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VII or E-UTRA Band 7 or NR Band n7 | 2500 – 2570 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VIII or E-UTRA Band 8 or NR Band n8 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band IX or E-UTRA Band 9 | 1749.9 – 1784.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band X or E-UTRA Band 10 | 1710 – 1770 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XI or E-UTRA Band 11 | 1427.9 – 1447.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n50 or n75 |
| UTRA FDD Band XII or  E-UTRA Band 12 | 699 – 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XIII or  E-UTRA Band 13 | 777 – 787 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XIV or  E-UTRA Band 14 or NR Band n14 | 788 – 798 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 17 | 704 – 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 18 | 815 – 830 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XX or E-UTRA Band 20 or NR Band n20 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXI or E-UTRA Band 21 | 1447.9 – 1462.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n50 or n75 |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3410 – 3490 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| E-UTRA Band 23 | 2000 – 2020 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 24 | 1626.5 – 1660.5 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXV or  E-UTRA Band 25 | 1850 – 1915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXVI or  E-UTRA Band 26 or NR Band n26 | 814 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 27 | 807 – 824 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 28 or NR Band n28 | 703 – 748 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 30 or NR Band n30 | 2305 – 2315 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 31 | 452.5 -457.5 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band a) or E-UTRA Band 33 | 1900 – 1920 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band a) or E-UTRA Band 34 | 2010 – 2025 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band b) or E-UTRA Band 35 | 1850 – 1910 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band b) or E-UTRA Band 36 | 1930 – 1990 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n2 |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 – 1930 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570 – 2620 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n38. |
| UTRA TDD Band f) or E-UTRA Band 39 | 1880 – 1920 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band e) or E-UTRA Band 40 | 2300 – 2400MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 41 or NR Band n41 | 2496 – 2690 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n41 |
| E-UTRA Band 42 | 3400 – 3600 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| E-UTRA Band 43 | 3600 – 3800 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| E-UTRA Band 44 | 703 – 803 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n28 |
| E-UTRA Band 45 | 1447 – 1467 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 46 or NR Band n46 | 5150 – 5925 MHz | N/A | -108.6 dBm | -105.6 dBm | 100 kHz | This is not applicable to BS operating in Band n46 or n96 |
| E-UTRA Band 48 | 3550 – 3700 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| E-UTRA Band 50 or NR Band n50 | 1432 – 1517 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n74 or n75 |
| E-UTRA Band 51 or NR Band n51 | 1427 – 1432 MHz | N/A | N/A | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n50, n75 or n76 |
| E-UTRA Band 53 or NR Band n53 | 2483.5 – 2495 MHz | N/A | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n41 or n90 |
| E-UTRA Band 65 or NR Band n65 | 1920 – 2010 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 66 or NR Band n66 | 1710 – 1780 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 68 | 698 – 728 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 70 or NR Band n70 | 1695 – 1710 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 71 or NR Band n71 | 663 – 698 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 72 | 451 – 456 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 74 or NR Band n74 | 1427 – 1470 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to BS operating in Band n50 |
| NR Band n77 | 3.3 – 4.2 GHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| NR Band n78 | 3.3 – 3.8 GHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to BS operating in Band n77 or n78 |
| NR Band n79 | 4.4 – 5.0 GHz | -113.6 dBm | -108.6 dBm | -105.6 dBm | 100 kHz |  |
| NR Band n80 | 1710 – 1785 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n81 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n82 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n83 | 703 – 748 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n84 | 1920 – 1980 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 85 | 698 - 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n86 | 1710 – 1780 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n89 | 824 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n95 | 2010 – 2025 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band 96 | 5925 - 7125 | N/A | -107.6 dBm | -104.6 dBm | 100 kHz | This is not applicable to BS operating in Band n46 or n96 |

NOTE 1: As defined in the scope for spurious emissions in this clause, the co-location requirements in table 6.7.5.5.5.1-1 do not apply for the frequency range extending ΔfOBUE immediately outside the BS transmit frequency range of a downlink *operating band* (see table 5.2-1 in TS 38.104 [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 [27].

NOTE 2: Table 6.7.5.5.5.1-1 assumes that two *operating bands*, where the corresponding BS transmit and receive frequency ranges in table 5.2-1 in TS 38.104 [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 (except in Band n46), special co-location requirements may apply that are not covered by the 3GPP specifications.

----------end of changed section---------------

----------start of changed section---------------

#### 7.2.5.2 Test requirements for *BS type 1-H* and *BS type 1-O*

For each measured carrier, the throughput measured in step 9 of clause 7.2.4.2 shall be ≥ 95 % of the maximum throughput of the reference measurement channel as specified in annex A.1 with parameters specified in table 7.2.5.2-1.

Table 7.2.5.2-1: EIS levels

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| BS channel | Sub-carrier | Reference | OTA sensitivity level, EIS (dBm) | | |
| bandwidth (MHz) | spacing (kHz) | measurement channel  (annex A.1) | f ≤ 3.0 GHz | 3.0 GHz < f ≤ 4.2 GHz | 4.2 GHz < f ≤ 6.0 GHz |
| 5, 10, 15 | 15 | G-FR1-A1-1 |  |  |  |
| 10, 15 | 30 | G-FR1-A1-2 |  |  |  |
| 10, 15 | 60 | G-FR1-A1-3 | Declared | Declared | Declared |
| 20, 25, 30, 40, 50 | 15 | G-FR1-A1-4 | minimum EIS | minimum EIS | minimum EIS |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 30 | G-FR1-A1-5 | + 1.3 | + 1.4 | + 1.6 |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 60 | G-FR1-A1-6 |  |  |  |
| NOTE: EIS is the power level of a single instance of the reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *BS channel bandwidth*. | | | | | |

**Table 7.2.5-2: EIS levels for band n46, for BS Type 1-H**

|  |  |  |  |
| --- | --- | --- | --- |
| BS channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel | OTA sensitivity level, EIS (dBm) |
| 10 | 15 | G-FR1-A1-12 (NOTE 2) | Declared  minimum EIS  + 1.6 |
|  | 30 | G-FR1-A1-13 (NOTE 2) |
|  | 60 | G-FR1-A1-3 (NOTE 1) |
| 20 | 15 | G-FR1-A1-14 (NOTE 2) |
|  | 30 | G-FR1-A1-15 (NOTE 2) |
|  | 60 | G-FR1-A1-6 (NOTE 1) |
| 40 | 15 | G-FR1-A1-16 (NOTE 2) |
|  | 30 | G-FR1-A1-17 (NOTE 2) |
|  | 60 | G-FR1-A1-6 (NOTE 1) |
| 60 | 30 | G-FR1-A1-18 (NOTE 2) |
|  | 60 | G-FR1-A1-6 (NOTE 1) |
| 80 | 30 | G-FR1-A1-19 (NOTE 2) |
|  | 60 | G-FR1-A1-6 (NOTE 1) |
| NOTE 1: EIS is the power level of a single instance of the reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *BS channel bandwidth*.  NOTE 2: EIS is the power level of a single instance of the reference measurement channel. This requirement shall be met for each single interlace of FRC G-FR1-A1-12 and G-FR1-A1-19, except for one instance that might overlap one other instance to cover the full *BS channel bandwidth*. | | | |

**Table 7.2.5-3: EIS levels for band n96, for BS Type 1-H**

|  |  |  |  |
| --- | --- | --- | --- |
| BS channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel | OTA sensitivity level, EIS (dBm) |
| 20 | 15 | G-FR1-A1-14 (NOTE 2) | -94.6 |
|  | 30 | G-FR1-A1-15 (NOTE 2) | -91.6 |
|  | 60 | G-FR1-A1-6 (NOTE 1) | -85.2 |
| 40 | 15 | G-FR1-A1-16 (NOTE 2) | -91.5 |
|  | 30 | G-FR1-A1-17 (NOTE 2) | -88.5 |
|  | 60 | G-FR1-A1-6 (NOTE 1) | -85.2 |
| 60 | 30 | G-FR1-A1-18 (NOTE 2) | -86.9 |
|  | 60 | G-FR1-A1-6 (NOTE 1) | -85.2 |
| 80 | 30 | G-FR1-A1-19 (NOTE 2) | -85.6 |
|  | 60 | G-FR1-A1-6 (NOTE 1) | -85.2 |
| NOTE 1: EIS is the power level of a single instance of the reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *BS channel bandwidth*.  NOTE 2: EIS is the power level of a single instance of the reference measurement channel. This requirement shall be met for each single interlace of FRC G-FR1-A1-12 and G-FR1-A1-19, except for one instance that might overlap one other instance to cover the full *BS channel bandwidth*. | | | |

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# A.1 Fixed Reference Channels for OTA sensitivity, OTA reference sensitivity level, OTA ACS, OTA in-band blocking, OTA out-of-band blocking, OTA receiver intermodulation and OTA in-channel selectivity (QPSK, R=1/3)

The parameters for the reference measurement channels are specified in table A.1-1 for FR1 OTA sensitivity, OTA reference sensitivity level, OTA ACS, OTA in-band blocking, OTA out-of-band blocking, OTA receiver intermodulation and OTA in-channel selectivity.

The parameters for the reference measurement channels are specified in table A.1-2 for FR2 OTA reference sensitivity level, OTA ACS, OTA in-band blocking, OTA out-of-band blocking, OTA receiver intermodulation and OTA in-channel selectivity.

Table A.1-1: FRC parameters for FR1 OTA sensitivity, OTA reference sensitivity level, OTA ACS, OTA in-band blocking, OTA out-of-band blocking, OTA receiver intermodulation and OTA in-channel selectivity

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reference channel | G-FR1-A1-1 | G-FR1-A1-2 | G-FR1-A1-3 | G-FR1-A1-4 | G-FR1-A1-5 | G-FR1-A1-6 | G-FR1-A1-7 | G-FR1-A1-8 | G-FR1-A1-9 |
| Subcarrier spacing (kHz) | 15 | 30 | 60 | 15 | 30 | 60 | 15 | 30 | 60 |
| Allocated resource blocks | 25 | 11 | 11 | 106 | 51 | 24 | 15 | 6 | 6 |
| CP-OFDM Symbols per slot (Note 1) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Modulation | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK |
| Code rate (Note 2) | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 |
| Payload size (bits) | 2152 | 984 | 984 | 9224 | 4352 | 2088 | 1320 | 528 | 528 |
| Transport block CRC (bits) | 16 | 16 | 16 | 24 | 24 | 16 | 16 | 16 | 16 |
| Code block CRC size (bits) | - | - | - | 24 | - | - | - | - | - |
| Number of code blocks - C | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Code block size including CRC (bits)  (Note 3) | 2168 | 1000 | 1000 | 4648 | 4376 | 2104 | 1336 | 544 | 544 |
| Total number of bits per slot | 7200 | 3168 | 3168 | 30528 | 14688 | 6912 | 4320 | 1728 | 1728 |
| Total symbols per slot | 3600 | 1584 | 1584 | 15264 | 7344 | 3456 | 2160 | 864 | 864 |
| NOTE 1: DM-RS configuration type = 1 with DM-RS duration = single-symbol DM-RS, additional DM-RS position = pos1 with *l0* = 2, *l* = 11 as per table 6.4.1.1.3-3 of TS 38.211 [20].  NOTE 2: MCS index 4 and target coding rate = 308/1024 are adopted to calculate payload size.  NOTE 3: Code block size including CRC (bits) equals to *K'* in TS 38.212 [19], clause 5.2.2. | | | | | | | | | |

Table A.1-1a: FRC parameters for band n46 and n96 OTA sensitivity, for BS Type 1-H

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reference channel | G-FR1-A1-12 | G-FR1-A1-13 | G-FR1-A1-14 | G-FR1-A1-15 | G-FR1-A1-16 | G-FR1-A1-17 | G-FR1-A1-18 | G-FR1-A1-19 |
| Channel bandwidth (MHz) | 10 | 10 | 20 | 20 | 40 | 40 | 60 | 80 |
| Subcarrier spacing (kHz) | 15 | 30 | 15 | 30 | 15 | 30 | 30 | 30 |
| Allocated resource blocks | 5 | 4 | 10 | 10 | 21 | 21 | 32 | 43 |
| CP-OFDM Symbols per slot (Note 1) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Modulation | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK |
| Code rate (Note 2) | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 |
| Payload size (bits) | 432 | 352 | 888 | 888 | 1864 | 1864 | 2792 | 3752 |
| Transport block CRC (bits) | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Code block CRC size (bits) | - | - | - | - | - | - | - | - |
| Number of code blocks - C | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Code block size including CRC (bits) (Note 3) | 448 | 368 | 904 | 904 | 1880 | 1880 | 2808 | 3768 |
| Total number of bits per slot | 1440 | 1152 | 2880 | 2880 | 6048 | 6048 | 9216 | 12384 |
| Total symbols per slot | 720 | 576 | 1440 | 1440 | 3024 | 3024 | 4608 | 6192 |
| NOTE 1: *UL-DMRS-config-type* = 1 with *UL-DMRS-max-len* = 1, *UL-DMRS-add-pos* = 1 with = 2, = 11 as per table 6.4.1.1.3-3 of TS 38.211 [5].  NOTE 2: MCS index 4 and target coding rate = 308/1024 are adopted to calculate payload size for receiver sensitivity and in-channel selectivity  NOTE 3: Code block size including CRC (bits) equals to  in sub-clause 5.2.2 of TS 38.212 [15].  NOTE 4: For reference channel A1-12, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+10, N+20, N+30, N+40 where N={0,1,2,3,4,…,9}.  NOTE 5: For reference channel A1-13, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+5, N+10, N+15 where N={0,1,2,3,4}.  NOTE 7: For reference channel A1-14, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+10,N+20,..N+90 where N={0,1,2,3,...,9}.  NOTE 8: For reference channel A1-15, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+5,N+10,..,N+45 where N={0,1,2,3,4}.  NOTE 10: For reference channel A1-16, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+10,N+20,...,N+200 where N={0,1,2,3,4,...,9}.  NOTE 11: For reference channel A1-17, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+5, N+10, ..., N+100 where N={0,1,2,3,4}.  NOTE 12: For reference channel A1-18, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+5,N+10,...,N+155 where N={0,1,2,3,4}.  NOTE 13: For reference channel A1-19, the allocated RB’s are uniformly spaced over the channel bandwidth at RB index N, N+5,N+10,...,N+210 where N={0,1,2,3,4}. | | | | | | | | |

Table A.1-2: FRC parameters for FR2 OTA reference sensitivity level, OTA ACS, OTA in-band blocking, OTA out-of-band blocking, OTA receiver intermodulation and OTA in-channel selectivity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference channel | G-FR2-A1-1 | G-FR2-A1-2 | G-FR2-A1-3 | G-FR2-A1-4 | G-FR2-A1-5 |
| Subcarrier spacing (kHz) | 60 | 120 | 120 | 60 | 120 |
| Allocated resource blocks | 66 | 32 | 66 | 33 | 16 |
| CP-OFDM Symbols per slot (Note 1) | 12 | 12 | 12 | 12 | 12 |
| Modulation | QPSK | QPSK | QPSK | QPSK | QPSK |
| Code rate (Note 2) | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 |
| Payload size (bits) | 5632 | 2792 | 5632 | 2856 | 1416 |
| Transport block CRC (bits) | 24 | 16 | 24 | 16 | 16 |
| Code block CRC size (bits) | - | - | - | - | - |
| Number of code blocks - C | 1 | 1 | 1 | 1 | 1 |
| Code block size including CRC (bits)  (Note 3) | 5656 | 2808 | 5656 | 2872 | 1432 |
| Total number of bits per slot | 19008 | 9216 | 19008 | 9504 | 4608 |
| Total symbols per slot | 9504 | 4608 | 9504 | 4752 | 2304 |
| NOTE 1: DM-RS configuration type = 1 with DM-RS duration = single-symbol DM-RS, additional DM-RS position = pos1 with *l0* = 2, *l* = 11 as per table 6.4.1.1.3-3 of TS 38.211 [20].  NOTE 2: MCS index 4 and target coding rate = 308/1024 are adopted to calculate payload size.  NOTE 3: Code block size including CRC (bits) equals to *K'* in TS 38.212 [19], clause 5.2.2. | | | | | |

----------end of changed section---------------