**3GPP TSG- Meeting # *revision of***

**, , -**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | (NR\_IAB-Perf, NR\_mmWave\_protect-Perf) Implementation of updated EESS protection requirement notes | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In this CR, we implement updated EESS protection requirements, reflecting Decision (EU) 2020/590. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. New reference added 2. Missing abbreviation added   OBUE and Rx spur requirement tables updated to reflect new regulation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | EESS protection requirements would not be aligned with the already exsiting regulation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.3, 6.7.4.5.5.3.1, 7.7.5.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.104, TS 38.106, TS 38.174 | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS38.115-2,TS38.141-2, TS38.176-2 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*------------------------------ Modified section ------------------------------*

# 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 38.174: "NR; Integrated access and backhaul radio transmission and reception".

[3] 3GPP TS 38.176-1: " NR; Integrated Access and Backhaul (IAB) conformance testing; Part 1: Conducted conformance testing".

[4] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".

[5] 3GPP TS 38.141-1: "NR, Base Station (BS) conformance testing, Part 1: Conducted conformance testing".

[6] 3GPP TS 38.141-2: "NR, Base Station (BS) conformance testing, Part 2: Radiated conformance testing".

[7] 3GPP TS 38.211: "NR; Physical channels and modulation".

[8] 3GPP TS 38.212: "NR; Multiplexing and channel coding".

[9] 3GPP TS 38.213: "NR; Physical layer procedures for control".

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

[11] ERC Recommendation 74-01: "Unwanted emissions in the spurious domain".

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

[13] Recommendation ITU-R SM.328: "Spectra and bandwidth of emissions".

[14] "Title 47 of the Code of Federal Regulations (CFR)", Federal Communications Commission.

[15] 3GPP TR 25.942: "RF system scenarios".

[16] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".

[17] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone".

[18] 3GPP TS 38.101-4: "NR; User Equipment (UE) radio transmission and reception; Part 4: Performance requirements".

[19] IEC 60 721-3-3: "Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weather protected locations".

[20] IEC 60 721-3-4: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Clause 4: Stationary use at non-weather protected locations".

[21] IEC 60 721: "Classification of environmental conditions".

[22] IEC 60 068-2-1 (2007): "Environmental testing - Part 2: Tests. Tests A: Cold".

[23] IEC 60 068-2-2: (2007): "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[24] IEC 60 068-2-6: (2007): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)".

[25] 3GPP TR 37.941: "Radio Frequency (RF) conformance testing background for radiated Base Station (BS) requirements".

[26] 3GPP TR 38.901: "Study on channel model for frequencies from 0.5 to 100 GHz".

[27] 3GPP TS 38.214: "NR; Physical layer procedures for data".

[28] 3GPP TS 38.521-1: "NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Range 1 standalone".

[29] 3GPP TS 38.521-2: "NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Range 2 standalone”.

[30] Commission Implementing Decision (EU) 2020/590 of 24 April 2020 amending Decision (EU) 2019/784 as regards an update of relevant technical conditions applicable to the 24,25-27,5 GHz frequency band

*------------------------------ Next modified section -------------------------*

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

AA Antenna Array

ACLR Adjacent Channel Leakage Ratio

ACS Adjacent Channel Selectivity

AoA Angle of Arrival

AWGN Additive White Gaussian Noise

BFD Beam Failure Detection

BFD-RS BFD Reference Signal

BLER Block Error Rate

BM-RS Beam Management Reference Signal

BS Base Station

BW Bandwidth

BWP Bandwidth Part

CA Carrier Aggregation

CACLR Cumulative ACLR

CBD Candidate Beam Detection

CCE Control Channel Element

CORESET Control Resource Set

CP Cyclic Prefix

CP-OFDM Cyclic Prefix-OFDM

CSI Channel-State Information

CSI-RS CSI Reference Signal

CW Continuous Wave

DCI Downlink Control Information

DL Downlink

DMRS Demodulation Reference Signal

DM-RS Demodulation Reference Signal

DRX Discontinuous Reception

EESS Earth Exploration Satellite Service

EIS Equivalent Isotropic Sensitivity

EIRP Equivalent Isotropic Radiated Power

E-UTRA Evolved UTRA

EVM Error Vector Magnitude

FBW Fractional Bandwidth

FR Frequency Range

FRC Fixed Reference Channel

GSM Global System for Mobile communications

IAB Integrated Access and Backhaul

IAB-DU IAB Distribution Unit

IAB-MT IAB Mobile Termination

ITU‑R Radiocommunication Sector of the International Telecommunication Union

ICS In-Channel Selectivity

L1-RSRP Layer 1 RSRP

LA Local Area

MCS Modulation and Coding Scheme

MGRP Measurement Gap Repetition Period

mIAB Mobile IAB

MR Medium Range

NB-IoT Narrowband – Internet of Things

NR New Radio

NR-ARFCN NR Absolute Radio Frequency Channel Number

OBUE Operating Band Unwanted Emissions

OOB Out-of-band

OSDD OTA Sensitivity Directions Declaration

OTA Over-The-Air

PCell Primary Cell

PDCCH Physical Downlink Control Channel

PDSCH Physical Downlink Shared Channel

PCell Primary Cell

PRACH Physical RACH

PDCCH Physical Downlink Control Channel

PDSCH Physical Downlink Shared Channel

PRACH Physical RACH

PRB Physical Resource Block

PSCell Primary SCell

PSS Primary Synchronization Signal

pTAG Primary Timing Advance Group

PUCCH Physical Uplink Control Channel

PUSCH Physical Uplink Shared Channel

QAM Quadrature Amplitude Modulation

QCL Quasi Co-Location

RB Resource Block

RDN Radio Distribution Network

RE Resource Element

REFSENS Reference Sensitivity

REG Resource Element Group

RF Radio Frequency

RIB Radiated Interface Boundary

RLM Radio Link Monitoring

RLM-RS Reference Signal for RLM

RMS Root Mean Square (value)

RoAoA Range of Angles of Arrival

RRC Radio Resource Control

RRM Radio Resource Management

RX Receiver

SCell Secondary Cell

SCS Sub-Carrier Spacing

SMTC SSB-based Measurement Timing configuration

SpCell Special Cell

SRS Sounding Reference Signal

SS-RSRP Synchronization Signal based Reference Signal Received Power

SSB Synchronization Signal Block

SSB\_RP Received (linear) average power of the resource elements that carry NR SSB signals and channels, measured at the UE antenna connector.

SSS Secondary Synchronization Signal

TA Timing Advance

TAB Transceiver Array Boundary

TCI Transmission Configuration Indicator

TX Transmitter

TRP Total Radiated Power

UTRA Universal Terrestrial Radio Access

WA Wide Area

*------------------------------ Next modified section -------------------------*

6.7.4.5.5.3 Additional OTA operating band unwanted emission limits

6.7.4.5.5.3.1 Protection of Earth Exploration Satellite Service

For IAB-Node operating in the frequency range 24.25 – 27.5 GHz, the power of unwanted emission shall not exceed the limits in table 6.7.4.5.5.3.1-1.

Table 6.7.4.5.5.3.1-1: OBUE limits for protection of Earth Exploration Satellite Service

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Measurement filter centre frequency range | Limit | Measurement bandwidth |
| 23.6 – 24 GHz | 23.7 – 23.9 GHz | -3 dBm (Note 1) | 200 MHz |
| 23.6 – 24 GHz | 23.7 – 23.9 GHz | -9 dBm (Note 2) | 200 MHz |
| NOTE 1: This limit applies to IAB-DU and IAB-MT brought into use on or before 1 September 2027 in countries not adopting EU Decision 2020/590 [30].  NOTE 2: This limit applies to IAB-DU and IAB-MT brought into use after 1 September 2027, or to IAB-DU and IAB-MT in countries adopting EU Decision 2020/590 [30]. | | | |

*------------------------------ Next modified section -------------------------*

#### 7.7.5.2 Test requirement for *IAB type 2-O*

The power of any receiver spurious emission shall not exceed the limits in table 7.7.5.2-1.

Table 7.7.5.2-1: Radiated Rx spurious emission limits for *IAB type 2-O*

|  |  |  |  |
| --- | --- | --- | --- |
| Spurious  frequency range  (Note 4) | Limit (Note 5) | Measurement Bandwidth | Note |
| 30 MHz ↔ 1 GHz | -36 dBm | 100 kHz | Note 1 |
| 1 GHz ↔ 18 GHz | -30 dBm | 1 MHz | Note 1 |
| 18 GHz ↔ Fstep,1 | -20 dBm | 10 MHz | Note 2 |
| Fstep,1 ↔ Fstep,2 | -15 dBm | 10 MHz | Note 2 |
| Fstep,2 ↔ Fstep,3 | -10 dBm | 10 MHz | Note 2 |
| Fstep,4 ↔ Fstep,5 | -10 dBm | 10 MHz | Note 2 |
| Fstep,5 ↔ Fstep,6 | -15 dBm | 10 MHz | Note 2 |
| Fstep,6 ↔ min(2nd harmonic of the upper frequency edge of the UL operating band in GHz; 60 GHz) | -20 dBm | 10 MHz | Note 2, Note 3 |
| NOTE 1: Bandwidth as in ITU-R SM.329 [10], s4.1.  NOTE 2: Limit and bandwidth as in ERC Recommendation 74-01 [11], Annex 2.  NOTE 3: Upper frequency as in ITU-R SM.329 [10], s2.5 table 1.  NOTE 4: The step frequencies Fstep,X are defined in table 7.7.5.2-2.  NOTE 5: Additional limits may apply regionally. | | | |

Table 7.7.5.2-2: Step frequencies for defining the radiated Rx spurious emission limits   
for *IAB-DU type 2-O*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating band | Fstep,1 (GHz) | Fstep,2 (GHz) | Fstep,3 (GHz) | Fstep,4 (GHz) | Fstep,5 (GHz) | Fstep,6 (GHz) |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
| n258 | 18 | 21 | 22.75 | 29 | 30.75 | 40.5 |
| n259 | 23.5 | 35.5 | 38 | 45 | 47.5 | 59.5 |
| n260 | 25 | 34 | 35.5 | 41.5 | 43 | 52 |
| n261 | 18 | 25.5 | 26.0 | 29.85 | 30.35 | 38.35 |

In addition, the following requirement may be applied for protection of EESS for IAB operating in frequency range 24.25 – 27.5 GHz.

The power of any receiver spurious emission shall not exceed the limits in Table 7.7.5.2-3.

Table 7.7.5.2-3: Limits for protection of Earth Exploration Satellite Service

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Limit | Measurement bandwidth | Note |
| 23.6 – 24 GHz | -3 dBm | 200 MHz | Note 1 |
| 23.6 – 24 GHz | -9 dBm | 200 MHz | Note 2 |
| NOTE 1: This limit applies to IAB brought into use on or before 1 September 2027 in countries not adopting EU Decision 2020/590 [30]  NOTE 2: This limit applies to IAB brought into use after 1 September 2027, or to IAB-DU and IAB-MT in countries adopting EU Decision 2020/590 [30]. | | | |

*------------------------------ End of modified section -------------------------*