**3GPP TSG-RAN4 Meeting # *R4-2201709***

 **Electronic Me**e**ting, 17th – 25th Jan 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-1** | **CR** |  | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network |  |

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|  |
| ***Title:***  | CR on RedCap UE FR1-TX and general |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_redcap-Core |  | ***Date:*** | 2022-1-17 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Redcap is introduced in Rel-17 in NR |
|  |  |
| ***Summary of change:*** | Inroduce the new suffix I in 4.3; introduce new operating band chapter for RedCap; introduce RedCap UE bandwidth in note of 5.3.5; introduce the power class chapter for Redcap UE in 6.2.1I |
|  |  |
| ***Consequences if not approved:*** | No RedCap UE specificaion in specificaitons. |
|  |  |
| ***Clauses affected:*** | 3,3,4.3,5.2I,5.3.5I, 6.2.1I |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.521-1  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

## < start of changes >

## 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].

ACLR Adjacent Channel Leakage Ratio

ACS Adjacent Channel Selectivity

A-MPR Additional Maximum Power Reduction

BS Base Station

BW Bandwidth

BWP Bandwidth Part

CA Carrier Aggregation

CA\_nX-nY Inter-band CA of component carrier(s) in one sub-block within Band nX and component carrier(s) in one sub-block within Band nY where nX and nY are the applicable NR *operating bands*

CC Component Carriers

CG Carrier Group

CP-OFDM Cyclic Prefix-OFDM

CW Continuous Wave

DC Dual Connectivity

DFT-s-OFDM Discrete Fourier Transform-spread-OFDM

DM-RS Demodulation Reference Signal

DTX Discontinuous Transmission

E-UTRA Evolved UTRA

EIRP Equivalent Isotropically Radiated Power

EVM Error Vector Magnitude

FR Frequency Range

FRC Fixed Reference Channel

FWA Fixed Wireless Access

GSCN Global Synchronization Channel Number

IBB In-band Blocking

IDFT Inverse Discrete Fourier Transformation

ITS Intelligent Transportation System

ITU‑R Radiocommunication Sector of the International Telecommunication Union

MBW Measurement bandwidth defined for the protected band

MCG Master Cell Group

MOP Maximum Output Power

MPR Allowed maximum power reduction

MSD Maximum Sensitivity Degradation

NR New Radio

NR-ARFCN NR Absolute Radio Frequency Channel Number

NS Network Signalling

OCNG OFDMA Channel Noise Generator

OOB Out-of-band

P-MPR Power Management Maximum Power Reduction

PRB Physical Resource Block

PSCCH Physical Sidelink Control CHannel

PSSCH Physical Sidelink Shared CHannel

QAM Quadrature Amplitude Modulation

RE Resource Element

RedCap Reduced Capability

REFSENS Reference Sensitivity

RF Radio Frequency

RMS Root Mean Square (value)

RSRP Reference Signal Receiving PowerRx Receiver

Rx Receiver

SC Single Carrier

SCG Secondary Cell Group

SCS Subcarrier spacing

SDL Supplementary Downlink

SEM Spectrum Emission Mask

SL Sidelink

SL-MIMO Sidelink-Multiple Antenna transmission

SNR Signal-to-Noise Ratio

SRS Sounding Reference Symbol

SS Synchronization Symbol

SUL Supplementary uplink

TAE Time Alignment Error

TAG Timing Advance Group

Tx Transmitter

TxD Tx Diversity

UL MIMO Uplink Multiple Antenna transmission

ULFPTx Uplink Full Power Transmission

V2X Vehicle to Everything

## << Unchanged part is omitted>>

## 4.3 Specification suffix information

Unless stated otherwise the following suffixes are used for indicating at 2nd level clause, shown in Table 4.3-1.

Table 4.3-1: Definition of suffixes

|  |  |
| --- | --- |
| Clause suffix | Variant |
| None | Single Carrier |
| A | Carrier Aggregation (CA) |
| B | Dual-Connectivity (DC) |
| C | Supplement Uplink (SUL) |
| D | UL MIMO |
| E | V2X |
| F | Shared spectrum channel access |
| G | Tx Diversity (TxD) |
| H | Carrier Aggregation(CA) for UL MIMO |
| I | RedCap |

A terminal which supports the above features needs to meet both the general requirements and the additional requirement applicable to the additional clause (suffixes A to F) in clauses 5, 6 and 7. Where there is a difference in requirement between the general requirements and the additional clause requirements (suffixes A to F) in clauses 5, 6 and 7, the tighter requirements are applicable unless stated otherwise in the additional clause.

A terminal which supports more than one feature in clauses 5, 6 and 7 shall meet all of the separate corresponding requirements.

For a terminal that supports SUL for the band combination specified in Table 5.2C-1, the current version of the specification assumes the terminal is configured with active transmission either on UL carrier or SUL carrier at any time in one serving cell and the UE requirements for single carrier shall apply for the active UL or SUL carrier accordingly.

For a terminal that supports operation in shared spectrum, the current version of this specification assumes in the uplink sub-bands within a wideband channel shall be contiguously allocated to the UE. The uplink requirements for one or more non-transmitted sub-bands between two transmitted sub-bands does not form a part of the current version of this specification.

## << Unchanged part is omitted>>

## 5.2I Operating band for RedCap

NR operation is designed to support RedCap UE operating in the operating band defined in Table 5.2-1, except the operating band for SUL, SDL, band n79, n47, n46, n96 and n102.

## << Unchanged part is omitted>>

### 5.3.5I UE channel bandwidth per operating band for RedCap

The requirements in this specification apply to the combination of channel bandwidths, SCS and operating bands shown in Table 5.3.5-1 with maximum channel bandwidth of 20MHz. The transmission bandwidth configuration in Table 5.3.2-1 shall be supported for each of the specified channel bandwidths. The channel bandwidths are specified for both the TX and RX path.

## << Unchanged part is omitted>>

### 6.2.1I UE maximum output power for RedCap

The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth of NR carrier unless otherwise stated. The period of measurement shall be at least one sub frame (1ms).

Table 6.2.1-1: UE Power Class

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NRband | Class 2 (dBm) | Tolerance (dB) | Class 3 (dBm) | Tolerance (dB) |
| n1 |  |  | 23 | ±2 |
| n2 |  |  | 23 | ±23 |
| n3 |  |  | 23 | ±23 |
| n5 |  |  | 23 | ±2 |
| n7 |  |  | 23 | ±23 |
| n8 |  |  | 23 | ±23 |
| n12 |  |  | 23 | ±23 |
| n13 |  |  | 23 | ±2 |
| n14 |  |  | 23 | ±2 |
| n18 |  |  | 23 | ±2 |
| n20 |  |  | 23 | ±23 |
| n24 |  |  | 23 | +2/-33 |
| n25 |  |  | 23 | ±23 |
| n26 |  |  | 23 | ±23 |
| n28 |  |  | 23 | +2/-2.5 |
| n30 |  |  | 23 | ±2 |
| n34 |  |  | 23 | ±2 |
| n38 |  |  | 23 | ±2 |
| n39 |  |  | 23 | ±2 |
| n40 |  |  | 23 | ±2 |
| n41 |  |  | 23 | ±23 |
| n48 |  |  | 23 | +2/-3 |
| n50 |  |  | 23 | ±2 |
| n51 |  |  | 23 | ±2 |
| n53 |  |  | 23 | ±2 |
| n65 |  |  | 23 | ±2 |
| n66 |  |  | 23 | ±2 |
| n70 |  |  | 23 | ±2 |
| n71 |  |  | 23 | +2/-2.5 |
| n74 |  |  | 23 | ±2 |
| n77 |  |  | 23 | +2/-3 |
| n78 |  |  | 23 | +2/-3 |
| n85 |  |  | 23 | ±23 |
| n91 |  |  | 23 | ±23, 4 |
| n92 |  |  | 23 | ±23, 4 |
| n93 |  |  | 23 | ±23, 4 |
| n94 |  |  | 23 | ±23, 4 |
| NOTE 1: PPowerClass is the maximum UE power specified without taking into account the toleranceNOTE 2: Powerclass 3 is default power class unless otherwise statedNOTE 3: Refers to the transmission bandwidths confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high – 4 MHz and FUL\_high, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB.NOTE 4: The maximum output power requirement is relaxed by reducing the lower tolerance limit by 0.3 dB |

## < end of changes >