**3GPP TSG-RAN4 Meeting # *R4-220xyz***

**Electronic Me**e**ting, 21st Feb – 3rd March 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** |  | **rev** | - | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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 | **x** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CR on RedCap UE FR1-RX | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap-Core | | | | |  | ***Date:*** | | | 2022-2-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Redcap is introduced in Rel-17 in NR | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce REFSESN requirments and receiver requirement for RedCap UE | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No RedCap UE specificaion in specificaitons. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 7.1I, 7.2, 7.3I | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **Y** |  | Test specifications | | | | TS 38.521-1 | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## < start of changes >

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

ΔFGlobal Granularity of the global frequency raster

ΔFRaster Band dependent channel raster granularity

ΔfOOB Δ Frequency of Out Of Band emission

ΔFTX-RX Maximum deviation to the Tx-Rx carrier center frequency separation for asymmetric uplink/downlink channel bandwidth operation

∆MPRc Allowed Maximum Power Reduction relaxation for serving cell *c*

ΔPPowerClass Adjustment to maximum output power for a given power class

DRB The starting frequency offset between the allocated RB and the measured non-allocated RB

ΔRIB,c Allowed reference sensitivity relaxation due to support for inter-band CA operation, for serving cell *c*

ΔRIB,4R Reference sensitivity adjustment due to support for 4 antenna ports

ΔR1RReference sensitivity adjustment due to support for 1 antenna ports

ΔShift Channel raster offset

DTC Allowed operating band edge transmission power relaxation

DTC,*c*Allowed operating band edge transmission power relaxation for serving cell *c*

ΔTIB,c Allowed maximum configured output power relaxation due to support for inter-band CA operation, inter-band NR-DC operation and due to support for SUL operations, for serving cell *c*

BWChannel Channel bandwidth

BWChannel,block Sub-block bandwidth, expressed in MHz. BWChannel,block= Fedge,block,high- Fedge,block,low

BWChannel\_CA Aggregated channel bandwidth, expressed in MHz

BWChannel,max Maximum channel bandwidth supported among all bands in a release

BWGB max( BWGB,Channel(*k*) )

BWGB,Channel(k) Minimum guard band defined in clause 5.3A.1 of carrier *k*

BWDL Channel bandwidth for DL

BWUL Channel bandwidth for UL

BWinterferer Bandwidth of the interferer

Ceil(x) Rounding upwards; ceil(x) is the smallest integer such that ceil(x) ≥ x

Floor(x) Rounding downwards; floor(x) is the greatest integer such that floor(x) ≤ x

FC *RF reference frequency* on the channel raster, given in table 5.4.2.2-1

FC,block, high Fc of the highest transmitted/received carrier in a *sub-block*

FC,block, low Fc of the lowest transmitted/received carrier in a *sub-block*

FC,low The Fc of the lowest carrier, expressed in MHz

FC,high The Fc of the highest carrier, expressed in MHz

FDL\_low The lowest frequency of the downlink *operating band*

FDL\_high The highest frequency of the downlink *operating band*

FUL\_low The lowest frequency of the uplink *operating band*

FUL\_high The highest frequency of the uplink *operating band*

Fedge,block,low The lower *sub-block* edge, where Fedge,block,low = FC,block,low - Foffset, low.

Fedge,block,high The upper *sub-block* edge, where Fedge,block,high = FC,block,high + Foffset, high.

Fedge , low The *lower edge* of *aggregated channel bandwidth*, expressed in MHz. Fedge,low = FC,low - Foffset,low.

Fedge, high The *higher edge* of *aggregated channel bandwidth*, expressed in MHz. Fedge,high = FC,high + Foffset,high.

FInterferer (offset) Frequency offset of the interferer (between the center frequency of the interferer and the carrier frequency of the carrier measured)

FInterferer Frequency of the interferer

FIoffset Frequency offset of the interferer (between the center frequency of the interferer and the closest edge of the carrier measured)

Foffset Frequency offset from FC\_high to the *higher edge* or FC\_low to the *lower edge.*

Foffset,high Frequency offset from FC,high to the upper *UE RF Bandwidth edge*, or from FC,block, high to the upper sub-block edge

Foffset,low Frequency offset from FC,low to the lower *UE RF Bandwidth edge*, or from FC,block, low to the lower sub-block edge

FOOB The boundary between the NR out of band emission and spurious emission domains

FREF RF reference frequency

FREF-Offs Offset used for calculating FREF

FREF, shift RF reference frequency for Supplementary Uplink (SUL) bands, the uplink of all FDD bands, and TDD bands

Fuw (offset) The frequency separation of the center frequency of the carrier closest to the interferer and the center frequency of the interferer

GBChannel Minimum guard band defined in clause 5.3.3

LCRB Transmission bandwidth which represents the length of a contiguous resource block allocation expressed in units of resources blocks

Max() The largest of given numbers

Min() The smallest of given numbers

 Physical resource block number

NRACLR NR ACLR

NRB Transmission bandwidth configuration, expressed in units of resource blocks

NRB\_agg The number of the aggregated RBs within the fully allocated aggregated channel bandwidth

for carrier 1 to j, where *μ* is defined in TS 38.211 [6]

NRB,c The transmission bandwidth configuration of component carrier c, expressed in units of resource blocks

for carrier j, where *μ* is defined in TS 38.211 [6]

NRB,largest BW The largest transmission bandwidth configuration of the component carriers in the bandwidth combination, expressed in units of resource blocks

NRB,low The transmission bandwidth configurations according to Table 5.3.2-1 for the lowest assigned component carrier in clause 5.3A.1

NRB,high The transmission bandwidth configurations according to Table 5.3.2-1 for the highest assigned component carrier in clause 5.3A.1

NREF NR Absolute Radio Frequency Channel Number (NR-ARFCN)

NREF-Offs Offset used for calculating NREF

PCMAX The configured maximum UE output power

PCMAX, *c* The configured maximum UE output power for serving cell *c*

PCMAX, *f*, *c* The configured maximum UE output power for carrier *f* of serving cell *c* in each slot

PEMAX Maximum allowed UE output power signalled by higher layers

PEMAX, *c* Maximum allowed UE output power signalled by higher layers for serving cell *c*

PInterferer Modulated mean power of the interferer

Plargest BW Power of the largest transmission bandwidth configuration of the component carriers in the bandwidth combination

PPowerClass The nominal UE power (i.e., no tolerance)

P-MPR*c* Power Management Maximum Power Reduction for serving cell *c*

PRB The transmitted power per allocated RB, measured in dBm

PUMAX The measured configured maximum UE output power

Puw Power of an unwanted DL signal

Pw Power of a wanted DL signal

RBstart The lowest RB index of transmitted resource blocks

RBstart\_CA The lowest RB index of transmitted resource blocks for intra-band contiguous CA

SCSc SCS for the component carrier c

SCSlargest BW SCS for the largest transmission bandwidth configuration of the component carriers in the bandwidth combination

SCSlow SCS for the lowest assigned component carrier in clause 5.3A.1

SCShigh SCS for the highest assigned component carrier in clause 5.3A.1

*tp* Transient Period value signalled by the UE

*tpstart* Start position of transient period relative to the symbol boundary

T(PCMAX, *f*, *c*) Tolerance for applicable values of PCMAX, *f*, *c* for configured maximum UE output power for carrier *f* of serving cell *c*

TL,c Absolute value of the lower tolerance for the applicable *operating band* as specified in clause 6.2.1

SSREF SS block reference frequency position

UTRAACLR UTRA ACLR

## << Unchanged part is omitted>>

## 7.1I General

For a Redcap UE the requirements in Section 7 shall be verified with the channel bandwidth according to clause 5.3.5I.

## << Unchanged part is omitted>>

7.2 Diversity characteristics

The UE is required to be equipped with a minimum of two Rx antenna ports in all operating bands except for the bands n7, n38, n41, n48, n77, n78, n79 where the UE is required to be equipped with a minimum of four Rx antenna ports. This requirement applies when the band is used as a standalone band or as part of a band combination.

For the single carrier REFSENS requirements in Clause 7, the UE shall be verified with two Rx antenna ports in all supported frequency bands, additional requirements for four Rx ports shall be verified in operating bands where the UE is equipped with four Rx antenna ports.

For Rx requirements other than single carrier REFSENS in Clause 7, the UE shall be verified with four Rx antenna ports and skip two Rx antenna ports requirements in operating bands where the UE is equipped with four Rx antenna ports, otherwise, the UE shall be verified with two Rx antenna ports.

The above rules apply for all clauses with the exception of clause 7.9.

For a Redcap UE the requirements in Section 7 assume that the receiver is equipped with a minimum of single Rx antenna port.

## << Unchanged part is omitted>>

## 7.3I Reference sensitivity for RedCap

### 7.3I.1 General

The reference sensitivity power level REFSENS is the minimum mean power applied to each one of the UE antenna ports for all UE categories, at which the throughput shall meet or exceed the requirements for the specified reference measurement channel.

### 7.3I.2 Reference sensitivity power level

For a RedCap UE equipped with 2 Rx antenna ports operating in the bands specified in clause 5.2I, the throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A3.2 and A.3.3 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.2-1a and Table 7.3.2-1b.

For a RedCap UE equipped with 1 Rx antenna ports operating in the bands specified in clause 5.2I, reference sensitivity for 2Rx antenna ports in Table 7.3.2-1a and in Table 7.3.2-1b shall be modified by the amount given in ΔRIB,1R in Table 7.3I.2-1 for the applicable operating bands.

**Table 7.3I.2-1: Single antenna port reference sensitivity allowance ΔR1R**

|  |  |  |
| --- | --- | --- |
| **Operating band** | **Channel bandwidth** | **ΔR1R (dB)** |
| TDD band according to clause 5.2I | According to clause 5.3.5I | 2,5 |
| FDD band according to clause 5.2I | 5MHz | 2.5 |
| FDD band according to clause 5.2I | 10MHz, 15MHz and 20MHz | 3 |

For a RedCap UE equipped with 2 Rx antenna ports and operating in HD-FDD mode, reference sensitivity for 2Rx antenna ports in Table 7.3I.2-3 shall be met with uplink transmission bandwidth less than or equal to that specified in Table 7.3I.2-5.

**Table 7.3I.2-3: HD-FDD RedCap UE with 2 Rx antenna port reference sensitivity**

| **Operating band / SCS / Channel bandwidth** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Operating Band** | **SCS kHz** | **5 MHz (dBm)** | **10 MHz (dBm)** | **15 MHz (dBm)** | **20 MHz (dBm)** |
| n1 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| 60 |  | -97.5 | -95.4 | -94.2 |
| n2 | 15 | -98.8 | -95.6 | -93.8 | -92.5 |
| 30 |  | -96.0 | -94.0 | -92.7 |
| 60 |  | -96.3 | -94.2 | -93.0 |
| n3 | 15 | -97.8 | -94.6 | -92.8 | -91.5 |
| 30 |  | -95.0 | -93.0 | -91.7 |
| 60 |  | -95.3 | -93.2 | -92.0 |
| n5 | 15 | -98.8 | -95.6 | -93.8 | -92.5 |
| 30 |  | -96.0 | -94.0 | -92.7 |
| n7 | 15 | -98.8 | -95.6 | -93.8 | -92.5 |
| 30 |  | -96.0 | -94.0 | -92.7 |
| 60 |  | -96.3 | -94.2 | -93.0 |
| n8 | 15 | -97.8 | -94.6 | -92.8 | -91.5 |
| 30 |  | -95.0 | -93.0 | -91.7 |
| n12 | 15 | -97.8 | -94.6 | -92.8 |  |
| 30 |  | -95.0 | -93.0 |  |
| n13 | 15 | -97.8 | -94.6 |  |  |
| 30 |  | -95.0 |  |  |
| n14 | 15 | -97.8 | -94.6 |  |  |
| 30 |  | -95.0 |  |  |
| n18 | 15 | -100.0 | -96.8 | -95.0 |  |
| 30 |  | -97.2 | -95.2 |  |
| n20 | 15 | -97.8 | -94.6 | -92.8 | -91.5 |
| 30 |  | -95.0 | -93.0 | -91.7 |
| n24 | 15 | -100.0 | -96.8 |  |  |
| 30 |  | -97.2 |  |  |
| 60 |  | -97.5 |  |  |
| n25 | 15 | -97.3 | -94.1 | -92.3 | -91.0 |
| 30 |  | -94.5 | -92.5 | -91.2 |
| 60 |  | -94.8 | -92.7 | -91.5 |
| n26 | 15 | -98.3 | -95.1 | -93.3 | -92.0 |
| 30 |  | -95.5 | -93.5 | -92.2 |
| n28 | 15 | -99.3 | -96.1 | -94.3 | -93.0 |
| 30 |  | -96.5 | -94.5 | -93.2 |
| n30 | 15 | -99.5 | -96.3 |  |  |
| 30 |  | -96.7 |  |  |
| n65 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| 60 |  | -97.5 | -95.4 | -94.2 |
| n66 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| 60 |  | -97.5 | -95.4 | -94.2 |
| n70 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| 60 |  | -97.5 | -95.4 | -94.2 |
| n71 | 15 | -98.0 | -94.8 | -93.0 | -91.7 |
| 30 |  | -95.2 | -93.2 | -91.9 |
| n74 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| 60 |  | -97.5 | -95.4 | -94.2 |
| n85 | 15 | -97.8 | -94.6 | -92.8 |  |
| 30 |  | -95.0 | -93.0 |  |
| n91 | 15 | -100.0 |  |  |  |
| n92 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |
| n93 | 15 | -100.0 |  |  |  |
| n94 | 15 | -100.0 | -96.8 | -95.0 | -93.7 |
| 30 |  | -97.2 | -95.2 | -93.9 |

For a RedCap UE equipped with 1 Rx antenna ports and operating in HD-FDD mode, reference sensitivity for 1Rx antenna ports in Table 7.3I.2-4 shall be met with uplink transmission bandwidth less than or equal to that specified in Table 7.3I.2-5.

**Table 7.3I.2-4: HD-FDD RedCap UE with 1 Rx antenna port reference sensitivity**

| **Operating band / SCS / Channel bandwidth** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Operating Band** | **SCS kHz** | **5 MHz (dBm)** | **10 MHz (dBm)** | **15 MHz (dBm)** | **20 MHz (dBm)** |
| n1 | 15 | -97.5 | -94.3 | -92.5 | -91.2 |
| 30 |  | -94.7 | -92.7 | -91.4 |
| 60 |  | -95.0 | -92.9 | -91.7 |
| n2 | 15 | -96.3 | -93.1 | -91.3 | -90.0 |
| 30 |  | -93.5 | -91.5 | -90.2 |
| 60 |  | -93.8 | -91.7 | -90.5 |
| n3 | 15 | -95.3 | -92.1 | -90.3 | -89.0 |
| 30 |  | -92.5 | -90.5 | -89.2 |
| 60 |  | -92.8 | -90.7 | -89.5 |
| n5 | 15 | -96.3 | -93.1 | -91.3 | -90.0 |
| 30 |  | -93.5 | -91.5 | -90.2 |
| n7 | 15 | -96.3 | -93.1 | -91.3 | -90.0 |
| 30 |  | -93.5 | -91.5 | -90.2 |
| 60 |  | -93.8 | -91.7 | -90.5 |
| n8 | 15 | -95.3 | -92.1 | -90.3 | -89.0 |
| 30 |  | -92.5 | -90.5 | -89.2 |
| n12 | 15 | -95.3 | -92.1 | -90.3 |  |
| 30 |  | -92.5 | -90.5 |  |
| n13 | 15 | -95.3 | -92.1 |  |  |
| 30 |  | -92.5 |  |  |
| n14 | 15 | -95.3 | -92.1 |  |  |
| 30 |  | -92.5 |  |  |
| n18 | 15 | -97.5 | -94.3 | -92.5 |  |
| 30 |  | -94.7 | -92.7 |  |
| n20 | 15 | -95.3 | -92.1 | -90.3 | -89.0 |
| 30 |  | -92.5 | -90.5 | -89.2 |
| n24 | 15 | -97.5 | -94.3 |  |  |
| 30 |  | -94.7 |  |  |
| 60 |  | -95.0 |  |  |
| n25 | 15 | -94.8 | -91.6 | -89.8 | -88.5 |
| 30 |  | -92.0 | -90.0 | -88.7 |
| 60 |  | -92.3 | -90.2 | -89.0 |
| n26 | 15 | -95.8 | -92.6 | -90.8 | -89.5 |
| 30 |  | -93.0 | -91.0 | -89.7 |
| n28 | 15 | -96.8 | -93.6 | -91.8 | -90.5 |
| 30 |  | -94.0 | -92.0 | -90.7 |
| n30 | 15 | -97.0 | -93.8 |  |  |
| 30 |  | -94.2 |  |  |
| n65 | 15 | -97.5 | -94.3 | -92.5 | -91.2 |
| 30 |  | -94.7 | -92.7 | -91.4 |
| 60 |  | -95.0 | -92.9 | -91.7 |
| n66 | 15 | -97.5 | -94.3 | -92.5 | -91.2 |
| 30 |  | -94.7 | -92.7 | -91.4 |
| 60 |  | -95.0 | -92.9 | -91.7 |
| n70 | 15 | -97.5 | -94.3 | -92.5 | -91.2 |
| 30 |  | -94.7 | -92.7 | -91.4 |
| 60 |  | -95.0 | -92.9 | -91.7 |
| n71 | 15 | -95.5 | -92.3 | -90.5 | -89.2 |
| 30 |  | -92.7 | -90.7 | -89.4 |
| n74 | 15 | -97.5 | -94.3 | -92.5 | -91.2 |
| 30 |  | -94.7 | -92.7 | -91.4 |
| 60 |  | -95.0 | -92.9 | -91.7 |
| n85 | 15 | -95.3 | -92.1 | -90.3 |  |
| 30 |  | -92.5 | -90.5 |  |
| n91 | 15 | -97.5 |  |  |  |
| n92 | 15 | -95.3 | -92.1 | -90.3 | -89.0 |
| 30 |  | -92.5 | -90.5 | -89.2 |
| n93 | 15 | -97.5 |  |  |  |
| n94 | 15 | -95.3 | -92.1 | -90.3 | -89.0 |
| 30 |  | -92.5 | -90.5 | -89.2 |

Table 7.3I.2-5: Uplink configuration for HD-FDD reference sensitivity

| **Operating band / SCS / Channel bandwidth** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Operating Band** | **SCS kHz** | **5 MHz** | **10 MHz** | **15 MHz** | **20 MHz** |
| n1 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| 60 |  | 10 | 18 | 24 |
| n2 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| 60 |  | 10 | 18 | 24 |
| n3 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| 60 |  | 10 | 18 | 24 |
| n5 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n7 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
|  |  | 10 | 18 | 24 |
| n8 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n12 | 15 | 25 | 50 | 75 |  |
| 30 |  | 24 | 36 |  |
| n13 | 15 | 25 | 50 |  |  |
| 30 |  | 24 |  |  |
| n14 | 15 | 25 | 50 |  |  |
| 30 |  | 24 |  |  |
| n18 | 15 | 25 | 50 | 75 |  |
| 30 |  | 24 | 36 |  |
| n20 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n24 | 15 | 25 | 50 |  |  |
| 30 |  | 24 |  |  |
|  |  | 10 |  |  |
| n25 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| 60 |  | 10 | 18 | 24 |
| n26 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n28 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n30 | 15 | 25 | 50 |  |  |
| 30 |  | 24 |  |  |
| n65 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
|  |  | 10 | 18 | 24 |
| n66 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
|  |  | 10 | 18 | 24 |
| n70 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
|  |  | 10 | 18 | 24 |
| n71 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n74 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
|  |  | 10 | 18 | 24 |
| n85 | 15 | 25 | 50 | 75 |  |
| 30 |  | 24 | 36 |  |
| n91 | 15 | 25 |  |  |  |
| n92 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |
| n93 | 15 | 25 |  |  |  |
| n94 | 15 | 25 | 50 | 75 | 100 |
| 30 |  | 24 | 36 | 50 |

The reference receive sensitivity (REFSENS) requirement operating in TDD and FDD duplex mode specified for a RedCap UE shall be met with uplink transmission bandwidth less than or equal to that specified in Table 7.3.2-3.

## < end of changes >