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Title: TP for TR 38.191 section 3 Definitions, symbols and abbreviations

Agenda Item: 7.22.2

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# **Introduction**

This TP will focus on section 3 Definitions, symbols and abbreviations.

Following TP capture the definitions, symotols and abbreviations from TS 38.101-1 and TR 38.769 and delete those that are not applicable for A-IoT device.

Noted, following definitions, symotols and abbreviations are not correctly sorted by the first letters in current version. After the merge of all TPs, they will be sorted by the first letters.

# **Reference**

[1]

# Text Proposal

**----- Start of TP -----**

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

**antenna connector:** connector at the conducted interface of the *BS type 1-C*

**active transmitter unit:** transmitter unit which is ON, and has the ability to send modulated data streams that are parallel and distinct to those sent from other transmitter units to a *BS type 1-C* *antenna connector*

**Base Station RF Bandwidth**: RF bandwidth in which a base station transmits and/or receives single or multiple carrier(s) within a supported *operating band*

NOTE: In single carrier operation, the *Base Station RF Bandwidth* is equal to the *BS channel bandwidth*.

**Base Station RF Bandwidth edge:** frequency of one of the edges of the *Base Station RF Bandwidth*.

**basic limit:** emissions limit relating to the power supplied by a single transmitter to a single antenna transmission line in ITU-R SM.329 [2] used for the formulation of unwanted emission requirements for FR1

**beam peak direction:** direction where the maximum EIRP is found

**beamwidth:** beam which has a half-power contour that is essentially elliptical, the half-power beamwidths in the two pattern cuts that respectively contain the major and minor axis of the ellipse

**BS channel bandwidth**: RF bandwidth supporting a single NR RF carrier with the *transmission bandwidth* configured in the uplink or downlink

NOTE 1: The *BS channel bandwidth* is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

NOTE 2: It is possible for the BS to transmit to and/or receive from one or more UE bandwidth parts that are smaller than or equal to the *BS transmission bandwidth configuration*, in any part of the *BS transmission bandwidth configuration*.

**BS transmission bandwidth**: set of resource blocks located within the *BS channel bandwidth* which may be used for transmitting by the BS

**BS type 1-C:** NR base station operating at FR1 with requirements set consisting only of conducted requirements defined at individual *antenna connectors*

**Channel edge:** lowest or highest frequency of the NR carrier, separated by the *BS channel bandwidth*.

**Command**: The service provided by the network to send the operation instruction to the A-IoT device (e.g. read, write, etc.).

**Device 1:** ~1 µW peak power consumption, has energy storage, initial sampling frequency offset (SFO) up to 10*X* ppm, neither R2D nor D2R amplification in the device. The device's D2R transmission is backscattered on a carrier wave provided externally.

**D1T1:** Deployment scenario 1 with connectivity topology 1, according to TR 38.848.

**Inventory**: The service provided by the network to discover and acquire the identifier of A-IoT device(s).

**maximum carrier output power:** mean power level measured per carrier at the indicated interface, during the *transmitter ON period* in a specified reference condition

**maximum total output power:** mean power level measured within the *operating band* at the indicated interface, during the *transmitter ON period* in a specified reference condition

**measurement bandwidth**: RF bandwidth in which an emission level is specified

**operating band:** frequency range in which NR operates (paired or unpaired), that is defined with a specific set of technical requirements

NOTE: The *operating band*(s) for a BS is declared by the manufacturer according to the designations in tables 5.2-1 and 5.2-2.

**polarization match:** condition that exists when a plane wave, incident upon an antenna from a given direction, has a polarization that is the same as the receiving polarization of the antenna in that direction

**rated carrier output power:** mean power level associated with a particular carrier the manufacturer has declared to be available at the indicated interface, during the *transmitter ON period* in a specified reference condition

**transmission bandwidth:** RF Bandwidth of an instantaneous transmission from a UE or BS, measured in resource block units

**transmitter OFF period:** time period during which the BS transmitter is not allowed to transmit

**transmitter ON period:** time period during which the BS transmitter is transmitting data and/or reference symbols

**transmitter transient period:** time period during which the transmitter is changing from the OFF period to the ON period or vice versa

**UE transmission bandwidth:** set of resource blocks located within the UE channel bandwidth which may be used for transmitting or receiving by the UE

## 3.2 Symbols

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

BWChannel *BS channel bandwidth*

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

BWConfig *Transmission bandwidth*, where BWConfig = *N*RB x SCS x 12

BWGB,low The minimum guard band defined in clause 5.3.3 for lowest assigned component carrier

BWGB,high The minimum guard band defined in clause 5.3.3 for highest assigned component carrier

Δf Separation between the *channel edge* frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency

ΔfBE\_offset Separation between the edge of the last transmitted channel of the channels assigned for NR-U channel bandwidth and the nominal -3 dB point of the measuring filter closest to the carrier frequency

ΔFGlobal Global frequency raster granularity

Δfmax f\_offsetmax minus half of the bandwidth of the measuring filter

ΔfOBUE Maximum offset of the *operating band* unwanted emissions mask from the downlink *operating band* edge

ΔfOOB Maximum offset of the out-of-band boundary from the uplink *operating band* edge

ΔFRaster Channel raster granularity

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

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*

Fedge,low The lower edge of *Aggregated BS Channel Bandwidth*, expressed in MHz. Fedge,low = FC,low - Foffset,low.

Fedge,high The upper edge of *Aggregated BS Channel Bandwidth*, expressed in MHz. Fedge,high = FC,high + Foffset,high.

Ffilter Filter centre frequency

Foffset,high Frequency offset from FC,high to the upper *Base Station RF Bandwidth edge*, or from F C,block,high to the *upper sub-block edge*

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

f\_offset Separation between the *channel edge* frequency and the centre of the measuring

f\_offsetmax The offset to the frequency ΔfOBUE outside the downlink *operating band*

FREF RF reference frequency

FREF-Offs Offset used for calculating FREF

FUL,low The lowest frequency of the uplink *operating band*

FUL,high The highest frequency of the uplink *operating band*

GBChannel Minimum guard band defined in clause 5.3.3

 Physical resource block number

NRB *Transmission bandwidth configuration*, expressed in resource blocks

NREF A-IoT Absolute Radio Frequency Channel Number (AIoT-ARFCN)

NREF-Offs Offset used for calculating NREF

Pmax,c,AC*Maximum carrier output power* measuredper *antenna connector*

Prated,c,AC The *rated carrier output power per antenna connector*

Prated,t,AC The *rated total output power* declared at the *antenna connector*

PREFSENS Conducted Reference Sensitivity power level

SSREF SS block reference frequency position

## 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].

1SB Single sideband

2SB Double sideband

ACLR Adjacent Channel Leakage Ratio

ACS Adjacent Channel Selectivity

AWGN Additive White Gaussian Noise

A-IoT Ambient IoT

A-IoT RAN Ambient IoT Radio Access Network

BPSK Binary phase-shift keying

BS Base Station

BW Bandwidth

CFO Carrier-frequency offset

CP Cyclic prefix

CW Carrier-wave

CW2D Carrier-wave, or carrier-wave node, to device

D2R Device to reader

ED Envelope detector

E-UTRA Evolved UTRA

FAR False alarm rate

FDR False detection rate

FEC Forward error-correction code

FR Frequency Range

FRC Fixed Reference Channel

IF Intermediate frequency

IoT Internet of Things

LPWA Low-power, wide-area

LTE-MTC Long Term Evolution – Machine Type Communication

MCS Modulation and coding scheme

MDR Missed detection rate

NB-IoT Narrowband IoT

OOK On-off keying

PDRCH Physical device-to-reader channel

PIE Pulse interval encoding

PRDCH Physical reader-to-device channel

R2D Reader to device

RE Resource Element

REFSENS Reference Sensitivity

RF Radio frequency

RFID Radio frequency identification

1. TAS R2D timing acquisition signal

SCS Sub-Carrier Spacing

SER Sample error rate

SFO Sampling-frequency offset

UEM Unwanted Emissions Mask

ZIF Zero IF