3GPP TSG-RAN WG4 Meeting #106bis-e draft R4-2306644

Online, April 17 – April 26, 2023

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **36.101** | **CR** |  | **rev** | **-** | **Current version:** | **18.1.0** |  |
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| *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:***  | Running Draft CR to TS 36.101 on additional OOBE requirements for aerial Ues |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | LTE\_UAV\_enh |  |  |  |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** |  This draft CR is a running CR to collect all the agreement on the implementation on the RAN4 objectives captured in the LTE\_UAV\_enh WI (latest WID in RP-230783). Additional updates are expected during RAN4#107 meeting. |
|  |  |
| ***Summary of change:*** | The following aspects were captured:* Section 3 updates
* 4.3A: New suffix H for the Aerial UE requirements.
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|  |  |
| ***Consequences if not approved:*** | Implementation of regulatory ECC Decision (22)07 would be missing.  |
|  |  |
| ***Clauses affected:*** | 3, 4.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS 38.101-1 |
| ***affected:*** |  | **x** |  Test specifications |  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

**Aerial UE:** TBD

**Aggregated Channel Bandwidth:** The RF bandwidth in which a UE transmits and receives multiple contiguously aggregated carriers.

**Aggregated Transmission Bandwidth Configuration:** The number of resource block allocated within the aggregated channel bandwidth.

**Carrier aggregation:** Aggregation of two or more component carriers in order to support wider transmission bandwidths.

**Carrier aggregation band:** A set of one or more operating bands across which multiple carriers are aggregated with a specific set of technical requirements.

**Carrier aggregation bandwidth class:** A class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by a UE.

**Carrier aggregation configuration**: A combination of CA operating band(s) and CA bandwidth class(es) supported by a UE.

**Channel edge:** The lowest and highest frequency of the carrier, separated by the channel bandwidth.

**Channel bandwidth:** The RF bandwidth supporting a single E-UTRA RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell. The channel bandwidth is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

**Composite spectrum emission mask:** Emission mask requirement for intraband non-contiguous carrier aggregation which is a combination of individual sub-block spectrum emissions masks.

**Composite spurious emission requirement:** Spurious emission requirement for intraband non-contiguous carrier aggregation which is a combination of individual sub-block spurious emission requirements.

**Contiguous carriers:** A set of two or more carriers configured in a spectrum block where there are no RF requirements based on co-existence for un-coordinated operation within the spectrum block.

**Contiguous resource allocation:** A resource allocation of consecutive resource blocks within one carrier or across contiguously aggregated carriers. The gap between contiguously aggregated carriers due to the nominal channel spacing is allowed.

**Contiguous spectrum:** Spectrum consisting of a contiguous block of spectrum with no sub-block gaps.

**Enhanced downlink control channel performance requirements type A:** This defines performance requirements for downlink control channel assuming as baseline receiver reference symbol based linear minimum mean square error interference rejection combining plus CRS interference cancellation.

**Enhanced downlink control channel performance requirements type B:** This defines performance requirements for downlink control channel assuming as baseline receiver reference symbol based enhanced linear minimum mean square error interference rejection combining plus CRS interference cancellation.

**Enhanced performance requirements type A:** This defines performance requirements assuming as baseline receiver reference symbol based linear minimum mean square error interference rejection combining.

**Enhanced performance requirements type B:** This defines performance requirements assuming as baseline receiver using network assisted interference cancelation and suppression.

**Enhanced performance requirements type C:** This defines performance requirements assuming as baseline receiver inter-stream interference cancellation.

**Inter-band carrier aggregation:** Carrier aggregation of component carriers in different operating bands.

NOTE: Carriers aggregated in each band can be contiguous or non-contiguous.

**Intra-band contiguous carrier aggregation:** Contiguous carriers aggregated in the same operating band.

**Intra-band non-contiguous carrier aggregation:** Non-contiguous carriers aggregated in the same operating band.

**Lower** sub-block **edge:** The frequency at the lower edge of one sub-block. It is used as a frequency reference point for both transmitter and receiver requirements.

**Category NB1/NB2 stand-alone operation**: category NB1/NB2 is operating standalone when it utilizes its own spectrum, for example the spectrum used by GERAN systems as a replacement of one or more GSM carriers, as well as scattered spectrum for potential IoT deployment.

**Category NB1/NB2** **guard band operation:** category NB1/NB2 is operating in guard band when it utilizes the unused resource block(s) within a E-UTRA carrier’s guard-band.

**Category NB1/NB2** **in-band operation:** category NB1/NB2 is operating in-band when it utilizes the resource block(s) within a normal E-UTRA carrier or within a normal NR carrier plus 15 kHz at each edge (and not within NR minimum guard band).

**Non-contiguous spectrum:** Spectrum consisting of two or more sub-blocks separated by sub-block gap(s).

**ProSe-enabled UE:** A UE that supports ProSe requirements and associated procedures.

NOTE: As defined in TS 23.303 [10].

**ProSe Direct Communication**: A communication between two or more UEs in proximity that are ProSe-enabled.

NOTE: As defined in TS 23.303 [10].

**ProSe Direct Discovery**: A procedure employed by a ProSe-enabled UE to discover other ProSe-enabled UEs in its vicinity.

NOTE: As defined in TS 23.303 [10].

**sTTI** : A transmission time interval (TTI) of either one slot or one subslot as defined in TS 36.211 [4] on either uplink or downlink.

**Sub-block:** This is one contiguous allocated block of spectrum for transmission and reception by the same UE. There may be multiple instances of sub-blocks within an RF bandwidth.

**Sub-block bandwidth:** The bandwidth of one sub-block.

**Sub-block gap:** A frequency gap between two consecutive sub-blocks within an RF bandwidth, where the RF requirements in the gap are based on co-existence for un-coordinated operation.

**Synchronized operation:** Operation of TDD in two different systems, where no simultaneous uplink and downlink occur.

**Unsynchronized operation:** Operation of TDD in two different systems, where the conditions for synchronized operation are not met.

**Upper sub-block edge:** The frequency at the upper edge of one sub-block. It is used as a frequency reference point for both transmitter and receiver requirements.

**V2X Communication**: V2X (Vehicle to Everything) service is operating in ITS spectrum and/or LTE licensed operating bands.

## 3.2 Symbols

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

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.

BWGB Virtual guard band to facilitate transmitter (receiver) filtering above / below edge CCs.

 Transmitted energy per RE for reference symbols during the useful part of the symbol, i.e. excluding the cyclic prefix, (average power normalized to the subcarrier spacing) at the eNode B transmit antenna connector

 The averaged received energy per RE of the wanted signal during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna connector; average power is computed within a set of REs used for the transmission of physical channels (including user specific RSs when present), divided by the number of REs within the set, and normalized to the subcarrier spacing

F Frequency

Fagg\_alloc\_low Aggregated Transmission Bandwidth Configuration. The lowest frequency of the simultaneously transmitted resource blocks.

Fagg\_alloc\_high Aggregated Transmission Bandwidth Configuration. The highest frequency of the simultaneously transmitted resource blocks.

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)

FC Frequency of the carrier centre frequency

FC\_agg Aggregated Transmission Bandwidth Configuration. Center frequency of the aggregated carriers.

FC,block, high Center frequency of the highest transmitted/received carrier in a sub-block.

FC,block, low Center frequency of the lowest transmitted/received carrier in a sub-block.

FC\_low The centre frequency of the *lowest carrier*, expressed in MHz.

FC\_high The centre frequency 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.

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

Fedge\_low The *lower edge* of aggregated channel bandwidth, expressed in MHz.

Fedge\_high The *higher edge* of aggregated channel bandwidth, expressed in MHz.

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

Foffset,block,low Separation between lower edge of a sub-block and the center of the lowest component carrier within the sub-block

Foffset,block,high Separation between higher edge of a sub-block and the center of the highest component carrier within the sub-block

Foffset\_NS\_23 Frequency offset in MHz needed if NS\_23 is used

FOOB The boundary between the E-UTRA out of band emission and spurious emission domains.

 The power spectral density of the total input signal (power averaged over the useful part of the symbols within the transmission bandwidth configuration, divided by the total number of RE for this configuration and normalised to the subcarrier spacing) at the UE antenna connector, including the own-cell downlink signal

 The total transmitted power spectral density of the own-cell downlink signal (power averaged over the useful part of the symbols within the transmission bandwidth configuration, divided by the total number of RE for this configuration and normalised to the subcarrier spacing) at the eNode B transmit antenna connector

 The total received power spectral density of the own-cell downlink signal (power averaged over the useful part of the symbols within the transmission bandwidth configuration, divided by the total number of RE for this configuration and normalised to the subcarrier spacing) at the UE antenna connector

 The received power spectral density of the total noise and interference for a certain RE (average power obtained within the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector

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

LCtone Transmission bandwidth which represents the length of a contiguous sub-carrier allocation expressed in units of tones

Ncp Cyclic prefix length

NDL Downlink EARFCN

 The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector

 The power spectral density of a white noise source (average power per RE normalized to the subcarrier spacing), simulating interference in non-CRS symbols in ABS subframe from cells that are not defined in a test procedure, as measured at the UE antenna connector.

 The power spectral density of a white noise source (average power per RE normalized to the subcarrier spacing), simulating interference in CRS symbols in ABS subframe from all cells that are not defined in a test procedure, as measured at the UE antenna connector.

 The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference in non-ABS subframe from cells that are not defined in a test procedure, as measured at the UE antenna connector

** The power spectral density (average power per RE normalised to the subcarrier spacing) of the summation of the received power spectral densities of the strongest interfering cells explicitly defined in a test procedure plus **, as measured at the UE antenna connector. The respective power spectral density of each interfering cell relative to ** is defined by its associated DIP value, or the respective power spectral density of each interfering cell relative to  is defined by its associated Es/Noc value.

NOffs-DL Offset used for calculating downlink EARFCN

NOffs-UL Offset used for calculating uplink EARFCN

 The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing) simulating eNode B transmitter impairments as measured at the eNode B transmit antenna connector

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.

NRB\_alloc Total number of simultaneously transmitted resource blocks in Channel bandwidth or Aggregated Channel Bandwidth.

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

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

NRX Number of receiver antennas

Ntone Transmission bandwidth configuration for category NB1 and NB2, expressed in units of tones.

Ntone 3.75kHz Transmission bandwidth configuration for category NB1 and NB2 with 3.75 kHz sub-carrier spacing, expressed in units of tones.

Ntone 15kHz  Transmission bandwidth configuration for category NB1 and NB2 with 15 kHz sub-carrier spacing, expressed in units of tones.

NUL Uplink EARFCN.

Rav Minimum average throughput per RB.

PCMAX The configured maximum UE output power.

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

PEMAX Maximum allowed UE output power signalled by higher layers. Same as IE *P-Max,* defined in [7].

PEMAX, *c* Maximum allowed UE output power signalled by higher layers for serving cell *c*. Same as IE
*P-Max,* defined in [7].

PInterferer Modulated mean power of the interferer

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

PPowerClass\_Default PPowerClass\_Default is the default nominal UE power (i.e., no tolerance) for the band.

PUMAX The measured configured maximum UE output power.

Puw Power of an unwanted DL signal

Pw Power of a wanted DL signal

RBstart Indicates the lowest RB index of transmitted resource blocks.

RBend Indicates the highest RB index of transmitted resource blocks.

Tno\_hopping Transmission period within a TTI duration when consecutive symbols are transmitted without applying any frequency hopping

ΔfOOB Δ Frequency of Out Of Band emission.

ΔPPowerClass Adjustment to maximum output power for a given power class.

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.

ΔRIB,8R Reference sensitivity adjustment due to support for 8 antenna ports.

ΔTIB,c Allowed maximum configured output power relaxation due to support for inter-band CA operation, for serving cell *c*.

TC Allowed operating band edge transmission power relaxation.

TC,*c*Allowed operating band edge transmission power relaxation for serving cell *c*.

TProSe Allowed operating band transmission power relaxation due to support of E-UTRA ProSe on an operating band.

 According to Clause 5.2 in TS 36.213 [6]

 According to Clause 5.2 in TS 36.213 [6]

σ Test specific auxiliary variable used for the purpose of downlink power allocation, defined in Annex C.3.2.

Wgap Sub-block gap size

Wgap\_L Sub-block gap size between lowest two CCs in frequency domain on CA\_X-X-X

Wgap\_H Sub-block gap size between highest two CCs in frequency domain on CA\_X-X-X

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

ABS Almost Blank Subframe

ACLR Adjacent Channel Leakage Ratio

ACS Adjacent Channel Selectivity

A-MPR Additional Maximum Power Reduction

AWGN Additive White Gaussian Noise

BS Base Station

CA Carrier Aggregation

CA\_X Intra-band contiguous CA of component carriers in one sub-block within Band X where X is the applicable E-UTRA operating band

CA\_X-X Intra-band non-contiguous CA of component carriers in two sub-blocks within Band X where X is the applicable E-UTRA operating band

CA\_X-X-X Intra-band non-contiguous CA of component carriers in three sub-blocks within Band X where X is the applicable E-UTRA operating band

CA\_X-X-X-X Intra-band non-contiguous CA of component carriers in four sub-blocks within Band X where X is the applicable E-UTRA operating band

CA\_X-Y Inter-band CA of component carrier(s) in one sub-block within Band X and component carrier(s) in one sub-block within Band Y where X and Y are the applicable E-UTRA operating band

CA\_X-X-Y CA of component carriers in two sub-blocks within Band X and component carrier(s) in one sub-block within Band Y where X and Y are the applicable E-UTRA operating bands

CC Component Carriers

CG Carrier Group

CPE Customer Premise Equipment

CPE\_X Customer Premise Equipment for E-UTRA operating band X

CW Continuous Wave

DC Dual Connectivity

DC\_X-Y Inter-band DC of component carrier(s) in one sub-block within Band X and component carrier(s) in one sub-block within Band Y where X and Y are the applicable E-UTRA operating band

DL Downlink

DIP Dominant Interferer Proportion

EARFCN E-UTRA Absolute Radio Frequency Channel Number

EIRP Effective Isotropic Radiated Power

EPRE Energy Per Resource Element

E-UTRA Evolved UMTS Terrestrial Radio Access

EUTRAN Evolved UMTS Terrestrial Radio Access Network

EVM Error Vector Magnitude

FDD Frequency Division Duplex

FRC Fixed Reference Channel

GNSS Global Navigation Satellite Systems

HD Half-Duplex for Sidelink Operation

HD-FDD Half- Duplex FDD

ITS Intelligent Transportation Systems

MCS Modulation and Coding Scheme

MCG Master Cell Group

MetSat Meteorological Satellite

MOP Maximum Output Power

MPR Maximum Power Reduction

MSD Maximum Sensitivity Degradation

OCNG OFDMA Channel Noise Generator

OFDMA Orthogonal Frequency Division Multiple Access

OOB Out-of-band

PA Power Amplifier

PCC Primary Component Carrier

P-MPR Power Management Maximum Power Reduction

ProSe Proximity-based Services

PSBCH Physical Sidelink Broadcast CHannel

PSCCH Physical Sidelink Control CHannel

PSDCH Physical Sidelink Discovery CHannel

PSS Primary Synchronization Signal

PSS\_RA PSS-to-RS EPRE ratio for the channel PSS

SSSS Secondary Sidelink Synchronization Signal

PSSCH Physical Sidelink Shared CHannel

PSSS Primary Sidelink Synchronization Signal

RAS Radar Absorbing Structure

RE Resource Element

REFSENS Reference Sensitivity power level

r.m.s Root Mean Square

SCC Secondary Component Carrier

SCG Secondary Cell Group

SINR Signal-to-Interference-and-Noise Ratio

SNR Signal-to-Noise Ratio

SSS Secondary Synchronization Signal

SSS\_RA SSS-to-RS EPRE ratio for the channel SSSSSSS Secondary Sidelink Synchronization Signal

TDD Time Division Duplex

UAV Uncrewed Aerial Vehicle

UE User Equipment

UL Uplink

UL-MIMO Up Link Multiple Antenna transmission

UMTS Universal Mobile Telecommunications System

UTRA UMTS Terrestrial Radio Access

UTRAN UMTS Terrestrial Radio Access Network

V2X Vehicle to Everything

xCH\_RA xCH-to-RS EPRE ratio for the channel xCH in all transmitted OFDM symbols not containing cell-specific RS

xCH\_RB xCH-to-RS EPRE ratio for the channel xCH in all transmitted OFDM symbols containing cell-specific RS

# 4 General

## 4.1 Relationship between minimum requirements and test requirements

The Minimum Requirements given in this specification make no allowance for measurement uncertainty. The test specification TS 36.521-1 Annex F defines Test Tolerances. These Test Tolerances are individually calculated for each test. The Test Tolerances are used to relax the Minimum Requirements in this specification to create Test Requirements.

The measurement results returned by the Test System are compared - without any modification - against the Test Requirements as defined by the shared risk principle.

The Shared Risk principle is defined in ITU-R M.1545 [3].

## 4.2 Applicability of minimum requirements

a) In this specification the Minimum Requirements are specified as general requirements and additional requirements. Where the Requirement is specified as a general requirement, the requirement is mandated to be met in all scenarios

b) For specific scenarios for which an additional requirement is specified, in addition to meeting the general requirement, the UE is mandated to meet the additional requirements.

c) The reference sensitivity power levels defined in subclause 7.3 are valid for the specified reference measurement channels.

d) NOTE: Receiver sensitivity degradation may occur when:

1) The UE simultaneously transmits and receives with bandwidth allocations less than the transmission bandwidth configuration (see Figure 5.6-1), and

2) Any part of the downlink transmission bandwidth is within an uplink transmission bandwidth from the downlink center subcarrier.

e) The spurious emissions power requirements are for the long term average of the power. For the purpose of reducing measurement uncertainty it is acceptable to average the measured power over a period of time sufficient to reduce the uncertainty due to the statistical nature of the signal.

f) The requirements in this specification for TDD operating bands apply for downlink and uplink operations using Frame Structure Type 2 [4] except for Band 46 operating with Frame Structure Type 3.

g) The requirements related to subslot TTI and/or slot TTI shall apply only if UE supports multiple TTI patterns. And these requirements only apply to subslot and/or slot TTI configurations

## 4.3 Void

## 4.3A Applicability of minimum requirements (CA, UL-MIMO, ProSe, Dual Connectivity, UE category 0, UE category M1, UE category M2, UE category 1bis, UE category NB1 and NB2, V2X Communication, MBMS UE, Aerial UE)

The requirements in clauses 5, 6 and 7 which are specific to CA, UL-MIMO, ProSe, Dual Connectivity, UE category 0, UE category M1, UE category M2, UE category 1bis, UE category NB1 and NB2, V2X Communication or Aerial UE are specified as suffix A, B, C, D, E, F and G to H, where:

a) Suffix A additional requirements need to support CA

b) Suffix B additional requirements need to support UL-MIMO

c) Suffix C additional requirements need to support Dual Connectivity

d) Suffix D additional requirements need to support ProSe

e) Suffix E additional requirements need to support UE category 0, category M1, category M2, and category 1bis

f) Suffix F additional requirements need to support UE category NB1 and NB2

g) Suffix G additional requirements need to support V2X Communication

h) Suffix H additional requirements need to support Aerial UE

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

A terminal which supports more than one feature (CA, UL-MIMO, ProSe, Dual Connectivity, UE category 0, UE category M1, UE category M2, UE category 1bis, UE category NB1 and NB2, V2X Communication, or Aerial UE) in clauses 5, 6 and 7 shall meet all of the separate corresponding requirements.

For a terminal supporting CA, compliance with minimum requirements for non-contiguous intra-band carrier aggregation in any given operating band does not imply compliance with minimum requirements for contiguous intra-band carrier aggregation in the same operating band.

For a terminal supporting CA, compliance with minimum requirements for contiguous intra-band carrier aggregation in any given operating band does not imply compliance with minimum requirements for non- contiguous intra-band carrier aggregation in the same operating band.

A terminal which supports a DL CA configuration shall support all the lower order fallback DL CA combinations and it shall support at least one bandwidth combination set for each of the constituent lower order DL combinations containing all the bandwidths specified within each specific combination set of the upper order DL combination.

A terminal which supports CA, for each supported CA configuration, shall support Pcell transmissions in each of the aggregated Component Carriers unless indicated otherwise in clause 5.6A.1.

Terminal supporting Dual Connectivity configuration shall meet the minimum requirements for corresponding CA configuration (suffix A), unless otherwise specified.

For a terminal that supports ProSe Direct Communication and/or ProSe Direct Discovery, the minimum requirements are applicable when

- the UE is associated with a serving cell on the ProSe carrier, or

- the UE is not associated with a serving cell on the ProSe carrier and is provisioned with the preconfigured radio parameters for ProSe Direct Communications and/or ProSe Direct Discovery that are associated with known Geographical Area, or

- the UE is associated with a serving cell on a carrier different than the ProSe carrier, and the radio parameters for ProSe Direct Discovery on the ProSe carrier are provided by the serving cell, or

- the UE is associated with a serving cell on a carrier different than the ProSe carrier, and has a non-serving cell selected on the ProSe carrier that supports ProSe Direct Discovery and/or ProSe Direct Communication.

When the ProSe UE is not associated with a serving cell on the ProSe carrier, and the UE does not have knowledge of its geographical area, or is provisioned with preconfigured radio parameters that are not associated with any Geographical Area, ProSe transmissions are not allowed, and the requirements in Section 6.3.3D apply.

A terminal that supports simultaneous E-UTRA ProSe sidelink transmissions and E-UTRA uplink transmissions for the inter-band E-UTRA ProSe/E-UTRA bands specified in Table 5.5D-2, shall meet the minimum requirements for the corresponding inter-band UL CA configuration (suffix A), unless otherwise specified. For transmitter characteristics specified in clause 6, the terminal is required to meet the conformance tests for the corresponding inter-band UL CA configuration and is not required to be retested with simultaneous E-UTRA ProSe sidelink and E-UTRA uplink transmissions.

A terminal that supports E-UTRA V2X intra-band multi-carrier operation including carrier aggregation for the band specified in Table 5.5G-3, shall meet the corresponding transmitter characteristics requirements (in subclauses with suffix G in Section 6) only when there are multiple active transmissions on all of the configured carrier components. When there is only one active transmission on one of the configured carrier components, the corresponding requirements for V2X single carrier operation apply for the corresponding active carrier component.

A terminal which supports MBMS (including 15 kHz, 7.5 kHz ,1.25 kHz, 2.5 kHz and 0.37 kHz subcarrier spacing), shall meet the minimum requirements in clauses 5 and 7. A terminal which supports MBMS is not required to support all kinds of subcarrier spacing.

A terminal that supports multiple TTI patterns in different carriers, different TTI patterns can only be used when the carriers are aggregated in inter-band manner. For intra-band carrier aggregation, only same TTI patterns and same TAG are allowed in aggregated carriers.

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