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**LTE;**
**Evolved Universal Terrestrial Radio Access (E-UTRA);**
**Requirements on User Equipments (UEs)**
**supporting a release-independent frequency band**
**(3GPP TS 36.307 version 14.11.0 Release 14)**


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# Contents

# Foreword

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# 1 Scope

The present document specifies requirements for Rel-14 UEs supporting release independent features like:

- additional E-UTRA operating frequency bands on top of Rel-14 of TS 36.101 [2] and TS 36.133 [3];
- additional E-UTRA CA configurations (intra-band/inter-band) on top of Rel-14 of TS 36.101 [2] and TS 36.133 [3];
- additional operating bands and/or CA configurations for specific features (like UE category 0, M1, NB1);
- other release independent features (like 4Rx antenna port, high speed scenario, 8Rx antenna port).

# 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.
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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) Radio Transmission and Reception".

NOTE: The considered release is given in the text of the present document that uses [2].

[3] 3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for Support of Radio Resource Management".

[4] 3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities".

NOTE: The considered release is given in the text of the present document that uses [4].

[5] Void

# 3 Definitions 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].

**release independent**: applicable to some frozen releases, starting from a certain release Rel-M

NOTE 1: Normally, a feature is introduced only in the latest open release Rel-N and future releases are based on the previous one so that future releases inherit the requirements of this feature. Introducing a feature "in a release independent way from Rel-M onwards" (M<N) means it was decided by TSG RAN that this feature would be also beneficial in previous, already frozen releases starting with Rel-M until Rel-(N-1). In order to avoid touching TS 36.101 [2] or TS 36.133 [3] of these frozen releases, the corresponding requirements are captured in TS 36.307 via pointers to [2] or [3] of the release in which the feature was introduced.

NOTE 2: Release independent does not mean applicable to all releases.

## 3.2 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].

| | |
|---|---|
| 4Rx | 4 UE receiver antenna ports |
| CA | Carrier Aggregation |
| CRS | Cell-specific Reference Signal |
| CSI | Channel State Indicator |
| FDD | Frequency Division Duplex |
| LAA | License-Assisted Access |
| RRC | Radio Resource Control |
| RRM | Radio Resource Management |
| SDR | Sustained Data Rate |
| TDD | Time Division Duplex |
| UE | User Equipment |

## 3.3 Symbols

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

| | |
|---|---|
| N | Release in which a feature is introduced into TS 36.101 [2] or TS 36.133 [3] |
| M | Release from which onwards (including release M) a feature is release independent |

# 3A Release independent features

## 3A.0 General

TSG-RAN has agreed for certain features (see the following clauses) to introduce them in a "release independent way".

This means for each feature:

- it is "introduced" in a release N, i.e. TS 36.101 [2] and TS 36.133 [3] of release N define certain UE requirements for this feature; the feature is indicated in the tables of the following clauses;
- it is "release independent" starting from a release M (M<N); M for the given feature is provided in the tables of the following clauses;
- UEs supporting this feature have to fulfill additional requirements in release M or higher which are specified in one or more Annexes of TS 36.307 of release N; the applicable Annexes for a given feature are provided in the tables of the following clauses.

The applicable UE Categories are specified in TS 36.306 [4] according to the release to which the UE conforms.

## 3A.1 Additional E-UTRA operating bands

Requirements for a Rel-14 UE for additional E-UTRA operating bands compared to TS 36.101 Rel-14 [2] are introduced via this clause.

**Table 3A.1-1: E-UTRA operating bands and UE power class**

| Feature | Duplex-mode | Release independent from | Requirements to be fulfilled (see TS 36.307 of the release in which the band was introduced) |
|---|---|---|---|
| Operating bands, band number <= 64, Power Class 3 | FDD, TDD | Rel-8 | Table B.2.1-1, Table B.4.1-1 |
| Operating bands, band number > 64, Power Class 3 | FDD, TDD | Rel-9 | Table B.2.1-1, Table B.4.1-1 |
| Operating bands, NS-value > 32 | FDD, TDD | Rel-10 | Table B.2.1-1, Table B.4.1-1 |
| Asymmetric operating bands, Power Class 3 | FDD | Rel-10 | Table B.2.1-1, Table B.4.1-1 |
| Operating bands, band number <= 64, Power Class 1 | FDD | Rel-10 | Table B.2.1-1, Table B.4.1-1 |
| Operating bands, Power Class 2 | TDD | Rel-10 | Table B.2.1-1, Table B.4.1-1 |

For example, Band 19 was introduced in the Release 9 specifications. In order to implement a UE conforming to Release 8 but supporting Band 19, it is necessary for the UE to additionally conform to some parts of the Release 9 specifications (see corresponding Annexes of TS 36.307 Rel-9 which will point to the requirements in the Rel-9 of TS 36.101 [2] or TS 36.133 [3] to be fulfilled), such as the radio frequency and radio resource management requirements for the Band 19.

# 3A.2 Additional E-UTRA CA configurations

Requirements for a Rel-14 UE for additional E-UTRA CA configurations compared to TS 36.101 Rel-14 [2] are introduced via this clause.

**Table 3A.2-1: Intra-band contiguous CA configurations and UE CA power class**

| Feature | DL/UL | CA BW Class | Duplex-mode | Release independent from | requirements to be fulfilled (see 36.307 of the REL in which the CA configuration and the power class were introduced) |
|---|---|---|---|---|---|
| Intra-band contiguous CA configurations, power class 3 | DL | B | FDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | | C | FDD, TDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | | D | TDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | | E | TDD | Rel-11 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | | F | TDD | Rel-12 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | UL | B | FDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| | | C, D | FDD, TDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| Intra-band contiguous CA configurations, power class 2 | UL | C | TDD | Rel-10 | Table B.2.2-1, Table B.3.2-1, Table B.4.2-1 |
| NOTE1: The duplex mode "FDD, TDD" refers to a CA configuration composed by only FDD bands or only TDD bands, respectively. | | | | | |

**Table 3A.2-2: Inter-band CAconfigurations**

| Feature | DL/UL | number of bands | number of CCs | CA BW Classes | Duplex-mode | Release independent from | requirements to be fulfilled (see 36.307 of the REL in which the CA configuration was introduced) |
|---|---|---|---|---|---|---|---|
| Inter-band CA configurations | DL | 2 | 2-4 | A, B, C | FDD, TDD | Rel-10 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 2-5 | D, E | FDD, TDD | Rel-11 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 2-5 | A, B, C, D, E | FDD and TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | A, C, D, E, F | FDD, TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | | FDD and TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | 3 | 3 | A | FDD, TDD | Rel-10 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 3-5 | B, C, D | FDD, TDD | Rel-11 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 3 | A | FDD and TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | A, C, D, E, F | FDD, TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | | FDD and TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | 4 | 4-5 | A, C | FDD, TDD | Rel-11 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 4-5 | | FDD and TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | A, C, D, E, F | FDD, TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | | FDD and TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | 5 | 5 | A | FDD, TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 5 | | FDD and TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | A, C, D, E, F | FDD, TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | | 6-7 | | FDD and TDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | | 6 | 6 | A | FDD | Rel-14 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| | UL | 2 | 2-4 | A, C | FDD, TDD | Rel-11 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2-3 | A, C | FDD and TDD | Rel-12 | Table B.2.4-1, Table B.3.2-1, Table B.4.3-1 or Table B.4.4-1 |
| NOTE 1: The duplex mode "FDD, TDD" refers to a CA configuration composed by only FDD bands or only TDD bands, respectively. The duplex mode "FDD and TDD" refers to a CA configuration including both FDD and TDD bands.<br>NOTE 2: CA configurations involving downlink only operation in Band 46 are release independent from Rel-13 onwards (LAA was introduced in Rel-13). The 10 MHz channel bandwidth for Band 46 was introduced in TS 36.101 Rel-14 [2] and can be implemented in a release independent way from Rel-13. | | | | | | | |

For example, CA configuration CA_1A-19A was introduced in the Release 11 specifications. In order to implement a UE conforming to Release 10 but supporting the CA configuration CA_1A-19A, it is necessary for the UE to additionally conform to some parts of the Release 11 specifications (see corresponding Annexes of TS 36.307 Rel-11 which will point to the requirements in the Rel-11 of TS 36.101 [2] or TS 36.133 [3] to be fulfilled), such as the radio frequency and radio resource management requirements for the CA configuration CA_1A-19A.

**Table 3A.2-3: Intra-band non-contiguous CA configurations**

| Feature | DL/UL | number of sub-blocks | number of CCs | CA BW Classes | Duplex-mode | Release independent from | requirements to be fulfilled (see 36.307 of the REL in which the CA configuration was introduced) |
|---|---|---|---|---|---|---|---|
| Intra-band non-contiguous CA configurations | DL | 2 | 2-5 | A, C, D | FDD, TDD | Rel-11 | Table B.2.3-1, Table B.3.2-1, Table B.4.5-1 |
| | | 3 | 3-5 | A, C | FDD, TDD | Rel-11 | Table B.2.3-1, Table B.3.2-1, Table B.4.5-1 |
| | UL | 2 | 2 | A | FDD | Rel-11 | Table B.2.3-1, Table B.3.2-1, Table B.4.5-1 |
| NOTE 1: The duplex mode "FDD, TDD" refers to a CA configuration composed by only FDD bands or only TDD bands, respectively. | | | | | | | |

# 3A.3 Additional operating bands and/or CA configurations for specific features

For a specific feature introduced in an earlier release, it may be decided in a later release to apply this specific feature in a release independent way for additional operating bands and/or CA configurations. For a Rel-14 UE corresponding requirements are then introduced via this clause.

**Table 3A.3-1: Operating bands for specific features**

| Feature | Release independent from | Requirements to be fulfilled (see 36.307 of the REL when the feature was introduced) | Further information |
|---|---|---|---|
| Operating bands for UE category 0 | Rel-12 | Table B.2.9-1, Table B.3.5-1, Table B.4.10-1 | Rel-14 WI LC_MTC_LTE_cat0_B25_B26-Core introduced RF, RRM, demodulation and CSI requirements for bands 25 and 26, see Table B.2.9-1, Table B.3.5-1, Table B.4.10-1 |
| Operating bands for UE category M1 | Rel-13 | Table B.2.10-1, Table B.3.6-1, Table B.4.11-1 | Rel-14 WI LTE_MTCe2_L1_cat1_B25_B40-Core introduced RF, RRM, demodulation and CSI requirements for bands 25 and 40, see Table B.2.10-1, Table B.3.6-1, Table B.4.11-1.<br>Rel-15 WI LTE_bands_R15_M1_NB1-Core introduced RF, RRM, demodulation and CSI requirements for bands 14 and 71, see Table B.2.10-1, Table B.3.6-1, Table B.4.11-1.<br>Rel-17 WI LTE_bands_R17_M1_M2_NB1_NB2 introduced RF, RRM, demodulation for band 24, see Table B.2.10-1, Table B.3.6-1, Table B.4.11-1. |
| Operating bands for UE category M2 | Rel-14 | Table B.2.11-1, Table B.3.6-1, Table B.4.11-1 | Rel-15 WI LTE_bands_R15_M2_NB2-Core introduced RF and RRM requirements for bands 14 and 71, see Table B.2.11-1, Table B.4.11-1.<br>Rel-17 WI LTE_bands_R17_M1_M2_NB1_NB2 introduced RF, RRM, demodulation for band 24, see Table B.2.11-1, Table B.3.6-1, Table B.4.11-1. |
| Operating bands for UE category NB1 | Rel-13 | Table B.2.8-1, Table B.3.7-1, Table B.4.9-1 | Rel-14 WI NB_IOT_R14_bands introduced RF, RRM and demodulation requirements for bands 11, 21, 25, 31, 70, see Table B.2.8-1, Table B.3.7-1, Table B.4.9-1.<br>Rel-15 WI LTE_bands_R15_M1_NB1-Core introduced RF, RRM and demodulation for bands 4, 14 and 71 see Table B.2.8-1, Table B.3.7-1, Table B.4.9-1.<br>Rel-16 WI LTE_bands_R16_M1_NB1 introduced RF, RRM, demodulation for band 65, see Table B.2.8-1, Table B.3.7-1, Table B.4.9-1.<br>Rel-17 WI LTE_bands_R17_M1_M2_NB1_NB2 introduced RF, RRM, demodulation for band 24, see Table B.2.8-1, Table B.3.7-1, Table B.4.9-1. |
| Operating bands for UE category NB2 | Rel-14 | Table B.2.12-1, Table 3.7-1, Table B.4.9-1 | Rel-15 WI LTE_bands_R15_M2_NB2-Core introduced RF, RRM and demodulation requirements for bands 4, 14 and 71, see Table B.2.12-1, Table 3.7-1, Table B.4.9-1.<br>Rel-16 WI LTE_bands_R16_M2_NB2 introduced RF, RRM, demodulation for band 65 , see Table B.2.12-1, Table B.3.7-1, Table B.4.9-1.<br>Rel-17 WI LTE_bands_R17_M1_M2_NB1_NB2 introduced RF, RRM, demodulation for band 24, see Table B.2.8-1, Table B.3.7-1, Table B.4.9-1. |

**Table 3A.3-2: CA configurations for specific features**

| Feature | Release independent from | Requirements to be fulfilled (see 36.307 of the REL when the feature was introduced) | Further information |
|---|---|---|---|
| Operating bands for V2X communication with con-current operation | Rel-14 | Table B.2.13-1, Table B.4.12-1 | Rel-15 WI V2X new band combinations (V2X_5A-47A, V2X_20A-47A, V2X_34A-47A, V2X_28A-47A, V2X_71A-47A) introduced and should be satisfied for the RF and RRM requirements in Table B.2.13-1, Table B.4.12-1 |
| Operating band for V2X communication with multi-carrier at Band 47 | Rel-14 | Table B.2.13-1, Table B.4.12-1 | In Rel-15 WI for eV2X, introduce intra-band multi-carrier V2X_47C and V2X_47C1 and should be satisfied for the RF and RRM requirements in Table B.2.13-1, Table B.4.12-1 |

# 3A.4 Other release independent features

This clause covers requirements for a Rel-14 UE coming from all other release independent features that are not covered under clause 3A.1, 3A.2 and 3A.3, e.g. generic baseband requirements or requirements that are not band/CA configuration specific.

**Table 3A.4-1: Additional requirements of other release independent features**

| Feature | Release independent from | Requirements to be fulfilled (see 36.307 of the REL when the feature was introduced) | Further information |
|---|---|---|---|
| RF and performance requirements for 4Rx UEs | Rel-10 | Table C.1-1, Table C.2-1 for single carrier and Table C.1-2, Table C.2-2 for CA | REL-13 WI LTE_4Rx_AP_DL introduced:<br>- single carrier RF requirements for bands 1, 2, 3, 7, 20, 39, 41, 42: see Table C.1-1<br>- CA RF requirements for CA_3A-42A and other 1UL CA configurations (see TS 36.101 REL-13 [2] Table 7.3.1A-0a NOTE 20): see Table C.1-2<br>- single carrier performance requirements for demodulation and CSI: see Table C.2-1<br>REL-14 WI LTE_4Rx_AP_DL_bands introduced:<br>- single carrier RF requirements for band 35, 40: see Table C.1-1<br>- CA RF requirements for some further 1UL CA configurations (see TS 36.101 REL-14 [2]): see Table C.1-2<br>REL-14 WI LTE_4Rx_AP_DL_CA introduced:<br>- CA RF requirements for some 2DL/2UL CA configurations (see TS 36.101 REL-14 [2]): see Table C.1-2<br>- CA performance requirements for demodulation/SDR and CSI: see Table C2-2<br>REL-15 WI LTE_4Rx_AP_DL_bands_R15 introduced:<br>- single carrier RF requirements for band 4, 34, 43, 66: see Table C.1-1<br>- CA RF requirements for some further 1UL CA configurations (see TS 36.101 REL-15 [2]): see Table C.1-2 |
| RF and performance requirements for 8Rx UEs | Rel-13 | Table E.1-1, Table E.2-1 for single carrier and Table E.1-2, Table E.2-2 for CA | REL-15 WI LTE_8Rx_AP_DL introduced:<br>- single carrier RF requirements for band 41, 42,43: see Table E.1-1<br>- CA RF requirements for CA_41C, CA_42C and CA_41A-42A CA configurations (see TS 36.101 REL-15 [2]): see Table E.1-2<br>- single carrier performance requirements for demodulation and CSI: see Table E.2-1<br>- CA performance requirements for demodulation/SDR: see Table E.2-2 |
| RRM and demodulation requirements for high speed scenario | Rel-13 (NOTE 1) | Table D.1-1, Table D.2-1 | Rel-14 WI LTE_high_speed introduced band independent RRM and demodulation requirements. see Table D.1-1, Table D.2-1 |
| NOTE 1: Rel-13 UEs supporting the high speed scenario are assumed to read the Rel-14 high speed scenario information, which is broadcast to all UEs. | | | |

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# Annex A (informative) : Frequency arrangement for overlapping operating bands

The following information is provided in order to assist a UE derive the DL EARFCN and UL EARFCN in a multi-band environment, in which multiple overlapping operating bands may be indicated in the fields *freqBandIndicator* and *multiBandInfoList* of SIB1.

The overlapping bands, independent of release, which may be indicated in a cell are shown in Table A-1 for applicable E-UTRA bands. The DL EARFCN and UL EARFCN are derived according to TS 36.101 Rel-14 [2].

**Table A-1: Overlapping bands (multi-band environments) for each E-UTRA band**

| E-UTRA Operating Band | Overlapping E-UTRA operating bands | Duplex Mode |
|---|---|---|
| 2 | 25 | FDD |
| 3 | 9 | FDD |
| 4 | 10, 66 | FDD |
| 5 | 18, 19, 26 | FDD |
| 9 | 3 | FDD |
| 10 | 4, 66 | FDD |
| 12 | 17 | FDD |
| 17 | 12 | FDD |
| 18 | 5, 26, 27 | FDD |
| 19 | 5, 26 | FDD |
| 25 | 2 | FDD |
| 26 | 5, 18, 19, 27 | FDD |
| 27 | 18, 26 | FDD |
| 33 | 39 | TDD |
| 38 | 41 | TDD |
| 39 | 33 | TDD |
| 41 | 38 | TDD |
| 66 | 4, 10 | FDD |

# Annex B (normative): Common Requirements for bands or CA

## B.1 Purpose of annex

The purpose of Annex B is to group the requirements that are common for several bands or CA configurations in this specification and use the common tables as references.

## B.2 Common RRM requirements

### B.2.1 Common RRM requirements for a release independent band

The requirements and test cases listed in Table B.2.1-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.1-1: Common RRM requirements for a release independent band**

| Section / Clause | Description |
|---|---|
| 4 Note 1 | E-UTRAN RRC_IDLE state mobility |
| 5 | E-UTRAN RRC_CONNECTED state mobility |
| 6 Note 2 | RRC Connection Mobility Control |
| 7 Note 3 | Timing and signalling characteristics |
| 8 Note 4 | UE Measurements Procedures in RRC_CONNECTED State |
| 9 Note 5 | Measurements performance requirements for UE |
| A.4 Note 1 | E-UTRAN RRC_IDLE state |
| A.5 | E-UTRAN RRC CONNECTED Mode Mobility |
| A.6 Note 2 | RRC Connection Control |
| A.7 Note 3 | Timing and Signalling Characteristics |
| A.8 Note 4 | UE Measurements Procedures |
| A.9 Note 5 | Measurement Performance Requirements |

NOTE 1: All requirements and the corresponding test cases shall apply, except:
- for supporting the corresponding band in Rel-9 and below: clause 4.3 (Minimization of Drive Tests).

NOTE 2: All requirements and the corresponding test cases shall apply, except:
- for supporting the corresponding band in Rel-8: clauses 6.3 (RRC Connection Release with Redirection), 6.4 (CSG Proximity Indication for E-UTRAN and UTRAN).

NOTE 3: All requirements and corresponding test cases shall apply, except those defined in sections 7.4 and 7.5.

NOTE 4: All requirements and corresponding test cases shall apply, except:
- for supporting the corresponding band in Rel-8: clauses 8.1.2.5 (E-UTRAN OTDOA Intra-Frequency RSTD Measurements), 8.1.2.6 (E-UTRAN Inter-Frequency OTDOA Measurements), 8.1.2.7 (E-UTRAN E-CID Measurements).

NOTE 5: All requirements and corresponding test cases shall apply, except:
- for supporting the corresponding band in Rel-8: clauses 9.1.9 (UE Rx–Tx time difference), 9.1.10 (Reference Signal Time Difference).
- for supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.
- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB.

NOTE 6: In addition to the exceptions above, all requirements and test cases in this table shall apply, except those defined for:
- carrier aggregation;
- for supporting the corresponding band in Rel-9 or below: measurements under time-domain measurement resource restriction without CRS assistance information;
- for supporting the corresponding band in Rel-10 or below: measurements under time-domain measurement resource restriction with CRS assistance information;
- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.

## B.2.2 Common RRM requirements for an intra-band contiguous CA configuration

The requirements and test cases listed in Table B.2.2-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.2-1: Common RRM requirements for a release independent single-band CA configuration**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| A.7 | Timing and Signalling Characteristics |
| A.8 | UE Measurements Procedures |
| A.9 Note 3 | Measurement Performance Requirements |
| NOTE 1: Only requirements and test cases defined for intra-band contiguous carrier aggregation shall apply.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.<br>- For supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.3 Common RRM requirements for an intra-band non-contiguous CA with single uplink configuration

The requirements and test cases listed in Table B.2.3-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.3-1: Common RRM requirements for a release independent single-band CA configuration**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| A.7 | Timing and Signalling Characteristics |
| A.8 | UE Measurements Procedures |
| A.9 Note 3 | Measurement Performance Requirements |
| NOTE 1: Only requirements and test cases defined for intra-band non-contiguous carrier aggregation with single uplink shall apply.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB<br>- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.4 Common RRM requirements for an inter-band CA with single uplink configuration

The requirements and test cases listed in Table B.2.4-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.4-1: Common RRM requirements for a release independent band-combination CA configuration**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| A.7 | Timing and Signalling Characteristics |
| A.8 | UE Measurements Procedures |
| A.9 Note 3 | Measurement Performance Requirements |
| NOTE 1: Only requirements and test cases defined for inter-band with single uplink carrier aggregation shall apply.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.<br>- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.5 Common RRM requirements for an inter-band CA with dual uplink configuration

The requirements and test cases listed in Table B.2.5-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.5-1: Common RRM requirements for a release independent band-combination CA configuration with dual uplink**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 7.17 | Maximum Transmission Timing Difference in Dual Connectivity |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| A.7 | Timing and Signalling Characteristics |
| A.8 | UE Measurements Procedures |
| A.9 Note 3 | Measurement Performance Requirements |
| NOTE 1: Only requirements and test cases defined for inter-band with dual uplink carrier aggregation shall apply.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.<br>- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.6 Common RRM requirements for an intra-band non-contiguous CA with dual uplink configuration

The requirements and test cases listed in Table B.2.6-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.6-1: Common RRM requirements for a release independent single-band CA configuration with dual uplink**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 7.17 | Maximum Transmission Timing Difference in Dual Connectivity |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| A.7 | Timing and Signalling Characteristics |
| A.8 | UE Measurements Procedures |
| A.9 Note 3 | Measurement Performance Requirements |
| NOTE 1: Only requirements and test cases defined for intra-band non-contiguous carrier aggregation with dual uplinks shall apply.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.<br>- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.7 Common RRM requirements for an inter-band CA with three uplink configuration

The requirements and test cases listed in Table B.2.7-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.7-1: Common RRM requirements for a release independent band-combination CA configuration with three uplink**

| Section / Clause | Description |
|---|---|
| 7.1 | UE transmit timing |
| 7.7 | SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation |
| 7.8 | Interruptions with Carrier Aggregation |
| 7.17 | Maximum Transmission Timing Difference in Dual Connectivity |
| 8.2 | Capabilities for Support of Event Triggering and Reporting Criteria |
| 8.3 | Measurements for E-UTRA carrier aggregation |
| 8.4 | OTDOA RSTD Measurements for E-UTRAN carrier aggregation |
| 9.1.11 Note 3 | Carrier aggregation measurement accuracy |
| 9.1.12 | Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation |
| NOTE 1: Only requirements defined for three uplink carrier aggregation shall apply. There are no test cases defined with a three uplink carrier aggregation configuration.<br>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:<br>- for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.<br>NOTE 3: - For supporting the corresponding band in Rel-11 or below: the RSRP absolute accuracy requirement under normal conditions in table 9.1.2.1-1, 9.1.2.3-1, 9.1.2.5-1 and 9.1.3.1-1 when Io≤-70dBm is ±6dB.<br>- for supporting the corresponding band in Rel-11 or below: the interfrequency RSRP relative accuracy requirement under normal conditions in table 9.1.3.2-1 is ±6dB. | |

## B.2.8 Common RRM requirements for operating bands for UE category NB1

The requirements and test cases listed in Table B.2.8-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.8-1: Common RRM requirements for release independent operating bands for UE category NB1**

| Section / Clause | Description |
|---|---|
| 4.6 | Cell Selection and Reselection Requirements for UE category NB1 |
| 6.6 | Random Access for UE category NB1 |
| 7.23 | Radio Link Monitoring for category NB1 UE |
| 8.14 | Measurements for UE category NB1 |
| 9.1.22 | Measurement accuracy for UE Category NB1 |
| 9.1.23 | Power Headroom for UE category NB1 |
| NOTE 1: Only requirements and test cases defined for UE category NB1 shall apply. | |

## B.2.9 Common RRM requirements for operating bands for UE category 0

The requirements and test cases listed in Table B.2.9-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.9-1: Common RRM requirements for release independent operating bands for a UE category 0**

| Section / Clause | Description |
|---|---|
| 7.11 | Radio Link Monitoring for UE category 0 |
| 8.5 | Measurements for UE category 0 |
| 9.1.13 | Measurement accuracy for UE category 0 |

## B.2.10 Common RRM requirements for operating bands for UE category M1

The requirements and test cases listed in Table B.2.10-1 are specified in TS 36.133 Rel-14 [3].

**Table B.2.10-1: Common RRM requirements for release independent operating bands for a UE category M1**

| Section / Clause | Description |
|---|---|
| 4.2.2.11 | Measurement and evaluation requirements for UE in enhanced coverage |
| 5.5 | E-UTRAN Handover for cat.M1 UEs in CEModeA |
| 5.6 | E-UTRAN Handover for cat.M1 UEs in CEModeB |
| 6.2.3 | Requirements for cat.M1 UEs |
| 6.7 | RRC Re-establishment for cat.M1 UEs |
| 7.19 | Radio Link Monitoring for UE Category M1 |
| 7.24 | UE transmit timing for category M1 |
| 8.13 | Measurements for UE category M1 |
| 9.1.21 | Measurement accuracy for UE category M1 |

# B.3 Common UE performance requirements

## B.3.1 Void

## B.3.2 Common UE performance requirements and tests for different CA configurations and combination sets

The requirements and test cases listed in Table B.3.2-1 are specified in TS 36.101 Rel-14 [2].

**Table B.3.2-1: Common UE performance requirements and tests for different CA configurations and combination sets**

| Section / Clause | Description |
|---|---|
| 8.2.1.1.1 | Single-antenna port performance (FDD) |
| 8.2.2.1.1 | Single-antenna port performance (TDD) |
| 8.2.3.1.1 | Single-antenna port performance (TDD-FDD CA) |
| 8.2.1.3.1 | Open-loop spatial multiplexing performance - Minimum Requirement 2 Tx Antenna Port (FDD) |
| 8.2.2.3.1 | Open-loop spatial multiplexing performance - Minimum Requirement 2 Tx Antenna Port (TDD) |
| 8.2.3.3.1 | Open-loop spatial multiplexing performance - Minimum Requirement 2 Tx Antenna Port (TDD-FDD CA) |
| 8.2.1.3.1A | Open-loop spatial multiplexing performance - Soft buffer management test (FDD) |
| 8.2.2.3.1A | Open-loop spatial multiplexing performance - Soft buffer management test (TDD) |
| 8.2.3.3.1A | Open-loop spatial multiplexing performance - Soft buffer management test (TDD-FDD CA) |
| 8.2.1.4.3 | Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (FDD) |
| 8.2.2.4.3 | Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (TDD) |
| 8.2.3.4.3 | Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (TDD-FDD CA) |
| 8.2.1.7 | Carrier aggregation with power imbalance (FDD) |
| 8.2.1.8 | Intra-band non-contiguous carrier aggregation with timing offset (FDD) |
| 8.2.2.7 | Carrier aggregation with power imbalance (TDD) |
| 8.7.1 | Sustained downlink data rate provided by lower layers (FDD) |
| 8.7.2 | Sustained downlink data rate provided by lower layers (TDD) |
| 8.7.5 | Sustained downlink data rate provided by lower layers (TDD-FDD CA) |
| 8.7.12.1 | Sustained downlink data rate provided by lower layers (FDD CA in licensed bands) |
| 8.7.12.2 | Sustained downlink data rate provided by lower layers (TDD CA in licensed bands) |
| 8.7.12.3 | Sustained downlink data rate provided by lower layers (TDD-FDD CA in licensed bands) |
| 9.6.1.1 | Additional requirements for carrier aggregation - Periodic reporting on multiple cells (Cell Specific Reference symbols) (FDD) |
| 9.6.1.2 | Additional requirements for carrier aggregation - Periodic reporting on multiple cells (Cell Specific Reference symbols) (TDD) |
| 9.6.1.3 | Additional requirements for carrier aggregation - Periodic reporting on multiple cells (Cell Specific Reference symbols) (TDD-FDD CA) |
| NOTE 1: The applicability of requirements for different CA configurations and bandwidth combination sets is specified in Section 8.1.2.3 and 9.1.1.2.<br>NOTE 2: The test coverage for different number of component carriers is defined in 8.1.2.4. | |

## B.3.3 Void

## B.3.4 Void

## B.3.5 Common UE performance requirements and tests for operating bands for UE category 0

The requirements and test cases listed in Table B.3.5-1 are specified in TS 36.101 Rel-14 [2].

**Table B.3.5-1: Common UE performance requirements and tests for release independent operating bands for UE category 0**

| Section / Clause | Description |
|---|---|
| 8.9 | Demodulation (single receiver antenna) |
| 9.7 | CSI reporting (Single receiver antenna) |

## B.3.6 Common UE performance requirements and tests for operating bands for UE category M1and M2

The requirements and test cases listed in Table B.3.6-1 are specified in TS 36.101 Rel-14 [2].

**Table B.3.6-1: Common UE performance requirements and tests for release independent operating bands for UE category M1 and M2**

| Section / Clause | Description |
|---|---|
| 8.11 | Demodulation (UE supporting coverage enhancement) |
| 9.8 | CSI reporting (UE supporting coverage enhancement) |

## B.3.7 Common UE performance requirements and tests for operating bands for UE category NB1

The requirements and test cases listed in Table B.3.7-1 are specified in TS 36.101 Rel-14 [2].

**Table B.3.7-1: Common UE performance requirements and tests for release independent operating bands for UE category NB1**

| Section / Clause | Description |
|---|---|
| 8.12 | Demodulation of Narrowband IoT |

# B.4 Common UE RF requirements

## B.4.1 Common UE RF requirements for a release independent band

The requirements and test cases listed in Table B.4.1-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.1-1: Common UE RF requirements for a release independent band**

| Section / Clause | Description |
|---|---|
| 5.5 | Operating bands |
| 5.6 | Channel bandwidth |
| 5.7 | Channel arrangement |
| 6.2 | Transmit power |
| 6.3 | Output power dynamics |
| 6.5 | Transmit signal quality |
| 6.6 | Output RF spectrum emissions |
| 6.7 | Transmit intermodulation |
| 7.3 | Reference sensitivity power level |
| 7.4 | Maximum input level |
| 7.5 | Adjacent Channel Selectivity (ACS) |
| 7.6 | Blocking characteristics |
| 7.7 | Spurious response |
| 7.8 | Intermodulation characteristics |
| 7.9 | RX spurious emissions |

## B.4.2 Common UE RF requirements for an intra-band contiguous CA configuration

The requirements and test cases listed in Table B.4.2-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.2-1: Common UE RF requirements for a release independent intra-band contiguous CA configuration**

| Section / Clause | Description |
|---|---|
| 5.5A | Operating bands for CA |
| 5.6A | Channel bandwidths per operating band for CA |
| 5.7.1A | Channel spacing for CA |
| 5.7.2A | Channel raster for CA |
| 5.7.4A | TX–RX frequency separation for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.3A | UE maximum output power for modulation/channel bandwidth for CA |
| 6.2.4A | UE maximum output power with additional requirements for CA |
| 6.2.5A | Configured transmitted power for CA |
| 6.3.2A | UE Minimum utput power for CA |
| 6.3.3A | UE Trasnsmit OFF power for CA |
| 6.3.4A | ON/OFF time mask for CA |
| 6.3.5A | Power control for CA |
| 6.5.1A | Frequency error for CA |
| 6.5.2A | Transmit modulation quality for CA |
| 6.6.1A | Occupied bandwidth for CA |
| 6.6.2.1A | Spectrum emission mask for CA |
| 6.6.2.2A | Additional Spectrum Emission mask for CA |
| 6.6.2.3.2A | UTRA ACLR for CA |
| 6.6.2.3.3A | E-UTRA ACLR for CA |
| 6.6.3.1A | Minimum requirements for CA |
| 6.6.3.2A | Spurious emission band UE co-existence for CA |
| 6.6.3.3A | Additional spurious emissions for CA |
| 6.7.1A | Minimum requirement for CA |
| 7.3.1A | Reference sensitivity for CA |
| 7.4.1A | Maximum input level for CA |
| 7.5.1A | Adjacent Channel Selectivity (ACS) for CA |
| 7.6.1.1A | In-band blocking for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.6.3.1A | Narrow band blocking for CA |
| 7.7.1A | Spurious response for CA |
| 7.8.1A | Wideband intermodulation for CA |
| 7.10.1A | Receiver response for CA |

## B.4.3 Common UE RF requirements for an single uplink inter-band CA configuration

The requirements and test cases listed in Table B.4.3-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.3-1: Common UE RF requirements for a release independent inter-band CA configuration**

| Section / Clause | Description |
|---|---|
| 5.5A | Operating bands for CA |
| 5.6A.1 | Channel bandwidths per operating band for CA |
| 5.7.2A | Channel raster for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.3A | UE maximum output power for modulation/channel bandwidth for CA |
| 6.2.5 | Configured transmitted power |
| 7.3.1A | Reference sensitivity for CA |
| 7.4.1A | Maximum input level for CA |
| 7.5.1A | Adjacent Channel Selectivity (ACS) for CA |
| 7.6.1.1A | In-band blocking for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.6.3.1A | Narrow band blocking for CA |
| 7.7.1A | Spurious response for CA |
| 7.8.1A | Wideband intermodulation for CA |

## B.4.4 Common UE RF requirements for an inter-band CA configuration including an operating band without uplink band

The requirements and test cases listed in Table B.4.4-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.4-1: Common UE RF requirements for a release independent inter-band CA configuration including an operating band without uplink band**

| Section / Clause | Description |
|---|---|
| 5.5 | Operating bands |
| 5.5A | Operating bands for CA |
| 5.6A.1 | Channel bandwidths per operating band for CA |
| 5.7 | Channel arrangement |
| 6.2.2A | UE maximum output power for CA |
| 6.2.3A | UE maximum output power for modulation/channel bandwidth for CA |
| 6.2.5 | Configured transmitted power |
| 7.3.1A | Reference sensitivity for CA |
| 7.4.1A | Maximum input level for CA |
| 7.5.1A | Adjacent Channel Selectivity (ACS) for CA |
| 7.6.1.1A | In-band blocking for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.6.3.1A | Narrow band blocking for CA |
| 7.7.1A | Spurious response for CA |
| 7.8.1A | Wideband intermodulation for CA |

## B.4.5 Common UE RF requirements for a single uplink intra-band non-contiguous CA configuration

The requirements and test cases listed in Table B.4.5-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.5-1: Common UE RF requirements for a release independent single uplink intra-band non-contiguous CA configuration**

| Section / Clause | Description |
|---|---|
| 5.5A | Operating bands for CA |
| 5.6A1 | Channel bandwidths per operating band for CA |
| 5.7.2A | Channel raster for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.3A | UE maximum output power for modulation/channel bandwidth for CA |
| 7.3.1A | Reference sensitivity for CA |
| 7.4.1A | Maximum input level for CA |
| 7.5.1A | Adjacent Channel Selectivity (ACS) for CA |
| 7.6.1.1A | In-band blocking for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.6.3.1A | Narrow band blocking for CA |
| 7.7.1A | Spurious response for CA |
| 7.8.1A | Wideband intermodulation for CA |

## B.4.6 Common UE RF requirements for dual uplink inter-band CA configuration

The requirements and test cases listed in Table B.4.6-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.6-1: Common UE RF requirements for a release independent dual uplink inter-band CA configuration**

| Section / Clause | Description |
|---|---|
| 5.6A.1 | Channel bandwidths per operating band for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.5A | Configured transmitted Power for CA |
| 6.3.2A | UE Minimum output power for CA |
| 6.3.3A | UE Transmit OFF power for CA |
| 6.3.4A | ON/OFF time mask for CA |
| 6.3.5A | Power control for CA |
| 6.5.1A | Frequency error for CA |
| 6.5.2A | Transmit modulation quality for CA |
| 6.6.1A | Occupied bandwidth for CA |
| 6.6.2.1A | Spectrum emission mask for CA |
| 6.6.2.3 | Adjacent Channel Leakage Ratio |
| 6.6.3.1A | Spurious Emission for CA |
| 6.6.3.2A | Spurious emission band UE co-existence for CA |
| 6.7.1A | Transmit intermodulation for CA |
| 7.3.1A | Reference sensitivity for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.7.1A | Spurious response for CA |

## B.4.7 Common UE RF requirements for dual uplink intra-band non-contiguous CA configuration

The requirements and test cases listed in Table B.4.7-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.7-1: Common UE RF requirements for a release independent dual uplink intra-band non-contiguous CA configuration**

| Section / Clause | Description |
|---|---|
| 5.6A.1 | Channel bandwidths per operating band for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.3A | UE Maximum Output power for modulation / channel bandwidth for CA |
| 6.2.5A | Configured transmitted Power for CA |
| 6.3.2A | UE Minimum output power for CA |
| 6.3.3A | UE Transmit OFF power for CA |
| 6.3.4A | ON/OFF time mask for CA |
| 6.3.5A | Power control for CA |
| 6.5.1A | Frequency error for CA |
| 6.5.2A | Transmit modulation quality for CA |
| 6.6.1A | Occupied bandwidth for CA |
| 6.6.2.1A | Spectrum emission mask for CA |
| 6.6.2.3 | Adjacent Channel Leakage Ratio |
| 6.6.3.1A | Spurious Emission for CA |
| 6.6.3.2A | Spurious emission band UE co-existence for CA |
| 7.3.1A | Reference sensitivity for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.7.1A | Spurious response for CA |

## B.4.8 Common UE RF requirements for three uplink inter-band CA configuration

The requirements and test cases listed in Table B.4.8-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.8-1: Common UE RF requirements for a release independent three uplink inter-band CA configuration**

| Section / Clause | Description |
|---|---|
| 5.6A.1 | Channel bandwidths per operating band for CA |
| 6.2.2A | UE maximum output power for CA |
| 6.2.5A | Configured transmitted Power for CA |
| 6.3.2A | UE Minimum output power for CA |
| 6.3.3A | UE Transmit OFF power for CA |
| 6.3.4A | ON/OFF time mask for CA |
| 6.3.5A | Power control for CA |
| 6.5.1A | Frequency error for CA |
| 6.5.2A | Transmit modulation quality for CA |
| 6.6.1A | Occupied bandwidth for CA |
| 6.6.2.1A | Spectrum emission mask for CA |
| 6.6.2.3 | Adjacent Channel Leakage Ratio |
| 6.6.3.1A | Spurious Emission for CA |
| 6.6.3.2A | Spurious emission band UE co-existence for CA |
| 6.7.1A | Transmit intermodulation for CA |
| 7.3.1A | Reference sensitivity for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.7.1A | Spurious response for CA |

## B.4.9 Common UE RF requirements for operating bands for UE category NB1

The requirements and test cases listed in Table B.4.9-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.9-1: Common UE RF requirements for release independent operating bands for UE category NB1**

| Section / Clause | Description |
|---|---|
| 5.5F | Operating bands for category NB1 |
| 5.6F | Channel bandwidth for category NB1 |
| 5.7.1F | Channel spacing for category NB1 |
| 5.7.2F | Channel raster for category NB1 |
| 5.7.3F | Carrier frequency and EARFCN for category NB1 |
| 5.7.4F | TX–RX frequency separation for category NB1 |
| 6.2.2F | UE maximum output power for category NB1 |
| 6.2.3F | UE maximum output power for category NB1 |
| 6.2.5F | Configured transmitted Power for category NB1 |
| 6.3.2F | UE Minimum output power for category NB1 |
| 6.3.3F | Transmit OFF power for category NB1 |
| 6.3.4F | ON/OFF time mask for category NB1 |
| 6.3.5F | Power Control for category NB1 |
| 6.5.1F | Frequency error for UE category NB1 |
| 6.5.2F | Transmit modulation quality for Category NB1 |
| 6.6.1F | Occupied bandwidth for category NB1 |
| 6.6.2F | Out of band emission for category NB1 |
| 6.6.3F | Spurious emission for category NB1 |
| 6.7.1F | Transmission intermodulation for category NB1 |
| 7.3.1F | Reference sensitivity for UE category NB1 |
| 7.4.1F | Maximum input level for category NB1 |
| 7.5.1F | Adjacent channel selectivity for category NB1 |
| 7.6.1.1F | In-band blocking for category NB1 |
| 7.6.2.1F | Out-of-band blocking for category NB1 |
| 7.7.1F | Spurious response for category NB1 |
| 7.8.1F | Intermodulation characteristics for category NB1 |

## B.4.10 Common UE RF requirements for operating bands for UE category 0

The requirements and test cases listed in Table B.4.10-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.10-1: Common UE RF requirements for release independent operating bands for UE category 0**

| Section / Clause | Description |
|---|---|
| 5.5E | Operating bands for UE category 0 |
| 7.3.1E | Minimum requirements (QPSK) for UE category 0 |

## B.4.11 Common UE RF requirements for operating bands for UE category M1

The requirements and test cases listed in Table B.4.11-1 are specified in TS 36.101 Rel-14 [2].

**Table B.4.11-1: Common UE RF requirements for release independent operating bands for UE category 0**

| Section / Clause | Description |
|---|---|
| 5.5E | Operating bands for UE category 0 and UE category M1 |
| 6.2.2E | UE maximum output power for Category M1 UE |
| 6.2.3E | UE maximum output power for modulation / channel bandwidth for category M1 |
| 6.2.4E | UE maximum output power with additional requirements for category M1 UE |
| 6.3.5E | Power control for category M1 |
| 6.5.2E | Transmit modulation quality for category M1 |
| 7.3.1E | Minimum requirements (QPSK) for UE category 0 and M1 |
| 7.5 | Adjacent Channel Selectivity (ACS) |
| 7.6.1 | In-band blocking |
| 7.6.2 | Out-of-band blocking |
| 7.6.3 | Narrow band blocking |
| 7.8.1 | Wide band intermodulation |

# Annex C (normative): Common Requirements for 4Rx

## C.1 Common UE RF requirements

The requirements and test cases listed in Table C.1-1 are specified in TS 36.101 Rel-14 [2].

**Table C.1-1: RF requirements for 4Rx for single band**

| Section / Clause | Description |
|---|---|
| 7.3 | Reference sensitivity power level |
| 7.4 | Maximum input level |
| 7.5 | Adjacent channel selectivity |
| 7.6 | Blocking characteristics |
| 7.7 | Spurious response |
| 7.8 | Intermodulation characteristics |
| 7.9 | Spurious emissions |

The requirements and test cases listed in Table C.1-2 are specified in TS 36.101 Rel-14 [2].

**Table C.1-2: RF requirements for 4Rx for CA**

| Section / Clause | Description |
|---|---|
| 6.2.5A | Configured maximum output power |
| 7.3.1A | Reference sensitivity for CA |
| 7.4.1A | Maximum input level for CA |
| 7.5.1A | Adjacent Channel Selectivity for CA |
| 7.6.1.1A | In-band blocking for CA |
| 7.6.2.1A | Out-of-band blocking for CA |
| 7.6.3.1A | Narrow band blocking for CA |
| 7.7.1A | Spurious response for CA |
| 7.8.1A | Wideband intermodulation for CA |

## C.2 Common UE demodulation and CSI requirements

The requirements and test cases listed in Table C.2-1 are specified in TS 36.101 Rel-14 [2].

**Table C.2-1: UE Demodulation and CSI requirements for 4Rx for single band**

| Section / Clause | Description |
|---|---|
| 8.10.1 (NOTE) | PDSCH |
| 8.10.2 | PDCCH/PCFICH |
| 8.10.3 | PHICH |
| 8.10.4 | ePDCCH |
| 9.9 | CSI reporting for 4Rx UE |

The requirements and test cases listed in Table C.2-2 are specified in TS 36.101 Rel-14 [2].

**Table C.2-2: UE Demodulation and CSI requirements for 4Rx CA/DC**

| Section / Clause | Description |
|---|---|
| 8.13 | Demodulation of PDSCH CA |
| 8.7.9 | SDR of FDD CA (4 layer MIMO) |
| 8.7.10 | SDR of TDD CA (4 layer MIMO) |
| 8.7.11 | SDR of TDD-FDD CA (4 layer MIMO) |
| 8.7.13 | SDR of FDD DC (4 layer MIMO) |
| 8.7.14 | SDR of TDD DC (4 layer MIMO) |
| 8.7.15 | SDR of TDD-FDD DC (4 layer MIMO) |
| 9.1.1.4.2 | CSI CA tests for 4Rx UE |

# Annex D (normative): Common Requirements for performance enhancements for high speed scenario

## D.1 Common RRM requirements for performance enhancements for high speed scenario

The requirements and test cases listed in Table D.1-1 are specified in TS 36.133 Rel-14 [3].

**Table D.1-1: RRM requirements for performance enhancements for high speed scenario**

| Section / Clause | Description |
|---|---|
| 4.2 | Cell Re-selection |
| 8.1.2.2 | E-UTRAN intra frequency measurements in RRC connected state |

## D.2 Common UE demodulation requirements for performance enhancements for high speed scenario

The requirements and test cases listed in Table D.2-1 are specified in TS 36.101 Rel-14 [2].

**Table D.2-1: UE Demodulation requirements for performance enhancements for high speed scenario**

| Section / Clause | Description |
|---|---|
| 8.2.1.9 | FDD PDSCH |
| 8.2.2.9 | TDD PDSCH |

# Annex E (normative): Common Requirements for 8Rx

## E.1 Common UE RF requirements

The requirements and test cases listed in Table E.1-1 are specified in TS 36.101 [2].

**Table E.1-1: RF requirements for 8Rx**

| Section / Clause | Description |
|---|---|
| 7.3 | Reference sensitivity power level |

The requirements and test cases listed in Table E.1-2 are specified in TS 36.101 [2].

**Table E.1-2: RF requirements for 8Rx for CA**

| Section / Clause | Description |
|---|---|
| 7.3.1A | Reference sensitivity for CA |

## E.2 Common UE demodulation and CSI requirements

The requirements and test cases listed in Table E.2-1 and Table E.2-2 are specified in TS 36.101 [2].

**Table E.2-1: UE Demodulation and CSI requirements for 8Rx for single band**

| Section / Clause | Description |
|---|---|
| 8.14.1 | PDSCH |
| 9.12 | CSI reporting for 8Rx UE |

**Table E.2-2: UE Demodulation and CSI requirements for 8Rx CA/DC**

| Section / Clause | Description |
|---|---|
| 8.14.2 | Demodulation of PDSCH CA |
| 8.7.17 | SDR of TDD CA (8 layer MIMO) |

# Annex F (informative): Change history

**Table C.1: Change History**

| Date | Meeting | TDoc | CR | Rev | Cat | Subject/Comment | New version |
|---|---|---|---|---|---|---|---|
| 11-2009 | RP#46 | RP-091141 | | | | TS36.307 V0.1.0 approved by RAN (Originally in R4-095022) | 0.1.0 |
| 02-2010 | R4#54 | R4-100419 | | | | For release 9 version, replace sections 4 to 6 as 'Void' and add a new void section as section 7. | 0.2.0 |
| 03-2010 | RP#47 | RP-100162 | | | | TS36.307 v1.0.0 for approval | 1.0.0 |
| 03-2010 | RP#47 | RP-100162 | | | | Approved by RAN | 9.0.0 |
| 09-2010 | RP-49 | RP-100927 | 2 | | | CR LTE_TDD_2600_US spectrum band definition additions to TS 36.307 V900 | 9.1.0 |
| | | | | | | Correction of section numbering | 9.1.1 |
| 12-2010 | RP-50 | RP-101356 | 008 | | | Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307 | 9.2.0 |
| 12-2010 | RP-50 | RP-101361 | 005 | | | Introduction of L-band in TS 36.307 | 9.2.0 |
| 12-2010 | RP-50 | RP-101344 | 016 | | | CR creating the rel-10 of the 36.307 specification | 9.3.0 |
| 12-2010 | RP-50 | RP-101356 | 012 | | | Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307 | 9.3.0 |
| 12-2010 | RP-50 | | | | | Raised to Rel-10 with no technical change | 10.0.0 |
| 01-2011 | | | | | | Correction to history table | 10.0.1 |
| 06-2011 | RP-52 | RP-110804 | 015 | | | Add Expanded 1900 MHz Band (Band 25) in 36.307 | 10.1.0 |
| 06-2011 | RP-52 | RP-110812 | 022 | | | Add 2GHz S-Band (Band 23) in 36.307 (Rel 10) | 10.1.0 |
| 09-2011 | RP-53 | RP-111255 | 025 | | | Add Band 22 for LTE/UMTS 3500 (FDD) to TS 36.307 | 10.2.0 |
| 03-2012 | RP-55 | RP-120305 | 029 | | | Introduction of Band 26/XXVI to TS 36.307 | 11.0.0 |
| 2012-06 | RP-56 | RP-120789 | 043 | | | Introduction of CA_1A-19A to TS 36.307 | 11.1.0 |
| 2012-06 | RP-56 | RP-120793 | 049 | | | Introduction of APAC700(FDD) into TS 36.307 Rel-11 | 11.1.0 |
| 2012-06 | RP-56 | RP-120793 | 053 | | | Introduction of APAC700(TDD) into TS 36.307 Rel-11 | 11.1.0 |
| 2012-06 | RP-56 | RP-120791 | 057 | | | Introduction of e850_LB (Band 27) to TS 36.307 | 11.1.0 |
| 2012-09 | RP-57 | RP-121335 | 059 | | | Introduction of CA_1A-21A to TS 36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121295 | 070r1 | | | Relation between EARFCN for overlapping bands with multiple FBI indication | 11.2.0 |
| 2012-09 | RP-57 | RP-121338 | 072 | | | 36.307 CR for LTE_CA_B7 | 11.2.0 |
| 2012-09 | RP-57 | RP-121337 | 073 | | | TS 36.307 CR for CA_38 | 11.2.0 |
| 2012-09 | RP-57 | RP-121327 | 074 | | | Introduction of CA_B7_B20 in 36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121329 | 075 | | | Introduction of CA band combination Band3 + Band5 to TS 36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121331 | 076 | | | Introduction of CA_3A-20A to TS 36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121334 | 077 | | | Add requirements for inter-band CA of B_1-18 in TS36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121333 | 078 | | | Introduction of CA_8_20 RF requirements into TS36.307 | 11.2.0 |
| 2012-09 | RP-57 | RP-121324 | 079 | | | Introduction of CA_B3_B7 in 36.307 | 11.2.0 |
| 2012-12 | RP-58 | RP-121890 | 086 | | | Introduction of CA_4A-5A into 36.307 | 11.3.0 |
| 2012-12 | RP-58 | RP-121889 | 088 | | | Introduction of CA band combination Band4 + Band13 to TS 36.307 (Rel-11) | 11.3.0 |
| 2012-12 | RP-58 | RP-121896 | 091 | | | Introduction of Band 5 + Band 17 inter-band CA configuration into 36.307 | 11.3.0 |
| 2012-12 | RP-58 | RP-121884 | 092 | | | Introduction of CA_3A-8A to TS 36.307 | 11.3.0 |
| 2012-12 | RP-58 | RP-121894 | 093 | | | Introduction of CA_B5_B12 in 36.307 | 11.3.0 |
| 2012-12 | RP-58 | RP-121887 | 095 | | | Introduction of CA_4-12 into TS 36.307 (Rel-11) | 11.3.0 |
| 2012-12 | RP-58 | RP-121882 | 097 | | | [Rel-11] Introduction of inter-band CA_11-18 into TS36.307 | 11.3.0 |
| 2012-12 | RP-58 | RP-121861 | 099 | | | Release-independent implementation of carrier aggregation configuration CA_4-7 | 11.3.0 |
| 2012-12 | RP-58 | RP-121901 | 101 | | | Introduction of Band 29 | 11.3.0 |
| 2012-12 | RP-58 | RP-121718 | 0102 | | | Introduction of CA band combination Band2 + Band17 to TS 36.307 (Rel-11) | 11.3.0 |
| 2012-12 | RP-58 | RP-121720 | 0104 | | | Introduction of CA band combination Band4 + Band17 to TS 36.307 (Rel-11) | 11.3.0 |
| 2013-06 | RP-60 | RP-130771 | 108 | | | Introduction of CA 1+8 into TS36.307(Rel-12) | 12.0.0 |
| 2013-06 | RP-60 | RP-130782 | 111 | | | Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 28 to TS 36.307 Rel-12 | 12.0.0 |
| 2013-06 | RP-60 | RP-130785 | 114 | | | Introduction of LTE Advanced inter-band Carrier Aggregation of Band 23 and Band 29 to TS 36.307 (Rel-12) | 12.0.0 |
| 2013-06 | RP-60 | RP-130779 | 117 | | | Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 26 to TS 36.307 (Rel-12) | 12.0.0 |
| 2013-06 | RP-60 | RP-130777 | 120 | | | Introduction of CA_3A-19A to TS 36.307 | 12.0.0 |
| 2013-06 | RP-60 | RP-130783 | 123 | | | Introduction of CA_19A-21A to TS 36.307 | 12.0.0 |
| 2013-06 | RP-60 | RP-130775 | 131 | | | Introduction of CA_2A-13A to TS 36.307 | 12.0.0 |
| 2013-06 | RP-60 | RP-130791 | 136 | | | Introduction of Band 30 | 12.0.0 |
| 2013-06 | RP-60 | RP-130790 | 143 | | | Introduction of LTE 450 into TS 36.307 R12 | 12.0.0 |
| 2013-06 | RP-60 | RP-130787 | 150 | | | Introduction of CA_4A-4A into 36.307 Rel-12 | 12.0.0 |
| 09-2013 | RP-61 | RP-131300 | 153 | | | 36.307 CR for LTE_CA_C_B3 (Rel-12) | 12.1.0 |
| 09-2013 | RP-61 | RP-131296 | 160 | | | [Rel-12] Add requirements for CA_1A-26A into TS36.307 | 12.1.0 |
| 09-2013 | RP-61 | RP-131297 | 163 | | | Introduction of CA_2A-4A to TS 36.307 | 12.1.0 |
| 09-2013 | RP-61 | RP-131298 | 167 | | | Introduction of inter-band CA Band 2+5 | 12.1.0 |
| 12-2013 | RP-62 | RP-131965 | 173 | | | Introduction of CA_23A-23A to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131946 | 178 | | | Introduction of CA band combination Band2 + Band12 to TS 36.307 | 12.2.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12-2013 | RP-62 | RP-131954 | 181 | | | Introduction of CA band combination Band12 + Band25 to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131959 | 184 | | | Introduction of LTE_CA_C_B27 to 36.307 (Rel-12) | 12.2.0 |
| 12-2013 | RP-62 | RP-131957 | 192 | | | Introduction of CA_23B to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131961 | 194 | | | Introduction of Intra-band non-contiguous CA in band 3 to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131950 | 200 | | | Introduction of CA band combination Band5 + Band25 to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131967 | 201r1 | | | Introducing 'General' clause with note referring to note in clause 4.4 in TS36.101, editorial corrections and modifications to Forward and Scope clauses | 12.2.0 |
| 12-2013 | RP-62 | RP-131948 | 204 | | | Introduction of CA band combination B5 + B7 to TS 36.307 R12 | 12.2.0 |
| 12-2013 | RP-62 | RP-131952 | 207 | | | Introduction of CA band combination B7 + B28 to TS 36.307 | 12.2.0 |
| 12-2013 | RP-62 | RP-131967 | 211 | | | Correction to release independent specification | 12.2.0 |
| 12-2013 | RP-62 | RP-131925 | 216 | | | UE performance requirements in release independent specification for CA | 12.2.0 |
| 12-2013 | RP-62 | RP-131963 | 219 | | | Introduction of CA_7A-7A to TS 36.307 Rel-12 | 12.2.0 |
| 03-2014 | RP-63 | RP-140371 | 235 | | | Release independence of Band 14 HPUE | 12.3.0 |
| 03-2014 | RP-63 | RP-140386 | 227 | | | Introduction of CA band combination Band 3 and Band 27 to TS 36.307 | 12.3.0 |
| 03-2014 | RP-63 | RP-140389 | 245r1 | | | Correction to release independent specification | 12.3.0 |
| 03-2014 | RP-63 | RP-140388 | 210r1 | | | Introduction of CA_39C to TS 36.307 | 12.3.0 |
| 03-2014 | RP-63 | RP-140387 | 197r1 | | | Introduction of CA_39A-41A to TS 36.307 | 12.3.0 |
| 06-2014 | RP-64 | RP-140911 | 259 | | | Introduction of CA band combination Band 1 and Band 5 to TS 36.307 | 12.4.0 |
| 06-2014 | RP-64 | RP-140918 | 300 | | | Correction of Common RRM requirements for CA in release independent specification (Rel-12) | 12.4.0 |
| 06-2014 | RP-64 | RP-140926 | 280r1 | | | Introduction of Band 20+32 CA | 12.4.0 |
| 06-2014 | RP-64 | RP-140931 | 265 | | | Introduction of CA 1+11 to 36.307 (Rel-12) | 12.4.0 |
| 06-2014 | RP-64 | RP-140933 | 275 | | | Introduction of CA band combination Band 4 and Band 27 to TS 36.307 | 12.4.0 |
| 06-2014 | RP-64 | RP-140938 | 291 | | | Introduction of CA_2A-2A to TS 36.307 Rel-12 | 12.4.0 |
| 06-2014 | RP-64 | RP-140940 | 319 | | | Introduction of LTE_CA_NC_B42 into 36.307 | 12.4.0 |
| 06-2014 | RP-64 | RP-140942 | 253 | | | Introduction of CA band combination Band 3 and Band 27 to TS 36.307 | 12.4.0 |
| 06-2014 | RP-64 | RP-140942 | 340 | | | Introduction of CA band combination Band 1 and Band 20 to TS 36.307 | 12.4.0 |
| 06-2014 | RP-64 | RP-140943 | 347 | | | Introduction of CA band combination CA_41D into TS 36.307 (Rel-12) | 12.4.0 |
| 09-2014 | RP-65 | RP-141110 | 0388r1 | | | [Rel-12] Introduction of inter-band CA_18-28 into TS36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141200 | 0366r1 | | | Introduction of CA_B1_B3_B19 into TS 36.307 (Rel-12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141205 | 0363r1 | | | Introduction of CA_B1_B3 into TS 36.307 (Rel-12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141332 | 0429r1 | | | Introduction of CA_1A-7A into 36.307 (Rel -12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141340 | 0376r1 | | | Introduction of CA_B1_B5_B7 into TS 36.307 (Rel-12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141467 | 0432 | | | Introduction of 3 DL CA for Band 1+7+20 | 12.5.0 |
| 09-2014 | RP-65 | RP-141527 | 415r1 | | | CR for 36.307 on CA UE performance requirement in Rel-12 | 12.5.0 |
| 09-2014 | RP-65 | RP-141551 | 360 | | | Introduction of CA 8+11 to 36.307 (Rel-12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141552 | 379 | | | Introduction of CA_41A-42A to TS 36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141553 | 381 | | | Introduction of a new bandwidth combination set for CA_25A-25A into 36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141554 | 418r1 | | | Introduction of requirements for 2DL inter-band carrier aggregation (FDD) and 2DL fallback | 12.5.0 |
| 09-2014 | RP-65 | RP-141554 | 421 | | | Introduction of requirements for 3DL inter-band carrier aggregation including Band 30 | 12.5.0 |
| 09-2014 | RP-65 | RP-141555 | 384 | | | Introduction of 3 Band Carrier Aggregation of Band 1,Band 3 and Band 5 to TS 36.307(Rel.12) | 12.5.0 |
| 09-2014 | RP-65 | RP-141556 | 357r1 | | | Introduction of 3 Band Carrier Aggregation (3DL/1UL) of Band 1, Band 3 and Band 8 to TS 36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141558 | 402 | | | Introduction of CA band combination Band 1, Band 3 and Band 20 to TS 36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141560 | 352 | | | Introduction of new CA_40C bandwidth combination set into 36.307 | 12.5.0 |
| 09-2014 | RP-65 | RP-141561 | 354 | | | CR to 36.307 Rel-12: Introduction of CA_41C-41A and CA_41A-41C | 12.5.0 |
| 12-2014 | RP-66 | RP-142142 | 440 | | | UE RF requirements in the release independent spec | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 444 | | | Revision of common RRM requirements for release independent specification | 12.6.0 |
| 12-2014 | RP-66 | RP-142182 | 448 | | | [Rel-12] Introduction of inter-band CA_1-28 into TS36.307 | 12.6.0 |
| 12-2014 | RP-66 | RP-142189 | 455 | | | CR for TR 36.307: LTE_CA_B5_B13 | 12.6.0 |
| 12-2014 | RP-66 | RP-142190 | 458r2 | | | Introduction of additional band combinations for 3DL inter-band CA | 12.6.0 |
| 03-2015 | RP-67 | RP-150387 | 463 | | | R4-73AH-0113: Correction of UE RF requirements for dual uplik to TS 36.307 Rel-12 | 12.7.0 |
| 03-2015 | RP-67 | RP-150392 | 468 | | | CR for 36.307 on CA UE performance requirement in Rel-12 | 12.7.0 |
| 03-2015 | RP-67 | RP-150387 | 469 | | | Further revision of RSRP requirement for 36.307 release 12 | 12.7.0 |
| 05-2015 | RP-68 | RP-151068 | 0511r1 | | | Introduction of CA_3A-40A to TS 36.307 R13 | 13.0.0 |
| 05-2015 | RP-68 | RP-151070 | 0513r1 | | | Introduction of CA_3A-40C to TS 36.307 R13 | 13.0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 05-2015 | RP-68 | RP-150958 | 461r1 | | | Introduction of dual uplink CA into 36.307 | 13.0.0 |
| 05-2015 | RP-68 | RP-150968 | 499r2 | | | Release independence CR for 2DL inter-band CA Rel-13 | 13.0.0 |
| 05-2015 | RP-68 | RP-150972 | 503r1 | | | Release independence CR for 3DL inter-band CA Rel-13 | 13.0.0 |
| 05-2015 | RP-68 | RP-150974 | 506r1 | | | Release independence CR for 4DL inter-band CA Rel-13 | 13.0.0 |
| 05-2015 | RP-68 | RP-150975 | 509 | | | Introduction of non-contiguous Carrier Aggregation (CA) in Band 42 for 3DL | 13.0.0 |
| 05-2015 | RP-68 | RP-151006 | 514 | | | Introduction of CA_42D to TS 36.307 | 13.0.0 |
| 09-2015 | RP-69 | RP-151501 | 0520r1 | | | Introduction of finished 4DL inter-band CAs to TS 36.307 | 13.1.0 |
| 09-2015 | RP-69 | RP-151503 | 0526 | | | [Rel-13] Introduction of dual uplink CA into 36.307 | 13.1.0 |
| 09-2015 | RP-69 | RP-151499 | 0538 | | | Rel-13 3DL combinations | 13.1.0 |
| 09-2015 | RP-69 | RP-151201 | 0543 | | | Introduction of CA_7A-40A and CA_7A-40C to TS 36.307 R13 | 13.1.0 |
| 10-2015 | | | | | | Correction of the release in the cover page | 13.1.1 |
| 12-2015 | RP-70 | RP-152158 | 0543a | | | Release independent requirements for CA_42E (Rel-13) | 13.2.0 |
| 12-2015 | RP-70 | RP-152160 | 0549 | | | Introduction of 4DL NC CA in band42 in 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152157 | 0561 | | | Introducing B20 + B67 CA into TS 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152168 | 0562 | | | Introduction of intra-band CA_8B to TS 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152171 | 0580 | | | Introduction of Band 65 | 13.2.0 |
| 12-2015 | RP-70 | RP-152167 | 0589 | | | Introduction of intra-band CA_5B to TS 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152169 | 0590 | | | Introduction of intra-band NC CA_5A-5A to TS 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152166 | 0596 | | | Introduction of 3DL/3UL Inter-band CA in TS36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152163 | 0598 | | | Introduction of 5DL/1UL CA combinations into TS 36.307 (Rel-13) | 13.2.0 |
| 12-2015 | RP-70 | RP-152162 | 0604 | | | Introduction of finished 4DL inter-band CAs to TS 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152173 | 0612 | | | Introduction of 1447-1467MHz Band into 36.307 | 13.2.0 |
| 12-2015 | RP-70 | RP-152156 | 0616 | | | Rel-13 2DL combinations | 13.2.0 |
| 12-2015 | RP-70 | RP-152161 | 0620 | | | Rel-13 3DL combinations | 13.2.0 |
| 12-2015 | RP-70 | RP-152172 | 0628 | | | Introduction of Band 66 | 13.2.0 |
| 12-2015 | RP-70 | RP-152159 | 0632 | | | Introduction of intra-band non-contiguous CA in Band 41 for 4DL | 13.2.0 |
| 12-2015 | RP-70 | RP-152165 | 0634 | | | Introduction of 2 UL and 3 DL mixed inter/intra cases without MSD into 36.307 Rel-13 | 13.2.0 |
| 03/2016 | RP-71 | RP-160480 | 0655 | | B | Rel-13 3DL combinations | 13.3.0 |
| 03/2016 | RP-71 | RP-160481 | 0642 | | B | Introduction of completed R13 4DL inter-band CA's to TS 36.307 | 13.3.0 |
| 03/2016 | RP-71 | RP-160482 | 0651 | | B | Introduction of 5DL/1UL CA combinations into TS 36.307 (Rel-13) | 13.3.0 |
| 03/2016 | RP-71 | RP-160483 | 0647 | | B | Introduction of Band 68 | 13.3.0 |
| 06/2016 | RP-72 | RP-161142 | 0682 | 1 | F | CR TS 36.307 REL-13 | 13.4.0 |
| 06/2016 | RP-72 | RP-161142 | 0691 | 1 | F | Correction of RRM multiple uplink requirements and test cases in 36.307 | 13.4.0 |
| 09/2016 | RP-73 | RP-161628 | 0693 | | A | Release 13 36.307 CAT A CR to make Band 41 power class 2 release independent | 13.5.0 |
| 09/2016 | RP-73 | RP-161613 | 0705 | | B | CR for 4Rx requirements for release independent in Rel-13 | 13.5.0 |
| 09/2016 | RP-73 | RP-161628 | 0692 | 1 | F | Release 14 36.307 CR to make Band 41 power class 2 release independent | 14.0.0 |
| 09/2016 | RP-73 | RP-161617 | 0703 | 1 | B | Introduction of V2V operating bands in TS36.307 Rel-14 | 14.0.0 |
| 12/2016 | RP-74 | RP-162387 | 0707 | | A | Introduction of B46 DL 10 MHz release independent feature | 14.1.0 |
| 12/2016 | RP-74 | RP-162398 | 0711 | 1 | A | Addition of CA bandwidth Class F | 14.1.0 |
| 12/2016 | RP-74 | RP-162459 | 0716 | 2 | A | Correction to UE category applicability | 14.1.0 |
| 12/2016 | RP-74 | RP-162390 | 0721 | 1 | A | Addition of UE category 0 and M1 to release independence specification | 14.1.0 |
| 12/2016 | RP-74 | RP-162407 | 0722 | - | A | Introduction of new bands for NB-IoT in 36.307 | 14.1.0 |
| 03/2017 | RP-75 | RP-170559 | 0733 | - | B | CR on 36.307 for V2X multi-carrier operation | 14.2.0 |
| 06/2017 | RP-76 | RP-171291 | 0749 | 1 | F | Cleanup of TS 36.307 | 14.3.0 |
| 09/2017 | RP-77 | RP-171943 | 4354 | | F | CR for adding NB-IoT performance requirements in 36.307 in Rel-14 | 14.4.0 |
| 09/2017 | RP-77 | RP-171953 | 4358 | | B | CR on TS36.307 in rel-14 for V2X release independents | 14.4.0 |
| 09/2017 | RP-77 | RP-171973 | 4359 | | A | CR for adding overlapping band B66 in 36.307 in Rel-14 | 14.4.0 |
| 09/2017 | RP-77 | RP-172045 | 4361 | | B | Additional LTE bands for UE category M1 and/or NB1 in Rel-15 | 14.4.0 |
| 09/2017 | RP-77 | RP-172052 | 4363 | | B | Additional LTE bands for UE category M2 and/or NB2 in Rel-14 | 14.4.0 |
| 2018-03 | RAN#79 | RP-180288 | 4370 | | A | Addition of missing features for TS 36.307 REL-14 | 14.5.0 |
| 2018-03 | RAN#79 | RP-180276 | 4375 | | B | Introduction of 4UL CA into TS36.307 | 14.5.0 |
| 2018-06 | RAN#80 | RP-181116 | 4380 | | B | TS 36.307 Rel-14 | 14.6.0 |
| 2018-06 | RAN#80 | RP-181097 | 4388 | 1 | A | TS 36.307 big CR for introduction new band support for 4Rx antenna ports R14 | 14.6.0 |
| 2018-06 | RAN#80 | RP-181087 | 4390 | 1 | A | TS 36.307 big CR for introduction new band support for 8Rx antenna ports R14 | 14.6.0 |
| 2018-06 | RAN#80 | RP-181110 | 4393 | 1 | F | CR for adding LAA SDR tests for release independent R14 | 14.6.0 |
| 2018-06 | RAN#80 | RP-181095 | 4399 | | B | Introduction of 3UL CA into TS36.307 | 14.6.0 |
| 2018-06 | RAN#80 | RP-181096 | 4401 | | B | CR on new V2X band combinations and eV2X feature in TS36.307 rel-14 | 14.6.0 |
| 2018-09 | RAN#81 | RP-181916 | 4405 | 2 | B | CR of release independent requirements for LTE Carrier Aggregation beyond 5 carriers (TS 36.307 Rel-14) | 14.7.0 |
| 2018-12 | RAN#82 | RP-182377 | 4408 | 1 | A | CR of adding B65 for NB1 | 14.8.0 |
| 2018-12 | RAN#82 | RP-182378 | 4410 | 1 | B | CR of adding B65 for NB2 | 14.8.0 |
| 2019-06 | RAN#84 | RP-191266 | 4413 | | A | Addition of 8Rx release independent features in TS 36.307 (Rel-14) | 14.9.0 |
| 2021-03 | RAN#91 | RP-210110 | 4444 | | A | CR of adding LTE B24 for UE category NB1 in R17 | 14.10.0 |
| 2021-03 | RAN#91 | RP-210110 | 4447 | 1 | B | CR of adding LTE B24 for UE category NB2 in R17 | 14.10.0 |

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| 2021-09 | RAN#93 | RP-211919 | 4451 | | B | CR on adding B24 for Cat-M2 36.307_14B | 14.11.0 |
| 2021-09 | RAN#93 | RP-211919 | 4452 | | A | CR on adding B24 for Cat-M1 36.307_14A | 14.11.0 |
| 2021-09 | RAN#93 | RP-211916 | 4457 | | B | CR Release independence aspect of 6-band LTE CA R14 CATB | 14.11.0 |

# History

| Document history | | |
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| V14.2.0 | April 2017 | Publication |
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