

# ETSI TS 136 307 V11.21.0 (2018-07)



**LTE;  
Evolved Universal Terrestrial Radio Access (E-UTRA);  
Requirements on User Equipments (UEs)  
supporting a release-independent frequency band  
(3GPP TS 36.307 version 11.21.0 Release 11)**



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# 1 Scope

The present document specifies requirements for Rel-11 UEs supporting release independent features like:

- additional E-UTRA operating frequency bands on top of Rel-11 of TS 36.101 [2] and TS 36.133 [3];
- additional E-UTRA CA configurations (intra-band/inter-band) on top of Rel-11 of TS 36.101 [2] and TS 36.133 [3];
- additional operating bands and/or CA configurations for specific features;
- other release independent features (like 4Rx antenna port).

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# 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.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[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".

NOTE: The considered release is given in the text of the present document that uses [3].

[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

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# 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
CSI	Channel State Indicator
FDD	Frequency Division Duplex
RRC	Radio Resource Control
RRM	Radio Resource Management
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] and TS 36.133 [3]
M	Release from which onwards (including release M) a feature is release independent

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# 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-11 UE for additional E-UTRA operating bands compared to TS 36.101 Rel-11 [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-11 UE for additional E-UTRA CA configurations compared to TS 36.101 Rel-11 [2] are introduced via this clause.

**Table 3A.2-1: Intra-band contiguous CA configurations**

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 was 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
	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
NOTE 1: 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 CA configurations

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
		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
	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	
	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
NOTE 1: The duplex mode "FDD, TDD" refers to a CA configuration composed by only FDD bands or only TDD bands, respectively.							

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] and 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-11 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

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

## 3A.4 Other release independent features

This clause covers requirements for a Rel-11 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	<p>REL-13 WI LTE_4Rx_AP_DL introduced:</p> <ul style="list-style-type: none"> <li>- single carrier RF requirements for bands 1, 2, 3, 7, 20, 39, 41, 42: see Table C.1-1</li> <li>- 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</li> <li>- single carrier performance requirements for demodulation and CSI: see Table C.2-1</li> </ul> <p>REL-14 WI LTE_4Rx_AP_DL_bands introduced:</p> <ul style="list-style-type: none"> <li>- single carrier RF requirements for band 35, 40: see Table C.1-1</li> <li>- CA RF requirements for some further 1UL CA configurations (see TS 36.101 REL-14 [2]): see Table C.1-2</li> </ul> <p>REL-14 WI LTE_4Rx_AP_DL_CA introduced:</p> <ul style="list-style-type: none"> <li>- CA RF requirements for some 2DL/2UL CA configurations (see TS 36.101 REL-14 [2]): see Table C.1-2</li> <li>- CA performance requirements for demodulation/SDR and CSI: see Table C2-2</li> </ul> <p>REL-15 WI LTE_4Rx_AP_DL_bands_R15 introduced:</p> <ul style="list-style-type: none"> <li>- single carrier RF requirements for band 4, 34, 43, 66: see Table C.1-1</li> <li>- CA RF requirements for some further 1UL CA configurations (see TS 36.101 REL-15 [2]): see Table C.1-2</li> </ul>

## 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-11 [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	FDD
5	18, 19, 26	FDD
9	3	FDD
10	4	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

# Annex B (normative): Common Requirements

## 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-11 [3].

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

Section / Clause	Description
4 <sup>Note 1</sup>	E-UTRAN RRC_IDLE state mobility
5	E-UTRAN RRC_CONNECTED state mobility
6 <sup>Note 2</sup>	RRC Connection Mobility Control
7 <sup>Note 3</sup>	Timing and signalling characteristics
8 <sup>Note 4</sup>	UE Measurements Procedures in RRC_CONNECTED State
9 <sup>Note 5</sup>	Measurements performance requirements for UE
A.4 <sup>Note 1</sup>	E-UTRAN RRC_IDLE state
A.5	E-UTRAN RRC_CONNECTED Mode Mobility
A.6 <sup>Note 2</sup>	RRC Connection Control
A.7 <sup>Note 3</sup>	Timing and Signalling Characteristics
A.8 <sup>Note 4</sup>	UE Measurements Procedures
A.9 <sup>Note 5</sup>	Measurement Performance Requirements
<p>NOTE 1: All requirements and the corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> <li>- for supporting the corresponding band in Rel-9 and below: clause 4.3 (Minimization of Drive Tests).</li> </ul> <p>NOTE 2: All requirements and the corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> <li>- 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).</li> </ul> <p>NOTE 3: All requirements and corresponding test cases shall apply, except those defined in sections 7.4 and 7.5.</p> <p>NOTE 4: All requirements and corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> <li>- 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).</li> </ul> <p>NOTE 5: All requirements and corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> <li>- for supporting the corresponding band in Rel-8: clauses 9.1.9 (UE Rx-Tx time difference), 9.1.10 (Reference Signal Time Difference).</li> </ul> <p>NOTE 6: All requirements and test cases in this table shall apply, except those defined for: carrier aggregation; measurements under time-domain measurement resource restriction with or without CRS assistance information, in addition to the exceptions listed above.</p>	

## 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-11 [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	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	Measurement Performance Requirements
NOTE: Only requirements and test cases defined for intra-band contiguous carrier aggregation shall apply.	

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

The requirements and test cases listed in Table B.2.3-1 are specified in TS 36.133 Rel-11 [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	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	Measurement Performance Requirements
NOTE: Only requirements and test cases defined for intra-band non-contiguous carrier aggregation shall apply.	

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

The requirements and test cases listed in Table B.2.4-1 are specified in TS 36.133 Rel-11 [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	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	Measurement Performance Requirements
NOTE: Only requirements and test cases defined for inter-band carrier aggregation shall apply.	

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## 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-11 [2] unless other references are mentioned.

**Table B.3.2-1: Common UE performance requirements and tests for release independent 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)
8.2.1.3.1	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)
8.2.1.3.1A	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)
8.2.1.4.3	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)
8.2.1.7	Carrier aggregation with power imbalance (FDD)
8.2.2.7	Carrier aggregation with power imbalance (TDD)
8.2.1.8	Intra-band non-contiguous carrier aggregation with timing offset (FDD)
8.7.1	Sustained downlink data rate provided by lower layers (FDD)
8.7.2	Sustained downlink data rate provided by lower layers (TDD)
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)
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.	
NOTE 2: The test coverage for different number of component carriers is defined in 8.1.2.4 in TS 36.101 Rel-12 [2].	

B.3.3 Void

B.3.4 Void

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## 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-11 [2] unless other references are mentioned.

**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 (NOTE)	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
NOTE:	Requirements in section 6.5.2.2.1 and 6.5.2.3.1 as specified in TS 36.101 Rel-10 [2] apply

## 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-11 [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 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
6.6.2.2A	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 inter-band CA configuration

The requirements and test cases listed in Table B.4.3-1 are specified in TS 36.101 Rel-11 [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-11 [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 Void

# Annex C (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	107r1			Introduction of CA 1+8 into TS36.307(Rel-11)	11.4.0
2013-06	RP-60	RP-130782	110r1			Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 28 to TS 36.307 Rel-11	11.4.0
2013-06	RP-60	RP-130785	113			Introduction of LTE Advanced inter-band Carrier Aggregation of Band 23 and Band 29 to TS 36.307 (Rel-11)	11.4.0
2013-06	RP-60	RP-130779	116			Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 26 to TS 36.307 (Rel-11)	11.4.0
2013-06	RP-60	RP-130777	119			Introduction of CA_3A-19A to TS 36.307	11.4.0
2013-06	RP-60	RP-130783	122			Introduction of CA_19A-21A to TS 36.307	11.4.0
2013-06	RP-60	RP-130787	128			Introduction of CA_4A-4A into 36.307 Rel-11	11.4.0
2013-06	RP-60	RP-130775	130			Introduction of CA_2A-13A to TS 36.307	11.4.0
2013-06	RP-60	RP-130791	135r1			Introduction of Band 30	11.4.0
2013-06	RP-60	RP-130790	142			Introduction of LTE 450 into TS 36.307 R11	11.4.0
09-2013	RP-61	RP-131300	152			36.307 CR for LTE_CA_C_B3 (Rel-11)	11.5.0
09-2013	RP-61	RP-131303	155			Band 31 release independence for UE demodulation performance	11.5.0
09-2013	RP-61	RP-131285	158			[Rel-11] Modify requirements for CA_1A-18A in TS36.307	11.5.0
09-2013	RP-61	RP-131296	159			[Rel-11] Add requirements for CA_1A-26A into TS36.307	11.5.0
09-2013	RP-61	RP-131297	162			Introduction of CA_2A-4A to TS 36.307	11.5.0

09-2013	RP-61	RP-131298	166		Introduction of inter-band CA Band 2+5	11.5.0
12-2013	RP-62	RP-131965	174		Introduction of CA_23A-23A to TS 36.307	11.6.0
12-2013	RP-62	RP-131946	177r1		Introduction of CA band combination Band2 + Band12 to TS 36.307	11.6.0
12-2013	RP-62	RP-131954	180r1		Introduction of CA band combination Band12 + Band25 to TS 36.307	11.6.0
12-2013	RP-62	RP-131959	183		Introduction of LTE_CA_C_B27 to 36.307 (Rel-11)	11.6.0
12-2013	RP-62	RP-131939	189r1		Correction to release independent specification	11.6.0
12-2013	RP-62	RP-131957	191		Introduction of CA_23B to TS 36.307	11.6.0
12-2013	RP-62	RP-131961	193		Introduction of Intra-band non-contiguous CA in band 3 to TS 36.307	11.6.0
12-2013	RP-62	RP-131950	199		Introduction of CA band combination Band5 + Band25 to TS 36.307	11.6.0
12-2013	RP-62	RP-131948	203r1		Introduction of CA band combination B5 + B7 to TS 36.307	11.6.0
12-2013	RP-62	RP-131952	206		Introduction of CA band combination B7 + B28 to TS 36.307	11.6.0
12-2013	RP-62	RP-131925	215		UE performance requirements in release independent specification for CA	11.6.0
12-2013	RP-62	RP-131963	218		Introduction of CA_7A-7A to TS 36.307 Rel-11	11.6.0
12-2013	RP-62	RP-131924	223		Introducing 'General' clause with note referring to note in clause 4.4 in TS36.101, editorial corrections and modifications to Forward and Scope clauses	11.6.0
03-2014	RP-63	RP-140375	231r1		CR on UE performance requirements in release independent specification	11.7.0
03-2014	RP-63	RP-140371	234		Release independence of Band 14 HPUE	11.7.0
03-2014	RP-63	RP-140375	244r1		Correction to release independent specification	11.7.0
03-2014	RP-63	RP-140386	226r2		Introduction of CA band combination Band 3 and Band 27 to TS 36.307	11.7.0
03-2014	RP-63	RP-140188	247		Addition of bandwidth combination set for CA_2A-29A and CA_4A-29A	11.7.0
03-2014	RP-63	RP-140387	196r1		Introduction of CA_39A-41A to TS 36.307	11.7.0
03-2014	RP-63	RP-140388	209r2		Introduction of CA_39C to TS 36.307	11.7.0
06-2014	RP-64	RP-140911	258		Introduction of CA band combination Band 1 and Band 5 to TS 36.307	11.8.0
06-2014	RP-64	RP-140918	299		Correction of Common RRM requirements for CA in release independent specification (Rel-11)	11.8.0
06-2014	RP-64	RP-140926	279		Introduction of Band 20+32 CA	11.8.0
06-2014	RP-64	RP-140931	264		Introduction of CA 1+11 to 36.307 (Rel-11)	11.8.0
06-2014	RP-64	RP-140933	274		Introduction of CA band combination Band 4 and Band 27 to TS 36.307	11.8.0
06-2014	RP-64	RP-140935	277		Addition of bandwidth combination sets for CA_3A-5A, CA_4A-5A, and CA_4A-12A into 36.307	11.8.0
06-2014	RP-64	RP-140938	290		Introduction of CA_2A-2A to TS 36.307 Rel-11	11.8.0
06-2014	RP-64	RP-140940	318		Introduction of LTE_CA_NC_B42 into 36.307	11.8.0
06-2014	RP-64	RP-140942	339		Introduction of CA band combination Band 1 and Band 20 to TS 36.307	11.8.0
06-2014	RP-64	RP-140942	252		Introduction of CA band combination Band 1 and Band 20 to TS 36.307	11.8.0
06-2014	RP-64	RP-140943	346		Introduction of CA band combination CA_41D into TS 36.307 (Rel-11)	11.8.0
06-2014	RP-64	RP-140946	342		Introduction of CA_42C to TS 36.307	11.8.0
06-2014	RP-64	RP-140947	302		Introduction of Band 40D in release independent specification (Rel-11)	11.8.0
06-2014	RP-64	RP-140953	0308		Introduction of a new CA_7C bandwidth combination set into 36.307 (Rel-11)	11.8.0
09-2014	RP-65	RP-141111	0389r1		[Rel-11] Introduction of inter-band CA_18-28 into TS36.307	11.9.0
09-2014	RP-65	RP-141199	0365r1		Introduction of CA_B1_B3_B19 into TS 36.307 (Rel-11)	11.9.0
09-2014	RP-65	RP-141204	0362r1		Introduction of CA_B1_B3 into TS 36.307 (Rel-11)	11.9.0
09-2014	RP-65	RP-141330	0428r1		Introduction of CA_1A-7A into 36.307 (Rel-11)	11.9.0
09-2014	RP-65	RP-141339	0375r2		Introduction of CA_B1_B5_B7 into TS 36.307 (Rel-11)	11.9.0
09-2014	RP-65	RP-141466	0431		Introduction of 3 DL CA for Band 1+7+20	11.9.0
09-2014	RP-65	RP-141527	414r1		CR for 36.307 on CA UE performance requirement in Rel-11	11.9.0
09-2014	RP-65	RP-141538	342r2		Introduction of CA_42C to TS 36.307	11.9.0
09-2014	RP-65	RP-141540	302r2		Introduction of Band 40D in release independent specification (Rel-11)	11.9.0
09-2014	RP-65	RP-141541	412		CR on UE performance requirement for Band 31 for 36.307 Rel-11	11.9.0
09-2014	RP-65	RP-141551	359		Introduction of CA 8+11 to 36.307 (Rel-11)	11.9.0
09-2014	RP-65	RP-141552	378		Introduction of CA_41A-42A to TS 36.307	11.9.0
09-2014	RP-65	RP-141553	380		Introduction of a new bandwidth combination set for CA_25A-25A into 36.307	11.9.0
09-2014	RP-65	RP-141554	417r1		Introduction of requirements for 3DL inter-band carrier aggregation (FDD) and 2DL fallback	11.9.0
09-2014	RP-65	RP-141554	420r1		Introduction of requirements for 3DL inter-band carrier aggregation including Band 30 and 2DL fallback	11.9.0

09-2014	RP-65	RP-141555	383r1			Introduction of 3 Band Carrier Aggregation of Band 1,Band 3 and Band 5 to TS 36.307(Rel.11)	11.9.0
09-2014	RP-65	RP-141556	356r1			Introduction of 3 Band Carrier Aggregation (3DL/1UL) of Band 1, Band 3 and Band 8 to TS 36.307	11.9.0
09-2014	RP-65	RP-141558	401			Introduction of CA band combination Band 1, Band 3 and Band 20 to TS 36.307	11.9.0
09-2014	RP-65	RP-141560	351			Introduction of new CA_40C bandwidth combination set into 36.307	11.9.0
09-2014	RP-65	RP-141561	353r2			CR to 36.307 Rel-11: Introduction of CA_41C-41A and CA_41A-41C and New BW Combination Set for CA_41C	11.9.0
12-2014	RP-66	RP-142142	439r1			UE RF requirements in the release independent spec	11.10.0
12-2014	RP-66	RP-142184	442			Introduction of CA band combinations for dual uplik to TS 36.307 Rel-11	11.10.0
12-2014	RP-66	RP-142182	447			[Rel-11] Introduction of inter-band CA_1-28 into TS36.307	11.10.0
12-2014	RP-66	RP-142189	454			CR for TR 36.307: LTE_CA_B5_B13	11.10.0
12-2014	RP-66	RP-142190	457r2			Introduction of additional band combinations for 3DL inter-band CA	11.10.0
03-2015	RP-67	RP-150387	462			R4-73AH-0112: Correction of UE RF requirements for dual uplik to TS 36.307 Rel-11	11.11.0
03-2015	RP-67	RP-150392	467			CR for 36.307 on CA UE performance requirement in Rel-11	11.11.0
03-2015	RP-67	RP-150388	476r1			Release independent requirements for CA_42C	11.11.0
06-2015	RP-68	RP-151025	0472r3			Introduction of CA_42D to TS 36.307(Rel-11)	11.12.0
06-2015	RP-68	RP-150958	459r1			Introduction of dual uplink CA into 36.307	11.12.0
06-2015	RP-68	RP-150955	481r1			Clean up of requirements of band release independent	11.12.0
06-2015	RP-68	RP-150958	486			CR for CA UE performance tests in 36.307 in Rel-11	11.12.0
06-2015	RP-68	RP-150968	497r2			Release independence CR for 2DL inter-band CA Rel-11	11.12.0
06-2015	RP-68	RP-150972	501r1			Release independence CR for 3DL inter-band CA Rel-11	11.12.0
06-2015	RP-68	RP-150974	504r1			Release independence CR for 4DL inter-band CA Rel-11	11.12.0
06-2015	RP-68	RP-150975	507			Introduction of non-contiguous Carrier Aggregation (CA) in Band 42 for 3DL	11.12.0
09-2015	RP-69	RP-151505	515			Additional bandwidth combination set for LTE Advanced intra-band non-contiguous Carrier Aggregation in Band 4	11.13.0
09-2015	RP-69	RP-151501	518			Introduction of finished 4DL inter-band CAs to TS 36.307	11.13.0
09-2015	RP-69	RP-151476	521r1			Correction of TS 36.307 for release independent	11.13.0
09-2015	RP-69	RP-151498	532			Rel-13 2DL combinations	11.13.0
09-2015	RP-69	RP-151499	536			Rel-13 3DL combinations	11.13.0
09-2015	RP-69	RP-151504	540			Introduction of 3DL/2UL inter-band CA combinations without self-interference issues	11.13.0
12-2015	RP-70	RP-152158	0545aR1			Release independent requirements for CA_42E (Rel-11)	11.14.0
12-2015	RP-70	RP-152160	0547a			Introduction of 4DL NC CA in band42 in 36.307	11.14.0
12-2015	RP-70	RP-152157	0559			Introducing B20 + B67 CA into TS 36.307	11.14.0
12-2015	RP-70	RP-152168	0564			Introduction of intra-band CA_8B to TS 36.307	11.14.0
12-2015	RP-70	RP-152133	0566			[Rel-11] Introduction of dual uplink CA into 36.307	11.14.0
12-2015	RP-70	RP-152164	0567			Introduction of 3DL/2UL inter-band CA combinations with self-interference issues	11.14.0
12-2015	RP-70	RP-152171	0578			Introduction of Band 65	11.14.0
12-2015	RP-70	RP-152133	0591			[Rel-11] Introduction of dual uplink CA into 36.307	11.14.0
12-2015	RP-70	RP-152164	0593			Introduction of 3DL/2UL Inter-band CA for CA_39A-41C and CA_39C-41A	11.14.0
12-2015	RP-70	RP-152164	0599			Introduction of 3DL/2UL inter-band CA_3A-7A-28A in TS36.307 Rel-11	11.14.0
12-2015	RP-70	RP-152162	0602			Introduction of finished 4DL inter-band CAs to TS 36.307	11.14.0
12-2015	RP-70	RP-152170	0605			Introduction of CA_7A-7A BCS1 to TS 36.307	11.14.0
12-2015	RP-70	RP-152173	0610			Introduction of 1447-1467MHz Band into 36.307	11.14.0
12-2015	RP-70	RP-152161	0618			Rel-13 3DL combinations	11.14.0
12-2015	RP-70	RP-152172	0626			Introduction of Band 66	11.14.0
12-2015	RP-70	RP-152165	0629			Introduction of 2 UL and 3 DL mixed inter/intra cases without MSD into 36.307 Rel-11	11.14.0
12-2015	RP-70	RP-152159	0630			Introduction of intra-band non-contiguous CA in Band 41 for 4DL	11.14.0
12-2015	RP-70	RP-152167	0636			Introduction of intra-band CA_5B to TS 36.307	11.14.0
12-2015	RP-70	RP-152169	0638			Introduction of intra-band non-contiguous CA in Band 5	11.14.0
03/2016	RP-71	RP-160480	0653		B	Rel-13 3DL combinations	11.15.0
03/2016	RP-71	RP-160481	0640		B	Introduction of completed R13 4DL inter-band CA's to TS 36.307	11.15.0
03/2016	RP-71	RP-160482	0649		B	Introduction of 5DL/1UL CA combinations into TS 36.307 (Rel-11)	11.15.0
03/2016	RP-71	RP-160483	0645		B	Introduction of Band 68	11.15.0
06/2016	RP-72	RP-161140	0680	1	F	CR TS 36.307 REL-11	11.16.0

09/2016	RP-73	RP-161628	0695		A	Release 11 36.307 CAT A CR to make Band 41 power class 2 release independent The CRs was not implemented because it was not based on the latest version of the spec.	11.17.0
09/2016	RP-73	RP-161633	0701		F	Correction of REL-11 TS 36.307 references	11.17.0
12/2016	RP-74	RP-162406	0713	2	F	Addition of power class 2 and correction to UE category applicability	11.18.0
06/2017	RP-76	RP-171295	0746	1	F	Cleanup of TS 36.307	11.19.0
2018-03	RAN#79	RP-180288	4367		B	Addition of missing features for TS 36.307 REL-11	11.20.0
2018-03	RAN#79	RP-180276	4372		B	Introduction of 4UL CA into TS36.307	11.20.0
2018-06	RAN#80	RP-181107	4377		B	TS 36.307 Rel-11	11.21.0
2018-06	RAN#80	RP-181097	4383	1	A	TS 36.307 big CR for introduction new band support for 4Rx antenna ports R11	11.21.0

## History

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