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supporting a release-independent frequency band
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Contents

Foreword

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1 Scope

The present document specifies requirements on UEs supporting a frequency band and inter-band/intra-band CA configurations that are independent of release. The present document also defines requirements for 4RX antenna port requirements that are independent of release.

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

[2] 3GPP TS 36.101 (Release 12): "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) Radio Transmission and Reception".

[3] 3GPP TS 36.133 (Release 12): "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for Support of Radio Resource Management".

3 Definitions and Abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

3.2 Abbreviations

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

3A General

3A.1 Operating bands and CA

TSG-RAN has agreed that the standardisation of new features listed in Tables 3A.1-1, 3A.1-2, 3A.1-3, and 3A.1-4 are independent of a release. UE conforming earlier release than when the feature was introduced into the specifications shall comply with RRM- , demodulation- and RF-requirements as specified in the Annex-B2, Annex-B3, and Annex-B4 of TS 36.307 in the release that the feature was introduced. The applicable UE Categories are specified in TS 36.306 according to the release to which the UE conforms.

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

Feature	Duplex-mode	Release independent from
Operating bands, band number <= 64, Power Class 3	FDD, TDD	8
Operating bands, band number > 64, Power Class 3	FDD, TDD	9
Asymmetric operating bands, Power Class 3	FDD	10
Operating bands, band number <= 64, Power Class 1	FDD	10
Operating bands, Power Class 2	TDD	10

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

CA feature	DL/UL	CA BW Class	Duplex-mode	Release independent from
Intra-band contiguous CA	DL	B	FDD	10
		C	FDD, TDD	10
		D	TDD	10[1]
			TDD	11[1]
		E	TDD	11
	UL	B	FDD	10
		C	FDD, TDD	10
NOTE 1: Applicable release depends on UE category.				

Table 3A.1-3: Inter-band CA

CAfeature	DL/UL	number of bands	CA BW Classes	Duplex-mode	Release independent from
Inter-band CA	DL	2	A, B, C	FDD, TDD	10
			A, B, C, D	FDD, TDD	11
			A, B, C, D	FDD and TDD	12
		3	A	FDD, TDD	10[2]
			A, B, C	FDD, TDD	11[2]
			A	FDD and TDD	12
		4	A, C	FDD, TDD	11
				FDD and TDD	12
		5	A	FDD, TDD	12
				FDD and TDD	12
	UL	2	A, C	FDD, TDD	11
			A	FDD and TDD	12
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. NOTE 2: Applicable release depends on UE category					

Table 3A.1-4: Intra-band non-contiguous CA

CA type	DL/UL	number of sub-blocks	CA BW Classes	Duplex-mode	Release independent from
Intra-band non-contiguous CA	Downlink	2	A, C, D	FDD, TDD	11
	Uplink	2	A	FDD	11

For example, Band 19 is contained 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, such as the radio frequency and radio resource management requirements for the Band 19.

For another example on carrier aggregations, CA configuration CA_1A-19A is contained 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, such as the radio frequency and radio resource management requirements for the CA configuration CA_1A-19A.

All frequency bands are fully specified in this release of the specifications. The present document does not contain any requirements for UEs supporting frequency bands independent of release.

NOTE: See NOTE in clause 4.4 in [2].

3A.2 Other features

Features other than frequency bands and CA configurations can also be implemented independent of release, as listed in Tables 3A.2-1.

4 Rx compliant Rel-10 UE that supports 4 Rx reception and declares compliance to 4 Rx requirements shall comply with RF requirements, UE demodulation and CSI requirements as specified in the Annex-C.1 and Annex-C.2 of TS 36.307 in the release that the feature was introduced.

Table 3A.2-1: Other feature

Feature	Release independent from
4RX	10

4 - 292Void

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 [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 band independent of release

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

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

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 [3].

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

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. NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except: - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. 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. - 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 [3].

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

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. NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except: - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. 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 - 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 [3].

Table B.2.4-1: Common RRM requirements for a 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. NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except: - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. 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. - 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 [3].

Table B.2.5-1: Common RRM requirements for a 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. NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except: - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. 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. - 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 [3].

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

Section / Clause	Description
7.1	UE transmit timing
7.7	SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation
7.17	Maximum Transmission Timing Difference in Dual Connectivity
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 dual uplinks shall apply. NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except: - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. 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. - 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.3 Common UE performance requirements

B.3.1 Void

Table B.3.1-1: Void

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

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)
8.2.1.3.1	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)
8.2.1.4.3A	Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (DC)
8.2.2.4.3	Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (TDD)
8.2.2.4.4	Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (DC)
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)
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 in [2]. NOTE 2: The test coverage for different number of component carriers is defined in 8.1.2.4 in [2].	

B.3.3 Void

Table B.3.3-1: Void

B.3.4 Void

B.4 Common UE RF requirements

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

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

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

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 [2].

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

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 [2].

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

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 [2].

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

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 [2].

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

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 [2].

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

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 [2].

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

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

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	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
06-2015	RP-68	RP-151026	0471r3			Introduction of CA_42D to TS 36.307(Rel-12)	12.8.0
06-2015	RP-68	RP-151067	0510r1			Introduction of CA_3A-40A to TS 36.307 R12	12.8.0
06-2015	RP-68	RP-151069	0512r1			Introduction of CA_3A-40C to TS 36.307 R12	12.8.0
06-2015	RP-68	RP-150958	460r1			Introduction of dual uplink CA into 36.307	12.8.0
06-2015	RP-68	RP-150958	487			CR for CA UE performance tests in 36.307 in Rel-12	12.8.0
06-2015	RP-68	RP-150968	498r2			Release independence CR for 2DL inter-band CA Rel-12	12.8.0
06-2015	RP-68	RP-150972	502r1			Release independence CR for 3DL inter-band CA Rel-12	12.8.0
06-2015	RP-68	RP-150974	505r1			Release independence CR for 4DL inter-band CA Rel-12	12.8.0
06-2015	RP-68	RP-150975	508			Introduction of non-contiguous Carrier Aggregation (CA) in Band 42 for 3DL	12.8.0
09-2015	RP-69	RP-151505	516			Additional bandwidth combination set for LTE Advanced intra-band non-contiguous Carrier Aggregation in Band 4	12.9.0
09-2015	RP-69	RP-151501	519r1			Introduction of finished 4DL inter-band CAs to TS 36.307	12.9.0
09-2015	RP-69	RP-151476	522r1			Correction of TS 36.307 for release independent	12.9.0
09-2015	RP-69	RP-151503	525			[Rel-12] Introduction of dual uplink CA into 36.307	12.9.0
09-2015	RP-69	RP-151498	533r1			Rel-13 2DL combinations	12.9.0
09-2015	RP-69	RP-151499	537			Rel-13 3DL combinations	12.9.0
09-2015	RP-69	RP-151504	541			Introduction of 3DL/2UL inter-band CA combinations without self-interference issues	12.9.0
09-2015	RP-69	RP-151202	544			Introduction of CA_7A-40A and CA_7A-40C to TS 36.307 R12	12.9.0
12-2015	RP-70	RP-152158	0544aR2			Release independent requirements for CA_42E (Rel-12)	12.10.0
12-2015	RP-70	RP-152160	0548a			Introduction of 4DL NC CA in band42 in 36.307	12.10.0
12-2015	RP-70	RP-152133	0556			[Rel-12] Introduction of dual uplink CA into 36.307	12.10.0
12-2015	RP-70	RP-152157	0560			Introducing B20 + B67 CA into TS 36.307	12.10.0
12-2015	RP-70	RP-152168	0563			Introduction of intra-band CA_8B to TS 36.307	12.10.0
12-2015	RP-70	RP-152164	0568			Introduction of 3DL/2UL inter-band CA combinations with self-interference issues	12.10.0
12-2015	RP-70	RP-152171	0579			Introduction of Band 65	12.10.0
12-2015	RP-70	RP-152133	0592			[Rel-12] Introduction of dual uplink CA into 36.307	12.10.0
12-2015	RP-70	RP-152164	0594			Introduction of 3DL/2UL Inter-band CA for CA_39A-41C and CA_39C-41A	12.10.0
12-2015	RP-70	RP-152166	0595			Introduction of 3DL/3UL Inter-band CA for CA_39A-41C and CA_39C-41A	12.10.0
12-2015	RP-70	RP-152163	0597			Introduction of 5DL/1UL CA combinations into TS 36.307 (Rel-12)	12.10.0
12-2015	RP-70	RP-152164	0600			Introduction of 3DL/2UL inter-band CA_3A-7A-28A in TS36.307 Rel-12	12.10.0
12-2015	RP-70	RP-152162	0603			Introduction of finished 4DL inter-band CAs to TS 36.307	12.10.0
12-2015	RP-70	RP-152170	0606			Introduction of CA_7A-7A BCS1 to TS 36.307	12.10.0
12-2015	RP-70	RP-152173	0611			Introduction of 1447-1467MHz Band into 36.307	12.10.0
12-2015	RP-70	RP-152156	0615			Rel-13 2DL combinations	12.10.0
12-2015	RP-70	RP-152161	0619			Rel-13 3DL combinations	12.10.0
12-2015	RP-70	RP-152172	0627			Introduction of Band 66	12.10.0
12-2015	RP-70	RP-152159	0631			Introduction of intra-band non-contiguous CA in Band 41 for 4DL	12.10.0
12-2015	RP-70	RP-152165	0633			Introduction of 2 UL and 3 DL mixed inter/intra cases without MSD into 36.307 Rel-12	12.10.0
12-2015	RP-70	RP-152167	0637			Introduction of intra-band CA_5B to TS 36.307	12.10.0
12-2015	RP-70	RP-152169	0639			Introduction of intra-band non-contiguous CA in Band 5	12.10.0
03/2016	RP-71	RP-160480	0654		B	Rel-13 3DL combinations	12.11.0
03/2016	RP-71	RP-160481	0641		B	Introduction of completed R13 4DL inter-band CAs to TS 36.307	12.11.0
03/2016	RP-71	RP-160482	0650		B	Introduction of 5DL/1UL CA combinations into TS 36.307 (Rel-12)	12.11.0
03/2016	RP-71	RP-160483	0646		B	Introduction of Band 68	12.11.0
2016/06	RP-72	RP-161141	681	1	F	CR TS 36.307 REL-12	12.12.0
2016/06	RP-72	RP-161141	690	1	F	Correction of RRM multiple uplink requirements and test cases in 36.307	12.12.0
09/2016	RP-73	RP-161628	694		A	Release 12 36.307 CAT A CR to make Band 41 power class 2 release independent	12.13.0
09/2016	RP-73	RP-161784	702		F	Correction of REL-12 TS 36.307 references	12.13.0

History

Document history		
V12.5.0	October 2014	Publication
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V12.9.0	October 2015	Publication
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