

ETSI TS 136 307 V12.7.0 (2015-04)



**LTE;
Evolved Universal Terrestrial Radio Access (E-UTRA);
Requirements on User Equipments (UEs)
supporting a release-independent frequency band
(3GPP TS 36.307 version 12.7.0 Release 12)**



Reference

RTS/TSGR-0436307vc70

Keywords

LTE

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2015.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Foreword.....	2
Modal verbs terminology.....	2
Foreword.....	8
1 Scope	9
2 References	9
3 Definitions and Abbreviations.....	9
3.1 Definitions	9
3.2 Abbreviations	9
3A General	9
4 Void.....	10
5 Void.....	10
6 Void.....	10
7 Void.....	10
8 Void.....	10
9 Void.....	10
10 Void.....	10
11 Void.....	10
12 Void.....	10
13 Void.....	11
14 Void.....	11
15 Void.....	11
16 Void.....	11
17 Void.....	11
18 Void.....	11
19 Void.....	11
20 Void.....	11
21 Void.....	11
22 Void.....	11
23 Void.....	11
24 Void.....	12
25 Void.....	12
26 Void.....	12
27 Void.....	12
28 Void.....	12
29 Void.....	12

30 Void.....12

31 Void.....12

32 Void.....12

33 Void.....12

34 Void.....12

35 Void.....13

36 Void.....13

37 Void.....13

38 Void.....13

39 Void.....13

40 Void.....13

41 Void.....13

42 Void.....13

43 Void.....13

44 Void.....13

45 Void.....13

46 Void.....14

47 Void.....14

48 Void.....14

49 Void.....14

50 Void.....14

51 Void.....14

52 Void.....14

53 Void.....14

54 Void.....14

55 Void.....14

56 Void.....14

57 Void.....15

58 Void.....15

59 Void.....15

60 Void.....15

61 Void.....15

62 Void.....15

63 Void.....15

64 Void.....15

65 Void.....15

66 Void.....15

67 Void.....15

68	Void.....	16
69	Void.....	16
70	Void.....	16
71	Void.....	16
72	Void.....	16
73	Void.....	16
74	Void.....	16
75	Void.....	16
76	Void.....	16
77	Void.....	16
78	Void.....	16
79	Void.....	17
80	Void.....	17
81	Void.....	17
82	Void.....	17
83	Void.....	17
84	Void.....	17
85	Void.....	17
86	Void.....	17
87	Void.....	17
88	Void.....	17
89	Void.....	17
90	Void.....	18
91	Void.....	18
92	Void.....	18
93	Void.....	18
94	Void.....	18
95	Void.....	18
96	Void.....	18
97	Void.....	18
98	Void.....	18
99	Void.....	18
100	Void.....	18
101	Void.....	19
102	Void.....	19
103	Void.....	19
104	Void.....	19
105	Void.....	19

106 Void.....19

107 Void.....19

108 Void.....19

109 Void.....19

110 Void.....19

111 Void.....19

112 Void.....20

113 Void.....20

114 Void.....20

115 Void.....20

116 Void.....20

117 Void.....20

118 Void.....20

119 Void.....20

120 Void.....20

121 Void.....20

122 Void.....20

123 Void.....21

124 Void.....21

125 Void.....21

126 Void.....21

127 Void.....21

128 Void.....21

129 Void.....21

130 Void.....21

131 Void.....21

132 Void.....21

133 Void.....21

134 Void.....22

135 Void.....22

136 Void.....22

137 Void.....22

138 Void.....22

139 Void.....22

Annex A (informative) : Frequency arrangement for overlapping operating bands23

Annex B (normative): Common Requirements.....24

B.1 Purpose of annex24

B.2 Common RRM requirements24

B.2.1	Common RRM requirements for a band independent of release.....	24
B.2.2	Common RRM requirements for an intra-band contiguous CA configuration	25
B.2.3	Common RRM requirements for an intra-band non-contiguous CA with single uplink configuration.....	26
B.2.4	Common RRM requirements for an inter-band CA with single uplink configuration	27
B.2.5	Common RRM requirements for an inter-band CA with dual uplink configuration.....	27
B.2.6	Common RRM requirements for an intra-band non-contiguous CA with dual uplink configuration	27
B.3	Common UE performance requirements.....	29
B.3.1	Void.....	29
B.3.2	Common UE performance requirements and tests for different CA configurations and combination sets	29
B.3.3	Void.....	30
B.3.4	Void.....	30
B.4	Common UE RF requirements	30
B.4.1	Common UE RF requirements for a band independent of release	30
B.4.2	Common UE RF requirements for an intra-band contiguous CA configuration	30
B.4.3	Common UE RF requirements for a single uplink inter-band CA configuration.....	31
B.4.4	Common UE RF requirements for an inter-band CA configuration including an operating band without uplink band.....	32
B.4.5	Common UE RF requirements for a single uplink intra-band non-contiguous CA configuration	32
B.4.6	Common UE RF requirements for Dual uplink inter-band CA configuration	33
B.4.7	Common UE RF requirements for Dual uplink intra-band non-contiguous CA configuration.....	33
Annex C (informative): Change history		35
History		38

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

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.

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 (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

TSG-RAN has agreed that the standardisation of new frequency bands may be independent of a release, and that the standardisations of new inter-band/intra-band CA configurations also may be independent of a release for Rel-10 upwards. However, in order to implement a UE that conforms to a particular release but supports a band of operation or carrier aggregation of particular inter-band/intra-band CA configurations that is specified in a later release, it is necessary to specify some extra requirements.

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].

4 Void

5 Void

6 Void

7 Void

8 Void

9 Void

10 Void

11 Void

12 Void

13 Void

14 Void

15 Void

16 Void

17 Void

18 Void

19 Void

20 Void

21 Void

22 Void

23 Void

24 Void

25 Void

26 Void

27 Void

28 Void

29 Void

30 Void

31 Void

32 Void

33 Void

34 Void

35 Void

36 Void

37 Void

38 Void

39 Void

40 Void

41 Void

42 Void

43 Void

44 Void

45 Void

46 Void

47 Void

48 Void

49 Void

50 Void

51 Void

52 Void

53 Void

54 Void

55 Void

56 Void

57 Void

58 Void

59 Void

60 Void

61 Void

62 Void

63 Void

64 Void

65 Void

66 Void

67 Void

68 Void

69 Void

70 Void

71 Void

72 Void

73 Void

74 Void

75 Void

76 Void

77 Void

78 Void

79 Void

80 Void

81 Void

82 Void

83 Void

84 Void

85 Void

86 Void

87 Void

88 Void

89 Void

90 Void

91 Void

92 Void

93 Void

94 Void

95 Void

96 Void

97 Void

98 Void

99 Void

100 Void

101 Void

102 Void

103 Void

104 Void

105 Void

106 Void

107 Void

108 Void

109 Void

110 Void

111 Void

112 Void

113 Void

114 Void

115 Void

116 Void

117 Void

118 Void

119 Void

120 Void

121 Void

122 Void

123 Void

124 Void

125 Void

126 Void

127 Void

128 Void

129 Void

130 Void

131 Void

132 Void

133 Void

134 Void

135 Void

136 Void

137 Void

138 Void

139 Void

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
<p>NOTE 1: All requirements and the corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> - for supporting the corresponding band in Rel-9 and below: clause 4.3 (Minimization of Drive Tests). <p>NOTE 2: All requirements and the corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> - 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). <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"> - 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). <p>NOTE 5: All requirements and corresponding test cases shall apply, except:</p> <ul style="list-style-type: none"> - 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 $l_0 \leq -70$ dBm is ± 6 dB. - 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 ± 6 dB. <p>NOTE 6: In addition to the exceptions above, all requirements and test cases in this table shall apply, except those defined for:</p> <ul style="list-style-type: none"> - 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
<p>NOTE 1: Only requirements and test cases defined for intra-band contiguous carrier aggregation shall apply.</p> <p>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:</p> <ul style="list-style-type: none"> - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. <p>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 $Io \leq -70\text{dBm}$ is $\pm 6\text{dB}$.</p> <ul style="list-style-type: none"> - 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 $\pm 6\text{dB}$. 	

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
<p>NOTE 1: Only requirements and test cases defined for intra-band non-contiguous carrier aggregation with single uplink shall apply.</p> <p>NOTE 2: In addition to the exceptions above, all requirements and test cases in this table shall apply, except:</p> <ul style="list-style-type: none"> - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12. <p>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 $Io \leq -70\text{dBm}$ is $\pm 6\text{dB}$.</p> <ul style="list-style-type: none"> - 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 $\pm 6\text{dB}$. 	

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 $I_{o \leq -70\text{dBm}}$ is $\pm 6\text{dB}$. - 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 $\pm 6\text{dB}$.	

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
TBD	TBD
NOTE 1: Only requirements and test cases defined for inter-band with dual uplink carrier aggregation shall apply.	

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
TBD	TBD
NOTE 1: Only requirements and test cases defined for intra-band non-contiguous carrier aggregation with dual uplinks shall apply.	

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)
8.2.3.1.1	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)
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 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 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 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	TSG#	TSG Doc.	CR	Subject	Old	New
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.	0.1.0	0.2.0
03-2010	RP#47	RP-100162		TS36.307 v1.0.0 for approval	0.2.0	1.0.0
03-2010	RP#47	RP-100162		Approved by RAN	1.0.0	9.0.0
09-2010	RP-49	RP-100927	2	CR LTE_TDD_2600_US spectrum band definition additions to TS 36.307 V900	9.0.0	9.1.0
				Correction of section numbering	9.1.0	9.1.1
12-2010	RP-50	RP-101356	008	Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307	9.1.1	9.2.0
12-2010	RP-50	RP-101361	005	Introduction of L-band in TS 36.307	9.1.1	9.2.0
12-2010	RP-50	RP-101344	016	CR creating the rel-10 of the 36.307 specification	9.2.0	9.3.0
12-2010	RP-50	RP-101356	012	Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307	9.2.0	9.3.0
12-2010	RP-50			Raised to Rel-10 with no technical change	9.3.0	10.0.0
01-2011				Correction to history table	10.0.0	10.0.1
06-2011	RP-52	RP-110804	015	Add Expanded 1900 MHz Band (Band 25) in 36.307	10.0.1	10.1.0
06-2011	RP-52	RP-110812	022	Add 2GHz S-Band (Band 23) in 36.307 (Rel 10)	10.0.1	10.1.0
09-2011	RP-53	RP-111255	025	Add Band 22 for LTE/UMTS 3500 (FDD) to TS 36.307	10.1.0	10.2.0
03-2012	RP-55	RP-120305	029	Introduction of Band 26/XXVI to TS 36.307	10.2.0	11.0.0
2012-06	RP-56	RP-120789	043	Introduction of CA_1A-19A to TS 36.307	11.0.0	11.1.0
2012-06	RP-56	RP-120793	049	Introduction of APAC700(FDD) into TS 36.307 Rel-11	11.0.0	11.1.0
2012-06	RP-56	RP-120793	053	Introduction of APAC700(TDD) into TS 36.307 Rel-11	11.0.0	11.1.0
2012-06	RP-56	RP-120791	057	Introduction of e850_LB (Band 27) to TS 36.307	11.0.0	11.1.0
2012-09	RP-57	RP-121335	059	Introduction of CA_1A-21A to TS 36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121295	070r1	Relation between EARFCN for overlapping bands with multiple FBI indication	11.1.0	11.2.0
2012-09	RP-57	RP-121338	072	36.307 CR for LTE_CA_B7	11.1.0	11.2.0
2012-09	RP-57	RP-121337	073	TS 36.307 CR for CA_38	11.1.0	11.2.0
2012-09	RP-57	RP-121327	074	Introduction of CA_B7_B20 in 36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121329	075	Introduction of CA band combination Band3 + Band5 to TS 36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121331	076	Introduction of CA_3A-20A to TS 36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121334	077	Add requirements for inter-band CA of B_1-18 in TS36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121333	078	Introduction of CA_8_20 RF requirements into TS36.307	11.1.0	11.2.0
2012-09	RP-57	RP-121324	079	Introduction of CA_B3_B7 in 36.307	11.1.0	11.2.0
2012-12	RP-58	RP-121890	086	Introduction of CA_4A-5A into 36.307	11.2.0	11.3.0
2012-12	RP-58	RP-121889	088	Introduction of CA band combination Band4 + Band13 to TS 36.307 (Rel-11)	11.2.0	11.3.0

2012-12	RP-58	RP-121896	091	Introduction of Band 5 + Band 17 inter-band CA configuration into 36.307	11.2.0	11.3.0
2012-12	RP-58	RP-121884	092	Introduction of CA_3A-8A to TS 36.307	11.2.0	11.3.0
2012-12	RP-58	RP-121894	093	Introduction of CA_B5_B12 in 36.307	11.2.0	11.3.0
2012-12	RP-58	RP-121887	095	Introduction of CA_4-12 into TS 36.307 (Rel-11)	11.2.0	11.3.0
2012-12	RP-58	RP-121882	097	[Rel-11] Introduction of inter-band CA_11-18 into TS36.307	11.2.0	11.3.0
2012-12	RP-58	RP-121861	099	Release-independent implementation of carrier aggregation configuration CA_4-7	11.2.0	11.3.0
2012-12	RP-58	RP-121901	101	Introduction of Band 29	11.2.0	11.3.0
2012-12	RP-58	RP-121718	0102	Introduction of CA band combination Band2 + Band17 to TS 36.307 (Rel-11)	11.2.0	11.3.0
2012-12	RP-58	RP-121720	0104	Introduction of CA band combination Band4 + Band17 to TS 36.307 (Rel-11)	11.2.0	11.3.0
2013-06	RP-60	RP-130771	108	Introduction of CA 1+8 into TS36.307(Rel-12)	11.3.0	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	11.3.0	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)	11.3.0	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)	11.3.0	12.0.0
2013-06	RP-60	RP-130777	120	Introduction of CA_3A-19A to TS 36.307	11.3.0	12.0.0
2013-06	RP-60	RP-130783	123	Introduction of CA_19A-21A to TS 36.307	11.3.0	12.0.0
2013-06	RP-60	RP-130775	131	Introduction of CA_2A-13A to TS 36.307	11.3.0	12.0.0
2013-06	RP-60	RP-130791	136	Introduction of Band 30	11.3.0	12.0.0
2013-06	RP-60	RP-130790	143	Introduction of LTE 450 into TS 36.307 R12	11.3.0	12.0.0
2013-06	RP-60	RP-130787	150	Introduction of CA_4A-4A into 36.307 Rel-12	11.3.0	12.0.0
09-2013	RP-61	RP-131300	153	36.307 CR for LTE_CA_C_B3 (Rel-12)	12.0.0	12.1.0
09-2013	RP-61	RP-131296	160	[Rel-12] Add requirements for CA_1A-26A into TS36.307	12.0.0	12.1.0
09-2013	RP-61	RP-131297	163	Introduction of CA_2A-4A to TS 36.307	12.0.0	12.1.0
09-2013	RP-61	RP-131298	167	Introduction of inter-band CA Band 2+5	12.0.0	12.1.0
12-2013	RP-62	RP-131965	173	Introduction of CA_23A-23A to TS 36.307	12.1.0	12.2.0
12-2013	RP-62	RP-131946	178	Introduction of CA band combination Band2 + Band12 to TS 36.307	12.1.0	12.2.0
12-2013	RP-62	RP-131954	181	Introduction of CA band combination Band12 + Band25 to TS 36.307	12.1.0	12.2.0
12-2013	RP-62	RP-131959	184	Introduction of LTE_CA_C_B27 to 36.307 (Rel-12)	12.1.0	12.2.0
12-2013	RP-62	RP-131957	192	Introduction of CA_23B to TS 36.307	12.1.0	12.2.0
12-2013	RP-62	RP-131961	194	Introduction of Intra-band non-contiguous CA in band 3 to TS 36.307	12.1.0	12.2.0
12-2013	RP-62	RP-131950	200	Introduction of CA band combination Band5 + Band25 to TS 36.307	12.1.0	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	12.1.0	12.2.0
12-2013	RP-62	RP-131948	204	Introduction of CA band combination B5 + B7 to TS 36.307 R12	12.1.0	12.2.0
12-2013	RP-62	RP-131952	207	Introduction of CA band combination B7 + B28 to TS 36.307	12.1.0	12.2.0

12-2013	RP-62	RP-131967	211	Correction to release independent specification	12.1.0	12.2.0
12-2013	RP-62	RP-131925	216	UE performance requirements in release independent specification for CA	12.1.0	12.2.0
12-2013	RP-62	RP-131963	219	Introduction of CA_7A-7A to TS 36.307 Rel-12	12.1.0	12.2.0
03-2014	RP-63	RP-140371	235	Release independence of Band 14 HPUE	12.2.0	12.3.0
03-2014	RP-63	RP-140386	227	Introduction of CA band combination Band 3 and Band 27 to TS 36.307	12.2.0	12.3.0
03-2014	RP-63	RP-140389	245r1	Correction to release independent specification	12.2.0	12.3.0
03-2014	RP-63	RP-140388	210r1	Introduction of CA_39C to TS 36.307	12.2.0	12.3.0
03-2014	RP-63	RP-140387	197r1	Introduction of CA_39A-41A to TS 36.307	12.2.0	12.3.0
06-2014	RP-64	RP-140911	259	Introduction of CA band combination Band 1 and Band 5 to TS 36.307	12.3.0	12.4.0
06-2014	RP-64	RP-140918	300	Correction of Common RRM requirements for CA in release independent specification (Rel-12)	12.3.0	12.4.0
06-2014	RP-64	RP-140926	280r1	Introduction of Band 20+32 CA	12.3.0	12.4.0
06-2014	RP-64	RP-140931	265	Introduction of CA 1+11 to 36.307 (Rel-12)	12.3.0	12.4.0
06-2014	RP-64	RP-140933	275	Introduction of CA band combination Band 4 and Band 27 to TS 36.307	12.3.0	12.4.0
06-2014	RP-64	RP-140938	291	Introduction of CA_2A-2A to TS 36.307 Rel-12	12.3.0	12.4.0
06-2014	RP-64	RP-140940	319	Introduction of LTE_CA_NC_B42 into 36.307	12.3.0	12.4.0
06-2014	RP-64	RP-140942	253	Introduction of CA band combination Band 3 and Band 27 to TS 36.307	12.3.0	12.4.0
06-2014	RP-64	RP-140942	340	Introduction of CA band combination Band 1 and Band 20 to TS 36.307	12.3.0	12.4.0
06-2014	RP-64	RP-140943	347	Introduction of CA band combination CA_41D into TS 36.307 (Rel-12)	12.3.0	12.4.0
09-2014	RP-65	RP-141110	0388r1	[Rel-12] Introduction of inter-band CA_18-28 into TS36.307	12.4.0	12.5.0
09-2014	RP-65	RP-141200	0366r1	Introduction of CA_B1_B3_B19 into TS 36.307 (Rel-12)	12.4.0	12.5.0
09-2014	RP-65	RP-141205	0363r1	Introduction of CA_B1_B3 into TS 36.307 (Rel-12)	12.4.0	12.5.0
09-2014	RP-65	RP-141332	0429r1	Introduction of CA_1A-7A into 36.307 (Rel -12)	12.4.0	12.5.0
09-2014	RP-65	RP-141340	0376r1	Introduction of CA_B1_B5_B7 into TS 36.307 (Rel-12)	12.4.0	12.5.0
09-2014	RP-65	RP-141467	0432	Introduction of 3 DL CA for Band 1+7+20	12.4.0	12.5.0
09-2014	RP-65	RP-141527	415r1	CR for 36.307 on CA UE performance requirement in Rel-12	12.4.0	12.5.0
09-2014	RP-65	RP-141551	360	Introduction of CA 8+11 to 36.307 (Rel-12)	12.4.0	12.5.0
09-2014	RP-65	RP-141552	379	Introduction of CA_41A-42A to TS 36.307	12.4.0	12.5.0
09-2014	RP-65	RP-141553	381	Introduction of a new bandwidth combination set for CA_25A-25A into 36.307	12.4.0	12.5.0
09-2014	RP-65	RP-141554	418r1	Introduction of requirements for 2DL inter-band carrier aggregation (FDD) and 2DL fallback	12.4.0	12.5.0
09-2014	RP-65	RP-141554	421	Introduction of requirements for 3DL inter-band carrier aggregation including Band 30	12.4.0	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)	12.4.0	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	12.4.0	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	12.4.0	12.5.0
09-2014	RP-65	RP-141560	352	Introduction of new CA_40C bandwidth combination set into 36.307	12.4.0	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	12.4.0	12.5.0
12-2014	RP-66	RP-142142	440	UE RF requirements in the release independent spec	12.5.0	12.6.0
12-2014	RP-66	RP-142188	444	Revision of common RRM requirements for release independent specification	12.5.0	12.6.0
12-2014	RP-66	RP-142182	448	[Rel-12] Introduction of inter-band CA_1-28 into TS36.307	12.5.0	12.6.0
12-2014	RP-66	RP-142189	455	CR for TR 36.307: LTE_CA_B5_B13	12.5.0	12.6.0
12-2014	RP-66	RP-142190	458r2	Introduction of additional band combinations for 3DL inter-band CA	12.5.0	12.6.0
03-2015	RP-67	RP-150387	463	R4-73AH-0113: Correction of UE RF requirements for dual uplink to TS 36.307 Rel-12	12.6.0	12.7.0
03-2015	RP-67	RP-150392	468	CR for 36.307 on CA UE performance requirement in Rel-12	12.6.0	12.7.0
03-2015	RP-67	RP-150387	469	Further revision of RSRP requirement for 36.307 release 12	12.6.0	12.7.0

History

Document history		
V12.5.0	October 2014	Publication
V12.6.0	February 2015	Publication
V12.7.0	April 2015	Publication