



**ARIB STD-T104-36.307 V10.6.0**

**Requirements on User  
Equipments (UEs)  
Supporting a release-independent  
frequency band**

**(Release 10)**

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# 3GPP TS 36.307 V10.6.0 (2012-12)

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*Technical Specification*

## **3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements on User Equipments (UEs) Supporting a release-independent frequency band (Release 10)**



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Keywords

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## Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> 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:

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  - 2 presented to TSG for approval;
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- 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.

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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. 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.

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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 (Release 11): "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) Radio Transmission and Reception".
- [3] 3GPP TS 36.133 (Release 11): "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for Support of Radio Resource Management".

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# 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:

CA Carrier Aggregation



|     |                           |
|-----|---------------------------|
| FDD | Frequency Division Duplex |
| RRC | Radio Resource Control    |
| RRM | Radio Resource Management |
| TDD | Time Division Duplex      |
| UE  | User Equipment            |

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4      Void

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5      Void

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6      Void

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7      Void

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8      Void

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9      Void

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10     Void

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11     Void

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12     Void

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## 13 Void

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## 14 Void

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## 15 Band 26 Independent of Release

Band 26 is specified in Release 11 but is defined as a release-independent frequency band. This approach aligns the Band 26 band with other frequency bands when considering features that have to be supported in different releases.

### 15.1 Band 26 UE

UEs that conform to Release 10 and support Band 26 shall support the following requirements in Release 11.

#### 15.1.1 RF Requirements

The UE shall comply with the RF requirements for Band 26 specified [2]. The requirements are:

**Table 15.1.1-1: RF Requirements for Band 26 UE**

| Section / Clause | Description                        |
|------------------|------------------------------------|
| 5.5              | Operating bands                    |
| 5.6              | Channel bandwidth                  |
| 5.7              | Channel arrangement                |
| 6.2              | Transmit power                     |
| 6.3              | Output power dynamics              |
| 6.6              | 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    |

#### 15.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for Band 26 specified in [3]. These requirements are:

**Table 15.1.2-1: RRM Requirements for Band 26 UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

## 16 Band 27 Independent of Release

Band 27 is specified in Release 11, but is defined as a release-independent frequency band. This approach aligns the Band 27 band with other frequency bands when considering features that have to be supported in different releases.

### 16.1 Band 27 UE

UEs that conform to Release 10 and support Band 27 shall support the following requirements in Release 11.

#### 16.1.1 RF Requirements

The UE shall comply with the Release 11 RF requirements for Band 27 specified [2]. The requirements are:

**Table 16.1.1-1: RF Requirements for Band 27 UE**

| Section / Clause | Description                        |
|------------------|------------------------------------|
| 5.5              | Operating bands                    |
| 5.6              | Channel bandwidth                  |
| 5.7              | Channel arrangement                |
| 6.2              | Transmit power                     |
| 6.3              | Output power dynamics              |
| 6.6              | 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    |

#### 16.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for Band 27 specified in [3]. These requirements are:

**Table 16.1.2-1: RRM Requirements for Band 27 UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

## 17 Band 28 Independent of Release

Band 28 is specified in Release 11 but is defined as a release-independent frequency band. This approach aligns the Band 28 band with other frequency bands when considering features that have to be supported in different releases.

### 17.1 Band 28 UE

UEs that conform to Release 8 and support Band 28 shall support the following requirements in Release 11.

## 17.1.1 RF Requirements

The UE shall comply with the RF requirements for Band 28 specified [2]. The requirements are:

**Table 17.1.1-1: RF Requirements for Band 28 UE**

| Section / Clause | Description                        |
|------------------|------------------------------------|
| 5.5              | Operating bands                    |
| 5.6              | Channel bandwidth                  |
| 5.7              | Channel arrangement                |
| 6.2              | Transmit power                     |
| 6.3              | Output power dynamics              |
| 6.6              | 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    |

## 17.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for Band 28 specified in [3]. These requirements are:

**Table 17.1.2-1: RRM Requirements for Band 28 UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

---

# 18 Band 44 Independent of Release

Band 44 is specified in Release 11 but is defined as a release-independent frequency band. This approach aligns the Band 44 band with other frequency bands when considering features that have to be supported in different releases.

## 18.1 Band 44 UE

UEs that conform to Release 8 and support Band 44 shall support the following requirements in Release 11.

### 18.1.1 RF Requirements

The UE shall comply with the RF requirements for Band 44 specified [2]. The requirements are:

**Table 18.1.1-1: RF Requirements for Band 44 UE**

| Section / Clause | Description                        |
|------------------|------------------------------------|
| 5.5              | Operating bands                    |
| 5.6              | Channel bandwidth                  |
| 5.7              | Channel arrangement                |
| 6.2              | Transmit power                     |
| 6.3              | Output power dynamics              |
| 6.6              | 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    |

## 18.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for Band 44 specified in [3]. These requirements are:

**Table 18.1.2-1: RRM Requirements for Band 44 UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

---

# 19 CA configuration CA\_41C Independent of Release

CA\_41C is specified in Release 11 but is defined as a release-independent E-UTRA CA configuration.

## 19.1 Band 41 UE

UEs that conform to Release 10 and support CA\_41C shall support the following requirements in Release 11 for both one uplink and simultaneous transmission on two uplinks.

### 19.1.1 RF Requirements

The UE shall comply with the following RF requirements for CA\_41C specified in [2]. These requirements are:

**Table 19.1.1-1: RF Requirements for CA\_41C UE**

| Section / Clause | Description   |
|------------------|---|
| 5.5A             | Operating bands for CA  |
| 5.6A.1           | Channel bandwidths per operating band for CA                    |
| 6.2.2A           | UE maximum output power for intra-band contiguous 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                             |
| 6.6.2.1A         | Spectrum emission mask for CA                                   |
| 6.6.2.2A         | Additional spectrum emission mask for C A                       |
| 6.6.3.2A         | Spurious emission band UE co-existence for CA                   |
| 7.3.1A           | Reference sensitivity power level minimum requirements for CA   |
| 7.6.1.1A         | In-band blocking minimum requirements for CA                    |
| 7.6.2.1A         | Out-of-band blocking minimum requirements for CA                |

## 19.1.2 RRM Requirements

The UE shall comply with the following RRM Requirements for CA\_41C specified in [3]. These requirements are:

**Table 19.1.1-2: RRM Requirements for CA\_41C UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

---

## 20 CA configuration CA\_1A-19A Independent of Release

CA configuration CA\_1A-19A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 20.1 CA\_1A-19A UE

UEs that conform to Release 10 and support CA\_1A-19A shall support the following requirements in Release 11.

#### 20.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_1A-19A specified in [2]. These requirements are:

**Table 20.1.1-1: RF Requirements for CA\_1A-19A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

## 20.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_1A-19A specified in [3]. These requirements are:

**Table 16.1.2-1: RRM Requirements for CA\_1A-19A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 21 CA configuration CA\_7C Independent of Release

CA configuration CA\_7C is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 21.1 CA\_7C UE

UEs that conform to Release 10 and support CA\_7C shall support the following requirements in Release 11.

#### 21.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_7C specified in [2]. These requirements are:

**Table 21.1.1-1: RF Requirements for CA\_7C UE**

| Section / Clause | Description   |
|------------------|---|
| 5.5A             | Operating bands for CA  |
| 5.6A.1           | Channel bandwidths per operating band for CA                    |
| 6.2.2A           | UE maximum output power for intra-band contiguous 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                             |
| 6.6.2.1A         | Spectrum emission mask for CA                                   |
| 6.6.3.2A         | Spurious emission band UE co-existence for CA                   |
| 7.3.1A           | Reference sensitivity power level minimum requirements for CA   |
| 7.6.1.1A         | In-band blocking minimum requirements for CA                    |
| 7.6.2.1A         | Out-of-band blocking minimum requirements for CA                |

#### 21.1.2 RRM Requirements

The UE shall comply with the following RRM Requirements for CA\_7C specified in [3]. These requirements are:

**Table 21.1.1-2: RRM Requirements for CA\_7C UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

## 22 CA configuration CA\_38C Independent of Release

CA\_38C is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 22.1 Band 38 UE

UEs that conform to Release 10 and support CA\_38C shall support the following requirements in Release 11 for both one uplink and simultaneous transmission on two uplinks.

#### 22.1.1 RF Requirements

The UE shall comply with the following RF requirements for CA\_38C specified in [2]. These requirements are:

**Table 22.1.1-1: RF Requirements for CA\_38C UE**

| Section / Clause | Description   |
|------------------|---|
| 5.5A             | Operating bands for CA  |
| 5.6A.1           | Channel bandwidths per operating band for CA                    |
| 6.2.2A           | UE maximum output power for intra-band contiguous 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                             |
| 6.6.2.1A         | Spectrum emission mask for CA                                   |
| 6.6.3.2A         | Spurious emission band UE co-existence for CA                   |
| 7.3.1A           | Reference sensitivity power level minimum requirements for CA   |
| 7.6.1.1A         | In-band blocking minimum requirements for CA                    |
| 7.6.2.1A         | Out-of-band blocking minimum requirements for CA                |

#### 22.1.2 RRM Requirements

The UE shall comply with the following RRM Requirements for CA\_38C specified in [3]. These requirements are:

**Table 22.1.2-1: RRM Requirements for CA\_38C UE**

| Section / Clause | Description                                       |
|------------------|---|
| 4                | E-UTRAN RRC_IDLE state mobility                   |
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |
| A.9              | Measurement Performances for UE Test Cases        |

## 23 CA configuration CA\_1A-18A Independent of Release

CA configuration CA\_1A-18A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 23.1 CA\_1A-18A UE

UEs that conform to Release 10 and support CA\_1A-18A shall support the following requirements in Release 11.



### 23.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_1A-18A specified in [2]. These requirements are:

**Table 23.1.1-1: RF Requirements for CA\_1A-18A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

### 23.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_1A-18A specified in [3]. These requirements are:

**Table 23.1.2-1: RRM Requirements for CA\_1A-18A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

## 24 CA configuration CA\_1A-21A Independent of Release

CA configuration CA\_1A-21A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 24.1 CA\_1A-21A UE

UEs that conform to Release 10 and support CA\_1A-21A shall support the following requirements in Release 11.

#### 24.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_1A-21A specified in [2]. These requirements are:

**Table 24.1.1-1: RF Requirements for CA\_1A-21A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 24.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_1A-21A specified in [3]. These requirements are:

**Table 24.1.2-1: RRM Requirements for CA\_1A-21A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 25 CA configuration CA\_3A-5A Independent of Release

CA configuration CA\_3A-5A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 25.1 CA\_3A-5A UE

UEs that conform to Release 10 and support CA\_3A-5A shall support the following requirements in Release 11.

#### 25.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_3A-5A specified in [2]. These requirements are:

**Table 25.1.1-1: RF Requirements for CA\_3A-5A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 25.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_3A-5A specified in [3]. These requirements are:

**Table 25.1.2-1: RRM Requirements for CA\_3A-5A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 26 CA configuration CA\_3A-7A Independent of Release

CA configuration CA\_3A-7A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 26.1 CA\_3A-7A UE

UEs that conform to Release 10 and support CA\_3A-7A shall support the following requirements in Release 11.

#### 26.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_3A-7A specified in [2]. These requirements are:

**Table 26.1.1-1: RF Requirements for CA\_3A-7A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

## 26.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_3A-7A specified in [3]. These requirements are:

**Table 26.1.2-1: RRM Requirements for CA\_3A-7A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

# 27 CA configuration CA\_3A-20A Independent of Release

CA configuration CA\_3A-20A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

## 27.1 CA\_3A-20A UE

UEs that conform to Release 10 and support CA\_3A-20A shall support the following requirements in Release 11.

### 27.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_3A-20A specified in [2]. These requirements are:

**Table 27.1.1-1: RF Requirements for CA\_3A-20A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

### 27.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_3A-20A specified in [3]. These requirements are:

**Table 27.1.2-1: RRM Requirements for CA\_3A-20A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

## 28 CA configuration CA\_7A-20A Independent of Release

CA configuration CA\_7A-20A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 28.1 CA\_7A-20A UE

UEs that conform to Release 10 and support CA\_7A-20A shall support the following requirements in Release 11.

#### 28.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_7A-20A specified in [2]. These requirements are:

**Table 28.1.1-1: RF Requirements for CA\_7A-20A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 28.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_7A-20A specified in [3]. These requirements are:

**Table 28.1.2-1: RRM Requirements for CA\_7A-20A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

## 29 CA configuration CA\_8A-20A Independent of Release

CA configuration CA\_8A-20A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 29.1 CA\_8A-20A UE

UEs that conform to Release 10 and support CA\_8A-20A shall support the following requirements in Release 11.

#### 29.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_8A-20A specified in [2]. These requirements are:

**Table 29.1.1-1: RF Requirements for CA\_8A-20A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

## 29.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_8A-20A specified in [3]. These requirements are:

**Table 29.1.2-1: RRM Requirements for CA\_8A-20A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

# 30 CA configuration CA\_2A-17A Independent of Release

CA configuration CA\_2A-17A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

## 30.1 CA\_2A-17A UE

UEs that conform to Release 10 and support CA\_2A-17A shall support the following requirements in Release 11.

### 30.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_2A-17A specified in [2]. These requirements are:

**Table 30.1.1-1: RF Requirements for CA\_2A-17A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

### 30.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_2A-17A specified in [3]. These requirements are:

**Table 30.1.2-1: RRM Requirements for CA\_2A-17A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 31 CA configuration CA\_2A-29A Independent of Release

CA configuration CA\_2A-29A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 31.1 CA\_2A-29A UE

UEs that conform to Release 10 and support CA\_2A-29A shall support the following requirements in Release 11.

#### 31.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_2A-29A specified in [2]. These requirements are:

**Table 31.1.1-1: RF Requirements for CA\_2A-29A UE**

| Section / Clause | Description   |
|------------------|---|
| 5.5              | Operating bands   |
| 5.5A             | Operating bands for CA  |
| 5.6A1            | Channel bandwidths per operating band for CA                  |
| 5.7              | Channel arrangement   |
| 6.2.5A           | Configured transmitted Power for CA                           |
| 7.3.1A           | Reference sensitivity power level minimum requirements for CA |
| 7.5.1A           | ACS minimum requirements for CA                               |
| 7.6.1.1A         | In-band blocking minimum requirements for CA                  |
| 7.7.1A           | Spurious response for CA                                      |
| 7.8.1A           | Intermodulation characteristics minimum requirement for CA    |

#### 31.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_2A-29A specified in [3]. These requirements are:

**Table 31.1.2-1: RRM Requirements for CA\_2A-29A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 32 CA configuration CA\_4A-29A Independent of Release

CA configuration CA\_4A-29A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 32.1 CA\_4A-29A UE

UEs that conform to Release 10 and support CA\_4A-29A shall support the following requirements in Release 11.

### 32.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-29A specified in [2]. These requirements are:

**Table 32.1.1-1: RF Requirements for CA\_4A-29A UE**

| Section / Clause | Description   |
|------------------|---|
| 5.5              | Operating bands   |
| 5.5A             | Operating bands for CA  |
| 5.6A1            | Channel bandwidths per operating band for CA                  |
| 5.7              | Channel arrangement   |
| 6.2.5A           | Configured transmitted Power for CA                           |
| 7.3.1A           | Reference sensitivity power level minimum requirements for CA |
| 7.5.1A           | ACS minimum requirements for CA                               |
| 7.6.1.1A         | In-band blocking minimum requirements for CA                  |
| 7.7.1A           | Spurious response for CA                                      |
| 7.8.1A           | Intermodulation characteristics minimum requirement for CA    |

### 32.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-29A specified in [3]. These requirements are:

**Table 32.1.2-1: RRM Requirements for CA\_4A-29A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 33 CA configuration CA\_3A-8A Independent of Release

CA configuration CA\_3A-8A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 33.1 CA\_3A-8A UE

UEs that conform to Release 10 and support CA\_3A-8A shall support the following requirements in Release 11.

#### 33.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_3A-8A specified in [2]. These requirements are:

**Table 33.1.1-1: RF Requirements for CA\_3A-8A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 33.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_3A-8A specified in [3]. These requirements are:

**Table 33.1.2-1: RRM Requirements for CA\_3A-8A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 34 CA configuration CA\_4A-5A Independent of Release

CA configuration CA\_4A-5A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 34.1 CA\_4A-5A UE

UEs that conform to Release 10 and support CA\_4A-5A shall support the following requirements in Release 11.

#### 34.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-5A specified in [2]. These requirements are:

**Table 34.1.1-1: RF Requirements for CA\_4A-5A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 34.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-5A specified in [3]. These requirements are:

**Table 34.1.2-1: RRM Requirements for CA\_4A-5A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 35 CA configuration CA\_4A-12A Independent of Release

CA configuration CA\_4A-12A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 35.1 CA\_4A-12A UE

UEs that conform to Release 10 and support CA\_4A-12A shall support the following requirements in Release 11.

#### 35.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-12A specified in [2]. These requirements are:



**Table 35.1.1-1: RF Requirements for CA\_4A-12A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

## 35.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-12A specified in [3]. These requirements are:

**Table 35.1.2-1: RRM Requirements for CA\_4A-12A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

# 36 CA configuration CA\_4A-13A Independent of Release

CA configuration CA\_4A-13A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

## 36.1 CA\_4A-13A UE

UEs that conform to Release 10 and support CA\_4A-13A shall support the following requirements in Release 11.

### 36.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-13A specified in [2]. These requirements are:

**Table 36.1.1-1: RF Requirements for CA\_4A-13A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

### 36.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-13A specified in [3]. These requirements are:

**Table 36.1.2-1: RRM Requirements for CA\_4A-13A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

## 37 CA configuration CA\_4A-17A Independent of Release

CA configuration CA\_4A-17A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 37.1 CA\_4A-17A UE

UEs that conform to Release 10 and support CA\_4A-17A shall support the following requirements in Release 11.

#### 37.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-17A specified in [2]. These requirements are:

**Table 37.1.1-1: RF Requirements for CA\_4A-17A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 37.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-17A specified in [3]. These requirements are:

**Table 37.1.2-1: RRM Requirements for CA\_4A-17A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

## 38 CA configuration CA\_5A-12A Independent of Release

CA configuration CA\_5A-12A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 38.1 CA\_5A-12A UE

UEs that conform to Release 10 and support CA\_5A-12A shall support the following requirements in Release 11.

#### 38.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_5A-12A specified in [2]. These requirements are:

**Table 38.1.1-1: RF Requirements for CA\_5A-12A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

## 38.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_5A-12A specified in [3]. These requirements are:

**Table 38.1.2-1: RRM Requirements for CA\_5A-12A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

---

# 39 CA configuration CA\_5A-17A Independent of Release

CA configuration CA\_5A-17A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

## 39.1 CA\_5A-17A UE

UEs that conform to Release 10 and support CA\_5A-17A shall support the following requirements in Release 11.

### 39.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_5A-17A specified in [2]. These requirements are:

**Table 39.1.1-1: RF Requirements for CA\_5A-17A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

### 39.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_5A-17A specified in [3]. These requirements are:

**Table 39.1.2-1: RRM Requirements for CA\_5A-17A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 40 CA configuration CA\_4A-7A Independent of Release

CA\_4A-7A is specified in Release 11 but is defined as a release-independent E-UTRA CA configuration.

### 40.1 CA\_4A-7A UE

UEs that conform to Release 10 and support CA\_4A-7A shall support the following requirements in Release 11 for one uplink.

#### 40.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_4A-7A specified in [2]. These requirements are:

**Table 40.1.1-1: RF Requirements for CA\_4A-7A UE**

| Section / Clause | Description                                  |
|------------------|--|
| 5.5A             | Operating bands for CA                       |
| 5.6A1            | Channel bandwidths per operating band for CA |
| 6.2.5A           | Configured transmitted Power for CA          |
| 7.3.1            | Minimum requirements (QPSK)                  |

#### 40.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_4A-7A specified in [3]. These requirements are:

**Table 40.1.2-1: RRM Requirements for CA\_4A-7A UE**

| Section / Clause | Description                                       |
|------------------|---|
| 8                | UE Measurements Procedures in RRC_CONNECTED State |
| 9                | Measurement Performances for UE.                  |

## 41 CA configuration CA\_11A-18A Independent of Release

CA configuration CA\_11A-18A is specified in Release 11 but is defined as a release-independent CA configuration for Rel-10 upwards.

### 41.1 CA\_11A-18A UE

UEs that conform to Release 10 and support CA\_11A-18A shall support the following requirements in Release 11.

#### 41.1.1 RF Requirements

The UE shall comply with the RF requirements for CA\_11A-18A specified in [2]. These requirements are:

**Table 41.1.1-1: RF Requirements for CA\_11A-18A UE**

| <b>Section / Clause</b> | <b>Description</b>                           |
|-------------------------|--|
| 5.5A                    | Operating bands for CA                       |
| 5.6A1                   | Channel bandwidths per operating band for CA |
| 6.2.5A                  | Configured transmitted Power for CA          |
| 7.3.1                   | Minimum requirements (QPSK)                  |

## 41.1.2 RRM Requirements

The UE shall comply with the following RRM requirements for CA\_11A-18A specified in [3]. These requirements are:

**Table 41.1.2-1: RRM Requirements for CA\_11A-18A UE**

| <b>Section / Clause</b> | <b>Description</b>                                |
|-------------------------|---|
| 8                       | UE Measurements Procedures in RRC_CONNECTED State |
| 9                       | Measurement Performances for UE.                  |

## 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 (informative): Change history

**Table B.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 | 028   | Introduction of Band 26/XXVI to TS 36.307   | 10.2.0 | 10.3.0 |
| 2012-06 | RP-56 | RP-120778 | 036r1 | Correction of references  | 10.3.0 | 10.4.0 |
| 2012-06 | RP-56 | RP-120789 | 042   | Introduction of CA_1A-19A to TS 36.307  | 10.3.0 | 10.4.0 |
| 2012-06 | RP-56 | RP-120785 | 044r1 | Backdating CA_41C to Rel-10   | 10.3.0 | 10.4.0 |
| 2012-06 | RP-56 | RP-120793 | 048   | Introduction of APAC700(FDD) into TS 36.307 Rel.10  | 10.3.0 | 10.4.0 |
| 2012-06 | RP-56 | RP-120793 | 052   | Introduction of APAC700(TDD) into TS 36.307 Rel.10  | 10.3.0 | 10.4.0 |
| 2012-06 | RP-56 | RP-120791 | 056   | Introduction of e850_LB (Band 27) to TS 36.307  | 10.3.0 | 10.4.0 |
| 2012-09 | RP-57 | RP-121335 | 058   | Introduction of CA_1A-21A to TS 36.307  | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121337 | 060r1 | TS 36.307 CR for CA_38  | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121327 | 061   | Introduction of CA_B7_B20 in 36.307   | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121334 | 062r1 | Add requirements for inter-band CA of B_1-18 in TS36.307  | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121329 | 063   | Introduction of CA band combination Band3 + Band5 to TS 36.307                                    | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121338 | 064r1 | 36.307 CR for LTE_CA_B7   | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121331 | 065   | Introduction of CA_3A-20A to TS 36.307  | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121333 | 066   | Introduction of CA_8_20 RF requirements into TS36.307   | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121295 | 069r1 | Relation between EARFCN for overlapping bands with multiple FBI indication                        | 10.4.0 | 10.5.0 |
| 2012-09 | RP-57 | RP-121324 | 071   | Introduction of CA_B3_B7 in 36.307  | 10.4.0 | 10.5.0 |

|         |       |           |      |  |        |        |
|---------|-------|-----------|------|--|--------|--------|
| 2012-12 | RP-58 | RP-121884 | 080  | Introduction of CA_3A-8A to TS 36.307  | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121890 | 085  | Introduction of CA_4A-5A into 36.307   | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121889 | 087  | Introduction of CA band combination Band4 + Band13 to TS 36.307 (Rel-10)       | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121894 | 089  | Introduction of CA_B5_B12 in 36.307  | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121896 | 090  | Introduction of Band 5 + Band 17 inter-band CA configuration into 36.307       | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121887 | 094  | Introduction of CA_4-12 into TS 36.307 (Rel-10)                                | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121882 | 096  | [Rel-10] Introduction of inter-band CA_11-18 into TS36.307                     | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121861 | 098  | Release-independent implementation of carrier aggregation configuration CA_4-7 | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121901 | 100  | Introduction of Band 29  | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121719 | 0103 | Introduction of CA band combination Band2 + Band17 to TS 36.307 (Rel-10)       | 10.5.0 | 10.6.0 |
| 2012-12 | RP-58 | RP-121721 | 0105 | Introduction of CA band combination Band4 + Band17 to TS 36.307 (Rel-10)       | 10.5.0 | 10.6.0 |