

ETSI TS 137 114 V14.1.0 (2017-08)



**Universal Mobile Telecommunications System (UMTS);
LTE;
Active Antenna System (AAS) Base Station (BS)
Electromagnetic Compatibility (EMC)
(3GPP TS 37.114 version 14.1.0 Release 14)**



Reference

RTS/TSGR-0437114ve10

Keywords

LTE,UMTS

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

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.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.

© ETSI 2017.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M logo is protected for the benefit of its Members.

GSM® and the GSM logo are trademarks 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 (<https://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.....	4
1 Scope	5
2 References	5
3 Definitions, symbols and abbreviations	6
3.1 Definitions	6
3.2 Symbols.....	6
3.3 Abbreviations	6
4 Test conditions	7
5 Performance assessment.....	7
6 Performance criteria	7
7 Applicability overview	7
8 Emission	8
9 Immunity	8
Annex A (informative): Change history	9
History	10

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 covers the assessment of UTRA TDD, UTRA FDD, E-UTRA and Multi-Standard Radio (MSR) Active Antenna Systems Base Stations in respect of Electromagnetic Compatibility (EMC).

NOTE: Whenever the UTRA AAS BS is referred in the following section, UTRA TDD and UTRA FDD shall be considered.

The present document specifies the applicable test conditions, performance assessment and performance criteria for base stations and associated ancillary equipment in the following categories:

- Active Antenna System Base Station for UTRA, E-UTRA and MSR meeting the conducted requirements of 3GPP TS 37.105 [2], with conformance demonstrated by compliance to 3GPP TS 37.145-1 [3],
- Active Antenna System Base Station for E-UTRA, UTRA and MSR meeting the OTA requirements of 3GPP TS 37.105 [2], with conformance demonstrated by compliance to 3GPP TS 37.145-2 [10].

The present document does not specify test conditions, performance assessment and performance criteria for the Narrow-Band Internet of Things (NB-IoT) in band, NB-IoT guard band, or standalone NB-IoT operation, for AAS BS in *single RAT E-UTRA operation* as defined in 3GPP TS 36.113 [6], or for AAS BS in *MSR operation* using E-UTRA as defined in 3GPP TS 37.113 [4].

The present document does not specify test conditions, performance assessment and performance criteria for Band 46 operation as it is not supported by AAS BS.

The scope of the present document is twofold:

- Requirement, procedures and values of an AAS BS with *TAB connectors* for every transceiver unit at the *transceiver array boundary* (TAB) , subject to conducted requirements,
- Requirements, procedures and values of an AAS Base Station without TAB connectors are not covered by the Rel-13 version of this document and are FFS.

The environment classification used in the present document refers to the residential, commercial and light industrial environment classification used in IEC 61000-6-1 [7] and IEC 61000-6-3 [8].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at residential, commercial and light industrial environments. The levels, however, do not cover extreme cases which may occur in any location but with low probability of occurrence.

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 37.105: "Active Antenna System (AAS) Base Station (BS) transmission and reception"
- [3] 3GPP TS 37.145-1: "Active Antenna System (AAS) Base Station (BS) conformance testing; Part 1: Conducted conformance testing "
- [4] 3GPP TS 37.113: "E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) Electromagnetic Compatibility (EMC)"

- [5] 3GPP TS 25.113: "Base Station (BS) and repeater ElectroMagnetic Compatibility (EMC)"
- [6] 3GPP TS 36.113: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) and repeater ElectroMagnetic Compatibility (EMC)"
- [7] IEC 61000-6-1: 2016: "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments"
- [8] IEC 61000-6-3: 2006/AMD1:2010: "Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light industrial environments"
- [9] 3GPP TR 37.842: "Radio Frequency (RF) requirement background for Active Antenna System (AAS) Base Station (BS)"
- [10] 3GPP TS 37.145-2: "Active Antenna System (AAS) Base Station (BS) conformance testing; Part 2: radiated conformance testing"

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1], 3GPP TS 37.113 [4] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1] or 3GPP TS 37.113 [4].

NOTE: Multi-word definitions are treated as linguistic expressions and printed in italic font throughout this requirement specification. Linguistic expressions may not be split and are printed in their entirety.

active antenna system base station: BS system which combines an Antenna Array with an Active Transceiver Unit Array and a Radio Distribution Network (RDN)

antenna array: group of radiating elements characterized by the geometry and the properties of the *array elements*

NB-IoT In-band operation: NB-IoT is operating in-band when it utilizes the resource block(s) within a normal E-UTRA carrier

NB-IoT guard band operation: NB-IoT is operating in guard band when it utilizes the unused resource block(s) within a E-UTRA carrier's guard-band.

NB-IoT standalone operation: NB-IoT is operating standalone when it utilizes its own spectrum, for example the spectrum currently being used by GERAN systems as a replacement of one or more GSM carriers, as well as scattered spectrum for potential IoT deployment.

radio distribution network: linear passive network which distributes the RF power generated by the transceiver unit array to the antenna array, and/or distributes the radio signals collected by the antenna array to the transceiver unit array

NOTE: In the case when the active transceiver units are physically integrated with the array elements of the antenna array, the *radio distribution network* is a one-to-one mapping.

TAB connector: *transceiver array boundary* connector

transceiver array boundary: conducted interface between the transceiver unit array and the composite antenna

3.2 Symbols

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

AAS	Active Antenna System
AAS BS	AAS Base Station
EMC	ElectroMagnetic Compatibility
MSR	Multi-Standard Radio
NB-IoT	Narrowband – Internet of Things
RDN	Radio Distribution Network
TAB	Transceiver Array Boundary

4 Test conditions

Where the AAS BS has multiple *TAB connectors* which are declared to be equivalent then it is sufficient to perform EMC tests on a single representative TAB connector. For the definition of the TAB connector equivalence declaration (D6.70), refer to 3GPP TS 37.145-1 [3].

EMC test shall not be performed with the AAS BS antenna array radiating, all *TAB connectors* shall be disconnected from the *radio distribution network* (RDN)/antenna array as specified in 3GPP TS 37.105 [2] and terminated in an appropriate load impedance. For the description of the general AAS BS radio architecture and relations between the RDN/antenna array and the Transceiver Array Boundary, refer to 3GPP TR 37.842 [9].

For UTRA AAS BS the test conditions from 3GPP TS 25.113 [5] apply.

For E-UTRA AAS BS the test conditions from 3GPP TS 36.113 [6] apply.

NOTE: The receiver exclusion band defined in 3GPP TS 36.113 [6] for Band 46 operation is not applicable for AAS BS, as the Band 46 operation is not supported by AAS BS.

For MSR AAS BS the test conditions from 3GPP TS 37.113 [4] apply.

NOTE: The receiver exclusion band defined in 3GPP TS 37.113 [4] for Band 46 operation is not applicable for AAS BS, as the Band 46 operation is not supported by AAS BS.

5 Performance assessment

For UTRA AAS BS the performance assessment from 3GPP TS 25.113 [5] applies.

For E-UTRA AAS BS the performance assessment from 3GPP TS 36.113 [6] applies.

For MSR AAS BS the performance assessment from 3GPP TS 37.113 [4] applies.

6 Performance criteria

For UTRA AAS BS the performance criteria from 3GPP TS 25.113 [5] apply.

For E-UTRA AAS BS the performance criteria from 3GPP TS 36.113 [6] apply.

For MSR AAS BS the performance criteria from 3GPP TS 37.113 [4] apply.

7 Applicability overview

For UTRA AAS BS the applicability overview from 3GPP TS 25.113 [5] applies.

For E-UTRA AAS BS the applicability overview from 3GPP TS 36.113 [6] applies.

For MSR AAS BS the applicability overview from 3GPP TS 37.113 [4] applies.

8 Emission

For UTRA AAS BS the emission requirement from 3GPP TS 25.113 [5] applies.

For E-UTRA AAS BS the emission requirement from 3GPP TS 36.113 [6] applies.

For MSR AAS BS the emission requirement from 3GPP TS 37.113 [4] applies.

9 Immunity

For UTRA AAS BS the immunity requirement from 3GPP TS 25.113 [5] applies.

For E-UTRA AAS BS the immunity requirement from 3GPP TS 36.113 [6] applies.

For MSR AAS BS the immunity requirement from 3GPP TS 37.113 [4] applies.

Annex A (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2016-02	RAN4#78	R4-161123				First version of TS	0.1.0
2016-03	RAN#71	RP-160401				Presented to RAN for approval. Editorial cotrections recommended by ETSI editHelp	1.0.0
2016-03	RP-71					TR approved by RAN plenary	13.0.0
2016/06	RP-72	RP-161142	0002	1	F	Clarification in EMC environmental conditions references	13.1.0
2017/03	RP-75	RP-170586	0004	-	F	CR to TS 37.114: Clarification of the EMC specification's scope	13.2.0
2017-03	RP-75	-	-	-	-	Update to Rel-14 version (MCC)	14.0.0
2017/06	RP-76	RP-171306	0009		A	CR to TS 37.114: Isolation of Band 46 and NB-IoT from the AAS BS specification	14.1.0

History

Document history		
V14.0.0	April 2017	Publication
V14.1.0	August 2017	Publication