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Universal Mobile Telecommunications System (UMTS);
LTE;
Active Antenna System (AAS) Base Station (BS)
Electromagnetic Compatibility (EMC)
(3GPP TS 37.114 version 13.3.0 Release 13)

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Contents

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

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  - 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 cotrrections 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
2017/06	RP-76	RP-171306	0008		B	CR to TS 37.114: Isolation of Band 46 and NB-IoT from the AAS BS specification	13.3.0

History

Document history		
V13.0.0	April 2016	Publication
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V13.2.0	April 2017	Publication
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