

ETSI TS 134 114 V9.3.0 (2012-01)



Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
User Equipment (UE) / Mobile Station (MS)
Over The Air (OTA) antenna performance;
Conformance testing
(3GPP TS 34.114 version 9.3.0 Release 9)**



Reference

RTS/TSGR-0534114v930

Keywords

GSM,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

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the 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:

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2012.
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>.

Contents

Intellectual Property Rights	2
Foreword.....	2
Foreword.....	4
1 Scope	5
2 References	6
3 Definitions, symbols, abbreviations and equations	6
4 General	6
5 to 6 Void.....	6
Annex A to H: Void	7
Annex I (informative): Bibliography.....	8
Annex J (informative): Change history	10
History	11

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 describes the test procedure for the radiated performances measurements of the 3G/2G user equipment/mobile stations (UE/MS) in active mode in both the up- and the downlink. The FDD UE test procedure is based on the test method developed as a result of COST 273 Sub-Working Group (SWG) 2.2 members' contributions. Background work has also been made in the former COST259 project. The TDD UE test procedure is based on the test method developed as a result of CCSA TC9 WG1 members' contributions. Background work has been made in the former CCSA TC9 project.

The measurement procedure explained in this document applies to UE/MS used under the "speech mode" conditions that correspond to predefined positions for voice application when the handset is held close to the user's head. This method is also applicable to free space measurements and for testing data applications.

The testing methodology applies to any single or multi-mode (GSM / UMTS / TD-SCDMA) terminals.

The radio tests considered here are:

1. The measurement of the Total Radiated Power (TRP)
2. The measurement of the Total Radiated Sensitivity (TRS)

The test procedure described in this document measures the performance of the transmitter and the receiver, including the antenna and also the effects of the user.

The major parts of this test procedure are based on the 3-D pattern measurement method. It has been considered necessary to define some items and components in the test procedure in detail, such as test channels and phantom setups, in order to make the testing in different laboratories harmonized. The procedure is, however, not limited to some specific antenna chambers or positioners.

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] to [13] (void)

[14] 3GPP TS 34.114 Release 10: "User Equipment (UE) / Mobile Station (MS) Over The Air (OTA) antenna performance; Conformance testing".

3 Definitions, symbols, abbreviations and equations

Void

4 General

The requirements of the present document are provided in 3GPP TS 34.114 Release 10 [14].

5 to 6 Void

Annex A to H:
Void

Annex I (informative): Bibliography

- P. Boutou, J. Krogerus, J. Ø. Nielsen, T. Bolin, I. Egorov, K. Sulonen, "Measurement of Radio Performances for UMTS Mobile in Speech Mode: the First Draft of the Prestandard", COST 273 TD(03) 140, Paris, France, May 2003, 6 p.
- "Feasibility Study of UE antenna efficiency test methods and performance requirement-final report", 3GPP TSG-RAN4 document TSGR#19(01)1086, September 2001.
- L. M. Correia (editor), "Wireless Flexible Personalised Communications – Final Report of COST 259", ISBN: 0-471-49836-X, Wiley Europe, March 2001, 482 p.
- "Development of Standard Test Procedure for 3G User Equipment Antenna Performance", 3GPP TSG-RAN Working Group 4 (Radio) meeting #23, R4-020724, Gyeongju, Korea, 13th -17th May, 2002.
- IEEE standard 1528; "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Experimental Techniques", December, 2003.
- M.Y. Kanda, M. Ballen, C.K. Chou. "Formulation and characterization of tissue simulating liquids used for SAR measurement (500-2000 MHz)" Asia-Pacific Radio Science Conference, Tokyo, Japan, August 1-4, 2001, p. 274.
- V. Vigneras, "Elaboration and characterization of biological tissues equivalent liquids in the frequency range 0.9-3 GHz", Final report, PIOM Laboratory, University of Bordeaux, France, November 2001.
- E. Van Lil, D. Trappeniers, J. Verhaevert, A. Van de Capelle, "On the influence of the size of objects on the number of power pattern samples and harmonics", COST273 TD(04)051.
- J. Krogerus, T. Jääskö, C. Icheln, "Comparison Measurements of the COST 273 SWG 2.2 Reference Monopole Antennas", COST273 TD(03)131.
- L. Foged, A. Gandois et. al. "Reference antennas", Draft report for COST273 SWG2.2 (unpublished), 12.10.2004.
- H. Shapter, J. Krogerus, "Uncertainty in Total Radiated Power measurements", Presentation in COST273 SWG2.2 Meeting, Helsinki, May 2002, 9 p. + Appendix 9 p., (unpublished).
- J. Krogerus, A. Kruy, H. Shapter, S. Pannetrat, B. Derat, "Estimation of Measurement Uncertainty in Total Radiated Power Measurements", COST 273 TD(04) 128, Gothenburg, June 2004, 23 p.
- "Guide to the Expression of Uncertainty in Measurement", International Organization for Standardization (ISO), Geneva, Switzerland 1995.
- NIST Technical Note 1297: "Guidelines for Evaluating and Expressing the Uncertainty of NIST measurement Results"
- IEC: "Guide to the expression of uncertainty in measurement", Ed 1:1995.
- "American National Standard for Expressing Uncertainty - U.S. Guide to the Expression of Uncertainty in Measurement," ANSI/NCSL Z540-2-1997, American National Standards Institute, New York, NY, 1997.
- J. Krogerus, "On the phantom and tissue simulating liquid to be used in handset antenna performance testing", COST 273 TD(02) 024, Guildford, UK, January 2002.
- J. Krogerus, "Phantoms for Terminal Antenna Performance Testing", COST 273 TD(02) 154, Lisbon, Portugal, September 2002, 14 p.
- H. Knoess, M. Christensen, S. Svendsen, T. Hiegler, A. Friederich, "Investigation of Different Phantom Head Models Including Holder", COST 273 TD(04) 068, Gothenburg, June 2004, 6 p.

- Alayon Glazunov, "Impact of Head Phantom Models on Handset Antenna Efficiency Measurement Accuracy in Terms of Body Loss in Passive Mode", COST273 TD(02)144.
- K. Sulonen, K. Kalliola, P. Vainikainen, "The effect of angular power distribution in different environments and the angular resolution of radiation pattern measurement on antenna performance", COST 273 TD(02) 028, Guildford, UK, January 2002, 7 p.

Annex J (informative): Change history

Meeting-1st-Level	Doc-1st-Level	CR	Rev	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
RP-37	RP-070665	-	-	TS 34.114 for information	-	-	1.0.0	R5-072420
RP-41	RP-080612	-	-	New version of 34.114	-	1.0.0	7.0.0	R5-083817
RP-43	RP-090203	0001	-	Update of TS 34.114 from Rel-7 to Rel-8		7.0.0	8.0.0	R5-090761
RP-43	RP-090203	0002	-	Addition of Band V,VI and VIII minimum & test requirements to 34.114		8.0.0	8.1.0	R5-090412
RP-45	RP-090813	0003	-	TDD UE over the Air conformance testing methodology	-	8.1.0	8.2.0	R5-094961
RP-46	RP-091119	0004	-	Over The Air antenna performance: New informative Annex for Recommended performance	-	8.2.0	8.3.0	R5-096254
RP-47	-	-	-	Moved to v9.0.0 with no change	-	8.3.0	9.0.0	-
RP-51	RP-110166	0005	-	OTA FDD Band 4 and 5 Mid Test Channel Change	F	9.0.0	9.1.0	R5-110530
RP-51	RP-110166	0006	-	CR to 34.114 : Addition of the GSM OTA requirements and recommended values	F	9.0.0	9.1.0	R5-110926
RP-53	RP-111157	0007	-	Update on abbreviation list in section 3.2	F	9.1.0	9.2.0	R5-113442
RP-54	RP-111584	0011	-	Removal of technical content in 34.114 v9.2.0 and substitution with pointer to the next Release	F	9.2.0	9.3.0	R5-115085

History

Document history		
V9.0.0	April 2010	Publication
V9.1.0	April 2011	Publication
V9.2.0	October 2011	Publication
V9.3.0	January 2012	Publication