



**LTE;  
Evolved Universal Terrestrial Radio Access (E-UTRA)  
and Evolved Universal Terrestrial  
Radio Access Network (E-UTRAN);  
Derivation of test tolerances for User Equipment (UE)  
radio reception conformance tests  
(3GPP TR 36.904 version 13.0.0 Release 13)**



---

Reference

RTR/TSGR-0536904vd00

---

Keywords

LTE

**ETSI**

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

---

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

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

---

**Important notice**

---

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

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

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<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/CommitteeSupportStaff.aspx>

---

**Copyright Notification**

---

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

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2017.

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 (<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 Report (TR) 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 "**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         |
| Introduction .....                                                                  | 4         |
| 1 Scope .....                                                                       | 5         |
| 2 References .....                                                                  | 5         |
| 3 Definitions, symbols and abbreviations .....                                      | 5         |
| 3.1 Definitions .....                                                               | 5         |
| 3.2 Symbols.....                                                                    | 5         |
| 3.3 Abbreviations .....                                                             | 5         |
| 4 General Principles .....                                                          | 6         |
| 4.1 Principle of Superposition.....                                                 | 6         |
| 4.2 Sensitivity analysis .....                                                      | 6         |
| 4.3 Statistical combination of uncertainties.....                                   | 6         |
| 4.4 Correlation between uncertainties .....                                         | 7         |
| 4.4.1 Uncorrelated uncertainties .....                                              | 7         |
| 4.4.2 Positively correlated uncertainties .....                                     | 7         |
| 4.4.3 Negatively correlated uncertainties.....                                      | 8         |
| 4.4.4 Treatment of uncorrelated uncertainties .....                                 | 9         |
| 4.4.5 Treatment of positively correlated uncertainties with adverse effect.....     | 9         |
| 4.4.6 Treatment of positively correlated uncertainties with beneficial effect ..... | 9         |
| 4.4.7 Treatment of negatively correlated uncertainties .....                        | 9         |
| 5 Grouping of test cases defined in TS 36.521-1 .....                               | 9         |
| 6 Determination of Test System Uncertainties.....                                   | 10        |
| 6.1 General .....                                                                   | 10        |
| 6.2 Uncertainty figures .....                                                       | 11        |
| 7 Determination of Test Tolerances .....                                            | 11        |
| 7.1 General .....                                                                   | 11        |
| <b>Annex A: Derivation documents.....</b>                                           | <b>12</b> |
| <b>Annex B: Change History .....</b>                                                | <b>13</b> |
| History .....                                                                       | 15        |

---

## Foreword

This Technical Report 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:

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.

---

## Introduction

---

# 1 Scope

The present document specifies a general method used to derive Test Tolerances for UE radio reception conformance tests in 3GPP TS 36.521-1 [2], and establishes a system for relating the Test Tolerances to the measurement uncertainties of the Test System.

The test cases which have been analysed to determine Test Tolerances are included as .zip files.

The present document is applicable from Release 10 up to the release indicated on the front page of the present Terminal conformance specifications.

---

# 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 36.521-1: "User Equipment (UE) conformance specification, Radio transmission and reception Part 1: conformance testing".
- [3] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

---

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

Other definitions used in the present document are listed in 3GPP TS 36.521-1 [2].

## 3.2 Symbols

Symbols used in the present document are listed in 3GPP TR 21.905 [1], 3GPP TS 36.521-1 [2].

## 3.3 Abbreviations

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

Other abbreviations used in the present document are listed in 3GPP TS 36.521-1 [2].