



**Speech and multimedia Transmission Quality (STQ);
Requirements and tests methods for terminal
equipment incorporating a handset when connected to the
analogue interface of the PSTN**

[ETSI ES 203 038 V1.2.1 \(2013-05\)](https://standards.iteh.ai/catalog/standards/etsi/6fc18897-3b77-41df-8ada-ff10e0d32310/etsi-es-203-038-v1-2-1-2013-05)

<https://standards.iteh.ai/catalog/standards/etsi/6fc18897-3b77-41df-8ada-ff10e0d32310/etsi-es-203-038-v1-2-1-2013-05>

ReferenceRES/STQ-203038

Keywords

analogue, PSTN, telephony, terminal

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

iteh Standards
(<https://standards.iteh.ai>)
Document Preview

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 2013.
All rights reserved.

DECTTM, PLUGTESTSTM, UMTSTM and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPPTM and LTETM 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.

Contents

Intellectual Property Rights	6
Foreword.....	6
Introduction	6
1 Scope	7
2 References	7
2.1 Normative references	8
2.2 Informative references	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions	9
3.2 Symbols	9
3.3 Abbreviations	10
4 Speech transmission aspects.....	10
4.1 General	10
4.1.1 Polarity independence	10
4.1.2 Feed conditions	10
4.1.3 Power supply	10
4.1.4 Volume control	11
4.1.5 Test setup	11
4.1.6 Environment for tests	11
4.1.7 Accuracy of measurements and test equipment setting	12
4.1.8 Order of tests	12
4.1.9 Acoustic environment	12
4.1.10 Alternative test methods	12
4.1.11 Testing arrangements	13
4.2 Speech performance characteristics.....	16
4.2.1 Sensitivity/frequency response	16
4.2.1.1 Sending Sensitivity	16
4.2.1.2 Receiving Sensitivity	17
4.2.2 Sending and Receiving Loudness Ratings (SLR and RLR).....	19
4.2.2.1 Sending Loudness Rating (SLR).....	19
4.2.2.2 Receiving Loudness Rating (RLR)	19
4.2.3 Sidetone	20
4.2.4 Distortion	21
4.2.4.1 Sending distortion	21
4.2.4.2 Receiving distortion	22
4.2.5 Linearity (variation of gain with input level).....	23
4.2.5.1 Sending linearity	23
4.2.5.2 Receiving linearity	23
4.2.6 Noise	23
4.2.6.1 Sending noise	23
4.2.6.2 Receiving noise	24
4.2.7 Acoustic shock.....	24
4.2.7.1 Continuous signal.....	24
4.2.7.2 Peak signal	24
4.2.8 Instability	25
4.2.9 Echo Return Loss (ERL).....	26
Annex A (normative): Requirements for LRGP measured terminals	28
A.1 Speech transmission aspects.....	28
A.1.1 General	28
A.1.1.1 Polarity independence	28
A.1.1.2 Feed conditions	28
A.1.1.3 Power supply	28

A.1.1.4	Volume control	28
A.2	Speech performance characteristics	29
A.2.1	Sensitivity/frequency response	29
A.2.1.1	Sending Sensitivity	29
A.2.1.2	Receiving Sensitivity	29
A.2.2	Sending and Receiving Loudness Ratings (SLR and RLR)	30
A.2.2.1	Sending Loudness Rating (SLR)	30
A.2.2.2	Receiving Loudness Rating (RLR)	31
A.2.3	Sidetone	31
A.2.4	Distortion	31
A.2.4.1	Sending distortion	31
A.2.4.2	Receiving distortion	31
A.2.5	Linearity (variation of gain with input level)	32
A.2.5.1	Sending linearity	32
A.2.5.2	Receiving linearity	32
A.2.6	Noise	32
A.2.6.1	Sending noise	32
A.2.6.2	Receiving noise	32
A.2.7	Instability	33
A.2.8	Echo Return Loss (ERL)	33

Annex B (normative): Speech transmission compliance tests for LRGP measured terminals34

B.1	General conditions for testing	34
B.1.1	Environment for tests	34
B.1.2	Accuracy of measurements and test equipment setting	34
B.1.3	Order of tests	35
B.1.4	Acoustic environment	35
B.1.5	Handset mounting	35
B.1.6	Test levels	35
B.1.6.1	Sending	35
B.1.6.2	Receiving	35
B.1.6.3	Sidetone	35
B.1.7	Volume control	35
B.1.8	Test equipment requirements	36
B.1.9	Alternative test methods	36
B.1.10	Testing arrangements	36
B.2	Speech transmission performance tests for LRGP measured terminals	39
B.2.1	Sensitivity/frequency response	39
B.2.1.1	Sending sensitivity	39
B.2.1.2	Receiving sensitivity	39
B.2.2	Loudness ratings	40
B.2.2.1	Sending loudness rating	40
B.2.2.2	Receiving loudness rating	40
B.2.3	Sidetone	41
B.2.4	Distortion	42
B.2.4.1	Sending distortion	42
B.2.4.2	Receiving distortion	43
B.2.5	Linearity (variation of gain with input level)	43
B.2.5.1	Sending linearity	43
B.2.5.2	Receiving linearity	44
B.2.6	Noise	44
B.2.6.1	Sending noise	44
B.2.6.2	Receiving noise	44
B.2.7	Instability	45
B.2.8	Echo Return Loss (ERL)	46

Annex C (informative): Table of changes relative to TBR 03848

Annex D (informative): Overview on levels constraints for measurements51

Annex E (informative):	Bibliography.....	53
History		54

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ETSI ES 203 038 V1.2.1 \(2013-05\)](https://standards.iteh.ai/catalog/standards/etsi/6fc18897-3b77-41df-8ada-ff10e0d32310/etsi-es-203-038-v1-2-1-2013-05)

<https://standards.iteh.ai/catalog/standards/etsi/6fc18897-3b77-41df-8ada-ff10e0d32310/etsi-es-203-038-v1-2-1-2013-05>

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 ETSI Standard (ES) has been produced by ETSI Technical Committee Speech and multimedia Transmission Quality (STQ).

The present document has been produced by ETSI in order to update the contents of initial standards for PSTN (e.g. TBR 038 [14]).

In particular, the update aims to take benefits of recent improvements in test methods and test equipments. Even the purpose of the standard is to consider Narrowband speech characteristics and test methods, the new test methods leave the door open for further services (e.g. wideband speech).

In this release 1 of the present document, no new measurement will be added except limitation of acoustic shock which is a requirement for safety. Previous requirements and test methods are kept in an annex in order to be used for terminals designed with LRGP method. Status of this annex is planned to be informative, but only in release 2.

The new measurements needed for handset terminal including speech processing functions will be introduced in a further release taking into account this type of terminal.

Introduction

The present document specifies only the technical characteristics for handset telephony and is intended to be used in conjunction with an appropriate access standard.

1 Scope

The present document specifies the technical characteristics (electrical and acoustic requirements and measurement methods) to be provided by a single, handset telephony, terminal equipment which is intended for connection by 2 wires to an analogue interface of a PSTN. This interface is characterized by a d.c. loop to indicate seizure and clearing, low frequency a.c. ringing signals below the speech passband to indicate an incoming call and the transmission phase having an approximate bandwidth of 3 kHz at the network terminating point.

The objective of the present document is to ensure minimum speech quality when interworking via the public network between two single items of equipment.

The present document only applies to terminal equipment supporting handset telephony.

The present document is applicable to handset telephony function. In the case of multiple functions provided in the same terminal equipment, the present document does not apply when those other functions are active in conjunction with handset telephony.

The present document also applies to any type of analogue handset terminal intended to be connected to a gateway.

The present document specifies the functions necessary to provide 2-way real-time speech conversation. Where a function is indicated as optional, it needs not to be provided, but, where such a function is provided, the terminal needs to conform to the requirements and tests specified in the present document.

A test is given for each requirement in the present document including measurement methods. The terminal equipment may be stimulated to perform the tests by additional equipment if necessary.

The present document gives requirements for new test methods based upon use of HATS and new tests signals.

In an annex, requirements with test methods corresponding to previous tests methods (LRGP) and test signals are given.

The application of the present document is intended also for handset telephony function employing a radio link (e.g. DECT).

The application of the present document is not intended for:

- a handset telephony function with speech transmission performance specially designed for the less abled (e.g. with amplification of received speech as an aid for the hard of hearing);
- a handset telephony function with speech transmission performance specifically designed to cater for hostile environments;
- any handsfree or loudspeaking voice telephony function;
- a handset telephony function employing speech processing techniques other than coding.

NOTE: The terminal equipment may provide additional functions or facilities to those of handset telephony.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.