

ETSI TS 126 444 V19.0.1 (2026-03)



TECHNICAL SPECIFICATION

**Universal Mobile Telecommunications System (UMTS);
LTE;
5G;
Codec for Enhanced Voice Services (EVS);
Test sequences
(3GPP TS 26.444 version 19.0.1 Release 19)**



Reference

RTS/TSGS-0426444vj01

Keywords

5G,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 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from the
[ETSI Search & Browse Standards](#) application.

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 prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed, this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our [Coordinated Vulnerability Disclosure \(CVD\)](#) program.

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

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 2026.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are 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 IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, 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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found at [3GPP to ETSI numbering cross-referencing](#).

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
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	6
3.1 Definitions	6
3.2 Abbreviations	6
4 General	6
4.1 Introduction	6
5 Test sequence format.....	7
5.1 Introduction to test sequence format	7
5.2 File format	7
6 EVS codec test sequences including error concealment of lost packets	7
6.1 Introduction to test sequences	7
6.2 Codec configuration	7
6.3 EVS codec test sequences	7
6.3.1 EVS encoder test sequences.....	7
6.3.2 EVS decoder test sequences.....	7
6.3.3 Test sequences for AMR-WB interoperable function.....	8
6.3.4 Test sequences for jitter buffer management	8
7 Conformance Testing	8
7.1 Bit-exact Conformance.....	8
7.2 Non-Bit-exact Conformance	8
7.2.1 Overview	8
7.2.2 Running the Tests.....	9
Annex A: Tools Description (normative).....	11
A.1 Decoder Test.....	11
A.1.1 General Considerations	11
A.1.2 Metrics.....	11
A.1.2.1 RMS Error Threshold	11
A.1.2.2 Signal to Noise Ratio (SNR)	12
A.1.2.3 Spectral Distortion.....	12
A.1.3 Analysis Flow and Reporting	13
A.2 Encoder Test	14
A.2.1 General Consideration	14
A.2.2 Metrics.....	15
A.3 MOS-LQO Test	16
A.3.1 General consideration.....	16
A.3.2 Test Files	17
A.3.3 Test Conditions.....	18
A.3.4 Thresholds and Criteria	19
A.4 Reference Implementations	20
Annex B (informative): Change history	22
History	23

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.

Sample Document

get full document from standards.iteh.ai

1 Scope

The present document specifies the digital test sequences for the Enhanced Voice Services (EVS) Codec. These sequences are used in conformance testing for implementations of the EVS Codec (3GPP TS 26.445), Voice Activity Detection (VAD) (3GPP TS.26.451), Comfort Noise Generation (3GPP TS 26.449), Discontinuous Transmission (DTX) (3GPP TS 26.450), Error Concealment of Lost Packets (3GPP TS 26.447), Jitter Buffer Management (JBM) (3GPP TS 26.448), and AMR-WB Interoperable Function (3GPP TS 26.446). In addition, the present document specifies procedures for conformance testing.

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 26.445: "Codec for Enhanced Voice Services (EVS); Detailed Algorithmic Description".
- [3] 3GPP TS 26.451: "Codec for Enhanced Voice Services (EVS); Voice Activity Detection (VAD)".
- [4] 3GPP TS 26.449: "Codec for Enhanced Voice Services (EVS); Comfort Noise Generation (CNG) Aspects".
- [5] 3GPP TS 26.450: "Codec for Enhanced Voice Services (EVS); Discontinuous Transmission (DTX)".
- [6] 3GPP TS 26.447: "Codec for Enhanced Voice Services (EVS); Error Concealment of Lost Packets".
- [7] 3GPP TS 26.442: " Codec for Enhanced Voice Services (EVS); ANSI C code (fixed-point)".
- [8] 3GPP TS 26.443: "Codec for Enhanced Voice Services (EVS); ANSI C code (floating-point)".
- [9] 3GPP TS 26.174: "Adaptive Multi-Rate - Wideband (AMR-WB) Speech Codec Test Sequences".
- [10] 3GPP TS 26.446: "Codec for Enhanced Voice Services (EVS); AMR-WB Backward Compatible Functions".
- [11] 3GPP TS 26. 448: "Codec for Enhanced Voice Services (EVS); Jitter Buffer Management".
- [12] 3GPP TS 26.452: "Codec for Enhanced Voice Services (EVS); ANSI C code; Alternative fixed-point using updated basic operators".
- [13] 3GPP TS 26.406: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Conformance testing".
- [14] 3GPP TS 26.274: "Audio codec processing functions; Extended Adaptive Multi-Rate - Wideband (AMR-WB+) speech codec; Conformance testing".
- [15] 3GPP TS 26.952: "Codec for Enhanced Voice Services (EVS); Performance Characterization".
- [16] ITU-T Recommendation P.863 (03/2018): "Perceptual objective listening quality assessment".
- [17] ITU-T Recommendation P.501 (03/2017): "Test signals for use in telephony".

- [18] ITU-R Recommendation BS.1387-1 (11/2001): "Method for objective measurements of perceived audio quality".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 26.445 [2], 3GPP TS 26.451 [3], 3GPP TS 26.449 [4], 3GPP TS 26.450 [5], 3GPP TS 26.447 [6], 3GPP TS 26.448 [11], and 3GPP TS 26.446 [10] apply.

3.2 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].

ACELP	Algebraic Code-Excited Linear Prediction
AMR-WB	Adaptive Multi Rate Wideband (codec)
CNG	Comfort Noise Generator
DTX	Discontinuous Transmission
EVS	Enhanced Voice Services
FB	Fullband
FEC	Frame Erasure Concealment
IP	Internet Protocol
JBM	Jitter Buffer Management
MSB	Most Significant Bit
MTSI	Multimedia Telephony Service for IMS
NB	Narrowband
PS	Packet Switched
PSTN	Public Switched Telephone Network
SAD	Sound Activity Detection
SC-VBR	Source Controlled - Variable Bit Rate
SID	Silence Insertion Descriptor
SWB	Super Wideband
VAD	Voice Activity Detection
WB	Wideband
WMOPS	Weighted Millions of Operations Per Second

4 General

4.1 Introduction

This specification provides digital test sequences which are necessary to test conformance for an implementation of the EVS codec (TS 26.445 [2]), Voice Activity Detection (TS 26.451 [3]), Comfort Noise Generation (TS 26.449 [4]), Discontinuous Transmission (TS 26.450 [5]), Concealment of Lost Packets (3GPP TS 26.447 [6]), Jitter Buffer Management (JBM) (3GPP TS 26.448 [11]) and AMR-WB Interoperable Function (3GPP TS 26.446 [10]), and for the testing of conformance for implementations of the ANSI C code in TS 26.442 [7], TS 26.443 [8] and TS 26.452 [12].

A standard compliant implementation of the above specifications shall pass conformance tests according to clause 7. The necessary test sequences can be found in the corresponding ZIP files according to the attached Readme.txt file.

Clause 5 describes the format of the files, which contain the digital test sequences. Clause 6 describes the test sequences for the EVS codec, including error concealment of lost packets, the AMR-WB interoperable function, the VAD, comfort noise generation, discontinuous transmission, the AMR-WB interoperable function, the EVS jitter buffer management, Clause 7 describes the conformance testing for implementations of the EVS codec.