# ETSI TS 126 115 V19.0.0 (2025-10)

TECHNICAL SPECIFICATION

**Universal Mobile Telecommunications System (UMTS);**
**LTE;**
**5G;**
**Echo control for speech and multimedia services**
**(3GPP TS 26.115 version 19.0.0 Release 19)**

Reference
RTS/TSGS-0426115vj00

Keywords
5G, LTE, UMTS

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# Contents

# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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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

The present document specifies minimum performance requirements for the transmission planning aspects of 3G speech and multi-media services.

The objective is to reach a quality as close as possible to ITU-T standards for PSTN circuits. However, due to technical and economic factors, there cannot be full compliance with the general characteristics of international telephone connections and circuits recommended by the ITU-T.

The performance requirements are specified the main body of the text; the test methods and considerations are described in [tbd].

# 1 Scope

The present document specifies minimum performance requirements for the gateway echo control of 3G speech and multi-media services. The present document is applicable to any narrow band speech telephony or multimedia service.

# 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] ITU-T Recommendation G.114 (2000): "One-way transmission time".

[2] ITU-T Recommendation G.168 (2000): "Digital network echo cancellers".

[3] ITU-T Recommendation G.131 (1996): "Control of talker echo".

[4] ITU-T Recommendation G.703 (1998): "Physical/electrical characteristics of hierarchical digital interfaces".

[5] ITU-T Recommendation G.711 (1988): "Pulse code modulation (PCM) of voice frequencies".

# 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| ADC | Analogue to Digital Converter |
| DAC | Digital to Analogue Converter |
| DTX | Discontinuous Transmission |
| EC | Echo Canceller |
| EEC | Electrical Echo Control |
| EL | Echo Loss |
| ERL | Echo Return Loss |
| ERLE | Echo Return Loss Enhancement |
| PCM | Pulse Code Modulation |
| POI | Point of Interconnection (with PSTN) |
| PSTN | Public Switched Telephone Network |
| TCL | Terminal Coupling Loss |
| TX | Transmission |

# 4 Interfaces

The POI with the public switched telephone network (PSTN) will generally be at the 2 048 kbits/ level at an interface in accordance with ITU-T Recommendation G.703 [4]/G.704 or STM1 155Mbit/s. At this point, which is considered to have a relative level of 0 dBr, the analogue signals will be represented by 8-bit A-law or μ-law according to ITU-T Recommendation G.711 [5]. Analogue measurements may be made at this point using a standard send and receive side, as defined in ITU-T Recommendations.

# 5 Narrow Band Speech Telephony Network Echo Control

## 5.1 GSTN Network Echo Cancellation

Narrow band speech calls from the 3G mobile system to the public GSTN are terminated on local switch line cards where two to four wire conversion takes place. The hybrid used to carry out this function is never perfect and echo is generated which degrades the speech call quality for the 3G mobile user. To overcome this situation an echo cancellation device should be used at the gateway from the 3G mobile network to the GSTN. This echo control device shall conform to ITU-T G.168 [2].

NOTE: Acoustic Echo Control: Narrow band speech calls from the 3G mobile network to the public GSTN involve a high delay. The only echo path that is audible to the GSTN user is the acoustic echo path in the UE. To overcome this echo a Terminal Coupling Loss (TCL) of 46dB should be achieved by the terminal. This provides adequate echo protection for calls up to a delay of 300ms as defined by ITU-T Recommendation G.131 [3].

# Annex A (informative): Change history

| Change history | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 03-2000 | 07 | SP-000020 | - | - | Approved at TSG SA #7 and placed under Change Control | - | 3.0.0 |
| 03-2001 | 11 | - | - | - | Version for Release 4 | 3.0.0 | 4.0.0 |
| 06-2002 | 16 | - | - | - | Version for Release 5 | 4.0.0 | 5.0.0 |
| 12-2004 | 26 | - | - | - | Version for Release 6 | 5.0.0 | 6.0.0 |
| 06-2007 | 36 | - | - | - | Version for Release 7 | 6.0.0 | 7.0.0 |
| 12-2008 | 42 | - | - | - | Version for Release 8 | 7.0.0 | 8.0.0 |
| 12-2009 | 46 | | | | Version for Release 9 | 8.0.0 | 9.0.0 |
| 03-2011 | 51 | | | | Version for Release 10 | 9.0.0 | 10.0.0 |
| 09-2012 | 57 | | | | Version for Release 11 | 10.0.0 | 11.0.0 |
| 09-2014 | 65 | | | | Version for Release 12 | 11.0.0 | 12.0.0 |
| 12-2015 | 70 | | | | Version for Release 13 | 12.0.0 | 13.0.0 |

| Change history | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2017-03 | 75 | | | | | Version for Release 14 | 14.0.0 |
| 2018-06 | 80 | | | | | Version for Release 15 | 15.0.0 |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | 16.0.0 |
| 2022-04 | - | - | - | - | - | Update to Rel-17 version (MCC) | 17.0.0 |
| 2024-03 | - | - | - | - | - | Update to Rel-18 version (MCC) | 18.0.0 |
| 2025-10 | - | - | - | - | - | Update to Rel-19 version (MCC) | **19.0.0** |

# History

| Document history | | |
|---|---|---|
| V19.0.0 | October 2025 | Publication |
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