ETSI TS 126 093 V13.0.0 (2016-01)

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Mandatory speech codec speech processing functions
Adaptive Multi-Rate (AMR) speech codec;
Source controlled rate operation
(3GPP TS 26.093 version 13.0.0 Release 13)

Reference
RTS/TSGS-0426093vd00

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

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
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:
https://portal.etsi.org/People/CommiteeSupportStaff.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 2016.
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 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.

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
Foreword 2
Modal verbs terminology 2
Foreword 5
1 Scope 6
2 References 6
3 Definitions, symbols and abbreviations 6
3.1 Definitions 6
3.2 Symbols 7
3.3 Abbreviations 7
4 General 7
4.1 General organisation 7
5 AMR SCR operation 8
5.1 Transmit (TX) side 8
5.1.1 General operation 8
5.1.2 Functions of the TX SCR handler 9
5.1.2.1 AMR SCR Timing procedures 9
5.1.3 The TX part of the AN 10
5.2 Receive (RX) side 11
5.2.1 General operation 11
5.2.3 Demands on the RX SCR handler 11
5.3 AMR SID Information format 12
Annex A (normative): AMR DTX handler for the GSM system (corresponding to GSM 06.93) 13
A.1 Scope 13
A.2 References 13
A.3 Definitions, symbols and abbreviations 14
A.3.1 Definitions 14
A.3.2 Symbols 14
A.3.3 Abbreviations 15
A.4 General 15
A.4.1 General organisation 15
A.5 Transmit (TX) side 16
A.5.1 General operation 16
A.5.1.1 Functions of the TX DTX handler 17
A.5.1.2 Functions of the TX Radio Subsystem 18
A.5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS 18
A.5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS 18
A.5.1.2.3 Functions of the Downlink TX Radio Subsystem for TFO 19
A.5.1.2.4 Functions of the TX Radio Subsystem for RATSCCH 20
A.6 Receive (RX) side 20
A.6.1 General operation 20
A.6.1.1 Functions of the RX radio subsystem 21
A.6.1.2 Functions of the RX DTX handler 21
Annex B (normative): ETSI GSM-EFR SCR handler 22
B.1 Transmit (TX) side 22

B.1.1 General operation 22
B.1.2 Functions of the TX SCR handler 22
B.1.2.1 GSM-EFR SCR Timing procedures 22
B.1.3 The TX part of the AN 22
B.1.3.1 Demands on the TX part of the Access Network 22
B.2 Receive (RX) side 23
B.3 SID Information format 23
Annex C (normative): TIA IS-641 SCR Handler 24
C.1 TX-side 24
C.2 RX-side 24
C.3 SID Information format 24
Annex D (normative): TIA TDMA-US1 SCR Handler 25
D.1 TX-side 25
D.2 RX-side 25
D.3 SID Information format 25
Annex E (normative): ARIB PDC-EFR SCR Handler 26
E.1 Transmit (TX) side 26
E.1.1 General operation 26
E.1.2 Functions of the TX SCR handler 26
E.1.2.1 PDC_EFR SCR Timing procedures 26
E.1.3 The TX part of the AN 27
E.1.3.1 Demands on the TX part of the Access Network 27
E.2 Receive (RX) side 27
E.3 SID information format 27
Annex F (informative): Change history 28
History 29

Foreword

This Technical Specification has been produced by the 3GPP.

The present document describes the operation of the Adaptive Multi Rate speech codec during Source Controlled Rate (SCR) operation within the 3GPP system.

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 this TS, 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 specification;

1 Scope

This document describes the Source Controlled Rate (SCR)operation of the Adaptive Multi-Rate speech Codec in Codec Types UMTS_AMR and UMTS_AMR2 for the UMTS system. The implementation of this SCR operation is mandatory in all UMTS equipment.

The description is structured according to the block diagram in figure 1. This structure of distributing the various functions between system entities is not mandatory for implementation, as long as the operation on the speech decoder output remains the same.

Annex A describes the Discontinuous Transmission (DTX) operation of the Adaptive Multi-Rate speech Codec in Codec Types FR_AMR, HR_AMR and OHR_AMR for GERAN. This annex is the former GSM 06.93 (Release 98).

Annexes B to E describe the SCR operation of the Adaptive Multi-Rate speech Codec in Codec Types GSM_EFR, TDMA_EFR, TDMA_US1 and PDC_EFR for the UMTS system.

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 TS 26.071 : "AMR Speech Codec; General description".

[2] 3GPP TS 26.073 : "AMR Speech Codec; ANSI-C code".

[3] 3GPP TS 26.074 : "AMR Speech Codec; Test sequences".

[4] 3GPP TS 26.090 : "AMR Speech Codec; Transcoding functions".

[5] 3GPP TS 26.091 : "AMR Speech Codec; Error concealment of lost frames".

[6] 3GPP TS 26.092 : "AMR Speech Codec; Comfort noise aspects".

[7] 3GPP TS 26.094 : "AMR Speech Codec; Voice Activity Detector (VAD)".

[8] 3GPP TS 26.101 : 'AMR Speech Codec; Frame structure".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purpose of this document, the following definitions apply.

frame: Time interval of 20 ms, corresponding to the time segmentation of the Adaptive Multi Rate speech Codec, also used as a short term for a traffic frame.

traffic frame: Block of 95..244 information bits transmitted on the speech traffic channels.

SID frame: Frame that conveys information about the acoustic background noise.