3GPP TS 55.216 V16.0.0(2020-07)

Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

3G Security;

Specification of the A5/3 encryption algorithms for GSM and

ECSD, and the GEA3 encryption algorithm for GPRS;

Document 1: A5/3 and GEA3 specifications

(Release 16)

 

The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP.   
The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented.   
This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification.  
Specifications and reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices.

Keywords

GSM, GPRS, security, algorithm

***3GPP***

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis

Valbonne - FRANCE

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

Internet

http://www.3gpp.org

***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.

© 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

UMTS™ is a Trade Mark of ETSI registered for the benefit of its members

3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  
LTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners

GSM® and the GSM logo are registered and owned by the GSM Association

Contents

Foreword [4](#__RefHeading___Toc185865900)

0 Scope [5](#__RefHeading___Toc185865901)

0A References [5](#__RefHeading___Toc185865902)

0B Definitions, symbols and abbreviations [5](#__RefHeading___Toc185865903)

0B.1 Definitions [5](#__RefHeading___Toc185865904)

0B.2 Symbols [5](#__RefHeading___Toc185865905)

0B.3 Abbreviations [5](#__RefHeading___Toc185865906)

0C Technical provisions [5](#__RefHeading___Toc185865907)

Annex D (informative): Change history [6](#__RefHeading___Toc185865908)

# 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.

# 0 Scope

The present document specifies the A5/3 and GEA3 specification.

# 0A 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 Task Force Specification: "Specification of the A5/3 encryption algorithms for GSM and ECSD, and the GEA3 encryption algorithm for GPRS; Document 1: A5/3 and GEA3 specification" version 1.1, 2002-05-30

Note: Reference [2] is available via <http://portal.etsi.org/dvbandca/home.asp> and is subject to licensing conditions described at this site.

# 0B Definitions, symbols and abbreviations

## 0B.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and in the 3GPP Task Force Specification [2] apply. A term defined in the latter document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

## 0B.2 Symbols

For the purposes of the present document, the symbols defined in the 3GPP Task Force Specification [2] apply.

## 0B.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [2] and in the 3GPP Task Force Specification [2] apply. An abbreviation defined in the latter document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

# 0C Technical provisions

The technical provisons of the current document are contained in the 3GPP Task Force Specification [2].

Annex D (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 2002-05 | - | - | - | - | ETSI SAGE first publication |  | SAGE V1.0 |
| 2002-07 | - | - | - | - | Agreed at SA WG3 #24 for presentation to TSG SA #17 for approval. Converted into 3GPP TS format as TS 55.216 (Technically equivalent to SAGE V1.0) | SAGE V1.0 | 1.0.0 |
| 2002-09 | SP-17 | SP-020506 | - | - | Approved for Release 6 - version 6.0.0 | 1.0.0 | 6.0.0 |
| 2002-12 | SP-18 | SP-020721 | 001 | - | EGPRS algoritm | 6.0.0 | 6.1.0 |
| 2003-09 | SP-19 | SP-030490 | 002 | - | Clarification on the usage of the Key length | 6.1.0 | 6.2.0 |
| 2007-12 | SP-38 | SP-070776 | 003 | - | Conversion to pointer to export controlled document  Note: Version 7.0.0 is a "readme" file placeholder with no technical content. | 6.2.0 | 7.1.0 |
| 2008-12 | SP-42 | - |  | - | Ugrade to Release 8 | 7.1.0 | 8.0.0 |
| 2009-12 | - | - | - | - | Update to Rel-9 version (MCC) | 8.0.0 | 9.0.0 |
| 2011-03 | - | - | - | - | Update to Rel-10 version (MCC) | 9.0.0 | 10.0.0 |
| 2012-09 | - | - | - | - | Update to Rel-11 version (MCC) | 10.0.0 | **11.0.0** |
| 2014-09 | - | - | - | - | Update to Rel-12 version (MCC) | 11.0.0 | **12.0.0** |
| 2016-01 | - | - | - | - | Update to Rel-13 version (MCC) | 12.0.0 | **13.0.0** |
| 2017-03 | SA#75 | - | - | - | Promotion to Release 14 without technical change | 13.0.0 | **14.0.0** |
| 2018-06 | - | - | - | - | Update to Rel-15 version (MCC) | 14.0.0 | **15.0.0** |
| 2020-07 | - | - | - | - | Update to Rel-16 version (MCC) | 15.0.0 | **16.0.0** |