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**Digital cellular telecommunications system (Phase 2+) (GSM);  
Specification of the GIA4 integrity algorithm for  
General Packet Radio Service (GPRS);  
GIA4 specification  
(3GPP TS 55.241 version 14.0.0 Release 14)**



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## Introduction

This specification has been prepared by the 3GPP Task Force, and gives a detailed specification of the 3GPP integrity algorithm GIA4.

This document is the first of three, which between them form the entire specification of the 3GPP Integrity Algorithm GIA4:

- **3GPP TS 55.241: "Specification of the GIA4 encryption algorithms for GPRS; GIA4 specification".**
- 3GPP TS 55.242: "Specification of the GIA4 encryption algorithms for GPRS; Implementers' test data".
- 3GPP TS 55.243: "Specification of the GIA4 encryption algorithms for GPRS; Design conformance test data".

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# 1 Scope

The present document defines the technical details of the 3GPP integrity algorithm GIA4.

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## 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 35.202: "3G Security; Specification of the 3GPP Confidentiality and Integrity Algorithms; Document 2: KASUMI Specification".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

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

(none)

### 3.2 Symbols

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

- |                      |  |
|----------------------|--|
| =                    | The assignment operator.   |
| $\oplus$             | The bitwise exclusive-OR operation.  |
|                      | The concatenation of the two operands.   |
| $\text{KASUMI}[x]_k$ | The output of the KASUMI algorithm [2] applied to input value $x$ using the key $k$ .  |
| $X[i]$               | The $i^{\text{th}}$ bit of the variable $X$ . ( $X = X[0]    X[1]    X[2]    \dots$ ). |
| $Y_i$                | The $i^{\text{th}}$ block of the variable $Y$ . ( $Y = Y_0    Y_1    Y_2    \dots$ ).  |