

ETSI TS 148 014 V14.0.0 (2017-04)



**Digital cellular telecommunications system (Phase 2+) (GSM);
General Packet Radio Service (GPRS);
Base Station System (BSS) -
Serving GPRS Support Node (SGSN) interface;
Gb interface Layer 1
(3GPP TS 48.014 version 14.0.0 Release 14)**



Reference

RTS/TSGR-0648014ve00

Keywords

GSM

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
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

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 2017.
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.....	4
1 Scope	5
2 References	5
3 Abbreviations	5
4 Definitions	6
4.1 Definitions	6
4.2 Symbols.....	6
5 Layer 1 specification	6
5.1 Physical configuration of the Gb interface	6
5.2 Physical layer interface	6
5.3 Error rate	7
5.4 Provision of physical channels	7
Annex A (informative): Change History	8
History	9

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.

1 Scope

The present document specifies the physical layer on the Base Station System (BSS) to Serving GPRS Support Node (SGSN) interface (Gb interface) and references layer 1 standards to be used on this interface.

The protocol stack on the Gb interface is defined in the stage 2 3GPP TS 23.060.

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 22.060: "General Packet Radio Service (GPRS); Service description; Stage 1".
- [3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [4] 3GPP TS 48.004: "Base Station System - Mobile-services Switching Centre (BSS-MSC) interface; Layer 1 specification".
- [5] FRF.1.2 (July 2000): "User-to-Network Interface (UNI) Implementation Agreement".
- [6] ITU-T Recommendation G.704 (Blue Book): "Synchronous frame structures used at 1 544, 6 312, 2 048, 8 488 and 44 736 kbit/s hierarchical levels".
- [7] ANSI T1.403-1999: "Network and Customer Installation Interfaces - DS1 - Electrical Interface".
- [8] Bellcore TR-NWT-001203 Issue 2 (December 1992): "Generic Requirements for the Switched DS1/Switched Fractional DS1 Service Capability From an ISDN Interface (SWF-DS1/ISDN)".
- [9] ITU-T Recommendation V.35: "Data transmission at 48 kilobits per second using 60-108 kHz group band circuits".
- [10] ITU-T Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [11] ITU-T Recommendation X.21: "Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks".
- [12] TIA/EIA-530-A: "High Speed 25-Position Interface for Data Terminal Equipment and Data Circuit-Terminating Equipment, Including Alternative 26-Position Connector (ANSI/TIA/EIA-530-A-92) (R98)".

3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 and 3GPP TS 23.060, and the following apply:

DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
FRF	Frame Relay Forum

4 Definitions

4.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 22.060 and the following apply:

E1: a four wire symmetrical digital transmission path carrying PCM signal at 2 048 kbit/s.

T1: a four wire symmetrical digital transmission path carrying PCM signal at 1 544 kbit/s.

4.2 Symbols

For the purposes of the present document, the symbols given in 3GPP TS 23.060 apply.

5 Layer 1 specification

Since Frame Relay shall be used on the Gb interface for phase 1 of GPRS, see 3GPP TS 23.060, the present document refers to "The Frame Relay Forum User-to-Network Implementation Agreement (UNI)" which recommends physical layer interfaces to be used in conjunction with Frame Relay.

5.1 Physical configuration of the Gb interface

The detailed physical configuration of the Gb interface is subject to negotiation between operators and equipment providers and is out of the scope of the present document.

EXAMPLE: Point-to-point physical lines or an intermediate Frame Relay network may be used. In the latter case, the two ends of the Gb interface may use different types of physical interfaces.

5.2 Physical layer interface

Each of the physical layer of the Gb interface shall conform to one of the following FRF 1.2 clauses. This does not mean that each BSS and SGSN equipment has to support all of these physical interfaces, it means that the supported physical interfaces shall be compliant with the corresponding clause of FRF 1.2.

- a) clause 2.1.1: ANSI T1.403.
- b) clause 2.1.2: V.35, physical circuit and DTE/DCE interface clauses.
- c) clause 2.1.3: G.703.
- d) clause 2.1.4: G.704.
- e) clause 2.1.5: X.21.
- f) clause 2.1.6: TIA/EIA-530-A.
- g) clause 2.1.7: HSSI.

The Gb interface may be multiplexed with the A interface on the same E1 (2 048 kbit/s), or T1 (15 44 kbit/s) digital path. In case of E1 interface, ITU-T Recommendation G.704 shall be applied according to FRF 1.2 and

3GPP TS 48.004 as appropriate, and in case of T1 interface ANSI T1.403 shall be applied according to FRF 1.1 and 3GPP TS 48.004 as appropriate.

In the case where multiple 64 kbit/s channels are used on an E1 (2048 kbit/s), digital path on the Gb interface, it is recommended to aggregate them into one $n \times 64$ kbit/s channel, see ITU-T Recommendation G.704, clause 5 and included clauses. In case where multiple 64 kbit/s channels are used on a T1 (1 544 kbit/s) digital path on the Gb interface, it is recommended to aggregate them into $n \times 64$ kbit/s (where $2 \leq n \leq 24$) channel, see Bellcore TR-NWT-1203. This approach optimises the use of the available bandwidth by taking advantage of the statistical multiplexing at the upper layer. However, this approach requires that no slipping occurs between individual 64 kbit/s channels e.g. when passing through intermediate equipment between BSS and SGSN.

5.3 Error rate

The error rate experienced at the physical layer between the BSS and the SGSN shall be compatible with the operation of the upper layers.

5.4 Provision of physical channels

The physical channels on the Gb interface shall be permanently reserved by means of administrative procedures.

Annex A (informative): Change History

TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
January 2016	-	-	-	Rel-13 version created based on v12.0.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	75					Version for Release 14 (frozen at TSG-75)	14.0.0

History

Document history		
V14.0.0	April 2017	Publication