

# ETSI TS 101 298 V7.0.1 (1999-08)

---

*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);  
General Packet Radio Service (GPRS);  
Base Station System (BSS) - Serving GPRS Support Node  
(SGSN) interface; Gb interface Layer 1  
(GSM 08.14 version 7.0.1 Release 1998)**

---

**GSM**®

GLOBAL SYSTEM FOR  
MOBILE COMMUNICATIONS



Reference

---

RTS/SMG-020814Q7 (c0o03i0r.PDF)

Keywords

---

Digital cellular telecommunications system,  
Global System for Mobile communications (GSM)

**ETSI**

Postal address

---

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

---

650 Route des Lucioles - Sophia Antipolis  
Valbonne - 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

Internet

---

[secretariat@etsi.fr](mailto:secretariat@etsi.fr)  
Individual copies of this ETSI deliverable  
can be downloaded from  
<http://www.etsi.org>  
If you find errors in the present document, send your  
comment to: [editor@etsi.fr](mailto:editor@etsi.fr)

---

**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.

© European Telecommunications Standards Institute 1999.  
All rights reserved.

---

# Contents

Intellectual Property Rights.....	4
Foreword .....	4
1 Scope.....	5
2 References.....	5
3 Definitions, symbols and abbreviations .....	5
3.1 Definitions .....	5
3.2 Symbols .....	5
3.3 Abbreviations.....	6
4 Layer 1 specification.....	6
4.1 Physical configuration of the Gb interface.....	6
4.2 Physical layer interface .....	6
4.3 Error rate.....	6
4.4 Provision of physical channels.....	7
<b>Annex A (informative): Document change history.....</b>	<b>8</b>
History.....	9

---

## 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 SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

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 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 the Special Mobile Group (SMG).

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 within the digital cellular telecommunications system.

The contents of the present document is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document, it will be re-released by SMG with an identifying change of release date and an increase in version number as follows:

Version 7.x.y

where:

- 7 indicates GSM Phase 2+ Release 1998;
- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.;
- y the third digit is incremented when editorial only changes have been incorporated in the specification.

---

# 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 GSM 03.60 [3].

---

# 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

- [1] GSM 01.04 (ETR 350): “Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms”.
- [2] GSM 02.60: “Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Service description; Stage 1”.
- [3] GSM 03.60: “Digital cellular telecommunications system (Phase 2+); Stage 2 Service Description of the General Packet Radio Service (GPRS)”.
- [4] GSM 08.04: “ Digital cellular telecommunications system (Phase 2); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification”.
- [5] FRF 1.1 (January 19, 1996): “The Frame Relay Forum User-to-Network Implementation Agreement (UNI)”.
- [6] CCITT Recommendation G.704 (Blue Book): “Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44 736 kbit/s hierarchical levels”.
- [7] ANSI T1.403 (1995): “Carrier to Customer Installation DS1 Metallic Interface”.
- [8] Bellcore TR-NWT-001203 Issue 2, December 1992: “Generic Requirements for the Switched DS1/Switched Fractional Capability from an ISDN Interface”.

---

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

Refer to GSM 02.60 [2].

## 3.2 Symbols

Refer to GSM 03.60 [3].

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply. Additional applicable abbreviations can be found in GSM 01.04 [1] and GSM 03.60 [3].

DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
E1	A four wire symmetrical digital transmission path carrying PCM signal at 2048 kbit/s.
FRF	Frame Relay Forum
T1	A four wire symmetrical digital transmission path carrying PCM signal at 1544 kbit/s.

---

## 4 Layer 1 specification

Since Frame Relay shall be used on the Gb interface for phase 1 of GPRS, see TS GSM 03.60 [3], this version of this Technical Specification refers to “The Frame Relay Forum User-to-Network Implementation Agreement (UNI)” [5] which recommends physical layer interfaces to be used in conjunction with Frame Relay.

### 4.1 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 this Technical Specification.

For 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.

### 4.2 Physical layer interface

Each of the physical layer of the Gb interface shall conform to one of the following FRF 1.1 [5] 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 1.1 [5].

- 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: ANSI-530-A-1992.
- g) clause 2.1.7: HSSI.

The Gb interface may be multiplexed with the A interface on the same E1 (2048 kbit/s), or T1 (1544 Kbit/s) digital path. In case of E1 interface, CCITT Recommendation G.704 [6] shall be applied according to FRF 1.1 [5] and GSM 08.04 [4] as appropriate, and in case of T1 interface ANSI Recommendation T1.403 [7] shall be applied according to FRF 1.1 [5] and GSM 08.04 [4] 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 CCITT Recommendation G.704 [6], clause 5 and included sub-clauses. In case where multiple 64 kbit/s channels are used on a T1 (1544 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 [8]. 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.

### 4.3 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.

## 4.4 Provision of physical channels

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

---

## Annex A (informative): Document change history

SPEC	SMG#	CR	PHASE	VERS	NEW_VERSIONS	SUBJECT
08.14	s24	new	R97	2.0.0	6.0.0	Gb interface Layer 1
08.14	s28	new	R98	6.0.0	7.0.0	ANSI references



---

# History

<b>Document history</b>		
V7.0.1	August 1999	Publication