ETSI TS 101 298 V8.0.0 (2000-06)

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 8.0.0 Release 1999)**

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Contents

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

Version 8.x.y

where:

8 indicates GSM Phase 2+ Release 1999;

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 1999 document, references to GSM documents are for Release 1999 versions (version 8.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 Franctional 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 symetrical 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 negociation 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 nx64 kbit/s channel, see CCITT Recommendation G.704 [6], clause 5 and included sub-clauses. In case where multiple 64kbit/s channels are used on a T1 (1544 kbit/s) digital path on the Gb interface, it is recommended to aggregate them into nx64kbit/s (where 2<=n<=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_VERS	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

Document history		
V8.0.0	June 2000	Publication