

ETSI TS 148 054 V13.0.0 (2016-01)



**Digital cellular telecommunications system (Phase 2+);
Base Station Controller - Base Transceiver Station (BSC - BTS)
interface;
Layer 1 structure of physical circuits
(3GPP TS 48.054 version 13.0.0 Release 13)**



Reference

RTS/TSGG-0248054vd00

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
<http://portal.etsi.org/tb/status/status.asp>

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 2016.
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 Layer 1 specification	6
Annex A (informative): Change History	7
History	8

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 use and general aspects of the A-bis interface are given in 3GPP TS 48.051.

The present document defines the structure of the physical layer (layer 1) of the BSC - BTS/TRX interface for supporting traffic channels and control channels. Use of the physical layer for supporting link protocol is covered in 3GPP TS 48.056.

The physical layer is the lowest layer in the OSI Reference Model and it supports all functions required for transmission of bit streams on the physical medium.

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 48.020: "Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [3] 3GPP TS 48.051: "Base Station Controller - Base Transceiver Station (BSC - BTS) interface; General aspects".
- [4] 3GPP TS 48.056: "Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 2 specification".
- [5] 3GPP TS 48.060: "In-band control of remote transcoders and rate adaptors for full rate traffic channels".
- [6] 3GPP TS 48.061: "In-band control of remote transcoders and rate adaptors for half rate traffic channels".
- [7] ITU-T Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [8] ITU-T Recommendation G.705: "Characteristics of plesiochronous digital hierarchy (PDH) equipment functional blocks".
- [9] ITU-T Recommendation G.711: "Pulse Code Modulation (PCM) of voice frequencies".
- [10] ITU-T Recommendation G.732: "Characteristics of primary PCM multiplex equipment operating at 2 048 kbit/s".
- [11] ITU-T Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 apply.

4 Layer 1 specification

All the ITU-T recommendations referred to are Blue Book.

Layer 1 shall utilize digital transmission at a rate of 2 048 kbit/s with a frame structure of 32 x 64 kbit/s time slots, as specified in ITU-T Recommendation G.705 clause 3 or at a rate of 64 kbit/s.

The physical/electrical characteristics are defined in ITU-T Recommendation G.703.

Synchronization at the BTS/TRX for the transmitted bit stream toward the BSC shall be derived from the received bit stream from the BSC.

For transmission rate at 64 kbit/sec it shall be an interface as defined in ITU-T Recommendation G.703.

For transmission rate at 2 048 kbit/s the functional characteristics are defined in ITU-T Recommendation G.732 clauses 2 and 3, and fault conditions should be treated in accordance with ITU-T Recommendation G.732 clause 4.

The idle pattern must be transmitted on every timeslot that is not assigned to a channel, and to every timeslot of a channel that is not allocated to a call. The idle pattern shall be 01010100 for a 64 kbit/s channel and the 2-bit pattern 01 for 16 kbit/s channels. For 8 kbit/s channels, the idle pattern shall be consecutive ones or zeros according to the corresponding idle pattern bit of a 16 kbit/s channel.

If transcoders are located in BTS speech encoding shall be the A-law as defined in ITU-T Recommendation G.711.

If speech transcoders are located in the BSC the speech, data and signalling channels will utilize transmission rates of 8 kbit/s, 16 kbit/s or 64 kbit/s according to 3GPP TS 48.060 and 3GPP TS 48.061. They shall be rate adapted or multiplexed according to ITU-T Recommendation I.460 with fixed format, to fit into the physical interface.

Data encoding is covered in 3GPP TS 48.020.

In the case of a 2 048 kbit/sec circuit, multidrop solutions should be possible. Dynamic sharing of terrestrial 64 kbit/sec channels between BTS:s on a per-call basis must not be used.

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

History

Document history		
V13.0.0	January 2016	Publication