

# ETSI TS 124 007 V13.0.0 (2016-03)



**Digital cellular telecommunications system (Phase 2+) (GSM);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
Mobile radio interface signalling layer 3;  
General Aspects  
(3GPP TS 24.007 version 13.0.0 Release 13)**



---

**Reference**RTS/TSGC-0124007vd00

---

**Keywords**LTE

---

**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/CommitteeSupportStaff.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.....	12
1 Scope .....	13
2 References .....	13
3 Definitions and abbreviations.....	15
3.1 Definitions .....	15
3.2 Abbreviations .....	15
4 Introduction .....	15
4.1 General .....	15
4.2 Applicability of functional blocks .....	17
4.3 Technique of description .....	17
4.3.1 Service description.....	17
4.3.2 Abstract service primitives .....	17
4.3.3 Protocols and peer-to-peer communication .....	18
4.3.4 Contents of layer 3 related Technical Specifications .....	19
5 Structure of layer 3 functions .....	20
5.1 Basic groups of functions .....	20
5.2 Protocol architecture.....	21
6 Services provided by signalling layer 3 at the MS side.....	31
6.1 Registration services.....	31
6.1.1 Service state diagram for MS not supporting GPRS service .....	32
6.1.2 Service primitives .....	32
6.1.2.1 MMR_REG_REQ.....	32
6.1.2.2 MMR_REG_CNF.....	32
6.1.2.3 Void.....	32
6.1.2.4 MMR_NREG_REQ .....	32
6.1.2.5 MMR_NREG_IND .....	33
6.1.3 Registration Services for CTS-Services.....	33
6.1.3.1 MMR_CTS_ATTACH_REQ.....	33
6.1.3.2 MMR_CTS_ATTACH_CNF.....	33
6.1.3.3 MMR_CTS_ATTACH_REJ .....	33
6.1.3.4 MMR_CTS_DETACH_IND .....	33
6.1.3.5 MMR_CTS_ENROLL_REQ .....	33
6.1.3.6 MMR_CTS_ENROLL_CNF .....	33
6.1.3.7 MMR_CTS_ENROLL_REJ .....	33
6.1.3.8 MMR_CTS_DE_ENROLL_IND.....	34
6.2 Call Control services .....	34
6.2.1 Service state diagram.....	34
6.2.2 Service primitives .....	37
6.2.2.1 MNCC_SETUP_REQ.....	37
6.2.2.2 MNCC_SETUP_IND.....	37
6.2.2.3 MNCC_SETUP_RES .....	37
6.2.2.4 MNCC_SETUP_CNF.....	37
6.2.2.5 MNCC_SETUP_COMPL_REQ .....	37
6.2.2.6 MNCC_SETUP_COMPL_IND .....	38
6.2.2.7 MNCC_REJ_REQ .....	38
6.2.2.8 MNCC_REJ_IND .....	38
6.2.2.9 MNCC_CALL_CONF_REQ .....	38
6.2.2.10 MNCC_CALL_PROC_IND .....	38

6.2.2.11	MNCC_PROGRESS_IND.....	38
6.2.2.12	MNCC_ALERT_REQ.....	38
6.2.2.13	MNCC_ALERT_IND.....	38
6.2.2.14	MNCC_NOTIFY_REQ.....	38
6.2.2.15	MNCC_NOTIFY_IND.....	38
6.2.2.16	MNCC_DISC_REQ.....	38
6.2.2.17	MNCC_DISC_IND.....	38
6.2.2.18	MNCC_REL_REQ.....	39
6.2.2.19	MNCC_REL_IND.....	39
6.2.2.20	MNCC_REL_CNF.....	39
6.2.2.21	MNCC_FACILITY_REQ.....	39
6.2.2.22	MNCC_FACILITY_IND.....	39
6.2.2.23	MNCC_START_DTMF_REQ.....	39
6.2.2.24	MNCC_START_DTMF_CNF.....	39
6.2.2.25	MNCC_STOP_DTMF_REQ.....	39
6.2.2.26	MNCC_STOP_DTMF_CNF.....	39
6.2.2.27	MNCC_MODIFY_REQ.....	39
6.2.2.28	MNCC_MODIFY_IND.....	39
6.2.2.29	MNCC_MODIFY_RES.....	39
6.2.2.30	MNCC_MODIFY_CNF.....	40
6.2.2.31	MNCC_SYNC_IND.....	40
6.3	Call independent Supplementary Services Support.....	40
6.3.1	Service state diagram.....	40
6.3.2	Service primitives.....	40
6.3.2.1	MNSS_BEGIN_REQ.....	41
6.3.2.2	MNSS_BEGIN_IND.....	41
6.3.2.3	MNSS_FACILITY_REQ.....	41
6.3.2.4	MNSS_FACILITY_IND.....	41
6.3.2.5	MNSS_END_REQ.....	41
6.3.2.6	MNSS_END_IND.....	41
6.4	Short Message Services Support.....	41
6.5	Session Management Services for GPRS-Services.....	41
6.5.1	Session Management Services for SMREG-SAP.....	42
6.5.1.1	SMREG-PDP-ACTIVATE-REQ.....	42
6.5.1.2	SMREG-PDP-ACTIVATE-CNF.....	42
6.5.1.3	SMREG-PDP-ACTIVATE-REJ.....	42
6.5.1.4	SMREG-PDP-ACTIVATE-IND.....	43
6.5.1.5	SMREG-PDP-DEACTIVATE-REQ.....	43
6.5.1.6	SMREG-PDP-DEACTIVATE-CNF.....	43
6.5.1.7	SMREG-PDP-DEACTIVATE-IND.....	43
6.5.1.8	SMREG-PDP-MODIFY-IND.....	43
6.5.1.9	Void.....	43
6.5.1.10	Void.....	43
6.5.1.11	Void.....	43
6.5.1.12	Void.....	43
6.5.1.13	Void.....	43
6.5.1.14	SMREG-PDP-ACTIVATE-REJ-RSP.....	43
6.5.1.15	SMREG-PDP-ACTIVATE-SEC-REQ.....	43
6.5.1.16	SMREG-PDP-ACTIVATE-SEC-CNF.....	44
6.5.1.17	SMREG-PDP-ACTIVATE-SEC-REJ.....	44
6.5.1.18	SMREG-PDP-MODIFY-REQ.....	44
6.5.1.19	SMREG-PDP-MODIFY-CNF.....	44
6.5.1.20	SMREG-PDP-MODIFY-REJ.....	44
6.5.1.21	SMREG-MBMS-ACTIVATE-REQ.....	44
6.5.1.22	SMREG-MBMS-ACTIVATE-CNF.....	44
6.5.1.23	SMREG-MBMS-ACTIVATE-REJ.....	44
6.5.1.24	SMREG-MBMS-ACTIVATE-REJ-RSP.....	44
6.5.1.25	SMREG-MBMS-ACTIVATE-IND.....	44
6.5.2	Session Management Services for SNSM-SAP (GSM only).....	46
6.5.3	Session Management Services for RABMSM-SAP (UMTS only).....	46
6.5.3.1	RABMSM-ACTIVATE-IND.....	47
6.5.3.2	RABMSM-ACTIVATE-RSP.....	47

6.5.3.3	RABMSM-DEACTIVATE-IND .....	47
6.5.3.4	RABMSM-DEACTIVATE-RSP .....	47
6.5.3.5	RABMSM-DEACTIVATE-REQ .....	47
6.5.3.6	RABMSM-MODIFY-IND .....	47
6.5.3.7	RABMSM-MODIFY-RSP .....	47
6.5.3.8	RABMSM-STATUS-REQ .....	47
6.6	Registration Services for GPRS-Services .....	47
6.6.1	Registration Services for GMMREG-SAP .....	48
6.6.1.1	GMMREG-ATTACH-REQ .....	48
6.6.1.2	GMMREG-ATTACH-CNF .....	48
6.6.1.3	GMMREG-ATTACH-REJ .....	48
6.6.1.4	GMMREG-DETACH-REQ .....	48
6.6.1.5	GMMREG-DETACH-CNF .....	48
6.6.1.6	GMMREG-DETACH-IND .....	48
6.7	Services provided to SMDCP entities by GPRS Logical Link Control services .....	49
6.7.1	Service state diagram for QoS1-SAP, QoS2-SAP, QoS3-SAP and QoS4-SAP .....	50
6.7.2	Service primitives for QoS1-SAP, QoS2-SAP, QoS3-SAP and QoS4-SAP .....	50
6.7.2.1	LL-ESTABLISH-REQ .....	50
6.7.2.2	LL-ESTABLISH-CNF .....	51
6.7.2.3	LL-ESTABLISH-IND .....	51
6.7.2.4	LL-ESTABLISH-RSP .....	51
6.7.2.5	LL-RELEASE-REQ .....	51
6.7.2.6	LL-RELEASE-CNF .....	51
6.7.2.7	LL-RELEASE-IND .....	51
6.7.2.8	LL-XID-REQ .....	51
6.7.2.9	LL-XID-IND .....	51
6.7.2.10	LL-XID-RSP .....	51
6.7.2.11	LL-XID-CNF .....	51
6.7.2.12	LL-DATA-REQ .....	51
6.7.2.13	LL-DATA-CNF .....	51
6.7.2.14	LL-DATA-IND .....	51
6.7.2.15	LL-UNITDATA-REQ .....	51
6.7.2.16	LL-UNITDATA-IND .....	52
6.7.2.17	LL-STATUS-IND .....	52
6.8	Location services at the type A LMU side .....	52
6.8.1	Service state diagram .....	52
6.8.2	Service primitives .....	53
6.8.2.1	MNLCS_BEGIN_REQ .....	53
6.8.2.2	MNLCS_BEGIN_IND .....	53
6.8.2.3	MNLCS_FACILITY_REQ .....	53
6.8.2.4	MNLCS_FACILITY_IND .....	53
6.8.2.5	MNLCS_END_REQ .....	53
6.8.2.6	MNLCS_END_IND .....	53
7	Services provided by signalling layer 3 on the Network side .....	53
7.1	Call control services .....	53
7.1.1	Service state diagram .....	54
7.1.2	Service primitives .....	57
7.1.2.1	MNCC_SETUP_REQ .....	57
7.1.2.2	MNCC_SETUP_IND .....	57
7.1.2.3	MNCC_SETUP_RSP .....	57
7.1.2.4	MNCC_SETUP_CNF .....	57
7.1.2.5	MNCC_SETUP_COMPL_REQ .....	57
7.1.2.6	MNCC_SETUP_COMPL_IND .....	58
7.1.2.7	MNCC_REJ_REQ .....	58
7.1.2.8	MNCC_REJ_IND .....	58
7.1.2.9	MNCC_CALL_CONF_IND .....	58
7.1.2.10	MNCC_CALL_PROC_REQ .....	58
7.1.2.11	MNCC_PROGRESS_REQ .....	58
7.1.2.12	MNCC_ALERT_REQ .....	58
7.1.2.13	MNCC_ALERT_IND .....	58
7.1.2.14	MNCC_NOTIFY_REQ .....	58

7.1.2.15	MNCC_NOTIFY_IND .....	58
7.1.2.16	MNCC_DISC_REQ .....	58
7.1.2.17	MNCC_DISC_IND .....	58
7.1.2.18	MNCC_REL_REQ .....	59
7.1.2.19	MNCC_REL_IND .....	59
7.1.2.20	MNCC_REL_CNF .....	59
7.1.2.21	MNCC_FACILITY_REQ .....	59
7.1.2.22	MNCC_FACILITY_IND .....	59
7.1.2.23	MNCC_START_DTMF_IND .....	59
7.1.2.24	MNCC_START_DTMF_RSP .....	59
7.1.2.25	MNCC_STOP_DTMF_IND .....	59
7.1.2.26	MNCC_STOP_DTMF_RSP .....	59
7.1.2.27	MNCC_MODIFY_REQ .....	59
7.1.2.28	MNCC_MODIFY_IND .....	59
7.1.2.29	MNCC_MODIFY_RES .....	59
7.1.2.30	MNCC_MODIFY_CNF .....	59
7.2	Call independent Supplementary Services Support .....	60
7.2.1	Service state diagram .....	60
7.2.2	Service primitives .....	60
7.2.2.1	MNSS_BEGIN_REQ .....	60
7.2.2.2	MNSS_BEGIN_IND .....	61
7.2.2.3	MNSS_FACILITY_REQ .....	61
7.2.2.4	MNSS_FACILITY_IND .....	61
7.2.2.5	MNSS_END_REQ .....	61
7.2.2.6	MNSS_END_IND .....	61
7.3	Short Message Services Support .....	61
7.4	Services provided to SMDCP and SMS entities by GPRS Logical Link Control services .....	61
7.4.1	Service state diagram for QoS1-SAP, QoS2-SAP, QoS3-SAP and QoS4-SAP .....	61
7.4.2	Service primitives for QoS1-SAP, QoS2-SAP, QoS3-SAP and QoS4-SAP .....	62
7.4.2.1	LL-ESTABLISH-REQ .....	62
7.4.2.2	LL-ESTABLISH-CNF .....	62
7.4.2.3	LL-ESTABLISH-IND .....	62
7.4.2.4	LL-ESTABLISH-RSP .....	62
7.4.2.5	LL-RELEASE-REQ .....	62
7.4.2.6	LL-RELEASE-CNF .....	62
7.4.2.7	LL-RELEASE-IND .....	62
7.4.2.8	LL-XID-REQ .....	62
7.4.2.9	LL-XID-IND .....	63
7.4.2.10	LL-XID-RSP .....	63
7.4.2.11	LL-XID-CNF .....	63
7.4.2.12	LL-DATA-REQ .....	63
7.4.2.13	LL-DATASENT-IND .....	63
7.4.2.14	LL-DATA-CNF .....	63
7.4.2.15	LL-DATA-IND .....	63
7.4.2.16	LL-UNITDATA-REQ .....	63
7.4.2.17	LL-UNITDATA-IND .....	63
7.4.2.18	LL-STATUS-IND .....	63
7.5	Session Management Services for GPRS and MBMS .....	63
7.5.1	Session Management Services for SMREG-SAP .....	64
7.5.1.1	SMREG-PDP-ACTIVATE-REQ .....	64
7.5.1.2	SMREG-PDP-ACTIVATE-REJ .....	64
7.5.1.3	SMREG-PDP-DEACTIVATE-REQ .....	64
7.5.1.4	SMREG-PDP-DEACTIVATE-CNF .....	64
7.5.1.5	SMREG-PDP-MODIFY-REQ .....	64
7.5.1.6	SMREG-PDP-MODIFY-CNF .....	64
7.5.1.7	SMREG-PDP-MODIFY-REJ .....	65
7.5.1.8	SMREG-MBMS-ACTIVATE-REQ .....	65
7.5.1.9	SMREG-MBMS-ACTIVATE-REJ .....	65
7.5.2	Session Management Services for SNSM-SAP .....	65
7.6	Location services at the Network side .....	65
7.6.1	Service state diagram .....	65
7.6.2	Service primitives .....	66

7.6.2.1	MNLCS_BEGIN_REQ.....	66
7.6.2.2	MNLCS_BEGIN_IND.....	67
7.6.2.3	MNLCS_FACILITY_REQ.....	67
7.6.2.4	MNLCS_FACILITY_IND.....	67
7.6.2.5	MNLCS_END_REQ.....	67
7.6.2.6	MNLCS_END_IND.....	67
8	Services assumed from signalling layers 1 and 2.....	67
8.1	Priority.....	67
8.2	Unacknowledged information transfer.....	67
8.3	Acknowledged information transfer.....	67
8.4	Random access.....	68
8.5	Channel management and measurements.....	68
9	Interlayer service interfaces on the MS side.....	68
9.1	Services provided by the Radio Resource Management entity.....	68
9.1.1	Service state diagram.....	69
9.1.2	Service primitives.....	70
9.1.2.1	RR_EST_REQ.....	70
9.1.2.2	RR_EST_IND.....	70
9.1.2.3	RR_EST_CNF.....	70
9.1.2.4	RR_REL_IND.....	70
9.1.2.5	RR_SYNC_IND.....	71
9.1.2.5a	Void.....	71
9.1.2.5b	Void.....	71
9.1.2.6	RR_DATA_REQ.....	71
9.1.2.7	RR_DATA_IND.....	71
9.1.2.7a	Void.....	71
9.1.2.8	RR_UNIT_DATA_IND.....	71
9.1.2.9	RR_ABORT_REQ.....	71
9.1.2.10	RR_ABORT_IND.....	71
9.1.3	Services provided by the Radio Resource Management entity for CTS.....	72
9.1.3.1	CTS_RR_ALIVE_CHECK_IND.....	72
9.2	Services provided by the Mobility Management entity.....	72
9.2.1	Service state diagram.....	73
9.2.2	Service primitives.....	74
9.2.2.1	MMXX_EST_REQ.....	74
9.2.2.2	MMXX_EST_IND.....	74
9.2.2.3	MMXX_EST_CNF.....	74
9.2.2.4	MMXX_REL_REQ.....	74
9.2.2.5	MMXX_REL_IND.....	74
9.2.2.6	MMXX_DATA_REQ.....	74
9.2.2.7	MMXX_DATA_IND.....	75
9.2.2.8	MMXX_UNIT_DATA_REQ.....	75
9.2.2.9	MMXX_UNIT_DATA_IND.....	75
9.2.2.10	MMCC_SYNC_IND.....	75
9.2.2.11	MMXX_REEST_REQ.....	75
9.2.2.12	MMXX_REEST_CNF.....	75
9.2.2.13	MMXX_ERR_IND.....	75
9.2.2.14	MMXX_PROMPT_IND.....	75
9.2.2.15	MMXX_PROMPT_REJ.....	75
9.3	Services provided by radio resource management entity for GPRS services.....	76
9.3.1	Service primitives for GRR-SAP (GSM only).....	76
9.3.2	Service primitives for GMMRR-SAP (GSM only).....	76
9.3.2.1	GMMRR-ASSIGN-REQ.....	76
9.3.2.2	GMMRR-PAGE-IND.....	76
9.3.3	Service primitives for RABMAS-SAP (UMTS only).....	76
9.3.3.1	RABMAS-RAB-ESTABLISH-IND.....	76
9.3.3.2	RABMAS-RAB-ESTABLISH-RES.....	76
9.3.3.3	RABMAS-RAB-ESTABLISH-REJ.....	77
9.3.3.4	RABMAS-RAB-RELEASE-IND.....	77
9.3.3.5	RABMAS-RAB-RELEASE-RES.....	77



9.3.3.6	RBMAS-STATUS-IND .....	77
9.3.4	Service primitives for GMMAS-SAP (UMTS only) .....	77
9.3.4.1	GMMAS-SECURITY-IND .....	77
9.3.4.2	GMMAS-SECURITY-RES .....	77
9.3.4.3	GMMAS-ESTABLISH-REQ .....	77
9.3.4.4	GMMAS-ESTABLISH-CNF .....	77
9.3.4.5	GMMAS-ESTABLISH-REJ .....	78
9.3.4.6	GMMAS- RELEASE-REQ .....	78
9.3.4.7	GMMAS- RELEASE-IND .....	78
9.3.4.8	GMMAS- DATA-REQ .....	78
9.3.4.9	GMMAS- DATA-IND .....	78
9.3.4.10	GMMAS-PAGE-IND .....	78
9.3.4.11	GMMAS-STATUS-IND .....	78
9.4	Services provided by the LLC entity for GPRS services (GSM only) .....	78
9.4.1	Service primitives for LLGMM-SAP .....	78
9.4.1.1	LLGMM-ASSIGN-REQ .....	78
9.4.1.2	LLGMM-TRIGGER-REQ .....	78
9.4.1.3	Void .....	79
9.4.1.4	LLGMM-SUSPEND-REQ .....	79
9.4.1.5	Void .....	79
9.4.1.6	Void .....	79
9.4.1.7	LLGMM-WINDOW-CNF .....	79
9.4.1.8	LL-UNITDATA-REQ .....	79
9.4.1.9	LL-UNITDATA-IND .....	79
9.4.1.10	LLGMM-STATUS-IND .....	79
9.4.2	Service primitives for LLSMS-SAP .....	79
9.4.2.1	LL-UNITDATA-REQ .....	79
9.4.2.2	LL-UNITDATA-IND .....	79
9.5	Services provided by the GMM for GPRS services .....	79
9.5.1	Service primitives for GMMSM-SAP .....	79
9.5.1.1	GMMSM-ESTABLISH-REQ .....	80
9.5.1.2	GMMSM-ESTABLISH-CNF .....	80
9.5.1.3	GMMSM-ESTABLISH-REJ .....	80
9.5.1.4	GMMSM-RELEASE-IND .....	80
9.5.1.5	GMMSM-UNITDATA-REQ .....	80
9.5.1.6	GMMSM-UNITDATA-IND .....	80
9.5.2	Void .....	80
9.5.3	Service primitives for GMMSMS-SAP .....	80
9.5.3.1	GMMSMS-REG-STATE-REQ .....	81
9.5.3.2	GMMSM- REG-STATE -RSP .....	81
9.5.4	Service primitives for PMMSMS-SAP .....	81
9.5.4.1	PMMSMS_EST_REQ .....	81
9.5.4.2	PMMSMS_EST_CNF .....	81
9.5.4.3	PMMSMS_ERROR_IND .....	81
9.5.4.4	PMMSMS_UNITDATA_REQ .....	81
9.5.4.5	PMMSMS_UNITDATA_IND .....	81
9.5.5	Service primitives for GMMRABM-SAP (UMTS only) .....	81
9.5.5.1	GMMRABM-REESTABLISH-REQ .....	82
9.5.5.2	GMMRABM-REESTABLISH-RSP .....	82
9.5.5.3	GMMRABM-REESTABLISH-REJ .....	82
9.5.6	Service primitives for GMMSS-SAP .....	82
9.5.6.1	GMMSS-ESTABLISH-REQ .....	82
9.5.6.2	GMMSS-ESTABLISH-CNF .....	82
9.5.6.3	GMMSS-ESTABLISH-REJ .....	82
9.5.6.4	GMMSS-RELEASE-IND .....	82
9.5.6.5	GMMSS-UNITDATA-REQ .....	82
9.5.6.6	GMMSS-UNITDATA-IND .....	83
9.5.7	Service primitives for GMMSS2-SAP .....	83
9.5.7.1	GMMSS2-REG-STATE-REQ .....	83
9.5.7.2	GMM SS2- REG-STATE -RSP .....	83
10	Interlayer service interfaces on the Network side .....	83

10.1	Services provided by the Radio Resource Management entity .....	83
10.1.1	Service state diagram .....	84
10.1.2	Service primitives .....	85
10.1.2.1	RR_EST_REQ .....	85
10.1.2.2	RR_EST_IND .....	85
10.1.2.3	RR_EST_CNF .....	85
10.1.2.4	RR_REL_REQ .....	85
10.1.2.5	RR_REL_IND .....	85
10.1.2.6	RR_SYNC_REQ .....	85
10.1.2.7	RR_SYNC_CNF .....	85
10.1.2.8	RR_DATA_REQ .....	85
10.1.2.9	RR_DATA_IND .....	86
10.1.2.10	RR_UNIT_DATA_REQ .....	86
10.1.2.11	RR_UNIT_DATA_IND .....	86
10.1.2.12	RR_ABORT_REQ .....	86
10.1.2.13	RR_ABORT_IND .....	86
10.2	Services provided by the Mobility Management entity .....	86
10.2.1	Service state diagram .....	86
10.2.2	Service primitives .....	87
10.2.2.1	MMXX_EST_REQ .....	87
10.2.2.2	MMXX_EST_IND .....	88
10.2.2.3	MMXX_EST_CNF .....	88
10.2.2.4	MMXX_REL_REQ .....	88
10.2.2.5	MMXX_REL_IND .....	88
10.2.2.6	MMXX_DATA_REQ .....	88
10.2.2.7	MMXX_DATA_IND .....	88
10.2.2.8	MMXX_UNIT_DATA_REQ .....	88
10.2.2.9	MMXX_UNIT_DATA_IND .....	88
10.2.2.10	MMCC_SYNC_REQ .....	88
10.2.2.11	MMCC_SYNC_CNF .....	88
10.3	Services provided by radio resource management entity for GPRS services .....	88
10.3.1	Service primitives for GRR-SAP .....	88
10.3.2	Service primitives for GMMRR-SAP .....	89
10.3.2.1	GMMRR-PAGE-REQ .....	89
10.4	Services provided by the LLC entity for GPRS services .....	89
10.4.1	Service primitives for LLGMM-SAP .....	89
10.4.1.1	LLGMM-ASSIGN-REQ .....	89
10.4.1.2	Void .....	89
10.4.1.3	LLGMM-SUSPEND-REQ .....	89
10.4.1.4	LLGMM-RESUME-REQ .....	89
10.4.1.5	Void .....	89
10.4.1.6	Void .....	89
10.4.1.7	LLGMM-PAGE-IND .....	89
10.4.1.8	LLGMM-PAGE-RESP-IND .....	90
10.4.1.9	LL-UNITDATA-REQ .....	90
10.4.1.10	LL-UNITDATA-IND .....	90
10.4.1.11	LLGMM-STATUS-IND .....	90
10.4.2	Service primitives for LLSMS-SAP .....	90
10.4.2.1	LL-UNITDATA-REQ .....	90
10.4.2.2	LL-UNITDATA-IND .....	90
10.5	Services provided by the GMM for GPRS services .....	90
10.5.1	Service primitives for GMMSM-SAP .....	90
10.5.1.1	GMMSM-RELEASE-IND .....	90
10.5.1.2	GMMSM-UNITDATA-REQ .....	91
10.5.1.3	GMMSM-UNITDATA-IND .....	91
10.5.2	Service primitives for PMMSMS-SAP .....	91
10.5.2.1	PMMSMS_REL_REQ .....	91
10.5.2.2	PMMSMS_ERROR_IND .....	91
10.5.2.3	PMMSMS_UNITDATA_REQ .....	91
10.5.2.4	PMMSMS_UNITDATA_IND .....	91
10.5.3	Service primitives for GMMSS-SAP .....	91
10.5.3.1	GMMSS-RELEASE-IND .....	91

10.5.3.2	GMMSS-UNITDATA-REQ .....	91
10.5.3.3	GMMSS-UNITDATA-IND .....	92
10.6	Services provided by the Radio Resource Management entity for CTS on the fixed part .....	92
10.6.1	Service primitives .....	92
10.6.1.1	RR_CTS_ALIVE_CHECK_REQ .....	92
10.6.1.2	RR_CTS_ALIVE_CHECK_IND .....	92
10.6.1.3	RR_CTS_HUNTING_REQ .....	92
10.6.1.4	RR_CTS_GROUP_ALERTING_REQ .....	92
11	L3 Messages .....	93
11.1	General .....	93
11.1.1	Messages .....	93
11.1.2	Octets .....	94
11.1.3	Integer .....	94
11.1.3.1	Binary .....	94
11.1.3.2	2-complement binary .....	94
11.1.4	Spare parts .....	94
11.2	Standard L3 messages .....	95
11.2.1	Components of a standard L3 message .....	95
11.2.1.1	Format of standard information elements .....	95
11.2.1.1.1	Information element type and value part .....	95
11.2.1.1.2	Length indicator .....	95
11.2.1.1.3	Information element identifier .....	96
11.2.1.1.4	Categories of IEs; order of occurrence of IEI, LI, and value part .....	96
11.2.2	Description methods for IE structure .....	98
11.2.2.1	Tables .....	98
11.2.2.1.1	Compact notation .....	99
11.2.3	Imperative part of a standard L3 message .....	99
11.2.3.1	Standard L3 message header .....	99
11.2.3.1.1	Protocol discriminator .....	100
11.2.3.1.2	Skip indicator .....	100
11.2.3.1.3	Transaction identifier .....	100
11.2.3.1.4	Sub-protocol discriminator .....	102
11.2.3.1.5	EPS bearer identity .....	102
11.2.3.1.6	Security header type .....	103
11.2.3.1a	Procedure transaction identity .....	103
11.2.3.2	Message type octet .....	103
11.2.3.2.1	Message type octet (when accessing Release 98 and older networks only) .....	103
11.2.3.2.2	Message type octet (when accessing Release 99 and newer networks) .....	104
11.2.3.2.3	Sequenced message transfer operation .....	106
11.2.3.2.3.1	Variables and sequence numbers .....	106
11.2.3.2.3.1.1	Send state variable V(SD) .....	106
11.2.3.2.3.1.2	Send sequence number N(SD) .....	107
11.2.3.2.3.2	Procedures for the initiation, transfer execution and termination of the sequenced message transfer operation .....	107
11.2.3.2.3.2.1	Initiation .....	107
11.2.3.2.3.2.2	Transfer Execution .....	107
11.2.3.2.3.2.3	Termination .....	107
11.2.3.3	Standard information elements of the imperative part .....	107
11.2.4	Non-imperative part of a standard L3 message .....	108
11.2.5	Presence requirements of information elements .....	108
11.2.6	Description of standard L3 messages .....	109
11.3	Non standard L3 messages .....	109
11.3.1	Case A: BCCH and AGCH/PCH messages .....	110
11.3.1.1	L2 Pseudo Length octet .....	110
11.3.1.2	Rest Octets .....	110
11.3.1.3	Description of a modified standard L3 message .....	110
11.3.2	Case B: SACCH / SDCCH / FACCH messages sent in unacknowledged mode .....	110
11.3.2.1	The first octet .....	110
11.3.2.2	The rest of the message .....	111
11.3.3	Design guidelines for non standard parts .....	111
11.3.3.1	General .....	111

11.4	Handling of superfluous information .....	111
11.4.1	Information elements that are unnecessary in a message.....	111
11.4.2	Other syntactic errors.....	112
<b>Annex A (informative):</b>	<b>MN-Services arrow diagram.....</b>	<b>113</b>
<b>Annex B (informative):</b>	<b>Description of CSN.1 .....</b>	<b>121</b>
B.1	The Basic Rules.....	121
B.1.1	Core Rules .....	121
B.1.1.1	Rule B1: Bits.....	121
B.1.1.2	Rule B2: Null String .....	121
B.1.1.3	Rule B3: Concatenation .....	122
B.1.1.4	Rule B4: Choice.....	122
B.1.1.5	Rule B5: Naming .....	123
B.1.1.6	Rule B6: Definition.....	123
B.1.2	Spare parts .....	123
B.1.2.1	Rule B7: Spare bits .....	123
B.1.2.2	Rule B8: Padding bits .....	124
B.1.3	Predefined sets.....	124
B.1.4	Labelling Parts.....	125
B.1.4.1	Rule A1: Labels .....	125
B.1.5	Goodies .....	125
B.1.5.1	Rule G1: Comments.....	125
B.2	Advanced rules .....	125
B.2.1	Rule A2: Exponent notation .....	125
<b>Annex C (informative):</b>	<b>GPRS-Services sequence diagram.....</b>	<b>127</b>
<b>Annex D (informative):</b>	<b>Change history .....</b>	<b>148</b>
History .....		150

---

# Foreword

This Technical Specification (TS) has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The present document defines the architecture of layer 3 and its sublayers on the GSM Um interface, i.e. the interface between Mobile Station and network within the 3GPP system.

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 defines the principal architecture of layer 3 and its sublayers on the GSM Um interface, i.e. the interface between Mobile Station (MS) and network; for the CM sublayer, the description is restricted to paradigmatic examples, call control, supplementary services, and short message services for non-GPRS services. It also defines the basic message format and error handling applied by the layer 3 protocols.

For CTS services, the present document defines the principal architecture of layer 3 on the GSM Um\* interface, i.e. the interface between a CTS capable Mobile Station (CTS-MS) and a Fixed Part (FP).

The corresponding protocols are defined in other Technical Specifications, see subclause 4.3.4.

For non-GPRS services the communication between sublayers and adjacent layers and the services provided by the sublayers are distributed by use of abstract service primitives. But only externally observable behaviour resulting from the description is normatively prescribed by the present document.

For GPRS services in addition the local information transfer and stimuli sent between sublayers is informatively included within Annex C of in the present document.

This document also defines the principal architecture of the EPS NAS layer 3 protocol and its sublayers, including the message format applied by layer 3.

In the present document MS is also used as a synonym for UE.

Descriptions in clauses 3 to 10 are not maintained actively.

---

# 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] GSM 01.02(R97): "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".
- [1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.101: "General UMTS Architecture".
- [3] 3GPP TS 44.001: "Mobile Station - Base Station System (MS - BSS) interface; General aspects and principles".
- [3a] 3GPP TS 23.060: "General Packet Radio Service (GPRS) description; Stage 2".
- [3b] GSM 03.56(R98): "Digital cellular telecommunications system (Phase 2+); GSM Cordless Telephony System (CTS), Phase 1; CTS Architecture Description; Stage 2".
- [3c] 3GPP TS 23.271: "Functional stage 2 description of location services".
- [4] 3GPP TS 44.005: "Data Link (DL) layer; General aspects".
- [5] 3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".