ETSI TS 151 010-5 V8.2.0 (2009-07)

Technical Specification

Digital cellular telecommunications system (Phase 2+);
Mobile Station (MS) conformance specification;
Part 5: Inter-Radio-Access-Technology (RAT)
(GERAN / UTRAN) interaction Abstract Test Suite (ATS)
(3GPP TS 51.010-5 version 8.2.0 Release 8)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

Reference
RTS/TSGG-0351010-5v820

Keywords
GSM

ETSI

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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.

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The present document describes the technical characteristics and methods of test for Mobile Stations (MSs), operating in the different frequency bands within the digital cellular telecommunications system.

The present document corresponds to technical specification 3GPP TS 51.010-5, covering the Digital cellular telecommunications system (3GPP Release 99, Release 4 , Release 5, Release 6, Release 7 and Release 8) version 8.x.x.

The present document, contains Tree and Tabular Combined Notation (TTCN) for Mobile Station (MS) Inter-RAT (GERAN to UTRAN) service conformity specifications, for which Mobile Stations, within the digital cellular telecommunications system (3GPP Release 99, Release 4 , Release 5, Release 6, Release 7 and Release 8), are tested for compliance.

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.

Introduction

The present document describes the technical characteristics and methods of test for Mobile Stations (MSs) within the digital cellular telecommunications system.

The graphical form ATS

The electronic form of the graphical representation (TTCN.GR format) corresponding to the ATS for Layer 3, is contained in the Adobe Portable Document Format™ file IR_XXX.pdf where XXX corresponds to the current version.

The machine processable ATS

The electronic form of the machine processable file (TTCN.MP format) corresponding to the ATS for Layer 3, is contained in the file IR_XXX.mp where XXX corresponds to the current version.

The present document is part 5 of a multi-part 3GPP TS covering the digital cellular telecommunications system; Mobile Station (MS) conformance specification, as identified below:

Part 1: Conformance specification
Reference: 3GPP TS 51.010-1.

Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification.
Reference: 3GPP TS 51.010-2.

Part 3: Layer 3 (L3) Abstract Test Suite (ATS).
Reference: 3GPP TS 51.010-3.

Part 4: SIM Application Toolkit conformance specification
Reference: 3GPP TS 11.10-4.

**Part 5: Inter-RAT (GERAN to UTRAN) Abstract Test Suite (ATS)
Reference: 3GPP TS 51.010-5.**

NOTE: At the present time, part 4 is 3GPP TS 11.10.

1 Scope

The present document specifies the Abstract Test Suites (ATS) and partial IXIT proforma for the Network Layer (Layer 3) at the mobile radio interface of the GSM/3GPP mobile stations (MS) conforming to the TSs for Layer 3, for the digital cellular telecommunications systems.

The present document is valid for MS implemented according to R99, 3GPP Release 4, Release 5, Release 6, Release 7 or Release 8.

The ISO standards for the methodology of conformance testing and the TTCN language are used as the basis for the test specifications.

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 TS 51.010-1: "Mobile Station (MS) conformance specification; Part 1: Conformance Specification".

[2]   3GPP TS 51.010-2: "Mobile Station (MS) conformance specification; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3]   ETSI TR 101 666 (V1.0.0): "Information technology; Open Systems Interconnection Conformance testing methodology and framework; The Tree and Tabular Combined Notation (TTCN) (Ed. 2++)".

[4]   3GPP TS 34.123-3: "User Equipment (UE) conformance specification; Part 3: Abstract Test Suites (ATSs)".

[5]   3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".

[6]   3GPP TS 04.18: "Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".

[7]   3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification"

[8]   3GPP TS 34.108: "Common test environments for User Equipment (UE) conformance testing".

[9]   ISO/IEC 9646 (all parts): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework".

[10]   ISO/IEC 8824 (all parts): "Information technology - Abstract Syntax Notation One (ASN.1)".

[11]   ISO/IEC 8825 (all parts): "Information technology - ASN.1 encoding rules".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 34.123-3 [4] apply.

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TS 51.010-1 [1], 3GPP TS 24.008 [5], 3GPP TS 04.18 [6], 3GPP TS 25.331[7] and TR 101 666 [3] apply.

4   ATS Structure

The modular TTCN approach is used for the development of the 3GPP ATS specification work. Four modules, BasicM, RRC_M, M_RAT_HO_GERAN_M and L3M are installed. Please refer to 3GPP TS 34.123-3 [4] for details of the modular structure.

5   Abstract test method and test configurations

Please refer to 3GPP TS 34.123-3 [4].

6   Specific Test Suite Operations for InterRAT GERAN to UTRAN Handover testing

Table 1: TSO definitions for InterRAT GERAN to UTRAN testing

TSO Name	Description
o_GSM_ToUTRANHO_PER_Encoding	**Type of the result:** OCTETSTRING **Parameters:** p_Msg : HandoverToUTRANCommand p_Len : O1 **Description:** It returns the aligned PER encoding of the input downlink message p_Msg (with "Encoder added (1-7) bits padding") of p_Len octets.
o_P_CheckClassmark3	**Type of the result:** BOOLEAN **Parameters:** p_FromUE : MSCLSMK3; p_FDD, p_TDD, p_P_GSM_900_BAND, p_E_GSM_900_BAND: BOOLEAN p_R_GSM_900_BAND, p_DCS_1800_BAND, p_PCS_1900_BAND: BOOLEAN p_GSM_450_BAND, p_GSM_480_BAND, p_GSM_700_BAND: BOOLEAN p_GSM_850_BAND, p_TypeGSMClass2, p_TypeGSMClass3 : BOOLEAN p_TypeGSMClass4, p_TypeGSMClass5, p_TypeDCSClass1:BOOLEAN p_TypeDCSClass2, p_TypeDCSClass3, p_TypePCSClass1: BOOLEAN p_TypePCSClass2, p_TypePCSClass3, p_TypeGSM850Class2: BOOLEAN p_TypeGSM850Class3, p_TypeGSM850Class4, p_TypeGSM850Class5, BOOLEAN p_DTM_Multislotclass5, p_DTM_Multislotclass9, p_DTM_SingleSlotAllocation : BOOLEAN p_EOTD_Assist, p_A_GPS_Assist, p_A_GPS_Based, p_Conv_GPS : BOOLEAN p_EOTD_Based, p_GERANFeatPackage1, p_GERANFeatPackage2: BOOLEAN p_GERANIuMode, p_DTMEnhancCap, p_TAOffset : BOOLEAN p_MultiSlotClass, p_EGPRS_MultiSlotClass : B5; p_SMS_Value, p_SM_Value : B4 p_GSM400_RadioCapability, p_T400_RadioCapability, p_710_RadioCapability, p_T810_RadioCapability, p_T900_RadioCapability : B4

p_RGSM_RadioCapability, p_DTMGPRSHighMultiSlotClass : B3
p_DTMEGPRSHighMultiSlotClass, p_MultislotCapDlDualCarrier : B3
p_DTM_EGPRS_MultiSlotSubClass, p_EDGEPwrCap1, p_EDGEPwrCap2 : B2
p_ExtDTM_MultiSlotClass, p_ExtDTM_EGPRS_MultiSlotClass, p_HighMultiSlotCap : B2
p_GMSKPowerProfile, p_8PSKPowerProfile, p_TGSM400Support : B2
p_DLAdvRxPerformance : B2
p_MS_ClsmkA5_4, p_MS_ClsmkA5_5, p_MS_ClsmkA5_6, p_MS_ClsmkA5_7 : B1
p_CDMA2000, p_ExtMeasCap, p_ModulationCapability, p_UCS2Treatment : B1
p_RptACCHCap, p_CipherModeSetDTM, p_AddPositionCap, p_EUTRA_FDD,
p_EUTRA_TDD : B1
Description
This is used when UE sends the MSCLSMK3 PDU in CLASSMARK CHANGE

To check each bit of the received octetstring from the UE against the CSN.1 format
constraint.
Please Note: Due to the shared radio frequency channel numbers between DCS 1800 and
PCS 1900, even if both p_DCS_1800_BAND and p_PCS_1900_BAND are set to TRUE,
the UE can only ever indicate support for one of these bands.
The format of the Classmark3 IE is as follows:

```
<Classmark 3 Value part> ::=
        < spare bit >
        {         < Multiband supported : { 000 } >
                        < A5 bits >
        |       < Multiband supported : { 101 | 110 } >
                        < A5 bits >
                        < Associated Radio Capability 2 : bit(4) >
                        < Associated Radio Capability 1 : bit(4) >
        |       < Multiband supported : { 001 | 010 | 100 } >
                        < A5 bits >
                        < spare bit >(4)
                        < Associated Radio Capability 1 : bit(4) > }
        { 0 | 1 < R Support > }
        { 0 | 1 < HSCSD Multi Slot Capability > }
        < UCS2 treatment: bit >
        < Extended Measurement Capability : bit >
        { 0 | 1 < MS measurement capability > }
        { 0 | 1 < MS Positioning Method Capability > }
        { 0 | 1 < ECSD Multi Slot Capability > }
        { 0 | 1 < 8-PSK Struct > }
        { 0 | 1 < GSM 400 Bands Supported : { 01 | 10 | 11 } >
                        < GSM 400 Associated Radio Capability: bit(4) > }

        { 0 | 1 <GSM 850 Associated Radio Capability : bit(4) > }
        { 0 | 1 <GSM 1900 Associated Radio Capability : bit(4) > }
        < UMTS FDD Radio Access Technology Capability : bit >
        < UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit >
        < CDMA 2000 Radio Access Technology Capability : bit >

        { 0 | 1         < DTM GPRS Multi Slot Class : bit(2) >
                        < Single Slot DTM : bit >
                        {0 | 1< DTM EGPRS Multi Slot Class : bit(2) > } }
        { 0 | 1 < Single Band Support > }                          -- Release 4 starts
here:
        { 0 | 1 <GSM 750 Associated Radio Capability : bit(4)>}

        < UMTS 1.28 Mcps TDD Radio Access Technology Capability : bit >
        < GERAN Feature Package 1 : bit >

        { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2) >
                        < Extended DTM EGPRS Multi Slot Class : bit(2) > }

        { 0 | 1 < High Multislot Capability : bit(2) > }                    ---Release
5 starts here.

        { 0 | 1 < GERAN Iu Mode Capabilities > }    -- '1' also means support of GERAN
Iu mode
        < GERAN Feature Package 2 : bit >
```

	< GMSK Multislot Power Profile : bit (2) >
	       < 8-PSK Multislot Power Profile : bit (2) >
	
	       { 0 | 1 < T-GSM 400 Bands Supported : { 01 | 10 | 11 } > -- Release 6 starts here.
	                      < T-GSM 400 Associated Radio Capability: bit(4) > }
	
	       { 0 | 1 < T-GSM 900 Associated Radio Capability: bit(4) > }
	       < Downlink Advanced Receiver Performance : bit (2)>
	
	       < DTM Enhancements Capability : bit >
	
	       { 0 | 1 < DTM GPRS High Multi Slot Class : bit(3) >
	                     < Offset required : bit>
	                     { 0 | 1 < DTM EGPRS High Multi Slot Class : bit(3) > } }
	
	       < Repeated ACCH Capability: bit >
	       { 0 | 1 <GSM 710 Associated Radio Capability : bit(4)>} -- Release 7 starts here.
	       { 0 | 1 <T-GSM 810 Associated Radio Capability : bit(4)>}
	       < Ciphering Mode Setting Capability : bit >
	
	       < Additional Positioning Capabilities : bit >
	
	       < E-UTRA FDD support : bit > *-- Release 8 starts here*
	       < E-UTRA TDD support : bit >
	           < spare bits > ;
	
	< A5 bits > ::=
	       < A5/7 : bit > < A5/6 : bit > < A5/5 : bit > < A5/4 : bit > ;
	
	<R Support>::=
	       < R-GSM band Associated Radio Capability : bit(3) > ;
	
	< HSCSD Multi Slot Capability > ::=
	       < HSCSD Multi Slot Class : bit(5) > ;
	
	< MS Measurement capability > ::=
	       < SMS_VALUE : bit (4) >
	       < SM_VALUE : bit (4) > ;
	
	< MS Positioning Method Capability > ::=
	       < MS Positioning Method : bit(5) > ;
	
	< ECSD Multi Slot Capability > ::=
	       < ECSD Multi Slot Class : bit(5) > ;
	
	< 8-PSK Struct> : :=
	       < Modulation Capability : bit >
	       { 0 | 1 < 8-PSK RF Power Capability 1: bit(2) > }
	       { 0 | 1 < 8-PSK RF Power Capability 2: bit(2) > }
	
	< Single Band Support > ::=
	       < GSM Band : bit (4) > ;
	
	< GERAN Iu Mode Capabilities > ::=
	       < Length : bit (4) > -- length in bits of Iu mode only capabilities and spare bits
	-- Additions in release 6
	       < FLO Iu Capability : bit >
	       <spare bits>** ; -- expands to the indicated length
	                    -- may be used for future enhancements

o_LengthofHO_Cmd	**Type of the result:** INTEGER **Parameters:** p_Msg : HandoverToUTRANCommand **Description:** it returns the no. of octets of the input downlink message p_Msg