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Contents

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.

The present document is an early draft of the USIM Conformance Test Specification. It is being elaborated during 2000 by 3GPP MCC task 162 under the guidance of 3GPP TSG-T WG3. It is expected to be complete by late November 2000 and then submitted for approval to 3GPP TSG-T #10 (6 - 8 December, Bangkok). For further information, please contact the T3 secretary (Michael.Sanders@etsi.fr) or the 31.122 rapporteur, (Simon.Knight@aspect-sw.com).

1 Scope

The present document provides the Conformance Test Specification for a Universal IC Card (UICC) defined in 3G TS 31.101 [1] with Universal Subscriber Identity Module (USIM) defined in 3G TS 31.102 [2].

2 Normative 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.

[1] 3G TS 31.101: "UICC-Terminal Interface; Physical and Logical Characteristics".

[2] 3G TS 31.102: "Characteristics of the USIM application".

[3] ISO/IEC 7816-1 (1998): "Identification cards - Integrated circuit(s) cards with contacts, Part 1: Physical characteristics".

[4] ISO/IEC 7816-2 (1999): "Identification cards - Integrated circuit(s) cards with contacts, Part 2: Dimensions and locations of the contacts".

[5] ISO/IEC 7816-3 (1997): "Identification cards - Integrated circuit(s) cards with contacts, Part 3: Electronic signals and transmission protocols".

[6] ISO/IEC 7816-4 (1995): "Identification cards - Integrated circuit(s) cards with contacts, Part 4: Interindustry commands for interchange".

[7] ISO/IEC 7816-5 (1994): "Identification cards - Integrated circuit(s) cards with contacts, Part 5: Numbering system and registration procedure for application identifiers".

[8] ISO/IEC 7816-6 (1996): "Identification cards - Integrated circuit(s) cards with contacts, Part 6: Interindustry data elements".

[9] ISO/IEC 7816-8 (1999): "Identification cards - Integrated circuit(s) cards with contacts, Part 8: Security related Interindustry commands".

[10] ISO/IEC FCD 7816-9 (1999): "Identification cards - Integrated circuit(s) cards with contacts, Part 9: Additional Interindustry commands and security attributes".

[11] ISO/IEC 7811-1 (1995): "Identification cards - Recording technique - Part 1: Embossing"

[12] ISO/IEC 7811-3 (1995): "Identification cards - Recording technique - Part 3: Location of embossed characters on ID-1 cards"

[13] GSM 11.11: "Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".

3 Definitions, symbols, abbreviations and coding

3.1 Definitions

For the purposes of the present document, the following definitions apply in addition to the terms defined in 3G TS 31.101 [1] and 3G TS 31.102 [2].

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

t_F	fall time
t_R	rise time
V_{IH}	Input Voltage (high)
V_{IL}	Input Voltage (low)
V_{OH}	Output Voltage (high)
V_{OL}	Output Voltage (low)

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CRn	Conformance Requirement 'n'
IUT	Implementation Under Test
ME	Mobile Equipment
TS	Test Specification
UICC	Universal Integrated Circuit Card
USIM	Universal Subscriber Identity Module

3.4 Coding Conventions

The following coding conventions apply to the present document:

All lengths are presented in bytes, unless otherwise stated. Each byte is represented by bit b8 to b1, where b8 is the most significant bit (MSB) and b1 is the least significant bit (LSB). In each representation, the leftmost bit is the MSB.

4 Test environment

This clause specifies several requirements which shall be met, and a number of rules which shall be adhered to before testing can proceed.

4.1 Test equipment

This subclause recommends a minimum specification for each of the items of test equipment referenced in the tests.

4.1.1 ME simulator

This item of equipment shall allow T=0 and T=1 protocol communications to take place on both ID-1 and plug-in UICCs. It shall be able to generate and send any command APDU and receive any of the possible responses. These commands may be generated manually, one at a time, or automatically from a predefined batch procedure containing one or more commands.

The ME simulator shall be able to support clock stop modes.

The ME simulator shall be able to accept an external clock signal to drive CLK (contact C3) of the UICC.

It shall be possible to access all the UICC contacts either directly or through test points.

4.1.2 Signal generation device

4.1.2.1 VCC

The voltage level for Vcc (contact C1) of the UICC shall be adjustable between -0,5 V and 6,0 V to an accuracy of 1% of the nominal Vcc voltage (e.g. 50 mV for a 5 V card).

The ME simulator shall be able to source current on the Vcc contact in the range –2 mA to 12 mA statically and to deliver charges of > 400 nAs without lowering the Vcc-voltage for more than 10% of Vcc nominal.

4.1.2.2 RST

The generated voltage level for RST (contact C2) of the UICC shall be adjustable between -0,5 V and 6,0 V to an accuracy of 50 mV.

The rise and fall times shall be adjustable from 0 µs to 500 µs with an accuracy of 5 µs. *(to check if the USIM works with the defined rise and fall times.)*

The beginning of the rising edge shall be programmable from 1 clk-cycle to 50,000 clk-cycles after enabling the clk-line.

4.1.2.3 CLK

This item of equipment shall be able to generate square wave signals for the clock on the UICC, any of which can be a single-shot or continuous signal, in the range 1 MHz to 5 MHz. The voltage levels for both high and low states shall be adjustable between -0,5 V and 6,0 V to an accuracy of 0,1 V. The duty cycle of the clock signal shall be adjustable between 40 % and 60 % to an accuracy of 1 %. It shall also provide control over the following parameters:

The voltage levels for both high and low states shall be adjustable between 0 V and 6 V to an accuracy of 1% of the nominal Vcc voltage. The duty cycle of the clock signal shall be adjustable between 40 % and 60 % to an accuracy of 1 % or 5 ns whichever is the worst.

It shall also provide control over the following parameters:

- rise and fall time to an accuracy of 1 % or 5 ns whichever is the worst. *(5 ns = 2,5 % accuracy for f_{max} = 5 MHz).*

4.1.2.4 IO

The equipment shall be able to generate IO-Signals according to 3G TS 31.101 [1]

The voltage levels for high and low states shall be adjustable between -0,5 V and 6,0 V to an accuracy of 1 % of the nominal Vcc voltage. The IO line in transmission mode (high bit) shall be programmable between state A (active driven output) and state Z (IO-voltage-driver inactive, current source I-IO-high active).

It shall also provide control over the rise and fall time of 100 ns to 1 000 ns with an accuracy of 50 ns.

The ME simulator shall be able to source and sink currents on the IO contact in the range –20 µA to +20 µA in state high and 0 mA to –1 mA in state low (receiving mode) and shall be able to switch in transmission mode (outputting a high bit) between voltage and current driving mode.

The timing of the bitstream (jitter, guardtime, etu-value, etc.) on the IO-Line shall be programmable with an accuracy of <=0,01 etu or 2 clk-cycles whichever is the worst.

4.1.3 Precision force-inducing contacting device

This item of equipment shall be able to apply a prescribed and maintained level of force onto one or more contacts of the UICC. The range shall be between 0 and 0,5 N and accurate to 0,01 N.

4.1.4 Temperature controllable environment

This item of equipment shall be able to control the temperature of a chamber large enough to enclose the UICC and the card reader. The range of temperature control shall be between –25 °C and +85 °C to an accuracy of 0,5 °C.

4.1.5 Temperature measuring device

This item of equipment shall be able to measure the temperature of the UICC to within 0,5 °C. The range of this device shall allow measurement of temperatures between –25 °C and +85 °C.

4.1.6 Voltage measuring device

This item of equipment shall be able to measure static and transient voltages on any one of the contacts of the UICC. The measurable voltage range shall be between –2 V and +7 V to an accuracy of 1% of the nominal Vcc voltage (e.g. 30 mV for 3 V cards) with a timebase accuracy of 25 ns.

4.1.7 Precision measuring device

This item of equipment shall be able to measure both linear and radius of curvature dimensions to an accuracy of 0,01 mm.

4.1.8 Current measuring device

This item of equipment shall be able to supervise the current levels for any one of the contacts of the USIM.

The Simulator shall be able to detect an over - or underload with a time resolution of ≤ 100 ns.

Channel	Minimum	Maximum	Resolution
Vcc high	-2 mA	+12,5 mA	125 µA
Vcc low	-2 mA	+12,5 mA	125 µA
Vcc Burst	12 mA	+250 mA	2,5 mA
RST/CLK High state	-50 µA	+50 µA	1 µA
RST/CLK Low state	-250 µA	+250 µA	2,5 µA
IO high state	-50 µA	+50 µA	1 µA
IO low state	-1 500 µA	+1 500 µA	15 µA

4.1.9 Timing Measurements on contact IO

To verify the timing of the IO transmission from the UICC, the ME Simulator shall be able to measure the IO-Bit-Timing in CLK-Cycles with an accuracy of <=0,01 etu or 2 clk-cycles whichever is the worst.

4.2 IUT default conditions

Unless otherwise stated, the following is default:

- The voltage level for Vcc (contact C1) shall be set to 3,0 V.
- The voltage levels for CLK (contact C3) shall be set to 0 V and 3,0 V for low and high respectively.

- The clock frequency CLK (contact C3) shall be set to 5 MHz with duty cycle 50 %.
- The ME simulator generated low transmission voltage level for I/O (contact C7) shall be set to 0 V and the current sources for high transmission and reception shall be set to -20 μA and +20 μA respectively
- PIN on the UICC shall be enabled with three VERIFY PIN attempts and ten UNBLOCK PIN attempts remaining.
- Three VERIFY PIN2 attempts and ten UNBLOCK PIN2 attempts shall be remaining for PIN2.

4.3 Default data formatting

All numeric data enclosed in single quotes (' ') in this document are hexadecimal data.

Where 'X' is used in place of a hexadecimal digit, X ranges from '0' to 'F'. For example, the data '6X' ranges from '60' to '6F' inclusive.

Where data is expressed as a group of bytes, it shall be in the following format: 'XX XX XX… XX', indicating first byte, second byte, third byte etc. in that order.

4.4 Test definition and applicability

The following statements are applicable to the Test definition and applicability clause for all test purposes contained within the present document:

- Unless otherwise stated, tests apply to both plug-in and ID-1 UICC cards.
- Unless otherwise stated, tests apply to each protocol supported by the UICC.
- The tests are performed to a UICC as defined in 3G TS 31.101 [1] with a USIM application as defined in 3G TS 31.102 [2]. The tests to check the requirement of 3G TS 31.101 [1] use the files as defined in 3G TS 31.102 [2].
- Unless otherwise stated, the tests apply to a multi and single application capability UICCs with USIM application(s). In the case of a multi-application capability UICC, there shall have only one application.

4.5 Test procedure

The following statements are applicable to the Test Procedure clause for all test purposes contained within the present document:

- Unless otherwise stated, all steps within the test procedure shall be carried out in order.
- Where steps indicate that a ME simulator shall select a particular DF or EF using an unspecified number of SELECT commands, the ME simulator is to send the correct sequence of SELECT commands in order to select the required file ID from the current file ID (this may be achieved most easily by selecting from the MF down each time).
- Unless otherwise stated, the Le (P3) for all READ RECORD and UPDATE RECORD commands sent by the ME simulator is to be that of the record length of the EF currently selected. In the case where an EF is not currently selected, the length sent is to be 1 unless otherwise stated.
- Unless otherwise stated, the offset for all READ BINARY and UPDATE BINARY commands sent by the ME simulator is to be '00 00'.
- Unless otherwise stated, the length (Le) for all STATUS and GET RESPONSE commands sent by the ME simulator is to be such that all available data is read.
- Unless otherwise stated, the PIN and UNBLOCK PIN presented for VERIFY PIN, CHANGE PIN, DISABLE PIN, ENABLE PIN and UNBLOCK PIN commands sent by the ME simulator is to be correct.

- Unless otherwise stated, the "PIN No." (P2) for VERIFY PIN, CHANGE PIN, DISABLE PIN, ENABLE PIN and UNBLOCK PIN commands sent by the ME simulator is to be 1.

- Unless otherwise stated, a SELECT command sent to UICC to select DF_{USIM} is with the application's AID, indicating in the command parameter that the application shall be activated.

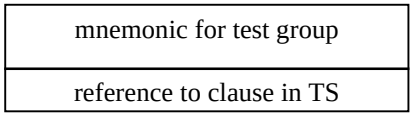
4.6 Test requirement

Where steps within a test procedure involve a ME simulator sending one or more commands to the UICC, these commands are required to be correctly executed, with the UICC responding with status conditions of '90 00', unless otherwise stated in the subclause for the test.

5 Test Group Hierarchy

This clause contains the Test Group Hierarchy diagrams which provide a structure for the test purposes and also a correlation between the base specification, ICS and the present document.

The information contained in each node for each of the diagrams is as follows:



As the Test Group Hierarchy for the UICC is large, it has been broken into sections to aid presentation.

5.1 Test groups under USIM

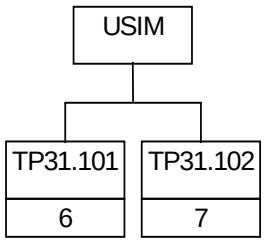


Figure 1: Top Level Test Group Hierarchy

The mnemonics chosen for this test group are as follows:

- TP31.101: Test Procedure - 3G TS 31.101[1]

- TP31.102: Test Procedure - 3G TS 31.102 [2]

The Test Groups "TP31.101" and "TP31.102", shown in figure 1, are broken down further, as shown in the following diagrams.

5.2 Test groups under TP31.101

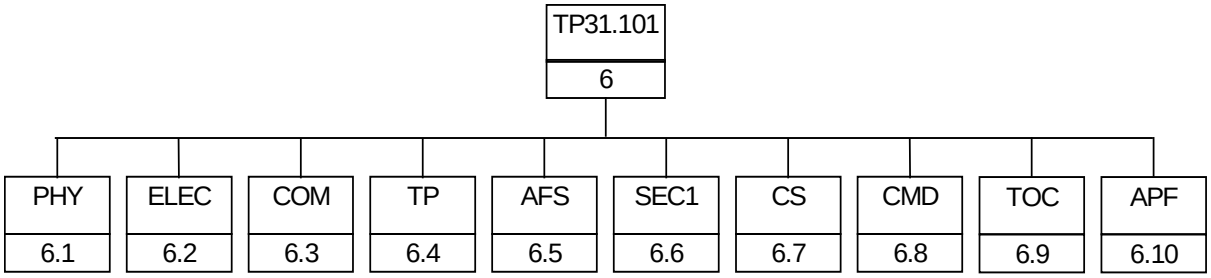


Figure 2: Breakdown of "TP31.101" Test Group

The mnemonics chosen for this test group are as follows:

- PHY: Physical characteristics - 3G TS 31.101 [1], clause 4
- ELEC: Electrical specifications of the UICC – Terminal interface - 3G TS 31.101 [1], clause 5
- COM: Initial communication establishment procedure - 3G TS 31.101 [1], clause 6
- TP: Transmission protocol - 3G TS 31.101 [1], clause 7
- AFS: Application and File structure - 3G TS 31.101 [1], clause 8
- SEC1: Security features - 3G TS 31.101 [1], clause 9
- CS: Structure of commands and responses - 3G TS 31.101 [1], clause 10
- CMD: Commands - 3G TS 31.101 [1], clause 11
- TOC: Transmission Oriented Commands - 3G TS 31.101 [1], clause 12
- APF: Application independent files - 3G TS 31.101 [1], clause 13

The Test Groups "PHY", "ELEC", "TP", "AFS", "SEC1", "CS", "CMD", "TOC" and "APF", shown in figure 2, are broken down further, as shown in the following diagrams.

5.3 Test groups under TP31.102

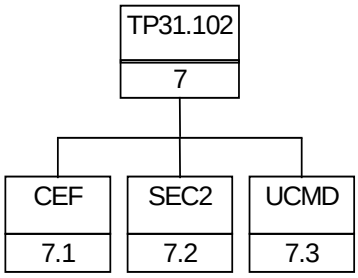


Figure 3: Breakdown of "TP31.102" Test Group

The mnemonics chosen for this test group are as follows:

- CEF: Contents of the Elementary Files- 3G TS 31.102 [2], clause 4
- SEC2: Security Features supported by USIM– Terminal interface - 3G TS 31.102 [2], clause 6
- UMCD: USIM commands- 3G TS 31.102 [2], clause 7

The Test Groups "CEF", "SEC2" and "COM", shown in figure 3, are broken down further, as shown in the following diagrams.

5.4 Test groups under PHY

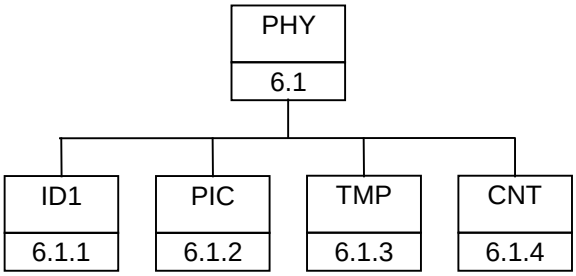


Figure 4: Breakdown of "PHY" Test Group

The mnemonics chosen for this test group are as follows:

- ID1: ID-1 UICC - 3G TS 31.101 [1], subclause 4.1
- PIC: Plug-in UICC - 3G TS 31.101 [1], subclause 4.2
- TMP: Temperature range for card operation - 3G TS 31.101 [1], subclause 4.3
- CNT: Contacts - 3G TS 31.101 [1], subclause 4.4

5.5 Test groups under ELEC

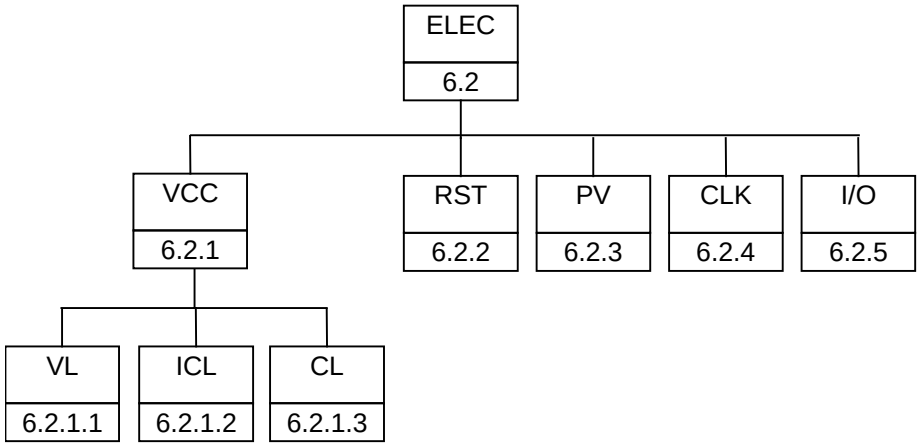


Figure 5: Breakdown of "ELEC" Test Group

The mnemonics chosen for this test group are as follows:

- VCC: Supply voltage Vcc (contact C1) - 3G TS 31.101 [1], subclause 5.1.1, 5.2.1 and 5.3.1
- VL: Voltage limits - 3G TS 31.101 [1], subclause 5.1.1, 5.2.1 and 5.3.1
- ICL: Idle current limits - 3G TS 31.101 [1], subclause 5.1.1, 5.2.1 and 5.3.1
- CL: Current limits in clock-stop-mode - 3G TS 31.101 [1], subclause 5.1.1, 5.2.1 and 5.3.1
- RST: Reset RST (contact C2) - 3G TS 31.101 [1], subclause 5.1.2, 5.2.2 and 5.3.2
- PV: Programming voltage VPP (contact C6) - 3G TS 31.101 [1], subclause 5.1.3, 5.2.3 and 5.3.3
- CLK: Clock CLK (contact C3) - 3G TS 31.101 [1], subclause 5.1.4, 5.2.4 and 5.3.4
- FDC: Frequency duty cycle - 3G TS 31.101 [1], subclause 5.1.4, 5.2.4 and 5.3.4
- VC: Voltage and current - 3G TS 31.101 [1], subclause 5.1.4, 5.2.4 and 5.3.4

- IO: I/O (contact C7) - 3G TS 31.101 [1], subclause 5.1.5, 5.2.5 and 5.3.5

5.6 Test groups under COM

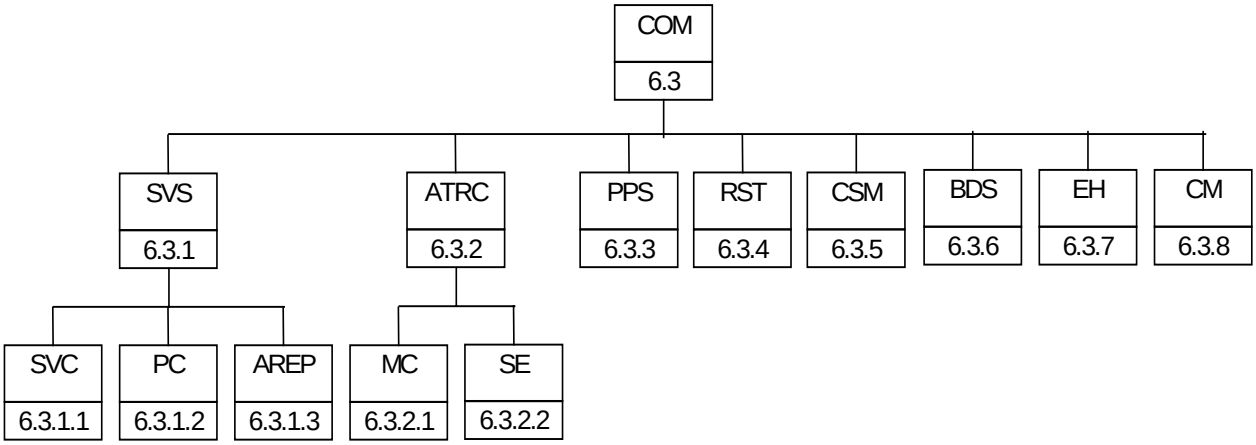


Figure 6: Breakdown of "COM" Test Group

The mnemonics chosen for this test group are as follows:

- SVS: Supply voltage switching - 3G TS 31.101 [1], subclause 6.2
- SVC: Supply voltage classes - 3G TS 31.101 [1], subclause 6.2.1
- PC: Power consumption of the UICC during ATR - 3G TS 31.101 [1], subclause 6.2.2
- AREP: Application Related Electrical Parameters - 3G TS 31.101 [1], subclause 6.2.3
- ATRC: ATR content - 3G TS 31.101 [1], subclause 6.3
- MC: Major capabilities - 3G TS 31.101 [1], subclause 6.3
- SE: Speed enhancement - 3G TS 31.101 [1], subclause 6.3.2
- PPS: PPS procedure - 3G TS 31.101 [1], subclause 6.4
- RST: Reset - 3G TS 31.101 [1], subclause 6.5 and 6.6
- CSM: Clock stop mode - 3G TS 31.101 [1], subclause 6.7
- BDS: Bit/character duration and sampling time - 3G TS 31.101 [1], subclause 6.8
- EH: Error handling - 3G TS 31.101 [1], subclause 6.9
- CM: Compatibility - 3G TS 31.101 [1], subclause 6.10

5.7 Test groups under TP

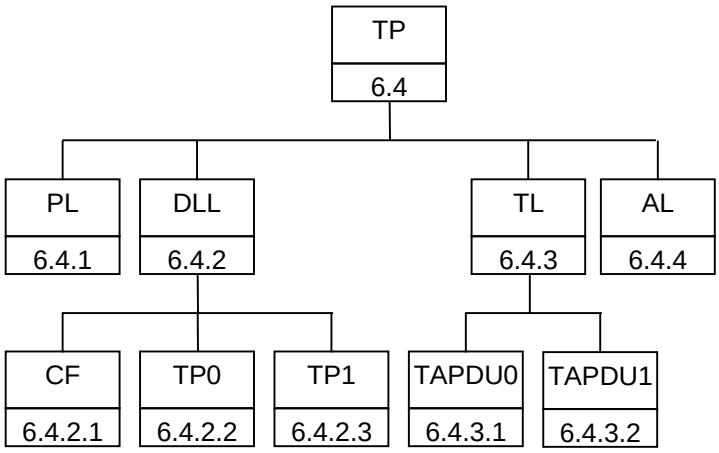


Figure 7: Breakdown of "TP" Test Group

The mnemonics chosen for this test group are as follows:

- PL: Physical Layer - 3G TS 31.101 [1], subclause 7.1
- DLL: Data Link Layer - 3G TS 31.101 [1], subclause 7.2
- CF: Character Frame - 3G TS 31.101 [1], subclause 7.2.1
- TP0: Transmission Protocol T=0 - 3G TS 31.101 [1], subclause 7.2.214
- TP1: Transmission Protocol T=1 - 3G TS 31.101 [1], subclause 7.2.3
- TL: Transport Layer - 3G TS 31.101 [1], subclause 7.3
- TAPDU0: Transportation of an APDU using T=0 - 3G TS 31.101 [1], subclause 7.3.1
- TAPDU1: Transportation of an APDU using T=1 - 3G TS 31.101 [1], subclause 7.3.2
- AP: Application Layer - 3G TS 31.101 [1], subclause 7.4

5.8 Test groups under AFS

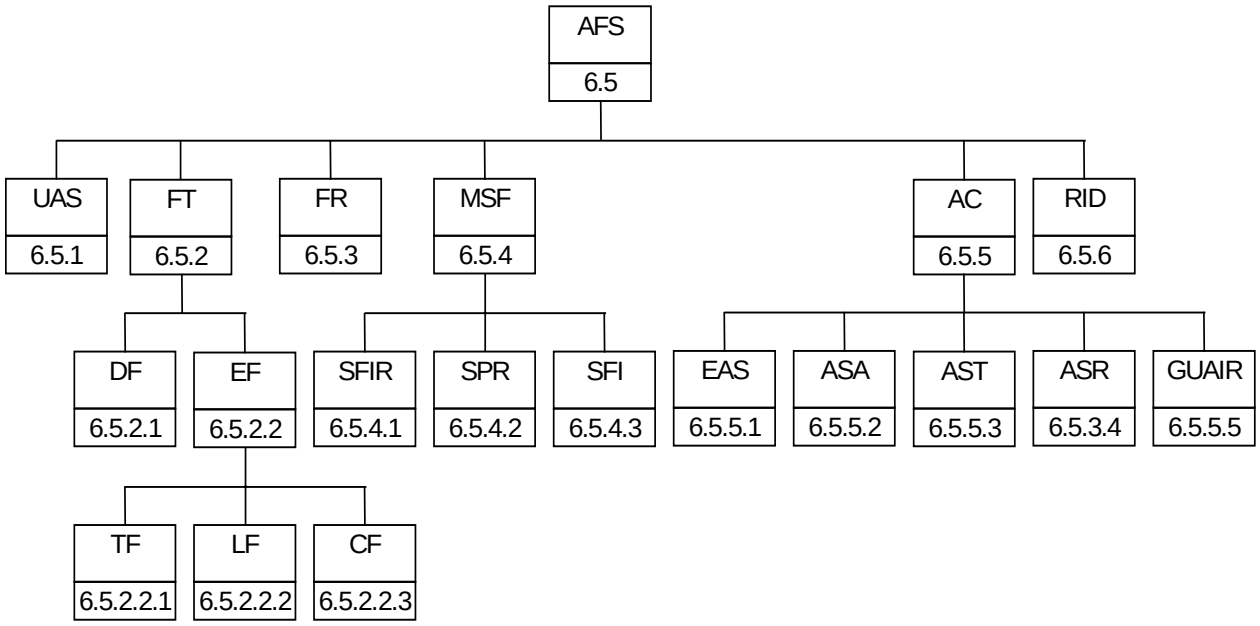


Figure 8: Breakdown of "AFS" Test Group

The mnemonics chosen for this test group are as follows:

- UAS: UICC Application structure - 3G TS 31.101 [1], subclause 8.1
- FTP: File type - 3G TS 31.101 [1], subclause 8.2
- DF: Dedicated files - 3G TS 31.101 [1], subclause 8.2.1
- EF: Elementary files - 3G TS 31.101 [1], subclause 8.2.2
- TF: Transparent EF - 3G TS 31.101 [1], subclause 8.2.2.1
- LF: Linear EF - 3G TS 31.101 [1], subclause 8.2.2.2
- CF: Cyclic EF - 3G TS 31.101 [1], subclause 8.2.2.3
- FR: File referencing - 3G TS 31.101 [1], subclause 8.3
- MSF: Method of selecting a file - 3G TS 31.101 [1], subclause 8.4
- SFIR: SELECT by File Identifier Referencing - 3G TS 31.101 [1], subclause 8.4.1
- SPR: SELECT by Path Referencing - 3G TS 31.101 [1], subclause 8.4.2
- SFI: Short File Identifier - 3G TS 31.101 [1], subclause 8.4.3
- AC: Application characteristic - 3G TS 31.101 [1], subclause 8.5
- EAS: Explicit Application selection - 3G TS 31.101 [1], subclause 8.5.1
- ASA: Application session activation - 3G TS 31.101 [1], subclause 8.5.2
- AST: Application session termination - 3G TS 31.101 [1], subclause 8.5.3
- ASR: Application session reset - 3G TS 31.101 [1], subclause 8.5.4
- GUAIR: GSM/USIM application interaction and restriction - 3G TS 31.101 [1], subclause 8.5.5
- RID: Reservation of file IDs - 3G TS 31.101 [1], subclause 8.6

5.9 Test groups under SEC1

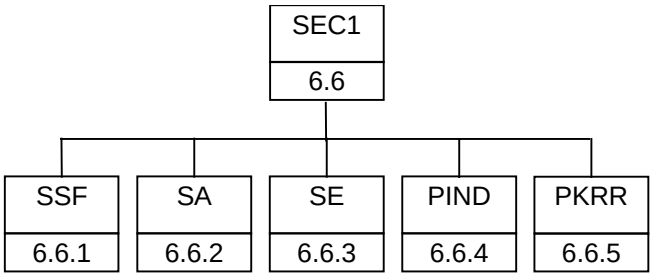


Figure 9: Breakdown of "SEC1" Test Group

The mnemonics chosen for this test group are as follows:

- SSF: Supported security features - 3G TS 31.101 [1], subclause 9.1
- SC: Security architecture - 3G TS 31.101 [1], subclause 9.2
- SE: Security environment - 3G TS 31.101 [1], subclause 9.3
- PIND: PIN definitions - 3G TS 31.101 [1], subclause 9.4
- PKRR: PIN and key reference relationship - 3G TS 31.101 [1], subclause 9.4.5

5.10 Test groups under CS

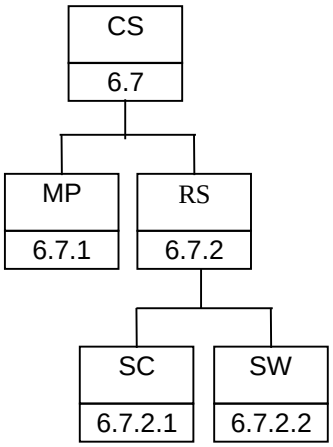


Figure 10: Breakdown of "CS" Test Group

The mnemonics chosen for this test group are as follows:

- MP: Mapping principles - 3G TS 31.101 [1], subclause 10.1
- RS: Response APDU Structure - 3G TS 31.101 [1], subclause 10.2
- SC: Status Conditions Returned by the UICC - 3G TS 31.101 [1], subclause 10.3
- SW: Status Words of the Commands - 3G TS 31.101 [1], subclause 10.3

5.11 Test groups under CMD

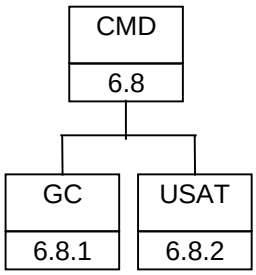


Figure 11: Breakdown of "CMD" Test Group

The mnemonics chosen for this test group are as follows:

- GC: Generic Commands - 3G TS 31.101 [1], subclause 11.1
- USAT: USAT Commands - 3G TS 31.101 [1], subclause 11.2

5.12 Test groups under TOC

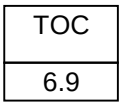


Figure 12: Breakdown of "TOC" Test Group

All of the tests in the "TOC" test group relate to 3G TS 31.101 [1], clause 12.

5.13 Test groups under APF

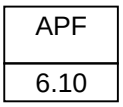


Figure 13: Breakdown of "APF" Test Group

All of the tests in the "APF" test group relate to 3G TS 31.101 [1], clause 13.

5.14 Test groups under CEF

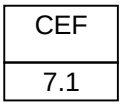


Figure 14: Breakdown of "CEF" Test Group

All of the tests in the "CEF" test group relate to 3G TS 31.102 [2], clause 4.

5.15 Test groups under SEC2

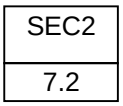


Figure 15: Breakdown of "SEC2" Test Group

All of the tests in the "SEC2" test group relate to 3G TS 31.102 [2], subclause 6.4.

5.16 Test groups under UCMD

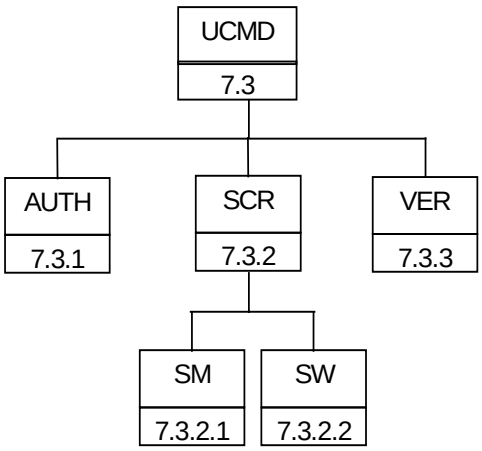


Figure 16: Breakdown of "UCMD" Test Group

The mnemonics chosen for this test group are as follows:

- AUTH: AUTHENTICATION function - 3G TS 31.102 [2], subclause 7.1
- EIMSI: Encipher IMSI - 3G TS 31.102 [2], subclause 7.2
- SCR: Status Conditions Returned by the UICC - 3G TS 31.102 [2], subclause 7.3
- SM: Security management - 3G TS 31.102 [2], subclause 7.3.1
- SW: Status Words of the Commands - 3G TS 31.102 [2], subclause 7.3.2
- VER: Verify command - 3G TS 31.102 [2], subclause 7.4

6 Test Procedure (31.101)

This clause details each of the tests in each of the test groups within the Test Group TP31.101. This test suite allows testing of the IUT against the base specification with respect to:

- Physical characteristics
- Electrical specifications of the UICC - Terminal interface
- Initial communication establishment procedure
- Transmission protocols
- Application and File structure
- Security features

- Structure of commands and responses
- Commands
- Transmission Oriented Commands
- Application independent files

6.1 Physical characteristics

The tests in this subclause ensure that the IUT conforms to the specification for both format and layout and contacts.

6.1.1 ID-1 UICC

6.1.1.1 Definition and applicability

The format and layout characteristics shall be adhered to, in order to ensure proper operation in the Telecom environment.

This test applies to ID-1 UICCs.

6.1.1.2 Conformance requirement

CR1 [31.101-4] Format and layout of the ID-1 UICC shall be in accordance with ISO 7816-1 [3] and ISO 7816-2 [4], unless otherwise specified.

CR2 [31.101-4.1] Any embossing on the card shall be in accordance with ISO 7811—1 [11] and ISO 7811-3 [12] (conditional).

CR3 [31.101-4.1] The contacts shall be located on the front (embossed face) of the card.

Reference: 3G TS 31.101[1], clause 4 and subclause 4.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_PHY_ID1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_PHY_ID1

6.1.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE 1: The testing of CR1 is outside the scope of the present document. Please refer to the TS for ISO/IEC 7816-1 [3] and ISO/IEC 7816-2 [4]

NOTE 2: The testing of CR2 is outside the scope of the present document. Please refer to the TS for ISO 7811-1 [11] and ISO 7811-3 [12].

6.1.1.4 Method of test

Initial conditions

None.

Test procedure

a) The card is examined for the following:

- contact location.

The card shall have been observed to exhibit the following [CR3]:

- *contact location on the front or the back of the card.*

6.1.2 Plug-in UICC

6.1.2.1 Definition and applicability

The format and layout characteristics shall be adhered to, in order to ensure proper operation in the Telecom environment.

This test applies to plug-in UICCs.

6.1.2.2 Conformance requirement

CR1 [31.101-4] Format and layout of the plug-in card shall be in accordance with ISO 7816-1 [3] and ISO 7816-2 [4], unless otherwise specified.

CR2 [31.101-4.2] The dimensions of the plug-in UICC shall be in accordance with Figure 4.1 of 3G TS 31.101 [1].

Reference: 3G TS 31.101 [1], clause 4 and subclause 4.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_PHY_PIC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_PHY_PIC

6.1.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE : The testing of CR1 is outside the scope of the present document. Please refer to the TS for ISO/IEC 7816-1 [3] and ISO/IEC 7816-2 [4].

6.1.2.4 Method of test

Initial conditions

None.

Test procedure

a) The card is examined for the following:

- width
- height
- feature for orientation

The card shall have been observed to exhibit the following [CR2]:

- *correct width and height*
- *feature for orientation*

6.1.3 Temperature range for card operation

6.1.3.1 Definition and applicability

The temperature range for full operational use shall be adhered to, in order to ensure proper operation in the Telecom environment.

6.1.3.2 Conformance requirement

CR1 [31.101-4.3] The temperature range for full operational use shall be between –25 °C and +70 °C with occasional peaks of up to +85 °C, where "occasional" means not more than 4 hours each time and not over 100 times during the life time of the card.

Reference: 3G TS 31.101 [1] , subclause 4.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_PHY_TMP

Test Procedure Reference (TPR): TPR_USIM_TP31.101_PHY_TMP

6.1.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.1.3.4 Method of test

Initial conditions

1) The UICC shall be placed in a temperature-controllable environment and connected to a ME simulator.

2) A temperature measuring device shall be connected to the surface of the UICC.

3) The UICC shall have passed the Format and Layout tests in subclauses 6.1.1 or 6.1.2.

Test procedure

a) The temperature of the UICC shall be set to +25 °C.

b) The ME simulator shall reset the UICC.

c) The ME simulator shall perform the USIM initialisation procedure, as defined in 3G TS 31.102 [2], subclause 5.1.1.

The UICC shall operate successfully [CR1].

d) The temperature of the UICC shall be reduced to –25 °C.

e) Steps b) and c) shall be repeated.

The UICC shall operate successfully [CR1].

f) The temperature of the UICC shall be increased to +70 °C.

g) Steps b) and c) shall be repeated.

The UICC shall operate successfully [CR1].

h) The temperature of the UICC shall be increased to +85 °C.

i) Steps b) and c) shall be repeated continually for a period of 4 hours.

The UICC shall operate successfully [CR1].

j) The temperature of the UICC shall be reduced to +25 °C.

k) Steps h), I) and j) shall be repeated a further 99 times.

The UICC shall operate successfully [CR1].

The UICC shall have satisfied the test requirements of subclauses 6.1.1 or 6.1.2 [CR1].

6.1.4 Contacts

6.1.4.1 Definition and applicability

The shape, robustness and provision of contacts shall be adhered to, in order to maintain good electrical contact with the ME, ensuring proper operation in the Telecom environment.

6.1.4.2 Conformance requirement

CR1 [31.101-4.4.1.2] If contacts C4 and C8 are provided, they shall not be connected internally in the UICC if the UICC only contains a Telecom application.

CR2 [31.101-4.4.1.2] Contact C6 shall not be bonded in the UICC for any function other than supplying Vpp.

Reference: 3G TS 31.101 [1] , subclause 4.4.1.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_PHY_CNT

Test Procedure Reference (TPR): TPR_USIM_TP31.101_PHY_CNT

6.1.4.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.1.4.4 Method of test

Initial Conditions

N/A

Test Procedure

N/A

6.2 Electrical specifications of the UICC – Terminal interface

The tests in this subclause ensure that the IUT conforms to the electrical specification for each of the contacts and the protocol.

6.2.1 Supply voltage Vcc (contact C1)

6.2.1.1 Voltage limits

6.2.1.1.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following supply voltage conditions to ensure proper operation in the Telecom environment.

This test applies to all UICC implementations with 1,8 V, 3 V and 5 V interfaces .

6.2.1.1.2 Conformance requirement

CR1 [31.101-5.3.1,2,3] The UICC shall operate when the supply voltage on contact C1 (Vcc) is in the following ranges:

Card Type	Vmin /V	Vmax /V
5V type	4,5	5,5
3V type	2,7	3,3
1,8V type	1,62	1,98

Reference: 3G TS 31.101 [1], subclause 5.1.1, 5.2.1 and 5.3.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_VCC_VL

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_VCC_VL

6.2.1.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.1.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

NOTE: The voltage Vcc min/max depends on the voltage class the UICC provides.

a) The following steps shall be repeated for every voltage class which the UICC provides.

b) The voltage source for contact C1 (Vcc) shall be set to Vcc min, and the UICC interface signals shall be powered from a Vcc min, source.

c) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence.

d) The ME simulator shall send a CHANGE PIN command to the UICC with new PIN value of 8 zeros.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command.

e) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence.

f) The ME simulator shall send a CHANGE PIN command to the UICC to return the PIN to its original value.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command.

g) The voltage source for contact C1 (Vcc) shall be set to Vcc max.

h) Steps c), d), e) and f) shall be repeated.

6.2.1.2 Idle current limits

6.2.1.2.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the current consumption shall not exceed the specified limit under idle conditions to ensure proper operation in the Telecom environment.

Table 1: Current consumption in idle mode

Card Type	Imax /µA in idle state clk frequency 1 MHz	Vcc_{max} /V maximum voltage on VCC during testing
5V type	200	5,5
3V type	200	3,3
1,8V type	200	1,98

6.2.1.2.2 Conformance requirement

CR1 [31.101-5,5.1.1] The idle current consumption of the UICC shall not exceed I_{max} at 1 MHz, +25 °C and Vcc_{max}.

Reference: 3G TS 31.101 [1], clause 5, subclauses 5.1.1. 5.2.1, and 5.3.1

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_VCC_ICL

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_VCC_ICL

6.2.1.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.1.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) The frequency of the clock source shall be set to 1 MHz.
3) The temperature of the UICC shall be +25 °C.
4) The voltage on Vcc shall be set to $Vcc_{max.}$

Test procedure

a) The ME simulator shall reset the UICC.

b) The idle current consumption shall be measured after receiving the ATR over a period of ten seconds.

The current consumption of the UICC shall not exceed I_{max} [CR1].

c) The test for all voltage classes which the UICC supports shall be repeated.

6.2.1.3 Current limits in clk-stop-mode

6.2.1.3.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the current consumption shall not exceed the specified limit under clk-stop conditions to ensure proper operation in the Telecom environment.

Table 2: Current consumption in clk stop mode

Card Type	Imax /µA in clk-stop mode (average value)	Vcc_{max} /V maximum voltage on VCC during testing
5V type	200	5,5
3V type	100	3,3
1,8V type	100	1,98

6.2.1.3.2 Conformance requirement

CR1 [31.101-5,1.1] The clk stop mode current consumption of the UICC shall not exceed I_{max} if clk stop mode is delivered by the UICC.

Reference: 3G TS 31.101 [1], clause 5 and subclause 5.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_VCC_CL

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_VCC_CL

6.2.1.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.1.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall wait at least 1 860 clocks.

c) The ME simulator shall stop the clock according to the clock stop mode which was read in the ATR.

d) The current consumption shall be measured during clk stop over a period of ten seconds.

The current consumption of the UICC shall not exceed I_{max} in average during clk stop [CR1].

6.2.2 Reset RST (contact C2)

6.2.2.1 Static operation

6.2.2.1.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following limits regarding the reset RST signal to ensure proper operation in the Telecom environment.

6.2.2.1.2 Conformance requirement

CR1 [31.101-5.X.2] The UICC shall operate within the following limits for RST:

Card Type	V_{OL} min/V	V_{OL} max/V	I_{OL} max/µA	V_{OH} min/V	V_{OH} max/V	I_{OH} max/µA
5V type	-0,3	0,6	-200	Vcc - 0.7	Vcc +0,3 V	+20
3V type	-0,3	0,2 × VCC	-200	0,8 × VCC	Vcc +0,3 V	+20
1,8V type	-0,3	0,2 × VCC	-200	0,8 × VCC	Vcc +0,3 V	+200

- t_R and t_F shall not exceed 400 µs, with C_{out} and C_{in} equal to 30 pF.

Reference: 3G TS 31.101 [1], subclauses 5.1.2, 5.2.2 and 5.3.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_RST

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_RST

6.2.2.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.2.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) A current measuring device shall be connected to RST (contact C2) of the UICC.

3) The capacitance, C_{in}, of RST (contact C2) shall be measured to be 30 pF.

Test procedure

a) The following parameters shall be set for RST:

- V_{OH} of the RST signal shall be set to V_{OH} min.
- V_{OL} of the RST signal shall be set to V_{OL} min.
- t_R and t_F shall be set to 400 µs.

b) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR1].

c) The following parameters shall be set for RST:

- V_{OH} of the RST signal shall be set to V_{OH} max.
- V_{OL} of the RST signal shall be set to V_{OL} max.
- t_R and t_F shall be set to 400 µs.

d) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR1].

e) The test for all voltage classes the card supports shall be repeated.

The following shall be true for all tests [CR1]:

- *I_{OLmax} measured to be less than or equal to I_{OL} max.*
- *I_{OHmax} measured to be less than or equal to I_{OH} max.*

6.2.3 Programming voltage Vpp (contact C6)

6.2.3.1 Static operation

6.2.3.1.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following limits regarding the programming voltage Vpp signal to ensure proper operation in the Telecom environment.

6.2.3.1.2 Conformance requirement

CR1 [31.101-5.1.3] The UICC shall not require any programming voltage on Vpp

CR2 [31.101-5.1.3] Plug-in UICC, contact C6 shall not be connected to the terminal.

Reference: 3G TS 31.101 [1], subclause 5.1.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_PV

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_PV

6.2.3.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.3.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) Contact C6 shall be connected to ground by the ME simulator

b) Vcc shall be applied to contact C1

c) Contact C2 (RST) shall be kept at low level, ground

d) A valid clock signal shall applied to Contact C3

The dc power consumption on Contact C1 shall not exceed 10 mA under any condition [CR1].

NOTE: This test ensures that Vpp and Vcc are not bonded together in the UICC, if this would be the case Vpp would also supply the UICC with current for its operation.

e) The ME simulator shall reset the UICC.

f) The ME simulator shall send a CHANGE PIN command to the UICC with new PIN value of 8 zeros.

The UICC operates successfully without requiring to set Vpp at programming state in protocol level [CR1, CR2].

g) The ME simulator shall reset the UICC.

h) The ME simulator shall send a CHANGE PIN command to the UICC to return the PIN to its original value.

The UICC operates successfully without requiring to set Vpp at programming state in protocol level [CR1, CR2].

6.2.4 Clock CLK (contact C3)

6.2.4.1 Frequency and duty cycle

6.2.4.1.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following limits regarding the clock CLK signal to ensure proper operation in the Telecom environment.

6.2.4.1.2 Conformance requirement

CR1 [31.101-5.1.4,5.2.3,5.3.3] The UICC shall **not** support an internal clock.

CR2 [31.101-5.1.4,5.2.3,5.3.3] The UICC shall support a duty cycle between 40% and 60% of the period during stable operation.

CR3 [31.101-5.1.4,5.2.3,5.3.3] The UICC shall operate within the following limits for CLK:

Card Type	V_{OL} min/V	V_{OL} max/V	V_{OH} min/V	V_{OH} max/V	T_R & T_F max	fmax /MHz
5V type	-0,3	0,5	0,7 × Vcc	Vcc +0,3 V	9% with a max. of 0,5 µs	5
3V type	-0,3	0,2 × VCC	0,7 × VCC	Vcc +0,3 V	50 ns	4
1,8V type	-0,3	0,2 × VCC	0,7 × VCC	Vcc +0,3 V	50 ns	4

Note: T_R and T_F have to be measured between 10 % and 90 % of V_{OL} and V_{OH} ; C_{in} is equal to 30 pF.

Reference: 3G TS 31.101 [1], subclauses 5.1.4, 5.2.3 and 5.3.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_CLK

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_CLK

6.2.4.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR1 cannot be tested as the UICC supports an internal clock.

6.2.4.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The frequency of the clock source shall be set to 1 MHz.

b) The duty cycle of the clock source shall be set to 40 % high.

c) V_{OH} shall be set to V_{OH} max, V_{OL} shall be set to V_{OL} min

d) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR2, CR3].

e) The duty cycle of the clock source shall be set to 60 % high.

f) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR2, CR3].

g) The frequency of the clock source shall be set to $f_{max.}$

h) The duty cycle of the clock source shall be set to 40 % high.

i) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR2, CR3].

j) The duty cycle of the clock source shall be set to 60 % high.

k) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR2, CR3]

l) Steps a) to j) with V_{OH} set to V_{OH} min, V_{OL} set to V_{OL} max shall be repeated.

m) Steps a) to k) for all voltage classes supported by the UICC shall be repeated.

6.2.4.2 Voltage and current

6.2.4.2.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following limits regarding the voltage and current condition to ensure proper operation in the Telecom environment.

6.2.4.2.2 Conformance requirement

CR1 [31.101-5.1.4,5.2.3,5.3.3] The UICC shall operate within the following limits for CLK:

Card Type	V_{OL} min/V	V_{OL} max/V	I_{OL} max/µA	V_{OH} min/V	V_{OH} max/V	I_{OH} max/µA	T_R & T_F max	fmax /MHz
5V type	-0,3	0,5	-200	0,7 × Vcc	Vcc +0,3 V	+20	9 % with a max. of 0,5 µs	5
3V type	-0,3	0,2 × VCC	-20	0,7 × VCC	Vcc +0,3 V	+20	50 ns	4
1,8V type	-0,3	0,2 × VCC	-20	0,8 × VCC	Vcc +0,3 V	+20	50 ns	4

Reference: 3G TS 31.101 [1], subclauses 5.1.5, 5.2.3 and 5.3.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_VC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_VC

6.2.4.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.4.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) A current measuring device shall be connected to CLK (contact C3) of the UICC.
3) The capacitance of CLK (contact C3) shall be measured to be ≤ 30 pF.

Test procedure

a) The clock signal shall be set to 1 MHz.

b) The following parameters shall be set for CLK:

- V_{OH} at V_{OH}max.
- V_{OL} at V_{OL}min.
- t_R and t_F shall be set to t_R max and t_F max

c) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR1].

d) The following parameters shall be set for CLK:

- V_{OH} at V_{OH}min
- V_{OL} at V_{OL}max

e) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence [CR1].

f) Steps a) to e) with $f_{clk} = f_{max}$, $T_R = T_R$ max and $T_F = T_f$ max shall be repeated.

g) Steps a) to f) for all voltage classes delivered by the UICC shall be repeated.

The following shall be true for all tests:

- *I_{OHmax} measured to be less than or equal to +20 µA [CR1].*
- *I_{OLmax} measured to be less than or equal to –200 µA [CR1].*
- *The UICC shall send the correct ATR sequence after a reset [CR1].*

6.2.5 I/O (contact C7)

6.2.5.1 Voltage and current

6.2.5.1.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [5], the UICC shall operate within the following limits regarding the I/O signal to ensure proper operation in the Telecom environment.

6.2.5.1.2 Conformance requirement

CR1 [31.101-5.1.5,5.2.4,5.3.4] The UICC shall operate within the following limits for I/O:

Card Type	V_{OL} min/V	V_{OL} max/V	I_{OL} max/µA	V_{OH} min/V	V_{OH} max/V	I_{OH} max/µA	T_R & T_F max	fmax /MHz
5V type	-0,3	0,4	-1 000	3,8	Vcc +0,3 V	+20	1 µs	5
3V type	-0,3	0,4	-1 000	0,7 × VCC	Vcc +0,3 V	+20	1 µs	4
1,8V type	-0,3	0,4	-1 000	0,7 × VCC	Vcc +0,3 V	+20	1 µs	4

Card Type	V_{IL} min/V	V_{IL} max/V	I_{IL} max/µA	V_{IH} min/V	V_{IH} max/V	I_{IH} min/max /µA	T_R & T_F max	fmax /MHz
5V type	-0,3	0,8	+1 000	0,7 × VCC	Vcc +0,3 V	±20	1 µs	5
3V type	-0,3	0,2 × VCC	+1 000	0,7 × VCC	Vcc +0,3 V	±20	1 µs	4
1,8V type	-0,3	0,2 × VCC	+1 000	0,7 × VCC	Vcc +0,3 V	±20	1 µs	4

Reference: 3G TS 31.101 [1], subclauses 5.1.5, 5.2.4 and 5.3.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_ELEC_I/O

Test Procedure Reference (TPR): TPR_USIM_TP31.101_ELEC_I/O

6.2.5.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.2.5.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) A current measuring device shall be connected to I/O (contact C7) of the UICC.
3) The capacitance, C_{out} and C_{in}, of I/O (contact C7) shall be measured to be 30 pF.

Test procedure

a) The ME simulator shall be set to the following max. range allowed by the UICC.
   - Vcc to Vcc max
   - V_{OL} to V_{OL} min, V_{OH} to V_{OH} max
   - I_{IL} to I_{IL} max, I_{IH} to I_{IH} max.
   - T_R to T_R max and T_F to T_F max

b) The ME simulator shall reset the UICC.

c) The ME simulator shall send a STATUS command to the UICC.

d) The ME simulator shall be set to the minimum range allowed by the UICC with VOH inactive:

- Vcc to Vcc min
- V_{OL} to V_{OL} max, V_{OH} to V_{OH} min,
- I_{IL} to I_{IL}max, I_{IH} to I_{IH} min.
- T_R to T_R max and T_F to T_F max

e) The ME simulator shall reset the UICC.

f) The ME simulator shall send a STATUS command to the UICC.

g) Steps a) to f) for all voltage classes shall be repeated

Acceptance criteria for all tests [CR1]:

- *I_{OL} has to be between 0 mA and I_{OL} max.*
- *I_{OH} has to be $\leq I_{OH}$ max.*
- *V_{IL} has to be between V_{IL} min and V_{IL} max.*
- *V_{IH} has to be between V_{IH} min and V_{IH} max*
- *T_R and T_R generated by the UICC have to be $\leq T_R$ and T_F max*

6.3 Initial Communication establishment procedure

6.3.1 Supply voltage switching

6.3.1.1 Supply Voltage Classes

6.3.1.1.1 Definition and applicability

The supply voltage class is indicated in the ATR to inform the ME of the classes of operating condition accepted by the UICC.

6.3.1.1.2 Conformance requirement

CR1 [31.101-6.2.1] The supply voltage class shall be indicated in the ATR.

CR2 [31.101-6.2.1] If the UICC supports several voltage classes, they shall be consecutive.

CR3 [21.111-9] Both UICC and ME shall support at least two voltage classes.

Reference: 3G TS 31.101 [1], subclause 6.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_SVS_SVC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_SVS_SVC

6.3.1.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.1.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

The UICC shall send the ATR sequence.

The supply voltage class indicator (the lower 6 bits in TA(I) after the first occurrence of T=15 in TD(I-1) for I>2) shall be exist and one of the following values:

'03', '06', '07' [CR1, CR2, CR3].

6.3.1.2 Power Consumption of the UICC during ATR

6.3.1.2.1 Definition and applicability

The current consumption shall not exceed the specified limit during ATR to ensure proper operation in the 3G environment.

6.3.1.2.2 Conformance requirement

CR1 [31.101-6.2.2] The UICC power consumption during the ATR at the maximum external clock CLK shall not exceed the value defined in the table 6.2a in 3G TS 31.101 [1] subclause 6.2.2, for each voltage class indicated in the ATR.

CR2 [31.101-6.2.2] The UICC power consumption during the ATR at the 4MHz CLK shall not exceed the value defined in the table 6.2b in 3G TS 31.101 [1] subclause 6.2.2, for each voltage class indicated in the ATR.

CR3 [31.101-6.2.3] The power consumption of the UICC is restricted to the values indicated in tables 6.2a and 6.2b 3G TS 31.101 [1] until an application is selected.

Reference: 3G TS 31.101 [1], subclauses 6.2.2 and 6.2.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_SVS_PC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_SVS_PC

6.3.1.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.1.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

NOTE: Repeat the following steps for each voltage class supported by the UICC.

a) The frequency of the clock source shall be set to 4 MHz.

b) The ME simulator shall reset the UICC.

The UICC shall send the ATR sequence.

c) The ME simulator shall send a CHANGE PIN command to the UICC with new PIN value of 8 zeros.

d) The ME simulator shall send a CHANGE PIN command to the UICC to return the PIN to its original value.

The current consumption of the UICC shall not exceed the maximum values given in table 6.2b in 3G TS 31.101 [1] subclause 6.2.1 according to the voltage class during b), c) and d) [CR1].

e) The frequency of the clock source shall be set to the maximum frequency according to the voltage class.

f) The ME simulator shall reset the UICC.

The UICC shall send the ATR sequence.

g) The ME simulator shall send a CHANGE PIN command to the UICC with new PIN value of 8 zeros.

h) The ME simulator shall send a CHANGE PIN command to the UICC to return the PIN to its original value.

The current consumption of the UICC shall not exceed the maximum values given in table 6.2a in 3G TS 31.101 [1] subclause 6.2.1 according to the voltage class during f), g) and h) [CR2].

6.3.1.3 Application Related Electrical Parameters

6.3.1.3.1 Definition and applicability

The current consumption shall not exceed the specified limit during the application is activated to ensure proper operation in the 3G environment.

6.3.1.3.2 Conformance requirement

CR1 [31.101-6.2.3] If an application specifies their own maximum power consumption values, it shall not exceed the maximum value defined in table 6.3 in 3G TS 31.101 [1] subclause 6.2.3. CR2 [31.101-6.2.3] If the applications specify their own maximum power consumption values, the current consumption shall conform to the voltage class indicated in the response for STATUS command, while the application is selected.

CR2 [31.101-6.2.3] If the application specifies their own maximum power consumption values, the current consumption shall conform to the values indicated in the response of a STATUS command, while the application is selected.

CR3 [31.101-6.2.3] If an application does not specify their own maximum power consumption values, the current consumption shall conform to the values defined in table 6.4 in 3G TS 31.101 [1] subclause 6.2.3, while the application is selected.

Reference: 3G TS 31.101 [1], subclause 6.2.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_SVS_AREP

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_SVS_AREP

6.3.1.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.1.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

NOTE: Following steps shall be repeated for each application in the UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) If the power consumption is present in the FCP, the following steps shall be performed.

The power consumption in the FCP does not exceed maximum values defined in table 6.3 in 3G TS 31.101 [1] subclause 6.2.3 [CR1].

c-1) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

c-2) The ME simulator shall send a SELECT command to select EF_{LOCI}.

c-3) The ME simulator shall send an UPDATE BINARY command with data = '11 22 33 44 55 66 77 88 99 AA BB'

The power consumption of the UICC shall not exceed the maximum values given in response data at b) during c-1), c-2) and c-3). [CR2]

d) If the power consumption is not present in the FCP, following steps shall be performed.

d-1) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

d-2) The ME simulator shall send a SELECT command to select EF_{LOCI}.

d-3) The ME simulator shall send an UPDATE BINARY command with data = '11 22 33 44 55 66 77 88 99 AA BB'

The power consumption of the UICC shall not exceed the maximum values given in table 6.4 in 3G TS 31.101 [1] during d-1), d-2) and d-3). [CR3]

6.3.2 ATR content

6.3.2.1 Major capabilities

6.3.2.1.1 Definition and applicability

The ATR is information presented by the UICC to the ME at the beginning of the card session and gives operational requirements.

6.3.2.1.2 Conformance requirement

CR1 [31.101-6.3] The ATR shall be in accordance with ISO/IEC 7816-3 [5].

CR2 [31.101-6.3] T=15 parameters shall be present in the ATR.

CR3 [31.101-6.3.1] The category indicator in the historical bytes shall be '80'.

CR4 [31.101-6.3.1] The first information sent by the card in the historical byte shall be the "card data service" data object.

CR5 [31.101-6.3.1] The second information sent by the card in the historical shall be the "card capabilities" data object.

CR6 [31.101-6.3.1] The information carried by the historical bytes of the UICC shall follow clause 8 of ISO/IEC 7816-4 [6].

Reference: 3G TS 31.101 [1], subclause 6.3 and 6.3.1

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_ATRC_MC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_ATRC_MC

6.3.2.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: The testing of CR1 is outside the scope of the present document.

6.3.2.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

The UICC shall send the correct ATR sequence.

The ATR is in accordance with ISO/IEC 7816-3 [5]

The following parameters shall be present:

- *T=15 parameter [CR2].*

The following parameters shall be present and in the following order in the historical bytes:

- *The category indicator='80' [CR3].*
- *"card data service" data object [CR4].*
- *"card capabilities" data object [CR5].*

The historical bytes shall follow clause 8 of ISO/IEC 7816-4 [6][CR6].

6.3.2.2 Speed enhancement

6.3.2.2.1 Definition and applicability

The UICC shall at least operate with all mandatory values of the transmission factors F and D described in 3G TS 31.101 [1] to ensure proper operation in the 3G environment.

6.3.2.2.2 Conformance requirement

CR1 [31.101-6.3.2] The UICC shall at least support (F, D) = (512, 8) and (512, 16) in addition to (372, 1).

CR2 [31.101-6.3.2] (F, D)=(372, 1) is the default value.

Reference: 3G TS 31.101 [1], subclause 6.3.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_ATRC_SE

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_ATRC_SE

6.3.2.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.2.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test Procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a PPS-Request to the UICC, selecting T=0 protocol and (F, D)=(512, 8).

The UICC shall send a valid PPS-Response.

c) The ME simulator shall send a STATUS command with P2='00' at (F, D)=(512, 8).

The UICC shall send a valid FCP [CR1].

d) The ME simulator shall reset the UICC.

e) The ME simulator shall send a PPS-Request to the UICC, selecting T=0 protocol and (F, D)=(512, 16).

The UICC shall send a valid PPS-Response.

f) The ME simulator shall send a STATUS command with P2='00' at (F, D)=(512, 16).

The UICC shall send a valid FCP [CR1].

g) The ME simulator shall reset the UICC.

h) The ME simulator shall send a STATUS command with P2='00' at (F, D)=(372, 1).

The UICC shall send a valid FCP [CR2].

i) The ME simulator shall reset the UICC.

j) The ME simulator shall send a PPS-Request to the UICC, selecting T=0 protocol and (F, D)=(372, 1).

The UICC shall send a valid PPS-Response.

k) The ME simulator shall send a STATUS command with P2='00' at (F, D)=(372, 1).

The UICC shall send a valid FCP [CR1].

6.3.3 PPS procedure

6.3.3.1 Definition and applicability

The ATR indicates which protocols are available for use during a session. The PPS procedure allows one of the available protocol types to be selected.

6.3.3.2 Conformance requirement

CR1 [31.101-6.4] The UICC shall support the PPS procedure in order to use other transmission parameters.

CR2 [31.101-6.4] The UICC shall respond to a PPS-Request from the ME with a PPS-Response.

CR3 [31.101-6.4] If the transmission parameters are indicated in the ATR, these shall be interpreted in accordance with ISO/IEC 7816-3 [5].

Reference: 3G TS 31.101 [1], subclause 5.8.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_PPS

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_PPS

6.3.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE1: CR1 and CR2 are implicitly tested in subclause 6.3.2.2.

NOTE2: CR3 is not tested as it is out of the scope of the present document.

6.3.3.4 Method of test

Initial conditions

N/A

Test Procedure

N/A

6.3.4 Reset

6.3.4.1 Definition and applicability

The UICC shall support both cold and warm resets.

6.3.4.2 Conformance requirement

CR1 [31.101-6.5] After a cold reset, the UICC shall enter the negotiable mode and the security status shall be reset.

CR2 [31.101-6.6] After a warm reset, the UICC shall enter either the negotiable mode or the specific mode and the security status shall be reset.

Reference: 3G TS 31.101 [1], subclauses 6.5 and 6.6.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_RST

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_RST

6.3.4.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.4.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) The PIN shall be enabled.

Test Procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

c) The ME simulator shall **cold** reset the UICC.

The UICC shall send the correct ATR sequence. The specific mode byte TA(2) shall not present within the ATR returned by the UICC [CR1].

d) The ME simulator shall send a SELECT command to the UICC to select EF_{PL}

e) The ME simulator shall send and UPDATE BINARY command using a length of 2 byte, and data string '00 00' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - Security status not satisfied [CR1].

f) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

g) The ME simulator shall **warm** reset the UICC.

The UICC shall send the correct ATR sequence [CR2].

h) The ME simulator shall send a SELECT command to the UICC to select EF_{PL}.

i) The ME simulator shall send an UPDATE BINARY command using a length of 2 bytes, and data string '00 00' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - Security status not satisfied [CR2].

6.3.5 Clock stop mode

6.3.5.1 Definition and applicability

It shall be mandatory for all UICCs complying with 3G TS 31.101 [1] to support clock stop mode described therein.

6.3.5.2 Conformance requirement

CR1 [31.101-6.7] The UICC shall support the clock stop procedure.

Reference: 3G TS 31.101 [1], subclause 6.7.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_CSM

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_CSM

6.3.5.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.3.5.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

The ATR shall contain a following character:

- *TA(I) after the first occurrence of T=15 in TD(I-1) for I>2;*
- *Both b8 and b7 shall not be equal to zero.[CR1]*

b) The ME simulator shall stop the clock according to the clock stop mode after ATR.

c) The ME simulator shall pause for 10 seconds, then starts the clock.

d) The ME simulator shall wait for more than 744 clock cycles after having started the clock, and then shall send a SELECT command to the UICC to select the EF_{ICCID}.

The SELECT command shall be executed successfully [CR1].

6.3.6 Bit/character duration and sampling time

6.3.6.1 Definition and applicability

The UICC shall adhere to the electronic signals and transmission protocols defined in 3G TS 31.101 [1] and ISO/IEC 7816-3 [5] to ensure proper operation in the 3G environment.

6.3.6.2 Conformance requirement

CR1 [31.101-6.8] The bit/character duration and sampling time specified in ISO/IEC 7816-3 [5], subclause 6.3.2 are valid for all communications.

Reference: 3G TS 31.101 [1], subclause 6.8.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_BDS

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_BDS

6.3.6.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: The testing of CR1 is outside the scope of the present document.

6.3.6.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.3.7 Error handling

6.3.7.1 Definition and applicability

The UICC shall adhere to the electronic signals and transmission protocols defined in 3G TS 31.101 [1] and ISO/IEC 7816-3 [5] to ensure proper operation in the 3G environment.

6.3.7.2 Conformance requirement

CR1 [31.101-6.9] Error detection and character repetition specified in ISO/IEC 7816-3 [5], subclause 6.3.3 is mandatory for the UICC for all communications using T = 0.

Reference: 3G TS 31.101 [1], subclause 6.9.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_EH

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_EH

6.3.7.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: The testing of CR1 is outside the scope of the present document.

6.3.7.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure for T=0 protocol

NOTE: The following steps shall be performed for each communication speed supported by the UICC.

a) The ME simulator shall reset the UICC.

b) The ME simulator shall request character repetition (i.e. transmits an error signal during the guard time) to the UICC for all character frames during the ATR.

The UICC shall send the correct ATR with character repetition [CR1].

c) The ME simulator shall send a correct PPS request to the UICC (conditional).

d) The ME simulator shall send a SELECT command to the UICC to select the MF with incorrect character parity for all character frames.

The UICC shall request character repetition (i.e. transmits an error signal during the guard time) for all character frames [CR1].

e) The ME simulator shall receive the response from the UICC but request character repetition for all character frames.

The UICC shall send the correct FCP with character repetition [CR1].

6.3.8 Compatibility

6.3.8.1 Definition and applicability

The UICC shall provide the voltage class indication defined in 3G TS 31.101 [1] to the terminal to ensure proper operation in the Telecom environment.

6.3.8.2 Conformance requirement

CR1 [31.101-6.10] UICCs that are used in applications where the supply voltage class detection is based on the STATUS response shall support this procedure in addition to the supply voltage class indication in the ATR.

Reference: 3G TS 31.101 [1], subclause 6.10.

Test Group Reference (TGR): TGR_USIM_TP31.101_COM_CM

Test Procedure Reference (TPR): TPR_USIM_TP31.101_COM_CM

6.3.8.3 Test purpose

To verify that the UICC conforms to the above requirements.

Note1: The supply voltage class indication in the ATR and STATUS response are tested respectively in subclause 6.3.1 and subclause 6.8.1.2 in the present document as they are mandatory for all the UICCs.

Note2: The supply voltage class detection based on STATUS response for compatibility purpose is out of the scope of the present document.

6.3.8.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.4 Transmission Protocols

6.4.1 Physical Layer

6.4.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.1.2 Conformance requirement

CR1 [31.101-7.1] Both protocols T=0 and T=1 shall use the physical layer and character frame as defined in 7.2.1.

Reference: 3G TS 31.101 [1], subclause 7.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_PL

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_PL

6.4.1.3 Test purpose

To verify that the physical layer function conforms to the above requirements.

NOTE: CR1 is tested in the subclause 6.4.2.1

6.4.1.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.4.2 Data Link Layer

6.4.2.1 Character Frame

6.4.2.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.1.2 Conformance requirement

CR0 [31.101-7.2.1] Before the transmission of a character, the I/O line shall be in state H.

CR1 [31.101-7.2.1] A character shall consist of 10 consecutive bits:

- 1 start bit in state L;
- 8 bits, which comprise the data byte;
- 1 even parity checking bit.

CR2 [31.101-7.2.1] The parity bit shall be set, in a way, that there is an even number of bits set to '1' including the parity bit in the character frame.

CR3 [31.101-7.2.1] The receiver shall confirm the existence of a start bit before 0.7 etu (receiver time).

CR4 [31.101-7.2.1] Then the subsequent bits shall be received at intervals of (n + 0.5 ± 0.2) etu (n being the rank of the bit).

CR5 [31.101-7.2.1] Within a character, the time from the leading edge of the start bit to the trailing edge of the nth bit shall be (n ± 0.2) etu.

CR6 [31.101-7.2.1] The interval between the leading edges of the start bits of two consecutive characters shall be comprised of the character duration (10 ± 0.2) etu, plus a guardtime.

CR7 [31.101-7.2.1] Under error free transmission, during the guardtime both the UICC and the ME shall be in reception mode (I/O line in state H).

CR8 [31.101-7.2.1] The data shall always be passed over the I/O line with the most significant byte first.

CR9 [31.101-7.2.1] The order of bits within a byte (that is, whether the least significant or most significant bit is transferred first) is specified in character TS returned in the answer to reset.

Reference: 3G TS 31.101 [1], subclause 7.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_CF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_CF

6.4.2.1.3 Test purpose

To verify that the Physical Layer function conforms to the above requirements.

6.4.2.1.4 Method of test

Initial conditions

1)The UICC shall be connected to a ME simulator.

Test procedure

a) The following steps b), c), d) and e) shall be repeated for the all communication speeds and protocols supported by the UICC.

b) The ME simulator shall reset the UICC.

c) The ME simulator shall send a PPS-Request to select a valid protocol and communication speed to the UICC.

d) The ME simulator shall send a STATUS command to the UICC.

e) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following conditions shall be true for all character frames during the above steps a), b), c) and d):

- *It consists of 10 consecutive bits [CR1];*
- *There is an even number of bits set to '1' including the parity bit [CR2].*
- *The time from the leading edge of the start bit to the trailing edge of the Nth bit shall be (N ± 0.2) etu [CR5].*
- *The order of bits within a byte is specified in character TS returned in the ATR.*

f) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

g) The ME simulator shall send a SELECT command with following condition to the UICC to select EF_{IMSI} under DF_{USIM}.

h) The ME simulator shall send a READ BINARY command to the UICC.

The response data sent from the UICC shall be passed over the I/O line with the most significant byte first [CR8].

i) The time from the leading edge of the start bit to the trailing edge of the nth bit is set to be (n + 0.2) etu.

j) The ME simulator shall reset the UICC.

The UICC shall send a valid ATR [CR4].

k) The ME simulator shall send a PPS-Request to select a valid protocol and communication speed to the UICC.

The UICC shall send a valid PPS-Response [CR4].

l) The ME simulator shall send a STATUS command to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR4].

m) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR4].

n) The time from the leading edge of the start bit to the trailing edge of the nth bit is set to be (n - 0.2) etu.

o) The ME simulator shall reset the UICC.

The UICC shall send a valid ATR [CR3, CR4].

p) The ME simulator shall send a PPS-Request to select a valid protocol and communication speed to the UICC.

The UICC shall send a valid PPS-Response [CR3, CR4].

q) The ME simulator shall send a STATUS command to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR3, CR4].

r) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The status condition returned by the UICC shall be SW1='90', SW2='00' –normal ending of the command [CR3, CR4].

6.4.2.2 Transmission Protocol T=0

6.4.2.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.2.2 Conformance requirement

CR1 [31.101-7]	The T=0 protocol is mandatory for the UICC.
CR2 [31.101-7]	The protocol shall start after either the ATR or a successful PPS exchange.
CR3 [31.101-7.2.2.1]	The minimum interval between the leading edge of the start bits of two consecutive characters shall be at least 12 etus.
CR4 [31.101-7.2.2.1]	The value of the WWT shall not exceed $960 \times WI \times Fi/f$.
CR5 [31.101-7.2.2.1]	The minimum interval between the leading edges of the start bits of two consecutive characters sent in opposite direction shall be 16 etus.
CR6 [31.101-7.2.2.3]	When the UICC has received the command header, a response containing a procedure byte shall be sent to the ME.
CR7 [31.101-7.2.2.3]	Both the ME and the UICC shall be able to keep track of the direction of the data flow and who has the access to the I/O-line.
CR8 [31.101-7.2.2.3.1]	Procedure bytes shall be used to keep up the communication between the ME and the UICC.
CR9 [31.101-7.2.2.3.2]	The status bytes SW1 SW2 form an end sequence indicating the status of the UICC at the end of a command.
CR10 [31.101-7.2.2.3.2]	A normal ending of a command is indicating by SW1 SW2 = '90 00'.
CR11 [31.101-7.2.2.4]	The error detection and correction procedure is mandatory.
CR12 [31.101-7.2.2.4]	The error is indicated on the I/O-line, which is set to state L after (10.5 ±0.2) etus after the leading edge of the start bit for the character, and the I/O line shall be in state L for a maximum of 2 etus and a minimum of 1 etu.

CR13 [31.101-7.2.2.4] If the UICC or ME as receiver detects a parity error within 11 ±0.2 etus starting from the leading edge of the start bit. In a character just received, it shall set I/O to state L to indicate the error to the sender.

CR14 [31.101-7.2.2.4] When the transmitter detects an error, the character shall be sent again after a minimum delay of 2 etus.

Reference: 3G TS 31.101 [1], subclause 7.2.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP0

6.4.2.2.3 Test purpose

To verify that the Physical Layer function conforms to the above requirements.

Note: CR6, 7, 8, 9 and 10 are tested in the subclause 6.8.

6.4.2.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) Steps b), c) and d) shall be repeated for the all communication speeds supported by the UICC.

b) The ME simulator shall reset the UICC.

c) The ME simulator shall send a PPS-Request to the UICC to select the T=0 protocol and the selected communication speed.

The UICC shall send a valid PPS-Response [CR1].

d) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

e) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI}.

The UICC shall have sent FCP data followed by SW1='90' and SW2='00' – normal ending of the command [CR2].

The following shall be true of the response data:

- *The interval between the leading edge of the start bits of two consecutive characters are at least 12 etus [CR3].*
- *The value of the WWT is not exceed 960 × WI × Fi/f [CR4].*
- *The minimum interval between the leading edges of the start bits of two consecutive characters sent in opposite directions is 16 etus [CR5]*

f) The ME simulator shall reset the UICC.

g) The ME simulator shall send a PPS-Request to the UICC to select the T=0 protocol and the selected communication speed.

h) The ME simulator shall request character repetition (i.e. transmits an error signal during the guard time) to the UICC for all character frames during the ATR.

The UICC shall send the correct ATR with character repetition [CR11].

i) The ME simulator shall send a SELECT command to the UICC to select the MF with incorrect character parity for all character frames.

The UICC shall request character repetition (i.e. transmits an error signal during the guard time) for all character frames [CR11].

j) The ME simulator shall receive the response from the UICC but request character repetition for all character frames.

The UICC shall send the correct FCP with character repetition [CR11].

The following shall be true of the response data:

- *The error is indicated on the I/O-line, which is set to state L after (10,5 ± 0,2) etus after the leading edge of the start bit for the character, and the I/O line shall be in state L for a maximum of 2 etus and a minimum of 1 etu [CR12].*
- *The UICC as receiver detects a parity error within 11 ± 0,2 etus starting from the leading edge of the start bit. In a character just received, it shall set I/O to state L to indicate the error to the sender [CR13].*
- *When the UICC as transmitter detects an error, the character shall be sent again after a minimum delay of 2 etus [CR14].*

6.4.2.3 Transmission Protocol T=1

6.4.2.3.1 Timing and specific options for blocks sent with T=1

This subclause defines conformance tests regarding timing, information file sizes and error detection parameters for blocks sent with T=1.

6.4.2.3.1.1 Information field size

6.4.2.3.1.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.1.2 Conformance requirement

CR1 [31.101-7.2.3.1.1] IFSD shall have a default value of 32 bytes and may be adjusted during the card session.

CR2 [31.101-7.2.3.1.1] The maximum value of the IFSD shall be 254 bytes.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.1

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_TS_IFS

6.4.2.3.1.1.3 Test purpose

To verify that an I-block from the UICC has an INF field of length ≤ IFSD.

6.4.2.3.1.1.4 Method of test

To be defined.

6.4.2.3.1.2 Character waiting integer

6.4.2.3.1.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.2.2 Conformance requirement

CR1 [31.101-7.2.3.1.2] CWI is used to calculate CWT and shall be in the range from 0 to 5.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_ TS_CWI

6.4.2.3.1.2.3 Test purpose

To verify that CWI, as coded in TB3, is in the range from 0 to 5.

6.4.2.3.1.2.4 Method of test

To be defined.

6.4.2.3.1.3 Character waiting time

6.4.2.3.1.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.3.2 Conformance requirement

CR1 [31.101-7.2.3.1.3] CWT is defined as the maximum delay between the leading edges of two consecutive characters in the block Figure 7.3 “T<CWT”.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_ TS_CWT

6.4.2.3.1.3.3 Test purpose

To verify that the maximum delay between two consecutive characters in a block sent by the UICC is CWT.

6.4.2.3.1.3.4 Method of test

To be defined.

6.4.2.3.1.4 Block guard time

6.4.2.3.1.4.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.4.2 Conformance requirement

CR1 [31.101-7.2.3.1.5] The delay between the last character of a block received by the UICC and the first character of the next block sent from the UICC shall be in the interval: BGT < delay < BWT.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.5.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_TS_BGT

6.4.2.3.1.4.3 Test purpose

To verify that, except after an S(WTX request) and S(WTX response), the delay between the last character of a block sent by the Terminal and the first character of a block sent by the UICC is between BGT and BWT.

6.4.2.3.1.4.4 Method of test

To be defined.

6.4.2.3.1.5 Waiting time extension

6.4.2.3.1.5.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.5.2 Conformance requirement

CR1 [31.101-7.2.3.1.6] WTX is a parameter used to ask for more time to process a command.

CR2 [31.101-7.2.3.2.3.3] S(WTX request), a request for an extension of the waiting time.

CR3 [31.101-7.2.3.3] The new allocated time starts at the leading edge of the last character of the S(WTX response).

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.6, 7.2.3.2 and 7.2.3.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_TS_WTE

6.4.2.3.1.5.3 Test purpose

To verify that, after an S(WTX request) and S(WTX response), the maximum delay between the last character of the S(WTX response) and the first character of the next block sent by the UICC is N x BWT.

6.4.2.3.1.5.4 Method of test

To be defined.

6.4.2.3.1.6 Error detection code

6.4.2.3.1.6.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.1.6.2 Conformance requirement

CR1 [31.101-7.2.3.1.7] LRC shall be used (b1=0). All other bits in TCi are RFU and shall be set to 0.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.7.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_TS_EDC

6.4.2.3.1.6.3 Test purpose

To verify that TCi, if present, is equal to 0.

6.4.2.3.1.6.4 Method of test

To be defined.

6.4.2.3.2 Block frame structure

This subclause defines conformance tests regarding the T=1 block structure.

6.4.2.3.2.1 Node address byte

6.4.2.3.2.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.2.1.2 Conformance requirement

CR1 [31.101-7.2.3.2.1.1] Only the default value SAD=DAD=0 shall be supported.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_BFS_NDB

6.4.2.3.2.1.3 Test purpose

To verify that only SAD=DAD=0 is used.

6.4.2.3.2.1.4 Method of test

To be defined.

6.4.2.3.2.2 Information Field

6.4.2.3.2.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.2.2.2 Conformance requirement

CR1 [31.101-7.2.3.2.1.4] The information field, INF, is optional and it depends on the type of the block and what the field will be used for. Table 7.10: Information field – R-block Not used.

CR2 [31.101-7.2.3.2.1.4] The information field, INF, is optional and it depends on the type of the block and what the field will be used for. Table 7.10: S-block – INF shall be present (single byte) to adjust IFS with WTX.

CR3 [31.101-7.2.3.2.1.4] The information field, INF, is optional and it depends on the type of the block and what the field will be used for. Table 7.10: S-block – INF shall be absent to signal error on VPP, or managing chain abortion or resynchronisation.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_BFS_IF

6.4.2.3.2.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.2.2.4 Method of test

To be defined.

6.4.2.3.2.3 Epilogue field

6.4.2.3.2.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.2.3.2 Conformance requirement

CR1 [31.101-7.2.3.2.2] The LRC as defined in ISO/IEC 7816-3 [5] shall be used.

Reference: 3G TS 31.101 [1], subclause 7.2.3.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_BSF_EF

6.4.2.3.2.3.3 Test purpose

To verify that the LRC is calculated correctly.

6.4.2.3.2.3.4 Method of test

To be defined.

6.4.2.3.3 Error free operation

6.4.2.3.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.3.2 Conformance requirement

CR1 [31.101-7.2.3.3] To change the value of IFSD, the terminal sends an S(IFS request). The request shall be acknowledged by the UICC with an S(IFS response) with the same INF. The new IFSD is assumed to be valid as long as no new S(IFS request) has been received by the UICC.

CR2 [31.101-7.2.3.3] If a sender S sends I(N_s(S), 0), the block is acknowledged by the receiver R with an I(N_r(S), M).

CR3 [31.101-7. 2.3.3] If a sender S sends an I(N_s(S), 1), it should be acknowledged by the receiver R with R(N_r®), where N_s(S) ≠ N_r®, to indicate that the received block was correct and that the receiver is ready to receive the next block.

Reference: 3G TS 31.101 [1], subclause 7.2.3.3.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_EFO

6.4.2.3.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.3.4 Method of test

To be defined.

6.4.2.3.4 Error Handling for T=1

This subclause describes a number of conformance tests to test the control of the error handling for the T=1 protocol.

6.4.2.3.4.1 Protocol initialisation

6.4.2.3.4.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.4.1.2 Conformance requirement

CR1 [31.101-7.2.3.4.1] When the protocol has been initiated and the first block received by the UICC is invalid, the UICC responds with a R(0).

Reference: 3G TS 31.101 [1], subclause 7.2.3.4.1

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_EH1

6.4.2.3.4.1.3 Test purpose

To verify that, if the first block received by the UICC is invalid, the UICC responds with R(0).

6.4.2.3.4.1.4 Method of test

To be defined.

6.4.2.3.4.2 Block dependant errors

6.4.2.3.4.2.1 Sending invalid blocks to the UICC

6.4.2.3.4.2.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.4.2.1.2 Conformance requirement

CR1 [31.101-7.2.3.4.2] When an I-block has been sent and … an invalid block has been received (with the terminal), an R-block is sent, which request with its N® for the expected I-block with N(S)=N®.

CR2 [31.101-7.2.3.4.2] When an R-block was sent and an invalid block is received … the R-block shall be resent.

CR3 [31.101-7.2.3.4.2] When an S(…request) has been sent and … the received response is not a S(…response), the S(…request) shall be resent.

CR4 [31.101-7.2.3.4.2] But if an S(…response) has been sent and … an invalid block is received …, an R-block shall be sent.

CR5 [31.101-7.2.3.4.2] When the UICC sends an S(IFS request) and receives an invalid block, the S(IFS request) shall be resent maximum one extra time to receive an S(IFS response). After the second failure to receive an S(IFS response), the UICC shall stay in reception mode.

Reference: 3G TS 31.101 [1], subclause 7.2.3.4.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_EH1_BDE_SIB

6.4.2.3.4.2.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.4.2.1.4 Method of test

To be defined.

6.4.2.3.4.2.2 Receiving invalid blocks from the UICC

6.4.2.3.4.2.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.4.2.2.2 Conformance requirement

CR1 [31.101-7.2.3.4.2] When an I-block has been sent and a BWT time-out occurs or an invalid block has been received, an R-block is sent, which requests with its N® for the expected I-block with N(S)=N®.

CR2 [31.101-7.2.3.4.2] When an R-block was sent and an invalid block is received or BWT time-out, the R-block shall be resent.

CR3 [31.101-7.2.3.4.2] When an S(…request) has been sent and either a BWT time-out occurs or the received response is not a S(…response), the S(…request) shall be resent.

CR4 [31.101-7.2.3.4.2] But if an S(…response) has been sent and either an invalid block is received or a BWT time-out occurs, an R-block shall be sent.

Reference: 3G TS 31.101 [1], subclause 7.2.3.4.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_EH1_BDE_RIB

6.4.2.3.4.2.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.4.2.2.4 Method of test

To be defined.

6.4.2.3.4.2.3 Specific block errors

6.4.2.3.4.2.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.4.2.3.2 Conformance requirement

CR1 [31.101-7.2.3.2.1.2] Table 7.5 (Coding of PCB for an I-block).

CR2 [31.101-7.2.3.2.1.2] Table 7.5 (Coding of PCB for an I-block) (b5-1 of PCB are RFU).

CR3 [31.101-7.2.3.2.1.2] Table 7.6 (Coding of PCB for an R-block) and Table 7.7 (Bit b4-b1 in the PCB-byte for the R-block).

CR4 [31.101-7.2.3.2.1.2] Table 7.8 (Coding of PCB for an S-block) and Table 7.9 (Bits b5-b1 of PCB for an S-block).

CR5 [31.101-7.2.3.2.3.3] A S(request) is always followed by a S(response) block.

CR6 [31.101-7.2.3.2.1.4] Table 7.10 (Information field). i.e. The UICC shall reject an R-block that contains an INF field.

CR7 [31.101-7.2.3.2.1.4] Table 7.10 (Information field). i.e. The UICC shall reject an S(IFS) that contains no INF field or an INF field of length ≠ 1.

CR8 [31.101-7.2.3.2.1.4] Table 7.10 (Information field). i.e. The UICC shall reject an S(ABORT) or an S(RESYNCH) that contains an INF field.

CR9 [31.101-7.2.3.4] The block component of the data link layer shall be able to handle errors like … receiving a block with parity errors.

CR10 [31.101-7.2.3.4] The block component of the data link layer shall be able to handle errors like … receiving a block with an EDC error.

CR11 [31.101-7.2.3.4] The block component of the data link layer shall be able to handle errors like … receiving a block with an invalid length.

CR12 [31.101-7.2.3.4] The block component of the data link layer shall be able to handle errors like, lost synchronisation.

Reference: 3G TS 31.101 [1], subclauses 7.2.3.2 and 7.2.3.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_EH1_BDE_SBE

6.4.2.3.4.2.3.2 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.4.2.3.4 Method of test

To be defined.

6.4.2.3.5 Chaining

6.4.2.3.5.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.2.3.5.2 Conformance requirement

CR1 [31.101-7.2.3.5.1] When the terminal is sender, all I-blocks of a chain shall have LEN = IFSC bytes except for the last, which could have a value in the range of 0 to IFSC.

CR2 [31.101-7.2.3.5.1] When the UICC is the receiver and receives a block with LEN > IFSC, the block shall be rejected and acknowledged with a R-block with bits b1-b4 in the PCB-byte having a value of 2.

CR3 [31.101-7. 2.3.5.1] When the UICC is the receiver and receives a block with LEN > IFSC, the block shall be rejected and acknowledged with a R-block with bits b1-b4 in the PCB-byte having a value of 2.

CR4 [31.101-7.2.3.5] If information longer than IFSC or IFSD is transferred, the information should be divided into pieces, each has a length ≤ IFSC or IFSD. Each piece should be sent in an I-block using the chaining function.

CR5 [31.101-7.2.3.5] The request shall be answered with an S(ABORT response).

CR6 [31.101-7. 2.3.5] The request shall be answered with an S(ABORT response).

Reference: 3G TS 31.101 [1], subclause 7.2.3.5.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_DLL_TP1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_DLL_TP1_CHN

6.4.2.3.5.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.2.3.5.4 Method of test

To be defined.

6.4.3 Transport Layer

6.4.3.1 Transportation of an APDU using T=0

This subclause describes conformance tests relating to the mapping of C-APDUs and R-APDUs for T=0 protocol, the APDU exchange and the use of the GET RESPONSE command for case 2 and case 4 commands.

6.4.3.1.1 Case 1

6.4.3.1.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.1.2 Conformance requirement

CR1 [31.101-7.3.1.1.1] The UICC shall analyse the T=0 command header to determine whether this is a case 1 command or a case 2 command requesting response data of maximum length.

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_C1

6.4.3.1.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.3.1.1.4 Method of test

To be defined.

6.4.3.1.2 Case 2

6.4.3.1.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.2.2 Conformance requirement

CR1 [31.101-7.3.1.1.2] [2 a)] On receipt of the command header the UICC, under normal processing shall return data and status to the Transport Layer of the Terminal.

CR2 [31.101-7.3.1.1.2] [2 b)] On receipt of the command header the UICC, under abnormal processing shall return status only to the Transport Layer of the Terminal.

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_C2

6.4.3.1.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.3.1.2.4 Method of test

To be defined.

6.4.3.1.3 Case 3

6.4.3.1.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.3.2 Conformance requirement

CR1 [31.101-7.3.1.1.3] [2 a)] …to the UICC under the control of procedure bytes returned by the UICC.

CR2 [31.101-7.3.1.1.3] [3] …the UICC shall return status following receipt of the conditional body of the C-APDU and completion of processing the command.

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_C3

6.4.3.1.3.3 Test purpose

To verify that, under normal processing of a case 3 command, the UICC reads the command header, reads the command data under control of procedure bytes and returns status.

6.4.3.1.3.4 Method of test

To be defined.

6.4.3.1.4 Case 4

6.4.3.1.4.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.4.2 Conformance requirement

CR1 [31.101-7.3.1.1.4] [2 a)] … to the UICC under the control of procedure bytes returned by the UICC.

CR2 [31.101-7.3.1.1.4] [3 a)] The UICC, under normal processing, shall return procedure bytes ‘61xx’ to the Transport Layer of the Terminal…

CR3 [31.101-7.3.1.1.4] [3 b)] The UICC, under abnormal processing, shall return status only to the Transport Layer of the Terminal.

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_C4

6.4.3.1.4.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.3.1.4.4 Method of test

To be defined.

6.4.3.1.5 Use of Procedure Bytes '61xx' and '6Cxx'

6.4.3.1.5.1 Case 2 Commands

6.4.3.1.5.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.5.1.2 Conformance requirement

CR1 [31.101-7.3.1.1.5.1] [1 a)]	If the UICC receives a case 2 command header and Le = '00' or Le > Luicc, it shall return procedure bytes '6C Luicc'…
CR2 [31.101-7.3.1.1.5.1] [1 b)]	If the UICC receives a case 2 command header and Le = '00' or Le > Luicc, it shall return status indicating a warning or error condition (but not SW1 SW2 = '90 00').
CR3 [31.101-7.3.1.1.5.1] [1 a), b)]	If the UICC receives a case 2 command header and Le = Luicc, it shall return data of length Le (= Luicc) under the control of the INS, $\overline{\text{INS}}$, or '60' procedure bytes followed by the associated status or procedure bytes '61xx'.
CR4 [31.101-7.3.1.1.5.1] [1 c)]	If the UICC receives a case 2 command header and Le = Luicc, it shall return status indicating a warning or error condition (but not SW1 SW2 = '90 00').
CR5 [31.101-7.3.1.1.5.1] [2 a)]	If the UICC receives a case 2 command header and Le < Luicc it shall return data of length Le under the control of the INS, $\overline{\text{INS}}$, or '60' procedure bytes followed by procedure bytes '61xx'.
CR6 [31.101-7.3.1.1.5.1] [2 b)]	If the UICC receives a case 2 command header and Le < Luicc it shall return status indicating a warning or error condition (but not SW1 SW2 = '90 00').

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.5.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_PB_C2

6.4.3.1.5.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.3.1.5.1.4 Method of test

To be defined.

6.4.3.1.5.2 Case 4 Commands

6.4.3.1.5.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.1.5.2.2 Conformance requirement

CR1 [31.101-7.3.1.1.5.2] [1 a)]	If the UICC receives a case 4 command, after processing the data sent with the C-APDU, it shall return procedure bytes '61 xx'.

CR2 [31.101-7.3.1.1.5.2] [1 b)] If the UICC receives a case 4 command, after processing the data sent with the C-APDU, it shall return status indicating a warning or error condition (but not SW SW2 = '90 00').

Reference: 3G TS 31.101 [1], subclause 7.3.1.1.5.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU0

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU0_PB_C4

6.4.3.1.5.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.4.3.1.5.2.4 Method of test

To be defined.

6.4.3.2 Transportation of an APDU using T=1

This subclause describes conformance tests relating to the transportation of an APDU using the T=1 protocol.

6.4.3.2.1 Case 1

6.4.3.2.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.2.1.2 Conformance requirement

CR1 [31.101-7.3.2.1] Figure 7.10.

Reference: 3G TS 31.101 [1], subclause 7.3.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU1_C1

6.4.3.2.1.3 Test purpose

To verify that, under normal or abnormal processing of a case 1 command, the UICC returns status only.

6.4.3.2.1.4 Method of test

To be defined.

6.4.3.2.2 Case 2

6.4.3.2.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.2.2.2 Conformance requirement

CR1 [31.101-7.3.2.2] Figure 7.11

Reference: 3G TS 31.101 [1], subclause 7.3.2.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU1_C2

6.4.3.2.2.3 Test purpose

To verify that, under normal processing of a case 2 command, the UICC returns data and status and that, under abnormal processing of a case 2 command, the UICC returns status only.

6.4.3.2.2.4 Method of test

To be defined.

6.4.3.2.3 Case 3

6.4.3.2.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.2.3.2 Conformance requirement

CR1 [31.101-7.3.2.3] Figure 7.12

Reference: 3G TS 31.101 [1], subclause 7.3.2.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU1_C3

6.4.3.2.3.3 Test purpose

To verify that, under normal or abnormal processing of a case 3 command, the UICC returns status only.

6.4.3.2.3.4 Method of test

To be defined.

6.4.3.2.4 Case 4

6.4.3.2.4.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.3.2.4.2 Conformance requirement

CR1 [31.101-7.3.2.4] Figure 7.13

Reference: 3G TS 31.101 [1], subclause 7.3.2.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_TL_TAPDU1

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_TL_TAPDU1_C4

6.4.3.2.4.3 Test purpose

To verify that, under normal processing of a case 4 command, the UICC returns data and status and that, under abnormal processing of a case 4 command, the UICC returns status only.

6.4.3.2.4.4 Method of test

To be defined.

6.4.4 Application Layer

6.4.4.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.4.4.2 Conformance requirement

CR1 Each step in an application layer exchange consists of a command-response pair, where the Application Layer of the ME sends a command to the UICC via the Transport Layer of the ME, and the UICC processes it and sends a response to Application Layer of ME using the Transport Layer of the UICC and the Transport Layer of ME.

CR2 Four cases shall be managed by the transmission protocols via the transport layer.

Reference: 3G TS 31.101 [1], subclause 7.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_TP_AL

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TP_AL

6.4.4.3 Test purpose

To verify that the Physical Layer function conforms to the above requirements.

NOTE: CR1 and CR2 are tested implicitly in tests for each UICC commands described in subclause 6.8.

6.4.4.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.5 Application and File structure

The tests in this subclause ensure that the IUT is tested against the specification of the logical structure, for a UICC, the code associated with it, and the structure of the files used.

6.5.1 UICC Application structure

6.5.1.1 Definition and applicability

EF_{DIR} provides the information of the application structure on the UICC in terms of application identifier(s). These application identifier(s) are used to select the relevant application.

6.5.1.2 Conformance requirement

CR1 [31.101-8.1] The UICC shall contain EF_{DIR}.

CR2 [31.101-8.1] EF_{DIR} shall contain application identifier(s) available on the UICC

CR3 [31.101-8.1] The UICC shall contain EF_{PL}.

CR4 [31.101-8.1] The UICC shall contain EF_{ICCID}.

CR5 [31.101-8.1] The UICC shall contain $DF_{TELECOM}$ and the file identifier shall be '7F 10' (optional).

Reference: 3G TS 31.101 [1], subclause 8.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_UAS

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_UAS

6.5.1.3 Test purpose

To verify that the Elementary Files within the UICC application structure conform to the above requirements.

6.5.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{DIR}.

The status condition returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR1].

c) The ME simulator shall send a READ RECORD command to read record 1 of the EF_{DIR}. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b).

d) The ME simulator shall reset a SELECT command to the UICC to select and activate the ADF stated in EF_{DIR} of record 1.

The status condition returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR2].

e) The ME simulator shall reset the UICC.

f) The ME simulator shall send a SELECT command to the UICC to select EF_{PL}.

The status condition returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR3].

g) The ME simulator shall reset the UICC.

h) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

The status condition returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR4].

i) The ME simulator shall reset the UICC.

j) The ME simulator shall send a SELECT command to the UICC to select $DF_{TELECOM}$.

The status condition returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command, if the UICC supports $DF_{TELECOM}$, otherwise the status condition returned by the UICC shall be SW1 = '6A', SW2= '82' – file ID not found [CR5].

6.5.2 File types

6.5.2.1 Dedicated files

6.5.2.1.1 Definition and applicability

Dedicated Files provide a functional grouping of Elementary Files. In this way a structured hierarchy of files can be established on the UICC.

6.5.2.1.2 Conformance requirement

CR1 [31.101-8.2.1] DFs shall be referenced by file identifiers.

CR2 [31.101-8.2.1] The Application DF (ADF) shall be a particular DF contained all the DFs and EFs of the application.

Reference: 3G TS 31.101 [1], subclause 8.2.1

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_FT_DF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_FT_DF

6.5.2.1.3 Test purpose

To verify that the Dedicated Files within the UICC file structure conform to the above requirements.

NOTE: CR1 and CR2 cannot be tested as the SELECT function requires the file ID in order to select the files

6.5.2.1.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.5.2.2 Elementary files

Elementary File structures the way in which information is held on the UICC and provides security on how this information is accessed.

6.5.2.2.1 Transparent EF

6.5.2.2.1.1 Definition and applicability

Transparent Elementary Files structure the way in which information is held in a sequence of bytes format on the UICC and provide means on how this information is accessed.

6.5.2.2.1.2 Conformance requirement

CR1 [31.101-8.2.2.1] The first byte of a transparent EF has the relative address '00 00'.

CR2 [31.101-8.2.2.1] The total data length of the body of an EF with transparent structure shall be indicated in the SELECT response of the EF.

Reference: 3G TS 31.101 [1], subclause 8.2.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_FT_EF_TF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_FT_EF_TF

6.5.2.2.1.3 Test purpose

To verify that the EFs within the UICC file structure conform to the above requirements.

6.5.2.2.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{UST}.

d) The ME simulator shall fulfil the READ access condition of the EF.

e) The ME simulator shall send a READ BINARY command to the UICC. The length used shall be the TLV DO with tag '80' of the response data in step b).

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2].

f) The ME simulator shall send a READ BINARY command with offset '00 01' to the UICC. The length used shall be the TLV DO with tag '80' of the response data in step b).

The status condition returned by the UICC shall indicate an error/warning [CR1, CR2].

6.5.2.2.2 Linear fixed EF

6.5.2.2.2.1 Definition and applicability

Linear fixed Elementary Files structure the way in which information is held in a sequence of the same length of record format on the UICC and provide means on how this information is accessed.

6.5.2.2.2.2 Conformance requirement

CR1 [31.101-8.2.2.2] A linear fixed EF consists of a sequence of records all having the same (fixed) length.

CR2 [31.101-8.2.2.2] The first record shall be record number 1.

CR3 [31.101-8.2.2.2] The length of a record shall indicate in the SELECT response of the EF.

CR4 [31.101-8.2.2.2] The length of a record multiplied by the number of records shall indicate in the SELECT response of the EF.

CR5 [31.101-8.2.2.2] The UICC shall be able to access records within a linear fixed EF using all of the following:

- absolutely using the record number;
- when the record pointer is not set, it shall be possible to perform an action on the first or the last record by using the NEXT or PREVIOUS mode;
- when the record pointer is set it shall be possible to perform an action on this record, the next record (unless the record pointer is set to the last record) or the previous record (unless the record pointer is set to the first record);
- by identifying a record using pattern search.

CR6 [31.101-8.2.2.2] If an action following selection of a record is aborted (e.g. due to an unsuccessful execution of a command), then the record pointer shall remain set at the record at which it was set prior to the action.

Reference: 3G TS 31.101 [1], subclause 8.2.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_FT_EF_LF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_FT_EF_LF

6.5.2.2.2.3 Test purpose

To verify that the EFs within the UICC file structure conform to the above requirements.

NOTE: CR5 and CR6 are tested in subclause 6.8.1.

6.5.2.2.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) The records in EF_{SMS} shall contain the following data:

   First record: '01' for all bytes

3) The data for the remainder of these two records and for all other records (if any) shall be '00'.

Test procedure

a) The ME simulator shall reset the UICC

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{ECC}.

d) The ME simulator shall fulfil the READ access condition of the EF.

e) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

   The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2, CR3].

f) The ME simulator shall send a READ RECORD command using ABSOLUTE mode to the UICC. The record length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b) and the record number shall be the byte 7 in TLV DO with tag '82' of the response data in step b).

   The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR4].

6.5.2.2.3 Cyclic EF

6.5.2.2.3.1 Definition and applicability

Cyclic Elementary Files structure the way in which information is held in a record format with chronological order on the UICC and provide means on how this information is accessed.

6.5.2.2.3.2 Conformance requirement

CR1 [31.101-8.2.2.3] An EF with a cyclic structure consists of a fixed number of records with the same (fixed) length.

CR2 [31.101-8.2.2.3] In this file structure there shall be a link between the last record (n) and the first record.

CR3 [31.101-8.2.2.3] When the record pointer shall be set to the last record n, then the next record shall be record number 1.

CR4 [31.101-8.2.2.3] When the record pointer is set to record 1, then the previous record shall be record number n.

CR5 [31.101-8.2.2.3] The last updated record containing the newest data shall be record number 1, and the oldest data shall be held in record number n.

CR6 [31.101-8.2.2.3] For update operations only PREVIOUS record shall be used.

CR7 [31.101-8.2.2.3] For reading operations, the methods of addressing shall be Next, Previous, Current and Record Number.

CR8 [31.101-8.2.2.3] If an action following selection of a record is aborted (e.g. due to an unsuccessful execution of a command), then the record pointer shall remain set at the record at which it was set prior to the action.

Reference: 3G TS 31.101 [1], subclause 8.2.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_FT_EF_CF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_FT_EF_CF

6.5.2.2.3.3 Test purpose

To verify that the EFs within the UICC file structure conform to the above requirements.

NOTE: CR8 are tested in subclause 6.8.1.

6.5.2.2.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) EF_{ICI} shall have at least 4 records
3) The records in EF_{ICI} shall contain the following data:

   First record: '01' for all bytes

   Second record: '02' for all bytes

   …

   Nth record: N for all bytes

Test procedure

a) The ME simulator shall reset the UICC

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall fulfil the READ access condition of the EF_{ICI}.

d) The ME simulator shall send a SELECT command to the UICC to select EF_{ICI}.

e) The ME simulator shall send a READ RECORD command using NEXT mode with record 1 to the UICC. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

   The response data shall be the data in the first record [CR1].

f) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC. The record length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b).

   The response data shall be the data in the last record [CR1, CR4].

g) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC. The record length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b).

   The response data shall be the data in the first record [CR2, CR3, CR4, CR7].

h) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC. The record length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b).

   The response data shall be the data in the last record [CR4, CR7].

i) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC with 'FF' for all the bytes. The record length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step b) [CR5].

j) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

The response data shall be the new data that has been updated in step j) [CR5].

k) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

The response data shall be the previous data in the second last record [CR5].

l) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode to the UICC with 'FF' for all the bytes. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

The status condition returned by the UICC shall be SW1='69', SW2='81' – command incompatible with file structure [CR6].

m) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC with 'FF' for all the bytes. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

The status condition returned by the UICC shall be SW1='69', SW2='81' – command incompatible with file structure [CR6].

n) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC with 'FF' for all the bytes. The length used shall be that of byte 5 in TLV DO with tag '82' of the response data in step d).

The status condition returned by the UICC shall be SW1='69', SW2='81' – command incompatible with file structure [CR6].

6.5.3 File referencing

6.5.3.1 Definition and applicability

A file identifier is used to identify each specific file. There are a number of rules regarding file ID assignment.

6.5.3.2 Conformance requirement

CR1 [31.101-8.3] A file ID shall be assigned at the time of creation of the file concerned.

CR2 [31.101-8.3] Two files under the same parent shall never have the same ID.

CR3 [31.101-8.3] The immediate children of the current DF, the parent DF or the immediate children of the parent DF shall not have the same FID.

CR4 [31.101-8.3] No two files under the same parent shall have the same SFI.

CR5 [31.101-8.3] The DF name shall be unique within a card.

Reference: 3G TS 31.101 [1], subclause 8.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_FR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_FR

6.5.3.3 Test purpose

To verify that all files within the UICC structure conform to the above requirements.

NOTE 1: CR1 cannot be tested as the SELECT function requires the file ID in order to select files.

NOTE 2: CR2, CR3 and CR5 cannot be tested due to the operation of the SELECT function which should only ever select a single file for a given file ID.

NOTE 3: CR4 cannot be tested due to the operation of commands which supports SFI referencing, they should only ever select a single file for a given SFI.

6.5.3.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.5.4 Methods for selecting a file

6.5.4.1 SELECT by File Identifier Referencing

6.5.4.1.1 Definition and applicability

The ME accesses information on the UICC navigating around the file structure by selecting ADFs, DFs and EFs as required. There are a number of rules regarding which file elements may be selected from a given ADF,DF or EF.

6.5.4.1.2 Conformance requirement

CR1 [31.101-8.4.1] Selection of an ADF, DF or MF shall set the current Directory on the UICC.

CR2 [31.101-8.4.1] After a selection of an ADF, DF or MF, there shall be no current EF.

CR3 [31.101-8.4.1] After a selection of an EF, the current EF shall be set to this EF and the current Directory shall remain the ADF, DF or MF which is the parent of this EF.

CR4 [31.101-8.4.1] Any application specific command shall only be operable if it is specific to the current Directory.

CR5 [31.101-8.4.1] It shall be possible to select the following from the last selected file:

a) any file which is an immediate child of the current Directory

b) any DF which is an immediate child of the parent of the current DF

c) the parent of the current Directory

d) the current DF or ADF

e) the MF

NOTE: Reselection of the last selected file shall be allowed.

CR6 [31.101-8.4.1] It shall be possible to select any of the 'valid selections' in Table 8.1, subclause 8.4.1 of 3G TS 31.101 [1] for each of the 'last selected file' entries.

Reference: 3G TS 31.101 [1], subclause 8.4.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_MSF_SFIR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_MSF_SFIR

6.5.4.1.3 Test purpose

To verify that the UICC conforms to the above requirements with regard to file selection by File Identifier Referencing.

NOTE 1: CR4 cannot be tested as it is outside the scope of the present document.

6.5.4.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a STATUS command to the UICC.

TLV DO with tag '83' of the response data shall indicate that DF_{USIM} is the currently selected directory [CR1].

d) The ME simulator shall send a READ BINARY command using a length of 1 byte to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='86' – command not allowed (no EF selected) [CR2].

e) The ME simulator shall send a SELECT command to the UICC to select EF_{AD}.

TLV DO with tag '83' of the response data shall indicate that EF_{AD} is the currently selected EF [CR3].

f) The ME simulator shall send a STATUS command to the UICC.

TLV DO with tag '83' of the response data shall indicate that DF_{USIM} is the currently selected directory [CR3].

g) Step h) shall be carried out for each line in Table 8.1, subclause 8.4.1 of 3G TS 31.101 [1].

h) Step I) shall be carried out for each one of the 'valid selections' in that line of the table.

i) Steps j) then k) shall be carried out in turn.

j) The ME simulator shall send a SELECT command to the UICC to select the 'last selected file'.

k) The ME simulator shall send a SELECT command to the UICC to select the 'valid selection'.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR6, CR7].

l) The following file IDs shall be used to represent the IDs in the table:

Table 3: Actual File Selection

Table	Actual
MF	MF
ADF1	DF_{USIM}
DF1	$DF_{TELECOM}$
DF4	$DF_{PHONEBOOK}$
EF1	EF_{ICCID}
EF2	EF_{AND}
EF3	EF_{AD}
EF5	EF_{PBR}

NOTE1: When EF_{AND} is not supported by the UICC, any supported EF in $DF_{TELECOM}$ may be chosen.

NOTE2: When EF_{PBR} is not supported by the UICC, any supported EF in $DF_{PHONEBOOK}$ may be chosen.

6.5.4.2 SELECT by Path Referencing

6.5.4.2.1 Definition and applicability

The ME accesses information on the UICC navigating around the file structure by selecting DFs and EFs as required. There are a number of rules regarding which file elements may be selected from a given DF or EF.

6.5.4.2.2 Conformance requirement

CR1 [31.101-8.4.2] It shall be possible to select any of the 'valid selections' in Table 8.2, subclause 8.4.2 of 3G TS 31.101 [1] for each of the 'last selected file' entries, assuming the current ADF has been previously selected.

Reference: 3G TS 31.101 [1], subclause 8.4.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_MSF_SPR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_MSF_SPR

6.5.4.2.3 Test purpose

To verify that the UICC conforms to the above requirements with regard to file selection by Path Referencing.

6.5.4.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) Step c) shall be carried out for each line in Table 8.2, subclause 8.4.2 of 3G TS 31.101 [1].

c) Step d) shall be carried out for each one of the 'example selections' in that line of the table.

d) Steps e) and f) shall be carried out in turn.

e) The ME simulator shall send a SELECT command to the UICC to select the 'last selected DF'.

f) The ME simulator shall send a SELECT command to the UICC to select the 'example selections'.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR2].

6.5.4.3 Short File Identifier

6.5.4.3.1 Definition and applicability

Any EF within a DF can be implicitly selected without giving a SELECT command by applying one of the following commands at the DF or ADF level and giving a Short File Identifier (SFI) as a part of the command:

6.5.4.3.2 Conformance requirement

CR1 [31.101-8.4.3] It shall be possible to use to the following commands.

a) READ RECORD

b) UPDATE RECORD

c) READ BINARY

d) UPDATE BINARY

e) INCREASE

f) SEARCH RECORD

CR2 [31.101-8.4.3] SFI shall be found in the TLV DO with tag '88'.

CR3 [31.101-8.4.3] If TLV DO is absent, the least significant 5 bits of the file identifier shall be used as SFI.

CR4 [31.101-8.4.3] SFI shall not be used in a path as file identifier.

CR5 [31.101-8.4.3] When the READ RECORD command contains a valid SFI, it shall set the file as the current EF and reset the current record pointer. Subsequent records are read with the READ RECORD command without SFI.

CR6 [31.101-8.4.3] When the UPDATE RECORD command contains a valid SFI, it shall set the file as the current EF and reset the current record pointer. Subsequent records are updated with the UPDATE RECORD command without SFI.

CR7 [31.101-8.4.3] When the INCREASE command contains a valid SFI, it shall set the file as the current EF and reset the current record pointer. Subsequent records are increased with the INCREASE command without SFI.

CR8 [31.101-8.4.3] When the SEARCH RECORD command contains a valid SFI, it shall set the file as the current EF and reset the current record pointer. Subsequent records are searched with the SEARCH RECORD command without SFI.

Reference: 3G TS 31.101 [1], subclause 8.4.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_MSF_SFI

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_MSF_SFI

6.5.4.3.3 Test purpose

To verify that the UICC conforms to the above requirements with regard to selection by short file identifier.

NOTE1: CR3 cannot be tested as it requires the information of the SFI.

NOTE2: CR1, CR4, CR5, CR6, CR7 and CR8 are tested in subclause 6.8.1.

6.5.4.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI}.

TLV DO with tag '88' of the response data shall indicate the SFI of the EF_{IMSI} [CR2].

d) The ME simulator shall reset the UICC.

e) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

f) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} with using the SFI in the path.

The status condition returned by the UICC shall indicate an error [CR4].

6.5.5 Application characteristic

6.5.5.1 Explicit Application selection

6.5.5.1.1 Definition and applicability

An application can be selected either explicitly or implicitly referenced. An application shall be explicitly referenced by selecting it with the AID.

6.5.5.1.2 Conformance requirement

CR1 [31.101-8.5.1] A selectable application shall be referenced by a DF name coded on 1 to 16 bytes.

CR2 [31.101-8.5.1] Each name shall be unique within a UICC.

CR3 [31.101-8.5.1] A DF name can be used in the SELECT command to select a selectable application.

Reference: 3G TS 31.101 [1], subclause 8.5.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_AC_EAS

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_AC_EAS

6.5.5.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR3 is tested in the subclause 6.5.5.1

6.5.5.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{DIR}.

c) The ME simulator shall send a READ RECORD command with NEXT mode to the UICC.

The length of the TLV DO with tag '4F' in the response data shall not exceed 16 bytes [CR1]

The TLV DO with tag '4F' in the response data shall not be same with any other TLV DO with tag '4F' of the other records [CR2].

d) Step c) shall be repeated until it reaches the end of file.

e) Following steps f) and g) shall be repeated for each AIDs read in the step c).

f) The ME simulator shall reset the UICC.

g) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the DF/ADF.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command .

The FCP shall contain the following [CR3]:

- *TLV DO with tag 82 shall be '38' or '78'(File Descriptor)*
- *TLV DO with tag 84 shall be the AID of the UICC (DF name – AID)*

6.5.5.2 Application session activation

6.5.5.2.1 Definition and applicability

An application session can be activated by activation procedure after the selection of the application.

6.5.5.2.2 Conformance requirement

CR1 [31.101-8.5.2] The application session is initiated when the ME sends a SELECT command, with the application's AID, indicating in the command parameters that the application shall be activated.

CR2 [31.101-8.5.2] There shall be only one active session on a given logical channel.

Reference: 3G TS 31.101 [1], subclause 8.5.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_AC_ASA

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_AC_ASA

6.5.5.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR2 cannot be tested as it is impossible to investigate the number of applications which are activated in a logical channel.

6.5.5.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command with AID to the UICC to select and activate USIM application.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

6.5.5.3 Application session termination

6.5.5.3.1 Definition and applicability

An application session can be terminated by termination procedure.

6.5.5.3.2 Conformance requirement

CR1 [31.101-8.5.3] An application session shall be terminated if one of the following events occur on the same logical channel that the application session has been previously activated on:

a) implicitly; if a SELECT by DF_{NAME} command with an AID different from the currently active application is performed by the UICC;

b) explicitly; if the application is reselected using the SELECT command indicating in the command parameters that the application shall be terminated;

c) the ME performs a reset of the UICC.

Reference: 3G TS 31.101 [1], subclause 8.5.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_AC_AST

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_AC_AST

6.5.5.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.5.5.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) If no other application than the USIM application exists in the UICC, steps c), d) and e) shall not be carried out.

c) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

d) The ME simulator shall send a SELECT command with AID to the UICC to select and activate an application different from the selected USIM application.

e) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The response data shall contain the following [CR1a]:

TLV DO with tag '84' shall indicate an AID of the selected application different from USIM application.

f) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

g) The ME simulator shall send a SELECT command with AID to the UICC to select and terminate the USIM application.

h) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The TLV DO with tag '83' of response data shall indicate the MF file identifier [CR1b].

i) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

j) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The response data shall contain the following:

- *TLV DO with tag '84' is the AID of the USIM application (DF name - AID)*

k) The ME simulator shall reset the UICC.

l) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The TLV DO with tag '83' of response data shall indicate the MF file identifier [CR1c].

6.5.5.4 Application session reset

6.5.5.4.1 Definition and applicability

An application can be reset using the SELECT command.

6.5.5.4.2 Conformance requirement

CR1 [31.101-8.5.4] An application shall be reset if the application is reselected using the SELECT command indicating in the command parameters that the application shall be activated.

CR2 [31.101-8.5.4] Reset shall initialise the application session activation procedure.

CR3 [31.101-8.5.4] The security status of the application shall be updated according to the application's session activation procedure, as specified by the application.

Reference: 3G TS 31.101 [1], subclause 8.5.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_AC_ASR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_AC_ASR

6.5.5.4.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.5.5.4.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

c) The ME simulator shall send a SELECT command to the UICC with EF_{FPLMN}.

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send an UPDATE BINARY command to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command.

f) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The response data shall contain the following:

- TLV DO with tag '84' is the AID of the USIM application (DF name - AID)

g) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

The status condition returned by the USIM shall be SW1='90', SW2='00' [CR1].

h) The ME simulator shall send a SELECT command to the UICC to select EF_{FPLMN}.

i) The ME simulator shall send an UPDATE BINARY command to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – Security status not satisfied [CR2, CR3].

6.5.5.5 GSM/USIM application interaction and restrictions

6.5.5.5.1 Definition and applicability

Interaction between a GSM session and a USIM session shall be done through the activation procedure.

6.5.5.5.2 Conformance requirement

CR1 [31.101-8.5.5] Activation of a USIM session shall exclude the activation of a GSM session.

CR2 [31.101-8.5.5] Once a USIM application session has been activated, commands sent to the UICC with CLA byte set to 'A0' shall return SW1SW2 '6E 00' (class not supported) to the ME.

CR3 [31.101-8.5.5] Activation of a GSM session shall exclude the activation of a USIM session.

Reference: 3G TS 31.101 [1], subclause 8.5.5.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_AC_GUAIR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_AC_GUAIR

6.5.5.5.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.5.5.5.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a STATUS command with 'A0' as the class byte.

The status condition returned by the UICC shall be SW1 ='6E', SW2 = '00' – class not supported [CR1, CR2].

d) The ME simulator shall reset the UICC.

e) If DF_{GSM} is present in the UICC, the following steps f) and g) shall be carried out.

f) The ME simulator shall send a SELECT command to the UICC to select DF_{GSM}.

g) The ME simulator shall send a STATUS command with '80' as the class byte.

The status condition returned by the UICC shall be SW1 ='6E', SW2 = '00' – class not supported [CR3].

6.5.6 Reservation of file IDs

6.5.6.1 Definition and applicability

In order to accommodate planned and possible future requirements, certain file IDs are considered reserved, and shall not be used in the UICC file structure.

6.5.6.2 Conformance requirement

CR1 [31.101-8.6] The following Application Dedicated File IDs shall be reserved for operational use by UICC:

'7F FF'

CR2 [31.101-8.6] The following Dedicated File IDs shall be reserved for operational use by UICC:

'7F 10', '7F 2X', '7F 80' and '7F 90'

CR3 [31.101-8.6] The following Elementary File IDs shall be reserved for operational use by UICC:

'6F 2X', '6F 3X', '6F 4X' in '7F 10' and '7F 2X';

'5F50' and '5F 3A'

'4F YX', where Y ranges from '2' to 'F' in all 2nd level DFs.

'2F05', '2F06' and '2F 1X' in the MF '3F 00'.

'2F00', '2F01' in the MF '3F00'

CR4 [31.101-8.6] The following Dedicated File IDs shall be reserved for administrative use by UICC:

'7F 4X', '7F 4X', '5F1X' and '5F2X'

CR5 [31.101-8.6] The following Elementary File IDs shall be reserved for administrative use by UICC:

'6F XX' in the DFs '7F 4X'; '4F XX' in the DFs '5F 1X', '5F2X'.

'6F 1X' in the DFs '7F 10', '7F 20', '7F 21';

'4F 1X' in all 2nd level DFs.

'2F EX' in the MF '3F 00';

Reference: 3G TS 31.101 [1], subclause 6.6.

Test Group Reference (TGR): TGR_USIM_TP31.101_AFS_RID

Test Procedure Reference (TPR): TPR_USIM_TP31.101_AFS_RID

6.5.6.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR4 and CR5 cannot be tested as the administrative functionality is outside the scope of this test specification.

6.5.6.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command with AID to the UICC to select and activate USIM application [CR1].

c) The ME simulator shall send a SELECT command using FID '7F FF' to the UICC to select and activate USIM application.

The response data shall contain the following:

- *TLV DO with tag '84' is the AID of the UICC (DF name - AID) shall be the same as in step b) [CR1].*

d) For all possible EFs on the UICC, the ME simulator shall send a SELECT command to the UICC to select each EF in sequence.

For all successful selections, the ID of the selected file shall be one of those in Figure 4.1 and Figure 4.2, subclause 4.7 of 3G TS 31.102 [2] or shall not be one of those listed as reserved for operational use. [CR2, CR3]

6.6 Security features

Two types of UICC are defined in 3G TS 31.101 [1], single application UICC and multi-application UICC. Every application shall conform to the security features defined in 3G TS 31.101 [1].

6.6.1 Supported security features

6.6.1.1 Definition and applicability

The UICC shall be designed to support single and multi-applications. In the case of multi-applications, the security features shall support several level of security requirement.

6.6.1.2 Conformance requirement

For a multi-application capability UICC

CR1 [31.101-9.1] The UICC shall support more than one level 1 user verification requirement (PIN).

CR2 [31.101-9.1] The UICC shall support the use of a universal PIN.

CR3 [31.101-9.1] The UICC shall support access rules defined in security attributes indicated in tag '8B' (i.e. referenced to expanded format).

For a single application UICC

CR4 [31.101-9.1] The UICC shall support one level 1 user verification requirement (PIN) as defined in table 9.3 in 3G TS 31.101 [1].

CR5 [31.101-9.1] The UICC shall have a level 2 user verification requirement (PIN2) on the application level, if assigned.

Reference: 3G TS 31.101 [1], subclause 9.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_SEC1_SSF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_SEC1_SSF

6.6.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR1 cannot be tested as the multi-application capability shall have only one USIM application in Release '99.

6.6.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

For a multi-application capability UICC

a) The ME simulator shall reset the UICC

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true for PS Template DO (tag 'C6') in the response data:

- *TLV DO with tag '83' shall be '11' (Universal PIN), if assigned [CR2].*
- *TLV DO with tag '83' shall be '01' (PIN Application 1) [CR1].*
- *TLV DO with tag '83' shall be '81' (Second PIN Application 2) [CR1], if assigned.*

The response data shall also contain TLV DO with tag '8B' [CR3].

For a single application UICC

a) The ME simulator shall reset the UICC

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true for PS Template DO (tag 'C6') in the response data:

- *TLV DO with tag '83' shall be '01' (PIN) [CR4].*
- *TLV DO with tag '83' shall be '81' (PIN2) [CR5], if assigned.*

c) Step b) shall be repeated for all the ADFs in the UICC.

6.6.2 Security architecture

6.6.2.1 Definition and applicability

The security architecture of the UICC shall conform to ISO/IEC 7816-9 [10]. It sets the access conditions of the ADF/DF and EF in the UICC.

6.6.2.2 Conformance requirement

CR1 [31.101-9.2] The security architecture shall contain the following:

a) security attributes as part of the DF/EF FCP using tag '8B', tag '8C' or tag 'AB'

b) access mode data object (AM_DO) defining for which group/type of command(s) the security condition apply

c) security condition data object (SC_DO) indicating which security related procedures (user PIN verification) shall be satisfied before a command may be performed on a file

d) access rule shall be stored in the EF_{ARR} which may be shared between files in the UICC

CR2 [31.101-9.2] In order to perform commands other than SELECT and STATUS the security condition for the file must be met.

Reference: 3G TS 31.101 [1], subclause 9.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_SEC1_SA

Test Procedure Reference (TPR): TPR_USIM_TP31.101_SEC1_SA

6.6.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR2 is tested in the subclause 6.8.1.

6.6.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The response data shall contain either TLV DO with tag '8B', '8C' or 'AB' [CR1a].

If the TLV DO with tag '8B' is present, the structure shall be the same as stated in subclause 9.2.7of 3G TS 31.101 [1] and the AM_DO and SC_DO shall be stored in EF_{ARR} [CR1d].

If the TLV DO with tag '8C' is present, the AM_DO and SC_DO shall be in a compact format according to ISO/IEC 7816-9 [10] [CR1b, CR1c].

If the TLV DO with tag 'AB' is present, the AM_DO and SC_DO shall be in an expanded format according to ISO/IEC 7816-9 [10] [CR1b, CR1c].

c) The ME simulator shall send a SELECT command to select EF_{ARR} if the TLV DO with tag '8B' is present in the response data returned in step b) [CR1d].

d) The ME simulator shall send a READ RECORD command to read record 1 of EF_{ARR}.

The response data shall contain the AM_DO and SC_DO in an expanded format according to ISO/IEC 7816-9 [10][CR1b, CR1c].

e) Step d) shall be repeated for all the records in EF_{ARR} [CR1d].

6.6.3 Security Environment

6.6.3.1 Definition and applicability

The security environment is a mechanism to specify for the card system the security functions that are available to provide protection to commands for a specific application of the UICC.

6.6.3.2 Conformance requirement

CR1 [31.101-9.3.1] For Release '99 (Card implementation) SE01 (default SE) and SE00 (no authentication method required) are defined.

CR2 [31.101-9.3.1] When the SE00 is active, Universal PIN shall be used if enabled, otherwise no PIN shall be used.

CR3 [31.101-9.3.1] When the SE00 is active, Application PIN shall be disabled or not known.

CR4 [31.101-9.3.1] When the SE01 is active, Application PIN shall be used if enabled, otherwise no PIN shall be used.

CR5 [31.101-9.3.1] A multi-application capability UICC shall support the use of SE00 and SE01 in order to allow application verification requirement to be replaced by the Universal PIN.

CR6 [31.101-9.3.1] The PIN shall map to the SE ID according to table 9.1 of the 3G TS 31.101 [1].

Reference: 3G TS 31.101 [1], subclause 9.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_SEC1_SE

Test Procedure Reference (TPR): TPR_USIM_TP31.101_SEC1_SE

6.6.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.6.3.4 Method of test

NOTE: The following test procedures shall be applicable only to a multi-application capability UICC.

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) SE01 shall be active

3) Application PINs shall be enabled.

4) Universal PIN shall be enabled.

Test procedures

For a multi-application capability UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application [CR1].

The following shall be true of the response data:

- *TLV DO with tag '90' (PIN Status) under TLV DO with tag 'C6' shall indicate that the Application PINs and the Universal Pin are enabled*

- *TLV DO with tag '8B' shall be as follows:*

EF_{ARR} FID	*SE ID1*	*Record No X*	*SE ID2*	*Record No Y*

where SE ID1 and SE ID2 can be either 00 or 01, but SE ID1 shall not be the same as SE ID2.

Record No X and Y are the record number of the EF_{ARR}.

c) The ME simulator shall send a READ RECORD command to read the record number X of EF_{ARR} [CR4].

If SE ID1 is 00, either one of the following shall be true of the response data:

- *The TLV_DO with tag '83' in the SC_DO shall be '11'.*

- *The SC_DO shall be '90 00'*

If SE ID1 is 01, either one of the following shall be true of the response data:

- *The TLV_DO with tag '83' in the SC_DO shall be '01'.*

- *The SC_DO shall be '90 00'*

d) Step c) shall be repeated for record number Y for SE ID2 [CR4].

e) If the TLV_DO with tag 83 is '01' for SE01, steps f) to u) shall be carried out.

f) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

g) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR6].

h) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

i) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '69', SW2 = '82' – security status not satisfied.

j) The ME simulator shall send a VERIFY PIN command using Universal PIN to the UICC.

The response data returned by the UICC shall be SW1 = '63', SW2 = 'C2' – verification failed [CR4].

k) The ME simulator shall send a VERIFY PIN command using PIN Application 1 to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR4].

l) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR4, CR6].

m) The ME simulator shall send a DISABLE PIN command to disable the Universal PIN to the UICC.

n) The ME simulator shall send a DISABLE PIN command to disable the PIN Application 1 to the UICC.

o) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true of the response data:

- *TLV DO with tag '90' (PIN Status) under TLV DO with tag 'C6' shall indicate that the Application PINs and the Universal Pin are disabled.*

p) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

q) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR6]

r) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

s) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR4, CR6].

t) The ME simulator shall send an ENABLE PIN command to enable the Universal PIN to the UICC.

u) The ME simulator shall send an ENABLE PIN command to disable the PIN Application 1 to the UICC.

v) The ME simulator shall send a DISABLE PIN command to disable and indicate the Universal PIN as a replacement of the PIN Application 1 to the UICC [CR5].

w) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true of the response data:

- *TLV DO with tag '90' (PIN Status) under TLV DO with tag 'C6' shall indicate that the PIN Application 1 is disabled and the Universal Pin is enabled [CR2, CR3].*

x) If the TLV_DO with tag 83 is '11' for SE00, steps w) to kk) shall be carried out.

y) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

z) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR6]

aa) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

bb) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '69', SW2 = '82' – security status not satisfied.

cc) The ME simulator shall send a VERIFY PIN command using *PIN Application 1* to the UICC.

The response data returned by the UICC shall be SW1 = '63', SW2 = 'C2' – verification failed [CR2].

dd) The ME simulator shall send a VERIFY PIN command using Universal PIN to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR2].

ee) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR2, CR6].

ff) The ME simulator shall send a DISABLE PIN command to disable the Universal PIN to the UICC.

gg) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true of the response data:

- *TLV DO with tag '90' (PIN Status) under TLV DO with tag 'C6' shall indicate that the PIN Application 1 and the Universal Pin are disabled.*

hh) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

ii) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR6]

jj) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

kk) The ME simulator shall send a READ BINARY command to the UICC.

The response data returned by the UICC shall be SW1 = '90', SW2 = '00' – normal ending of the command [CR2, CR6].

ll) The ME simulator shall send an ENABLE PIN command to disable the Universal PIN to the UICC.

mm) The ME simulator shall send an ENABLE PIN command to disable the *PIN Application 1* to the UICC.

6.6.4 PIN definitions

6.6.4.1 Definition and applicability

Several types of PIN shall exist in the UICC. Different types of the PIN shall be used for different access conditions of the application.

6.6.4.2 Conformance requirement

CR1 [31.101-9.4.1] A multi-application capability UICC shall support the usage of Universal PIN.

CR2 [31.101-9.4.1] The key reference value 11 shall only be reserved for Universal PIN.

CR3 [31.101-9.4.1] The Universal PIN shall be part of the access condition for each UICC application on a multi-application UICC.

CR4 [31.101-9.4.1] In case of a single application capability UICC the Universal PIN shall not be used.

CR5 [31.101-9.4.2] An application PIN shall be used based on which application it is assigned.

CR6 [31.101-9.4.3] A local PIN shall only be valid within the ADF/DF except $DF_{TELECOM}$ where it is indicated in the FCP.

Reference: 3G TS 31.101 [1], subclause 9.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_SEC1_PIND

Test Procedure Reference (TPR): TPR_USIM_TP31.101_SEC1_PIND

6.6.4.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR3 is tested in subclause 6.6.3.

6.6.4.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

For a multi-application capability UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The response data shall contain PS Template DO with tag 'C6'.

The following shall be true of the PS Template DO:

- *One of the TLV DO with tag 83 shall be '11' indicating the key reference value for Universal PIN, if assigned [CR1, CR2].*
- *One of the TLV DO with tag 83 shall be '01' indicating the key reference value for PIN Application 1 [CR5].*
- *One of the TLV DO with tag 83 shall be '81' indicating the key reference value for second Application/local PIN except $DF_{TELECOM}$ [CR6].*

For a single application UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The response data shall contain PS Template DO with tag 'C6'.

The following shall be true of the PS Template DO:

- *Any of the TLV DO with tag 83 shall not be '11' indicating the key reference value for Universal PIN [CR4].*
- *One of the TLV DO with tag 83 shall be '01' indicating the key reference value for PIN Application 1 [CR5].*
- *One of the TLV DO with tag 83 shall be '81' indicating the key reference value for second Application/local PIN except $DF_{TELECOM}$. [CR6].*

c) Step b) shall be repeated for the remaining ADF/DFs.

6.6.5 PIN and key reference relationship

6.6.5.1 Definition and applicability

The relationship between the user verification requirement PIN and the referencing to a PIN in the commands VERIFY, CHANGE, DISABLE/ENABLE, and UNBLOCK is defined in the subclause 9.5 of 3G TS 31.101 [1].

6.6.5.2 Conformance requirement

CR1 [31.101-9.5.1]	For access condition ALWAYS, the command shall be performed without any restriction.
CR2 [31.101-9.5.1]	For access condition PIN, the command shall only be possible if the relevant application PIN is verified successfully.
CR3 [31.101-9.5.1]	For access condition Second PIN, the command shall only be possible if the relevant application PIN2 is verified successfully.
CR4 [31.101-9.5.1]	For access condition NEVER, the command shall not be possible over the UICC/ME interface.
CR5 [31.101-9.5.2]	The status of a PIN shall be stored in the PS Template DO with tag 'C6' and it shall be indicated in the FCP in a response to the SELECT and STATUS command.
CR6 [31.101-9.5.2]	The usage qualifier data object shall be empty or absent in the PS Template DO to indicate that Universal PIN is not supported in the single application capability UICC.

Reference: 3G TS 31.101 [1], subclause 9.5.

Test Group Reference (TGR): TGR_USIM_TP31.101_SEC1_PKRR

Test Procedure Reference (TPR): TPR_USIM_TP31.101_SEC1_PKRR

6.6.5.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: Allocation of ADM levels and the respective requirements for their fulfilment are the responsibility of the appropriate administrative authority.

6.6.5.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) EF_{FDN} shall be present and not invalidated.

Test procedure

For a multi-application capability UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The response data shall indicate the PS Template DO with tag 'C6' [CR5].

The PS Template DO with tag 'C6' shall contain TLV DO with tag '95' indicating the usage qualifier[CR.6].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1].

c) The ME simulator shall send a STATUS command to the UICC.

The response data shall indicate the PS Template DO with tag 'C6' [CR5]

The PS Template DO with tag 'C6' shall contain a TLV DO with tag '95' indicating the usage qualifier[CR.6].

d) The ME simulator shall send a SELECT command to the UICC to select EF_{FDN}.

The response data shall contain the PS Template DO with tag 'C6' and the status of the Universal PIN, PIN Application 1 and second PIN Application 2 shall be enabled [CR5].

The PS Template DO with tag 'C6' shall contain a TLV DO with tag '95' indicating the usage qualifier [CR.6].

e) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR2].

f) The ME simulator shall gain PIN Application 1 security access.

g) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2].

h) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR3].

i) The ME simulator shall gain the second PIN Application 2 security access.

j) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

k) The ME simulator shall send a SELECT command to the UICC to select MF.

l) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

m) The ME simulator shall send a READ BINARY command to the UICC to read the byte in the EF_{ICCID}.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

n) The ME simulator shall send an UPDATE BINARY command to the UICC to update the byte in EF_{ICCID}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR4].

o) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

p) The ME simulator shall send a DISABLE PIN command to disable and indicate the Universal PIN as a replacement of the PIN Application 1 to the UICC.

q) The ME simulator shall send a SELECT command to the UICC to select EF_{FDN}.

r) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR2].

s) The ME simulator shall gain Universal PIN security access.

t) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2].

u) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR3].

v) The ME simulator shall gain the second PIN Application 2 security access.

w) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

x) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

y) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

z) The ME simulator shall send a READ BINARY command to the UICC to read the byte in the EF_{ICCID}.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

aa) The ME simulator shall send an UPDATE BINARY command to the UICC to update the byte in EF_{ICCID}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR4].

bb) The ME simulator shall send an ENABLE PIN command to enable PIN Application 1 to the UICC.

For a single application UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The response data shall indicate the PS Template DO with tag 'C6' [CR5].

The PS Template DO with tag 'C6' shall not contain TLV DO with tag '95' indicating the usage qualifier[CR.6].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1].

c) The ME simulator shall send a STATUS command to the UICC.

The response data shall indicate the PS Template DO with tag 'C6' [CR5]

The PS Template DO with tag 'C6' shall not contain a TLV DO with tag '95' indicating the usage qualifier[CR.6].

d) The ME simulator shall send a SELECT command to the UICC to select EF_{FDN}.

The response data shall contain the PS Template DO with tag 'C6' and the status of the PIN and PIN2 shall be enabled [CR5].

The PS Template DO with tag 'C6' shall not contain a TLV DO with tag '95' indicating the usage qualifier [CR.6].

e) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR2].

f) The ME simulator shall gain PIN security access.

g) The ME simulator shall send a READ RECORD command to the UICC to read the first record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2].

h) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR3].

i) The ME simulator shall gain the PIN2 security access.

j) The ME simulator shall send an UPDATE RECORD command to the UICC to update record in EF_{FDN}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

k) The ME simulator shall send a SELECT command to the UICC to select MF.

l) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

m) The ME simulator shall send a READ BINARY command to the UICC to read the byte in the EF_{ICCID}.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

n) The ME simulator shall send an UPDATE BINARY command to the UICC to update the byte in EF_{ICCID} with the byte read in step c).

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR4].

6.7 Structure of commands and responses

The tests in this subclause ensure that the IUT conforms to the specification for the mapping of functions onto Application Protocol Data Units (APDUs) which are used by the transmission protocol.

6.7.1 Mapping principles

6.7.1.1 Definition and applicability

The transmission protocol requires that the command and response Application Protocol Data Units (APDUs) are mapped using certain principles, in order to ensure correct operation in the 3G environment.

6.7.1.2 Conformance requirement

CR1 [31.101-10.1] The command APDU shall have format (CLA, INS, P1, P2 {, Lc, Data}{, Le}).

CR2 [31.101-10.2] The response APDU shall have format ({data,} SW1, SW2).

CR3 [31.101-10.1.1] The class 'AX', '8X' and '0X' shall be accepted by the UICC.

Reference: TS 3G 31.101, subclause 10.1 and 10.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_CS_MP

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CS_MP

6.7.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.7.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select MF with P2='04'.
[Bytes sent: CLA='00', INS='A4', P1='00', P2='04', Lc='02', data='3F 00', Le='00' (Case 4)]
[Bytes received: data, SW1, SW2]

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1, CR2, CR3].

c) The ME simulator shall send a SELECT command to the UICC to select MF with P2='0C'.
[Bytes sent: CLA='00', INS='A4', P1='00', P2='0C', Lc='02', data='3F 00' (Case 3)]
[Bytes received: data, SW1, SW2] UICC with P2='00'.
[Bytes sent: CLA='80', INS='F2', P1='00', P2='00', Le='00'

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1, CR2, CR3].

d) The ME simulator shall send a STATUS command to the (Case 2)]
[Bytes received: data, SW1, SW2]

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1, CR2, CR3].

e) The ME simulator shall send a STATUS command to the UICC.
[Bytes sent: CLA='80', INS='F2', P1='00', P2='0C' (Case 1)]
[Bytes received: SW1, SW2]

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1, CR2, CR3].

f) Steps b) to e) shall be repeated for DF_{GSM} with CLA='A0' using coding of the commands defined in GSM 11.11 [13] and check whether the appropriate response data are returned with SW1='90', SW2='00', if it is supported [CR3]

6.7.2 Response APDU Structure

6.7.2.1 Status Conditions Returned by the UICC

6.7.2.1.1 Definition and applicability

The status words SW1 and SW2 provide the method with which the UICC can respond to the ME after executing a command.

6.7.2.1.2 Conformance requirement

CR1 [31.101-10.2.1.1] The UICC shall respond with the appropriate SW1 and SW2 status words for commands which are correctly executed.

CR2 [31.101-10.2.1.3] The UICC shall respond with the appropriate SW1 and SW2 status words for commands which produce warnings.

CR3 [31.101-10.2.1.4] The UICC shall respond with the appropriate SW1 and SW2 status words for commands which produce execution errors.

CR4 [31.101-10.2.1.5] The UICC shall respond with the appropriate SW1 and SW2 status words for commands which produce checking errors.

CR5 [31.101-10.2.1.6] The UICC shall respond with the appropriate SW1 and SW2 status words for commands which produce application errors.

Reference: 3G TS 31.101 [1], subclause 10.2.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_CS_RS_SC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CS_RS_SC

6.7.2.1.3 Test purpose

To verify that the UICC conforms to the above requirements when issuing SW1 and SW2 status words.

6.7.2.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) EF_{AND} on the UICC is not invalidated.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' or SW1='91', SW2='XX' - normal ending of the command, if USAT is supported [CR1]

c) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

d) The ME simulator shall send a READ BINARY command without SFI referencing to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='86' - command not allowed (no EF selected) [CR4].

e) The ME simulator shall send a SELECT command to the UICC to select EF_{LOCI}.

f) The ME simulator shall send a READ BINARY command with Le = 'FF' to the UICC.

The status condition returned by the UICC shall be SW1='62', SW2='82' - end of file/record reached before reading Le bytes [CR2].

g) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

h) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

i) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' - record not found [CR4].

j) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'AA' (1 byte).

The status condition returned by the UICC shall be SW1='67', SW2='00' - wrong length [CR4].

k) The ME simulator shall send a READ BINARY command using a length of 1 byte to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='81' – command incompatible with file structure [CR4].

l) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' – security status not satisfied.

m) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' – security status not satisfied.

n) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' – security status not satisfied.

o) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' – authentication method blocked.

p) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

q) The ME simulator shall send a READ RECORD command using P2='01' to the UICC.

The status condition returned by the UICC shall be SW1='6B', SW2='00' – wrong parameter(s) P1 - P2, or SW1='6A', SW2='86' - incorrect parameter P1 or P2 [CR4].

r) The ME simulator shall send the following APDU to the UICC.
[Bytes sent: CLA='00', INS='6F', P1='00', P2='00', P3='00']

The status condition returned by the UICC shall be SW1='6D', SW2='00' - instruction code not supported or invalid [CR4].

s) The ME simulator shall send a GET RESPONSE command to the UICC.

The status condition returned by the UICC shall be SW1='6F', SW2='XX' - technical problem, no precise diagnosis [CR4].

t) The ME simulator shall send the following APDU to the UICC.
[Bytes sent: CLA='40', INS='C0', P1='00', P2='00', P3='00']

The status condition returned by the UICC shall be SW1='6E', SW2='00' – class not supported [CR4].

u) The ME simulator shall send a STATUS command with CLA= '81' to the UICC.

The status condition returned by the UICC shall be SW1='68', SW2='81' – logical channel not supported [CR4].

v) The ME simulator shall send a STATUS command with CLA= '84' to the UICC.
[Bytes sent: CLA='01', INS='84', P1='00', P2='00', Le='02']

The status condition returned by the UICC shall be SW1='68', SW2='82' – secure messaging not supported [CR4].

x) The ME simulator shall reset the UICC.

y) The ME simulator shall send a SELECT command with an incorrect file ID to the UICC.
[Bytes sent: CLA='01', INS='A4', P1='00', P2='00', Lc='02', data='12 34']

The status condition returned by the UICC shall be SW1='6A', SW2='82' – file not found [CR4].

z) The ME simulator shall send a SELECT command to the UICC to select EF_{ICCID}.

aa) The ME simulator shall send an UPDATE BINARY command to the UICC. The data used shall be '00 00'.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR5]

SW1	SW2	Description	CR	TP
'90'	'00'	- Normal ending of the command	CR1	b)
'91'	'XX'	- Normal ending of the command, with extra information from the proactive UICC containing a command for the ME. Length 'XX' of the response data	SAT	
SW1	**SW2**	**Error description**		
'93'	'00'	- SIM Application Toolkit is busy. Command cannot be executed at present, further normal commands are allowed.	SAT	
SW1	**SW2**	**Description**		
'62'	'00'	- No information given, state of non volatile memory unchanged	CR2	N/A
'62'	'81'	- Part of returned data may be corrupted	CR2	N/A
'62'	'82'	- End of file/record reached before reading Le bytes	CR2	f)
'62'	'83'	- Selected file invalidated	CR2	o)
'62'	'84'	- FCI not formatted according to chapter 11.1.3.1	CR2	
'63'	'00'	- No information given, state of non volatile memory changed	CR2	N/A
'63'	'81'	- File filled up by the last write	CR2	
'63'	'CX'	- Command successful but after using an internal update retry routine 'X' times - Verification failed, 'X' retries remaining	CR2	- l), m), n)
SW1	**SW2**	**Description**		
'64'	'00'	- No information given, state of non-volatile memory unchanged	CR3	N/A
'65'	'00'	- No information given, state of non-volatile memory changed	CR3	N/A
'65'	'81'	- Memory problem		N/A
SW1	**SW2**	**Description**		
'67'	'XX'	- Wrong length	CR4	j)
'6B'	'00'	- Wrong parameter(s) P1-P2	CR4	q)
'6D'	'00'	- Instruction code not supported or invalid	CR4	r)
'6E'	'00'	- Class not supported	CR4	t)
'6F'	'XX'	- Technical problem, no precise diagnosis	CR4	s)
SW1	**SW2**	**Description**		
'68'	'00'	- No information given	CR4	
'68'	'81'	- Logical channel not supported	CR4	u)
'68'	'82'	- Secure messaging not supported	CR4	v)
SW1	**SW2**	**Description**		
'69'	'00'	- No information given	CR4	
'69'	'81'	- Command incompatible with file structure	CR4	k)
'69'	'82'	- Security status not satisfied	CR4	z)
'69'	'83'	- Authentication method blocked	CR4	
'69'	'84'	- Referenced data invalidated	CR4	
'69'	'85'	- Conditions of used not satisfied	CR4	
'69'	'86'	- Command not allowed (no EF selected)	CR4	d)
SW1	**SW2**	**Description**		
'6A'	'80'	- Incorrect parameters in the data field	CR4	
'6A'	'81'	- Function not supported	CR4	
'6A'	'82'	- File not found	CR4	x)
'6A'	'83'	- Record not found	CR4	i)
'6A'	'84'	- Not enough memory space in the file	CR4	
'6A'	'85'	- Lc inconsistent with TLV structure	CR4	
'6A'	'86'	- Incorrect parameters P1-P2	CR4	q)
'6A'	'87'	- Lc inconsistent with P1-P2	CR4	
'6A'	'88'	- Referenced data not found	CR4	
SW1	**SW2**	**Error description**		
'98'	'50'	- INCREASE cannot be performed, max value reached.	CR5	
'98'	'62'	- Authentication error, application specific	CR5	

6.7.2.3 Status Words of the Commands

6.7.2.3.1 Definition and applicability

Limiting the status conditions for each command to a defined set allows the ME to efficiently manage the handling of the status condition.

6.7.2.3.2 Conformance requirement

CR1 [31.101-10.2.2] Table 10.16 in 3G TS 31.101 [1], subclause 10.2.2 shows for each command the possible status conditions returned (marked by an asterisk *). The UICC shall not generate status conditions other than those allowed for each command.

Reference: 3G TS 31.101 [1], subclause 10.2.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_CS_RS_SW

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CS_RS_SW

6.7.2.3.3 Test purpose

To verify for each command that the UICC only generates the allowed status conditions.

NOTE: The CR1 is tested in the subclause 6.7.2 and subclause 6.8.1

6.7.2.3.4 Method of test

Initial conditions

N/A

Test procedure

N/A

6.8 Commands

6.8.1 Generic Commands

6.8.1.1 SELECT

6.8.1.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.1.2 Conformance requirement

CR1 [31.101-11.1.1] This function shall select a file according to the methods described in subclause 8.4 of 3G TS 31.101 [1].

CR2 [31.101-11.1.1] The function shall accept as an input;

a) a file ID (FID)

b) an application ID (AID)

c) a path

d) empty

CR3 [31.101-11.1.1] If the selected file is the MF or a DF, then the function shall output the file descriptor, file identifier, UICC characteristics, life cycle status integer, security attributes and PIN status.

CR4 [31.101-11.1.1] If the selected file is the a ADF, then the function shall output the file descriptor, DF name, UICC characteristics, life cycle status integer, security attributes and PIN status.

CR5 [31.101-11.1.1] If the selected file is an EF, then the function shall output the file descriptor ,file identifier, UICC characteristics, security attributes, life cycle status integer and file size.

CR6 [31.101-11.1.1] After a successful selection the record pointer shall be undefined.

CR7 [31.101-11.1.1] If P2='0C' the function shall output only SW1 and SW2.

Reference: 3G TS 31.101 [1], subclause 11.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_SEL

6.8.1.1.3 Test purpose

To verify that the SELECT function conforms to the above requirements for the different file types available.

NOTE: CR1 is tested in subclause 6.5.4.

6.8.1.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select $DF_{TELECOM}$.

The status returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR2a].

The FCP shall contain the following tags [CR3];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' or '78' (indicating a DF or ADF)

- *Tag '83' (File Identifier)*

  The value shall be '7F 10' (indicating $DF_{TELECOM}$)

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*

- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*

- *Tag 'AB' (Expanded format)*

- *Tag '8B' (Referenced to Expanded Format)*

c) The ME simulator shall send a SELECT command to the UICC to select the MF.

The status returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR2a].

The FCP shall contain the following tags [CR3];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' or '78' (indicating a DF or ADF)
- *Tag '83' (File Identifier)*

  The value shall be '3F 00' (indicating MF)
- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)
- *Tag '8A' (Life Cycle Status Integer)*
- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

d) The ME simulator shall send a SELECT command to the UICC to select EF_{DIR}.

The status returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR2a].

The FCP shall contain the following tags [CR5];

- *Tag '82' (File Descriptor)*

  The value shall be '02' or '42' (indicating a linear fixed EF)

  The length shall be '05' (i.e. containing record length etc)
- *Tag '83' (File Identifier)*

  The value shall be '2F 00' (indicating EF_{DIR})
- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)
- *Tag '8A' (Life Cycle Status Integer)*
- *Tag '80' (File size)*

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

e) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The status returned by the UICC shall be SW1='6A', SW2='83' - Record not found [CR6].

f) The ME simulator shall send a SELECT command with P2='0C' to the UICC to select the MF.

The response from the UICC shall be only SW1='90', SW2='00' – normal ending of the command [CR7].

g) The ME simulator shall send a SELECT command to the UICC to select the EF_{ARR} under $DF_{TELECOM}$ by path selection.

The response from the UICC shall be only SW1='90', SW2='00' – normal ending of the command.

The TLV DO with Tag '83' in the FCP shall indicate the current EF is EF_{ARR} [CR2c]

h) The ME simulator shall send a SELECT command to the UICC to select the parent DF.

The response from the UICC shall be only SW1='90', SW2='00' – normal ending of the command.

The TLV DO with Tag '83' in the FCP shall indicate the current DF is MF [CR2d]

i) The ME simulator shall send a SELECT command with AID to the UICC to select and activate the USIM application.

The status returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR2b].

The FCP shall contain the following tags [CR4];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' or '78' (indicating a DF or ADF)

- *Tag '84' (DF name - AID)*

  The value shall be the AID of the USIM application

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*

- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*

- *Tag 'AB' (Expanded format)*

- *Tag '8B' (Referenced to Expanded Format)*

6.8.1.2 STATUS

6.8.1.2.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.2.2 Conformance requirement

CR1 [31.101-11.1.2] If the parameter P2 is '00', then the STATUS function shall output the FCP of the currently selected MF, DF or ADF.

CR2 [31.101-11.1.2] If the parameter P2 is '01', then the STATUS function shall output the DF_{NAME} TLV DO of the currently selected ADF.

CR3 [31.101-11.1.2] If the parameter P2 is '0C', then the STATUS function shall output only SW1 and SW2.

Reference: 3G TS 31.101 [1], subclause 11.1.2.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_STATUS

6.8.1.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

6.8.1.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a STATUS command with P2='00' to the UICC.

The FCP shall contain the following tags [CR1];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' (indicating a DF)

- *Tag '83' (File Identifier)*

  The value shall be '3F 00' (indicating MF)

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*

- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

c) The ME simulator shall send a SELECT command to select $DF_{TELECOM}$.

d) The ME simulator shall send a STATUS command with P2=00 to the UICC.

The FCP shall contain the following tags [CR1];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' (indicating a DF)

- *Tag '83' (File Identifier)*

  The value shall be '7F 10' (indicating $DF_{TELECOM}$)

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*

- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

e) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The response data returned by the UICC shall be SW1 = '6A', SW2 = '82' – file not found [CR2].

f) The ME simulator shall send a SELECT command to the UICC to select and activate the USIM application.

g) The ME simulator shall send a STATUS command with P2='00' to the UICC.

The FCP shall contain the following tags [CR1];

- *Tag '82' (File Descriptor)*

  The first byte shall be '78' (indicating an ADF)

- *Tag '84' (DF name - AID)*

  The value shall be the AID of the USIM application

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*
- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

h) The ME simulator shall send a SELECT command to the UICC to select the $DF_{PHONEBOOK}$.

i) The ME simulator shall send a STATUS command with P2='00' to the UICC.

The FCP shall contain the following tags [CR1];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' (indicating a DF)

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*
- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

j) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The following shall be true of the response data [CR2]:

Value of tag '84' shall be the AID of the USIM application.

k) The ME simulator shall send a STATUS command with P2='0C' to the UICC.

The following shall be true of the response data [CR3]:

- *The response data from the UICC shall be only SW1='90', SW2='00' – normal ending of the command [CR3].*

l) The ME simulator shall send a SELECT command to select $DF_{TELECOM}$.

m) The ME simulator shall send a STATUS command with P2=00 to the UICC.

The FCP shall contain the following tags [CR1];

- *Tag '82' (File Descriptor)*

  The first byte shall be '38' (indicating a DF)

- *Tag '83' (File Identifier)*

  The value shall be '7F 10' (indicating $DF_{TELECOM}$)

- *Tag 'A5' (Proprietary information)*

  It shall contain tag '80' (UICC characteristics)

- *Tag '8A' (Life Cycle Status Integer)*
- *Tag 'C6' (PIN Status Template DO)*

  It shall contain tag '90' (PS_DO)

The FCP shall contain exactly one of the following tags;

- *Tag '8C' (Compact format)*
- *Tag 'AB' (Expanded format)*
- *Tag '8B' (Referenced to Expanded Format)*

n) The ME simulator shall send a STATUS command with P2='01' to the UICC.

The following shall be true of the response data [CR2]:

Value of tag '84' shall be the AID of the USIM application.

6.8.1.3 READ BINARY

6.8.1.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.3.2 Conformance requirement

CR1 [31.101-11.1.3] The READ BINARY function shall read a string of bytes from the current transparent EF.

CR2 [31.101-11.1.3] The function shall accept as an input, the relative address (offset) and the length (in bytes) of the string.

CR3 [31.101-11.1.3] The function shall output the string of bytes.

CR4 [31.101-11.1.3] The function shall only be performed if the READ access condition for the current EF is satisfied.

CR5 [31.101-11.1.3] The function shall accept SFI referencing.

CR6 [31.101-11.1.3] The function shall be aborted if it is applied to an EF without transparent structure.

Reference: 3G TS 31.101 [1], subclause 11.1.3.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_RDBIN

6.8.1.3.3 Test purpose

To verify that the READ BINARY function conforms to the above requirements.

6.8.1.3.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) EF_{LOCI} shall contain the data string: 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00'.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select the USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{LOCI}.

d) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR4].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC to gain the access condition for EF_{LOCI}.

f) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1-CR4].

The data string returned shall be 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00' [CR1- CR4].

g) The ME simulator shall send a READ BINARY command using a length of 1 byte to the UICC.

The data string returned shall be 'A1' [CR2].

h) The ME simulator shall send a READ BINARY command using an offset of '00 01' and length 10 bytes to the UICC.

The data string returned shall be 'A2 A3 A4 A5 A6 A7 A8 A9 00 00' [CR2].

i) The ME simulator shall send a SELECT command to the UICC to select EF_{Keys}.

j) The ME simulator shall send a READ BINARY command using SFI reference to select EF_{LOCI} and length 11 bytes to the UICC.

The data string returned shall be 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00' [CR3, CR5].

k) The ME simulator shall send a SELECT command to the UICC to select MF.

l) The ME simulator shall send a SELECT command to the UICC to select EF_{DIR}.

m) The ME simulator shall send a READ BINARY command using a length of 1 byte to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='81' - command incompatible with file structure [CR6].

6.8.1.4 UPDATE BINARY

6.8.1.4.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.4.2 Conformance requirement

CR1 [31.101-11.1.4] The UPDATE BINARY function shall update the current transparent EF with a string of bytes.

CR2 [31.101-11.1.4] The function shall accept as an input, the relative address (offset), the length (in bytes) of the string, and the string of bytes.

CR3 [31.101-11.1.4] The function shall only be performed if the UPDATE access condition for the current EF is satisfied.

CR4 [31.101-11.1.4] The function shall accept SFI referencing.

CR5 The function shall be aborted if it is applied to an EF without transparent structure.

Reference: 3G TS 31.101 [1], subclause 11.1.4.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_UPBIN

6.8.1.4.3 Test purpose

To verify that the UPDATE BINARY function conforms to the above requirements.

6.8.1.4.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) EF_{LOCI} shall contain the data string: 'FF FF FF FF FF FF FF FF FF 00 00'.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{LOCI} under $DF_{USIM.}$

c) The ME simulator shall send an UPDATE BINARY command using a length of 11 bytes, and data string 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR3].

d) The ME simulator shall send a VERIFY PIN command to the UICC to gain the access condition for the EF_{LOCI}.

e) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the *UICC*.

The data string returned shall be 'FF FF FF FF FF FF FF FF FF 00 00'.

f) The ME simulator shall send an UPDATE BINARY command using a length of 11 bytes, and data string 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00' to the *UICC*.

The status condition returned by the UICC shall be SW1='90', SW2='00' [CR3].

g) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the *UICC*.

The data string returned shall be 'A1 A2 A3 A4 A5 A6 A7 A8 A9 00 00' [CR1].

h) The ME simulator shall send an UPDATE BINARY command using a length of 1 byte, and data string 'E4' to the UICC.

i) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the *UICC*.

The data string returned shall be 'E4 A2 A3 A4 A5 A6 A7 A8 A9 00 00' [CR1].

j) The ME simulator shall send an UPDATE BINARY command using an offset of '00 01', a length 1 byte, and data string 'E5' to the *UICC*.

k) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the *UICC*.

The data string returned shall be 'E4 E5 A3 A4 A5 A6 A7 A8 A9 00 00' [CR1, CR2].

l) The ME simulator shall send a SELECT command to the UICC to select EF_{Keys}.

m) The ME simulator shall send an UPDATE BINARY command using SFI reference to select EF_{LOCI} and a length 1 byte, and string 'D1' to the UICC.

n) The ME simulator shall send a READ BINARY command using a length of 11 bytes to the UICC.

The data string returned shall be 'D1 E5 A3 A4 A5 A6 A7 A8 A9 00 00' [CR1, CR4].

o) The ME simulator shall send a SELECT command to the UICC to select EF_{DIR}.

p) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

q) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

r) The ME simulator shall send an UPDATE BINARY command using a length 1 byte and data string 'D2' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='81' - command incompatible with file structure [CR6].

6.8.1.5 READ RECORD

6.8.1.5.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.5.2 Conformance requirement

CR1 [31.101-11.1.5] The READ RECORD function shall read one complete record in the current linear fixed or cyclic EF.

CR2 [31.101-11.1.5] The function shall accept as an input, the mode, record number if absolute mode, and the length of the record.

CR3 [31.101-11.1.5] The function shall output the record specified by the mode.

CR4 [31.101-11.1.5] The function shall only be performed if the READ access condition for the current EF is satisfied.

CR5 [31.101-11.1.5] If the mode is CURRENT, the current record *shall be* read.

CR6 [31.101-11.1.5] If the mode is CURRENT, the record pointer shall not affected.

CR7 [31.101-11.1.5] If the mode is ABSOLUTE, the record given by the record number *shall be* read.

CR8 [31.101-11.1.5] If the mode is ABSOLUTE, the record pointer shall not be affected.

CR9 [31.101-11.1.5] If the mode is NEXT, the record pointer *shall be* incremented before the function is performed and the pointed record *shall be* read.

CR10 [31.101-11.1.5] If the mode is NEXT, and the record pointer has not been previously been set within the selected EF, the **first** record shall be read and the record pointer *shall be* set to this record.

CR11 [31.101-11.1.5] If the mode is NEXT, and the record pointer addresses the last record in a linear fixed EF, the record pointer shall not change and no data shall be read.

CR12 [31.101-11.1.5] If the mode is NEXT, and the record pointer addresses the last record in a cyclic EF, the **first** record shall be read and the record pointer *shall be* set to this record.

CR13 [31.101-11.1.5] If the mode is PREVIOUS, the record pointer *shall be* decremented before the function is performed and the pointed record *shall be* read.

CR14 [31.101-11.1.5] If the mode is PREVIOUS, and the record pointer has not been previously been set within the selected EF, the **last** record shall be read and the record pointer *shall be* set to this record.

CR15 [31.101-11.1.5] If the mode is PREVIOUS, and the record pointer addresses the first record in a linear fixed EF, the record pointer shall not change and no data shall be read.

CR16 [31.101-11.1.5] If the mode is PREVIOUS, and the record pointer addresses the first record in a cyclic EF, the **last** record shall be read and the record pointer *shall be* set to this record.

CR17 [31.101-11.1.5] The record pointer shall not be changed if the function is unsuccessful.

CR18 [31.101-8.4.3] The function shall accept the SFI as an input.

CR19 [31.101-8.4.3] When the command contains a valid SFI, it shall set the file as the current EF, reset the current record pointer and subsequent records are read with the READ RECORD command without SFI.

Reference: 3G TS 31.101 [1], subclause 11.1.5.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_RDREC

6.8.1.5.3 Test purpose

To verify that the READ RECORD function conforms to the above requirements using three test procedures.

NOTE: CR12 and CR16 can only be tested if any cyclic EFs are present.

6.8.1.5.4 Method of test

NOTE1: Test procedures have been separated into 3 parts. The first part is for testing CURRENT and ABSOLUTE mode, the second part is for testing NEXT and PREVIOUS mode and the third part is for testing the SFI referencing.

NOTE2: When EF_{AND} under $DF_{PHONBOOK}$ under DF_{USIM} is not supported by the UICC, any supported linear EF in DF_{USIM} supporting SFI may be chosen. In such case, $DF_{PHONEBOOK}$ in c) of the test procedure 3 may be replaced to relevant DF, if any.

NOTE3: When EF_{ACM} is not supported by the UICC, any supported cyclic EF in DF_{USIM} may be chosen.

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) The records in EF_{AND} shall contain the following data for the first 14 bytes:

1st record	'10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D'
2nd record	'20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D'
2nd last record	'E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 EA EB EC ED'
Last record	'F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA FB FC FD'

3) The data for the remainder of these four records and for all other records (if any) *shall be* 'FF'.

4) The records in EF_{ACM} shall contain the following data, if it is supported :

Record 1: '01 01 01' (last updated record)

Record 2: '02 02 02'

Record 3: '03 03 03'

…and so on for all records…

Record X: '0X 0X 0X' (first updated record)

Test procedure 1 (CURRENT and ABSOLUTE mode)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK}$.

d) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR4].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

f) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR4].

The record data returned shall be that of the first record in the EF_{AND} [CR1-CR4, CR7].

g) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK}$.

h) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record in the $EF_{AND.}$

i) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be that of the second record in the EF_{AND} [CR7].

j) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in the EF_{AND} [CR5, CR8].

k) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the second record in the EF_{AND} [CR6].

l) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record to the UICC.

The record data returned shall be that of the last record in the EF_{AND} [CR7].

m) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record + 1 to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found.

n) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the second record in the EF_{AND} [CR17].

o) The ME simulator shall send a SELECT command to the UICC to select EF_{ACM}.

p) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record in the EF_{ACM} [CR1].

q) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in the EF_{ACM} [CR5].

r) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 3 to the UICC.

The record data returned shall be that of the record 3 in the EF_{ACM} [CR1, CR7].

s) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record + 1 to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found.

t) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in the EF_{ACM} [CR17].

Test procedure 2 (NEXT and PREVIOUS mode)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK}$.

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record in the EF_{AND} [CR10].

f) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in the EF_{AND} [CR10].

g) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR11].

h) The record data returned shall be that of the second record in the EF_{AND} [CR9].

i) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the second record in the EF_{AND} [CR9].

j) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK}$.

k) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

The record data returned shall be that of the last record in the EF_{AND} [CR14].

l) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – Record not found [CR11].

m) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the last record in the EF_{AND} [CR11].

n) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR18].

The record data returned shall be that of the second last record in the EF_{AND} [CR13].

o) The ME simulator shall send a SELECT command to the UICC to select EF_{AND}.

p) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record in the EF_{AND} [CR10].

q) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found [CR15].

r) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in the EF_{AND} [CR15].

s) The ME simulator shall send a SELECT command to the UICC to select EF_{ACM}.

t) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

The record data returned shall be that of the last record (record X) in the EF_{ACM} [CR16].

u) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the last record (record X) in the EF_{ACM} [CR16].

v) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record (record 1) in the EF_{ACM} [CR12].

w) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

The record data returned shall be that of the last record (record X) in the EF_{ACM} [CR16].

Test procedure 3 (SFI referencing)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$.

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 and to select to EF_{AND} with the SFI to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR18].

The record data returned shall be that of the first record in the EF_{AND} [CR18].

f) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found [CR19].

g) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be that of the first record (record 1) in the EF_{AND} [CR19].

6.8.1.6 UPDATE RECORD

6.8.1.6.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.6.2 Conformance requirement

CR1 [31.101-11.1.6] The UPDATE RECORD function shall update one complete record in the current linear fixed or cyclic EF.

CR2 [31.101-11.1.6] The function shall accept as an input, the mode, record number if absolute mode, the length of the record, and the data used for updating the record.

CR3 [31.101-11.1.6] The function shall only be performed if the UPDATE access condition for the current EF is satisfied.

CR4 [31.101-11.1.6] For cyclic files, only PREVIOUS mode shall be allowed.

CR5 [31.101-11.1.6] If the mode is CURRENT, the current record shall be updated

CR6 [31.101-11.1.6] If the mode is CURRENT, the record pointer shall not be affected.

CR7 [31.101-11.1.6] If the mode is ABSOLUTE, the record given by the record number shall be updated.

CR8 [31.101-11.1.6] If the mode is ABSOLUTE, the record pointer shall not be affected.

CR9 [31.101-11.1.6] If the mode is NEXT, the record pointer shall be incremented before the function is performed and the pointed record shall be updated.

CR10 [31.101-11.1.6] If the mode is NEXT, and the record pointer has not previously been set within the selected EF, the **first** record shall be updated and the record pointer shall be set to this record.

CR11 [31.101-11.1.6] If the mode is NEXT, and the record pointer addresses the last record, the record pointer shall not change and no record shall be updated.

CR12 [31.101-11.1.6] If the mode is PREVIOUS, the record pointer shall be decremented before the function shall be performed and the pointed record shall be updated.

CR13 [31.101-11.1.6] If the mode is PREVIOUS, and the record pointer has not previously been set within the selected EF, the **last** record shall be updated and the record pointer set to this record.

CR14 [31.101-11.1.6] If the mode is PREVIOUS, the EF is a linear fixed, and the record pointer addresses the first record, the record pointer shall not change and no record shall be updated.

CR15 [31.101-11.1.6] If the mode is PREVIOUS and the EF is a cyclic file, the oldest record shall be updated, the record pointer set to this record, and this record shall become the first record.

CR16 [31.101-11.1.6] The record pointer shall not be changed if the function is unsuccessful.

CR17 [31.101-11.1.6] For modes NEXT and PREVIOUS, P1 has no significance and shall not be interpreted by the USIM.

CR18 [31.101-8.4.3] The function shall accept the SFI as an input.

CR19 [31.101-8.4.3] When the command contains a valid SFI, it shall set the file as the current EF and resets the current record pointer.

Reference: 3G TS 31.101 [1], subclause 11.1.6.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_UPREC

6.8.1.6.3 Test purpose

To verify that the UPDATE RECORD function conforms to the above requirements for the different modes available.

NOTE: CR4 and CR13 can only be tested if any cyclic EF is present.

6.8.1.6.4 Method of test

NOTE1: Test procedures have been separated into 3 parts. The first part is for testing CURRENT and ABSOLUTE mode, and the second part is for testing NEXT and PREVIOUS mode and the third part is for testing the SFI referencing.

NOTE2: When EF_{AND} under $DF_{PHONBOOK}$ under DF_{USIM} is not supported by the UICC, any supported linear EF in DF_{USIM} supporting SFI may be chosen. In such case, $DF_{PHONEBOOK}$ in c) of the test procedure 3 may be replaced to relevant DF, if any.

NOTE3: When EF_{ACM} is not supported by the UICC, any supported cyclic EF in DF_{USIM} may be chosen.

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) PIN shall be enabled.

3) The records in EF_{AND} shall contain the following data for the first 14 bytes:

1st record	'10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D'
2nd record	'20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D'
2nd last record	'E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 EA EB EC ED'
Last record	'F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA FB FC FD'

4) The data for the remainder of these four records and for all other records (if any) shall be 'FF'.

5) The records in EF_{ACM} shall contain the following data:

Record 1: '01 01 01' (last updated record)

Record 2: '02 02 02'

Record 3: '03 03 03'

…and so on for all records…

Record X: '0X 0X 0X' (first updated record)

Test procedure 1 (CURRENT and ABSOLUTE mode)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK.}$

d) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with record 1 to the UICC. The data used shall be 'C1' for all bytes.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR3].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

f) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with record 1 to the UICC. The data used shall be 'C2' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

g) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'C2' for all bytes [CR1-CR3, CR7].

h) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK.}$

i) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'FF' for all bytes.

j) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with record 2 to the UICC. The data used shall be 'C3' for all bytes.

k) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be 'C3' for all bytes [CR7].

l) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be the data used shall be 'C4' for all bytes.

m) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'C4' for all bytes [CR5, CR8].

n) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'C5' for all bytes.

o) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be 'C5' for all bytes [CR8].

p) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with the last record to the UICC. The data used shall be 'C6' for all bytes.

q) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record to the UICC.

The record data returned shall be 'C6' for all bytes [CR7].

r) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with the last record + 1 to the UICC. The data used shall be 'C7' for all bytes.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found.

s) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'C8' for all bytes.

t) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be 'C8' for all bytes [CR16].

u) The ME simulator shall send a SELECT command to the UICC to select EF_{ACM}.

v) The ME simulator shall send a VERIFY PIN command with the relevant PIN to the UICC.

w) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'C9' for all bytes.

The status condition returned by the UICC shall indicate an error [CR4].

x) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with record 3 to the UICC. The data used shall be 'CA' for all bytes.

The status condition returned by the UICC shall indicate an error [CR4].

y) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'CB' for all bytes.

The status condition returned by the UICC shall indicate an error [CR4].

z) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC. The data used shall be 'CC' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR4].

aa) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'CC' for all bytes [CR16].

Test procedure 2 (NEXT and PREVIOUS mode)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK.}$

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'C2' for all bytes.

f) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'C2' for all bytes [CR10].

g) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'C3' for all bytes.

h) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'C3' for all bytes [CR10].

i) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'C4' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR17].

j) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be 'C4' for all bytes [CR9, CR17].

k) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'C5' for all bytes.

l) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 2 to the UICC.

The record data returned shall be 'C5' for all bytes [CR9].

m) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK.}$

n) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC. The data used shall be 'C6' for all bytes.

o) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record to the UICC.

The record data returned shall be 'C6' for all bytes [CR13].

p) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'C7' for all bytes.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found [CR11].

q) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'C8' for all bytes.

r) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the last record to the UICC.

The record data returned shall be 'C8' for all bytes [CR16].

s) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC. The data used shall be 'C9' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR17].

t) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the second last record to the UICC.

The record data returned shall be 'C9' for all bytes [CR12, CR17].

u) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONBOOK.}$

v) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'CA' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

w) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC. The data used shall be 'CB' for all bytes.

The status condition returned by the UICC shall be SW1='6A', SW2='83' - record not found [CR13].

x) The ME simulator shall send an UPDATE RECORD command using CURRENT mode to the UICC. The data used shall be 'CC' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR13].

y) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The record data returned shall be 'CC' for all bytes [CR16].

z) The ME simulator shall send a SELECT command to the UICC to select EF_{ACM}.

aa) The ME simulator shall send a VERIFY PIN command with relevant PIN to the UICC.

bb) The ME simulator shall send an UPDATE RECORD command using PREVIOUS mode to the UICC. The data used shall be 'CD' for all bytes.

cc) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with the record 1 to the UICC.

The record data returned shall be 'CD' for all bytes [CR15].

dd) The ME simulator shall send an UPDATE RECORD command using NEXT mode to the UICC. The data used shall be 'CE' for all bytes.

The status condition returned by the UICC shall indicate an error. [CR4]

Test procedure 3 (SFI referencing)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$.

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send an UPDATE RECORD command using ABSOLUTE mode with record 1 and to select to EF_{AND} under $DF_{PHONBOOK}$ under DF_{USIM} with the SFI to the UICC. The data used shall be 'C0' for all bytes.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR18].

f) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The status condition returned by the UICC shall be SW1='6A', SW2='83' – record not found [CR19].

g) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

The record data returned shall be 'CC' for all bytes [CR19].

6.8.1.7 SEARCH RECORD

6.8.1.7.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.7.2 Conformance requirement

CR1 [31.101-11.1.7] The SEARCH RECORD function shall search through a current linear fixed EF or cyclic EF to find records containing a specific pattern.

CR2 [31.101-11.1.7] The search shall start:

a) from the first byte of the record

b) from given offset in the record

c) from the first occurrence of a given byte in the record

CR3 [31.101-11.1.7] For a simple search, the function shall accept as an input, the record number, search mode and search pattern.

CR4 [31.101-11.1.7] For an enhanced search, the function shall accept as an input, the record number, search mode, search pattern and offset.

CR5 [31.101-11.1.7] The SEARCH RECORD function shall output either:

a) none, if Le is empty or no matches where found; or

b) at most the number of records numbers defined in Le.

CR6 [31.101-11.1.7] For a simple search, the function shall support the following modes:

a) start forward search from record indicated in P1

b) start backward search from record indicated in P1

CR7 [31.101-11.1.7] For an enhanced search, the SEARCH RECORD function shall support the following modes:

a) start forward search from record indicated in P1 with search indication

b) start backward search from record indicated in P1 with search indication

c) start forward search from next record with search indication

d) start backward search from previous record with search indication

CR8 [31.101-11.1.7]	The function shall only be performed if the READ access condition for the current EF is satisfied.
CR9 [31.101-8.2.2]	For a SEARCH RECORD function of forward search from next record (enhanced search), if the record pointer has not been previously set within the selected linear fixed or cyclic EF, the search shall begin with the first record.
CR10 [31.101-8.2.2]	For a SEARCH RECORD function of backward search from previous record (enhanced search), if the record pointer has not been previously set within the selected linear fixed EF, the search shall begin with the last record.
CR11 [31.101-11.1.7]	After a successful SEARCH RECORD function, the record pointer shall be set to the first record in which the pattern was found.
CR12 [31.101-8.2.2]	The record pointer shall not be changed by an unsuccessful SEARCH RECORD function.
CR13 [31.101-8.4.3]	The function shall accept the SFI as an input.
CR14 [31.101-8.4.3]	When the SEARCH RECORD command contains a valid SFI, it shall set the file as the current EF and resets the current record pointer.

Reference: 3G TS 31.101 [1], subclause 11.7.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_SRREC

6.8.1.7.3 Test purpose

To verify that the SEARCH RECORD function conforms to the above requirements for the different modes available.

6.8.1.7.4 Method of test

NOTE1: CR5 cannot be tested for T=0 protocol as the Le byte is not transmitted to the UICC. It is dependant on the design of the ME whether to get the response data bytes from the UICC according to the Le byte.

NOTE2: When EF_{SMS} does not support the SFI, any linear fixed EF in DF_{USIM} supporting SFI shall be chosen for test procedure 3 (SFI).

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) PIN shall be enabled.
3) The records in EF_{SMS} shall contain the following data for the first 20 bytes:

   record 1: 'A0 A1 A2 B0 B1 B2 A0 A1 A2 A0 A1 A2 FF A0 A1 A2 A3 A4 A5 A6'

   record 2: 'B0 B1 B2 A0 A1 A2 A0 A1 A2 B0 B1 B2 FF B0 B1 B2 B3 B4 B5 B6'

   record 3: 'B0 B1 B2 A0 A1 A2 B0 B1 B2 A0 A1 A2 FF C0 C1 C2 C3 C4 C5 C6'

   record 4: 'A0 A1 A2 B0 B1 B2 B0 B1 B2 B0 B1 B2 FF D0 D1 D2 D3 D4 D5 D6'

4) The data for the remainder of these four records and for all other records shall be 'FF'.

Test procedure 1 (simple search)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

d) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with an empty Le to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR8].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

f) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with an empty Le to the UICC.

(T=1 protocol only) The UICC shall not return any response data bytes [CR5a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR3, CR6a, CR8].

g) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with Le = '01' to the UICC.

(T=1 protocol only) The data returned shall be '01' indicating that the first record has been found [CR2a, CR5b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

h) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with Le = '04' to the UICC.

The data returned shall be '01 02 03 04' indicating that first, second, third and fourth record have been found [CR2a, CR5b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

i) The ME simulator shall send a SEARCH RECORD command using the record number = '02', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02 03' indicating that the second and third record have been found [CR2a, CR6a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

j) The ME simulator shall send a SEARCH RECORD command using the record number = '02', the 'simple backward search from record indicated in P1' mode and search pattern 'A0 A1 A2 B0' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02 01' indicating that the first and second record have been found [CR2a, CR6b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

k) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the second record in EF_{SMS} [CR11].

l) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A2 A3 A4' with Le = '01' to the UICC.

No data shall be returned by the UICC as this search pattern can not be found in any of the records [CR5a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

m) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the second record in EF_{SMS} [CR12].

n) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

o) The ME simulator shall send a SEARCH RECORD command using the record number = '00' (current record), the 'simple forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' with Le = '00' to the UICC.

The status condition returned by the UICC shall indicate an error as no current record exists.

p) The ME simulator shall send a READ RECORD command using NEXT mode to the UICC.

q) The ME simulator shall send a SEARCH RECORD command using the record number = '00' (current record), the 'simple forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '01 02 03 04' indicating that the first, second, third and fourth record have been found [CR2a, CR6a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

r) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

s) The ME simulator shall send a SEARCH RECORD command using the record number = '00' (current record), the 'simple backward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' with Le = '00' to the UICC.

The status condition returned by the UICC shall indicate an error as no current record exists.

t) The ME simulator shall send a READ RECORD command using PREVIOUS mode to the UICC.

u) The ME simulator shall send a SEARCH RECORD command using the record number = '00' (current record), the 'simple backward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '04 03 02 01' indicating that the first, second, third and fourth record have been found [CR2a, CR6b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

v) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the ' simple forward search from record indicated in P1' mode and search pattern 'A0 A2 A3 A4' with Le = '01' to the UICC.

No data shall be returned by the UICC as this search pattern can not be found in any of the records [CR5a].

w) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the fourth record in EF_{SMS} [CR12].

Test procedure 2 (enhanced search)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

d) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with an empty Le to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR8].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

f) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with an empty Le to the UICC.

(T=1 protocol only) The UICC shall not return any response data bytes [CR5a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR4, CR7a, CR8].

g) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with Le = '01' to the UICC.

(T=1 protocol only) The data returned shall be '02' indicating that the second record has been found [CR2b, CR5b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

h) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with Le = '04' to the UICC.

(T=1 protocol only) The data returned shall be ' 02 03' indicating that the second and third record have been found [CR2b, CR5b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

i) The ME simulator shall send a SEARCH RECORD command using the record number = '03', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with Le = '01' to the UICC.

(T=1 protocol only) The response data shall be '03' indicating that the third record has been found [CR2b, CR7a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

j) The ME simulator shall send a SEARCH RECORD command using the record number = '02', the 'enhanced backward search from record indicated in P1' mode, search pattern 'A0 A1 A2 B0' and offset = '03' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02 03' indicating that the second and third record has been found [CR2b, CR7b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

k) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced forward search from next record' mode, search pattern 'A1 A2' and offset = '07' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '03' indicating that the third record have been found [CR2b, CR7c].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

l) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced backward search from previous record' mode, search pattern 'B1 B2' and offset = '07' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02' indicating that the second record have been found [CR2b, CR7d].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

m) The ME simulator shall send a SEARCH RECORD command using the record number = '03', the 'enhanced forward search from record indicated in P1' mode, search pattern B1 B2 A0' and offset character = 'B0' with Le = '01' to the UICC.

(T=1 protocol only) The response data shall be '03' indicating that the third record has been found [CR2c, CR7a].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

n) The ME simulator shall send a SEARCH RECORD command using the record number = '02', the 'enhanced backward search from record indicated in P1' mode, search pattern 'B1 B2 A0' and offset character = 'B0' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02 01' indicating that the first and second record has been found [CR2c, CR7b].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

o) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced forward search from next record' mode, search pattern 'B0 B1' and offset character = 'A2' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '03' indicating that the third record have been found [CR2c, CR7c].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

p) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced backward search from previous record' mode, search pattern 'B0 B1' and offset character = 'A2' with Le = '02' to the UICC.

(T=1 protocol only) The response data shall be '02' indicating that the second record have been found [CR2c, CR7d].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

q) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

r) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced forward search from record indicated in P1' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

The status condition returned by the UICC shall indicate an error as no current record exists.

s) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced forward search from next record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '01 02 03 04' indicating that the first, second, third and fourth record have been found [CR9].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

t) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced forward search from next record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '02 03 04' indicating that the second, third and fourth record have been found [CR7c, CR11].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

u) The ME simulator shall send a SELECT command to the UICC to select EF_{SMS}.

v) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced backward search from record indicated in P1' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

The status condition returned by the UICC shall indicate an error as no current record exists.

w) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced backward search from previous record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '04 03 02 01' indicating that the first, second, third and fourth record have been found [CR10].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

x) The ME simulator shall send a SEARCH RECORD command using the P1 = '00', the 'enhanced backward search from previous record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '00' to the UICC.

(T=1 protocol only) The response data shall be '03 02 01' indicating that the first, second and third record have been found [CR7d, CR11].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

y) The ME simulator shall send a SEARCH RECORD command using the P1 = '01', the 'enhanced forward search from next record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '02' to the UICC.

The status condition returned by the UICC shall indicate an error.

z) The ME simulator shall send a SEARCH RECORD command using the P1 = '01', the 'enhanced backward search from previous record' mode, search pattern 'A0 A1 A2' and offset = '00' with Le = '02' to the UICC.

The status condition returned by the UICC shall indicate an error.

aa) The ME simulator shall send a SEARCH RECORD command using the record number = '01', the 'enhanced forward search from record indicated in P1' mode and search pattern 'A0 A2 A3 A4' and offset = '03' with Le = '01' to the UICC.

No data shall be returned by the UICC as this search pattern can not be found in any of the records [CR5a].

bb) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the third record in EF_{SMS} [CR12].

Test procedure 3 (SFI)

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

d) The ME simulator shall send a SEARCH RECORD command using the SFI of EF_{SMS}, the record number = '01', the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A1 A2' with Le = '00' to the UICC.

The data returned shall be '01 02 03 04' indicating that the first, second, third and fourth records have been found.

The status condition returned shall be SW1='90', SW2='00' - normal ending of the command [CR13].

e) The ME simulator shall send a SEARCH RECORD command using the SFI of EF_{SMS}, the record number = '01' (current record), the 'simple forward search from record indicated in P1' mode and search pattern 'A0 A2 A3' with Le = '00' to the UICC.

No data shall be returned by the UICC as this search pattern can not be found in any of the records.

f) The ME simulator shall send a READ RECORD command using CURRENT mode to the UICC.

The record data returned shall be that of the first record in EF_{SMS} [CR12, CR14].

6.8.1.8 INCREASE

6.8.1.8.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] and containing EFs which have the INCREASE access condition assigned i.e. EF_{ACM} associated with EF_{ACMMAX}, EF_{ICT} or EF_{OCT}, to support all functions described therein.

6.8.1.8.2 Conformance requirement

CR1 [31.101-11.1.8] This function shall add the value given by the ME to the value of the last increased/updated record of the current cyclic EF and store the result into the oldest record.

CR2 [31.101-11.1.8]	The record pointer shall be set to this record and this record becomes the record number 1.
CR3 [31.101-11.1.8]	The function shall only be used if the INCREASE access condition is fulfilled.
CR4 [31.101-11.1.8]	The function shall accept the input as the value to be added.
CR5 [31.101-11.1.8]	The function shall output the value of the increased record and the value which has been added.
CR6 [31.101 V3.0.0-11.8]	The UICC shall not perform the INCREASE if the result would exceed the maximum value of the record (represented by all bytes set to 'FF).
CR7	This command shall only be used on files that refer to an access rule where this INS code is indicated as part of the rule.

Reference: 3G TS 31.101 [1], subclause 11.1.8.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_INC

6.8.1.8.3 Test purpose

To verify that the INCREASE function conforms to the above requirements.

6.8.1.8.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) PIN is enabled.
3) Each record in EF_{ACM} shall contain the data '00 00 01'.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{ACM} under $DF_{USIM.}$

c) The ME simulator shall send an INCREASE command with value '00 00 02' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' – security status not satisfied [CR3].

d) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

e) The ME simulator shall send an INCREASE command with value '00 00 03' to the UICC.

The response data shall be '00 00 04 00 00 03' [CR1, CR4, CR5].

f) The ME simulator shall send an INCREASE command with value '01 02 00' to the UICC.

The response data shall be '01 02 04 01 02 00' [CR1].

g) The ME simulator shall send a READ RECORD command using ABSOLUTE mode with record 1 to the UICC.

The data read shall be '01 02 04' [CR2].

h) The ME simulator shall send an INCREASE command with value 'FF 00 00' to the UICC.

The status condition returned by the UICC shall be SW1='98', SW2='50' - INCREASE cannot be performed, maximum value reached [CR6].

i) The ME simulator shall send an INCREASE command with value '00 FF FD' to the UICC.

The response data shall be '02 02 01 00 FF FD' [CR5].

j) The ME simulator shall send a SELECT command to the UICC to select EF_{ICI}.

k) The ME simulator shall send an INCREASE command with value '01 02 00' to the UICC.

The status condition returned by the UICC shall indicate an error.

6.8.1.9 VERIFY PIN

6.8.1.9.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.9.2 Conformance requirement

CR1 [31.101-11.1.9] This command shall initiate the comparison in the UICC of the PIN verification data sent from the ME with the PIN reference data stored in the card.

CR2 [31.101-11.1.9] The function shall accept as an input, an indication of PIN (key reference number), the PIN value, or empty.

CR3 [31.101-11.1.9] The verification process shall be subject to the following conditions being fulfilled:

a) PIN is not disabled;

b) PIN is not blocked.

CR4 [31.101-11.1.9] If the access condition for a function to be performed on the last selected file is PIN, then a successful verification of PIN shall be required prior to the use of the function on this file unless the PIN is disabled.

CR5 [31.101-11.1.9] If the PIN presented is correct, the number of remaining PIN attempts for that PIN shall be reset to its initial value 3.

CR6 [31.101-11.1.9] If the PIN presented is false, the number of remaining PIN attempts for that PIN shall be decremented.

CR7 [31.101-11.1.9] After 3 consecutive false PIN presentations, not necessarily in the same card session, the respective PIN shall be blocked.

CR8 [31.101-11.1.9] The value of the retry counter and how many verification attempts are left, shall be obtained in the following ways.

a) The VERIFY command is sent to the UICC with parameter P2 indicating PIN for which the retry counter value is to be retrieved with an empty data field (response SW1, SW2 '63CX' where X indicates the number of further allowed retries)

b) In case of an unsuccessful PIN verification the UICC shall return the remaining retry value in the response parameters SW1, SW2 (response '63CX' where X indicates the number of further allowed retries)

CR10 [31.101-11.1.9] The access condition can never be fulfilled until the UNBLOCK PIN function has been successfully performed on the respective PIN.

Reference: 3G TS 31.101 [1], subclause 11.1.9.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_VERPIN

6.8.1.9.3 Test purpose

To verify that the VERIFY PIN function conforms to the above requirements.

NOTE: This function is only tested for PIN. It is assumed that if the function operates correctly for PIN, it will also operate correctly for PIN2 or other PIN.

6.8.1.9.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) PIN shall be enabled.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI}.

d) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - access condition not fulfilled [CR4].

e) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR2].

f) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR4].

g) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' -unsuccessful PIN verification, 2 attempts left.[CR6, CR8b]

h) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

i) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left.[CR5, CR8a]

j) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' -unsuccessful PIN verification, 2 attempt left.[CR8b]

k) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' -unsuccessful PIN verification, 1 attempt left.[CR8b]

l) The ME simulator shall reset the UICC and select UICC application..

m) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful PIN verification, no attempts left [CR7, CR8b].

n) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - unsuccessful PIN verification, no attempts left [CR7].

o) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - PIN blocked [CR3b, CR7].

p) The ME simulator shall reset the UICC and select and activate USIM application..

q) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - PIN blocked [CR3b, CR7].

r) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI}.

s) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied *[CR7].*

t) The ME simulator shall send an UNBLOCK PIN command to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR9].

u) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left. [CR1 of subclause 6.8.1.13.2]

v) The ME simulator shall send a DISABLE PIN command to the UICC.

w) The ME simulator shall reset the UICC.

x) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

y) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI}.

z) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR4].

aa) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall indicate an error [CR3a].

6.8.1.10 CHANGE PIN

6.8.1.10.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.10.2 Conformance requirement

CR1 [31.101-11.1.10] This command shall be used to initiate the comparison of the verification data with the PIN, and then to conditionally replace the existing PIN with the new PIN sent to the UICC in the command.

CR2 [31.101-11.1.10] This function shall assign a new value to the relevant PIN subject to the following conditions being fulfilled:

a) PIN is not disabled;

b) PIN is not blocked.

CR3 [31.101-11.1.10] The function shall accept as input, an indication of PIN (key reference number), the old and new PIN.

CR4 [31.101-11.1.10] If the old PIN presented is correct, the number of remaining PIN attempts for that PIN shall be reset to its initial value 3 and the new value for the PIN becomes valid.

CR5 [31.101-11.1.10] If the old PIN presented is false, the number of remaining PIN attempts for that PIN shall be decremented and the value of the PIN shall remain unchanged.

CR6 [31.101-11.1.10] After 3 consecutive false PIN presentations, not necessarily in the same card session, the respective PIN shall be blocked and the access condition can never be fulfilled until the UNBLOCK PIN function has been performed successfully on the respective PIN.

Reference: 3G TS 31.101 [1], subclause 11.1.10.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_CHPIN

6.8.1.10.3 Test purpose

To verify that the CHANGE PIN function conforms to the above requirements.

NOTE: This function is only tested for PIN. It is assumed that if the function operates correctly for PIN, it will also operate correctly for PIN2 or other PIN.

6.8.1.10.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) PIN of the UICC shall be set to '00000000'.

3) PIN2 of the USIM application shall be set to '11111111'.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send a CHANGE PIN command with an **incorrect** old PIN and new PIN of '33333333' to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' - unsuccessful PIN verification, 2 attempts left [CR5]

d) The ME simulator shall send a CHANGE PIN command with a correct old PIN and new PIN of '33333333' to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR2, CR4].

e) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' - unsuccessful PIN verification, 3 attempts left [CR3].

f) The ME simulator shall send a VERIFY PIN command with a new PIN of '33333333' to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

g) The ME simulator shall send a CHANGE PIN command with an **incorrect** old PIN and new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' - unsuccessful PIN verification, 2 attempts left [CR5].

h) The ME simulator shall send a CHANGE PIN command with an **incorrect** old PIN and new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' - unsuccessful PIN verification, 1 attempt left [CR5].

i) The ME simulator shall reset the UICC.

j) The ME simulator shall send a CHANGE PIN command with an **incorrect** old PIN and new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful PIN verification, no attempt left [CR5].

k) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - unsuccessful PIN verification, no attempts left.

l) The ME simulator shall reset the UICC.

m) The ME simulator shall send a CHANGE PIN command with an old PIN of '33333333' and new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - PIN blocked [CR2b].

n) The ME simulator shall send an UNBLOCK PIN command with new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR5].

o) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left. [CR1 of subclause 6.8.1.13.2]

p) The ME simulator shall send a VERIFY PIN command with a new PIN of '55555555' to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

q) The ME simulator shall send a DISABLE PIN command to the UICC.

r) The ME simulator shall reset the UICC.

s) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

t) The ME simulator shall send a CHANGE PIN command with an old PIN '55555555' and new PIN of '77777777' to the UICC.

The status condition returned by the UICC shall indicate an error [CR1a].

v) The ME simulator shall send an ENABLE PIN command to the *UICC* with PIN '55555555'.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1a].

6.8.1.11 DISABLE PIN

6.8.1.11.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.11.2 Conformance requirement

CR1 [31.101-11.1.11] This function shall switch off the requirement to compare the PIN verification data with the PIN reference data.

CR2 [31.101-11.1.11] The command shall allow an indication whether to use an alternative global key reference, if enabled, or not when the application PIN is disabled.

CR3 [31.101-11.1.11] If an alternative global key reference is used as a replacement for the application PIN, the verification of the alternative global key reference shall be performed instead of the application PIN verification to get access to the application.

CR4 [31.101-11.1.11] The successful execution of this function shall have the effect that files protected by PIN are now accessible as if they were marked "ALWAYS", except in the case where the alternative global key reference is to be used as a replacement for the disabled PIN.

CR5 [31.101-11.1.11] In the case where the alternative global key reference is to be used as a replacement for the disabled PIN, the access condition for files containing only a reference to the disabled PIN is the alternative global key reference.

CR6 [31.101-11.1.11] The function shall accept as input, PIN indication and PIN.

CR7 [31.101-11.1.11] The function shall accept as input, Global key reference data number for verification replacement, PIN indication and PIN.

CR8 [31.101-11.1.11] For files having more than one global key reference indicated in the access rules the access condition is "ALWAYS" after disabling on of the key references used in the access rules.

CR9 [31.101-11.1.11] The function shall not be executed by the UICC when PIN is already disabled or blocked.

CR10 [31.101-11.1.11] If the PIN presented is correct, the number of remaining PIN attempts shall be reset to its initial value 3 and PIN shall be disabled.

CR11 [31.101-11.1.11] If the PIN presented is false, the number of remaining PIN attempts shall be decremented and PIN remains enabled.

CR12 [31.101-11.1.11] After 3 consecutive false PIN presentations, not necessarily in the same card session, the PIN shall be blocked and the access condition can never be fulfilled until the UNBLOCK PIN function has been successfully performed on PIN.

Reference: 3G TS 31.101 [1], subclause 11.1.11.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_DISPIN

6.8.1.11.3 Test purpose

To verify that the DISABLE PIN function conforms to the above requirements.

NOTE : The test procedure for an alternative global key reference is not included as it is out of the scope of the present document.

6.8.1.11.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

c) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - access condition not fulfilled.

d) The ME simulator shall send a DISABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' - unsuccessful PIN verification, 2 attempts left [CR11].

e) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - access condition not fulfilled [CR11].

f) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR11]:

The value of tag '90' in tag 'C6' in tag '62' shall be '80' indicating that PIN is still enabled [CR11].

g) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' -unsuccessful PIN verification, 2 attempts left [CR11].

h) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR6].

i) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR10]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is disabled.*

j) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left [CR10].

k) The ME simulator shall reset the UICC.

l) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

m) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1].

n) The ME simulator shall send an ENABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

o) The ME simulator shall send a DISABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' - unsuccessful PIN verification, 2 attempt left.

p) The ME simulator shall send a DISABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' - unsuccessful PIN verification, 1 attempt left.

q) The ME simulator shall reset the UICC.

r) The ME simulator shall send a DISABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful PIN verification, no attempt left [CR12].

s) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - unsuccessful PIN verification, no attempt left [CR7, CR8b].

t) The ME simulator shall reset the UICC.

u) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - PIN blocked [CR9].

v) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

w) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left. [CR1 of subclause 6.8.1.13.2]

a) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR6].

b) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall indicate an error [CR9].

6.8.1.12 ENABLE PIN

6.8.1.12.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.12.2 Conformance requirement

CR1 [31.101-11.1.12] This function shall switch on the requirement to compare the PIN verification data with the PIN reference data.

CR2 [31.101-11.1.12] The function shall not be executed by the UICC when PIN is already enabled or blocked.

CR3 [31.101-11.1.12] If the PIN presented is correct, the number of remaining PIN attempts shall be reset to its initial value 3 and PIN shall be enabled.

CR4 [31.101-11.1.12] If the PIN presented is false, the number of remaining PIN attempts shall be decremented and PIN shall remains disabled.

CR5 [31.101-11.1.12] After 3 consecutive false PIN presentations, not necessarily in the same card session, PIN shall be blocked.

CR6 If the PIN is blocked and "enabled", the access condition can never be fulfilled until the UNBLOCK PIN function has been successfully performed on PIN.

CR7 The function shall accept as input, PIN.

CR9 [31.101-11.1.12] The usage of the alternative global key reference as a replacement shall be disabled upon enabling the PIN for which the alternative global key reference has been a replacement.

CR10 [31.101-11.1.12] If the PIN is blocked and "disabled", the access condition shall remain granted.

Reference: 3G TS 31.101 [1], subclause 11.1.12.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_ENPIN

6.8.1.12.3 Test purpose

To verify that the ENABLE PIN function conforms to the above requirements.

NOTE : CR9 is not tested as it is outside the scope of the present document.

6.8.1.12.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.
2) PIN on the UICC shall be disabled.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

c) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

d) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' – unsuccessful PIN verification, 2 attempts left [CR4].

e) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

f) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR4]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is still disabled.*

g) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' - unsuccessful PIN verification, 1 attempt left.

h) The ME simulator shall send an ENABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2, CR7].

i) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR4]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is now enabled.*

j) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left [CR3, CR8b].

k) The ME simulator shall reset the UICC.

l) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}

m) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - access condition not fulfilled [CR1].

n) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command

o) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' - unsuccessful PIN verification, 2 attempt left.

p) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' - unsuccessful PIN verification, 1 attempt left.

q) The ME simulator shall reset the UICC.

r) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful PIN verification, no attempt left [CR5].

s) The ME simulator shall send an ENABLE PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' – PIN blocked [CR5].

t) The ME simulator shall send a SELECT command to the UICC to select EF_{IMSI} under DF_{USIM}.

u) The ME simulator shall send a STATUS command to the UICC.

If the value of tag '90' in the PS template DO of the response data indicates that PIN is enabled, then v1) and v2) are to be carried out.

If the value of tag '90' in the PS template DO of the response data indicates that PIN is disabled, then v3) are to be carried out.

v1) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR6].

v2) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - PIN blocked.

v3) The ME simulator shall send a READ BINARY command using a length of 2 bytes to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR10].

w) The ME simulator shall reset the UICC.

x) The ME simulator shall send an ENABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' -PIN blocked [CR2].

y) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

z) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR5]:

The value of tag '90' in the PS template DO of the response data shall indicate that PIN is enabled.

aa) The ME simulator shall send an ENABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall indicate an error/warning [CR2].

6.8.1.13 UNBLOCK PIN

6.8.1.13.1 Definition and applicability

It shall be mandatory for all UICC complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.13.2 Conformance requirement

CR1 [31.101-11.1.13] This function shall be used to reset the PIN retry counter to its initial value and then to conditionally set a new PIN value.

CR2 [31.101-11.1.13] The function shall accept as input, an indication of PIN, the UNBLOCK PIN and the new PIN.

CR3 [31.101-11.1.13] This function shall be performed regardless of whether or not the relevant PIN is blocked.

CR4 [31.101-11.1.13] If the UNBLOCK PIN presented is correct, the new PIN value, presented together with the UNBLOCK PIN shall be stored in the relevant EF_{PIN}, the number of remaining UNBLOCK PIN attempts for that UNBLOCK PIN shall be reset to its initial value 10 and the number of remaining PIN attempts for that PIN shall be reset to its initial value 3.

CR5 [31.101-11.1.13] After a successful unblocking attempt, the PIN shall be enabled, and the relevant access condition level satisfied.

CR6 [31.101-11.1.13] If the presented UNBLOCK PIN is false, the number of remaining UNBLOCK PIN attempts for that UNBLOCK PIN shall be decremented.

CR7 [31.101-11.1.13] After 10 consecutive false UNBLOCK PIN presentations, not necessarily in the same card session, the respective UNBLOCK PIN shall be blocked.

CR8 [31.101-11.1.13] A false UNBLOCK PIN shall have no effect on the status of the respective PIN itself.

CR9 [31.101-11.1.13] If the data field is empty, this UICC shall return the value of retry counter with response status word '63CX'.

CR10 [31.101-11.1.13] In case of an unsuccessful PIN verification, the UICC shall return an error.

Reference: 3G TS 31.101 [1], subclause 11.1.13.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_UNPIN

6.8.1.13.3 Test purpose

To verify that the UNBLOCK PIN function conforms to the above requirements.

NOTE 1: CR1 is tested in subclauses 6.8.1.9, 6.8.1.10, 6.8.1.11, 6.8.1.12.

NOTE 2: This function is only tested for PIN. It is assumed that if the function operates correctly for PIN, it will also operate correctly for PIN2 or other PIN.

6.8.1.13.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) Allowed retries for an UNBLOCK PIN command shall be 10.

3) Allowed retries for PIN shall be 3.

4) PIN shall be enabled.

Test procedure 1

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

c) The ME simulator shall send an UNBLOCK PIN command with **incorrect** UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C9' - unsuccessful UNBLOCK PIN verification, 9 attempts left [CR10].

d) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR6, CR8]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is enabled.*

e) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left.

f) The ME simulator shall send a UNBLOCK PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C9' -unsuccessful PIN verification, 3 attempts left [CR9].

g) The ME simulator shall send a DISABLE PIN command with PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command.

h) The ME simulator shall send an UNBLOCK PIN command with **incorrect** UNBLOCK PIN to the UICC.

The status condition returned by the SIM shall be SW1='63', SW2='C8' - unsuccessful UNBLOCK PIN verification, eight attempts left.

i) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR6, CR8]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is disabled.*

j) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' -unsuccessful PIN verification, 2 attempts left.

k) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2].

l) The ME simulator shall send a STATUS command to the UICC.

The following shall be true of the response data [CR4, CR5]:

- *The value of tag '90' in the PS template DO of the response data shall indicate that PIN is enabled.*

m) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left [CR4].

n) The ME simulator shall send a VERIFY PIN command with a new PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command [CR1].

o) The ME simulator shall send an UNBLOCK PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='CA' -unsuccessful PIN verification, 10 attempts left [CR4].

q) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C2' -unsuccessful PIN verification, 2 attempt left.

r) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C1' -unsuccessful PIN verification, 1 attempt left.

s) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful PIN verification, no attempt left.

t) The ME simulator shall send a VERIFY PIN command with **incorrect** PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - unsuccessful PIN verification, no attempt left.

u) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR3].

v) The ME simulator shall send a VERIFY PIN command with an empty data field to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C3' -unsuccessful PIN verification, 3 attempts left [CR3].

Test procedure 2 - * Destructive test *****

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send 9 UNBLOCK PIN command with **incorrect** UNBLOCK PIN to the UICC.

The status condition returned by the UICC each time shall be SW1='63', SW2='CX' - unsuccessful UNBLOCK PIN verification 'X' retries remaining. After 9 times of unsuccessful UNBLOCK PIN verification, the SW shall be SW1='63', SW2='C1', at least one attempt left [CR6, CR10].

c) The ME simulator shall reset the UICC.

d) The ME simulator shall send an UNBLOCK PIN command with **incorrect** UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='63', SW2='C0' - unsuccessful UNBLOCK PIN verification, no attempt left [CR7].

e) The ME simulator shall send an UNBLOCK PIN command with UNBLOCK PIN to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='83' - UNBLOCK PIN blocked [CR7].

6.8.1.14 DEACTIVATE FILE

6.8.1.14.1 Definition and applicability

It shall be mandatory for all UICC complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.14.2 Conformance requirement

CR1 [31.101-11.1.14] This function shall deactivate the EF.

CR2 [31.101-11.1.14] The target EF shall be selected by following ways;

a) Select by file id (P1='00')

b) Select by path from MF (P1='08')

c) Select by path from current DF (P1='09')

CR3 [31.101-11.1.14] After a DEACTIVATE FILE function the respective flag in the file status shall be changed accordingly.

CR4 [31.101-11.1.14] The function shall only be performed if the DEACTIVATE FILE access condition for the designated EF is satisfied.

CR5 [31.101-11.1.14] A deactivated file shall no longer be available within the application for any function except for the SELECT and ACTIVATE FILE functions.

Reference: 3G TS 31.101 [1], subclause 11.1.14.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_DEACTV

6.8.1.14.3 Test purpose

To verify that the DEACTIVATE FILE function conforms to the above requirements.

6.8.1.14.4 Method of test

NOTE1: Deactivation requires the verification of ADM, and the respective requirements for their fulfilment are the responsibility of the appropriate administrative authority. Therefore, the following test procedure shall be understood as an example.

NOTE2: When EF_{AND} under $DF_{PHONEBOOK}$ under DF_{USIM} is not supported by the UICC, any supported linear fixed EF in the UICC except for the EFs existing directly under MF may be chosen.

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) EF_{AND} under $DF_{PHONEBOOK}$ under $DF_{TELECOM}$ shall be activated in the USIM application.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$ under DF_{USIM}.

c) The ME simulator shall send a DEACTIVATE FILE command using "file ID selection" to the UICC to deactivate EF_{AND}.

The status condition returned by the UICC shall be SW1='69', SW2='82' - access condition not fulfilled [CR4].

d) The ME simulator shall reset the UICC.

e) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$ under DF_{USIM}.

The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND} under $DF_{PHONEBOOK}$ under DF_{USIM}. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps).

f) The ME simulator shall send a SELECT command to the UICC to select EF_{AND}.

The following shall be true of the response data:

- *The value of Life Cycle Status Integer of the response data shall indicate that the EF is activated.*

g) The ME simulator shall send a DEACTIVATE FILE command using 'file ID selection' to the UICC to deactivate EF_{AND}.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR2a, CR3, CR4].

h) The ME simulator shall send a SELECT command to the UICC to select EF_{AND}.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is deactivated.

The status condition returned by the UICC shall be SW1='62', SW2='83' – selected file invalidated.

i) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

j) The ME simulator shall send an UPDATE RECORD command to the UICC to update record 1.

The status condition returned by the UICC shall be SW1='69', SW2='84' – in contradiction with invalidation status [CR5].

k) The ME simulator shall send a READ RECORD command to the UICC to read record 1.

The status condition returned by the UICC shall be SW1='69', SW2='84' - in contradiction with invalidation status [CR5].

l) The ME simulator shall send an ACTIVATE FILE command to the UICC to select and activate EF_{AND}.

m) The ME simulator shall reset the UICC.

n) The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND}. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps.)

o) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

p) The ME simulator shall send a DEACTIVATE commands using 'path selection from MF' to the UICC to deactivate EF_{AND} under $DF_{PHONEBOOK}$.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

q) The ME simulator shall send a SELECT command to the UICC to select the EF_{AND} under $DF_{PHONEBOOK}$.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is deactivated [CR2b].

The status condition returned by the UICC shall be SW1='62', SW2='83' – selected file invalidated.

r) The ME simulator shall send an ACTIVATE FILE command to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$.

s) The ME simulator shall reset the UICC.

t) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

u) The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND} under $DF_{PHONEBOOK}$. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps.)

v) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$.

w) The ME simulator shall send a DEACTIVATE FILE commands to the UICC to deactivate EF_{AND} under $DF_{PHONEBOOK}$ using 'path selection from current DF'.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

x) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONEBOOK}$.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is deactivated [CR2b].

The status condition returned by the UICC shall be SW1='62', SW2='83' – selected file invalidated.

y) The ME simulator shall send an ACTIVATE FILE command to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$.

6.8.1.15 ACTIVATE FILE

6.8.1.15.1 Definition and applicability

It shall be mandatory for all UICC complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.15.2 Conformance requirement

CR1 [31.101-11.1.15] This function shall activate a deactivated EF.

CR2 [31.101-11.1.14] The target EF shall be selected by following ways;

a) Select by file id (P1='00')

b) Select by path from MF (P1='08')

c) Select by path from current DF (P1='09')

CR3 [31.101-11.1.15] After an ACTIVATE FILE function the respective flag in the file status byte shall be changed accordingly.

CR4 [31.101-11.1.15] The function shall only be performed if the ACTIVATE FILE access condition for the designated EF is satisfied.

Reference: 3G TS 31.101 [1], subclause 11.1.15.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_ACTV

6.8.1.15.3 Test purpose

To verify that the ACTIVATE FILE function conforms to the above requirements.

6.8.1.15.4 Method of test

NOTE1: Activation requires the verification of ADM, and the respective requirements for their fulfilment are the responsibility of the appropriate administrative authority. Therefore, the following test procedure shall be understood as an example.

NOTE2: When EF_{AND} under $DF_{PHONEBOOK}$ under DF_{USIM} is not supported by the UICC, any supported linear fixed EF in UICC except for the EFs existing directly under MF may be chosen.

Initial conditions

1) The UICC shall be connected to a ME simulator.

2) EF_{AND} under $DF_{PHONEBOOK}$ under DF_{USIM} shall be deactivated.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select and activate the USIM application.

c) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$.

d) The ME simulator shall send an ACTIVATE FILE command to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$ using 'file ID selection'.

The status condition returned by the SIM shall be SW1='69', SW2='82' - access condition not fulfilled [CR4].

e) The ME simulator shall reset the UICC.

f) The ME simulator shall send a SELECT command to the UICC to select and activate the USIM application.

g) The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND} under $DF_{PHONEBOOK}$. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps.)

h) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$.

i) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONEBOOK.}$

The value of Life Cycle Status Integer of the response data shall indicate that the EF is deactivated.

The status condition returned by the UICC shall be SW1='62', SW2='83' – selected file invalidated.

j) The ME simulator shall send an ACTIVATE FILE command to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$ using 'file ID selection'.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR2a, CR3, CR4].

k) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONEBOOK}$.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is activated.

l) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

m) The ME simulator shall send a READ RECORD command to the UICC.

The status condition returned by the UICC shall be SW1='90', SW2='00' – normal ending of the command.

n) The ME simulator shall send a DEACTIVATE FILE command to the UICC to deactivate EF_{AND} under $DF_{PHONEBOOK}$.

o) The ME simulator shall reset the UICC.

p) The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND} under $DF_{PHONEBOOK}$. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps.)

q) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

r) The ME simulator shall send an ACTIVATE commands to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$ using 'path selection from MF'.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

s) The ME simulator shall send a SELECT command to the UICC to select EF_{AND} under $DF_{PHONEBOOK}$.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is activated.

t) The ME simulator shall send a DEACTIVATE FILE command to the UICC to deactivate EF_{AND} under $DF_{PHONEBOOK}$.

u) The ME simulator shall reset the UICC.

v) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

w) The ME simulator shall gain the security access condition(s) specified for both DEACTIVATE and ACTIVATE on EF_{AND} under $DF_{PHONEBOOK}$. (This procedure is dependent on the respective requirements of appropriate administrative authority and may require several steps.)

x) The ME simulator shall send a SELECT command to the UICC to select $DF_{PHONEBOOK}$ under DF_{USIM}.

y) The ME simulator shall send an ACTIVATE FILE commands to the UICC to select and activate EF_{AND} under $DF_{PHONEBOOK}$ using 'path selection from current DF'.

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command.

z) The ME simulator shall send a SELECT command to select EF_{AND} under $DF_{PHONEBOOK}$ to the UICC.

The value of Life Cycle Status Integer of the response data shall indicate that the EF is activated.

6.8.1.16 AUTHENTICATE

6.8.1.16.1 Definition and applicability

It shall be mandatory for all UICC complying with 3G TS 31.101 [1] to support all functions described therein.

6.8.1.16.2 Conformance requirement

CR1 [31.101-11.1.16] An appropriate application shall be selected in the UICC before issuing this command.

Reference: 3G TS 31.101 [1], subclause 11.15.

Test Group Reference (TGR): TGR_USIM_TP31.101_CMD_GC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_CMD_GC_AUTH

6.8.1.16.3 Test purpose

To verify that the AUTHENTICATE function conforms to the above requirements.

6.8.1.16.4 Method of test

NOTE 1: Consequences are not clearly defined when the AUTHENTICATE command is performed where no application is being selected. Therefore, the test for CR1 should be left N/A.

NOTE 2: Authentication procedure for USIM application is tested in subclause 7.3.1 of this present document.

Initial conditions

N/A

Test procedure

N/A

6.8.1.17 MANAGE CHANNEL

This command is for further study by 3GPP TSG-T WG3.

6.9 Transmission Oriented Commands

6.9.1 T=0 specific commands

6.9.1.1 GET RESPONSE

6.9.1.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] to support all functions described therein.

6.9.1.1.2 Conformance requirement

CR1 [31.101-12.1.1] The GET RESPONSE command shall provide response data after the execution of commands AUTHENTICATE, SEARCH RECORD, SELECT and INCREASE.

CR2 [31.101-12.1.1] It is required that the GET RESPONSE command is executed immediately after the command it is related to (no other command shall come between the command/response pair and the command GET RESPONSE).

CR3 [31.101-12.1.1] If the sequence is not respected, the UICC shall send the status information "technical problem, no precise diagnosis" as a reaction to the GET RESPONSE.

CR4 [31.101-12.1.1] Since the MF is implicitly selected after activation, GET RESPONSE shall be allowed as the first command after activation.

Reference: 3G TS 31.101 [1], subclause 12.1.1.

Test Group Reference (TGR): TGR_USIM_TP31.101_TOC

Test Procedure Reference (TPR): TPR_USIM_TP31.101_TOC_T0_GETRSP

6.9.1.1.3 Test purpose

To verify that the coding of the GET RESPONSE command conforms to the above requirements.

NOTE: CR1 is tested in subclauses 6.8.8.1, 6. 8.8.7, 6. 8.8.8, 6. 8.8.16 and 6. 8.8.17.

6.9.1.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a GET RESPONSE command to the UICC.

The UICC shall send valid FCP.

The value of tag '83' in tag '62' shall indicate that MF is the currently selected file [CR4].

c) The ME simulator shall send a STATUS command to the UICC with P2='0C'.

d) The ME simulator shall send a GET RESPONSE command to the UICC.

The status condition returned by the UICC shall be SW1='6F', SW2='00' - technical problem with no diagnostic given [CR2, CR3].

6.10 Application independent files

The subclause provides tests to ensure that the IUT contains all of the EFs need for a 3GPP session.

6.10.1 Definition and applicability

The Elementary Files described in 3G TS 31.101 [1], clause 13 are required on the UICC in order for a 3GPP session to be carried out.

6.10.2 Conformance requirement

The following conformance requirements refer to the tables for each EF in 3G TS 31.101 [1], clause 13.

CR1 Each existing EF shall be selectable under the MF using the identifier given in the table for that EF.

CR2 All mandatory EFs shall exist on the UICC.

CR3 The identifier of the EF shall be that given in the table for that EF.

CR4 The type and structure of the EF shall be that given in the table for that EF.

CR5 The file size shall be at least that given in the table for that EF.

CR6 The short file identifier shall exist if it is mandatory in the table for that EF.

CR7 The access conditions shall be those given in the table for that EF.

Reference: 3G TS 31.101 [1], clause 13.

Test Group Reference (TGR): TGR_USIM_TP31.101_APF

Test Procedure Reference (TPR): TPR_USIM_TP31.101_APF

6.10.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: The contents and coding of the data within the files are not tested, but shall conform to the respective contents and coding of the data given for each file in 3G TS 31.101 [1], clause 13.

6.10.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a STATUS command to the UICC.

TLV DO with tag '83' in the response data shall indicate the identifier of the MF '3f 00'

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1].

c) The ME simulator shall send a SELECT command to the UICC to select the first EF clause 13 of 3G TS 31.101 [1].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR2].

The following shall be true of the response data:

- *TLV DO with tag '83' shall indicate the identifier of the file selected [CR3].*
- *TLV DO with tag '82' shall not be '38' and '78' indicating EF [CR4].*
- *TLV DO with tag '82' shall indicate the structure given in the table for the file in clause 13 of 3G TS 31.101 [1] [CR4].*
- *TLV DO with tag '80' shall be at least the minimum file size given in the table for the file in clause 13 of 3G TS 31.101 [1]. if the EF is transparent [CR5].*
- *Byte 3 of TLV DO with tag '82' shall be in accordance with the record length given in the table for the file in clause 13 of 3G TS 31.101 [1]. if the EF is linear fixed or cyclic [CR5].*
- *TLV DO with tag '80' shall be an integer multiple of the record length if the EF is linear fixed or cyclic [CR5].*
- TLV DO with tag '88' shall indicate the short file identifier given in the table for the file in clause 13 of 3G TS 31.101 [1]. [CR5,6].

- *TLV DO with tag '86' or '8B' or '8C' or 'AB' shall indicate the access conditions given in the table for the file in clause 13 of 3G TS 31.101 [1]. [CR8].*

d) Steps a) to c) shall be repeated for the remaining mandatory EFs in clause 13 of 3G TS 31.101 [1].

e) Steps a) to c) shall be repeated for the existing optional EFs in clause 13 of 3G TS 31.101 [1].

7 Test Procedure (31.102)

This clause details each of the tests in each of the test groups within the Test Group TP31.102. This test suite allows testing of the IUT against the base specification with respect to:

- Contents of the Elementary Files
- Security Features supported by USIM
- USIM commands

7.1 Contents of the Elementary Files (EF)

The subclause provides tests to ensure that the IUT contains all of the EFs need for a Telecom session.

7.1.1 Definition and applicability

The Elementary Files described in 3G TS 31.102 [2], clause 4 are required on the UICC in order for a 3GPP session to be carried out.

The contents of these files are not tested as they are card/personalisation specific.

7.1.2 Conformance requirement

The following conformance requirements refer to the tables for each EF in 3G TS 31.102 [2], clause 4.

CR1 Each existing EF shall be selectable under the respective DF using the identifier given in the table for that EF.

CR2 All mandatory EFs shall exist on the UICC.

CR3 The identifier of the EF shall be that given in the table for that EF.

CR4 The type and structure of the EF shall be that given in the table for that EF.

CR5 The file size shall be at least that given in the table for that EF.

CR6 The short file identifier shall be those given in the table for that EF.

CR7 The short file identifier shall exist if it is mandatory in the table for that EF.

CR8 The access conditions shall be those given in the table for that EF.

Reference: 3G TS 31.102 [2], clause 4.

Test Group Reference (TGR): TGR_USIM_TP31.102_CEF

Test Procedure Reference (TPR): TPR_USIM_TP31.102_CEF

7.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: The contents and coding of the data within the files are not tested, but shall conform to the respective contents and coding of the data given for each file in 3G TS 31.102 [2], clause 4.

7.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select the respective DF for the first EF in clause 4 of 3G TS 31.102 [2].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1].

c) The ME simulator shall send a SELECT command to the UICC to select the first EF in clause 4 of 3G TS 31.102 [2].

The status condition returned by the UICC shall be SW1='90', SW2='00' - normal ending of the command [CR1, CR2].

The following shall be true of the response data:

- *TLV DO with tag '83' shall indicate the identifier of the file selected [CR3].*
- *TLV DO with tag '82' shall not be '38' and '78' indicating EF [CR4].*
- *TLV DO with tag '82' shall indicate the structure given in the table for the file in clause 4 of 3G TS 31.102 [2] [CR4].*
- *TLV DO with tag '80' shall be at least the minimum file size given in the table for the file in clause 4 of 3G TS 31.102 [2]. if the EF is transparent [CR5].*
- *Byte 3 of TLV DO with tag '82' shall be in accordance with the record length given in the table for the file in clause 4 of 3G TS 31.102 [2]. if the EF is linear fixed or cyclic [CR5].*
- *TLV DO with tag '80' shall be an integer multiple of the record length if the EF is linear fixed or cyclic [CR5].*
- *TLV DO with tag '88' shall indicate the short file identifier given in the table for the file in clause 4 of 3G TS 31.102 [2]. [CR5, CR6].*
- *TLV DO with tag '86' or '8B' or '8C' or 'AB' shall indicate the access conditions given in the table for the file in clause 4 of 3G TS 31.102 [2] [CR8].*

d) Steps a) to c) shall be repeated for the remaining mandatory EFs clause 4 of 3G TS 31.102 [2].

e) Steps a) to c) shall be repeated for the existing optional EFs clause 4 of 3G TS 31.102 [2].

7.2 Security features

7.2.1 Definition and applicability

Every file has its own specific access condition for each command which shall be fulfilled before the command can take place.

7.2.2 Conformance requirement

CR1 [31.102-6.4] The UICC application shall use key reference '01' as PIN and key reference '81' as PIN2.

CR2 [31.102-6.4] Access with PIN2 shall be limited to the UICC application (i.e. PIN2 is used only in the ADF).

CR3 [31.102-6.4] For multi application capability UICC, the only valid usage qualifier shall be '08' which means user authentication knowledge based (PIN) as defined in ISO/IEC 7816-9 [10].

CR4 [31.102-6.4] Every file in the USIM application shall have a reference to an access rule stored in EF_{ARR}.

CR5 [31.102-6.4] Every file under $DF_{TELECOM}$ shall have a reference to an access rule stored in EF_{ARR} under $DF_{TELECOM}$.

CR6 [31.102-6.4] A multi-application capability UICC (from the security context point of view) shall support the referenced format using SE ID as defined in 3G TS 31.101 [1].

CR7 [31.102-6.4] A multi-application capability UICC (from the security context point of view) shall support the replacement of a UICC application PIN with the Universal PIN, key reference '01', as defined in 3G TS 31.101 [1]. Only the Universal PIN is allowed as a replacement.

Reference: 3G TS 31.102 [2], subclause 6.4.

Test Group Reference (TGR): TGR_USIM_TP31.102_SEC2

Test Procedure Reference (TPR): TPR_USIM_TP31.102_SEC2

7.2.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE 1: CR1, CR2 are tested in the subclause 6.6.4.

NOTE 2: CR6 is tested in the subclause 6.6.3.

7.2.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

For a multi-application capability UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select $DF_{TELECOM}$.

The response data shall contain the TLV DO with tag '8B' [CR5].

c) The following step b) shall be repeated for all the EFs under $DF_{TEL:ECOM}$ in the UICC [CR5].

d) The ME simulator shall send a SELECT command to the UICC to select and activate USIM application.

The following shall be true of the response data:

- *TLV DO with tag 'C6' (PS Template DO) shall contain TLV DO with tag '95' (Usage Qualifier) and the value of this TLV shall be '08', if Universal PIN is assigned [CR3].*

- *TLV DO with tag '8B' shall contain the SE number (if Universal PIN is assigned) and EF_{ARR} record number [CR5, CR6].*

e) Step d) shall be repeated for all the EFs under the selected ADF in the UICC [CR4].

For a single application UICC

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select $DF_{TELECOM}$.

The response data shall contain the TLV DO with tag '8B' and the value of this tag shall be the record number of EF_{ARR} [CR5].

c) The following step b) shall be repeated for all the EFs under $DF_{TEL:ECOM}$ in the UICC [CR5].

d) The following step b) shall be repeated for all the ADF and the EFs under the selected ADF in the UICC [CR4].

7.3 USIM commands

7.3.1 AUTHENTICATE function

7.3.1.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] and 3G TS 31.102 [2] to support all functions described therein.

7.3.1.2 Conformance requirement

CR1 This function shall cause the UICC to run the f1, f2, f3, f4, f5, and f1* algorithms using a 16 bytes random number, AUTN, and the subscriber authentication key K stored in the UICC.

CR2 If the received sequence number SQN is in the correct range, the function shall return the response RES, cipher key CK, and integrity key IK.

CR3 If the UICC detects the sequence numbers to be not in the correct range, the function shall return the signed response AUTS.

CR4 The function shall not be executable unless a particular UICC application or any sub-directory has been selected as the Current Directory.

CR5 The function shall not be executable unless a successful PIN verification procedure has been performed.

CR6 The function shall not be executable unless the received MAC-A is expected one.

CR7 If the UICC is not supporting 'GSM context', the function shall not be executable unless the parameter P2 is expected one.

Reference: 3G TS 31.102 [2], subclause 7.1.

Test Group Reference (TGR): TGR_USIM_TP31.102_UCMD_AUTH

Test Procedure Reference (TPR): TPR_USIM_TP31.102_UCMD_AUTH

7.3.1.3 Test purpose

To verify that the UICC conforms to the above requirements.

7.3.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select the USIM application.

c) The ME simulator shall send an AUTHENTICATE command to the UICC.

The status condition returned by the UICC shall be SW1='69', SW2='82' - security status not satisfied [CR5].

d) The ME simulator shall reset the UICC.

e) The ME simulator shall send a SELECT command to the UICC to select the USIM application.

f) The ME simulator shall send a VERIFY PIN command with PIN to the UICC.

g) The ME simulator shall send a SELECT command to the UICC to select the MF.

h) The ME simulator shall send an AUTHENTICATE command to the UICC.

The command shall be aborted [CR4].

i) The ME simulator shall send a SELECT command to the UICC to select the current ADF ('7FFF').

j) The ME simulator shall send an AUTHENTICATE command to the UICC with incorrect signed data.

The status condition returned by the UICC shall be SW1='98', SW2='62' - authentication error, incorrect MAC [CR6].

k) If the 'GSM context' is not available, the ME simulator shall send an AUTHENCITATE command with incorrect parameter P2.

The status condition returned by the UICC shall be SW1='98', SW2='64' - authentication error, GSM security context not supported [CR7].

l) The ME simulator shall send an AUTHENTICATE command to the UICC with incorrect sequence number SQN.

The data field returned shall begin with the tag 'DC', and the data shall be correct for the given f1 and f5 algorithms and K stored in the UICC [CR1, CR3].*

m) The ME simulator shall send an AUTHENTICATE command to the UICC with correct data.

The data field returned shall begin with the tag 'DB', and the data shall be correct for the given f2, f3 and f4 algorithms and K stored in the UICC [CR1, CR2].

7.3.2 Status Conditions Returned by the UICC

7.3.2.1 Security management

7.3.2.1.1 Definition and applicability

The status words SW1 and SW2 provide the method with which the UICC can respond to the ME after executing a command.

7.3.2.1.2 Conformance requirement

CR1 [31.102-7.3.1] The UICC shall respond with the correct SW1 and SW2 status words for commands which produce authentication errors.

Reference: 3G TS 31.102 [2], subclause 7.3.

Test Group Reference (TGR): TGR_USIM_TP31.102_UCMD_SCR_SM

Test Procedure Reference (TPR): TPR_USIM_TP31.102_UCMD_SCR_SM

7.3.2.1.3 Test purpose

To verify that the UICC conforms to the above requirements when issuing SW1 and SW2 status words.

7.3.2.1.4 Method of test

Initial conditions

1) The UICC shall be connected to a ME simulator.

Test procedure

a) The ME simulator shall reset the UICC.

b) The ME simulator shall send a SELECT command to the UICC to select the UICC application.

c) The ME simulator shall send a VERIFY PIN command with relevant PIN to the UICC.

d) The ME simulator shall send an AUTHENTICATE command to the UICC with incorrect MAC.

The status condition returned by the UICC shall be SW1='98', SW2='62' - authentication error, incorrect MAC [CR1].

e) If the 'GSM context' is not available, the ME simulator shall send an AUTHENCITATE command with incorrect parameter P2.

The status condition returned by the UICC shall be SW1='98', SW2='64' - authentication error, GSM security context not supported [CR1].

7.3.2.2 Status Words of the Commands

7.3.2.2.1 Definition and applicability

Limiting the status conditions for each command to a defined set allows the ME to efficiently manage the handling of the status condition.

7.3.2.2.2 Conformance requirement

CR1 [31.102-7.3.2] Table in 3G TS 31.102 [2], subclause 7.3.2 shows for each command the possible status conditions returned (marked by an asterisk *). The UICC shall not generate status conditions other than those allowed for each command.

Reference: 3G TS 31.102 [2], subclause 7.3.2.

Test Group Reference (TGR): TGR_USIM_TP31.102_UCMD_SCR_SW

Test Procedure Reference (TPR): TPR_USIM_TP31.102_UCMD_SCR_SW

7.3.2.2.3 Test purpose

To verify for each command that the UICC will only generate the allowed status conditions.

NOTE: CR1 cannot be tested as it is not possible to force the UICC to generate all of the allowed status conditions for each command and there is no way of forcing the UICC to generate disallowed status conditions for each command.

7.3.2.2.4 Method of test

Initial conditions

N/A

Test procedure

N/A

7.3.3 VERIFY command

7.3.3.1 Definition and applicability

It shall be mandatory for all cards complying with 3G TS 31.101 [1] and 3G TS 31.102 [2] to support all functions described therein.

7.3.3.2 Conformance requirement

CR1 For the USIM application during the 3G session, the parameter P2 shall be restricted to '01' indicating verification of the PIN, or '81' indicating the verification of PIN2.

CR2 After 3 unsuccessful verification of attempts, not necessarily in the same session, the PIN shall be blocked.

Reference: 3G TS 31.102 [2], subclause 7.4.

Test Group Reference (TGR): TGR_USIM_TP31.102_UCMD_VER

Test Procedure Reference (TPR): TPR_USIM_TP31.102_UCMD_VER

7.3.3.3 Test purpose

To verify that the UICC conforms to the above requirements.

NOTE: CR2 is tested in subclause 6.8.1.9.

7.3.3.4 Method of test

Initial conditions

N/A

Test procedure

N/A

8. History

Document history		
0.0.1	14th June 2000	First Draft version.
0.0.2	16th June 2000	The test procedures of the file structures and security features modified. Clause 5 (Testing Group Hierarchy) added. Some editorial modification.
0.0.9	23rd June 2000	Modification to subclause 6.5 – 7.3 (TK & SUN).
0.1.0	27th June 2000 (SUN)	- Change in the format of the document. - TPR and TGR inserted.
0.1.1	3rd July 2000	Minor additions to the Foreword and History by MS.
0.1.2	31 July 2000	- Change in the SEARCH RECORD command test procedures (TK & SUN). - Minor changes in clauses 1 – 5 by TK. - Changes according to core spec version 3.2 for File structures & Security Features.

0.1.3	14 August 2000	Incorporated T=1 draft (SK).
0.1.4	15 August 2000	Insert the word 'shall' in the test procedures.
0.1.5	15 August 2000	Editorial changes.
0.1.6	16 August 2000	The document number for presentation added.
0.2.0	18 August 2000	- Contact C6 test procedures modified. - Test procedures for a multi-application capability UICC included. - Interpretation B of SEARCH RECORD removed.
1.0.0	September 2000	Presented for information to TSG-T #9

The present document is an early draft of the USIM Conformance Test Specification. It is being elaborated during 2000 by 3GPP MCC task 162 under the guidance of 3GPP TSG-T WG3. It is expected to be complete by late November 2000 and then submitted for approval to 3GPP TSG-T #10 (6 - 8 December, Bangkok). For further information, please contact the 3GPP TSG-T WG3 secretary (Michael.Sanders@etsi.fr) or the 31.122 rapporteur, (Simon.Knight@aspect-sw.com).