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**Universal Mobile Telecommunications System (UMTS);
LTE;
UICC-terminal interface;
Physical and logical characteristics
(3GPP TS 31.101 version 15.1.0 Release 15)**



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Foreword

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Introduction

The present document defines a generic Terminal/Integrated Circuit Card (ICC) interface for 3GPP applications. The present document is based on ETSI TS 102 221 [1], which defines a generic platform for any IC card application. The functionality provided by this platform may be operated either over the electrical interface specified in ETSI TS 102 221 [1], or by transporting APDUs over the Inter-Chip USB Terminal/ICC interface specified in ETSI TS 102 600 [7].

Requirements that are common to all 3GPP smart card based applications are also listed in this specification.

The aim of the present document is to ensure interoperability between an ICC and a terminal independently of the respective manufacturer, card issuer or operator. The present document does not define any aspects related to the administrative management phase of the ICC. Any internal technical realisation of either the ICC or the terminal is only specified where these are reflected over the interface.

Application specific details for applications residing on an ICC are specified in the respective application specific documents.

1 Scope

The present document specifies the interface between the UICC and the Terminal for 3G telecom network operation.

The present document specifies:

- the requirements for the physical characteristics of the UICC;
- the electrical interface between the UICC and the Terminal;
- the initial communication establishment and the transport protocols;
- the model which serves as a basis for the logical structure of the UICC;
- the communication commands and the procedures;
- the application independent files and protocols.

The administrative procedures and initial card management are not part of the present document.

For the avoidance of doubt, references to clauses of ETSI TS 102 221 [1] include all the subclauses of that clause, unless specifically mentioned.

The target specification ETSI TS 102 221 [1] contains material that is outside of the scope of 3GPP requirements and the present document indicates which parts are in the scope and which are not.

A 3GPP ME may support functionality that is not required by 3GPP, but the requirements to do so are outside of the scope of 3GPP.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] ETSI TS 102 221 V15.0.0: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics".
- [2] 3GPP TS 31.102: "Characteristics of the USIM Application".
- [3] ETSI TS 101 220: "Smart cards; ETSI numbering system for telecommunication application providers".
- [4] Void.
- [5] ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange".
- [6] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".
- [7] ETSI TS 102 600 V7.6.0: "Smart cards; UICC-Terminal interface; Characteristics of the USB interface".
- [8] 3GPP TS 31.111: "USIM Application Toolkit (USAT)".

- [9] ETSI TS 102 671 V9.2.0: "Smart Cards; Machine to Machine UICC; Physical and logical characteristics"

3 Definitions, symbols, abbreviations and coding

All definitions, symbols, abbreviations applicable to the terminal are specified in ETSI TS 102 221 [1] and ETSI TS 102 600 [7].

The coding of Data Objects in the present document is according to ETSI TS 102 221 [1].

'XX': Single quotes indicate hexadecimal values. Valid elements for hexadecimal values are the numbers '0' to '9' and 'A' to 'F'.

Within the context of the present document, the term "terminal" used in ETSI TS 102 221 [1] refers to the Mobile Equipment (ME).

Within the context of the present document, the term "NAA" used in ETSI TS 102 221 [1] refers to the (U)SIM or the ISIM.

4 General 3GPP platform requirements

4.1 GSM/USIM application interaction and restrictions

Activation of a USIM session excludes the activation of a GSM session. In particular, this implies that once a USIM application session has been activated, commands sent to the UICC with CLAss byte set to 'A0' shall return SW1SW2 '6E 00' (class not supported) to the terminal.

Similarly, activation of a GSM session excludes the activation of a USIM session.

At most one USIM session can be active at the same time.

4.2 3GPP platform overview

The UICC/terminal interface shall support the interface specified in ETSI TS 102 221 [1]. In addition, the UICC/terminal interface may support the Inter-Chip USB interface defined in ETSI TS 102 600 [7].

3GPP ICC based applications (e.g. USIM, USIM Application Toolkit, ISIM, SIM) are supported over both interfaces (see figure 1).

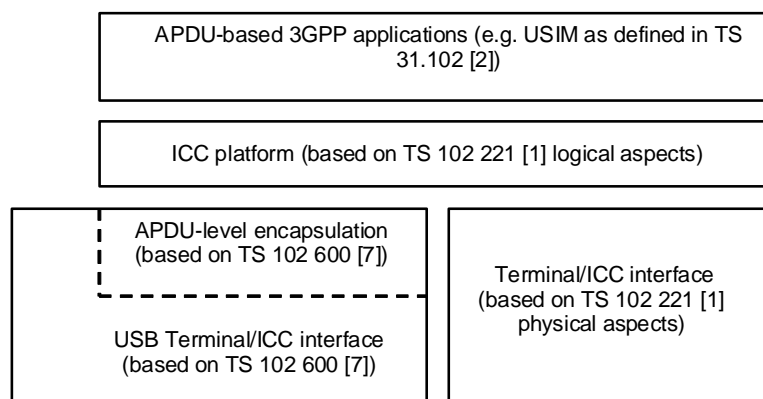


Figure 1: Terminal/UICC interface

4.3 TS 102 221 UICC/terminal interface

The UICC/terminal interface shall comply with all requirements stated in ETSI TS 102 221 [1]. Where options are indicated in ETSI TS 102 221 [1], the present document specifies which options are to be used for a TS 102 221 UICC/terminal interface where the UICC supports a 3GPP application.

4.4 TS 102 600 Inter-Chip USB UICC/terminal interface

If the Inter-Chip USB UICC/terminal interface is supported, it shall comply with ETSI TS 102 600 [7]. Where options are indicated in ETSI TS 102 600 [7], the present document specifies which options are to be used for an Inter-Chip USB UICC/terminal interface where the UICC supports a 3GPP application.

The protocol stack for APDU-level exchanges that are described in ETSI TS 102 600 [7] allow the transmission of APDUs. USB UICCs and USB UICC-enabled terminals shall comply with the functionality of the TS 102 221 interface. Where options are indicated in ETSI TS 102 221 [1], the present document specifies which options are to be used for APDU-based applications where the UICC supports a 3GPP application.

The mapping of APDU into TPDU (see ETSI TS 102 221 [1] clause 7.3.1.1) and transmission oriented commands (see ETSI TS 102 221 [1] clause 12) do not apply in the USB context as the APDU commands and responses are transmitted over USB as encoded at the application layer (i.e. C-APDU and R-APDU are directly encapsulated).

In the context of UICC applications running over USB, the card activation and deactivation process, the cold and warm reset procedures and the request for additional processing time as described in ETSI TS 102 221 [1] shall be performed by USB commands as described in ETSI TS 102 600 [7]. Any reference to the above procedures shall be interpreted in a USB context according to ETSI TS 102 600 [7]. When an ATR is received then the corresponding provisions and error handling procedures of ETSI TS 102 221 [1] apply.

4A Physical Characteristics

The provisions of ETSI TS 102 221 [1] clause 4 apply.

In addition to the form factors described in clause 4.0 of ETSI TS 102 221 [1], the form factors defined in ETSI TS 102 671 [9] clause 6.2 are applicable.

The usage of contact C6 for contactless as defined in ETSI 102 221 [1] is not required by 3GPP. This impacts the following sub-clauses:

ETSI TS 102 221 [1] sub-clause 4.5.1.1

ETSI TS 102 221 [1] sub-clause 4.5.1.2

ETSI TS 102 221 [1] sub-clause 4.5.2.1

ETSI TS 102 221 [1] sub-clause 4.5.2.2

ETSI TS 102 221 [1] sub-clause 4.5.3

5 Physical and logical characteristics

5.1 Transmission speed

See clause 6A.3.2.

5.2 Voltage classes

See clause 6A.2.

5.3 File Control Parameters (FCP)

See clause 11.1.1.4.

5.3.1 Minimum application clock frequency

See clause 11.1.1.4.6.

5.4 Interface protocol

See clause 6A.3.

5A Electrical specifications of the UICC – Terminal interface

The provisions of ETSI TS 102 221 [1] clause 5 apply.

5A.1 Class A operating conditions

Class A operating conditions as specified in ETSI TS 102 221 [1] clause 5.1 is not required by 3GPP.

3G MEs shall not support class A operating conditions as specified in ETSI TS 102 221 [1] clause 5.1 on the ME – UICC interface.

5A.2 Class B operating conditions

The provisions of ETSI TS 102 221 [1] clause 5.2 apply.

5A.3 Class C operating conditions

The provisions of ETSI TS 102 221 [1] clause 5.3 apply.

6 Application protocol

See clause 7A.4.

6A Initial communication establishment procedures

6A.1 UICC activation and deactivation

The provisions of ETSI TS 102 221 [1] clause 6.1 apply.

6A.2 Supply voltage switching

The provisions of ETSI TS 102 221 [1] clause 6.2 apply.

In addition, a UICC holding a 3GPP application shall support at least two consecutive voltage classes as defined in ETSI TS 102 221 [1] clause 6.2.1, e.g. AB or BC. If the UICC supports more than two classes, they shall all be consecutive, e.g. ABC

6A.3 Answer To Reset content

The provisions of ETSI TS 102 221 [1] clause 6.3 apply.

In addition, no extra guard time, indicated in TC1 in the ATR, needs to be supported when sending characters from the terminal to the card. The terminal may reject a UICC indicating values other than 0 or 255 in TC1.

6A.3.1 Coding of historical bytes

The provisions of ETSI TS 102 221 [1] clause 6.3.1 apply.