



Global Handset Requirements for CDMA R-UIM

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Revision History

Date	Version	Description
2 August 2006	0.1	Initial release
7 August 2006	0.2	Update to incorporate CDG template format
27 November 2006	0.3	Update per input from GHRC Toronto meeting in Oct 2006
18 January 2007	0.4	Incorporated the approved Als discussed on the conf call
02 February 2007	0.5	Incorporated the Approved Als discussed on the conf call
15 February 2007	0.9	Approved Publication Text

1. Introduction

1.1 Purpose

This document describes the specifications for Removable User Identity Module (R-UIM)-related aspects of a Mobile Entity (ME) and R-UIM card.

These specifications shall be met by both the R-UIM card and the CDMA terminal (ME) vendors.

The purpose of this document is to specify an interface between an R-UIM card and a ME independently so that the respective manufacturers ensure interoperability between the two.

This document also describes the application interface between the R-UIM and the ME. This will allow service providers to offer unique services to their subscribers by loading applications on the R-UIM cards.

1.2 Document Organization

The organization of the document is as follows:

- Section 1 – Defines the necessary features/set commands that shall be supported by the ME and used for communication between the R-UIM and the ME.
- Section 2 – Support of the Dynamic R-UIM. Defines the necessary feature set/commands that shall be supported by the ME
- Section 3 – Defines the necessary feature set/commands that shall be supported by the R-UIM cards to be used by the operator.

The purpose of these three sections is to corroborate the requirements and support present in the R-UIM/ME to the R-UIM vendors and OEMs.

Code	Category	Description
M	Mandatory	A device must support that characteristic in order to achieve operator approval.
HD	Highly Desirable	It is highly desirable that the terminal supports this characteristic. This degree of compliance can become mandatory in subsequent versions of the document. Supporting this characteristic will be valued in the commercial promotion of the terminal.
O	Optional	It is left up to the manufacturer whether or not the terminal supports this characteristic.
D	Discarded	The terminal MUST NOT support this characteristic in order to achieve an operator's approval.

1.3 Reference Documents

Ref	Document Title	Version
1	<i>Recommended Minimum Performance Standards for Dual-Mode Wideband Spread Spectrum Cellular Mobile Station</i>	TIA/EIA IS-98
2	<i>Removable User Identity Module for Spread Spectrum Systems</i>	C.S0023 –B v1.0
3	<i>CDMA Card Application Toolkit (CCAT)</i>	C.S0035 – A v1.0
4	<i>Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module – Mobile Equipment (SIM-ME) interface</i>	ETSI TS 11.11 v.8.12.0 Release 1999 (2004-03)
5	<i>Specification on the 3 volt subscriber identity module Equipment (SIMME) interface</i>	ETSI TS 11.12 v.5.0.0 Release 1996-01-25
6	<i>Specification of the 1.8 Volt Subscriber Identity Module – Mobile Equipment (SIM-ME) interface</i>	ETSI TS 101 116 V7.0.1 (1999-07) or GSM 11.18 version 7.0.1 Release 1998
7	<i>Specification of the SIM Application Toolkit for the Subscriber Identity Module – Mobile Equipment (SIM-ME) interface (Release 1999)</i>	3GPP TS 11.14 V8.17.0 (2004-09)
8	<i>Smart Cards; Card Application Toolkit, Release 4</i>	ETSI TS 102 223,
9	<i>Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Systems</i>	TIA/EIA/IS-683-C
10	<i>Short Message Service for Spread Spectrum Systems, December 17, 1999</i>	3GPP2 C.S0015-0,
11	<i>Administration of Parameter Value Assignments for TIA/EIA Spread Spectrum Standards</i>	TSB58-D,
12	<i>Cellular Radio-Telecommunications Intersystem Operations, 1997</i>	TIA/EIA/IS-41-D,
13	<i>Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module – Mobile Equipment (SIM-ME) interface (GSM 11.14)</i>	GSM 11.14
14	<i>Secured Packet Structure for CDMA Card Application Toolkit (CCAT) Applications</i>	C.S0078-0
15	<i>Remote APDU Structure for CDMA Card Application Toolkit (CCAT) Applications</i>	C.S0079-0
16	<i>Mobile Station Equipment Identifier (MEID) Support for cdma2000 Spread Spectrum Systems</i>	C.S0072-0
17	<i>ME Personalization for cdma2000</i>	C.S0068-0



1.4 Acronyms and Abbreviations

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Acronym	Description
3GPD	Third Generation Packet Data
A-Key	Authentication Key
ANSI	American National Standards Institute
APDU	Application Protocol Data Unit
ASCII	American Standard Code for Information Interchange
AT	Access Terminal
BER	Bit Error Rate
BREW	Binary Runtime Environment for Wireless
BS	Base station
CAT	Card Application Toolkit
CATPT	Card Application Toolkit Protocol Teleservice
CAVE	Authentication algorithm
CB	Cell Broadcast
CCAT	CDMA Card Application Toolkit
CDG	CDMA Development Group
CDMA	Code Division Multiple Access
CHV	Card Holder Verification information; access condition used by the SIM for the verification of the identity of the user
CMOS	Complementary Metal Oxide Semiconductor (????)
D	Discarded
DF	Dedicated File (abbreviation formerly used for Data Field)
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
ESN	Electronic Serial Number
ETSI	European Telecommunications Standards Institute
EVDO	Evolution-Data Optimized/Only
GSM	Global System for Mobile communications
HR	Highly recommended
HRPD	High Rate Packet Data
IC	Integrated Circuit(s) Card
ID	IDentifier
IEC	Inter Exchange Carrier (????)
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
ISO	International Organization for Standardization
M	Mandatory
MCC	Mobile Country Code
MDN	Mobile Directory Number
ME	Mobile Equipment. A mobile station without an R-UIM inserted.

Acronym	Description
MEID	Mobile Equipment Identifier
MIN	Mobile Identifier Number
MNC	Mobile Network Code
MS	Mobile Station. A station, fixed or mobile, which serves as the end user's wireless communication link with the base station. MS include portable units and units installed in vehicles.
MT	Mobile Terminated
NAM	Number Assignment Module
NID	Network Identification
O	Optional
OEM	Original Equipment Manufacturer
OTAF	Over-the-Air Function
OTAPA	Over-the-Air Parameter Administration
OTASP	Over-the-Air Service Provisioning
PIN	Personal Identification Number. See CHV
PRI	Product Release Instruction
PRL	Preferred Roaming List
PUK	Personal Unblocking Key
RFU	Reserved for future use
R-UIM	Removable User Identity Module
SID	System Identification
SIM	Subscriber Identity Module
SIM-ME	Subscriber Identity Module – Mobile Equipment
SMS	Short Message Service
SMS-PP	Short Message Service Point to Point
SPN	Service Provider Name
SSD	Shared Secret Data
SSPR	System Selection for Preferred Roaming
TLV	Tag, Length, Value
UCS2	Universal Multiple-Octet Coded Character Set
UI	User Interface
UTK	User Identity Module Toolkit
VPN	Virtual Private Network



2. *R-UIM Related Mobile Entity (ME) Specification*

2.1 *Introduction*

This section defines CDMA terminal specifications for the interface between the Removable User Identity Module (R-UIM) and the Mobile Equipment (ME).

2.2 *Requirements*

2.2.1 *General Requirements*

Ref. #	Requirement	Cat.	Remarks	References
2.2.1.1	C.S0023-B	M		Reference [2]
2.2.1.2	C.S0035-A	M		Reference [3]

2.2.2 *Physical Characteristics*

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.2.2.1	Physical Type Plug-in R-UIM.	M		Reference [4]
2.2.2.2	Temperature range for card operation between -25°C and +85°C.	M		Reference [4]
2.2.2.3	The voltages on contacts C1, C2, C3, C6 and C7 of the ME shall be between 0 and $\pm 0,4$ volts referenced to ground (C5) when the ME is switched off with the power source connected to the ME.	M	The measurement equipment shall have a resistance of 50k ohms when measuring the voltage on C2, C3, C6 and C7. The resistance shall be 10k ohms when measuring the voltage on C1.	Reference [4]
2.2.2.4	The contact pressure shall be large enough to ensure reliable and continuous contact.	M	For example, to overcome oxidation and to prevent interruption caused by vibration.	Reference [4]
2.2.2.5	The radius of any curvature of the contacting elements shall be greater than or equal to 0.8 mm, over the contact area.	M		Reference [4]
2.2.2.6	Static protection	M	Considering that the R-UIM is a CMOS device, the ME manufacturer shall take adequate precautions (in addition to the protection diodes inherent in the R-UIM) to safeguard the ME, R-UIM and R-UIM/ME interface from static discharges at all times, and particularly during R-UIM insertion into the ME.	Reference [4]

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2.2.3 Electronic Signals and Transmission Protocols

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.2.3.1	The choice of the transmission protocol(s) to be used to communicate between the R-UIM and the ME shall at least include that specified and denoted by T=0 in ISO/IEC 7816-3 [26].	M		Reference [4]
2.2.3.2	Supply voltage: 1.8V, 3V, and 5V	M		References [4], [5] and [6].

¹ **2.3 Operational Considerations**

² **2.3.1 General Functionalities**

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.3.1.1	MIN Lock Feature – Out of Range. The ME should check for the IMSI_S value available in the R-UIM card. To provide service, the MIN number should be within the specified range of 10 digit numbers defined by the operator.	HD	The operator shall provide the MIN range to the OEM. If the conditions are not met, the ME should reject the card displaying “ MIN out of range – please enter valid MIN ” and allow only emergency numbers to be dialed.	
2.3.1.2	MIN Lock Feature – Default MIN (as per IS 683 standards based on R-UIMID). If the MIN number is out of the range specified, the mobile terminal should check if the MIN value in the R-UIM is set to default MIN.	HD	If the MIN value matches the default MIN the ME shall display “ Please dial *228 to activate phone ” and allow no other calls except to *228.	
2.3.1.3	In case invalid MIN is sent using OTASP/OTAPA the ME shall send RESULT CODE indicating the appropriate error and not write the incorrect MIN to its permanent memory.	M	In case of OTASP/OTAPA the ME should send either a download response message with invalid parameter or “Commit Response” message with invalid parameter to the BS	
2.3.1.4	The ME shall allow a maximum of 5 attempts of insertion of an invalid R-UIM. The counter should decrement the value upon every unsuccessful attempt & finally reach the locked state. The locked condition may be arrived at by any of the following means: Keypad entry using hidden code, programming software tool, or over the air programming.	M	Once the limit exceeds the ME should lock up with a display “ Phone locked – please contact service centre ”. If a correct MIN is entered after 1,2,3,or 4 attempts of entering a wrong MIN, then the counter status shall be reset to initial/default value. The operator must have the opportunity to enable or disable.	Appendix A

Ref. #	Requirement	Cat.	Remarks	References
2.3.1.5	ME Personalization feature shall allow operators the ability to lock a ME to a particular R-UIM or set of R-UIMs	O	The locking feature works by storing personalization information in the ME that limits the R-UIM with which it will work and by checking this information against the R-UIM upon power up or insertion of an R-UIM	Reference [17]
2.3.1.6	Service provider name: The ME shall read the EF _{6F41} SPN for operator name	O	The R-UIM stores the operator name for instance TATA Indicom (encoded using 16-bit Unicode) in the service provider name EF _{6F41} . The ME shall be able to read the EF _{6F41} to display on the ME	
2.3.1.7	Execute the authentication algorithm (e.g. CAVE) in the R-UIM, if the card is installed.	M	Devices supporting R-UIM shall use/execute the authentication algorithm (e.g. CAVE) in the R-UIM, and not in the device.	Reference [2]
2.3.1.8	SSD update: The SSD update must be done in the card if the card is inserted and when this procedure is requested by the network.	M		Reference [2]
2.3.1.9	SMS-PP: CATPT Teleservice ID - Parameter Value: 4103. The ME must send SMS messages to the card, adopting the CATPT Teleservice ID (SMS-PP).	M		Reference [3].
2.3.1.10	The MDN value displayed must be the one stored in the card.	M		Reference [2].
2.3.1.11	All the services supported by the ME must be set in the Terminal Profile and send to the R-UIM card.	M	Terminal Profile must accurately reflect the features supported by the ME.	Reference [3].

Ref. #	Requirement	Cat.	Remarks	References
2.3.1.12	The phone must provide a feature to change or disable the PIN (CHV).	M	User shall be able to change the PIN (CHV) to secure the data.	
2.3.1.13	Every time the user enters a wrong PIN (CHV) the phone shall decrement the counter and display number of attempts remaining.	M	The phone UI shall support only 4 digits while entering PIN (CHV). The phone shall read the maximum number of re-tries from the R-UIM card.	
2.3.1.14	After the number of re-tries of PIN (CHV) is exceeded the ME must allow the user to enter the PUK.	M	PUK is 8 digits and the ME UI shall allow user to enter only 8 digits.	
2.3.1.15	The ME shall support the MEID after ESN exhaustion	M		Reference [16]
2.3.1.16	The ME shall support Timer Expiration	M		

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2.3.2 OTASP/OTAPA

Ref. #	Requirement	Cat.	Remarks	References
2.3.2.1	OTASP/OTAPA C.S0016-0 for 1X-RTT MEs.	M	OTASP/OTAPA must be supported with the card inserted. The ME must update card parameters based on OTASP/OTAPA C.S0016-0, for 1X MEs, including A-key update	
2.3.2.2	OTASP/OTAPA for EVDO MEs.	M	OTASP/OTAPA must be supported with the card inserted.	Reference [9]
2.3.2.3	The ME must update card parameters based on OTASP/OTAPA procedure	M		Reference [9]
2.3.2.4	OTASP/OTAPA shall be configurable based on carrier support	M		Reference [9]
2.3.2.5	Reserved			

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¹ **2.3.3 Phonebook Integration**

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.3.3.1	The ME must provide a way for the user to store contacts in the R-UIM card or locally.	M		Reference [4]
2.3.3.2	The ME must provide a method for selecting the default location (phone memory or R-UIM card) for storing new contact entries.	M	This configuration field must be present under phonebook/contacts settings The user can change the settings when R-UIM is selected.	
2.3.3.3	Show combined phonebook – ME phonebook must simultaneously present card and ME contact list information.	M		CDG #90, Phonebook Section
2.3.3.4	The user must be able to distinguish if the contact is stored either in the card or in the ME.	M	This shall be done by using R-UIM icon in the annunciator area.	
2.3.3.5	The user must be allowed to manually proceed with the following operation: add contact directly to the card phonebook.	M		
2.3.3.6	The user must be allowed to manually proceed with the following operation: delete contact directly from the card phonebook.	M		
2.3.3.7	The user must be allowed to manually proceed with the following operation: modify a contact in the card phonebook.	M		
2.3.3.8	The user must be allowed to manually proceed with the following operation: copy contact from card phonebook to ME phonebook.	M		

Ref. #	Requirement	Cat.	Remarks	References
2.3.3.9	The user must be allowed to manually proceed with the following operation: copy contact from ME phonebook to card phonebook.	M		
2.3.3.10	When moving contacts from the phone to the card, the ME must adapt the contacts: name and mobile phone must fit in the R-UIM standard phonebook	M		
2.3.3.11	The user must be able to select and copy a single phone number entry from a contact with multiple phone numbers entries to the card.	M		CDG #90, Phonebook Section
2.3.3.12	The user must be able to copy all phone number entries from a contact with multiple phone numbers entries to the card.	M	Individual numbers must be saved as separate contacts on the card. If card memory is full and all contact phonebook entries cannot be saved on the ME, the user must be informed.	
2.3.3.13	Card phonebook with memory full: if card phonebook memory is full, the user must be notified	M		Reference [4]
2.3.3.14	(Reserved)			

¹ **2.3.4 SMS Storage Integration**

² All requirements in this section apply when the R-UIM card is inserted.

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.3.4.1	The ME must support a feature that allows the user to define preference of the storage.	M	e.g. R-UIM only, ME only	
2.3.4.2	The user must be allowed to manually proceed with the following operations: copy messages from ME to the card.	M		
2.3.4.3	The user must be allowed to manually proceed with the following operations: copy messages from card to ME.	M		
2.3.4.4	The user must be allowed to manually proceed with the following operations: delete messages in the card.	M		
2.3.4.5	The ME must adapt the message to fit in the R-UIM card.	M		
2.3.4.6	(Reserved)			
2.3.4.7	The ME must display SMS memory capacity or message count for RUIM and phone memory	M		

2.4 C.S0023-B Commands Requirement

- The following commands requirements must be developed according to the C.S0023-B message flow specified.

2.4.1 ESN Management Commands

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.4.1.1	Store ESN_ME	M		Reference [2].

2.4.2 ANSI – 41 Security Related Commands

Ref. #	Requirement	Cat.	Remarks	References
2.4.2.1	Update SSD	M		Reference [2]
2.4.2.2	Base Station Challenge	M		Reference [2]
2.4.2.3	Confirm SSD	M		Reference [2]
2.4.2.4	RUN CAVE	M		Reference [2]
2.4.2.5	Generate Key/VPM	M		Reference [2]
2.4.2.6	Get Response	M		Reference [13]

2.4.3 OTASP/OTAPA Commands

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.4.3.1	Ms key request	M		Reference [2]
2.4.3.2	Key generation request	M		Reference [2]
2.4.3.3	Commit	M		Reference [2]
2.4.3.4	Validate	M		Reference [2]
2.4.3.5	Configuration request	M		Reference [2]
2.4.3.6	Download request	M		Reference [2]
2.4.3.7	SSPR configuration request	M		Reference [2]
2.4.3.8	SSPR download request	M		Reference [2]
2.4.3.9	OTAPA request	M		Reference [2]
2.4.3.10	3GPD configuration request	M		Reference [2]
2.4.3.11	3GPD download request	M		Reference [2]
2.4.3.12	Secure mode	M		Reference [2]
2.4.3.13	FRESH	M		Reference [2]
2.4.3.14	Protocol Capability Request Message	M		Reference [2]

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2.4.4 Packet Data Security-Related Commands

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.4.4.1	Compute IP authentication	M		Reference [2]
2.4.4.2	CHAP IP authentication command type	M		Reference [2]
2.4.4.3	MN-HA Authenticator IP authentication command type	M		Reference [2]
2.4.4.4	MN-AAA Authenticator IP authentication command type	M		Reference [2]
2.4.4.5	HRPD Access Authenticator IP authentication command type	M	Only for EVDO devices.	Reference [2]

¹ **2.5 Card Application Toolkit Support**

² **2.5.1 Proactive Commands**

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.5.1.1	Select item	M		Reference [3]
2.5.1.2	Display text	M		Reference [3]
2.5.1.3	Display text with icon support.	M		Reference [3]
2.5.1.4	Get input.	M		Reference [3]
2.5.1.5	Get input with the possibility to hide the text being typed.	M		Reference [3]
2.5.1.6	More time.	M		Reference [3]
2.5.1.7	Poll interval.	M		Reference [3]
2.5.1.8	Poll interval with time specified by R-UIM support.	HR		Reference [3]
2.5.1.9	Polling off.	M		Reference [3]
2.5.1.10	Refresh.	M		Reference [3]
2.5.1.11	Setup event list.	M		Reference [3]
2.5.1.12	Setup menu.	M		Reference [3]
2.5.1.13	CDMA Send SMS.	M		Reference [3]
2.5.1.14	MT call event.	HR		Reference [3]
2.5.1.15	Launch browser.	M		Reference [3]
2.5.1.16	Call connected event.	HR		Reference [3]
2.5.1.17	Call disconnected event.	HR		Reference [3]
2.5.1.18	Provide local information: current date, time, and time zone.	M		Reference [3]
2.5.1.19	Provide local information: ESN or MEID of ME.	M		Reference [3]

Ref. #	Requirement	Cat.	Remarks	References
2.5.1.20	Provide Local Information: location information (IMSI_11_12, SID, NID, BASE ID, BASE LAT, BASE LONG).	M		Reference [3]
2.5.1.21	Provide local information: ME language setting.	M		Reference [3]
2.5.1.22	Provide local information: current access technology.	M		Reference [3]
2.5.1.23	Open channel.	OP		Reference [3]
2.5.1.24	Close channel.	OP		Reference [3]
2.5.1.25	Receive data.	OP		Reference [3]
2.5.1.26	Send data.	OP		Reference [3]
2.5.1.27	Get channel status.	OP		Reference [3]
2.5.1.28	Get inkey.	M		Reference [3]
2.5.1.29	Play tone.	M		Reference [3]
2.5.1.30	Perform card APDU.	OP		Reference [3]
2.5.1.31	Power off card.	OP		Reference [3]
2.5.1.32	Power on card.	OP		Reference [3]
2.5.1.33	Get reader status.	OP		Reference [3]
2.5.1.34	Set up idle mode text.	OP		Reference [3]
2.5.1.35	Run AT command.	OP		Reference [3]
2.5.1.36	Send DTMF.	OP		Reference [3]
2.5.1.37	Language notification.	OP		Reference [3]
2.5.1.38	Service search.	OP		Reference [3]

Ref. #	Requirement	Cat.	Remarks	References
2.5.1.39	Get service information.	OP		Reference [3]
2.5.1.40	Declare service.	OP		Reference [3]

1 **2.5.2 Events**

Ref. #	Requirement	Cat.	Remarks	References
2.5.2.1	CCAT SMS-PP data download.	M		Reference [3]
2.5.2.2	Menu selection.	M		Reference [3]
2.5.2.3	Profile download.	M		Reference [3]
2.5.2.4	Status command.	M		Reference [3]
2.5.2.5	Call control by R-UIM.	HR		Reference [3]
2.5.2.6	Location status.	M		Reference [3]
2.5.2.7	Data available event.	OP		Reference [3]
2.5.2.8	Channel status.	OP		Reference [3]
2.5.2.9	SMS-CB data download.	M		Reference [3]
2.5.2.10	Timer expiration.	M		Reference [3]
2.5.2.11	Event download.	M		Reference [3]

2 **2.6 BREW Parameter Definition (Reserved)**

3 **2.7 Others**

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
2.7.1	The ME shall support the CCAT service menu exist on the R-UIM.	M	The latest CCAT application service menu to be provided by the operator.	Reference [3]
2.7.2	When the ME has received a command from the R-UIM, it shall attempt to process the command immediately	M		Reference [3]
2.7.2.1	If the command has been successfully executed, the ME shall inform the R-UIM as soon as possible using TERMINAL RESPONSE (OK)			Reference [3]
2.7.2.2	If the command was not successfully executed, the ME shall inform the R-UIM as soon as possible using TERMINAL RESPONSE with an error condition			Reference [3]
2.7.3	The maximum amount of data sent in one proactive R-UIM command is 255 bytes. The ME shall support this.	M		Section 6.48, Reference [4]
2.7.4	All quantities in the EF are represented in binary format, unless otherwise specified. All unused, allocated bytes of memory are set to '00' unless otherwise specified. Some bits are marked as RFU. Some or all of these RFU bits may be used in the future for additional parameters. Therefore, all RFU bits shall be set to '0' (zero). The ME shall ignore the state of all RFU bits.	M		Section 4, Reference [4]

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3. Support of the Dynamic R-UIM (Optional)

3.1 Dynamic Support Definition

This requirement shall be implemented only after discussion with the operator. This item shall be PRI configurable.

3.2 Dynamic R-UIM Implementation

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
3.2.1	Devices with R-UIM support shall use the R-UIM features only if the card is inserted. Otherwise the absence of the card shall have no consequences to the device functionality.	O	ME must work with or without the R-UIM card inserted. The phone must have the memory to store all user parameters plus PRL and ESN (MIN, MDN, MCC, MNC, SID, A-key, etc.) as a regular phone, but if an R-UIM card is inserted, the phone must use the values (including ESN and PRL) from the R-UIM, as long as it is on the phone.	
3.2.2	When no card is inserted, the ME must behave as a non-R-UIM device, acquiring network service based on the pre-configured NAM parameters (if any) and ME-based ESN.	M		
3.2.3	The ME ESN must be used for registration if no card is inserted.	M		
3.2.4	The file EF _{R-UIMID} must be used for registration if a card is inserted.	M		
3.2.5	R-UIM support for EVDO devices: The ME must use the card when inserted for EVDO AAN authentication and as resource to the EVDO PRL. The login and password for EVDO AAN authentication are stored in the R-UIM card.	M	The R-UIM card is responsible for computing the authentication process.	Reference [2].
3.2.6	Dynamic R-UIM only applies to CDMA mode operation.	M	For example: support for CDMA only MEs or CDMA/GSM MEs in CDMA mode only. GSM modes are unaffected by this item.	
3.2.7	When R-UIM is removed the NAM values stored in the ME prior to R-UIM card insertion must be maintained.	O	This is contrary to Reference [2] section 5.2, which was not developed for dynamic R-UIM implementations.	
3.2.8	If dynamic support definition is not supported, the ME shall indicate no service and	M		CDG # 90

Ref. #	Requirement	Cat.	Remarks	References
	only find service when emergency calls are dialed.			
3.2.9	Emergency calling procedure shall be followed	M		CDG # 90

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3.3 General Functionalities

Ref. #	Requirement	Cat.	Remarks	References
3.3.1	When no card is inserted, all subscription parameters (MIN, MDN, MCC, MNC, SID, A-key, etc.) and PRL must be programmable or updated using OTASP/OTAPA and stored in the phone PRI if ME supports OTASP.	M		Reference [2].
3.3.2	R-UIM PRL usage priority	M	When the R-UIM is inserted, the PRL shall be retrieved from the card; if there is no card, the ME shall use the PRL stored in the MEs.	
3.3.3	The phone must use the ESN/MEID or R-UIMID/EUIMID, SSD and A-KEY from the R-UIM card, if the card is installed.	M	<p>Devices with the R-UIM installed shall use the R-UIMID/EUIMID, SSD and A-KEY stored in the card, and not the device ESN/MEID for registration and authentication process.</p> <p>The ME remains with its own ESN/MEID that can be retrieved by the card using the Provide Local Information command or the ESN value stored in the EF_{ESNME}</p>	



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4. R-UIM Card Specification

4.1 Introduction

This section of the document contains the requirements for the Removable User Identity Module (R-UIM) card.

This specification addresses the physical and electrical characteristics of the removable module, along with the user-to-card interface and terminal (ME)-to-card signaling protocol.

This document also defines Elementary Files (EFs) for storage of various parameters. This standard specifies security-related procedures and commands, along with data and information storage items that permit basic operation in CDMA environment.

All quantities in the EF are represented in binary format, unless otherwise specified. All unused, allocated bytes of memory are set to '00' unless otherwise specified. Some bits are marked as RFU. Some or all of these RFU bits may be used in the future for additional parameters. Therefore, all RFU bits shall be set to '0' (zero). The ME shall ignore the state of all RFU bits.

4.2 Requirements

4.2.1 General Requirements

Ref. #	Requirement	Cat.	Remarks	References
4.2.1.1	C.S0023-B	M		Reference [2]
4.2.1.2	C.S0035-A	M		Reference [3]
4.2.1.3	C.S0015-0	M		Reference [10]

4.2.2 Physical Characteristics

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
4.2.2.1	The information on the exterior of the R-UIM should include at least the individual account identifier and the check digit of the IC card identification. The physical characteristics of the R-UIM shall follow the definitions specified in the sections of reference [4].	M		Section 4, Reference [4]

1 **4.2.3 Electrical Interface**

Ref. #	Requirement	Cat.	Remarks	References
4.2.3.1	The electrical characteristics of the R-UIM shall follow the definitions specified in the sections of reference [4].	M		Section 5, Reference [4]

2 **4.2.4 Logical Interface**

Ref. #	Requirement	Cat.	Remarks	References
4.2.4.1	The logical interface of the R-UIM shall follow the definitions specified in the sections of reference [4]. The dedicated file ID for CDMA is '7F25'.	M		Section 6, Reference [4]

3 **4.2.5 Security Features**

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
4.2.5.1	Authentication and key generation procedure	M		Section 7, Reference [4]
4.2.5.2	Algorithms and processes	M		Section 7, Reference [4]
4.2.5.3	File access conditions	M		Section 7, Reference [4]

1 **4.2.6 Function Description**

Ref. #	Requirement	Cat.	Remarks	References
4.2.6.1	The functions of the R-UIM shall follow the definitions specified in reference [2]. The following functions from section 4 are used: update SSD, base station challenge, confirm SSD, run CAVE, generate key/VPM, and store ESN_ME.	M		Section 8, Reference [4] Reference [2]

2 **4.2.7 Command Description**

Ref. #	Requirement	Cat.	Remarks	References
4.2.7.1	The commands used with the R-UIM shall follow the definitions specified in the sections of reference [4].	M		Section 9, Reference [4]

3 **4.2.8 Content of EFs**

Ref. #	Requirement	Cat.	Remarks	References
4.2.8.1	The content of the EFs of the R-UIM shall follow reference [2]	M		Reference [2]
4.2.8.2	The content of the EFs of the R-UIM shall include the sections of reference [4].	M		Section 10, Reference [4]

4 **4.2.9 Application Protocol**

Ref. #	Requirement	Cat.	Remarks	References
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4.2.9.1	General procedures	M		Section 11, Reference [4]
4.2.9.2	Reading an EF	M		Section 11, Reference [4]
4.2.9.3	Updating an EF	M		Section 11, Reference [4]
4.2.9.4	Increasing an EF	M		Section 11, Reference [4]
4.2.9.5	Administrative information request	M		Section 11, Reference [4]
4.2.9.6	SIM service table request	M		Section 11, Reference [4]
4.2.9.7	SIM revision request	M		Section 11, Reference [4]
4.2.9.8	SIM presence detection and proactive polling	M		Section 11, Reference [4]

4.2.10 CDMA Card Application Toolkit

- The CDMA Card Application Toolkit (CCAT) provides mechanisms, which allow applications exist in the R-UIM to interact and operate with any ME supporting the specific mechanism(s) required by the application.

4.2.11 Profile Download

Ref. #	Requirement	Cat.	Remarks	References
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4.2.11.1	The profile download instruction shall be sent by the ME to the R-UIM as part of the R-UIM initialization procedure and as soon as CAT functionality is modified in the terminal	M		Section 5.1, Reference [8]
4.2.11.2	The profile sent by the ME shall state the facilities relevant to CAT that are supported by the ME	M		Section 5.1, Reference [8]
4.2.11.3	If no command is sent by the terminal, the R-UIM shall assume that the ME does not support CAT	M		Section 5.1, Reference [8]

¹ **4.2.12 Proactive R-UIM**

² The list of proactive commands supported by the R-UIM card shall be as follows:

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
4.2.12.1	Select item.	M		Reference [3]
4.2.12.2	Display text.	M		Reference [3]
4.2.12.3	Display text with icon support.	M		Reference [3]
4.2.12.4	Get input.	M		Reference [3]
4.2.12.5	Get input with the possibility to hide the text being typed.	M		Reference [3]
4.2.12.6	More time.	M		Reference [3]
4.2.12.7	Poll interval.	M		Reference [3]
4.2.12.8	Poll interval with time specified by R-UIM support.	M		Reference [3]
4.2.12.9	Polling off.	M		Reference [3]
4.2.12.10	Refresh.	M		Reference [3]
4.2.12.11	Setup event list.	M		Reference [3]
4.2.12.12	Setup menu.	M		Reference [3]
4.2.12.13	CDMA Send SMS.	M		Reference [3]
4.2.12.14	MT call event.	M		Reference [3]
4.2.12.15	Launch browser.	M		Reference [3]
4.2.12.16	Call connected event.	M		Reference [3]
4.2.12.17	Call disconnected event.	M		Reference [3]
4.2.12.18	Provide local information: current date, time, and time zone.	M		Reference [3]
4.2.12.19	Provide local information: ESN or MEID.	M		Reference [3]

Ref. #	Requirement	Cat.	Remarks	References
4.2.12.20	Provide local information: location information (IMSI_11_12, SID, NID, BASE ID, BASE LAT, BASE LONG).	M		Reference [3]
4.2.12.21	Provide local information: ME language setting.	M		Reference [3]
4.2.12.22	Provide local information: current access technology.	M		Reference [3]
4.2.12.23	Open channel.	M		Reference [3]
4.2.12.24	Close channel.	M		Reference [3]
4.2.12.25	Receive data.	M		Reference [3]
4.2.12.26	Send data.	M		Reference [3]
4.2.12.27	Get channel status.	M		Reference [3]
4.2.12.28	Get inkey.	M		Reference [3]
4.2.12.29	Play tone.	M		Reference [3]
4.2.12.30	Perform card APDU.	M		Reference [3]
4.2.12.31	Power off card.	M		Reference [3]
4.2.12.32	Power on card.	M		Reference [3]
4.2.12.33	Get reader status.	M		Reference [3]
4.2.12.34	Set up idle mode text.	M		Reference [3]
4.2.12.35	Run AT command.	M		Reference [3]
4.2.12.36	Send DTMF.	M		Reference [3]
4.2.12.37	Language notification.	M		Reference [3]
4.2.12.38	Service search.	M		Reference [3]

Ref. #	Requirement	Cat.	Remarks	References
4.2.12.3	Get service information.	M		Reference [3]
4.2.12.4	Declare service.	M		Reference [3]

4.2.13 Envelope Commands

Ref. #	Requirement	Cat.	Remarks	References
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Ref. #	Requirement	Cat.	Remarks	References
4.2.13.1	<p>SMS-PP DATA DOWNLOAD</p> <p>When the ME receives a short message with teleservice identifier = Card Application Toolkit Protocol teleservice (CATPT), the ME shall pass the message transparently to the R-UIM using the ENVELOPE (SMS-PP DATA DOWNLOAD) command.</p> <p>The ME shall not display the message, or alert the user of a short message waiting.</p>	M		Section 7.1.1, Reference [3]
4.2.13.2	<p>CELL BROADCAST DATA DOWNLOAD</p> <p>When the ME receives a new Broadcast SMS message, the ME shall check the service category of the broadcast SMS message. If the service category is CATPT, the ME shall pass the message transparently to the R-UIM using the ENVELOPE (BROADCAST SMS DATA DOWNLOAD) commands.</p> <p>The ME shall not display the message, or alert the user of a short message waiting.</p>	M		Section 7.1.2, Reference [3]

1 4.2.14 Data Download to R-UIM

Ref. #	Requirement	Cat.	Remarks	References
4.2.14.1	Data downloading to the R-UIM uses either dedicated commands (using the transport mechanisms of the technology) or the bearer independent protocol. Transfer of information over the R-UIM-terminal interface uses the ENVELOPE command.	M		Section 4.3, Reference [8]

1 **4.2.15 Menu Selection**

Ref. #	Requirement	Cat.	Remarks	References
4.2.15.1	A set of possible menu entries is supplied by R-UIM in a proactive SIM command. The menu selection mechanism is used to transfer the R-UIM application menu item that has been selected by the user to the R-UIM.	M		Section 4.4, Reference [8]

2 **4.2.16 Call Control by Network Access Application**

Ref. #	Requirement	Cat.	Remarks	References
4.2.16.1	When this service is activated by the R-UIM, all dialed digit strings and supplementary service control are first passed to the R-UIM before the ME sets up the call or the supplementary service operation. R-UIM has the ability to allow, bar or modify the call or the supplementary service operation.	O		Section 4.5, Reference [8]

1 **4.2.17 Event Download**

- 2 A set of events to monitor for is supplied by the R-UIM in a Proactive SIM command.
 3 The event download mechanism is used to transfer details of the event to the R-UIM,
 4 when it occurs. Events that the terminal can report to the R-UIM include incoming calls,
 5 location status, access technology, display parameters changed, and availability of the
 6 screen for applications.

Ref. #	Requirement	Cat.	Remarks	References
4.2.17.1	The R-UIM shall support Event Download	M		Reference [3]

7 **4.2.18 Security**

Ref. #	Requirement	Cat.	Remarks	References
4.2.18.1	Applications designed using the features in [8] may require methods to ensure data confidentiality, data integrity, and data sender validation, or any subset of these. Requirements for these mechanisms are defined in reference [14] and [15]	M		Section 4.8, Reference [8] Reference [14] Reference [15]

8 **4.2.19 Multiple Card**

Ref. #	Requirement	Cat.	Remarks	References
4.2.19.1	This clause applies if class "a" is supported. The R-UIM supporting CAT shall be able to communicate with the additional card(s) and get information about the additional reader(s) via the terminal.	O		Section 4.9, Reference [8]

1 **4.2.20 Timer Expiration**

Ref. #	Requirement	Cat.	Remarks	References
4.2.20.1	The R-UIM is able to manage timers running physically in the terminal with a proactive command. The timer expiration mechanism is used to inform the R-UIM when a timer expires.	M		Section 4.10, Reference [8]

2 **4.2.21 Bearer Independent Protocol**

Ref. #	Requirement	Cat.	Remarks	References
4.2.21.1	Data downloading to the R-UIM uses either dedicated commands (using the transport mechanisms of the technology) or the bearer independent protocol. Transfer of information over the R-UIM-terminal interface uses the ENVELOPE command.	M		Section 4.11, Reference [8]

3 **4.2.22 Description of Access Technology Indicator Mechanism**

Ref. #	Requirement	Cat.	Remarks	References
4.2.22.1	Data downloading to the R-UIM uses either dedicated commands (using the transport mechanisms of the technology) or the bearer independent protocol. Transfer of information over the R-UIM-terminal interface uses the ENVELOPE command.	M		Section 4.12, Reference [8]

1 **4.2.23 Tag Allocation Guidelines**

Ref. #	Requirement	Cat.	Remarks	References
4.2.23.1	The guidelines that should be followed when requesting tag values for both BER TLV and Simple TLV tags are mentioned in sections of reference [8]	M		Section 4.13, Reference [8]

2 **4.2.24 Coding of Alpha Fields in the R-UIM for UCS2**

Ref. #	Requirement	Cat.	Remarks	References
4.2.24.1	Reserved	O		Section 4, Reference [4]

3 **4.2.25 Over the Air Service Provisioning**

Ref. #	Requirement	Cat.	Remarks	References
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4.2.25.1	The R-UIM card should be capable of being provisioned over the air via OTASP and OTAPA. The standard followed will be the latest version of OTAF (IS-683A, B and C). The parameters to be programmed via OTAF would be NAM block, PRL, and A-Key.	M		Reference [9]
4.2.25.2	Via SMS-PP: When the ME receives a short message with teleservice identifier = card application toolkit protocol tele-service (CATPT) then the ME shall pass the message transparently to the R-UIM using the ENVELOPE (SMS-PP DATA DOWNLOAD) command.	M	Using Secured Packet Structure	Section 4.1, Reference [3]

1 **4.2.26 Authentication**

Ref. #	Requirement	Cat.	Remarks	References
4.2.26.1	The authentication procedure for subscribers shall be as specified in section 4 of the specification: Removable User Identity Module for Spread Spectrum Systems (3GPP2 C.S0023-B).	M		Reference [2]

2 **4.2.27 SMS and Phone Book Support**

Ref. #	Requirement	Cat.	Remarks	References
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4.2.27.1	For CDMA subscription, SMS data should be taken from CDMA dedicated file, DF"7F25" directory, whereas for GSM subscription, SMS data should be taken from Telecom dedicated file, DF"7F10". So there shall be two separate sets of SMS data defined in R-UIM.	M		Reference [2]
4.2.27.2	Minimum number of SMS that can be stored in the R-UIM shall be greater than 10.	M		Reference [2]

1 **4.2.28 Coding**

Ref. #	Requirement	Cat.	Remarks	References
4.2.28.1	The R-UIM shall support coding of text strings with encoding scheme as ASCII or Unicode.	M		Reference [11]

2 **4.2.29 Capacity Requirements**

3 A memory map will be created by the R-UIM vendor and will be mutually agreed upon by
4 operators and the R-UIM vendor.

Ref. #	Requirement	Cat.	Remarks	References
4.2.29.1	The R-UIM card should allow the user to enter alphanumeric characters in the number field. For example, * or + etc.	M		Reference [2]

5 **4.2.30 Service Provider Name**

Ref. #	Requirement	Cat.	Remarks	References
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4.2.30.1	The R-UIM shall store operator name for instance TATA Indicom (encoded using 16-bit Unicode) in the service provider name EFSPN.	M		Reference [2]
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1 **4.2.31 PIN (CHV) and PUK Retries**

Ref. #	Requirement	Cat.	Remarks	References
4.2.31.1	The maximum number of PIN (CHV) retries shall be 3. The default PIN (CHV) shall be set as defined by operator	M		
4.2.31.2	The maximum number of PUK retries shall be 10. The PUK shall be random in commercial cards.	M		

2 **4.2.32 GSM Plastic Roaming Support**

- 3 The following requirements are applicable to Dual Mode R-UIM cards (also called “Super
4 SIM”) only.

Ref. #	Requirement	Cat.	Remarks	References
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4.2.32.1	All the GSM EFs should be populated as per sections of reference [4].	M		Reference [4]
4.2.32.2	The authentication algorithm and procedures used for GSM roaming shall be compliant with the standard GSM procedures.	M		Reference [4]
4.2.32.3	The SMS EFs for both GSM and CDMA should be accessible by the ME.	M		Reference [3]
4.2.32.4	The phonebook EFs for both GSM and CDMA should be accessible by the ME.	M		Reference [3]



A. Appendix A – PRI Parameters

A.1 ME Specific PRI

No.	PRI Configuration	PRI Setting	Remarks
1	MIN Lock	On or Off	
2	MIN Lock Trial	The number of an invalid R-UIM insertion to the ME	
3	ME Software Switch	<input type="checkbox"/> Dynamic R-UIM <input type="checkbox"/> R-UIM <input type="checkbox"/> Non-R-UIM	

A.2 R-UIM EF Mapping of Data Provisioning to the ME

No.	Provisioning Requirement	EF Name	Remarks
1	NAM Programming	EFSPC EFOTA EFNAMLOCK EFOTAPASPC EFMDN EFIMSI_M EFIMSI_T EFTMSI EFACCOLC EFCSSPR	Reference [2] Reference [9]