



Dual SIM Dual Standby (DSDS) Terminal Requirements

CDG Document 202

Version 1.0

12 October 2011

CDMA Development Group
575 Anton Boulevard, Suite 560
Costa Mesa, California 92626
PHONE +1 888 800-CDMA
+1 714 545-5211
FAX +1 714 545-4601
<http://www.cdg.org>
cdg@cdg.org

Notice

Each CDG member acknowledges that CDG does not review the disclosures or contributions of any CDG member nor does CDG verify the status of the ownership of any of the intellectual property rights associated with any such disclosures or contributions. Accordingly, each CDG member should consider all disclosures and contributions as being made solely on an as-is basis. If any CDG member makes any use of any disclosure or contribution, then such use is at such CDG member's sole risk. Each CDG member agrees that CDG shall not be liable to any person or entity (including any CDG member) arising out of any use of any disclosure or contribution, including any liability arising out of infringement of intellectual property rights.



Contents

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

Dual SIM Dual Standby (DSDS) Terminal Requirements	i
CDG Document 202	i
Version 1.0	i
1. Introduction	1
1.1 Purpose	1
1.2 Scope of Document.....	1
1.3 Organization	2
1.4 Reference Documents	2
1.5 Acronyms and Abbreviations	3
1.6 Terms and Definitions	5
1.6.1 Definitions	5
2. DSDS Terminal/Device Requirements	7
2.1 Operational Requirements	7
2.2 UI Requirements	13
2.3 Other Requirements	17
Appendix A – DSDS Terminal Concurrency Summery	18



Tables

1		
2	Table 1: Acronyms and Abbreviations	3
3	Table 2: Operational Requirements	7
4	Table 3: UI Requirements	13
5	Table 4: Other Requirements.....	17
6	Table 5: W (SIM1) + G(SIM2) Concurrency.....	18
7	Table 6: G (SIM1) + G(SIM2) Concurrency	18
8	Table 7: C (SIM1) + G(SIM2) Concurrency.....	19
9	Table 8: Outgoing Voice Call Events Concurrency*	19
10		

¹ Revision History

Date	Version	Description
October 2011	1.0	Initial Release

1. Introduction

1.1 Purpose

The purpose of this document is to specify requirements for providing Dual SIM Dual Stand-by (DSDS) capability in a mobile terminal or device. Growth in use of devices with two or more SIM/UIM/R-UIM has accelerated significantly in India, China, MEA, SEA, and other emerging markets. The DSDS (or DS2) capability allows the users to have two phone numbers or subscriptions on the same mobile operator network or on different mobile operator networks.

DSDS operation allows the use of two subscriptions without the need to carry two mobile terminals at the same time. For example, the same handset can be used for business and private use with separate numbers and bills; or for travel, with an additional SIM for the country visited. Using multiple SIM cards allows the user to take advantage of different pricing plans for calls and text messages to certain destinations as well as mobile data usage.

In DSDS device, a single baseband/RF is provided and shared between both subscriptions. Typically, one SIM/USIM/R-UIM/CSIM is used for each subscription. DSDS enables registration and camping on either the same or different networks based on the subscriptions. It also allows the user to originate voice calls, receive voice calls, originate SMS and receive SMS on either subscription. By designating data subscription on one of the subscription, the user can utilize this subscription for all packet data services including MO and MT SMS over packet data service.

1.2 Scope of Document

The goal of CDG 202 document is to define a minimum set of technical requirements for a terminal employing DSDS capability. While it is conceivable to arrive at numerous combinations depending upon the air interface technology selected for each subscription, the scope of this document is limited to the following two subscription combinations:

1. WCDMA(UMTS)/GSM + GSM (W/G + G) subscriptions
2. CDMA2000 1x/CDMA2000 1xEV-DO + GSM (C+G) subscriptions

The requirements for services of individual subscription are specified in various CDG documents, namely, CDG 77, Multi-mode Multi-band Mobile Terminal Specification; CDG 90, Global Handset Requirements for Voice, SMS and data; CDG 109, Global

1 Handset Requirements for CDMA – Worldmode; CDG 148, CDMA Device
 2 Requirements — CDMA2000 1xEV-DO Release 0 & Revision A & B; CDG 177,
 3 3GPP2/3GPP Multi Mode Device and Interoperability Requirements; and relevant 3GPP
 4 and 3GPP2 standards. These requirements are not specified again in this document and
 5 hence, the requirements specified in this document focus on DSDS related operations,
 6 functions and capabilities.

7 **1.3 Organization**

8 It is recommended that informative details such as illustrations and examples are included
 9 in the document to make a point clear. These detailed will be marked as Informative and
 10 supplied in an appendix in the document.

11 This document is organized in sections relating to major functional elements:

- 12 • Introduction
- 13 • DSDS Terminal Requirements
- 14 • Appendix – Informative details and illustrations

15 **1.4 Reference Documents**

16 3GPP2 reference documents can be found at
 17 http://www.3gpp2.org/Public_html/specs/index.cfm.

18 CDG reference documents can be found at <http://www.cdg.org>.

19 CCF reference documents can be found at <http://www.globalccf.org>.

Standard	Description
CDG Document 77	Multi-mode Multi-band Mobile Terminal Specification
CDG Document 90	Global Handset Requirements For CDMA — CDMA2000® Voice, SMS and Data
CDG Document 109	Global Handset Requirements for CDMA – Worldmode
CDG Document 148	CDMA Device Requirements — CDMA2000® 1xEV-DO Release 0 & Revision A

Standard	Description
CDG Document 177	3GPP2/3GPP Multi Mode Device and Interoperability Requirements

1.5 Acronyms and Abbreviations

Table 1: Acronyms and Abbreviations

Acronym / Abbreviation	Description
DSDS or DS	Dual SIM Dual Standby
R-UIM	Removable User Identity Module
CSIM	CDMA Subscriber Identity Module
UICC	Universal Identity Circuit Card
USIM	Universal Subscriber Identity Module
CDMA	Code Division Multiple Access
Cdma2000®	TIA/EIA/IS-2000, with a 1.2288 MHz spreading rate
CDG	CDMA Development Group
CCF	CDMA Certification Forum
SMS	Short Message Service
MO-SMS	Mobile Originated Short Message Service

Acronym / Abbreviation	Description
MT-SMS	Mobile Terminated Short Message Service
WCDMA	Wideband Code Division Multiple Access
UMTS	Universal Mobile Telecommunications System
GSM	Global System for Mobile
GHRC	Global Handset Requirements for CDMA
RAT	Radio Access Technology
GCF	Global Certification Forum
IOT	Interoperability Tests
DAK	Delivery ACK
SUPL	Secure User Plan Location
DLL	Dynamic-Link Library
MMS	Multi-media Message Service
OoS	Out of Service
CB	Cell Broadcast
UI	User Interface

Acronym / Abbreviation	Description
PDP	Packet Data Protocol
DUN	Dial Up Networking

1.6 Terms and Definitions

1.6.1 Definitions

The following definitions are critical for this document.

1.6.1.1 Definition of Dual SIM Dual Standby (DSDS):

When incorporated in a mobile terminal it provides one or more of the following key capabilities.

- Up to two (2) subscription or phone numbers on same or different mobile networks
- Ability to originate and receive voice calls as well as send and receive SMS on either subscription
- Ability to initiate data calls using the subscription designated for data

1.6.1.2 Definition of a DSDS Terminal:

A wireless or mobile terminal incorporating DSDS capability.

1.6.1.3 Definition of a W/G+G DSDS Terminal:

A wireless or mobile terminal that incorporates WCDMA/GSM dual mode in one subscription and GSM in the other subscription.

1.6.1.4 Definition of a C+G DSDS Terminal:

A wireless or mobile terminal that incorporates CDMA2000 1x/EV-DO in one subscription and GSM in the other subscription.

- 1 Three categories of requirements are established:

(M) Mandatory	The device must support that characteristic in order to achieve approval.
(HD) Highly Desirable	It is highly desirable and recommended that the device supports this characteristic. This feature may 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. The handset may support this characteristic.

2

2. DSDS Terminal/Device Requirements

This section states the requirements for DSDS terminal facilitating either W/G + G or C + G configuration as explained in the scope of the document. It is mandatory that the DSDS terminal contains both subscriptions in the specified configuration for applying these requirements. Requirements for DSDS terminal being used for single subscription are not specified.

2.1 Operational Requirements

The DSDS terminal shall meet the following operational requirements. These requirements are in addition to the operational requirements which must be met by the DSDS terminal when it is operating as a single SIM terminal using either subscription.

Table 2: Operational Requirements

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.1	The DSDS terminal SHALL support two subscriptions over two UICC cards on one or two different networks.	M			W/G+G
2.1.1.1	If one subscription of the DSDS terminal SHALL support 3G subscription (WCDMA+GSM Dual Mode), then the other shall be limited to 2G only.	M			W/G+G
2.1.2	The DSDS terminal SHALL support two subscriptions over RUIM/CSIM for CDMA and SIM/USIM for GSM on two different networks.	M			C+G

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.2.1	If one subscription of the DSDS terminal SHALL support 3G subscription (CDMA2000 1x/CDMA2000 1xEV-DO Dual Mode), then the other shall be limited to 2G only.	M			W/G+G
2.1.3	The DSDS terminal, upon power on, shall validate both subscriptions.	M			Both
2.1.4	The DSDS terminal SHALL acquire, camp and register on both subscriptions, if the service is available. If the service is not available on a subscription, then the terminal SHALL attempt to re-acquire service on the OoS subscription as it would, in a single subscription configuration.	M	The DSDS terminal begins monitoring of pages on both subscriptions.		W/G + G
2.1.5	The DSDS terminal SHALL acquire, camp and register on both subscriptions, if the service is available. In CDMA, it SHALL acquire, camp and register on both CDMA2000 1x and CDMA2000 1xEV-DO networks, if applicable. If the service is not available on a subscription, then the terminal SHALL attempt to re-acquire service on the OoS subscription as it would, in a single subscription configuration.	M	The DSDS terminal begins monitoring of pages on both subscriptions.		C + G
2.1.6	Once camped on both subscriptions, the DSDS terminal SHALL support incoming and outgoing circuit switched calls on both subscriptions.	M	If one of the subscription is OoS, then the requirement applies to the camped on subscription.		Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.7	The DSDS terminal SHALL perform all the mobility procedures on each subscription, as it would in case of a single SIM configuration.	M	The mobility procedures on one subscription could lead to other subscription going OoS due to loss of radio for extended periods.		Both
2.1.8	The supplementary services per subscription such as call waiting activation/deactivation, call barring query, call transfer, etc. SHALL be supported on each subscription that is in a call, as it would in a single SIM configuration.	M			Both
2.1.9	The DSDS terminal shall support DDS sticky setting via the terminal UI menu to determine the subscription to use for active PDP contexts. The packet service capabilities on DDS shall function the same as single SIM subscription.	M	Even during inactive or dormant PDP connect on DDS, user can not perform data transfer on non-DDS subscription without changing the preference via the terminal UI. Change of preference will lead to tear down of all data connections on the DDS and the user will be required to resume the data service on new DDS.		Both
2.1.10	The DSDS terminal shall support tune away capability to allow receipt of incoming voice calls on GSM (G) subscription during the low priority background traffic on the 3G (DDS) subscriptions.	HD	The DSDS terminal does not support packet data contexts on both subscriptions concurrently.		Both
2.1.10.1	Tune away to GSM shall be based on tune-away rules and using the existing tune-away mechanisms and timings.	HD			Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.11	The DSDS terminal SHALL support manual system parameters change for PLMN and band selection on each subscription.	M			W/G+G
2.1.12	The DSDS terminal SHALL support manual PLMN scan request for each subscription.	M			W/G+G
2.1.13	The DSDS terminal SHALL support full inter-RAT capabilities as it would in case of a single SIM subscription.	M			W/G+G
2.1.14	When one subscription is disabled and other subscription active, the DSDS terminal SHALL behave as a single SIM terminal.	M			Both
2.1.14.1	When one subscription is disabled, the other subscription SHALL provide similar power consumption, performance, operation and processing requirements as a similar single SIM configuration device. This shall include GCF compliance and passing of all relevant IOT and carrier tests.	M			Both
2.1.15	When an active mobile originated or mobile terminated voice call is active on an subscription, the other subscription SHALL be OoS (out of service).	M			Both
2.1.16	The DSDS terminal Shall support MO and MT SMS over CS on both subscriptions.	M			Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.16.1	The DSDS terminal SHALL allow user to select the subscription to use (via terminal UI) for MO SMS over CS.	M			Both
2.1.16.2	The DSDS terminal SHALL allow MT SMS services on both subscriptions.	M			Both
2.1.16.3	The DSDS terminal SHALL support SMS on PS only using the DDS.	O			Both
2.1.17	The DSDS terminal SHALL support sending of MMS on DDS only.	M			Both
2.1.17.1	The DSDS terminal shall support receipt of MT SMS notification of an incoming MMS on either subscription.	M	The application UI level may provide ability to switch DDS to the subscription corresponding to the notification MT SMS.		Both
2.1.17.2	The DSDS terminal SHALL support retrieval of incoming MMS on DDS only.	M			Both
2.1.18	The DSDS terminal SHALL support standalone GPS in the same fashion as a Single SIM configuration terminal.	M			Both
2.1.19	The DSDS terminal SHALL allow user to initiate MO SUPL aGPS session on DDS only.	M			Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.19.1	The DSDS terminal SHALL allow user to receive and respond MT SUPL aGPS session trigger on DDS only.	M			Both
2.1.19.2	The DSDS terminal SHALL time from CDMA network if the DDS is on GSM.	HD			C+G
2.1.20	The DSDS terminal SHALL support emergency calling on both subscriptions. The DSDS terminal SHALL support user selection (via terminal UI) of subscription for emergency calls.	M			Both
2.1.20.1	The DSDS terminal SHALL use the other subscription for emergency calls if the user selected subscription is OoS.	M	If the emergency call set up on a subscription fails, the terminal may re-attempt on the other subscription.		Both
2.1.21	The DSDS terminal SHALL support dual IMEIs, one for each WCDMA and/or GSM subscription.	M			W/G+G
2.1.22	The DSDS terminal shall support Cell Broadcast (CB) reception on the GSM subscription.	M			Both
2.1.22.1	The DSDS terminal shall support reception of CB messages on both GSM subscriptions when camped to their respective GSM networks.	M	Since CB reception carries very low priority in DSDS terminal, the performance may not be as effective as a single SIM configuration terminal.		W/G+G

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.1.22.2	The DSDS terminal may support CB on CDMA subscription.	O			C+G

1 2.2 UI Requirements

2 The DSDS terminal shall meet the following User Interface (UI) requirements. These
3 include displaying appropriate notifications to user, allow user to control various settings,
4 terminal status displays, etc. These requirements are in addition to the UI requirements
5 which must be met by the DSDS terminal when it is operating as a single SIM terminal
6 using either subscription.

7 **Table 3: UI Requirements**

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.2.1	The DSDS terminal SHALL validate and enable both active SIMs upon power up. The UI SHALL display appropriate results. If one or both SIMs are absent, appropriate notification shall be displayed via UI.	M			Both
2.2.2	The DSDS terminal SHALL support notification display for each subscription to include, but not limited to, signal strength, service availability, subscription identification, network name, etc.	M			Both
2.2.3	The DSDS terminal SHALL allow enabling and disabling of each subscription via UI.	M	Includes enabling/disabling of SIM application and access.		Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.2.4	The DSDS terminal shall support overall terminal Airplane mode as well as for each subscription individually.	M			Both
2.2.5	The DSDS terminal SHALL support Low Power Mode setting for each subscription.	M	Disable air interface, SIM application, powering down associated hardware, etc.		Both
2.2.6	The DSDS terminal SHALL support designating one subscription as DDS.	M	The other subscription automatically becomes non-DDS.		Both
2.2.7	The DSDS terminal SHALL support designating one subscription as default subscription which is to be used for all outgoing activities such as voice calls, SMS, Data, etc.	HD	Valid selections are SIM1 Default, SIM2 Default or None. If no subscription is designated as default (None), then individual settings for various services are required.		Both
2.2.7.1	The DSDS terminal SHALL support subscription selection for each voice call or MO SMS.	M			Both
2.2.8	The DSDS terminal shall display activity status for each subscription.	M	Voice call, SMS, Data, GPS, etc.		Both
2.2.8.1	The DSDS terminal SHALL indicate to user if an active context on one subscription is preventing a service on other subscription.	M			Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.2.9	The DSDS terminal SHALL allow user to program the subscription to use for the outgoing calls.	M	Programming options may be SIM1, SIM2 or Ask me.		Both
2.2.10	The DSDS terminal shall include subscription identification in the incoming call notification,	M			Both
2.2.11	<p>The DSDS terminal SHALL support phonebook and contact management functions across both subscriptions – SIMs and phone. These management functions include, but not limited to:</p> <ul style="list-style-type: none"> • Copy to either SIM or phone • Move between either SIM and phone • Add to either SIM and phone • Add numbers from SMS or calls to either SIM or phone • Delete from either SIM or phone 	M			Both
2.2.12	The DSDS terminal shall allow to maintain the PDP context information (history, bookmarks, etc.) when changing DDS from one subscription to other	M			Both
2.2.13	The DSDS terminal SHALL support network setting and operations for each SIM within the constraints of the DSDS terminal.	M	Preferred networks, network selection, manual/auto search, etc.		Both

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.2.14	The DSDS terminal SHALL notify the user when one of the two SIMs is invalidated and DSDS terminal is working in single SIM configuration.	M			Both
2.1.15	The DSDS terminal SHALL support ability to turn on or off cell broadcast reception for each subscription.	M			Both
2.1.16	The DSDS terminal SHALL provide power saving methods to the user.	M			Both
2.1.17	The DSDS terminal SHALL support SIM toolkit application (at least on one SIM).	M			Both
2.1.18	The DSDS terminal SHALL support SMS and MMS settings per subscription.	M			Both
2.1.18.1	The DSDS terminal SHALL provide ability to switch DDS to the subscription corresponding to the notification MT SMS received for MMS.	M			Both
2.1.19	The DSDS terminal SHALL display IMEI and associated subscription when requested.	M	##06#		Both
2.1.20	The DSDS terminal SHALL be able to specify relative priority between dual standby operation and GPS.	M	In the event that both are unable to coexist.		Both

2.3 Other Requirements

The DSDS terminal shall meet the following other requirements.

Table 4: Other Requirements

Req. #	Requirement	Category	Remarks	References	W/G+G or C+G or both
2.3.1	The DSDS terminal SHALL support AT commands to set up DUN call over DDS.	HD			Both
2.3.2	The DSDS terminal SHALL support setting of supplementary services for each SIM.	M	These include call waiting, call forwarding, caller ID, call transfer, etc.		Both
2.3.3	The DSDS terminal SHALL optimize the mobile originated call set up such that any increase in call set up time is not perceptible to the use.	HD			Both
2.3.4	The DSDS terminal SHALL optimize the paging arbitration such that paging to high priority is not lost due to activities on other subscription.	HD			Both
2.3.5	The DSDS terminal SHALL prioritize MO calls over other activities.	M			Both
2.3.6	The DSDS terminal SHALL prioritize outgoing emergency calls over all other activities.	M			Both
2.3.7	The DSDS terminal SHALL perform all capabilities normally for the active subscription in the event other subscription is not in service (invalidated, Out of service, no SIM, etc.).	M			Both



1 **Appendix A – DSDS Terminal Concurrency** 2 **Summery**

3 **Table 5: W (SIM1) + G(SIM2) Concurrency**

SIM1 Precondition	New Incoming Event	Concurrency	Interrupt
Voice Call	SIM1 Data Call	Yes	No
Voice Call	SIM2 Voice Call	No	No
Voice Call	SIM2 Data Call	No	No
Data Call	SIM1 Voice Call	Yes	No
Data Call	SIM2 Voice Call	No	Yes*
Data Call	SIM2 Data Call	No	No

4 * If tune away is supported.

5 **Table 6: G (SIM1) + G(SIM2) Concurrency**

SIM1 Precondition	New Incoming Event	Concurrency	Interrupt
Voice Call	SIM1 Data Call	No	No
Voice Call	SIM2 Voice Call	No	No
Voice Call	SIM2 Data Call	No	No

SIM1 Precondition	New Incoming Event	Concurrency	Interrupt
Data Call	SIM1 Voice Call	Yes	Yes
Data Call	SIM2 Voice Call	No	No
Data Call	SIM2 Data Call	No	No

¹ * If tune away is supported.

²

Table 7: C (SIM1) + G(SIM2) Concurrency

SIM1 Precondition	New Incoming Event	Concurrency	Interrupt
Voice Call	SIM1 Data Call	Yes	No
Voice Call	SIM2 Voice Call	No	No
Voice Call	SIM2 Data Call	No	No
Data Call	SIM1 Voice Call	No	No
Data Call	SIM2 Voice Call	No	Yes*
Data Call	SIM2 Data Call	No	No

³ * If tune away is supported and SIM1 data call is on CDMA2000 1xEV-DO

⁴

Table 8: Outgoing Voice Call Events Concurrency*

Precondition	New Outgoing Event	Concurrency	Interrupt
SIM1 Data Call	SIM2 Voice Call	No	Yes

Precondition	New Outgoing Event	Concurrency	Interrupt
SIM2 Data Call	SIM1 Voice Call	No	Yes

- ¹ * MO call is considered high priority than an ongoing data call irrespective of W, C or G
- ² designation of SIM1 or SIM2.