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SIGNALING CONFORMANCE TEST SPECIFICATION FOR INTERWORKING OF CDMA2000 1X AND HIGH RATE PACKET DATA SYSTEMS REVISION A

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1

FOREWORD

2

(This foreword is not part of this specification)

3

This Specification was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This Specification is the first revision of the document and defines air interface signaling conformance tests for CDMA/HRPD mobile stations/access terminals. This

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version of the specification supersedes all previous revisions.

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NORMATIVE REFERENCES

2 This section provides references to other specifications and standards that are necessary to
3 implement this document.

4 The following standards contain provisions which, through reference in this text, constitute
5 provisions of this Standard. At the time of publication, the editions indicated were valid. All
6 standards are subject to revision, and parties to agreements based on this Standard are
7 encouraged to investigate the possibility of applying the most recent editions of the standards
8 indicated below.

1. 3GPP2 C.S0003-E, *Medium Access Control (MAC) Standard for cdma2000 Spread Spectrum Systems*.
2. 3GPP2 C.S0005-E, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems*.
3. 3GPP2 C.S0015-B, *Short Message Service (SMS) for Wideband Spread Spectrum Systems - Release B, 2006*
4. 3GPP2 C.S0024-C, *cdma2000 High Rate Packet Data Air Interface Specification*
5. 3GPP2 A.S0009-C, *Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Packet Control Function*
6. 3GPP2 C.S0075-0, *Interworking Specification for cdma2000 1x and High Rate Packet Data Systems*

9

10

1

INFORMATIVE REFERENCES

2

3 References in this section are informative.

4

IR 1. 3GPP2 S.R0108-0 *HRPD-cdma2000 1x Interoperability for Voice and Data*

5

System Requirements

1 INTRODUCTION

2 1.1 Scope

3 This specification defines air interface signaling conformance tests for CDMA/HRPD mobile
4 stations/access terminals. It is applicable to P_REV_IN_USE equal to or less than seven, and/or
5 access terminals supporting revision 0, revision A, revision B and/or revision C of [4].

6 In this document, 'mobile station' or 'access terminal' refers to a subscriber terminal, handset,
7 PDA, wireless local loop unit, or any other CDMA/HRPD subscriber terminal that communicates
8 with the base station at the air interface. 'Base station' or 'access network' refers to the
9 composite functionality of the base station and connected network elements. A cabled
10 connection is typically used for the air interface connection between the mobile station and an
11 emulated base station(s).

12 1.2 Device Modes

13 The devices that can be tested using this specification operate under one of the following modes:

- 14 1. Hybrid Mode: Hybrid mode device that can support cdma20001x and HRPD by periodic
15 monitoring the paging channel of cdma20001x. Such a device prioritizes cdma20001x
16 call and is incapable of simultaneous connection on cdma20001x and HRPD
- 17 2. SVDO Mode: SVDO mode device can support simultaneous cdma20001x and HRPD
18 traffic channels. Further, there are two different SVDO devices:
 - 19 a. SVDO Mode 1: This mode supports only a limited separation between HRPD and
20 cdma20001x channels. This value is called referred to as the maximum
21 Supported Bandwidth (MSBW) and is an implementation dependent value.
 - 22 b. SVDO Mode 2: This mode supports unlimited separation between HRPD and
23 cdma20001x carrier assignments.

24 Applicability of tests to hybrid mode, SVDO mode 1, and SVDO mode 2 is indicated for each test.
25 Unless otherwise noted tests are applicable to SVDO are applicable to SVDO mode 1 and SVDO
26 mode 2.

27 1.3 Testing Objective

28 The objective of these tests is to demonstrate mobile station signaling conformance with base
29 station equipment compliant to the cdma2000^{®1} family of standards. References to the applicable
30 standard functionality are listed in the traceability section of each test case.

31 1.4 Execution Strategy

32 All features supported by the base station, such as Signaling Message Encryption,
33 Authentication, Voice Privacy, etc. should be enabled.

¹ cdma2000[®] is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OP's) of 3GPP2. Geographically (and as of the date of publication), cdma2000[®] is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.

- 1 All applicable tests should be executed for all supported Band Classes and Radio Configurations.
 2 The following general comments apply to all tests:
- 3 a. Unless specified otherwise in a test case, channel conditions for a test shall be set to
 4 have low FER.
 - 5 b. Base stations should be configured for normal operation as specified in [1] unless
 6 otherwise specified in a specific test.
 - 7 c. Unless otherwise specified, the Reverse Traffic Channel should be operated at a
 8 sufficiently high E_b/N_0 to ensure insignificant (for example, less than 1%) FER.

9 1.5 Notes

10 “Shall” and “shall not” identify requirements to be followed strictly to conform to this document and
 11 from which no deviation is permitted. “Should” and “should not” indicate that one of several
 12 possibilities is recommended as particularly suitable, without mentioning or excluding others, that
 13 a certain course of action is preferred but not necessarily required, or that (in the negative form) a
 14 certain possibility or course of action is discouraged but not prohibited. “May” and “need not”
 15 indicate a course of action permissible within the limits of the document. “Can” and “cannot” are
 16 used for statements of possibility and capability, whether material, physical or causal.

17 1.6 Supplementary Terms and Definitions

- 18
 19 **1x** – A system compliant with 3GPP2 C.S0001, C.S0002, C.S0003, C.S0004 and C.S0005.
- 20 **Active Mode** – An AT is in Active Mode when it has a session established with an HRPD system,
 21 a PPP session established and an air-interface connection open with the HRPD system.
- 22 **AN**- Access Network
- 23 **AT** – Access Terminal
- 24 **Band Class** - A set of frequency channels and a numbering scheme for these channels.
- 25 **Base Station** - A fixed station used for communicating with mobile stations. In this document, the
 26 term base station refers to the entire cellular system infrastructure including transceiver
 27 equipment and Mobile Switching Center.
- 28 **BS** – See base station.
- 29 **CDMA** - See Code Division Multiple Access.
- 30 **Code Division Multiple Access (CDMA)** - A technique for spread-spectrum multiple-access
 31 digital communications that creates channels through the use of unique code sequences.
- 32 **Dormant Mode** – An AT is in Dormant Mode when it has a session established with an HRPD
 33 system, and has a PPP session established, but does not have a connection open with that
 34 system.
- 35 **E_b/N_0** - Energy-per-bit-to noise-per-hertz ratio.
- 36 **f-csch** - Forward common signaling logical channel.
- 37 **f-dsch** - Forward dedicated signaling logical channel.
- 38 **FER** - Frame Error Rate of Forward Traffic Channel.
- 39 **HRPD** – High Rate Packet Data
- 40 **Hybrid AT** – An AT capable of operating on both a cdma2000 1x and HRPD system.

- 1 **Idle Mode** – An AT is in Idle Mode when it has a session established with the HRPD system but
2 does not have a PPP session established.
- 3 **IOS** – Interoperability Specification.
- 4 **IP** – Internet Protocol.
- 5 **Mobile IP** - A packet data session where the user continuously maintains mobility bindings at the
6 Home Agent and there is no lapse in Mobile IP registrations/re-registrations (i.e., the IP address
7 is persistent).
- 8 **Mobile Station (MS)** - A station that communicates with a base station while in motion or during
9 halts at unspecified points.
- 10 **MS** – See Mobile Station
- 11 **MSC** - See Mobile Switching Center
- 12 **Mobile Switching Center (MSC)** - A configuration of equipment that provides radiotelephone
13 service. Also called the Mobile Telephone Switching Office (MTSO).
- 14 **P_REV_IN_USE** – Protocol revision level currently in use by a mobile station
- 15 **Packet** - The unit of information exchanged between the service option applications of the base
16 station and the mobile station.
- 17 **PN** - Pseudonoise
- 18 **PPP** – Point-to-Point Protocol
- 19 **r-csch** - Reverse common signaling logical channel
- 20 **r-dsch** - Reverse dedicated signaling logical channel
- 21 **Radio Configuration (RC)** - A set of Forward Traffic Channel and Reverse Traffic Channel
22 transmission formats that are characterized by physical layer parameters such as transmission
23 rates, modulation characteristics and spreading rate.
- 24 **RC** - See Radio configuration.
- 25 **Short Message Services (SMS)** - A suite of services such as SMS Text Delivery, Digital Paging
26 (i.e., Call Back Number - CBN), and Voice Mail Notification (VMN).
- 27 **System** – A system is a cellular telephone service or personal communications service that
28 covers a geographical area such as a city, metropolitan region, country, or group of countries.
- 29 **SVDO AT** – An AT capable of simultaneously operating on cdma2000 1x and HRPD system.

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1 **2 INTERWORKING OF 1X AND HRPD – HRPD IDLE MODE**

2 For HRPD test cases described in Chapter 2, the terms mobile station and base station represent
3 the access terminal (AT) and access network (AN) respectively.

4 For all tests in Chapter 2, Session Security should be enabled if supported. Tests in this chapter
5 are applicable to AT that are capable of operation in hybrid or SVDO modes. These tests should
6 be repeated for all revisions of HRPD supported by the AT.

7 **2.1 Hybrid / SVDO AT Voice Origination in HRPD Idle Mode**

8 2.1.1 Definition

9 This test verifies a voice call origination when in HRPD Idle Mode.

10 2.1.2 Traceability

11 (see [6])

12 (see [IR 1])

13 (see [4])

14 Chapter 7 Session Layer

15 Chapter 8 Connection Layer

16 Chapter 10 MAC Layer

17 (see [5])

18 Chapter 3 HRPD IOS Call Flows

19 (see [2])

20 2.2.6.2.5 Mobile Station Origination Operation

21 2.6.3 System Access State

22 2.6.3.5 Mobile Station Origination Attempt Substate

23 2.6.4 Mobile Station Control on the Traffic Channel State

24 2.7.1.3.2.4 Origination Message

25 2.7.2.3.2.15 Service Option Control Message

26 2.7.3 Orders

27 3.6.3.5 Response to Origination Message

28 3.6.4 Traffic Channel Processing

29 3.7.2.3.2.21 Extended Channel Assignment Message

30 3.7.3.3.2.3 Alert With Information Message

31 3.7.3.3.2.20 Service Connect Message

32 3.7.4 Orders

33 3.7.5.5 Signal

34 2.1.3 Call Flow Example(s)

35 None.

1 2.1.4 Method of measurement

- 2 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
3 as cdma2000 1x and AN 2 configured as HRPD.
- 4 b. Ensure that the AT has an HRPD session established with AN 2 but does not have a
5 PPP session established. Note the UATI assigned to the AT.
- 6 c. Initiate a voice call from the Hybrid / SVDO AT.
- 7 d. Verify the call completes and verify CDMA user data in both directions.
- 8 e. End the call.
- 9 f. Cause the AT to access the HRPD system.
- 10 g. Verify that the AT uses the UATI assigned in step b.

11 2.1.5 Minimum Standard

12 The AT shall comply with step d and g.

13 **2.2 Hybrid / SVDO AT Voice Termination in HRPD Idle Mode**

14 2.2.1 Definition

15 This test verifies a voice call termination when in HRPD Idle Mode.

16 2.2.2 Traceability

17 Same as section 2.1.2.

18 2.2.3 Call Flow Example(s)

19 None

20 2.2.4 Method of measurement

- 21 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
22 as cdma2000 1x and AN 2 configured as HRPD.
- 23 b. Ensure that the AT has an HRPD session established with AN 2 but does not have a
24 PPP session established. Note the UATI assigned to the AT.
- 25 c. Initiate a voice call to the Hybrid / SVDO AT.
- 26 d. Verify the call completes and verify CDMA user data in both directions.
- 27 e. End the call.
- 28 h. Cause the AT to access the HRPD system.
- 29 f. Verify that the AT uses the UATI assigned in step b.

30 2.2.5 Minimum Standard

31 The AT shall comply with step d and g.

32 **2.3 Hybrid / SVDO AT SMS Origination in HRPD Idle Mode**

33 2.3.1 Definition

34 This test verifies SMS Origination when in HRPD Idle Mode.

1 2.3.2 Traceability

2 (see [6])

3 (see [IR 1])

4 (see [4])

5 Chapter 7 Session Layer

6 Chapter 8 Connection Layer

7 Chapter 10 MAC Layer

8 (see [5])

9 Chapter 3 HRPD IOS Call Flows

10 (see [3])

11 2.3.3 Call Flow Example(s)

12 None

13 2.3.4 Method of measurement

14 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
15 as cdma2000 1x and AN 2 configured as HRPD.

16 b. Ensure that the AT has an HRPD session established with AN 2 but does not have a
17 PPP session established. Note the UATI assigned to the AT.

18 c. Instruct the Hybrid / SVDO AT to send an SMS message to the network on the r-csch.

19 d. Verify SMS message is correctly sent to the SMS Message Center.

20 e. Instruct the Hybrid / SVDO AT to send an SMS message on the r-dsch.

21 f. Verify the SMS is correctly sent to the SMS Message Center.

22 i. Cause the AT to access the HRPD system.

23 g. Verify that the AT uses the UATI assigned in step b.

24 2.3.5 Minimum Standard

25 The AT shall comply with steps d, f and g.

26 **2.4 Hybrid / SVDO AT SMS Termination in HRPD Idle Mode**

27 2.4.1 Definition

28 This test verifies SMS termination when in HRPD Idle Mode.

29 2.4.2 Traceability

30 (see [6])

31 (see [IR 1])

32 (see [4])

33 Chapter 7 Session Layer

34 Chapter 8 Connection Layer

35 Chapter 10 MAC Layer

36 (see [5])

- 1 Chapter 3 HRPD IOS Call Flows
2 (see [3])
- 3 2.4.3 Call Flow Example(s)
4 None.
- 5 2.4.4 Method of measurement
- 6 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
7 as cdma2000 1x and AN 2 configured as HRPD.
- 8 b. Ensure that the AT has an HRPD session established with AN 2 but does not have a
9 PPP session established. Note the UATI assigned to the AT.
- 10 c. Instruct the network to send an SMS message to the Hybrid / SVDO AT on the f-csch.
- 11 d. Verify SMS message is correctly received at the Hybrid / SVDO AT.
- 12 e. Instruct the network to send an SMS message to the Hybrid / SVDO AT on the f-dsch.
- 13 f. Verify the SMS message is correctly received at the Hybrid / SVDO AT.
- 14 j. Cause the AT to access the HRPD system.
- 15 g. Verify that the AT uses the UATI assigned in step b.
- 16 2.4.5 Minimum Standard
- 17 The AT shall comply with steps d, f and g.

1 **3 INTERWORKING OF 1X AND HRPD – HRPD ACTIVE MODE**

2 For HRPD test cases described in Chapter 3, the terms mobile station and base station represent
3 the access terminal (AT) and access network (AN) respectively.

4 For all tests in Chapter 3, Session Security should be enabled if supported. These tests should be
5 repeated for all revisions of HRPD supported by the AT. The Hybrid AT (3.1 - 3.4) tests are also
6 applicable to SVDO Mode 1 AT and should be repeated with cdma20001x channel and HRPD
7 channel being further apart than the MSBW of the AT.

8 **3.1 Hybrid / SVDO MODE 1 AT Voice Origination in HRPD Active Mode**

9 Note: Certain Hybrid ATs may not support this feature.

10 3.1.1 Definition

11 This test verifies a voice call origination when in HRPD Active Mode.

12 3.1.2 Traceability

13 Same as section 2.1.2.

14 3.1.3 Call Flow Example(s)

15 None

16 3.1.4 Method of measurement

- 17 a. Connect the Hybrid / SVDO MODE 1 AT to the AN as shown in Figure A-1 with AN 1
18 configured as cdma2000 1x and AN 2 configured as HRPD.
- 19 b. Initiate a HRPD packet data call from the Hybrid / SVDO MODE 1 AT.
- 20 c. Issue a continuous “ping” command from the Hybrid / SVDO MODE 1 AT to a remote
21 host.
- 22 d. Initiate a voice call from the Hybrid / SVDO MODE 1 AT.
- 23 e. Verify the call completes and verify CDMA user data in both directions.
- 24 f. End the voice call.
- 25 g. After call is released, verify that Hybrid / SVDO MODE 1 AT re-connects the HRPD
26 packet data call and pings are continuous on same PPP session.
- 27 h. End the HRPD packet data call.
- 28 i. If the AT is capable of SVDO MODE 1 operation, repeat the test with cdma20001x and
29 HRPD channels being further apart than the maximum bandwidth supported by the AT.

30 3.1.5 Minimum Standard

31 The AT shall comply with steps e and g.

32 **3.2 Hybrid / SVDO MODE 1 AT Voice Termination in HRPD Active Mode**

33 Note: Certain Hybrid ATs may not support this feature

34 3.2.1 Definition

35 This test verifies a voice call termination when in HRPD Active Mode.

- 1 3.2.2 Traceability
2 Same as section 2.1.2..
- 3 3.2.3 Call Flow Example(s)
4 None
- 5 3.2.4 Method of measurement
- 6 a. Connect the Hybrid / SVDO MODE 1 AT to the AN as shown in Figure A-1 with AN 1
7 configured as cdma2000 1x and AN 2 configured as HRPD.
- 8 b. Initiate a HRPD packet data call from the Hybrid / SVDO MODE 1 AT.
- 9 c. Issue a continuous "ping" command from the Hybrid / SVDO MODE 1 AT to a remote
10 host.
- 11 d. Initiate a voice call to the AT.
- 12 e. Verify the call completes and verify CDMA user data in both directions.
- 13 f. End the voice call.
- 14 g. After call is released, verify that Hybrid / SVDO MODE 1 AT re-connects the HRPD
15 packet data call on the same PPP session and pings are continuous.
- 16 h. End the HRPD packet data call.
- 17 i. If the AT is capable of SVDO MODE 1 operation, repeat the test with cdma20001x and
18 HRPD channels being further apart than the maximum bandwidth supported by the AT.
- 19 3.2.5 Minimum Standard
20 The AT shall comply with steps e and g.
- 21 **3.3 Hybrid / SVDO MODE 1 AT SMS Origination in HRPD Active Mode**
- 22 Note: Certain Hybrid ATs may not support this feature
- 23 3.3.1 Definition
24 This test verifies SMS Origination when in HRPD Active Mode.
- 25 3.3.2 Traceability
26 Same as section 2.1.2
- 27 3.3.3 Call Flow Example(s)
28 None
- 29 3.3.4 Method of measurement
- 30 a. Connect the Hybrid / SVDO MODE 1 AT to the AN as shown in Figure A-1 with AN 1
31 configured as cdma2000 1x and AN 2 configured as HRPD.
- 32 b. Initiate a HRPD packet data call from the Hybrid / SVDO MODE 1 AT.
- 33 c. Issue a continuous "ping" command from the Hybrid / SVDO MODE 1 AT to a remote
34 host.
- 35 d. Instruct the Hybrid / SVDO MODE 1 AT to send an SMS message to the network on the
36 r-csch
- 37 e. Verify SMS message is correctly sent to the SMS Message Center.

- 1 f. After SMS Origination procedure is completed, verify that Hybrid / SVDO MODE 1 AT
2 starts sending and receiving continuous pings on HRPD on the same PPP session.
- 3 g. Instruct the Hybrid / SVDO MODE 1 AT to send an SMS message to the network on the
4 r-dsch.
- 5 h. Verify SMS message is correctly sent to the SMS Message Center.
- 6 i. After SMS Origination procedure is completed, verify that Hybrid / SVDO MODE 1 AT
7 starts sending and receiving continuous pings on HRPD on the same PPP session.
- 8 j. End the HRPD packet data call.
- 9 k. If the AT is capable of SVDO MODE 1 operation, repeat the test with cdma20001x and
10 HRPD channels being further apart than the maximum bandwidth supported by the AT.

11 3.3.5 Minimum Standard

12 The AT shall comply with steps e, f, h and i.

13 3.4 Hybrid / SVDO MODE 1 AT SMS Termination in HRPD Active Mode

14 Note: Hybrid ATs may not support this feature

15 3.4.1 Definition

16 This test verifies SMS termination when in HRPD Active Mode.

17 3.4.2 Traceability

18 Same as section 2.1.2.

19 3.4.3 Call Flow Example(s)

20 None

21 3.4.4 Method of measurement

- 22 a. Connect the Hybrid / SVDO MODE 1 AT to the AN as shown in Figure A-1 with AN 1
23 configured as cdma2000 1x and AN 2 configured as HRPD.
- 24 b. Initiate a HRPD packet data call from the Hybrid / SVDO MODE 1 AT.
- 25 c. Issue a continuous "ping" command from the Hybrid / SVDO MODE 1 AT to a remote
26 host.
- 27 d. Instruct the network to send an SMS message to the Hybrid / SVDO MODE 1 AT on the
28 f-csch.
- 29 e. Verify SMS message is correctly received by the Hybrid / SVDO MODE 1 AT.
- 30 f. After SMS message is received, verify that Hybrid / SVDO MODE 1 AT starts sending
31 and receiving continuous pings on HRPD on the same PPP session.
- 32 g. Instruct the network to send an SMS message to the Hybrid / SVDO MODE 1 AT on the
33 f-dsch.
- 34 h. Verify SMS message is correctly received by the Hybrid / SVDO MODE 1 AT.
- 35 i. After SMS message is received, verify that Hybrid / SVDO MODE 1 AT starts sending
36 and receiving continuous pings on HRPD on the same PPP session.
- 37 j. End the HRPD packet data call.
- 38 k. If the AT is capable of SVDO MODE 1 operation, repeat the test with cdma20001x and
39 HRPD channels being further apart than the maximum bandwidth supported by the AT.

1 3.4.5 Minimum Standard

2 The AT shall comply with steps e, f, h and i.

3 **3.5 Voice Origination in HRPD Active Mode for SVDO Operation**

4 3.5.1 Definition

5 This test verifies a voice call origination in active HRPD mode for SVDO capable AT.

6 3.5.2 Traceability

7 Same as section 2.1.2.

8 3.5.3 Call Flow Example(s)

9 None

10 3.5.4 Method of measurement

- 11 a. Connect the AT to the AN as shown in Figure A-1 with AN 1 configured as cdma2000
12 1x and AN 2 configured as HRPD.
- 13 b. Ensure that AT is setup for SVDO mode.
- 14 c. Initiate a HRPD packet data call from the AT.
- 15 d. Issue a continuous “ping” command to the AT from a remote host. Note any other
16 means may be used to maintain data session continuity.
- 17 e. Initiate a voice call from the AT.
- 18 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
19 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
20 base station to assign traffic channels on cdma2000 1x and HRPD in separate
21 bandclass that are supported by the AT.
- 22 g. Verify the call completes and verify CDMA user data in both directions.
- 23 h. Verify that the voice call does not impact the data session. For example if ping is used,
24 then the AT continues to respond to the pings on HRPD. Note, for SVDO Mode 1 AT,
25 data on HRPD may be lost during the access on the cdma2000 1x system.
- 26 i. Verify that the “ping” packets/data packets and voice frames are being sent and
27 received simultaneously by the AT.
- 28 j. End the HRPD packet data call and the voice call.

29 3.5.5 Minimum Standard

30 The AN and AT shall comply with steps g, h and i.

31 **3.6 Voice Termination in HRPD Active Mode for SVDO Operation**

32 3.6.1 Definition

33 This test verifies a voice call termination in active HRPD mode for SVDO capable AT.

34 3.6.2 Traceability

35 Same as section 2.1.2.

1 3.6.3 Call Flow Example(s)

2 None

3 3.6.4 Method of measurement

4 a. Connect the AT to the AN as shown in Figure A-1 with AN 1 configured as cdma2000
5 1x and AN 2 configured as HRPD.

6 b. Ensure that AT is setup for SVDO mode.

7 c. Initiate a HRPD packet data call from the AT.

8 d. Issue a continuous "ping" command to the AT from a remote host. Note any other
9 means may be used to maintain data session continuity.

10 e. Initiate a voice call to the AT.

11 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
12 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
13 base station to assign traffic channels on cdma2000 1x and HRPD in separate
14 bandclass that are supported by the AT.

15 g. Verify that the call completes and verify CDMA user data in both directions.

16 h. Verify that the voice call does not impact the data session. For example if ping is used,
17 then the AT continues to respond to the pings on HRPD. Note, for SVDO Mode 1 AT,
18 data on HRPD may be lost during the access on the cdma2000 1x system.

19 i. Verify that the "ping" packets/data packets and voice frames are being sent and
20 received simultaneously by the AT.

21 j. End the HRPD packet data call and the voice call.

22 3.6.5 Minimum Standard

23 The AN and AT shall comply with steps g, h and i.

24 **3.7 SMS Origination in HRPD Active Mode for SVDO Operation**

25 3.7.1 Definition

26 This test verifies SMS Origination in active HRPD mode for SVDO capable AT.

27 3.7.2 Traceability

28 Same as section 2.1.2.

29 3.7.3 Call Flow Example(s)

30 None

31 3.7.4 Method of measurement

32 a. Connect the AT to the AN as shown in Figure A-1 with AN 1 configured as cdma2000
33 1x and AN 2 configured as HRPD. For SVDO Mode 1 AT, instruct the base station to
34 assign traffic channels on cdma2000 1x and HRPD that are within the MSBW of the AT.
35 For SVDO Mode 2 AT, instruct the base station to assign traffic channels on cdma2000
36 1x and HRPD in separate bandclass that are supported by the AT.

37 b. Ensure that AT is setup for SVDO mode.

- 1 c. Initiate a HRPD packet data call from the SVDO AT.
- 2 d. Issue a continuous “ping” command to the AT from a remote host. Note any other
- 3 means may be used to maintain data session continuity.
- 4 e. Instruct the AT to send an SMS message to the AN on the r-csch.
- 5 f. Verify SMS message is correctly sent to the SMS Message Center.
- 6 g. Verify that the SMS transmission does not impact the data session. For example if ping
- 7 is used, then the AT continues to respond to the pings on HRPD. Note, for SVDO Mode
- 8 1 AT, data on HRPD may be lost during the access on the cdma2000 1x system.
- 9 h. Repeat steps e-g with the use of r-dsch instead of r-csch.
- 10 i. End the HRPD packet data call.

11 3.7.5 Minimum Standard

12 The AT shall comply with steps f, and g

13 The AN shall comply with steps f, and g.

14 3.8 SMS Termination in HRPD Active Mode for SVDO Operation

15 3.8.1 Definition

16 This test verifies SMS Termination in active HRPD mode for SVDO capable AT.

17 3.8.2 Traceability

18 Same as section 2.1.2.

19 3.8.3 Call Flow Example(s)

20 None

21 3.8.4 Method of measurement

- 22 a. Connect the AT to the AN as shown in Figure A-1 with AN 1 configured as cdma2000
- 23 1x and AN 2 configured as HRPD. For SVDO Mode 1 AT, instruct the base station to
- 24 assign traffic channels on cdma2000 1x and HRPD that are within the MSBW of the AT.
- 25 For SVDO Mode 2 AT, instruct the base station to assign traffic channels on cdma2000
- 26 1x and HRPD in separate bandclass that are supported by the AT.
- 27 b. Ensure that AT is setup for SVDO mode.
- 28 c. Initiate a HRPD packet data call from the SVDO AT.
- 29 d. Issue a continuous “ping” command to the AT from a remote host. Note any other
- 30 means may be used to maintain data session continuity.
- 31 e. Instruct the AN to send an SMS message to the AT on the f-csch.
- 32 f. Verify SMS message is correctly received by the AT.

33 Verify that the SMS transmission does not impact the data session. For example if ping is used,
 34 then the AT continues to respond to the pings on HRPD. Note, for SVDO Mode 1 AT,

1 **4 INTERWORKING OF 1X AND HRPD – HRPD DORMANT MODE**

2 For HRPD test cases described in Chapter 4, the terms mobile station and base station represent
3 the access terminal (AT) and access network (AN) respectively.

4 For all tests in Chapter 4, Session Security should be enabled if supported. Tests in this chapter
5 are applicable to AT that are capable of operation in hybrid or SVDO modes. These tests should
6 be repeated for all revisions of HRPD supported by the AT.

7 **4.1 Hybrid / SVDO AT Voice Origination in HRPD Dormant Mode**

8 Note: Certain Hybrid ATs may not support this feature

9 4.1.1 Definition

10 This test verifies a voice call origination when in HRPD Dormant Mode.

11 4.1.2 Traceability

12 Same as section 2.1.2.

13 4.1.3 Call Flow Example(s)

14 None

15 4.1.4 Method of measurement

16 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
17 as cdma2000 1x and AN 2 configured as HRPD.

18 b. Initiate a HRPD packet data call from the Hybrid / SVDO AT.

19 c. Wait for Hybrid / SVDO AT to go dormant.

20 d. Initiate a voice call from the Hybrid / SVDO AT.

21 e. Verify the call completes and verify CDMA user data in both directions.

22 f. End the voice call.

23 g. Verify that PPP connection is not dropped, Hybrid / SVDO AT is in dormant state and
24 HRPD session is active.

25 h. Issue a ping command and verify that pings are successful.

26 i. End the HRPD packet data call.

27 j.

28 4.1.5 Minimum Standard

29 The AT shall comply with steps e, g and h.

30 **4.2 Hybrid / SVDO AT Voice Termination in HRPD Dormant Mode**

31 4.2.1 Definition

32 This test verifies a voice call termination when in HRPD Dormant Mode.

33 4.2.2 Traceability

34 Same as section 2.1.2.

1 4.2.3 Call Flow Example(s)

2 None

3 4.2.4 Method of measurement

4 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
5 as cdma2000 1x and AN 2 configured as HRPD.

6 b. Initiate a HRPD packet data call from the Hybrid / SVDO AT.

7 c. Wait for Hybrid / SVDO AT to go dormant.

8 d. Initiate a voice call to the Hybrid / SVDO AT.

9 e. Verify the call completes and verify CDMA user data in both directions.

10 f. End the voice call.

11 g. Verify that PPP connection is not dropped and Hybrid / SVDO AT is in dormant state.

12 h. Issue a ping command and verify that pings are successful.

13 i. End the HRPD packet data call.

14 4.2.5 Minimum Standard

15 The AT shall comply with steps e, g and h.

16 **4.3 Hybrid / SVDO AT SMS Origination in HRPD Dormant Mode**

17 4.3.1 Definition

18 This test verifies SMS Origination when in HRPD Dormant Mode.

19 4.3.2 Traceability

20 Same as section 2.1.2.

21 4.3.3 Call Flow Example(s)

22 None

23 4.3.4 Method of measurement

24 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
25 as cdma2000 1x and AN 2 configured as HRPD.

26 b. Initiate a HRPD packet data call from the Hybrid / SVDO AT.

27 c. Wait for Hybrid / SVDO AT to go dormant.

28 d. Instruct the Hybrid / SVDO AT to send an SMS message to the network on the r-csch.

29 e. Verify SMS message is correctly sent to the SMS Message Center.

30 f. Verify that PPP connection is not dropped and Hybrid / SVDO AT is in dormant state.

31 g. Issue a ping command and verify that pings are successful.

32 h. Wait for Hybrid / SVDO AT to go dormant.

33 i. Instruct the Hybrid / SVDO AT to send an SMS message to the network on the r-dsch.

34 j. Verify SMS message is correctly sent to the SMS Message Center.

35 k. Verify that PPP connection is not dropped and Hybrid / SVDO AT is in dormant state.

36 l. Issue a ping command from the remote host and verify that the ping is successful.

1 m. End the HRPD packet data call.

2 4.3.5 Minimum Standard

3 The AT shall comply with steps e, f, g, j, k and l.

4 **4.4 Hybrid / SVDO AT SMS Termination in HRPD Dormant Mode**

5 4.4.1 Definition

6 This test verifies SMS termination when in HRPD Dormant Mode.

7 4.4.2 Traceability

8 Same as section 2.1.2.

9 4.4.3 Call Flow Example(s)

10 None

11 4.4.4 Method of measurement

12 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
13 as cdma2000 1x and AN 2 configured as HRPD.

14 b. Initiate a HRPD packet data call from the Hybrid / SVDO AT.

15 c. Wait for Hybrid / SVDO AT to go dormant.

16 d. Instruct the network to send an SMS message to the Hybrid / SVDO AT on the f-csch.

17 e. Verify SMS message is correctly received by the Hybrid / SVDO AT.

18 f. Verify that PPP connection is not dropped and Hybrid / SVDO AT is in dormant state.

19 g. Issue a ping command from the remote host and verify that the ping is successful.

20 h. Wait for Hybrid / SVDO AT to go dormant.

21 i. Instruct the network to send an SMS message to the Hybrid / SVDO AT on the f-dsch.

22 j. Verify SMS message is correctly received by the Hybrid / SVDO AT.

23 k. Verify that PPP connection is not dropped and Hybrid / SVDO AT is in dormant state.

24 l. Issue a ping command and verify that pings are successful.

25 m. End the HRPD packet data call.

26 4.4.5 Minimum Standard

27 The AT shall comply with steps e, f, g, j, k and l

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1 **5 INTER TECHNOLOGY SWITCHING**

2 For HRPD test cases described in Chapter 5, the terms mobile station and base station represent
3 the access terminal (AT) and access network (AN) respectively.

4 For all tests in Chapter 5, Session Security should be enabled if supported. Tests in this chapter
5 are applicable to AT that are capable of operation in hybrid or SVDO modes. These tests should
6 be repeated for all revisions of HRPD supported by the AT.

7 **5.1 Inter Technology Switching – Dormant HRPD to cdma2000 1x**

8 5.1.1 Definition

9 This test verifies inter-technology switching from dormant HRPD to cdma2000 1x using mobile IP.
10 This test only applies to AT that are capable of switching from HRPD to cdma2000 1x while the
11 AT is dormant. The algorithm for switching is AT dependent and should be known before test
12 case execution. The test should be repeated using all supported revisions of [4] supported by the
13 AT and AN.

14 5.1.2 Traceability

15 Same as section 2.1.2.

16 5.1.3 Call Flow Example(s)

17 None

18 5.1.4 Method of measurement

- 19 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
20 as HRPD and AN 2 configured as cdma2000 1x.
- 21 b. Configure the Hybrid / SVDO AT for Mobile IP mode.
- 22 c. Cause the Hybrid / SVDO AT to acquire AN 1 configured as HRPD.
- 23 d. Initiate a HRPD packet data call from the Hybrid / SVDO AT.
- 24 e. Record the IP address assigned to the Hybrid / SVDO AT.
- 25 f. Wait for Hybrid / SVDO AT to go dormant.
- 26 g. Cause the AT terminal to switch from AN 1, configured as HRPD to AN 2 configured as
27 cdma2000 1x.
- 28 h. Verify Hybrid / SVDO AT is dormant for data (active pilot set) on AN 2 configured as
29 cdma2000 1x.
- 30 i. Issue a “ping” command from the remote host to the Hybrid / SVDO AT using the IP
31 address assigned to the AT in step e.
- 32 j. Verify the Hybrid / SVDO AT is active for data on AN 2 configured for cdma2000 1x,
33 and verify the remote host receives a “ping” response from the Hybrid / SVDO AT.
- 34 k. End the call.
- 35 l. Repeat steps a-k using all supported revisions of [4] by the AT and AN.

36 5.1.5 Minimum Standard

37 The AT shall comply with steps h and j

1 **5.2 Inter Technology Switching – Active HRPD to cdma2000 1x**

2 5.2.1 Definition

3 This test verifies inter-technology switching from active HRPD to cdma2000 1x using mobile IP.
4 This test only applies to AT that are capable of switching from HRPD to cdma2000 1x while the
5 AT is active for data. The algorithm for switching is AT dependent and should be known before
6 test case execution. The test should be repeated using all supported revisions of [4] supported by
7 the AT and AN.

8 5.2.2 Traceability

9 Same as section 2.1.2..

10 5.2.3 Call Flow Example(s)

11 None

12 5.2.4 Method of measurement

- 13 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
14 as HRPD and AN 2 configured as cdma2000 1x.
- 15 b. Configure the Hybrid / SVDO AT for mobile IP mode.
- 16 c. Cause the Hybrid / SVDO AT to acquire AN 1 configured as HRPD.
- 17 d. Initiate a HRPD packet data call from the Hybrid / SVDO AT.
- 18 e. Record the IP address assigned to the Hybrid / SVDO AT.
- 19 f. Issue a continuous “ping” command from the remote host to the Hybrid / SVDO AT
20 using the IP address assigned to the AT in step e.
- 21 g. Ensure that AT is active for data on AN 1 configured as HRPD and verify the remote
22 host receives a “ping” response from the AT.
- 23 h. Cause the AT terminal to switch from AN 1, configured as HRPD to AN 2 configured as
24 cdma2000 1x.
- 25 i. Verify Hybrid / SVDO AT is active for data on AN 2 configured as cdma2000 1x and
26 verify the remote host receives a “ping” response from the Hybrid / SVDO AT.
- 27 j. End the call.
- 28 k. Repeat steps a-k using all supported revisions of [4] by the AT and AN.

29 5.2.5 Minimum Standard

30 The AT shall comply with step i

31 **5.3 Inter Technology Switching – Dormant cdma2000 1x to HRPD**

32 5.3.1 Definition

33 This test verifies inter-technology handoff from dormant cdma2000 1x to HRPD using mobile IP.
34 This test only applies to AT that are capable of switching from cdma2000 1x to HRPD while the
35 AT is dormant. The algorithm for switching is AT dependent and should be known before test
36 case execution. The test should be repeated using all supported revisions of [4] supported by the
37 AT and AN.

38 5.3.2 Traceability

39 Same as section 2.1.2..

1 5.3.3 Call Flow Example(s)

2 None

3 5.3.4 Method of measurement

4 a. Connect the Hybrid / SVDO AT to the AN as shown in Figure A-1 with AN 1 configured
5 as cdma2000 1x and AN 2 configured as HRPD.

6 b. Configure the Hybrid / SVDO AT for mobile IP mode.

7 c. Cause the Hybrid / SVDO AT to acquire AN 1 configured as cdma2000 1x.

8 d. Initiate a cdma2000 1x packet data call from the Hybrid / SVDO AT.

9 e. Record the IP address assigned to the Hybrid / SVDO AT.

10 f. Wait for Hybrid / SVDO AT to go dormant.

11 g. Cause the AT terminal to switch from AN 1, configured as cdma2000 1x to AN 2
12 configured as HRPD.

13 h. Verify Hybrid / SVDO AT is dormant for data (active pilot set) on AN 2 configured as
14 HRPD.

15 i. Issue a "ping" command from the remote host to the Hybrid / SVDO AT using the IP
16 address assigned to the AT in step e.

17 j. Verify the Hybrid / SVDO AT is active for data on AN 2 configured for HRPD, and verify
18 the remote host receives a "ping" response from the Hybrid / SVDO AT.

19 k. End the call

20 l. Repeat steps a-k using all supported revisions of [4] by the AT and AN.

21 5.3.5 Minimum Standard

22 The AT shall comply with steps h and j.

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1 **6 SVDO TESTS**

2 **6.1 cdma20001x Soft handoff in SVDO Operation**

3 6.1.1 Definition

4 This test verifies voice call soft handoff while active HRPD mode for SVDO capable AT.

5 6.1.2 Traceability

6 Same as section 2.1.2.

7 6.1.3 Call Flow Example(s)

8 None

9 6.1.4 Method of measurement

- 10 a. Connect the SVDO AT to the AN as shown in Figure A-5 with AN 1 configured as
11 cdma2000 1x and AN 2 configured as HRPD. Two sectors alpha and Beta should be
12 enabled on AN 1.
- 13 b. Ensure that AT is setup for SVDO mode.
- 14 c. Initiate a HRPD packet data call from the AT.
- 15 d. Issue a continuous “ping” command from the AT to a remote host.
- 16 e. Initiate a voice call from the AT on sector alpha.
- 17 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
18 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
19 base station to assign traffic channels on cdma2000 1x and HRPD in separate
20 bandclass that are supported by the AT..
- 21 g. Ensure the call completes and verify CDMA user data in both directions.
- 22 h. Ensure that the “ping” packets and voice frames are being sent and received
23 simultaneously by the access terminal.
- 24 i. Cause the pilot strength from a neighboring sector (Beta) on AN1- cdma2000 1x to
25 increase such that the pilot is added in the active set.
- 26 j. Cause the pilot strength from the original sector (Alpha) on AN1- cdma2000 1x to
27 decrease such that the pilot is removed in the active set.
- 28 k. Verify that soft handoff is successful to AN1- cdma2000 1x.
- 29 l. Verify that AT does not perform handoff on HRPD.
- 30 m. Verify that the AT continues to send and receive ‘ping’ packets and voice frames.
- 31 n. End the HRPD packet data call and the voice call.

32 6.1.5 Minimum Standard

33 The AT and AN shall comply with steps k, l and m.

34 **6.2 HRPD Soft handoff in SVDO Operation**

35 6.2.1 Definition

36 This test verifies HRPD soft handoff while active voice call for SVDO capable AT

1 6.2.2 Traceability

2 Same as section 2.1.2.

3 6.2.3 Call Flow Example(s)

4 None

5 6.2.4 Method of measurement

- 6 a. Connect the SVDO AT to the AN as shown in Figure A-5 with AN 1 configured as
7 cdma2000 1x and AN 2 configured as HRPD. Two sectors *alpha* and *Beta* should be
8 enabled on AN 2.
- 9 b. Ensure that AT is setup for SVDO mode.
- 10 c. Initiate a HRPD packet data call from the AT.
- 11 d. Issue a continuous “ping” command from the AT to a remote host.
- 12 e. Initiate a voice call from the AT on sector alpha.
- 13 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
14 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
15 base station to assign traffic channels on cdma2000 1x and HRPD in separate
16 bandclass that are supported by the AT.
- 17 g. Ensure the call completes and verify CDMA user data in both directions.
- 18 h. Ensure that the “ping” packets and voice frames are being sent and received
19 simultaneously by the access terminal.
- 20 i. Cause the pilot strength from a neighboring sector (*Beta*) on AN2-HRPD to increase
21 such that the pilot is added in the active set.
- 22 j. Cause the pilot strength from the original sector (*Alpha*) on AN2-HRPD to decrease
23 such that the pilot is removed in the active set.
- 24 k. Verify that soft handoff is successful to AN2-HRPD.
- 25 l. Verify that AT does not perform cdma2000 1x handoff.
- 26 m. Verify that the AT continues to send and receive ‘ping’ packets and voice frames.
- 27 n. End the HRPD packet data call and voice call.

28 6.2.5 Minimum Standard

29 The AT and AN shall comply with steps k, l and m.

30 **6.3 cdma20001x Hard handoff in SVDO Operation**

31 6.3.1 Definition

32 This test verifies voice call hard handoff on cdma2000 1x while active HRPD mode for SVDO
33 capable AT.

34 6.3.2 Traceability

35 Same as section 2.1.2.

36 6.3.3 Call Flow Example(s)

37 None

1 6.3.4 Method of measurement

- 2 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
- 3 cdma2000 1x and AN 2 configured as HRPD. Two sectors alpha and Beta should be
- 4 enabled on AN 1. The sectors alpha and Beta should be on different frequencies of the
- 5 same bandclass. For SVDO Mode 1 device, these frequencies should each be within
- 6 the MSBW from the HRPD channel assigned to the AT.
- 7 b. Ensure that AT is setup for SVDO mode.
- 8 c. Initiate a HRPD packet data call from the AT.
- 9 d. Issue a continuous "ping" command from the AT to a remote host.
- 10 e. Initiate a voice call from the AT on sector alpha.
- 11 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
- 12 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
- 13 base station to assign traffic channels on cdma2000 1x and HRPD in separate
- 14 bandclass that are supported by the AT.
- 15 g. Ensure the call completes and verify CDMA user data in both directions.
- 16 h. Ensure that the "ping" packets and voice frames are being sent and received
- 17 simultaneously by the access terminal.
- 18 i. Change the RF conditions such that hard handoff to sector Beta can be initiated.
- 19 j. Instruct the AN 1 to send a handoff message (EHDM/GHDM/UHDM) to initiate a hard
- 20 handoff to sector Beta.
- 21 k. Verify that the cdma20001x hard handoff is successful to sector Beta and the AT sends
- 22 a Handoff Complete Message.
- 23 l. Verify that AT does not perform handoff for HRPD.
- 24 m. Verify that the AT continues to send and receive 'ping' packets and voice frames.
- 25 n. End the HRPD packet data call and the voice call.

26 6.3.5 Minimum Standard

27 The AT shall comply with steps k, l, and m.

28 The AN shall comply with steps k and m.

29 **6.4 HRPD Hard handoff in SVDO Operation**

30 6.4.1 Definition

31 This test verifies HRPD hard handoff while active voice call for SVDO capable AT.

32 6.4.2 Traceability

33 Same as section 2.1.2.

34 6.4.3 Call Flow Example(s)

35 None

36 6.4.4 Method of measurement

- 37 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
- 38 cdma2000 1x and AN 2 configured as HRPD. Two sectors alpha and Beta should be
- 39 enabled on AN 2. The sectors alpha and Beta should be on different frequencies of the
- 40 same bandclass. For SVDO Mode 1 device, these frequencies should each be within
- 41 the MSBW from the cdma20001x channel assigned to the AT..

- 1 b. Ensure that AT is setup for SVDO mode.
- 2 c. Initiate a HRPD packet data call from the AT.
- 3 d. Issue a continuous "ping" command from the AT to a remote host.
- 4 e. Initiate a voice call from the AT on sector alpha.
- 5 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
6 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
7 base station to assign traffic channels on cdma2000 1x and HRPD in separate
8 bandclass that are supported by the AT.
- 9 g. Ensure the call completes and verify CDMA user data in both directions.
- 10 h. Ensure that the "ping" packets and voice frames are being sent and received
11 simultaneously by the access terminal.
- 12 i. Change the RF conditions such that hard handoff to sector Beta can be initiated.
- 13 j. Instruct the AN 2 to send a TrafficChannelAssignment message causing the AT to
14 handoff to sector Beta.
- 15 k. Verify that the HRPD hard handoff to sector Beta is successful and the AT sends a
16 TrafficChannelComplete message to the AN.
- 17 l. Verify that AT does not perform handoff on cdma20001x.
- 18 m. Verify that the AT continues to send and receive 'ping' packets and voice frames.
- 19 n. End the HRPD packet data call and the voice call.

20 6.4.5 Minimum Standard

21 The AT shall comply with steps k, l, and m.

22 The AN shall comply with steps k and m.

23 6.5 cdma20001x Hard handoff disrupting SVDO Mode 1 Operation

24 6.5.1 Definition

25 This test verifies voice call hard handoff on cdma2000 1x to a frequency that causes disrupts the
26 HRPD in active mode for SVDO Mode 1 capable AT.

27 6.5.2 Traceability

28 Same as section 2.1.2.

29 6.5.3 Call Flow Example(s)

30 None

31 6.5.4 Method of measurement

- 32 a. Connect the SVDO Mode 1 AT to the AN as shown in Figure A-1 with AN 1 configured
33 as cdma2000 1x and AN 2 configured as HRPD. Two sectors alpha and Beta should be
34 enabled on AN 1. The sectors alpha and Beta should be on different frequencies. The
35 frequency on sector alpha is in the same bandclass and within the maximum bandwidth
36 separation from the HRPD channel assigned to the AT. The frequency on sector Beta
37 should be outside the maximum bandwidth separation from the HRPD channel
38 assigned to the AT.
- 39 b. Ensure that AT is setup for SVDO Mode 1 mode.
- 40 c. Initiate a HRPD packet data call from the AT.

- 1 d. Issue a continuous “ping” command from the AT to a remote host.
- 2 e. Initiate a voice call from the AT on sector alpha.
- 3 f. Instruct the base station to assign a traffic channel on cdma2000 1x that is within the
- 4 maximum bandwidth separation between cdma2000 1x and HRPD that is supported by
- 5 the AT.
- 6 g. Ensure the call completes and verify CDMA user data in both directions.
- 7 h. Ensure that the “ping” packets and voice frames are being sent and received
- 8 simultaneously by the access terminal.
- 9 i. Change the RF conditions such that hard handoff to sector Beta can be initiated.
- 10 j. Instruct the AN 1 to send a handoff message (EHDM/GHDM/UHDM) to initiate a hard
- 11 handoff to sector Beta.
- 12 k. Verify that the cdma20001x hard handoff is successful to sector Beta and the AT sends
- 13 a Handoff Complete Message.
- 14 l. Verify that AT loses the HRPD connection and is unable to respond to Page message
- 15 sent on HRPD.
- 16 m. Verify that the AT continues to send and receive voice frames.
- 17 n. End the voice call.
- 18 o. Send a Page to the AT on the HRPD system. Note, this may occur as a consequence
- 19 of the ping packets being sent by the remote host.
- 20 p. Verify that the AT responds to the Page message and establishes a connection.
- 21 q. Verify that the AT responds to the ping packets being sent by the remote host.
- 22 r. While the HRPD connection is active, terminate a voice call to the AT on the cdma2000
- 23 1x system.
- 24 s. Verify that the AT responds to the Page message on the cdma20001x and establishes
- 25 a connection.
- 26 t. Verify that the AT does not respond to the ping packets being sent on the HRPD
- 27 system,

28 6.5.5 Minimum Standard

29 The AT shall comply with steps k, l, m, p, q, s and t.

30 The AN shall comply with steps k and m.

31 **6.6 HRPD Hard handoff disrupting SVDO MODE 1 Operation**

32 6.6.1 Definition

33 This test verifies HRPD hard handoff while active voice call for SVDO Mode 1 capable AT.

34 6.6.2 Traceability

35 Same as section 2.1.2.

36 6.6.3 Call Flow Example(s)

37 None

38 6.6.4 Method of measurement

- 39 a. Connect the SVDO Mode 1 AT to the AN as shown in Figure A-1 with AN 1 configured
- 40 as cdma2000 1x and AN 2 configured as HRPD. Two sectors alpha and Beta should be

- 1 enabled on AN 2. The sectors alpha and Beta should be on different frequencies. The
 2 frequency on sector alpha is in the same bandclass and within the maximum bandwidth
 3 separation from the cdma20001x channel assigned to the AT. The frequency on sector
 4 Beta should be outside the maximum bandwidth separation from the cdma20001x
 5 channel assigned to the AT.
- 6 b. Ensure that AT is setup for SVDO Mode 1 mode.
 - 7 c. Initiate a HRPD packet data call from the AT.
 - 8 d. Issue a continuous “ping” command from the AT to a remote host.
 - 9 e. Initiate a voice call from the AT on sector alpha.
 - 10 f. Instruct the base station to assign a traffic channel on cdma2000 1x that is within the
 11 maximum bandwidth separation between cdma2000 1x and HRPD that is supported by
 12 the AT.
 - 13 g. Ensure the call completes and verify CDMA user data in both directions.
 - 14 h. Ensure that the “ping” packets and voice frames are being sent and received
 15 simultaneously by the access terminal.
 - 16 i. Change the RF conditions such that hard handoff to sector Beta can be initiated.
 - 17 j. Instruct the AN 2 to send a TrafficChannelAssignment message causing the AT to
 18 handoff to sector Beta.
 - 19 k. Verify that the HRPD hard handoff to sector Beta is unsuccessful.
 - 20 l. Change the RF conditions such that the AT is unable to acquire sector alpha and verify
 21 that the AT does not respond to Page message sent on HRPD.
 - 22 m. Verify that AT does not perform handoff on cdma20001x.
 - 23 n. Verify that the AT continues to send and receive and voice frames.
 - 24 o. End the voice call.
 - 25 p. Send a Page to the AT on the HRPD system. Note, this may occur as a consequence
 26 of the ping packets being sent by the remote host.
 - 27 q. Verify that the AT responds to the Page message and establishes a connection.
 - 28 r. Verify that the AT responds to the ping packets being sent by the remote host.
 - 29 s. While the HRPD connection is active, terminate a voice call to the AT on the cdma2000
 30 1x system.
 - 31 t. Verify that the AT responds to the Page message on the cdma20001x and establishes
 32 a connection.
 - 33 u. Verify that the AT does not respond to the ping packets being sent on the HRPD
 34 system,

35 6.6.5 Minimum Standard

36 The AT shall comply with steps k, l, m, n, q, r, t and u.

37 The AN shall comply with steps k and m.

38 6.7 cdma20001x Operation under HRPD reverse link failure

39 6.7.1 Definition

40 This test verifies voice call on cdma2000 1x can be maintained when an active HRPD connection
 41 is lost due to radio link failure.

1 6.7.2 Traceability

2 Same as section 2.1.2.

3 6.7.3 Call Flow Example(s)

4 None

5 Method of measurement

6 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
7 cdma2000 1x and AN 2 configured as HRPD.

8 b. Ensure that AT is setup for SVDO mode.

9 c. Initiate a HRPD packet data call from the AT.

10 d. Issue a continuous "ping" command from the AT to a remote host.

11 e. Initiate a voice call from the AT.

12 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
13 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
14 base station to assign traffic channels on cdma2000 1x and HRPD in separate
15 bandclass that are supported by the AT.

16 g. Ensure the call completes and verify CDMA user data in both directions.

17 h. Ensure that the "ping" packets and voice frames are being sent and received
18 simultaneously by the access terminal.

19 i. Change the RF conditions such that the AT undergoes MAC supervision failure for the
20 HRPD connection.

21 j. Verify that the AT continues to send and receive voice frames.

22 6.7.4 Minimum Standard

23 The AT shall comply with step j.

24 **6.8 HRPD Operation under cdma20001x reverse link failure**

25 6.8.1 Definition

26 This test verifies data traffic on HRPD can be maintained when an active cdma2000 1x
27 connection is lost due to radio link failure.

28 6.8.2 Traceability

29 Same as section 2.1.2.

30 6.8.3 Call Flow Example(s)

31 None

32 6.8.4 Method of measurement

33 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
34 cdma2000 1x and AN 2 configured as HRPD.

35 b. Ensure that AT is setup for SVDO mode.

36 c. Initiate a HRPD packet data call from the AT.

37 d. Issue a continuous "ping" command from the AT to a remote host.

38 e. Initiate a voice call from the AT.

- 1 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
 2 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
 3 base station to assign traffic channels on cdma2000 1x and HRPD in separate
 4 bandclass that are supported by the AT.
- 5 g. Ensure the call completes and verify CDMA user data in both directions.
- 6 h. Ensure that the “ping” packets and voice frames are being sent and received
 7 simultaneously by the access terminal.
- 8 i. Change the RF conditions such that the AT undergoes MAC supervision failure for the
 9 cdma2000 1x connection.
- 10 j. Verify that the AT continues to send and receive the ping packets on HRPD.
- 11 6.8.5 Minimum Standard
- 12 The AT shall comply with step j.

13 6.9 cdma20001x Preference Under PA Headroom Limitation

14 6.9.1 Definition

15 This test verifies voice call on cdma2000 1x is preferred over HRPD when AT becomes PA
 16 headroom limited.

17 6.9.2 Traceability

18 Same as section 2.1.2.

19 6.9.3 Call Flow Example(s)

20 None

21 6.9.4 Method of measurement

- 22 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
 23 cdma2000 1x and AN 2 configured as HRPD.
- 24 b. Ensure that AT is setup for SVDO mode.
- 25 c. Initiate a HRPD packet data call from the AT.
- 26 d. Issue a continuous “ping” command from the AT to a remote host.
- 27 e. Initiate a voice call from the AT.
- 28 f. For SVDO Mode 1 AT, instruct the base station to assign traffic channels on cdma2000
 29 1x and HRPD that are within the MSBW of the AT. For SVDO Mode 2 AT, instruct the
 30 base station to assign traffic channels on cdma2000 1x and HRPD in separate
 31 bandclass that are supported by the AT.
- 32 g. Ensure the call completes and verify CDMA user data in both directions.
- 33 h. Ensure that the “ping” packets and voice frames are being sent and received
 34 simultaneously by the access terminal.
- 35 i. Change the RF conditions such that the transmit power of AT continues to increase and
 36 the AT becomes PA headroom limited.
- 37 j. Verify that the AT provides preference for cdma20001x voice call over the HRPD data
 38 call, i.e. the AT should drop the HRPD call and continue to send and receive voice
 39 frames.
- 40 6.9.5 Minimum Standard
- 41 The AT shall comply with step j.

1 **6.10 Preferred HRPD Channel in ConnectionRequest Message**

2 6.10.1 Definition

3 This test verifies that the AT includes PreferredChannel field in the ConnectionRequest Message
4 for HRPD.

5 6.10.2 Traceability

6 (see [24])

7 7.5.6.2.2 ConnectionRequest Message

8 7.6.6.2.2 ConnectionRequest Message

9 6.10.3 Call Flow Example(s)

10 None

11 6.10.4 Method of measurement

- 12 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
13 cdma2000 1x and AN 2 configured as HRPD. Ensure that BCMCS is not enabled on
14 any of the channels.
- 15 b. If the AT being tested is a SVDO Mode 1 AT, configure the HRPD channels on AN1
16 such that only two channels listed in the SectorParameters Message are within the AT's
17 MSBW w.r.t. the cdma20001x channel and there are other channels listed in the
18 SectorParameters message that are outside the AT's MSBW.
- 19 c. Ensure that AT is setup for SVDO mode.
- 20 d. During HRPD session negotiation ensure that the AT and AN negotiate Enhanced Idle
21 State Protocol or Quick Idle State Protocol.
- 22 e. Initiate a HRPD packet data call from the AT.
- 23 f. For SVDO Mode 1 AT, verify that the AT includes the two channels within the MSBW
24 separation of the cdma20001x channel in the PreferredChannel field in the
25 ConnectionRequest Message. For SVDO Mode 2 AT, verify that the AT does not
26 include the PreferredChannel in the ConnectionRequest Message.
- 27 g. For SVDO Mode 1 AT, repeat steps a-e with the following change: All HRPD channels
28 listed in the SectorParameters Message are within the AT's MSBW w.r.t. the
29 cdma20001x channel.
- 30 h. Verify that the AT does not include the PreferredChannel in the ConnectionRequest
31 Message.
- 32 i. For SVDO Mode 1 AT, repeat steps a-e with the following change: The
33 SectorParameters Message lists no HRPD channels that are within the AT's MSBW
34 w.r.t. the cdma20001x channel.
- 35 j. Verify that the AT does not include the PreferredChannel in the ConnectionRequest
36 Message.
- 37 k. For SVDO Mode 1 AT that supports BCMCS, repeat steps a-b with the following
38 change in configuration: The SectorParameters Message lists one HRPD channel that
39 is within the AT's MSBW w.r.t. the cdma20001x channel and another HRPD channel
40 that is outside the AT's MSBW w.r.t. the cdma20001x channel and has BCMCS
41 enabled.
- 42 l. Repeat steps c-d.
- 43 m. Ensure that the AT sends a BCMCSFlowRegistration message to the AN.
- 44 n. Ensure that the AT is dormant on HRPD.

- 1 o. Repeat step e.
- 2 p. Verify that the AT includes the channel with BCMCS as the PreferredChannel in the
- 3 ConnectionRequest Message.

4 6.10.5 Minimum Standard

5 The AT shall comply with step f, h, j, and p.

6 **6.11 Multimode Capability Discovery Protocol Attribute Negotiation**

7 6.11.1 Definition

8 This test verifies that the AT negotiates Multimode Capability Discovery Protocol attributes during

9 the HRPD session negotiation.

10 6.11.2 Traceability

11 (see [24])

12 6.5.9 Configuration Attributes for the Multimode Capability Discovery Protocol

13 6.11.3 Call Flow Example(s)

14 None

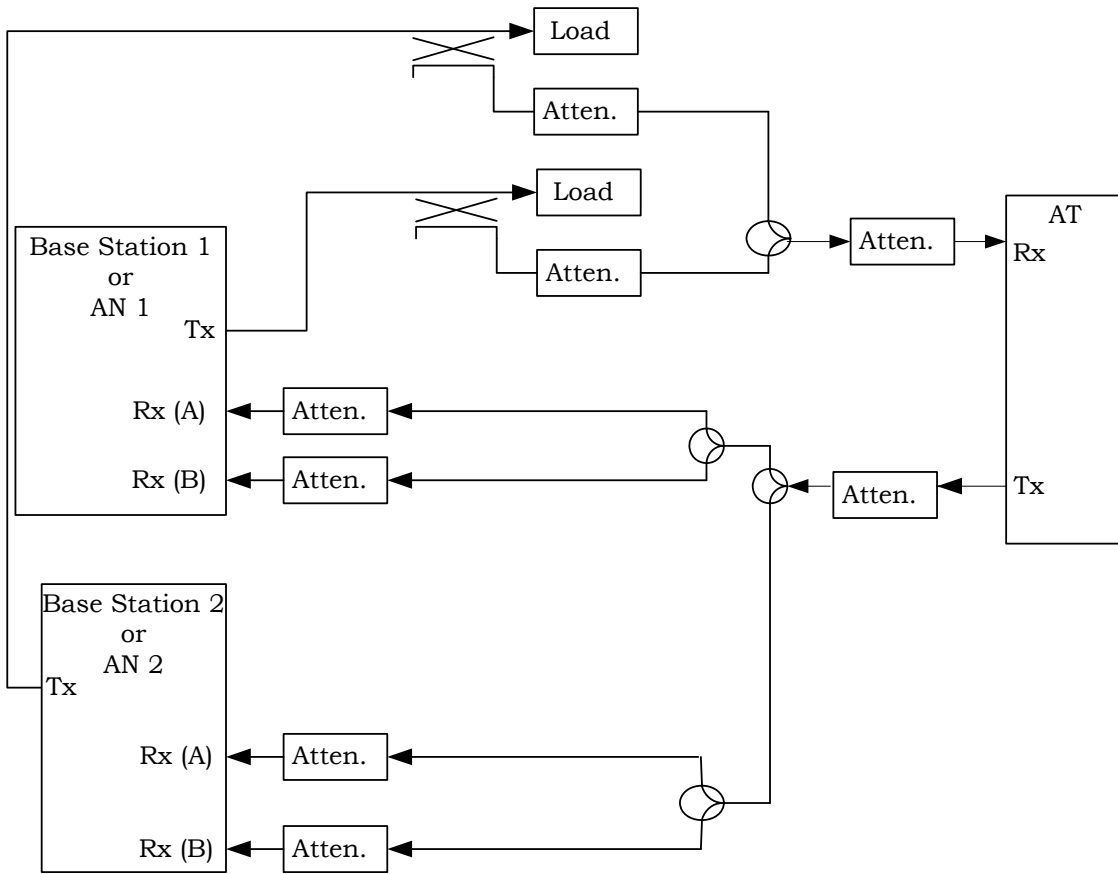
15 6.11.4 Method of measurement

- 16 a. Connect the SVDO AT to the AN as shown in Figure A-1 with AN 1 configured as
- 17 cdma2000 1x and AN 2 configured as HRPD.
- 18 b. Ensure that AT is setup for SVDO mode.
- 19 c. During HRPD session negotiation ensure that the AT and the AN negotiate the use of
- 20 Multimode Capability Discovery Protocol.
- 21 d. Verify that the AT sends a ConfigurationRequest Message for the Multimode Capability
- 22 Discovery Protocol requesting a non-default value of
- 23 SimultaneousCommonChannelTransmit, SimultaneousDedicatedChannelTransmit,
- 24 SimultaneousCommonChannelReceive and SimultaneousDedicatedChannelReceive
- 25 attributes.
- 26 e. Verify that the attribute values proposed by the AT are correct according to the SVDO
- 27 Mode 1 or SVDO Mode 2. For example, verify that the SVDO Mode 1 AT specifies the
- 28 MSBW in the SimultaneousDedicatedChannelTransmit attribute and SVDO Mode 2 AT
- 29 specifies 0x0B in the SimultaneousDedicatedChannelTransmit attribute.

30 6.11.5 Minimum Standard

31 The AT shall comply with steps d and e.

1 **7 ANNEX A (INFORMATIVE) - FIGURES**



2

3

Figure A - 1 Connection Diagram for Hybrid/SVDO AT testing