*3GPP2 C.S0094-0*

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

## REVISION 0

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**CONTENTS**

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# FOREWORD

## Introduction

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

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

## Testing Objective

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

## Execution Strategy

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

All applicable tests should be executed for all supported Band Classes and Radio Configurations.

The following general comments apply to all tests:

a. Unless specified otherwise in a test case, channel conditions for a test shall be set to have low FER.

b. Base stations should be configured for normal operation as specified in [1] unless otherwise specified in a specific test.

c. Unless otherwise specified, the Reverse Traffic Channel should be operated at a sufficiently high $E_b/N_O$ to ensure insignificant (for example, less than 1%) FER.

## Supplementary Terms and Definitions

**1x** – A system compliant with 3GPP2 C.S0001, C.S0002, C.S0003, C.S0004 and C.S0005.

**Active Mode** – An AT is in Active Mode when it has a session established with an HRPD system, a PPP session established and an air-interface connection open with the HRPD system.

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[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.

**AN-** Access Network

**AT** – Access Terminal

**Band Class -** A set of frequency channels and a numbering scheme for these channels.

**Base Station -** A fixed station used for communicating with mobile stations. In this document, the term base station refers to the entire cellular system infrastructure including transceiver equipment and Mobile Switching Center.

**BS** – See base station.

**CDMA -** See Code Division Multiple Access.

**Code Division Multiple Access (CDMA) -** A technique for spread-spectrum multiple-access digital communications that creates channels through the use of unique code sequences.

**Dormant Mode** – An AT is in Dormant Mode when it has a session established with an HRPD system, and has a PPP session established, but does not have a connection open with that system.

**$E_b/N_o$ -** Energy-per-bit-to noise-per-hertz ratio.

**f-csch** - Forward common signaling logical channel.

**f-dsch** - Forward dedicated signaling logical channel.

**FER -** Frame Error Rate of Forward Traffic Channel.

**HRPD** – High Rate Packet Data

**Hybrid AT** – An AT capable of operating on both a cdma2000 1x and HRPD system.

**Idle Mode** – An AT is in Idle Mode when it has a session established with the HRPD system but does not have a PPP session established.

**IOS** – Interoperability Specification.

**IP** – Internet Protocol.

**Mobile IP** - A packet data session where the user continuously maintains mobility bindings at the Home Agent and there is no lapse in Mobile IP registrations/re-registrations (i.e., the IP address is persistent).

**Mobile Station (MS)** - A station that communicates with a base station while in motion or during halts at unspecified points.

**MS** – See Mobile Station

**MSC -** See Mobile Switching Center

**Mobile Switching Center (MSC) -** A configuration of equipment that provides radiotelephone service. Also called the Mobile Telephone Switching Office (MTSO).

**P_REV_IN_USE** – Protocol revision level currently in use by a mobile station

**Packet -** The unit of information exchanged between the service option applications of the base station and the mobile station.

**PN -** Pseudonoise

**PPP –** Point-to-Point Protocol

**r-csch -** Reverse common signaling logical channel

**r-dsch** - Reverse dedicated signaling logical channel

**Radio Configuration (RC)** - A set of Forward Traffic Channel and Reverse Traffic Channel transmission formats that are characterized by physical layer parameters such as transmission rates, modulation characteristics and spreading rate.

**RC -** See Radio configuration.

**Short Message Services (SMS) -** A suite of services such as SMS Text Delivery, Digital Paging (i.e., Call Back Number - CBN), and Voice Mail Notification (VMN).

**System** – A system is a cellular telephone service or personal communications service that covers a geographical area such as a city, metropolitan region, country, or group of countries.

## Document References

The following documents contain provisions, which through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. ANSI and TIA maintain registers of currently valid national standards published by them. Unless otherwise noted, references are considered normative.

1. 3GPP2 C.S0003-A, *Medium Access Control (MAC) Standard for cdma2000 Spread Spectrum Systems*.
2. 3GPP2 C.S0005-A, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems*.
3. 3GPP2 C.S0015-A, *Short Message Service (SMS) for Wideband Spread Spectrum Systems - Release A,* 2002
4. 3GPP2 C.S0024-A, *cdma2000 High Rate Packet Data Air Interface Specification*
5. 3GPP2 A.S0009-A, *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*
7. (Informative) 3GPP2 S.R0108-0 *HRPD-cdma2000 1x Interoperability for Voice and Data System Requirements*

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# 1 INTERWORKING OF 1X AND HRPD – HRPD IDLE MODE

For HRPD test cases described in Chapter 1, the terms mobile station and base station represent the access terminal (AT) and access network (AN) respectively.

For all tests in Chapter 1, Session Security should be enabled if supported.

## 1.1 AT Voice Origination in HRPD Idle Mode

### 1.1.1 Definition

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

### 1.1.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
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| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
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| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

### 1.1.3 Call Flow Example(s)

None.

1.1.4 Method of measurement

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

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

c. Initiate a voice call from the Hybrid AT.

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

e. End the call.

f. Cause the AT to access the HRPD system.

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

1.1.5 Minimum Standard

The AT shall comply with step d and g.

## 1.2 AT Voice Termination in HRPD Idle Mode

1.2.1 Definition

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

1.2.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |

| | | |
|---|---|---|
| | 3.7.3.3.2.20 | Service Connect Message |
| | 3.7.4 | Orders |
| | 3.7.5.5 | Signal |

1.2.3 Call Flow Example(s)

None

1.2.4 Method of measurement

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

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

c. Initiate a voice call to the Hybrid AT.

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

e. End the call.

h. Cause the AT to access the HRPD system.

f. Verify that the AT uses the UATI assigned in step b.

1.2.5 Minimum Standard

The AT shall comply with step d and g.

## 1.3 AT SMS Origination in HRPD Idle Mode

1.3.1 Definition

This test verifies SMS Origination when in HRPD Idle Mode.

1.3.2 Traceability

(see [6])

(see [7])

(see [4])

| | | |
|---|---|---|
| | Chapter 7 | Session Layer |
| | Chapter 8 | Connection Layer |
| | Chapter 10 | MAC Layer |

(see [5])

| | | |
|---|---|---|
| | Chapter 3 | HRPD IOS Call Flows |

(see [3])

1.3.3 Call Flow Example(s)

None

1.3.4 Method of measurement

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

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

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

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

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

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

i. Cause the AT to access the HRPD system.

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

1.3.5 Minimum Standard

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

## 1.4 AT SMS Termination in HRPD Idle Mode

1.4.1 Definition

This test verifies SMS termination when in HRPD Idle Mode.

1.4.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [3])

1.4.3 Call Flow Example(s)

None.

1.4.4 Method of measurement

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

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

c. Instruct the network to send an SMS message to the Hybrid AT on the f-csch.

d. Verify SMS message is correctly received at the Hybrid AT.

e. Instruct the network to send an SMS message to the Hybrid AT on the f-dsch.

f. Verify the SMS message is correctly received at the Hybrid AT.

j. Cause the AT to access the HRPD system.

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

### 1.4.5 Minimum Standard

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

No Text

# 2 INTERWORKING OF 1X AND HRPD – HRPD ACTIVE MODE

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

For all tests in Chapter 2, Session Security should be enabled if supported.

## 2.1 AT Voice Origination in HRPD Active Mode

Note: Hybrid ATs may not support this feature

### 2.1.1 Definition

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

### 2.1.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

### 2.1.3 Call Flow Example(s)

None

2.1.4 Method of measurement

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

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

c. Issue a continuous “ping” command from the Hybrid AT to a remote host.

d. Initiate a voice call from the Hybrid AT.

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

f. End the voice call.

g. After call is released, verify that Hybrid AT re-connects the HRPD packet data call and pings are continuous on same PPP session.

h. End the HRPD packet data call.

2.1.5 Minimum Standard

The AT shall comply with steps e and g.

## 2.2 AT Voice Termination in HRPD Active Mode

Note: Hybrid ATs may not support this feature

2.2.1 Definition

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

2.2.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |

| | | |
|---|---|---|
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

2.2.3 Call Flow Example(s)

None

2.2.4 Method of measurement

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

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

c. Issue a continuous “ping” command from the Hybrid AT to a remote host.

d. Initiate a voice call to the AT.

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

f. End the voice call.

g. After call is released, verify that Hybrid AT re-connects the HRPD packet data call on the same PPP session and pings are continuous.

h. End the HRPD packet data call.

2.2.5 Minimum Standard

The AT shall comply with steps e and g.

## 2.3 AT SMS Origination in HRPD Active Mode

Note: Hybrid ATs may not support this feature

2.3.1 Definition

This test verifies SMS Origination when in HRPD Active Mode.

2.3.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [3])

2.3.3 Call Flow Example(s)

None

2.3.4 Method of measurement

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

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

c. Issue a continuous “ping” command from the Hybrid AT to a remote host.

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

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

f. After SMS Origination procedure is completed, verify that Hybrid AT starts sending and receiving continuous pings on HRPD on the same PPP session.

g. Instruct the Hybrid AT to send an SMS message to the network on the r-dsch.

h. Verify SMS message is correctly sent to the SMS Message Center.

i. After SMS Origination procedure is completed, verify that Hybrid AT starts sending and receiving continuous pings on HRPD on the same PPP session.

j. End the HRPD packet data call.

2.3.5 Minimum Standard

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

## 2.4 AT SMS Termination in HRPD Active Mode

Note: Hybrid ATs may not support this feature

2.4.1 Definition

This test verifies SMS termination when in HRPD Active Mode.

2.4.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [3])

2.4.3 Call Flow Example(s)

None

2.4.4 Method of measurement

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

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

c. Issue a continuous “ping” command from the Hybrid AT to a remote host.

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

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

f. After SMS message is received, verify that Hybrid AT starts sending and receiving continuous pings on HRPD on the same PPP session.

g. Instruct the network to send an SMS message to the Hybrid AT on the f-dsch.

h. Verify SMS message is correctly received by the Hybrid AT.

i. After SMS message is received, verify that Hybrid AT starts sending and receiving continuous pings on HRPD on the same PPP session.

j. End the HRPD packet data call.

2.4.5 Minimum Standard

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

No Text

# 3 INTERWORKING OF 1X AND HRPD – HRPD DORMANT MODE

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

For all tests in Chapter 3, Session Security should be enabled if supported.

## 3.1 AT Voice Origination in HRPD Dormant Mode

Note: Hybrid ATs may not support this feature

### 3.1.1 Definition

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

### 3.1.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

### 3.1.3 Call Flow Example(s)

None

3.1.4 Method of measurement

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

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

c. Wait for Hybrid AT to go dormant.

d. Initiate a voice call from the Hybrid AT.

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

f. End the voice call.

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

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

i. End the HRPD packet data call.

3.1.5 Minimum Standard

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

## 3.2 AT Voice Termination in HRPD Dormant Mode

3.2.1 Definition

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

3.2.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |

| | | |
|---|---|---|
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

3.2.3 Call Flow Example(s)

None

3.2.4 Method of measurement

a. Connect the Hybrid AT to the AN as shown in Figure A-1 with AN 1 configured as cdma2000 1x and AN 2 configured as HRPD.
b. Initiate a HRPD packet data call from the Hybrid AT.
c. Wait for Hybrid AT to go dormant.
d. Initiate a voice call to the Hybrid AT.
e. Verify the call completes and verify CDMA user data in both directions.
f. End the voice call.
g. Verify that PPP connection is not dropped and Hybrid AT is in dormant state.
h. Issue a ping command and verify that pings are successful.
i. End the HRPD packet data call.

3.2.5 Minimum Standard

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

## 3.3 AT SMS Origination in HRPD Dormant Mode

3.3.1 Definition

This test verifies SMS Origination when in HRPD Dormant Mode.

3.3.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [3])

3.3.3 Call Flow Example(s)

None

3.3.4 Method of measurement

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

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

c. Wait for Hybrid AT to go dormant.

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

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

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

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

h. Wait for Hybrid AT to go dormant.

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

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

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

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

m. End the HRPD packet data call.

3.3.5 Minimum Standard

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

## 3.4 AT SMS Termination in HRPD Dormant Mode

3.4.1 Definition

This test verifies SMS termination when in HRPD Dormant Mode.

3.4.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [3])

3.4.3 Call Flow Example(s)

None

3.4.4 Method of measurement

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

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

c. Wait for Hybrid AT to go dormant.
d. Instruct the network to send an SMS message to the Hybrid AT on the f-csch.
e. Verify SMS message is correctly received by the Hybrid AT.
f. Verify that PPP connection is not dropped and Hybrid AT is in dormant state.
g. Issue a ping command from the remote host and verify that the ping is successful.
h. Wait for Hybrid AT to go dormant.
i. Instruct the network to send an SMS message to the Hybrid AT on the f-dsch.
j. Verify SMS message is correctly received by the Hybrid AT.
k. Verify that PPP connection is not dropped and Hybrid AT is in dormant state.
l. Issue a ping command and verify that pings are successful.
m. End the HRPD packet data call.

3.4.5 Minimum Standard

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

No Text

# 4 INTER TECHNOLOGY SWITCHING

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

For all tests in Chapter 4, Session Security should be enabled if supported.

## 4.1 Inter Technology Switching – Dormant HRPD to cdma2000 1x

### 4.1.1 Definition

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

### 4.1.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

4.1.3 Call Flow Example(s)

None

4.1.4 Method of measurement

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

b. Configure the Hybrid AT for Mobile IP mode.

c. Cause the Hybrid AT to acquire AN 1 configured as HRPD.

d. Initiate a HRPD packet data call from the Hybrid AT.

e. Record the IP address assigned to the Hybrid AT.

f. Wait for Hybrid AT to go dormant.

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

h. Verify Hybrid AT is dormant for data (active pilot set) on AN 2 configured as cdma2000 1x.

i. Issue a “ping” command from the remote host to the Hybrid AT using the IP address assigned to the AT in step e.

j. Verify the Hybrid AT is active for data on AN 2 configured for cdma2000 1x, and verify the remote host receives a “ping” response from the Hybrid AT.

k. End the call.

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

4.1.5 Minimum Standard

The AT shall comply with steps h and j

## 4.2 Inter Technology Switching – Active HRPD to cdma2000 1x

4.2.1 Definition

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

4.2.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

4.2.3 Call Flow Example(s)

None

4.2.4 Method of measurement

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

b. Configure the Hybrid AT for mobile IP mode.

c. Cause the Hybrid AT to acquire AN 1 configured as HRPD.

d. Initiate a HRPD packet data call from the Hybrid AT.

e. Record the IP address assigned to the Hybrid AT.

f. Issue a continuous “ping” command from the remote host to the Hybrid AT using the IP address assigned to the AT in step e.

g. Ensure that AT is active for data on AN 1 configured as HRPD and verify the remote host receives a “ping” response from the AT.

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

i. Verify Hybrid AT is active for data on AN 2 configured as cdma2000 1x and verify the remote host receives a “ping” response from the Hybrid AT.

j. End the call.

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

4.2.5 Minimum Standard

The AT shall comply with step i

## 4.3 Inter Technology Switching – Dormant cdma2000 1x to HRPD

### 4.3.1 Definition

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

### 4.3.2 Traceability

(see [6])

(see [7])

(see [4])

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 10 | MAC Layer |

(see [5])

| | |
|---|---|
| Chapter 3 | HRPD IOS Call Flows |

(see [2])

| | |
|---|---|
| 2.2.6.2.5 | Mobile Station Origination Operation |
| 2.6.3 | System Access State |
| 2.6.3.5 | Mobile Station Origination Attempt Substate |
| 2.6.4 | Mobile Station Control on the Traffic Channel State |
| 2.7.1.3.2.4 | Origination Message |
| 2.7.2.3.2.15 | Service Option Control Message |
| 2.7.3 | Orders |
| 3.6.3.5 | Response to Origination Message |
| 3.6.4 | Traffic Channel Processing |
| 3.7.2.3.2.21 | Extended Channel Assignment Message |
| 3.7.3.3.2.3 | Alert With Information Message |
| 3.7.3.3.2.20 | Service Connect Message |
| 3.7.4 | Orders |
| 3.7.5.5 | Signal |

### 4.3.3 Call Flow Example(s)

None

### 4.3.4 Method of measurement

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

b. Configure the Hybrid AT for mobile IP mode.

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

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

e. Record the IP address assigned to the Hybrid AT.

f. Wait for Hybrid AT to go dormant.

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

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

i. Issue a “ping” command from the remote host to the Hybrid AT using the IP address assigned to the AT in step e.

j. Verify the Hybrid AT is active for data on AN 2 configured for HRPD, and verify the remote host receives a “ping” response from the Hybrid AT.

k. End the call

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

#### 4.3.5 Minimum Standard

The AT shall comply with steps h and j.

No Text

# 5 ANNEX A (INFORMATIVE) - FIGURES

**Figure A - 1**