

3GPP2 C.S0096-0
Version: 1.0
Date: January 2011



3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"

Recommended Minimum Performance Standards for Simultaneous cdma2000 and cdma2000-HRPD Access Terminal

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Revision History

Revision	Description of Changes	Date
1.0	Initial publication	January 2011

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FOREWORDS**(This foreword is not part of this Standard)**1
2
3
4
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6

This Standard was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This Standard contains recommended minimum performance standards for Simultaneous cdma2000®¹ and cdma2000-HRPD Access Terminal.

¹ cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) 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

FOREWORDS

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2

NOTES

- 1 1. “Mobile station” and “Access terminal” are used interchangeably in this document.
- 2 2. Throughput this document, cdma2000 1x is called CDMA, and cdma2000 HRPD is
3 called HRPD.
- 4 3. An simultaneous cdma2000 and cdma2000 HRPD capable access terminal is one
5 that is capable of supporting calls on a CDMA and one or more HRPD carriers at the
6 same time. Such capability is denoted as CDMA-HRPD in this specification. A
7 single-band CDMA-HRPD capable (SB-CDMA-HRPD) access terminal is one that
8 can support simultaneous calls on a CDMA and one or more HRPD carriers when
9 the CDMA and HRPD carriers belong to the same band class. A dual-band CDMA-
10 HRPD capable (DB-CDMA-HRPD) access terminal is one that can support
11 sumultaneous calls on a CDMA and one or more HRPD carriers when the carriers
12 belong to two different band classes.
- 13 4. To ensure that the tests accurately represent CDMA-HRPD performance, the tester
14 should start collecting minimum performance data for CDMA-HRPD only after both
15 CDMA and HRPD calls have been established. This is true for all tests that require
16 simultaneous CDMA and HRPD calls.
- 17 5. The term “Band Class Combination” is used in the context of dual-band
18 CDMA_HRPD. A band class combination is a pair of band classes on which a mobile
19 station can operate a CDMA carrier and one or more HRPD carriers simultaneously.
20 The band class combination lists the CDMA band class first, followed by the HRPD
21 band class. For example, for a mobile station supporting a CDMA carrier on Band
22 Class A and a HRPD carrier on Band Class B, the band class combination would be
23 designated as Band Class A, Band Class B.
- 24 6. “Base station” refers to the functions performed on the land side, which are typically
25 distributed among a cell, a sector of a cell, and a mobile communications switching
26 center.
- 27 7. “Access network” refers to the network equipment providing data connectivity
28 between a packet switched data network (typically the Internet) and the access
29 terminals. Connectivity is typically provided at the Link Layer (PPP).
- 30 8. “Sector” refers to the part of the access network that provides the land-side modem.
- 31 9. This standard uses the following verbal forms: “Shall” and “shall not” identify
32 requirements to be followed strictly to conform to the standard and from which no
33 deviation is permitted. “Should” and “should not” indicate that one of several
34 possibilities is recommended as particularly suitable, without mentioning or
35 excluding others; that a certain course of action is preferred but not necessarily
36 required; or that (in the negative form) a certain possibility or course of action is
37 discouraged but not prohibited. “May” and “need not” indicate a course of action
38 permissible within the limits of the standard. “Can” and “cannot” are used for
39 statements of possibility and capability, whether material, physical, or causal.
- 40 10. Unless indicated otherwise, this document presents numbers in decimal form.
41 Binary numbers are distinguished in the text by the use of single quotation marks.

NOTES

- 1 11. Those wishing to deploy systems compliant with this standard should also be
2 compliant with local radio regulations. For example, operation within the United
3 States of America shall comply with Parts 2, 15, 22, 24, and 27 of [6] and with the
4 applicable rules and regulations of local administrations.
- 5 12. The following operators define mathematical operations:
6 \times indicates multiplication.
7 $/$ indicates division.
8 $+$ indicates addition.
9 $-$ indicates subtraction.
10 $*$ indicates complex conjugation.
11 \in indicates a member of the set.
12 $\lfloor x \rfloor$ indicates the largest integer less than or equal to x : $\lfloor 1.1 \rfloor = 1$, $\lfloor 1.0 \rfloor = 1$.
13 $|x|$ indicates the absolute value of x : $|-17| = 17$, $|17| = 17$.
- 14 13. All Radio Configuration 1 Eb/Nt requirements for Band Class 0 in this document
15 are based on measured data. For all other band classes, the radio configuration
16 Eb/Nt requirements in this document are based on simulated data with standard
17 margins of 1.3 dB for static and 1.5 dB for fading channel cases. Additional Forward
18 Fundamental Channel rate determination margins of 0.2, 0.3, and 0.4 dB are added
19 for the 1/2, 1/4, and 1/8 rate cases, respectively.
- 20 14. Tests in this revision reference the *General Neighbor List Message*, *Universal*
21 *Neighbor List Message* and the *Universal Handoff Direction Message* to maintain
22 consistency with new tests that require the extended capability of these messages.
23 Where needed to test a P_REV six or lower mobile station, the *Neighbor List*
24 *Message*, *Extended Neighbor List Message*, and *Extended Handoff Direction Message*
25 may be used as specified in [11].
- 26 15. Some tests may specify using the Paging Channel for general test setup
27 requirements. If the mobile station does not support the Paging Channel, then the
28 Broadcast Control Channel and Forward Common Control Channel shall be used in
29 lieu of the Paging Channel.
- 30 16. The specification applies only to Band Classes 0 (Band Subclasses 0 and 1), 1, 2
31 (Band Subclasses 0, 1, and 2), 3, 4, 5 (Band Subclasses 0 through 7), 6, 7, 8, 9, 10
32 (Band Subclasses 0 through 4), 11 (Band Subclasses 0 through 5), and 12 (Band
33 Subclasses 0 and 1) as defined in [7]. Operation with other band classes and band
34 subclasses may not be supported by this specification.

35

1 INTRODUCTION

1.1 Scope

This Standard details definitions, methods of measurement, and minimum performance characteristics for CDMA-HRPD-capable access terminals. An CDMA-HRPD-capable access terminal shall satisfy the requirements of this document *in addition to* satisfying those in [4] and [17]. A single-band CDMA-HRPD (SB-CDMA-HRPD) access terminal shall pass all SB-CDMA-HRPD MPS tests in this document. A dual-band CDMA-HRPD (DB-CDMA-HRPD) access terminal that also supports SB-CDMA-HRPD shall pass the SB-CDMA-HRPD MPS tests in each individual band class in addition to passing the DB-CDMA-HRPD MPS tests in this document. The purpose of this standard is to ensure that an CDMA-HRPD-capable access terminal can obtain service in any system that meets the compatibility requirements of [1] and [8].

Compatibility, as used in connection with this Standard and [1] and [8], is understood to mean that any CDMA-HRPD-capable access terminal is able to simultaneously open data connections in any HRPD system and place and receive calls in any CDMA system. Conversely, all HRPD systems are able to open connections and all CDMA systems are able to place and receive calls simultaneously with any CDMA-HRPD-capable access terminal.

Test methods are recommended in this document; however, methods other than those recommended may suffice for the same purpose.

The performance metrics in this Standard require an access terminal to provide a single antenna connector for testing. Access terminals having multiple antenna, such as for receive diversity, shall provide a single antenna connector for testing. If an access terminal has more than one antenna connector, only one connector shall be used for testing. Additional requirements specifically for multiple antenna configurations, i.e. receive diversity, are for future study.

1.2 Terms and Definitions

Since CDMA-HRPD consists of simultaneous CDMA and HRPD calls, the terms and definitions used in this document are the same as those of the respective technologies. These terms and definitions are listed in Section 1.2 of the most recent revision and version of [4] (for CDMA) and [17] (for HRPD).

The test modes and the mapping to radio configurations for CDMA are described in Section 1.3 of [4].

1.3 CDMA and HRPD Equations

Sections 1.4 of [4] and 1.3 of [17] list the equations that describe the relationship between various test parameters under different conditions for CDMA and HRPD respectively.

1 **1.4 Tolerances**

2 1.4.1 CDMA and HRPD System Parameter Tolerances

3 CDMA parameters are specified in [8]. HRPD parameters are specified in [1]. All
4 parameters indicated in all sections are exact unless an explicit tolerance is stated.

5 1.4.2 Measurement Tolerances

6 Unless otherwise specified, a measurement tolerance, including the tolerance of the
7 measurement equipment, of $\pm 10\%$ is assumed.

8 Unless otherwise specified, the \hat{I}_{OR}/I_{OC} value shall be within ± 0.1 dB of the value specified,
9 and the I_{OC} value shall be within ± 5 dB of the value specified.

10 **1.5 References**

11 **NORMATIVE REFERENCES**

12 The following standards contain provisions that, through reference in this text, constitute
13 provisions of this Standard. At the time of publication, the editions indicated were valid.
14 All standards are subject to revision, and parties to agreements based on this Standard
15 are encouraged to investigate the possibility of applying the most recent editions of the
16 standards indicated below. ANSI and TIA maintain registers of currently valid national
17 standards published by them.

- 18
- 19 [1] 3GPP2 C.S0024-B v3.0, cdma2000 High Rate Packet Data Air Interface Specification,
20 September 2009.
- 21 [2] 3GPP2 C.S0032-C v1.0, Recommended Minimum Performance Standards for
22 cdma2000 High Rate Packet Data Access Network. September 2010.
- 23 [3] 3GPP2 C.S0029-B v1.0, Test Application Specification for cdma2000 High Rate Packet
24 Data Air Interface, March 2008.
- 25 [4] 3GPP2 C.S0011-C v2.0, Recommended Minimum Performance Standards for
26 cdma2000 Spread Spectrum Mobile Stations, March 2006.
- 27 [5] ANSI C63.4-2003, American National Standard for Methods of Measurement of Radi-
28 Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of
29 9 kHz to 40 GHz, 2000.
- 30 [6] CFR Title 47, Code of Federal Regulations, October 2009.
- 31 [7] 3GPP2 C.S0057-E v1.0, Band Class Specification for cdma2000 Spread Spectrum
32 Systems, October 2010.
- 33 [8] 3GPP2 C.S0002-E v2.0, Physical Layer Standard for cdma2000 Spread Spectrum
34 Systems, June 2010.
- 35 [9] Reserved.

- 1 [10] 3GPP2 C.S0004-E v2.0, Signaling Link Access Control (LAC) Standard for
2 cdma2000 Spread Spectrum Systems, June 2010.
- 3 [11] 3GPP2 C.S0005-E v2.0, Upper Layer (Layer 3) Signaling Standard for cdma2000
4 Spread Spectrum Systems, June 2010.
- 5 [12] 3GPP2 C.S0010-D v1.0, Recommended Minimum Performance Standards for
6 cdma2000 Spread Spectrum Base Stations, September 2010.
- 7 [13] 3GPP2 C.S0026-A v1.0, Test Data Service Option (TDSO) for cdma2000 Spread
8 Spectrum Systems, February 2005.
- 9 [14] 3GPP2 C.S0025-0 v2.0, Markov Service Option (MSO) for cdma2000 Spread
10 Spectrum Systems, May 2006.
- 11 [15] 3GPP2 C.S0013-A, Loopback Service Options (LSO) for cdma2000 Spread
12 Spectrum Systems, 2001.
- 13 [16] 3GPP2 C.S0003-E v2.0, Medium Access Control (MAC) Standard for cdma2000
14 Spread Spectrum Systems, June 2010.
- 15 [17] 3GPP2 C.S0033-B v1.0, Recommended Minimum Performance Standards for
16 cdma2000 High Rate Packet Data Access Terminal, May 2008.
- 17 [18] 3GPP TS 45.004, 3rd Generation Partnership Project; Technical Specification
18 Group GSM/EDGE Radio Access Network; Modulation.
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2 STANDARD RADIATED EMISSIONS MEASUREMENT PROCEDURE

The measurement and calibration procedures described are intended to provide an overview of radiated and conducted signal measurements. A detailed description of the required measurement procedures is given in [5].

2.1 Standard Radiation Test Site

The test site shall be on level ground that is of uniform electrical characteristics. The site shall be clear of overhead wires and other metallic objects and shall be as free as possible from undesired signals, such as ignition noise and other carriers. Reflecting objects, such as rain gutters and power cables shall lie outside an ellipse measuring 60 meters on the major axis by 52 meters on the minor axis for a 30-meter site, or an ellipse measuring 6 meters on the major axis by 5.2 meters on the minor axis for a 3-meter site. The equipment under test shall be located at one focus of the ellipse and the measuring antenna at the other focus. If desired, shelters may be provided at the test site to protect the equipment and personnel. All such construction shall be of wood, plastic, or other non-metallic material. All power, telephone, and control circuits to the site shall be buried at least 0.3 meter under ground.

A turntable, essentially flush with the ground, shall be provided that can be remotely controlled. A platform 1.2 meters high shall be provided on this turntable to hold the equipment under test. Any power and control cables that are used for this equipment should extend down to the turntable, and any excess cabling should be coiled on the turntable.

If the equipment to be tested is mounted in racks and is not easily removed for testing on the above platform, then the manufacturer may elect to test the equipment when it is mounted in its rack (or racks). In this case, the rack (or racks) may be placed directly on the turntable.

If a transmitter with an external antenna connection is being tested, then the RF output of this transmitter shall be terminated in a non-radiating load that is placed on the turntable. A non-radiating load is used in lieu of an antenna to avoid interference with other radio users. The RF cable to this load should be of minimum length. The transmitter shall be tuned and adjusted to its rated output value before starting the tests.

In order to conduct unintentional radiator tests as specified in Part 15, subpart B of [6], the radiation site must comply with 5.4.6 through 5.5 of [5] as required by Part 2.948 of [6].

2.2 Search Antenna

For narrow-band dipole adjustable search antennas, the dipole length shall be adjusted for each measurement frequency. This length may be determined from a calibration ruler that is normally supplied with the equipment.

The search antenna shall be mounted on a movable non-metallic horizontal boom that can be raised or lowered on a wooden or other non-metallic pole. The cable connected to the search antenna shall be at a right angle to the antenna. The cable shall be dressed at least 3 meters, either through or along the horizontal boom, in a direction away from the

1 equipment being measured. The search antenna cable may then be dropped from the end
2 of the horizontal boom to ground level for connection to the field-strength measuring
3 equipment.

4 The search antenna shall be capable of being rotated 90 degrees on the end of the
5 horizontal boom to allow measurement of both vertically and horizontally polarized signals.
6 When the antenna length of a vertically mounted antenna does not permit the horizontal
7 boom to be lowered to its minimum specified search range, adjust the minimum height of
8 the boom for 0.3 meter clearance between the end of the antenna and the ground.

9 **2.3 Field-Strength Measurement**

10 A field-strength meter shall be connected to a search antenna. The field-strength meter
11 shall have sufficient sensitivity and selectivity to measure signals over the required
12 frequency ranges at levels at least 10 dB below the levels specified in any document,
13 standard, or specification that references this measurement procedure. The calibration of
14 the measurement instruments (field-strength meter, antennas, etc.) shall be checked
15 frequently to ensure that their accuracy is in accordance with the current standards. Such
16 calibration checks shall be performed at least once per year.

17 **2.4 Frequency Range of Measurements**

18 When measuring radiated signals from transmitting equipment, the measurements shall be
19 made from the lowest radio frequency (but no lower than 25 MHz) generated in the
20 equipment to the tenth harmonic of the carrier, except for that region close to the carrier
21 equal to $\pm 250\%$ of the authorized bandwidth.

22 When measuring radiated signals from receiving equipment, the measurements shall be
23 made from 25 MHz to at least 6 GHz.

24 **2.5 Test Ranges**

25 **2.5.1 30-Meter Test Range**

26 Measurement of radiated signals shall be made at a point 30 meters from the center of the
27 turntable. The search antenna shall be raised and lowered from 1 to 4 meters in both
28 horizontally and vertically polarized orientations.

29 The field-strength measuring meter may be placed on a suitable table or tripod at the foot
30 of the mast.

31 When measuring radiated emissions from receivers, equipment that contains its own
32 receive antenna shall be tested with the antenna in place. Equipment that is connected to
33 an external receive antenna via a cable shall be tested without the antenna, and the receive
34 ports on the equipment under test shall be terminated in a 50Ω non-radiating resistive
35 load.

36 **2.5.2 3-Meter Test Range**

37 Measurement of radiated signals may be made at a point 3 meters from the center of the
38 turntable, provided the following three conditions can be met:

- 1 1. A ground screen that covers an elliptical area at least 6 meters on the major axis by
2 5.2 meters on the minor axis is used with the measuring antenna and turntable
3 mounted 3 meters apart. The measuring antenna and turntable shall lie on the
4 major axis and shall be equidistant from the minor axis of the elliptical area.
- 5 2. The maximum dimension of the equipment shall be 3 meters or less. When
6 measuring radiated signals from receivers, the maximum dimension shall include
7 the antenna if it is an integral part of the device.
- 8 3. The field-strength measuring equipment is either mounted below the ground level at
9 the test site or is located a sufficient distance away from the equipment being tested
10 and from the search antenna to prevent corruption of the measured data.

11 The search antenna shall be raised and lowered over a range from 1 to 4 meters in both
12 horizontally and vertically polarized orientations. When the search antenna is vertically
13 oriented, the minimum height of the center of the search antenna shall be defined by the
14 length of the lower half of the search antenna.

15 When measuring radiated emissions from receivers, equipment that contains its own
16 receive antenna shall be tested with the antenna in place. Equipment that is connected to
17 an external receive antenna via a cable shall be tested without the antenna, and the receive
18 ports on the equipment under test shall be terminated in a 50Ω non-radiating resistive
19 load. The 3-meter test range may be used for determining compliance with limits specified
20 at 30 meters (or other distances), provided that:

- 21 1. The ground reflection variations between the two distances have been calibrated for
22 the frequencies of interest at the test range, or
- 23 2. A 5 dB correction factor is added to the specified radiation limit(s) to allow for
24 average ground reflections.

25 Radiated field strength (volts/meter) varies inversely with distance, so that a measurement
26 made on the 3-meter test range divided by 10 gives the equivalent value that would be
27 measured on a 30-meter test range for the same EIRP (effective isotropic radiated power).
28 The 30-meter field strength in volts/meter can be calculated from the EIRP by using the
29 following formula:

$$30 \quad \mu\text{V}/\text{m}@30 \text{ meters} = 5773.5 \times 10^{\text{EIRP}(\text{dBm})/20}$$

31 **2.6 Radiated Signal Measurement Procedures**

32 Radiated signals having significant levels shall be measured on the 30-meter or the 3-meter
33 range by using the following procedure:

- 34 1. For each observed radiated signal, raise and lower the search antenna to obtain a
35 maximum reading on the field-strength meter with the antenna horizontally
36 polarized. Then rotate the turntable to maximize the reading. Repeat this procedure
37 of raising and lowering the antenna and rotating the turntable until the highest
38 possible signal has been obtained. Record this maximum reading.
- 39 2. Repeat step 1 for each observed radiated signal with the antenna vertically
40 polarized.

- 1 3. Remove the equipment being tested and replace it with a half-wave antenna. The
2 center of the half-wave antenna should be at the same approximate location as the
3 center of the equipment being tested.
- 4 4. Feed the half-wave antenna replacing the equipment under test with a signal
5 generator connected to the antenna by means of a non-radiating cable. With the
6 antennas at both ends horizontally polarized and with the signal generator tuned to
7 the observed radiated signal, raise and lower the search antenna to obtain a
8 maximum reading on the field-strength measuring meter. Adjust the level of the
9 signal generator output until the previously recorded maximum reading for this set
10 of conditions is obtained. Record the signal generator power output.
- 11 5. Repeat step 4 above with both antennas vertically polarized.
- 12 6. Calculate the power into a reference ideal isotropic antenna by:
 - 13 a. First reducing the readings obtained in steps 4 and 5 above by the power loss in
14 the cable between the generator and the source antenna, and
 - 15 b. Then correcting for the gain of the source antenna used relative to an ideal
16 isotropic antenna. The reading thus obtained is the equivalent effective isotropic
17 radiated power (EIRP) level for the spurious signal being measured.
- 18 7. Repeat steps 1 through 6 above for all observed signals from the equipment being
19 tested.

3 PHYSICAL LAYER RECEIVER MINIMUM STANDARDS

3.1 Demodulation Requirements for SB-CDMA-HRPD

3.1.1 Demodulation of Forward Traffic Channel in AWGN

On the CDMA carrier, this test shall be performed on the Forward Fundamental Channel, if the Forward Fundamental Channel is supported by the mobile station. Forward Traffic Channel closed loop power control in the CDMA base station shall be disabled during this test.

3.1.1.1 Definition

The performance of the demodulation of Forward Traffic Channel in an AWGN (no fading or multipath) environment is determined by the frame error rate (FER) for the CDMA channel and packet error rate (PER) for the HRPD channel. The PER and FER are calculated for each individual data rate and on a per carrier basis.² For CDMA Radio Configuration 2 Fundamental Channel, the accuracy of the Erasure Indicator bits sent by the mobile station is verified in this test.

3.1.1.2 Method of Measurement

1. Connect the sectors and the AWGN generator to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]).
2. For each band class that the access terminal supports, configure the access terminal to operate in that band class. Configure the access terminal to transmit on one CDMA and one HRPD channel at maximum separation supported by the device. The maximum carrier separation should be at least 2.46 MHz. Perform steps 3 through 14.
3. For each CDMA radio configuration supported on the Forward Fundamental Channel, set up a CDMA call using Fundamental Channel (see 1.3 of [4]) with frame activity equal to 100%.
4. For HRPD, perform steps 5 and 6. For Subtype 0 to 1 Physical Layer tests, perform steps 7 through 9. For Subtype 2 or 3 Physical Layer tests, perform steps 13 and 14.
5. Set the access network's forward HRPD packet activity to 100%. If the data rate under test is 1.536 Mbps or higher, an access network simulator meeting the waveform quality requirements in 8.4.3 of [17] shall be used. Set the access network's Control Channel data rate to 38.4 kbps.

² To ensure that the tests accurately represent CDMA-HRPD performance, the tester should start collecting PER and FER data only after both CDMA and HRPD calls have been established.

6. Set the HRPD *SetManagementSameChannelParameters* attribute fields of the Default Route Update Protocol to the values specified below:

Field	Value (Hex)
PilotDrop	0x1c (-14 dB)

7. Set up a HRPD Test Application session. Open a connection and configure the Test Application FTAP (for Subtype 0 or 1 Physical Layer) so that the HRPD Forward Traffic Channel rate corresponds to the rate of the test only.
8. Set the test parameters for each HRPD demodulation test specified in Table A.1.1.1-1.
9. From the number of HRPD packets transmitted and the number of bad packets received, calculate the PER for this test. Unless otherwise specified, the PER shall be measured at the end of the packet.
10. Set the test parameters for each CDMA demodulation test as specified in Table A.2.1.1-1 through Table A.2.1.1-5.
11. Count, at the base station, the number of CDMA frames transmitted and the number of good frames received at the mobile station.
12. For CDMA Radio Configuration 2, check the accuracy of the received Erasure Indicator bits at the base station against the corresponding frames received at the mobile station.
13. If the access terminal supports HRPD Subtype 2 or Subtype 3 Physical Layer, set up a HRPD Test Application session. Open a connection and configure the Test Application FETAP (for Subtype 2 or 3 Physical Layer) so that the HRPD Forward Traffic Channel rate corresponds to the rate of the test only.
14. Set the test parameters for each HRPD demodulation test specified in Table A.1.1.1-2 and repeat step 9.

3.1.1.3 Minimum Standard for HRPD

The actual E_b/N_t used in each test shall be within ± 0.2 dB of the value indicated in Table A.1.1.1-1 through Table A.1.1.1-2.

For access terminals that support HRPD Subtype 0 or Subtype 1 Physical Layer, the PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-1 with 95% confidence. The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-2 with 95% confidence.

For access terminals that support HRPD Subtype 2 or Subtype 3 Physical Layer, the PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-3 with 95% confidence. The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-4 with 95% confidence.

1 3.1.1.4 Minimum Standard for CDMA

2 The actual power measurement uncertainty shall be less than or equal to 0.2 dB. Test
3 durations must be sufficient to meet confidence level requirements.

4 The actual E_b/N_t used in each test shall be within ± 0.2 dB of the value indicated in Table
5 A.2.1.1-1 through Table A.2.1.1-5.

6 For Radio Configuration 2 Fundamental Channels, the mobile station shall set the Erasure
7 Indicator Bit to '1' in the second transmitted frame following the reception of any bad frame
8 on the Forward Fundamental Channel. The value of the Erasure Indicator bits
9 corresponding to all other frames received at the mobile station shall be '0'.

10 The FER for each test shall not exceed the piecewise linear FER curve specified by the
11 points in Table A.2.1.2-1 through Table A.2.1.2-5 with 95% confidence (see 6.6 of [4]).

12 **3.2 Demodulation Requirements for DB-CDMA-HRPD**

13 3.2.1 Demodulation of Forward Traffic Channel in AWGN

14 Forward Traffic Channel closed loop power control in the CDMA base station shall be
15 disabled during this test.

16 3.2.1.1 Definition

17 The performance of the demodulation of the Forward Traffic Channel in an AWGN (no
18 fading or multipath) environment is determined by the frame error rate (FER) for the CDMA
19 channel and packet error rate (PER) for the HRPD channels. The PER and FER are
20 calculated for each individual data rate and on a per carrier basis.

21 3.2.1.2 Method of Measurement

- 22 1. Connect the sector to the access terminal antenna connector as shown in Figure
23 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]).
- 24 2. For all band class combinations supported by the access terminal, configure the
25 access terminal to operate with that band class combination, where B1 is the CDMA
26 band class and B2 is the HRPD band class.
- 27 3. Perform steps 5 through 16 if the access terminal can simultaneously support a
28 single CDMA carrier in B1 and one or more HRPD carriers in B2.
- 29 4. Perform steps 17 and 18 if the access terminal can simultaneously support a single
30 CDMA carrier in B1 and two or more HRPD carriers in B2.
- 31 5. Configure the access terminal to transmit on a single CDMA carrier in B1, and on a
32 single HRPD carrier in B2. Perform steps 6 through 16.
- 33 6. For CDMA radio configurations 3 and 4 supported on the Forward Fundamental
34 Channel, set up a CDMA call on B1 using Fundamental Channel (see 1.3 of [4]) with
35 frame activity equal to 100%.

- 1 7. For HRPD on B2, perform steps 8 and 9. For Subtype 0 to 1 Physical Layer tests,
2 perform steps 10 through 12. For Subtype 2 or 3 Physical Layer tests, perform steps
3 13 and 14.
- 4 8. Set the access network's forward HRPD packet activity to 100%. If the data rate
5 under test is 1.536 Mbps or higher, an access network simulator meeting the
6 waveform quality requirements in 8.4.3 of [17] shall be used. Set the access
7 network's Control Channel data rate to 38.4 kbps.
- 8 9. Set the HRPD *SetManagementSameChannelParameters* attribute fields of the Default
9 Route Update Protocol to the values specified below:

Field	Value (Hex)
PilotDrop	0x1c (-14 dB)

- 10
- 11
- 12 10. Set up a HRPD Test Application session for B2. Open a connection and configure
13 the Test Application FTAP (for Subtype 0 or 1 Physical Layer) so that the HRPD
14 Forward Traffic Channel rate corresponds to the rate of the test only.
- 15 11. Set the test parameters for each HRPD demodulation test specified in Table
16 A.1.1.1-1.
- 17 12. From the number of HRPD packets transmitted and the number of bad packets
18 received, calculate the PER for this test. Unless otherwise specified, the PER shall
19 be measured at the end of the packet.
- 20 13. If the access terminal supports HRPD Subtype 2 or Subtype 3 Physical Layer, set
21 up a HRPD Test Application session for B2. Open a connection and configure the
22 Test Application FETAP (for Subtype 2 or 3 Physical Layer) so that the HRPD
23 Forward Traffic Channel rate corresponds to the rate of the test only.
- 24 14. Set the test parameters for each HRPD demodulation test specified in Table
25 A.1.1.1-2 and repeat step 12.
- 26 15. Set the test parameters for each CDMA demodulation test as specified in Table
27 A.2.1.1-1 through Table A.2.1.1-5.
- 28 16. Count, at the base station, the number of CDMA frames transmitted and the
29 number of good frames received at the mobile station.
- 30 17. Configure the access terminal to transmit on the maximum number of adjacent
31 HRPD carriers supported by the access terminal on B2.
- 32 18. If the access terminal supports multiple HRPD carriers in B2, set up a HRPD Test
33 Application session. Open a connection and configure the Test Application FMCTAP
34 (for Subtype 3 Physical Layer) so that the Forward Traffic Channel rate corresponds
35 to the rate of the test only. Set the test parameters for tests 5 and 6 as specified in
36 Table A.1.1.1-3 and repeat step 12. The data rate and geometry parameters are on a
37 per carrier basis.

3.2.1.3 Minimum Standard for HRPD

The actual E_b/N_t used in each test shall be within ± 0.2 dB of the value indicated in Table A.1.1.1-1 through Table A.1.1.1-3.

For access terminals that support HRPD Subtype 0 or Subtype 1 Physical Layer, the PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-1 with 95% confidence. The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-2 with 95% confidence.

For access terminals that support HRPD Subtype 2 or Subtype 3 Physical Layer, the PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-3 with 95% confidence. The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-4 with 95% confidence. For access terminals that support Subtype 3 Physical Layer, for each active carrier the PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-5 with 95% confidence. For access terminals that support Subtype 3 Physical Layer, for each active carrier the PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.3-6 with 95% confidence.

3.2.1.4 Minimum Standard for CDMA

The actual power measurement uncertainty shall be less than or equal to 0.2 dB. Test durations must be sufficient to meet confidence level requirements.

The actual E_b/N_t used in each test shall be within ± 0.2 dB of the value indicated in Table A.2.1.1-3 through Table A.2.1.1-4.

The value of the Erasure Indicator bits corresponding to all frames received at the mobile station shall be '0'.

The FER for each test shall not exceed the piecewise linear FER curve specified by the points in Table A.2.1.2-3 through Table A.2.1.2-4 with 95% confidence (see 6.6 of [4]).

3.3 Receiver Performance for SB-CDMA-HRPD

3.3.1 Receiver Sensitivity and Dynamic Range

3.3.1.1 Definition

The RF sensitivity of the access terminal receiver is the minimum received power, measured at the access terminal antenna connector, at which the packet error rate (PER) for HRPD and the frame error rate (FER) for CDMA do not exceed a specified value. The receiver dynamic range is the input power range at the access terminal antenna connector over which the PER and FER do not exceed a specific value.

3.3.1.2 Method of Measurement

1. Connect the HRPD and CDMA sector(s) to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generators and the CW generators are not applicable in this test.

- 1 2. For each band class that the mobile station supports, configure the base station to
2 operate in that band class. Configure the access terminal to simultaneously perform
3 a CDMA and one or more HRPD calls as indicated in Table 3.3.1.2-1. Use a power
4 control step size of 0.5dB for CDMA as well as HRPD carriers. Perform steps 3
5 through 13.
- 6 3. If the mobile station supports demodulation of Radio Configuration 1, 2, 3, 4, or 5,
7 set up a CDMA call using Fundamental Channel Test Mode 1 or 3 (see 1.3 of [4])
8 with 9600 bps data rate only, or Fundamental Channel Test Mode 2 or 5 (see 1.3 of
9 [4]) with 14400 bps data rate only. Perform steps 5 through 13.
- 10 4. If the mobile station supports demodulation of Radio Configuration 6, 7, 8, or 9, set
11 up a CDMA call using Fundamental Channel Test Mode 7 (see 1.3 of [4]) with 9600
12 bps data rate only and perform steps 5 through 13.
- 13 5. For testing dynamic range (Test 1), perform steps 6 through 8. For testing sensitivity
14 (Test 2), perform steps 9 through 13.
- 15 6. Set up a HRPD test Application session. Open a HRPD connection and configure the
16 Test Application FTAP (for Subtype 0 OR 1 Physical Layer) or FETAP (for Subtype 2
17 Physical Layer) or FMCTAP (for Subtype 3 Physical Layer) so that the Forward
18 Traffic Channel rate corresponds to the one specified in Table 3.3.1.2-1 for Test 1.
- 19 7. Set the test parameters for the CDMA and HRPD channels as specified in Table
20 3.3.1.2-1.
- 21 8. From the number of HRPD packets transmitted and the number of bad packets
22 received, calculate the PER for HRPD. From the number of CDMA frames
23 transmitted and the number of bad frames received, calculate the FER for CDMA.
- 24 9. For Test 2, open a HRPD connection and configure the Test Application FTAP (for
25 Subtype 0 OR 1 Physical Layer) or FETAP (for Subtype 2 Physical Layer) or FMCTAP
26 (for Subtype 3 Physical Layer) so that the Forward Traffic Channel rate corresponds
27 to the one specified in Table 3.3.1.2-1 for Test 2.
- 28 10. Set the test parameters (all except \hat{I}_{OR}) as specified in Table 3.3.1.2-1. Set \hat{I}_{OR} to –
29 75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{OR} to –75 dBm/1.23 MHz for the
30 CDMA channel.
- 31 11. Send continuously alternate ‘0’ and ‘1’ power control bits to the access terminal on
32 the CDMA carrier, and send continuously ‘0’ power control bits to the access
33 terminal on each HRPD carrier and measure the total transmitted power at the
34 access terminal until it becomes stable. For this test, denote this stable transmitted
35 power value MaxAccessTerminalTxPower (in dBm).
- 36 12. Manually set the transmitted power on each CDMA and HRPD channel to
37 MaxAccessTerminalTxPower – $10 \times \log_{10}(N)$ – Backoff, where N is the number of
38 simultaneously active CDMA as well as HRPD carriers and Backoff is 3.3dB. Here,
39 manual setting of the transmitted power implies using reverse power control
40 commands to maintain the transmitted power close to a specified target. The

1 difference between the target transmitted power and the actual or measured
 2 transmitted power shall not exceed the power control step size.

3 13. Set the \hat{I}_{or} for Test 2 for both CDMA and HRPD as specified in Table 3.3.1.2-1 and
 4 repeat step 8.

5 **Table 3.3.1.2-1. Test Parameters for Receiver Sensitivity (Test 2) and Dynamic Range**
 6 **(Test 1)**

Parameter		Units	Test 1	Test 2
HRPD	\hat{I}_{or}	dBm/1.23 MHz	-25	-105.5
	Forward Traffic Channel Data Rate	kbps	307.2	
		slots/packet	2	
CDMA	\hat{I}_{or}	dBm/1.23 MHz	-25	-104
	$\frac{Pilot E_c}{I_{or}}$	dB	-7	
	$\frac{Traffic E_c}{I_{or}}$	dB	-15.6 (RC 1 and 3) -12.3 (RC 2 and 5) -20.6 (RC 7)	
Number of carriers		N/A	One CDMA channel and the maximum number of HRPD Forward Traffic channels that can be demodulated by the AT. The HRPD carriers are all adjacent to one another and adjacent to the single CDMA carrier with a spacing of 1.23 MHz (for Band Class 0) and 1.25 MHz (for all other Band Classes) between center frequencies.	One CDMA and one HRPD Forward Traffic channels at maximum allowable frequency separation supported by the device. The maximum separation should be at least 2.46MHz.

7 3.3.1.3 Minimum Standard

8 The PER for HRPD as well as FER for CDMA in both Test 1 and Test 2 shall not exceed
 9 0.5% with 95% confidence.

10 3.3.2 Single Tone Desensitization

11 3.3.2.1 Definition

12 For single carrier operation, the single tone desensitization is a measure of a receiver's
 13 ability to receive a CDMA or HRPD signal at its assigned channel frequency in the presence

1 of an interferer spaced at a given frequency offset from the center frequency of the assigned
2 channel. For multi-carrier operation, the single tone desensitization is a measure of a
3 receiver's ability to receive a multi-carrier HRPD or CDMA-HRPD signal at its assigned
4 channel frequencies in the presence of a single jammer spaced at a given frequency offset
5 from the center frequency of the outermost channels. The receiver desensitization
6 performance is measured by the packet error rate (PER) for HRPD and the frame error rate
7 (FER) for CDMA.

8 This test is applied to all band classes except Band Class 6, where no narrow-band
9 interferers are currently known.

10 3.3.2.2 Method of Measurement

- 11 1. Connect the sector and an interfering tone to the access terminal antenna
12 connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The GMSK tone
13 is modulated as defined in [18].
- 14 2. For each band class that the access terminal supports, except Band Class 6,
15 configure the access terminal to operate in that band class. Use a power control
16 step size of 0.5dB for CDMA as well as HRPD carriers. Configure the access
17 terminal to simultaneously perform a CDMA and a HRPD call with the two carriers
18 at the maximum carrier separation supported by the device and perform steps 3
19 through 13. The maximum carrier separation should be at least 2.46MHz.
- 20 3. If the mobile station supports demodulation of Radio Configuration 1, 2, 3, 4, or 5,
21 set up a CDMA call using Fundamental Channel Test Mode 1 (see 1.3 of [4]) with
22 9600 bps data rate only and perform steps 5 through 13.
- 23 4. If the mobile station supports demodulation of Radio Configuration 6, 7, 8, or 9, set
24 up a CDMA call using Fundamental Channel Test Mode 7 (see 1.3 of [4]) with 9600
25 bps data rate only and perform steps 5 through 13.
- 26 5. Set up a HRPD Test Application session. Open a connection and configure the
27 HRPD Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for
28 Subtype 2 Physical Layer) so that the HRPD rate corresponds to the 2-slot version of
29 307.2 kbps.
- 30 6. Set the test parameters (excluding \hat{I}_{or}) for the CDMA channel as specified in Table
31 3.3.2.2-1.
- 32 7. Set \hat{I}_{or} to -75 dBm/1.23 MHz for the HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23 MHz
33 for the CDMA channel.
- 34 8. Send continuously alternate '0' and '1' power control bits to the access terminal on
35 the CDMA carrier, and send continuously '0' power control bits to the access
36 terminal on the HRPD carrier and measure the total transmitted power at the
37 access terminal until it becomes stable. For this test, denote this stable transmitted
38 power value MaxAccessTerminalTxPower (in dBm).
- 39 9. Manually set the transmitted power on each CDMA and HRPD channel to
40 MaxAccessTerminalTxPower $- 10 \times \log_{10}(N)$, where N is the number of

- 1 simultaneously active CDMA as well as HRPD carriers. Here, manual setting of the
 2 transmitted power implies using reverse power control commands to maintain the
 3 transmitted power close to a specified target. The difference between the target
 4 transmitted power and the actual or measured transmitted power shall not exceed
 5 the power control step size.
- 6 10. Set the test parameters for Test 1 as specified in Table 3.3.2.2-1 and perform steps
 7 12 and 13.
- 8 11. Repeat steps 6 through 9. Set the test parameters for Test 2 as specified in Table
 9 3.3.2.2-1 and perform steps 12 and 13.
- 10 12. For Band Class 3, verify that the ERP is at a level higher than the minimum
 11 specified in Table 3.3.2.2-2 for the current test. Otherwise, repeat steps 10 and 11
 12 until the EIRP or ERP reach desirable levels.
- 13 13. From the number of HRPD packets transmitted and the number of bad packets
 14 received calculate the PER for this test. From the number of CDMA frames
 15 transmitted and the number of bad frames received calculate the FER for this test.

16
 17 **Table 3.3.2.2-1. Test Parameters for Single Tone Desensitization for CDMA-HRPD**
 18 **operation**

Parameter		Units	Test 1	Test 2
Jammer Offset from Carrier		kHz	+1100 from highest frequency carrier (Band Groups 450 and 800, except BC 3) +900 (BC 3) +1250 from highest frequency carrier (BC 1, 4, 8, 14 and 15)	-1100 from lowest frequency carrier (Band Groups 450 and 800, except BC 3) -900 (BC 3) -1250 from lowest frequency carrier (BC 1, 4, 8, 14 and 15)
Number of active carriers		N/A	1 CDMA + 1 HRPD	
Jammer Power / Type		dBm	-50 GMSK (Except BC 3) -50 CW (BC 3)	
HRPD	\hat{I}_{or}	dBm/ 1.23 MHz	-92.4 (Except BC 3) -99.4 (BC 3)	
CDMA	\hat{I}_{or}	dBm/ 1.23 MHz	-91 (Except BC 3) -98 (BC 3)	
	$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
	$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-15.6	

Table 3.3.2.2-2. Minimum Effective Radiated Power for Single Tone Desensitization Test for Band Class 3

Access terminal Class	Minimum Access terminal ERP
	Tests 1 and 2
I	-7 dBW (200 mW)
II	-11 dBW (80 mW)
III	-15 dBW (32 mW)

3.3.2.3 Minimum Standard

The FER for CDMA carriers and PER for HRPD carriers for each test shall not exceed 1.0% with 95% confidence (see 8.8 of [17] and 6.6 of [4]).

3.4 Receiver Performance for DB-CDMA-HRPD

3.4.1 Receiver Sensitivity and Dynamic Range

3.4.1.1 Definition

The RF sensitivity of the access terminal receiver is the minimum received power, measured at the access terminal antenna connector, at which the packet error rate (PER) for HRPD and the frame error rate (FER) for CDMA do not exceed a specified value. The receiver dynamic range is the input power range at the access terminal antenna connector over which the PER and FER do not exceed a specific value.

3.4.1.2 Method of measurement

1. Connect the HRPD access network(s) and the CDMA base station to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are not applicable in this test.
2. For all band class combinations supported by the access terminal, configure the access terminal to operate with that band class combination, where B1 is the CDMA band class and B2 is the HRPD band class.
3. Perform steps 4 through 10, and 16 through 22 if the access terminal can support a single CDMA carrier in B1 and only one HRPD carrier in B2. Perform steps 11 through 15 and 23 through 29 if the access terminal can simultaneously support a single CDMA carrier in B1 and two or more HRPD carriers in B2. Use a power control step size of 0.5dB for CDMA as well as HRPD carriers.
4. Configure the access terminal to transmit on one CDMA carrier in B1 and on one HRPD carrier in B2.
5. If the mobile station supports demodulation of Radio Configuration 3, 4 or 5, set up a CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with

- 1 9600 bps data rate only, or Fundamental Channel Test Mode 5 (see 1.3 of [4]) with
2 14400 bps data rate only.
- 3 6. Set up a HRPD Test Application session in B2. Open a HRPD connection and
4 configure the Test Application FTAP (for Subtype 0 OR 1 Physical Layer) or FETAP
5 (for Subtype 2 Physical Layer) so that the Forward Traffic Channel rate corresponds
6 to the one specified in Table 3.4.1.2-1 for Test 1.
- 7 7. Set the test parameters for Test 1 as specified in Table 3.4.1.2-1.
- 8 8. From the number of HRPD packets transmitted and the number of bad packets
9 received, calculate the PER for HRPD. From the number of CDMA frames
10 transmitted and the number of bad frames received, calculate the FER for CDMA.
- 11 9. Open a HRPD connection in B2 and configure the Test Application FTAP (for
12 Subtype 0 OR 1 Physical Layer) or FETAP (for Subtype 2 Physical Layer) so that the
13 Forward Traffic Channel rate corresponds to the one specified in Table 3.4.1.2-1 for
14 Test 2.
- 15 10. Set the test parameters for Test 2 as specified in Table 3.4.1.2-1 and repeat step 8.
- 16 11. Configure the access terminal to transmit on one CDMA carrier in B1 and on the
17 maximum number of HRPD Forward Traffic channels that can be demodulated by
18 the AT in B2 simultaneously.
- 19 12. If the mobile station supports demodulation of Radio Configuration 3, 4 or 5, set up
20 a CDMA call on B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with
21 9600 bps data rate only, or Fundamental Channel Test Mode 5 (see 1.3 of [4]) with
22 14400 bps data rate only.
- 23 13. Open a HRPD connection in B2 and configure the Test Application FMCTAP (for
24 Subtype 3 Physical Layer) so that the Forward Traffic Channel rate corresponds to
25 the one specified in Table 3.4.1.2-2 for Test 4.
- 26 14. Set the test parameters for Test 4 as specified in Table 3.4.1.2-2. The parameter \hat{I}_{OR}
27 denotes received power per carrier. The forward traffic channel data rate is on a per
28 carrier basis.
- 29 15. From the number of HRPD packets transmitted and the number of bad packets
30 received, calculate the PER for each HRPD carrier. From the number of CDMA
31 frames transmitted and the number of bad frames received, calculate the FER for
32 CDMA. The PER and FER are computed on a per carrier basis.
- 33 16. Configure the access terminal to transmit on one CDMA carrier in B1 and on one
34 HRPD carrier in B2.
- 35 17. If the mobile station supports demodulation of Radio Configuration 3, 4 or 5, set up
36 a CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with
37 9600 bps data rate only, or Fundamental Channel Test Mode 5 (see 1.3 of [4]) with
38 14400 bps data rate only.
- 39 18. Open a HRPD connection in B2 and configure the Test Application FTAP (for
40 Subtype 0 or 1 Physical Layer) or FETAP (for Subtype 2 Physical Layer) so that the

- 1 Forward Traffic Channel rate corresponds to the one specified in Table 3.4.1.2-1 for
2 Test 3.
- 3 19. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
4 MHz for the CDMA channel.
- 5 20. Set the transmission power on the CDMA carrier in B1 to be $L1 - 3$ dB, where L1 is
6 the lower limit on maximum output power for the band class and mobile station
7 class with appropriate backoff as specified in Table 4.3.4.3-1 of [17]. Maintain the
8 CDMA channel output power at the current level for tests 3 and 5.
- 9 21. Send continuously '0' power control bits to the access terminal on each HRPD
10 carrier. Measure the total transmitted power at the access terminal until it becomes
11 stable.
- 12 22. Set the test parameters for Test 3 as specified in Table 3.4.1.2-1 and repeat step 8.
- 13 23. Configure the access terminal to transmit on one CDMA carrier in B1 and on two
14 HRPD Forward Traffic channels at maximum allowable frequency separation
15 ($\text{MaxForwardLinkBandwidthNoJammer}$)³ in B2.
- 16 24. If the mobile station supports demodulation of Radio Configuration 3, 4 or 5, set up
17 a CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with
18 9600 bps data rate only, or Fundamental Channel Test Mode 5 (see 1.3 of [4]) with
19 14400 bps data rate only.
- 20 25. Open a HRPD connection and configure the Test Application FMCTAP (for Subtype 3
21 Physical Layer) so that two Forward Traffic Channels at the maximum channel
22 separation ($\text{MaxForwardLinkBandwidthNoJammer}$)⁴ are assigned to the AT and the
23 rate corresponds to the 2-slot version of 307.2 kbps in each channel.
- 24 26. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
25 MHz for the CDMA channel.
- 26 27. Set the transmission power on the CDMA carrier in B1 to be $L1 - 3$ dB, where L1 is
27 the lower limit on maximum output power for the band class and mobile station
28 class with appropriate backoff as specified in Table 4.3.4.3-1 of [17]. Maintain the
29 CDMA channel output power at the current level for tests 3 and 5.
- 30 28. Send continuously '0' power control bits to the access terminal on each HRPD
31 carrier. Measure the total transmitted power at the access terminal until it becomes
32 stable.
- 33 29. Set the test parameters for Test 5 as specified in Table 3.4.1.2-2 and repeat step 8.

³ See Section 8.9.7.1 in [1].

⁴ See Section 8.9.7.1 in [1].

1

2

Table 3.4.1.2-1. Test Parameters for Receiver Sensitivity (Test 3) and Dynamic Range (Tests 1, 2)

3

Parameter		Units	Test 1	Test 2	Test 3
HRPD	\hat{I}_{or}	dBm/1.23 MHz	-25	-25	-105.5
	Forward Traffic Channel Data Rate	kbps	307.2	2,457.6	307.2
		slots/packet	2	1	2
CDMA	\hat{I}_{or}	dBm/1.23 MHz	-25	-25	-104
	$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
	$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-15.6 (RC 1 and 3)		

4

Table 3.4.1.2-2. Test Parameters for Receiver Sensitivity (Test 5) and Dynamic Range (Test 4)

Parameter		Units	Test 4	Test 5
HRPD	\hat{I}_{or}	dBm/1.23 MHz	-25	-105.5
	Forward Traffic Channel Data Rate	kbps	307.2	
		slots/packet	2	
CDMA	\hat{I}_{or}	dBm/1.23 MHz	-25	-104
	$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
	$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-15.6 (RC 1 and 3)	
Number of carriers	N/A	One CDMA channel (in B1) and the maximum number of HRPD Forward Traffic channels (in B2) that can be demodulated by the AT. The HRPD carriers are all adjacent to one another with a spacing of 1.23 MHz (for Band Class 0) and 1.25 MHz (for all other Band Classes) between center frequencies.	One CDMA channel (in B1) and two HRPD Forward Traffic channels (in B2) at maximum allowable frequency separation supported by the device. The maximum separation should be at least 2.46MHz.	

3.4.1.3 Minimum Standard

The PER for HRPD as well as FER for CDMA in both Test 1 and Test 2 shall not exceed 0.5% with 95% confidence. The PER in Test 3 should not exceed 0.5% with 95% confidence. The PER in Test 4 and Test 5 shall not exceed 0.5% in each Forward Traffic Channel with 95% confidence.

3.4.2 Single Tone Desensitization

3.4.2.1 Definition

For single carrier operation, the single tone desensitization is a measure of a receiver's ability to receive a CDMA or HRPD signal at its assigned channel frequency in the presence of an interferer spaced at a given frequency offset from the center frequency of the assigned channel. For multi-carrier operation, the single tone desensitization is a measure of a

1 receiver's ability to receive a multi-carrier HRPD or CDMA-HRPD signal at its assigned
 2 channel frequencies in the presence of an interferer spaced at a given frequency offset from
 3 the center frequency of the outermost channels. The receiver desensitization performance
 4 is measured by the packet error rate (PER) for HRPD and the frame error rate (FER) for
 5 CDMA.

6 This test is applied to all band classes except Band Class 6, where no narrow-band
 7 interferers are currently known.

8 3.4.2.2 Method of Measurement

- 9 1. Connect the HRPD access network(s) and the CDMA base station and an interfering
 10 tone to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4]
 11 (Figure 8.5.1-4 of [17]). The GMSK tone is modulated as defined in [18].
- 12 2. For all band class combinations supported by the access terminal, configure the
 13 access terminal to operate with that band class combination, where B1 is the CDMA
 14 band class and B2 is the HRPD band class. Use a power control step size of 0.5dB
 15 for CDMA and HRPD carriers.
- 16 3. Perform steps 4 through 23 if the access terminal can support a single CDMA
 17 carrier in B1 and one or more HRPD carriers in B2.
- 18 4. Perform steps 24 through 29 if the access terminal can simultaneously support a
 19 single CDMA carrier in B1 and two or more HRPD carriers in B2.
- 20 5. Configure the access terminal to transmit on one CDMA carrier in B1 and on one
 21 HRPD carrier in B2.
- 22 6. If the mobile station supports demodulation of Radio Configuration 3 or 4, set up a
 23 CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with 9600
 24 bps data rate only.
- 25 7. Set up a HRPD Test Application session in B2. Open a connection and configure the
 26 HRPD Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for
 27 Subtype 2 Physical Layer) or FMCTAP (for Subtype 3 Physical Layer) so that the
 28 HRPD rate corresponds to the 2-slot version of 307.2 kbps.
- 29 8. Set the test parameters for the CDMA channel as specified in Table 3.4.2.3-1.
- 30 9. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
 31 MHz for the CDMA channel.
- 32 10. Set the transmission power on the CDMA carrier in B1 to be $L1 - 3$ dB, where L1 is
 33 the lower limit on maximum output power for the band class and mobile station
 34 class with appropriate backoff as specified in Table 4.3.4.3-1 of [17]. Maintain the
 35 CDMA channel output power at the current level.
- 36 11. Send continuously '0' power control bits to the access terminal on each HRPD
 37 carrier. Measure the total transmitted power at the access terminal until it becomes
 38 stable.

- 1 12. Set the test parameters for Test 1 on the CDMA carrier as specified in Table
2 3.4.2.3-1 and perform steps 16 and 17. Repeat for Test 5, Test 7 and Test 9 using
3 the parameters as specified in Table 3.4.2.3-1 and perform steps 10 and 11.
- 4 13. Set the test parameters for Test 2 on the CDMA carrier as specified in Table
5 3.4.2.3-1 and perform steps 16 and 17. Repeat for Test 6, Test 8 and Test 10 using
6 the parameters as specified in Table 3.4.2.3-1 and perform steps 10 and 11.
- 7 14. If B1 belongs to Band Class 3 with Radio Configuration 3, set the test parameters
8 for Test 3 using the parameters as specified in Table 3.4.2.3-1 on the CDMA carrier
9 and perform steps 16 and 17.
- 10 15. If B1 belongs to Band Class 3 with Radio Configuration 3, set the test parameters
11 for Test 4 using the parameters as specified in Table 3.4.2.3-1 on the CDMA carrier
12 and perform steps 16 and 17.
- 13 16. Use closed loop power control commands to adjust the CDMA transmit power, as
14 measured at the mobile station antenna connector. If B1 is Band Class 3, set the
15 ERP to a level higher than the minimum specified in Table 3.4.2.3-2 for the current
16 test. If B1 is any other band class, use closed loop power control commands to
17 adjust the access terminal transmit power, as measured at the access terminal
18 antenna connector, to +20 dBm.
- 19 17. Count, at the base station, the number of CDMA frames transmitted and the
20 number of good frames received at the mobile station.
- 21 18. Set the test parameters for Test 11 on the HRPD carrier as specified in Table
22 3.4.2.3-3 and perform steps 22 and 23. Repeat for Test 15, Test 17 and Test 19
23 using the parameters as specified in Table 3.4.2.3-3 and perform steps 22 and 23.
- 24 19. Set the test parameters for Test 12 on the HRPD carrier as specified in Table
25 3.4.2.3-3 and perform steps 22 and 23. Repeat for Test 16, Test 18 and Test 20
26 using the parameters as specified in Table 3.4.2.3-3 and perform steps 22 and 23.
- 27 20. If the access terminal is operating in Band Class 3, set the test parameters for Test
28 13 using the parameters as specified in Table 3.4.2.3-3 on the HRPD carrier and
29 perform steps 22 and 23.
- 30 21. If the access terminal is operating in Band Class 3, set the test parameters for Test
31 14 using the parameters as specified in Table 3.4.2.3-3 on the HRPD carrier and
32 perform steps 22 and 23.
- 33 22. Use closed loop power control commands to adjust the access terminal transmit
34 power, as measured at the access terminal antenna connector. For Band Class 3,
35 set the ERP to a level higher than the minimum specified in Table 3.4.2.3-2 for the
36 current test. For all other band classes, use closed loop power control commands to
37 adjust the access terminal transmit power, as measured at the access terminal
38 antenna connector, to +20 dBm.
- 39 23. From the number of HRPD packets transmitted and the number of bad packets
40 received calculate the PER for this test.

- 1 24. For an access terminal supporting HRPD Subtype 3 Physical Layer (multi-carrier
2 capable) in B2 simultaneously with a CDMA carrier in B1, perform the additional
3 steps 25 through 28. \hat{I}_{or} refers to received power in each carrier in the following
4 tests.
- 5 25. Set up a Test Application session. Open a connection and configure the Test
6 Application FMCTAP (for Subtype 3 Physical Layer) so that two Forward Traffic
7 Channels at the maximum channel separation
8 (MaxForwardLinkBandwidthNoJammer)⁵ are assigned to the AT on B2 and the rate
9 corresponds to the 2-slot version of 307.2 kbps in each channel.
- 10 26. Set the test parameters for Test 21 as specified in Table 3.4.2.3-4 and perform steps
11 28 and 29.
- 12 27. Set the test parameters for Test 22 as specified in Table 3.4.2.3-4 and perform steps
13 28 and 29.
- 14 28. Use closed loop power control commands to adjust the access terminal transmit
15 power, as measured at the access terminal antenna connector. When B2 is Band
16 Class 3, set the ERP to a level higher than the minimum specified in Table 3.4.2.3-2
17 for the current test. When B2 is any other band class, use closed loop power control
18 commands to adjust the access terminal transmit power, as measured at the access
19 terminal antenna connector, to +20 dBm.
- 20 29. From the number of HRPD packets transmitted and the number of bad packets
21 received calculate the PER for this test. The PER shall be calculated on a per carrier
22 basis.

23 3.4.2.3 Minimum Standard

24 For CDMA: The FER in each test shall not exceed 1.0% with 95% confidence (see 6.6 of [4]).

25 For HRPD: The PER for each test shall not exceed 1.0% with 95% confidence (see 8.8 of
26 [17]).

⁵ See Section 8.9.7.1 in [1].

Table 3.4.2.3-1. Test Parameters for CDMA carrier Single Tone Desensitization in B1

Parameter		Units	Tests 1, 3, 5, 7, and 9	Tests 2, 4, 6, 8, and 10
Jammer Offset from Carrier	SR 1	kHz	+1100 (Test 1, Band Groups 450 and 800, except BC 3) +900 (Tests 1 and 3, BC 3) +1250 (Test 1, BC 1, 4, 8, 14 and 15) +5000 (Test 5) +10000 (Test 7) +900 (Test 9, BC 10)	-1100 (Test 2, Band Groups 450 and 800, except BC 3) -900 (Tests 2 and 4, BC 3) -1250 (Test 2, BC 1, 4, 8, 14 and 15) -5000 (Test 5) -10000 (Test 7) -900 (Test 9, BC 10)
Jammer Power / Type		dBm	-45 GMSK (Tests 1 and 2, except BC 3) -30 CW (Tests 1 and 3, BC 3) -40 CW (Tests 1 and 3, BC 3) -38 GMSK (Tests 5 and 6) -30 GMSK (Tests 7 and 8) -50 GMSK (Tests 9 and 10)	
\hat{I}_{or}		dBm/ 1.23 MHz	-94 (Except BC 3) -101 (BC 3)	
$\frac{\text{Pilot } E_c}{I_{or}}$		dB	-7	
$\frac{\text{Traffic } E_c}{I_{or}}$		dB	-15.6 (SR 1)	

Table 3.4.2.3-2. Minimum Effective Radiated Power for CDMA carrier Single Tone Desensitization Test for B1 = Band Class 3 and for HRPD carrier Single Tone Desensitization Test for B2 = Band Class 3.

Mobile Station Class	Minimum Mobile Station ERP	
	Tests 1 and 2 Tests 11 and 12 Tests 21 and 22	Tests 3 and 4 Tests 13 and 14
I	-7 dBW (200 mW)	-2 dBW (630 mW)
II	-11 dBW (80 mW)	-6 dBW (250 mW)
III	-15 dBW (32 mW)	-10 dBW (100 mW)

1 **Table 3.4.2.3-3. Test Parameters for HRPD carrier Single Tone Desensitization in B2**

Parameter	Units	Tests 11, 13, 15, 17, and 19	Tests 12, 14, 16, 18 and 20
Jammer Offset from Carrier	kHz	+1100 (Test 11, Band Classes 0, 2, 5, 7, 9, 10, 11, and 12) +900 (Tests 11 and 13, Band Class 3) +1250 (Test 11, Band Classes 1, 4 and 8) +5000 (Test 15) +10000 (Test 17) +900 (Test 19, Band Class 10)	-1100 (Test 12, Band Classes 0, 2, 5, 7, 9, 10, 11, and 12) -900 (Tests 12 and 14, Band Class 3) -1250 (Test 12, Band Classes 1, 4 and 8) -5000 (Test 16) -10000 (Test 18) -900 (Test 20, Band Class 10)
Jammer Power / Type	dBm	-45 GMSK (Tests 1 and 2, except BC 3) -30 CW (Tests 1 and 3, BC 3) -40 CW (Tests 1 and 3, BC 3) -38 GMSK (Tests 5 and 6) -30 GMSK (Tests 7 and 8) -50 GSMK (Tests 9 and 10)	
\hat{I}_{or}	dBm/ 1.23 MHz	-95.4 (Except BC 3) -102.4 (BC 3)	

2

1 **Table 3.4.2.3-4. Test Parameters for HRPD carrier Single Tone Desensitization for**
 2 **Multi-carrier HRPD Operation (Subtype 3 Physical Layer)**

Parameter	Units	Test 21	Test 22
Jammer Offset from Carrier	kHz	+1100 (Band Classes 0, 2, 5, 7, 9, 10, 11, and 12) +900 (Band Class 3) +1250 (Band Classes 1, 4 and 8)	-1100 (Band Classes 0, 2, 5, 7, 9, 10, 11, and 12) -900 (Band Class 3) -1250 (Band Classes 1, 4 and 8)
Jammer Power (CW Tone for BC 3, GMSK for others)	dBm	-50 (Tests 21 and 22)	
\hat{I}_{or}	dBm/ 1.23 MHz	-92.4 (Except Band Class 3) -99.4 (Band Class 3)	
Number of active carriers	N/A	2	
Separation between the active carriers	MHz	MaxForwardLinkBandwidthNoJammer	

3

4 PHYSICAL LAYER TRANSMITTER MINIMUM STANDARDS

4.1 Modulation Requirements for SB-CDMA-HRPD

4.1.1 Waveform Quality and Frequency Accuracy

4.1.1.1 Definition

The waveform quality factor, ρ_{Overall} (see 8.4.2.1 of [17] for HRPD) and correspondingly ρ (see 6.4.2 of [4] for CDMA), are measured in this test. The measurement also returns values for Δf and $\hat{\tau}$, which are used to provide estimates of carrier frequency offset and transmit time offset, respectively. The waveform quality factor shall be measured on a per carrier basis.

4.1.1.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are not applicable in this test.
2. For each band class that the access terminal supports, configure the access terminal to operate in that band class. Use a power control step size of 0.5dB for CDMA as well as HRPD carriers. Configure the access terminal to simultaneously perform a CDMA and a HRPD call with the two carriers at the closest possible frequency separation and perform steps 3 through 12.
3. Set up a HRPD Test Application session. Open a connection. For Subtype 0 or 1 Physical Layer, configure the Test Application RTAP so that the Reverse Data Channel rate corresponds to 9.6 kbps. For Subtype 2 Physical Layer, configure the Test Application RETAP so that the Reverse Data Channel payload size corresponds to 256 bits with Termination Target of 4 sub-packets. For Subtype 3 Physical Layer, configure the Test Application RMCTAP so that the Reverse Data Channel payload size corresponds to 256 bits with Termination Target of 4 sub-packets. Configure the Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for Subtype 2 Physical Layer) or FMCTAP (for Subtype 3 Physical Layer) so that the ACK Channel is transmitted at all the slots.
4. If the mobile station supports demodulation of Radio Configuration 1 or 2, set up a CDMA call using Fundamental Channel Test Mode 1 (see 1.3 of [4]) with 9600 bps data rate only and perform steps 5 and 6.
5. Set the CDMA test parameters as specified below. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel.

Parameter	Units	Value
\hat{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

1

2

3

4

6. Measure the CDMA waveform quality factor, ρ , frequency error, $\Delta\hat{f}$, and transmit time error, $\hat{\tau}$, at the mobile station antenna connector using the ρ -meter described in 6.4.2 of [4].

5

6

7

7. If the mobile station supports demodulation of Radio Configuration 3, 4, or 5, set up a CDMA call using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with 9600 bps data rate only and perform steps 9 through 12.

8

9

10

8. If the mobile station supports demodulation of Radio Configuration 6, 7, 8, or 9, set up a CDMA call using Fundamental Channel Test Mode 7 (see 1.3 of [4]) with 9600 bps data rate only and perform steps 9 through 12.

11

12

9. Set the CDMA test parameters as specified below. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel.

Parameter	Units	Value
\hat{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

13

14

15

10. Send a *Universal Handoff Direction Message* with a change to either the frame offset or the PN offset, using the rest of the following parameters, to the mobile station to force a hard handoff:

Parameter	Value (Decimal)
USE_TIME	1 (use action time)
EXTRA_PARMS	1
FRAME_OFFSET	may change
PILOT_PN	may change
NOM_PWR_EXT	0 (0 dB correction)
NOM_PWR	0 (0 dB correction)
NUM_PREAMBLE	7 (20 ms preamble)
BAND_CLASS	same as current
CDMA_FREQ	same as current

- 1 11. Measure the CDMA waveform quality factor, ρ , frequency error, $\Delta\hat{f}$, and transmit
2 time error, $\hat{\tau}$, at the mobile station antenna connector using the ρ -meter described
3 in 6.4.2 of [4] on the preamble following the explicit action time of the *Universal*
4 *Handoff Direction Message*.
- 5 12. Measure the HRPD waveform quality factor, ρ_{Overall} , frequency error, $\Delta\hat{f}$, and
6 transmit time error, $\hat{\tau}$, at the access terminal antenna connector using the ρ -meter
7 described in 8.4.2 of [17].

8 4.1.1.3 Minimum Standard

9 The waveform quality factor, ρ for each CDMA carrier and ρ_{Overall} for each HRPD carrier,
10 shall be greater than 0.933 (excess power is less than 0.30 dB). The frequency error, $\Delta\hat{f}$,
11 shall be within ± 300 Hz while transmitting in Band Groups 450 and 800. The frequency
12 error, $\Delta\hat{f}$, shall be within ± 150 Hz while transmitting in Band Group 1900. The transmit
13 time error, $\hat{\tau}$, shall be within ± 1 μs .

14 4.2 Modulation Requirements for DB-CDMA-HRPD

15 4.2.1 Waveform Quality and Frequency Accuracy

16 4.2.1.1 Definition

17 The waveform quality factor, ρ_{Overall} (see 8.4.2.1 of [17] for HRPD) and correspondingly ρ
18 (see 6.4.2 of [4] for CDMA), are measured in this test. The measurement also returns values
19 for $\Delta\hat{f}$ and $\hat{\tau}$, which are used to provide estimates of carrier frequency offset and transmit
20 time offset, respectively. The waveform quality factor shall be measured on a per carrier
21 basis.

22 4.2.1.2 Method of Measurement

- 23 1. Connect the sector to the access terminal antenna connector as shown in Figure
24 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are
25 not applicable in this test.

- 1 2. For all band class combinations supported by the access terminal, configure the
2 access terminal to operate with that band class combination, where B1 is the CDMA
3 band class and B2 is the HRPD band class.
- 4 3. Perform steps 4 through 12 if the access terminal can simultaneously support a
5 single CDMA carrier in B1 and no more than one HRPD carrier in B2.
- 6 4. Perform steps 13 through 16 if the access terminal can simultaneously support a
7 single CDMA carrier in B1 and two or more HRPD carriers in B2.
- 8 5. Configure the access terminal to transmit on a single CDMA carrier in B1, and on a
9 single HRPD carrier in B2. Perform steps 6 through 12.
- 10 6. Set up a HRPD Test Application session in B2. Open a connection. For Subtype 0 or
11 1 Physical Layer, configure the Test Application RTAP so that the Reverse Data
12 Channel rate corresponds to 9.6 kbps. For Subtype 2 Physical Layer, configure the
13 Test Application RETAP so that the Reverse Data Channel payload size corresponds
14 to 256 bits with Termination Target of 4 sub-packets. For Subtype 3 Physical Layer,
15 configure the Test Application RMCTAP so that the Reverse Data Channel payload
16 size corresponds to 256 bits with Termination Target of 4 sub-packets. Configure
17 the Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for Subtype
18 2 Physical Layer) so that the ACK Channel is transmitted at all the slots.
- 19 7. Set \hat{I}_{or} to -75 dBm/1.23 MHz for the HRPD carrier.
- 20 8. If the mobile station supports demodulation of Radio Configuration 3 or 4, set up a
21 CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with 9600
22 bps data rate only and perform steps 9 through 12.
- 23 9. Set the CDMA test parameters as specified below.

Parameter	Units	Value
\hat{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

- 24 10. Send a *Universal Handoff Direction Message* with a change to either the frame offset
25 or the PN offset, using the rest of the following parameters, to the mobile station to
26 force a hard handoff:

Parameter	Value (Decimal)
USE_TIME	1 (use action time)
EXTRA_PARMS	1
FRAME_OFFSET	may change
PILOT_PN	may change
NOM_PWR_EXT	0 (0 dB correction)
NOM_PWR	0 (0 dB correction)
NUM_PREAMBLE	7 (20 ms preamble)
BAND_CLASS	same as current
CDMA_FREQ	same as current

- 1 11. Measure the CDMA waveform quality factor, ρ , frequency error, $\Delta\hat{f}$, and transmit
2 time error, $\hat{\tau}$, at the mobile station antenna connector using the ρ -meter described
3 in 6.4.2 of [4] on the preamble following the explicit action time of the *Universal*
4 *Handoff Direction Message*.
- 5 12. Measure the HRPD waveform quality factor, ρ_{Overall} , frequency error, $\Delta\hat{f}$, and
6 transmit time error, $\hat{\tau}$, at the access terminal antenna connector using the ρ -meter
7 described in 8.4.2 of [17].
- 8 13. Configure the access terminal to transmit on a single CDMA carrier in B1, and on
9 two HRPD carriers at the closest possible frequency separation between them in B2.
10 Perform steps 14 through 16.
- 11 14. Set up a HRPD Test Application session for Subtype 3 Physical Layer in B2. Open a
12 connection. Configure the Test Application RMCTAP so that the Reverse Data
13 Channel payload size corresponds to 256 bits with Termination Target of 4 sub-
14 packets. Configure the Test Application FMCTAP (for Subtype 3 Physical Layer) so
15 that the ACK Channel is transmitted at all the slots.
- 16 15. Set \hat{I}_{OR} to -75 dBm/1.23 MHz for both HRPD carriers.
- 17 16. Repeat steps 8 through 12.

18 4.2.1.3 Minimum Standard

19 The waveform quality factor, ρ , for each CDMA carrier shall be greater than 0.944 (excess
20 power is less than 0.25 dB). The waveform quality factor, ρ_{Overall} , for each HRPD carrier,
21 shall be greater than 0.944 (excess power is less than 0.25 dB) if the test is performed with
22 a single HRPD carrier in its band class (B2). The waveform quality factor, ρ_{Overall} , for each
23 HRPD carrier, shall be greater than 0.933 (excess power is less than 0.30 dB) if the test is
24 performed on two HRPD carriers at the closest possible frequency separation between them
25 in the same band class (B2). The frequency error, $\Delta\hat{f}$, shall be within ± 300 Hz while
26 transmitting in Band Groups 450 and 800. The frequency error, $\Delta\hat{f}$, shall be within ± 150
27 Hz while transmitting in Band Group 1900. The transmit time error, $\hat{\tau}$, shall be within ± 1
28 μs .

4.3 RF Output Power Requirements for SB-CDMA-HRPD

4.3.1 Maximum RF Output Power

4.3.1.1 Definition

The maximum radiated RF output power is determined by the measurement of the maximum power that the access terminal transmits as measured at the access terminal antenna connector plus the antenna gain recommended by the access terminal manufacturer. The antenna gain is determined by using the Radiated Signal Measurement Procedures (see 2.6) and calculating the antenna gain for EIRP or ERP as appropriate.

4.3.1.2 Method of Measurement

1. Set the following parameters of the HRPD *AccessParameters Message* as specified below:

Parameter	Value (Decimal)
OpenLoopAdjust	81 (-81 dB) for BC 0, 2, 3, 5, 7, 9, 10, 11, and 12 84 (-84 dB) for BC 1, 4, 6, and 8
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

2. Connect the sector to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are not applicable in this test. Connect a spectrum analyzer (or other suitable test equipment) to the access terminal antenna connector. Use a power control step size of 0.5dB for CDMA as well as HRPD carriers.
3. For each band class that the access terminal supports, configure the access terminal to operate in that band class. Configure the access terminal to simultaneously perform a CDMA call and the maximum number of HRPD calls supported by the device. For this test, the HRPD carriers are all adjacent to one another and adjacent to the single CDMA carrier with a spacing of 1.23 MHz (for Band Class 0) and 1.25 MHz (for all other Band Classes) between the center frequencies.
4. Perform step 5 using the HRPD Physical Layer Subtype (Subtype 0, 1, 2 or 3) supported by the access terminal.
5. Set up a Test Application session. Open each HRPD connection. For Subtype 0 or 1 Physical Layer, configure the Test Application RTAP so that the Reverse Data Channel rate corresponds to 153.6 kbps. For Subtype 2 or Subtype 3 Physical Layer, configure the Test Application RETAP so that the Reverse Data Channel payload size corresponds to 4096 bits with Termination Target of 4 sub-packets. Configure the Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for Subtype 2 or Subtype 3 Physical Layer) so that the Forward Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is transmitted at all the

- 1 slots. Set RAB to '0' at all times. If there are multiple HRPD calls, set up a Test
 2 Application session for Subtype 3 Physical Layer. Configure the Test Application
 3 RMCTAP so that the Reverse Data Channel payload size corresponds to 4096 bits
 4 with Termination Target of 16 slots. Configure the Test Application FMCTAP (for
 5 Subtype 3 Physical Layer) so that the Forward Traffic Channel data rate corresponds
 6 to the 2-slot version of 307.2 kbps, and the ACK Channel is transmitted at all the
 7 slots.
- 8 6. If the mobile station supports Reverse Traffic Channel Radio Configuration 1 and
 9 Forward Traffic Channel Radio Configuration 1 during an CDMA-HRPD call, then set
 10 up a CDMA call using Fundamental Channel Test Mode 1 (see 1.3 of [4]) with 9600
 11 bps data rate only and perform steps 12 through 16.
 - 12 7. If the mobile station supports the Radio Configuration 3 Reverse Fundamental
 13 Channel and demodulation of Radio Configuration 3, 4, or 5 during an CDMA-HRPD
 14 call, then set up a CDMA call using Fundamental Channel Test Mode 3 (see 1.3 of [4])
 15 with 9600 bps data rate only and perform steps 12 through 16.
 - 16 8. If the mobile station supports the Radio Configuration 3 Reverse Dedicated Control
 17 Channel and demodulation of Radio Configuration 3, 4, or 5 during an CDMA-HRPD
 18 call, then set up a CDMA call using Dedicated Control Channel Test Mode 3 (see 1.3
 19 of [4]) with 9600 bps data rate and 100% frame activity and perform steps 12 through
 20 16.
 - 21 9. If the mobile station supports the Radio Configuration 5 Reverse Fundamental
 22 Channel and demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-
 23 HRPD call, then set up a CDMA call using Fundamental Channel Test Mode 7 (see
 24 1.3 of [4]) with 9600 bps data rate only and perform steps 12 through 16.
 - 25 10. If the mobile station supports the Radio Configuration 5 Reverse Dedicated Control
 26 Channel and demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-
 27 HRPD call, then set up a CDMA call using Dedicated Control Channel Test Mode 7
 28 (see 1.3 of [4]) with 9600 bps data rate and 100% frame activity and perform steps 12
 29 through 16.
 - 30 11. If the mobile station supports the Radio Configuration 5 Reverse Fundamental
 31 Channel, Radio Configuration 5 Reverse Dedicated Control Channel and
 32 demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-HRPD call, then
 33 set up a CDMA call using Fundamental Channel Test Mode 7 (see 1.3 of [4]) with
 34 1500 bps Fundamental Channel data rate only and 9600 bps Dedicated Control
 35 Channel with 100% frame activity, and perform steps 12 through 16.
 - 36 12. Set the test parameters for the CDMA channel as specified in Table 4.3.1.3-1.
 - 37 13. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23 MHz
 38 for for the CDMA channel.
 - 39 14. Send continuously alternate '0' and '1' power control bits to the access terminal on
 40 the CDMA carrier, and send continuously '0' power control bits to the access terminal
 41 on each HRPD carrier and measure the total transmitted power at the access

1 terminal until it becomes stable. For this test, denote this stable transmitted power
2 value MaxAccessTerminalTxPower (in dBm).

3 15. Manually set the transmitted power on each CDMA and HRPD channel to
4 MaxAccessTerminalTxPower – $10 \times \log_{10}(N)$ – Backoff, where N is the number of
5 simultaneously active CDMA as well as HRPD carriers. Here, manual setting of the
6 transmitted power implies using reverse power control commands to maintain the
7 transmitted power close to a specified target. The difference between the target
8 transmitted power and the actual or measured transmitted power shall not exceed
9 the power control step size.

10 16. Measure the mean access terminal output power at the access terminal antenna
11 connector.

12 4.3.1.3 Minimum Standard

13 The maximum output power (of all active carriers) of each access terminal class shall be
14 such that the maximum radiated power for the access terminal class using the antenna
15 gain recommended by the access terminal manufacturer is within the limits specified in
16 Table 4.3.1.3-2 less transmit power backoff of 3.3 dB. The antenna gain is determined
17 using the Radiated Signal Measurement Procedures (see 2.6 of [17]) and calculating the
18 antenna gain for EIRP or ERP as appropriate.

19 **Table 4.3.1.3-1. Test Parameters for Maximum RF Output Power with a Single Traffic**
20 **Code Channel, Spreading Rate 1**

Parameter	Units	Value
\hat{I}_{or}	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_C}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_C}{I_{or}}$	dB	-7.4

21

22

Table 4.3.1.3-2. Effective Radiated Power at Maximum Output Power

Band Class	Access Terminal Class	Radiating Measurement	Lower Limit	Upper Limit
0, 3, 9, and 12	Class I	ERP	1 dBW (1.25 W)	8 dBW (6.3 W)
	Class II	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class III	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
1, 4 and 8	Class I	EIRP	-2 dBW (0.63 W)	3 dBW (2.0 W)
	Class II	EIRP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class III	EIRP	-12 dBW (63 mW)	-3 dBW (0.5 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
6 (outside Japan)	Class I	EIRP	-2 dBW (0.63 W)	3 dBW (2.0 W)
	Class II	EIRP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class III	EIRP	-12 dBW (63 mW)	-3 dBW (0.5 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
6 (in Japan)	Class I and II	EIRP	-10 dBW (0.1 W)	-6 dBW (0.25 W)
	Class III	EIRP	-12 dBW (63 mW)	-6 dBW (0.25 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
2	Class II	ERP	1 dBW (1.25 W)	8 dBW (6.3 W)
	Class III	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class IV	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
5 and 11	Class I	ERP	3 dBW (2.0 W)	10 dBW (10 W)
	Class II	ERP	-2 dBW (0.63 W)	5 dBW (3.2 W)
	Class III	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class IV	ERP	-12 dBW (63 mW)	-5 dBW (320 mW)
7 and 10	Class I	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class II	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)

2 For Band Classes 0 and 3, the lower limit of the Effective Radiated Power at Maximum
3 Output Power specified in Table 4.3.1.3-2 shall not apply to access terminals operated in
4 Japan specifically used for fixed telemetry services. The mobile station should use country
5 code information in the SectorParameter messages to determine correct ERP when it is
6 used for fixed telemetry service.

1 For Band Class 6 operation, the access terminal should use country code information in
2 the SectorParameters message to determine the correct maximum radiated power allowed.

3 **4.4 RF Output Power Requirements for DB-CDMA-HRPD**

4 4.4.1 Maximum RF Output Power

5 4.4.1.1 Definition

6 The maximum radiated RF output power is determined by the measurement of the
7 maximum power that the access terminal transmits as measured at the access terminal
8 antenna connector plus the antenna gain recommended by the access terminal
9 manufacturer. The antenna gain is determined by using the Radiated Signal Measurement
10 Procedures (see 2.6 of [17]) and calculating the antenna gain for EIRP or ERP as
11 appropriate. The power measurements are performed on a per-band class basis.

12 4.4.1.2 Method of Measurement

- 13 1. Set the following parameters of the HRPD *AccessParameters Message* as specified
14 below:

Parameter	Value (Decimal)
OpenLoopAdjust	81 (-81 dB) for BC 0, 2, 3, 5, 7, 9, 10, 11, and 12 84 (-84 dB) for BC 1, 4, 6, and 8
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

- 15
- 16 2. Connect the sector to the access terminal antenna connector as shown in Figure
17 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are
18 not applicable in this test.
- 19 3. For all band class combinations supported by the access terminal, configure the
20 access terminal to operate with that band class combination, where B1 is the CDMA
21 band class and B2 is the HRPD band class.
- 22 4. Perform steps 6 through 13 if the access terminal can support a single CDMA
23 carrier in B1 and a single HRPD carrier in B2.
- 24 5. Perform steps 14 through 19 if the access terminal can simultaneously support a
25 single CDMA carrier in B1 and two or more HRPD carriers in B2.
- 26 6. Configure the access terminal to transmit on a single CDMA carrier in B1, and on a
27 single HRPD carrier in B2. Perform step 7 for the HRPD call. Perform step 8 for the
28 CDMA call.
- 29 7. Set up a Test Application session. Open a HRPD connection. For Subtype 0 or 1
30 Physical Layer, configure the Test Application RTAP so that the Reverse Data
31 Channel rate corresponds to 153.6 kbps. For Subtype 2 or Subtype 3 Physical

- 1 Layer, configure the Test Application RETAP so that the Reverse Data Channel
 2 payload size corresponds to 4096 bits with Termination Target of 4 sub-packets.
 3 Configure the Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP
 4 (for Subtype 2 or Subtype 3 Physical Layer) so that the Forward Traffic Channel
 5 data rate corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is
 6 transmitted at all the slots. Set RAB to '0' at all times.
- 7 8. If the mobile station supports the Radio Configuration 3 Reverse Fundamental
 8 Channel and demodulation of Radio Configuration 3 or 4 during a CDMA-HRPD
 9 call, then set up a CDMA call using Fundamental Channel Test Mode 3 (see 1.3 of
 10 [4]) with 9600 bps data rate only and perform steps 9 and 10.
- 11 9. Set the test parameters for the CDMA channel as specified in Table 4.4.1.2-1.
- 12 10. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
 13 MHz for the CDMA channel.
- 14 11. Set the transmitted power on the CDMA carrier to $L_{B1} - 3$ dB, where L_{B1} is the lower
 15 limit on the maximum RF output power in B1 for the mobile station class in
 16 question (see Table 4.4.1.3-1).
- 17 12. Send continuously '0' power control bits to the access terminal on each HRPD
 18 carrier and measure the total transmitted power at the access terminal in each
 19 band class.
- 20 13. Measure the mean access terminal output power for each band class at the access
 21 terminal antenna connector. (Test 1).
- 22 14. Configure the access terminal to transmit on a single CDMA carrier in B1, and on
 23 the maximum number of adjacent reverse HRPD channels that the access terminal
 24 can support in B2, with the HRPD channels at a spacing of 1.23 MHz (for Band
 25 Class 0) and 1.25 MHz (for all other Band Classes) between the center frequencies.
 26 Perform step 15 for the HRPD calls.
- 27 15. Set up a Test Application session for Subtype 3 Physical Layer. Configure the Test
 28 Application RMCTAP so that the Reverse Data Channel payload size corresponds to
 29 4096 bits with Termination Target of 4 sub-packets. Configure the Test Application
 30 FMCTAP (for Subtype 3 Physical Layer) so that the Forward Traffic Channel data
 31 rate corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is
 32 transmitted at all the slots.
- 33 16. Perform step 8 for the CDMA call.
- 34 17. Set the transmitted power on the CDMA carrier to $L_{B1} - 3$ dB, where L_{B1} is the lower
 35 limit on the maximum RF output power in B1 for the mobile station class in
 36 question, and $Backoff_{B1}$ is the recommended maximum RF power backoff for B1
 37 (see Table 4.4.1.3-1).
- 38 18. Send continuously '0' power control bits to the access terminal on each HRPD
 39 carrier and measure the total transmitted power at the access terminal on each
 40 band class until it becomes stable.

19. Measure the mean access terminal output power for each band class at the access terminal antenna connector (Test 2).

Table 4.4.1.2-1. Test Parameters for CDMA channel

Parameter	Units	Value
\bar{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

4.4.1.3 Minimum Standard

To describe the minimum standard, we define the following notation. Let the mean access terminal output power in band classes B1 and B2 be P_{B1} and P_{B2} respectively (in dBm). Also, let the lower and upper limits on the maximum RF output power for the access terminal class in question be L_{B1} and U_{B1} respectively (in dBm) for band class B1, and L_{B2} and U_{B2} respectively (in dBm) for band class B2. These lower and upper limits on maximum RF output power are specified in Table 4.4.1.3-1.

For Test 1, the maximum output power of each access terminal class shall satisfy the following condition (lower bound):

$$1. 10^{(0.1 \times (P_{B1} - L_{B1}))} + 10^{(0.1 \times (P_{B2} - L_{B2}))} > 1,$$

and shall satisfy *all* of the following conditions (upper bound):

$$1. P_{B1} \leq U_{B1},$$

$$2. P_{B2} \leq U_{B2},$$

For Test 2, the maximum output power of each access terminal class shall satisfy *at least one* of the following conditions (lower bound):

$$1. P_{B1} \geq L_{B1} - \text{Backoff},$$

$$2. P_{B2} \geq L_{B2} - \text{Backoff},$$

$$3. 10^{(0.1 \times (P_{B1} - L_{B1} + \text{Backoff}))} + 10^{(0.1 \times (P_{B2} - L_{B2} + \text{Backoff}))} > 1,$$

where Backoff = 3.3dB if there are multiple carriers in the band class in question and 0dB if there is only a single carrier in the band class, and shall satisfy *all* of the following conditions (upper bound):

$$1. P_{B1} \leq U_{B1},$$

$$2. P_{B2} \leq U_{B2}.$$

The antenna gain is determined using the Radiated Signal Measurement Procedures (see 2.6 of [17]) and calculating the antenna gain for EIRP or ERP as appropriate.

1
2**Table 4.4.1.3-1. Effective Radiated Power at Maximum Output Power**

Band Class	Access Terminal Class	Radiating Measurement	Lower Limit	Upper Limit
0, 3, 9, and 12	Class I	ERP	1 dBW (1.25 W)	8 dBW (6.3 W)
	Class II	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class III	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
1, 4 and 8	Class I	EIRP	-2 dBW (0.63 W)	3 dBW (2.0 W)
	Class II	EIRP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class III	EIRP	-12 dBW (63 mW)	-3 dBW (0.5 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
6 (outside Japan)	Class I	EIRP	-2 dBW (0.63 W)	3 dBW (2.0 W)
	Class II	EIRP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class III	EIRP	-12 dBW (63 mW)	-3 dBW (0.5 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
6 (in Japan)	Class I and II	EIRP	-10 dBW (0.1 W)	-6 dBW (0.25 W)
	Class III	EIRP	-12 dBW (63 mW)	-6 dBW (0.25 W)
	Class IV	EIRP	-17 dBW (20 mW)	-6 dBW (0.25 W)
	Class V	EIRP	-22 dBW (6.3 mW)	-9 dBW (0.13 W)
2	Class II	ERP	1 dBW (1.25 W)	8 dBW (6.3 W)
	Class III	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class IV	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
5 and 11	Class I	ERP	3 dBW (2.0 W)	10 dBW (10 W)
	Class II	ERP	-2 dBW (0.63 W)	5 dBW (3.2 W)
	Class III	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class IV	ERP	-12 dBW (63 mW)	-5 dBW (320 mW)
7 and 10	Class I	ERP	-3 dBW (0.5 W)	4 dBW (2.5 W)
	Class II	ERP	-7 dBW (0.2 W)	0 dBW (1.0 W)

3 For Band Classes 0 and 3, the lower limit of the Effective Radiated Power at Maximum
4 Output Power specified in Table 4.3.1.3-2 shall not apply to access terminals operated in
5 Japan specifically used for fixed telemetry services. The mobile station should use country
6 code information in the SectorParameter messages to determine correct ERP when it is
7 used for fixed telemetry service.

1 For Band Class 6 operation, the access terminal should use country code information in
2 the SectorParameters message to determine the correct maximum radiated power allowed.

4 4.5 Limitations on Emissions for SB-CDMA-HRPD

5 4.5.1 Conducted Spurious Emissions

6 4.5.1.1 Definition

7 Conducted spurious emissions are emissions at frequencies that are outside the assigned
8 CDMA and HRPD Channels, measured at the access terminal antenna connector. This test
9 measures the spurious emissions during continuous transmission.

10 4.5.1.2 Method of Measurement

- 11 1. Set the following parameters of the HRPD *AccessParameters Message* as specified
12 below:

Parameter	Value (Decimal)
OpenLoopAdjust	81 (-81 dB) for BC 0, 2, 3, 5, 7, 9, 10, 11, and 12 84 (-84 dB) for BC 1, 4, 6, and 8
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

- 13
- 14 2. Connect the sector to the access terminal antenna connector as shown in Figure
15 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are
16 not applicable in this test. Connect a spectrum analyzer (or other suitable test
17 equipment) to the access terminal antenna connector.
- 18 3. For each band class that the access terminal supports, configure the access terminal
19 to operate in that band class. Use a power control step size of 0.5dB for CDMA as
20 well as HRPD carriers. Configure the access terminal to simultaneously perform a
21 CDMA and a HRPD call with the two carriers at the maximum carrier separation
22 supported by the device. The maximum carrier separation should be at least
23 2.46MHz.
- 24 4. Perform step 5 using the HRPD Physical Layer Subtype (Subtype 0, 1, 2 or 3)
25 supported by the access terminal.
- 26 5. Set up a Test Application session. Open an HRPD connection. For Subtype 0 or 1
27 Physical Layer, configure the Test Application RTAP so that the Reverse Data
28 Channel rate corresponds to 153.6 kbps. For Subtype 2 or Subtype 3 Physical Layer,
29 configure the Test Application RETAP so that the Reverse Data Channel payload size
30 corresponds to 4096 bits with Termination Target of 4 sub-packets. Configure the
31 Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for Subtype 2 or

- 1 Subtype 3 Physical Layer) so that the Forward Traffic Channel data rate corresponds
 2 to the 2-slot version of 307.2 kbps, and the ACK Channel is transmitted at all the
 3 slots. Set RAB to '0' at all times.
- 4 6. If the mobile station supports Reverse Traffic Channel Radio Configuration 1 and
 5 Forward Traffic Channel Radio Configuration 1 during an CDMA-HRPD call, then set
 6 up a CDMA call using Fundamental Channel Test Mode 1 (see 1.3 of [4]) with 9600
 7 bps data rate only and perform steps 12 through 16.
 - 8 7. If the mobile station supports the Radio Configuration 3 Reverse Fundamental
 9 Channel and demodulation of Radio Configuration 3, 4, or 5 during an CDMA-HRPD
 10 call, then set up a CDMA call using Fundamental Channel Test Mode 3 (see 1.3 of [4])
 11 with 9600 bps data rate only and perform steps 12 through 16.
 - 12 8. If the mobile station supports the Radio Configuration 3 Reverse Dedicated Control
 13 Channel and demodulation of Radio Configuration 3, 4, or 5 during an CDMA-HRPD
 14 call, then set up a CDMA call using Dedicated Control Channel Test Mode 3 (see 1.3
 15 of [4]) with 9600 bps data rate and 100% frame activity and perform steps 12 through
 16 16.
 - 17 9. If the mobile station supports the Radio Configuration 5 Reverse Fundamental
 18 Channel and demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-
 19 HRPD call, then set up a CDMA call using Fundamental Channel Test Mode 7 (see
 20 1.3 of [4]) with 9600 bps data rate only and perform steps 12 through 16.
 - 21 10. If the mobile station supports the Radio Configuration 5 Reverse Dedicated Control
 22 Channel and demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-
 23 HRPD call, then set up a CDMA call using Dedicated Control Channel Test Mode 7
 24 (see 1.3 of [4]) with 9600 bps data rate and 100% frame activity and perform steps 12
 25 through 16.
 - 26 11. If the mobile station supports the Radio Configuration 5 Reverse Fundamental
 27 Channel, Radio Configuration 5 Reverse Dedicated Control Channel and
 28 demodulation of Radio Configuration 6, 7, 8, or 9 during an CDMA-HRPD call, then
 29 set up a CDMA call using Fundamental Channel Test Mode 7 (see 1.3 of [4]) with
 30 1500 bps Fundamental Channel data rate only and 9600 bps Dedicated Control
 31 Channel with 100% frame activity, and perform steps 12 through 16.
 - 32 12. Set the test parameters for the CDMA channel as specified in Table 4.5.1.2-1.
 - 33 13. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23 MHz
 34 for the CDMA channel.
 - 35 14. Send continuously alternate '0' and '1' power control bits to the access terminal on
 36 the CDMA carrier, and send continuously '0' power control bits to the access terminal
 37 on each HRPD carrier and measure the total transmitted power at the access
 38 terminal until it becomes stable. For this test, denote this stable transmitted power
 39 value MaxAccessTerminalTxPower (in dBm).
 - 40 15. Manually set the transmitted power on each CDMA and HRPD channel to
 41 MaxAccessTerminalTxPower $- 10 \times \log_{10}(N)$, where N is the number of simultaneously
 42 active CDMA as well as HRPD carriers. Here, manual setting of the transmitted power

- 1 implies using reverse power control commands to maintain the transmitted power
 2 close to a specified target. The difference between the target transmitted power and
 3 the actual or measured transmitted power shall not exceed the power control step
 4 size.
- 5 16. Measure the spurious emission levels for all CDMA and HRPD carriers. (Test 1)
- 6 17. Configure the access terminal to simultaneously perform a CDMA call and the
 7 maximum number of HRPD calls supported by the device. For this test, the HRPD
 8 carriers are all adjacent to one another and adjacent to the single CDMA carrier with
 9 a spacing of 1.23 MHz (for Band Class 0) and 1.25 MHz (for all other Band Classes)
 10 between the center frequencies.
- 11 18. Repeat step 5 if there is a single HRPD carrier. If there are multiple HRPD carriers,
 12 set up a Test Application session for Subtype 3 Physical Layer. Configure the Test
 13 Application RMCTAP so that the Reverse Data Channel payload size corresponds to
 14 4096 bits with Termination Target of 16 slots. Configure the Test Application
 15 FMCTAP (for Subtype 3 Physical Layer) so that the Forward Traffic Channel data rate
 16 corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is transmitted
 17 at all the slots.
- 18 19. For the CDMA carrier, repeat steps 6 Through 11. (Test 2)

19
 20 **Table 4.5.1.2-1. Test Parameters for Testing Spurious Emissions with a Single Traffic**
 21 **Code Channel at Maximum RF Output Power**

Parameter	Units	Value
\bar{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

22
 23 4.5.1.3 Minimum Standard

24 The spurious emissions in the mobile station's receive band shall be less than -76 dBm
 25 measured in a 1 MHz resolution bandwidth for band classes 0, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11
 26 and 12. For band class 3, the spurious emissions in the mobile station's receive band shall
 27 be less than -81 dBm measured in a 1 MHz resolution bandwidth. Throughout this section,
 28 'reverse CDMA channel' refers to the reverse CDMA channel of both CDMA and HRPD
 29 technologies.

30 Test 1

31 When transmitting in Band Classes 0, 2, 3, 5, 7, 9, 10, 11 or 12, the spurious emissions
 32 with ten or more averages shall be less than the limits specified in Table 4.5.1.3-1.

1 **Table 4.5.1.3-1. Band Classes 0, 2, 3, 5, 7, 9, 10, 11, and 12 Transmitter**
 2 **Spurious Emission Limits for Test 1**

For $ \Delta f $ Within the Range	Emission Limit
885 kHz to 1.885 MHz	6 dBm / 1 MHz
> 1.885 MHz	-13 dBm / 1 MHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf is measured as the frequency offset from the center frequency of each reverse CDMA channel.

Emission Limits shall apply between the reverse CDMA channels when the maximum frequency separation (denoted MaxCarrierSeparation⁶, measured from carrier to carrier, and specified in MHz for this test), MaxCarrierSeparation $\geq 4 \times 1.23$ MHz.

3

4 When transmitting in Band Classes 1, 4, 6, or 8, the spurious emissions with ten or more
 5 averages shall be less than the limits specified in Table 4.5.1.3-2.

6 **Table 4.5.1.3-2. Band Classes 1, 4, 6, and 8 Transmitter Spurious Emission Limits for**
 7 **Test 1**

For $ \Delta f $ Within the Range	Emission Limit
1.25 MHz to 2.25 MHz	6 dBm / 1 MHz
2.25 MHz to $3.5 \times N_s$ MHz	-13 dBm / 1 MHz
> $3.5 \times N_s$ MHz (ITU Category B)	-36 dBm / 1 kHz; $9 \text{ kHz} < f < 150 \text{ kHz}$ -36 dBm / 10 kHz; $150 \text{ kHz} < f < 30 \text{ MHz}$ -36 dBm / 100 KHz; $30 \text{ MHz} < f < 1 \text{ GHz}$ -30 dBm / 1 MHz; $1 \text{ GHz} < f < 12.75 \text{ GHz}$

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf is measured as the frequency offset from the center frequency of each channel.

Except for ITU Category B, emission limits shall apply between the carriers when MaxCarrierSeparation $\geq 4 \times 1.25$ MHz.

N_s = MaxCarrierSeparation is the maximum separation between carriers in MHz.

ITU Category B limit is intended to apply only to Band Classes 6 and 8.

8 A single exception will be allowed for spurious emission frequencies between the two
 9 reverse CDMA channels (for both Table 4.5.1.3-1 and Table 4.5.1.3-2).

10 Test 2

⁶ MaxCarrierSeparation is not an air interface parameter.

1 For adjacent reverse CDMA channels, the spurious emissions with ten or more averages
 2 shall be less than the limits specified in Table 4.5.1.3-3 and Table 4.5.1.3-4.

3 **Table 4.5.1.3-3. Adjacent Multi-carrier Transmitter Spurious Emission Limits for**
 4 **Number of adjacent reverse CDMA channels, N = 3**

For $ \Delta f $ Within the Range	Emission Limit
2.5 MHz to 2.7 MHz	-14 dBm / 30 kHz
2.7 MHz to 3.5 MHz	$-[14 + 15 \times (\Delta f - 2.7 \text{ MHz})]$ dBm / 30 kHz
3.08 MHz (Band Class 6 only)	-33 dBc / 3.84 MHz
3.5 MHz to 7.5 MHz	$-[13 + 1 \times (\Delta f - 3.5 \text{ MHz})]$ dBm / 1 MHz
7.5 MHz to 8.5 MHz	$-[17 + 10 \times (\Delta f - 7.5 \text{ MHz})]$ dBm / 1 MHz
8.08 MHz (Band Class 6 only)	-43 dBc / 3.84 MHz
8.5 MHz to 12.5 MHz	-27 dBm / 1 MHz
> 12.5 MHz (ITU Category A)	-13 dBm / 1 kHz; 9 kHz < f < 150 kHz -13 dBm / 10 kHz; 150 kHz < f < 30 MHz -13 dBm/100 kHz; 30 MHz < f < 1 GHz -13 dBm / 1 MHz; 1 GHz < f < 5 GHz
> 12.5 MHz (ITU Category B)	-36 dBm / 1 kHz; 9 kHz < f < 150 kHz -36 dBm / 10 kHz; 150 kHz < f < 30 MHz -36 dBm/100 kHz; 30 MHz < f < 1 GHz -30 dBm / 1 MHz; 1 GHz < f < 12.75 GHz

5 Note: All frequencies in the measurement bandwidth shall satisfy the
 6 restrictions on $|\Delta f|$ where Δf = center frequency of the middle reverse
 7 CDMA channel- closer measurement edge frequency (f). The
 8 requirements at offsets of 3.08 and 8.08 MHz are equivalent to ACLR
 9 requirements of 33 and 43 dB from a Spreading Rate 3 mobile station
 10 transmitter into a Spreading Rate 3 or IMT-DS mobile station receiver
 11 offset by 5 and 10 MHz respectively. ITU Category B is intended to apply
 12 to only Band Class 6, 8, 9, 11 and 12.

Table 4.5.1.3-4. Adjacent Multi-carrier Transmitter Spurious Emission Limits for Number of adjacent reverse CDMA channels, $N \neq 3$

For $ \Delta f $ Within the Range	Emission Limit
$2.5 + \Delta$ MHz to $3.5 + \Delta$ MHz	-13 dBm / (12.5 kHz \times N) kHz
$3.5 + \Delta$ MHz to $3.125 \times (N + 1)$ MHz	-13 dBm / 1 MHz
$> 3.125 \times (N + 1)$ MHz (ITU Category A)	-13 dBm / 1 kHz; 9 kHz $< f < 150$ kHz -13 dBm / 10 kHz; 150 kHz $< f < 30$ MHz -13 dBm / 100 kHz; 30 MHz $< f < 1$ GHz -13 dBm / 1 MHz; 1 GHz $< f < 5$ GHz
$> 3.125 \times (N + 1)$ MHz (ITU Category B)	-36 dBm / 1 kHz; 9 kHz $< f < 150$ kHz -36 dBm / 10 kHz; 150 kHz $< f < 30$ MHz -36 dBm / 100 kHz; 30 MHz $< f < 1$ GHz -30 dBm / 1 MHz; 1 GHz $< f < 12.75$ GHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency - closer measurement edge frequency (f). ITU Category B is intended to apply to only Band Class 6, 8, 9, 11 and 12. $\Delta = (N - 3) \times 625$ kHz, where N is the number of carriers ($N \geq 2$).

Current region-specific radio regulation rules shall also apply.

4.5.2 Occupied Bandwidth

This test is applicable to Band Class 0 Band Subclasses 2 and 3, Band Class 3 and Band Class 6 mobile stations only.

4.5.2.1 Definition

The occupied bandwidth is defined as the frequency range, whereby the power of emissions averaged over the frequency above and under the edge frequency are 0.5 % each of the total radiation power of a modulated carrier.

4.5.2.2 Method of Measurement

1. Connect the HRPD access network(s) and the CDMA base station to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are not applicable in this test. Connect a spectrum analyzer to the access terminal antenna connector. Use a power control step size of 0.5dB for CDMA as well as HRPD carriers.
2. Configure the access terminal to transmit on one CDMA and one HRPD reverse carrier with the maximum possible frequency separation supported by the device between carriers. The maximum carrier separation should be at least 2.46MHz.

- 1 3. If the mobile station supports demodulation of Radio Configuration 1, 2, 3, 4, or 5,
2 set up a CDMA call using Fundamental Channel Test Mode 1 or 3 (see 1.3 of [4])
3 with 9600 bps data rate only and perform steps 5 through 10.
- 4 4. If the mobile station supports Band Class 6 and demodulation of Radio
5 Configuration 6, 7, 8, or 9, set up a CDMA call using Fundamental Channel Test
6 Mode 7 or Control Channel Test Mode 7 (see 1.3 of [4]) with 9600 bps data rate only
7 and perform steps 5 through 10.
- 8 5. Set up a HRPD Test Application session. Open a connection. For Subtype 0 or 1
9 Physical Layer, configure the Test Application RTAP so that the HRPD Reverse Data
10 Channel rate corresponds to 9.6 kbps. For Subtype 2 or 3 Physical Layer, configure
11 the Test Application RETAP so that the HRPD Reverse Data Channel payload size
12 corresponds to 256 bits with Termination Target of 4 sub-packets. Configure the
13 Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP (for Subtype 2
14 or 3 Physical Layer) so that the HRPD Forward Traffic Channel data rate
15 corresponds to the 2-slot version of 307.2 kbps, and the HRPD ACK Channel is
16 transmitted at all the slots. Set RAB to '0' at all times.
- 17 6. Set the test parameters for the CDMA channel as specified in Table 4.5.2.3-1.
- 18 7. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
19 MHz for for the CDMA channel.
- 20 8. Send continuously alternate '0' and '1' power control bits to the access terminal on
21 the CDMA carrier, and send continuously '0' power control bits to the access
22 terminal on each HRPD carrier and measure the total transmitted power at the
23 access terminal until it becomes stable. For this test, denote this stable transmitted
24 power value MaxAccessTerminalTxPower (in dBm).
- 25 9. Manually set the transmitted power on each CDMA and HRPD channel to
26 MaxAccessTerminalTxPower – $10 \times \log_{10}(N)$, where N is the number of
27 simultaneously active CDMA as well as HRPD carriers. Here, manual setting of the
28 transmitted power implies using reverse power control commands to maintain the
29 transmitted power close to a specified target. The difference between the target
30 transmitted power and the actual or measured transmitted power shall not exceed
31 the power control step size.
- 32 10. Set the resolution bandwidth of the spectrum analyzer to a maximum of 30 kHz.
33 The value of the occupied bandwidth is calculated by an external or internal
34 computer by summing all samples stored as "total power" (Test 1). The occupied
35 bandwidth shall be measured for each isolated carrier independently.
- 36 11. For an access terminal that supports Subtype 3 HRPD physical layer and two or
37 more HRPD reverse link channels during CDMA-HRPD operation, configure the
38 access terminal to transmit on one CDMA reverse channel and the maximum
39 number of simultaneously supported HRPD channels with the CDMA channel
40 adjacent to all the adjacent HRPD reverse channels at a spacing of 1.23 MHz (for
41 Band Class 0) and 1.25 MHz (for all other Band Classes) between the center
42 frequencies.

- 1 12. Repeat steps 3 and 4.
- 2 13. Using Subtype 3 Physical Layer, configure the Test Application RMCTAP so that the
3 HRPD Reverse Data Channel payload size corresponds to 256 bits with Termination
4 Target of 4 sub-packets. Configure the Test Application FMCTAP so that the HRPD
5 Forward Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps,
6 and the HRPD ACK Channel is transmitted at all the slots.
- 7 14. Repeat steps 6 through 10 (Test 2).
- 8 15. For an access terminal that supports Subtype 3 HRPD physical layer and two or
9 more HRPD reverse link channels during CDMA-HRPD operation, configure the
10 access terminal to simultaneously transmit on one CDMA reverse channel and two
11 HRPD channels, where any two of the aforementioned three carriers are at the
12 maximum possible frequency separation, and the third carrier is adjacent to either
13 the leftmost or the rightmost carrier. The channel spacing shall be a multiple of
14 1.23 MHz for BC 0 Subclass 2 and 3 or 1.25 MHz for BC 3 and 6. This test (Test 3)
15 shall be performed only if the AT is able to support the transmission mode
16 described above.
- 17 16. Repeat steps 3 and 4.
- 18 17. Repeat step 13.
- 19 18. Repeat steps 6 through 10 (Test 3). The occupied bandwidth shall be measured for
20 the isolated carrier and two adjacent carriers independently.
- 21 19. For an access terminal that supports Subtype 3 HRPD physical layer and two or
22 more HRPD reverse link channels during CDMA-HRPD operation, configure the
23 access terminal to simultaneously transmit on one CDMA reverse channel and two
24 HRPD channels, where any two of the aforementioned three carriers are at the
25 maximum possible frequency separation, and the third carrier is not adjacent to
26 either the leftmost or the rightmost carrier. The channel spacing shall be a multiple
27 of 1.23 MHz for BC 0 Subclass 2 and 3 or 1.25 MHz for BC 3 and 6. This test (Test
28 4) shall be performed only if the AT is able to support the transmission mode
29 described above.
- 30 20. Repeat steps 3 and 4.
- 31 21. Repeat step 13.
- 32 22. Repeat steps 6 through 10 (Test 4). The occupied bandwidth shall be measured for
33 each isolated carrier independently.

34 4.5.2.3 Minimum Standard

35 The occupied bandwidth shall be measured separately for each isolated carrier and each
36 set of adjacent carriers.

37 The following conditions shall be met for Tests 1, 2, 3 and 4. Whenever there is an isolated
38 carrier (CDMA or HRPD, with no carriers adjacent to it), the occupied bandwidth for the
39 isolated carrier shall not exceed 1.48MHz. When there are two or more adjacent carriers,
40 the occupied bandwidth for a set of N adjacent carriers shall not exceed $(N-1) \times M + 1.48$

1 MHz where N is the total number of adjacent carriers (including both CDMA and HRPD)
 2 and M is the minimum carrier spacing between the center frequencies, which is 1.23 MHz
 3 (for Band Class 0) and 1.25 MHz (for all other Band Classes).

4 **Table 4.5.2.3-1. Test Parameters for Testing Occupied Bandwidth at Maximum RF**
 5 **Output Power**

Parameter	Units	Value
\bar{I}_{Or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_C}{I_{Or}}$	dB	-7
$\frac{\text{Traffic } E_C}{I_{Or}}$	dB	-7.4

6 4.6 Limitations on Emissions for DB-CDMA-HRPD

7 4.6.1 Conducted Spurious Emissions

8 4.6.1.1 Definition

9 Conducted spurious emissions are emissions at frequencies that are outside the assigned
 10 CDMA and HRPD Channels, measured at the access terminal antenna connector. This test
 11 measures the spurious emissions during continuous transmission. Emissions are
 12 measured on a per-band class basis.

13 4.6.1.2 Method of Measurement

- 14 1. Set the following parameters of the HRPD *AccessParameters Message* as specified
 15 below:

Parameter	Value (Decimal)
OpenLoopAdjust	81 (-81 dB) for BC 0, 2, 3, 5, 7, 9, 10, 11, and 12 84 (-84 dB) for BC 1, 4, 6, and 8
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

- 16 2. Connect the sector to the access terminal antenna connector as shown in Figure
 17 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are
 18 not applicable in this test. Connect a spectrum analyzer (or other suitable test
 19 equipment) to the access terminal antenna connector.
 20
- 21 3. For all band class combinations supported by the access terminal, configure the
 22 access terminal to operate with that band class combination, where B1 is the CDMA
 23 band class and B2 is the HRPD band class.

- 1 4. Perform steps 6 through 13 if and only if the access terminal can simultaneously
2 support only one CDMA carrier in B1 and only one HRPD carrier in B2.
- 3 5. Perform steps 14 through 24 if the access terminal can simultaneously support a
4 single CDMA carrier in B1 and two or more HRPD carriers in B2.
- 5 6. Configure the access terminal to transmit on a single CDMA carrier in B1, and on a
6 single HRPD carrier in B2. Perform step 7 for the HRPD call. Perform step 8 for the
7 CDMA call.
- 8 7. Set up a Test Application session. Open a HRPD connection. For Subtype 0 or 1
9 Physical Layer, configure the Test Application RTAP so that the Reverse Data
10 Channel rate corresponds to 153.6 kbps. For Subtype 2 or Subtype 3 Physical
11 Layer, configure the Test Application RETAP so that the Reverse Data Channel
12 payload size corresponds to 4096 bits with Termination Target of 4 sub-packets.
13 Configure the Test Application FTAP (for Subtype 0 or 1 Physical Layer) or FETAP
14 (for Subtype 2 or Subtype 3 Physical Layer) so that the Forward Traffic Channel
15 data rate corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is
16 transmitted at all the slots. Set RAB to '0' at all times.
- 17 8. If the mobile station supports the Radio Configuration 3 Reverse Fundamental
18 Channel and demodulation of Radio Configuration 3 or 4 during an CDMA-HRPD
19 call, then set up a CDMA call using Fundamental Channel Test Mode 3 (see 1.3 of
20 [4]) with 9600 bps data rate only and perform steps 10 and 11.
- 21 9. Set the test parameters for the CDMA channel as specified in Table 4.6.1.2-1.
- 22 10. Set \hat{I}_{or} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{or} to -75 dBm/1.23
23 MHz for the CDMA channel.
- 24 11. Set the transmitted power on the CDMA carrier to $L_{B1} - 3$ dB, where L_{B1} is the lower
25 limit on the maximum RF output power in B1 for the access terminal class in
26 question (see Table 4.3.4.3-1 of [17]).
- 27 12. Send continuously '0' power control bits to the access terminal on each HRPD
28 carrier and measure the total transmitted power at the access terminal on each
29 band.
- 30 13. Measure the spurious emission levels for each band class (Test 1).
- 31 14. Configure the access terminal to transmit on a single CDMA carrier in B1, and on
32 two HRPD carriers in B2 with the pair of carriers at the maximum possible
33 frequency separation ($\text{MaxReverseLinkBandwidth}^7$) between them. Perform step 16
34 for the HRPD calls.

⁷ The maximum separation between the highest and lowest reverse link CDMA channels within a Band Class that can be assigned to the access terminal in units of 2.5 kHz. See Table 7.9.7.1-1 in [1] for more details

- 1 15. Set up a Test Application session for Subtype 3 Physical Layer. Configure the Test
 2 Application RMCTAP so that the Reverse Data Channel payload size corresponds to
 3 4096 bits with Termination Target of 4 sub-packets. Configure the Test Application
 4 FMCTAP (for Subtype 3 Physical Layer) so that the Forward Traffic Channel data
 5 rate corresponds to the 2-slot version of 307.2 kbps, and the ACK Channel is
 6 transmitted at all the slots.
- 7 16. Perform step 8 for the CDMA call.
- 8 17. Set the transmitted power on the CDMA carrier to $L_{B1} - 3\text{dB}$, where L_{B1} is the lower
 9 limit on the maximum RF output power in B1 for the mobile station class in
 10 question, and Backoff_{B1} is the recommended maximum RF power backoff for B1
 11 (see Table 4.3.4.3-1 of [17]).
- 12 18. Send continuously '0' power control bits to the access terminal on each HRPD
 13 carrier and measure the total transmitted power at the access terminal in each
 14 band class.
- 15 19. Measure the spurious emission levels for each band class (Test 2).
- 16 20. Configure the access terminal to transmit on a single CDMA carrier in B1, and on
 17 the maximum number of adjacent reverse HRPD channels that the access terminal
 18 can support in B2, with the HRPD channels at a spacing of 1.23 MHz (for Band
 19 Class 0) and 1.25 MHz (for all other Band Classes) between the center frequencies.
 20 Perform step 16 for the HRPD calls. Perform step 8 for the CDMA call.
- 21 21. Set the transmitted power on the CDMA carrier to $L_{B1} - 3\text{dB}$, where L_{B1} is the lower
 22 limit on the maximum RF output power in B1 for the mobile station class in
 23 question, and Backoff_{B1} is the recommended maximum RF power backoff for B1.
- 24 22. Send continuously '0' power control bits to the access terminal on each HRPD
 25 carrier and measure the total transmitted power at the access terminal in each
 26 band class.
- 27 23. Measure the spurious emission levels for each band class. (Test 3)

Table 4.6.1.2-1. Test Parameters for CDMA channel

Parameter	Units	Value
\bar{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_C}{I_{\text{or}}}$	dB	-7
$\frac{\text{Traffic } E_C}{I_{\text{or}}}$	dB	-7.4

1 4.6.1.3 Minimum Standard

2 The spurious emissions in the mobile station's receive band shall be less than -76 dBm
 3 measured in a 1 MHz resolution bandwidth for band classes 0, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11
 4 and 12. For band class 3, the spurious emissions in the mobile station's receive band shall
 5 be less than -81 dBm measured in a 1 MHz resolution bandwidth.

6 Limit for Test 1 (B1 and B2), Test 2 (B1 only) and Test 3 (B1 only)

7 When transmitting in Band Classes 0, 2, 5, 7, 9, 10, 11 or 12, the spurious emissions with
 8 ten or more averages shall be less than the limits specified in Table 4.6.1.3-1.

9
 10 **Table 4.6.1.3-1. Band Classes 0, 2, 5, 7, 9, 10, 11, and 12 Transmitter**
 11 **Spurious Emission Limits**

For $ \Delta f $ Within the Range	Emission Limit
885 kHz to 1.98 MHz	Less stringent of -42 dBc/30 kHz or -54 dBm/1.23 MHz
1.25 to 4.00 MHz (Band Class 10 only)	-13 dBm / 30 kHz
1.98 MHz to 4.00 MHz	Less stringent of -54 dBc/30 kHz or -54 dBm/1.23 MHz
2.25 MHz to 4.00 MHz (Band Class 7 only)	-35 dBm/6.25 kHz
> 4.00 MHz (ITU Category A only)	-13 dBm / 1 kHz; 9 kHz < f < 150 kHz -13 dBm / 10 kHz; 150 kHz < f < 30 MHz -13 dBm/100 kHz; 30 MHz < f < 1 GHz -13 dBm / 1 MHz; 1 GHz < f < 5 GHz
> 4.00 MHz (ITU Category B only)	-36 dBm / 1 kHz; 9 kHz < f < 150 kHz -36 dBm / 10 kHz; 150 kHz < f < 30 MHz -36 dBm/100 kHz; 30 MHz < f < 1 GHz -30 dBm / 1 MHz; 1 GHz < f < 12.75 GHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency - closer measurement edge frequency (f). Compliance with the -35 dBm / 6.25 kHz limit is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral power in a 6.25 kHz segment. ITU Category B is intended to apply to only Band Class 5, 9, 11 and 12. The -13 dBm/30 kHz requirement for Band Class 10 is based on CFR 47 Part 90.691(a)(2).

12
 13 When transmitting in Band Classes 1, 4, 6, 8 or 13, the spurious emissions with ten or
 14 more averages shall be less than the limits specified in Table 4.6.1.3-2.

1 **Table 4.6.1.3-2. Band Classes 1, 4, 6, 8 and 13 Transmitter Spurious Emission Limits**

For $ \Delta f $ Within the Range	Emission Limit
1.25 MHz to 1.98 MHz	less stringent of -42 dBc/30 kHz or -54 dBm/1.23 MHz
1.98 MHz to 4.00 MHz	less stringent of -50 dBc/30 kHz or -54 dBm/1.23 MHz
2.25 MHz to 4.00 MHz (Band Class 6, 8 and 13 only)	$-(13 + 1 \times (\Delta f - 2.25 \text{ MHz}))$ dBm / 1 MHz
> 4.00 MHz (ITU Category A)	-13 dBm / 1 kHz; 9 kHz < f < 150 kHz -13 dBm / 10 kHz; 150 kHz < f < 30 MHz -13 dBm/100 kHz; 30 MHz < f < 1 GHz -13 dBm / 1 MHz; 1 GHz < f < 10 GHz
> 4.00 MHz (ITU Category B)	-36 dBm / 1 kHz; 9 kHz < f < 150 kHz -36 dBm / 10 kHz; 150 kHz < f < 30 MHz -36 dBm/100 kHz; 30 MHz < f < 1 GHz -30 dBm / 1 MHz; 1 GHz < f < 12.75 GHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency - closer measurement edge frequency (f). ITU Category B is intended to apply to only Band Classes 6, 8 and 13.

2
3 When transmitting in Band Class 3, the spurious emissions with ten or more averages
4 shall be less than the limits specified in Table 4.6.1.3-3.

Table 4.6.1.3-3. Band Class 3 Transmitter Spurious Emission Limits

Measurement Frequency	For Δf Within the Range	Emission Limit
> 815 MHz and ≤ 850 MHz,	≥ 900 kHz and < 1.98 MHz	-42 dBc / 30 kHz
> 887 MHz and ≤ 889 MHz, > 893 MHz and ≤ 901 MHz, > 915 MHz and ≤ 925 MHz	≥ 1.98 MHz	25 μW (-16 dBm) / 100 kHz; Pout ≤ 30 dBm -54 dBc / 100 kHz; Pout > 30 dBm
> 885 MHz and ≤ 958 MHz, except	< 1.98 MHz	25 μW (-16 dBm) / 30 kHz; Pout ≤ 30 dBm; Less stringent of -60 dBc / 30 kHz or 2.5 μW (-26 dBm) / 30 kHz; Pout > 30 dBm
> 887 MHz and ≤ 889 MHz > 893 MHz and ≤ 901 MHz > 915 MHz and ≤ 925 MHz	≥ 1.98 MHz	25 μW (-16 dBm) / 100 kHz; Pout ≤ 30 dBm; Less stringent of -60 dBc / 100 kHz or 2.5 μW (-26 dBm) / 100 kHz; Pout > 30 dBm
≤ 885 MHz and > 958 MHz, except 815-850 MHz	< 1.98 MHz	25 μW (-16 dBm) / 30 kHz; Pout ≤ 30 dBm; Less stringent of -60 dBc / 30 kHz or 2.5 μW (-26 dBm) / 30 kHz; Pout > 30 dBm
	≥ 1.98 MHz	25 μW (-16 dBm) / 1 MHz; Pout ≤ 44 dBm More stringent of -60 dBc / 1 MHz and 20 mW (13 dBm) / 1 MHz; Pout > 44 dBm
Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $ \Delta f $ where Δf = center frequency – closer measurement edge frequency (f). The lower and upper limits of the frequency measurement are currently 10 MHz and 3 GHz in Japan radio measurement documents.		

2

3 When transmitting in Band Class 6, the spurious emissions with ten or more averages
4 shall also be less than the requirements in Table 4.6.1.3-4.

5

Table 4.6.1.3-4. Additional Band Class 6 Transmitter Spurious Emission Limits

Measurement Frequency	Emission Limit	Victim Band
1884.5 to 1919.6 MHz	-41 dBm / 300 kHz	PHS
925 to 935 MHz	-67 dBm / 100 kHz	GSM 900
935 to 960 MHz	-79 dBm / 100 kHz	GSM 900
1805 to 1880 MHz	-71 dBm / 100 kHz	DCS 1800

Note: Measurements apply only when the measurement frequency is at least 5.625 MHz from the CDMA center frequency. The non-PHS band measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the spurious emission limits in Table 4.4.1.3-1 are allowed.

When transmitting in Band Class 11 or 12, the spurious emissions with ten or more averages shall also be less than the requirements in Table 4.6.1.3-5.

Table 4.6.1.3-5. Additional Band Class 11 and 12 Transmitter Spurious Emission Limits

For $ \Delta f $ Within the Range	Emission Limit Band Class 11 Subclasses 4, 5; Band Class 12 Subclass 1	Emission Limit Band Class 11 Subclasses 0, 1, 2, 3; Band Class 12 Subclass 0
885 kHz to 1.12 MHz	$-47 - 7 \times (\Delta f - 885) / 235$ dBc in 30 kHz	Not Specified
1.12 MHz to 1.98 MHz	$-54 - 13 \times (\Delta f - 1120) / 860$ dBc in 30 kHz	Not Specified
1.98 MHz to 4.00 MHz	$-67 - 15 \times (\Delta f - 1980) / 2020$ dBc in 30 kHz	Not Specified
4.00 MHz to 10.0 MHz	-51 dBm in 100 kHz	Not Specified

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency - closer measurement edge frequency (f). Δf is positive offset from the highest valid CDMA channel in the band subclass or negative offset from the lowest valid CDMA channel in the band subclass. The emission limits for Band Class 11 and 12 (European PAMR bands) are designed to allow co-existence with incumbent services in Europe and are tighter than ITU Category B requirements.

When transmitting in Band Class 7, the spurious emissions with ten or more averages shall also be less than the requirements in Table 4.6.1.3-6.

Table 4.6.1.3-6. Additional Band Class 7 Transmitter Spurious Emission Limits⁸

Transmission Frequency (MHz)	Measurement Frequency (MHz)	Emission Limit	Victim Band
776-788	763-775	-35 dBm/6.25 kHz	Public Safety
788-793	769-775	-35 dBm/6.25 kHz	Public Safety
776-788	793-805	-35 dBm/6.25 kHz	Public Safety
788-793	799-805	-35 dBm/6.25 kHz	Public Safety

Limit for Test 2 (B2 only)

When transmitting in Band Classes 0, 2, 3, 5, 7, 9, 10, 11 or 12, the spurious emissions with ten or more averages shall be less than the limits specified in Table 4.6.1.3-7.

Table 4.6.1.3-7. Band Classes 0, 2, 3, 5, 7, 9, 10, 11, and 12 Transmitter Spurious Emission Limits

For Δf Within the Range	Emission Limit
885 kHz to 1.885 MHz	6 dBm / 1 MHz
> 1.885 MHz	-13 dBm / 1 MHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf is measured as the frequency offset from the center frequency of each reverse CDMA channel.

Emission Limits shall apply between the reverse CDMA channels when $\text{MaxReverseLinkBandwidth} \geq 4 \times 1.23 \text{ MHz}$.

When transmitting in Band Classes 1, 4, 6, or 8, the spurious emissions with ten or more averages shall be less than the limits specified in Table 4.6.1.3-8.

⁸ Based on FCC recommendations in FCC 07-132, 2nd Report and Order, August 10, 2007.

Table 4.6.1.3-8. Band Classes 1, 4, 6, and 8 Transmitter Spurious Emission Limits

For $ \Delta f $ Within the Range	Emission Limit
1.25 MHz to 2.25 MHz	6 dBm / 1 MHz
2.25 MHz to $3.5 \times N_s$ MHz	-13 dBm / 1 MHz
$> 3.5 \times N_s$ MHz (ITU Category B)	-36 dBm / 1 kHz; $9 \text{ kHz} < f < 150 \text{ kHz}$ -36 dBm / 10 kHz; $150 \text{ kHz} < f < 30 \text{ MHz}$ -36 dBm / 100 KHz; $30 \text{ MHz} < f < 1 \text{ GHz}$ -30 dBm / 1 MHz; $1 \text{ GHz} < f < 12.75 \text{ GHz}$

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf is measured as the frequency offset from the center frequency of each channel.

Except for ITU Category B, emission Limits shall apply between the carriers when $\text{MaxReverseLinkBandwidth} \times 0.0025 \geq 4 \times 1.25 \text{ MHz}$.

$N_s = \text{MaxReverseLinkBandwidth} \times 0.0025$

ITU Category B limit is intended to apply only to Band Classes 6 and 8.

A single exception will be allowed for spurious emission frequencies between the two reverse CDMA channels (for both Table 4.6.1.3-7 and Table 4.6.1.3-8).

Limit for Test 3 (B2 only)

For adjacent reverse CDMA channels, the spurious emissions with ten or more averages shall be less than the limits specified in Table 4.6.1.3-9 and Table 4.6.1.3-10.

**Table 4.6.1.3-9. Adjacent Multi-carrier Transmitter Spurious Emission Limits for
Number of adjacent reverse CDMA channels, N = 3**

For Δf Within the Range	Emission Limit
2.5 MHz to 2.7 MHz	-14 dBm / 30 kHz
2.7 MHz to 3.5 MHz	$-[14 + 15 \times (\Delta f - 2.7 \text{ MHz})]$ dBm / 30 kHz
3.08 MHz (Band Class 6 only)	-33 dBc / 3.84 MHz
3.5 MHz to 7.5 MHz	$-[13 + 1 \times (\Delta f - 3.5 \text{ MHz})]$ dBm / 1 MHz
7.5 MHz to 8.5 MHz	$-[17 + 10 \times (\Delta f - 7.5 \text{ MHz})]$ dBm / 1 MHz
8.08 MHz (Band Class 6 only)	-43 dBc / 3.84 MHz
8.5 MHz to 12.5 MHz	-27 dBm / 1 MHz
> 12.5 MHz (ITU Category A)	-13 dBm / 1 kHz; 9 kHz < f < 150 kHz -13 dBm / 10 kHz; 150 kHz < f < 30 MHz -13 dBm/100 kHz; 30 MHz < f < 1 GHz -13 dBm / 1 MHz; 1 GHz < f < 5 GHz
> 12.5 MHz (ITU Category B)	-36 dBm / 1 kHz; 9 kHz < f < 150 kHz -36 dBm / 10 kHz; 150 kHz < f < 30 MHz -36 dBm/100 kHz; 30 MHz < f < 1 GHz -30 dBm / 1 MHz; 1 GHz < f < 12.75 GHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency of the middle reverse CDMA channel- closer measurement edge frequency (f). The requirements at offsets of 3.08 and 8.08 MHz are equivalent to ACLR requirements of 33 and 43 dB from a Spreading Rate 3 mobile station transmitter into a Spreading Rate 3 or IMT-DS mobile station receiver offset by 5 and 10 MHz respectively. ITU Category B is intended to apply to only Band Class 6, 8, 9, 11 and 12.

Table 4.6.1.3-10. Adjacent Multi-carrier Transmitter Spurious Emission Limits for Number of adjacent reverse CDMA channels, $N \neq 3$

For $ \Delta f $ Within the Range	Emission Limit
$2.5 + \Delta$ MHz to $3.5 + \Delta$ MHz	-13 dBm / (12.5 kHz \times N) kHz
$3.5 + \Delta$ MHz to $3.125 \times (N+1)$ MHz	-13 dBm / 1 MHz
$> 3.125 \times (N+1)$ MHz (ITU Category A)	-13 dBm / 1 kHz; 9 kHz $< f < 150$ kHz -13 dBm / 10 kHz; 150 kHz $< f < 30$ MHz -13 dBm/100 kHz; 30 MHz $< f < 1$ GHz -13 dBm / 1 MHz; 1 GHz $< f < 5$ GHz
$> 3.125 \times (N+1)$ MHz (ITU Category B)	-36 dBm / 1 kHz; 9 kHz $< f < 150$ kHz -36 dBm / 10 kHz; 150 kHz $< f < 30$ MHz -36 dBm/100 kHz; 30 MHz $< f < 1$ GHz -30 dBm / 1 MHz; 1 GHz $< f < 12.75$ GHz

Note: All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = center frequency - closer measurement edge frequency (f). ITU Category B is intended to apply to only Band Class 6, 8, 9, 11 and 12. $\Delta = (N-3) \times 625$ kHz, where N is the number of carriers ($N \geq 2$). Operation outside North America is for future study.

Current region-specific radio regulation rules shall also apply.

4.6.2 Occupied Bandwidth

This test is applicable to Band Class 0 Band Subclasses 2 and 3, Band Class 3 and Band Class 6 mobile stations only.

4.6.2.1 Definition

The occupied bandwidth is defined in each band class as the frequency range, whereby the power of emissions averaged over the frequency above and under the edge frequency are 0.5% each of the total radiation power of all modulated carriers.

4.6.2.2 Method of Measurement

1. Connect the HRPD access network(s) and the CDMA base station to the access terminal antenna connector as shown in Figure 6.5.1-4 of [4] (Figure 8.5.1-4 of [17]). The AWGN generator and the CW generator are not applicable in this test. Connect a spectrum analyzer to the access terminal antenna connector. Use a power control step size of 0.5dB for CDMA and HRPD carriers.
2. For all band class combinations supported by the access terminal, configure the access terminal to operate with that band class combination, where B1 is the CDMA band class and B2 is the HRPD band class.

- 1 3. Perform steps 4 through 14 if the access terminal can support a single CDMA
2 carrier in B1 and one or more HRPD carriers in B2.
- 3 4. Perform steps 15 through 22 if the access terminal can simultaneously support a
4 single CDMA carrier in B1 and two or more HRPD carriers in B2.
- 5 5. Configure the access terminal to transmit on one CDMA reverse channel in B1 and
6 on the maximum number of adjacent HRPD reverse channels that the access
7 terminal can support simultaneously in B2 at a spacing of 1.23 MHz for BC 0
8 Subclass 2 and 3 or 1.25 MHz for BC 3 and 6 between the center frequencies.
- 9 6. If the mobile station supports demodulation of Radio Configuration 3 or 4, set up a
10 CDMA call on B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with
11 9600 bps data rate only and perform steps 7 through 14.
- 12 7. Set up a HRPD Test Application session in B2. Open a connection. If the access
13 terminal can support only one HRPD channel in B2, then perform step 8.
14 Otherwise, perform step 9.
- 15 8. If the access terminal can support only one HRPD channel in B2, then do the
16 following. For Subtype 0 or 1 Physical Layer, configure the Test Application RTAP so
17 that the HRPD Reverse Data Channel rate corresponds to 9.6 kbps. For Subtype 2
18 or 3 Physical Layer, configure the Test Application RETAP so that the HRPD Reverse
19 Data Channel payload size corresponds to 256 bits with Termination Target of 4
20 sub-packets. Configure the Test Application FTAP (for Subtype 0 or 1 Physical
21 Layer) or FETAP (for Subtype 2 or 3 Physical Layer) so that the HRPD Forward
22 Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps, and the
23 HRPD ACK Channel is transmitted at all the slots. Set RAB to '0' at all times.
- 24 9. If the access terminal can support two or more HRPD channels in B2, then do the
25 following. Using Subtype 3 Physical Layer, configure the Test Application RMCTAP
26 to transmit on the maximum number of adjacent HRPD reverse channels so that
27 the HRPD Reverse Data Channel payload size corresponds to 256 bits with
28 Termination Target of 4 sub-packets. Configure the Test Application FMCTAP so
29 that the HRPD Forward Traffic Channel data rate corresponds to the 2-slot version
30 of 307.2 kbps, and the HRPD ACK Channel is transmitted at all the slots.
- 31 10. Set the test parameters for the CDMA channel as specified in Table 4.6.2.3-1.
- 32 11. Set \hat{I}_{OR} to -75 dBm/1.23 MHz for each HRPD channel. Set \hat{I}_{OR} to -75 dBm/1.23
33 MHz for the CDMA channel.
- 34 12. Set the transmission power on the CDMA carrier in B1 to be $L1 - 3$ dB, where $L1$ is
35 the lower limit on maximum output power for the band class and mobile station
36 class with appropriate backoff as specified in Table 4.3.4.3-1 of [17].
- 37 13. Send continuously '0' power control bits to the access terminal on each HRPD
38 carrier. Measure the total transmitted power.
- 39 14. Set the resolution bandwidth of the spectrum analyzer to a maximum of 30 kHz.
40 The value of the occupied bandwidth is calculated for each band class by an

- 1 external or internal computer by summing all samples stored as “total power” (Test
2 1).
- 3 15. Configure the access terminal to transmit on one CDMA reverse channel in B1 and
4 on two HRPD reverse channels at the maximum possible frequency separation
5 (MaxReverseLinkBandwidth⁹) between them in B2.
- 6 16. If the mobile station supports demodulation of Radio Configuration 3 or 4, set up a
7 CDMA call in B1 using Fundamental Channel Test Mode 3 (see 1.3 of [4]) with 9600
8 bps data rate only and perform steps 17 through 22.
- 9 17. Set up a HRPD Test Application session in B2. Open a connection. Using Subtype 3
10 Physical Layer, configure the Test Application RMCTAP to transmit on two HRPD
11 reverse channels at the maximum possible frequency separation
12 (MaxReverseLinkBandwidth¹⁰) between them so that the HRPD Reverse Data
13 Channel payload size corresponds to 256 bits with Termination Target of 4 sub-
14 packets. Configure the Test Application FMCTAP so that the HRPD Forward Traffic
15 Channel data rate corresponds to the 2-slot version of 307.2 kbps, and the HRPD
16 ACK Channel is transmitted at all the slots.
- 17 18. Repeat steps 10 through 14 (Test 2).
- 18 19. Set up a HRPD Test Application session in B2. Open a connection. Using Subtype 3
19 Physical Layer, configure the Test Application RMCTAP to transmit on three HRPD
20 reverse channels, of which two are at the maximum possible frequency separation
21 (MaxReverseLinkBandwidth¹¹) between them, and the third is adjacent to either the
22 leftmost or the rightmost carrier. The HRPD Reverse Data Channel payload size
23 corresponds to 256 bits with Termination Target of 4 sub-packets. Configure the
24 Test Application FMCTAP so that the HRPD Forward Traffic Channel data rate
25 corresponds to the 2-slot version of 307.2 kbps, and the HRPD ACK Channel is
26 transmitted at all the slots.
- 27 20. Repeat steps 10 through 14 (Test 3). The occupied bandwidth shall be measured for
28 each isolated carrier and the set of two adjacent carriers independently.
- 29 21. Set up a HRPD Test Application session in B2. Open a connection. Using Subtype 3
30 Physical Layer, configure the Test Application RMCTAP to transmit on three HRPD

⁹ The maximum separation between the highest and lowest reverse link HRPD CDMA channels within a Band Class that can be assigned to the access terminal in units of 2.5 kHz. See Table 7.9.7.1-1 in **Error! Reference source not found.** for more details.

¹⁰ The maximum separation between the highest and lowest reverse link HRPD CDMA channels within a Band Class that can be assigned to the access terminal in units of 2.5 kHz. See Table 7.9.7.1-1 in **Error! Reference source not found.** for more details.

¹¹ The maximum separation between the highest and lowest reverse link HRPD CDMA channels within a Band Class that can be assigned to the access terminal in units of 2.5 kHz. See Table 7.9.7.1-1 in **Error! Reference source not found.** for more details.

- 1 reverse channels, of which two are at the maximum possible frequency separation
 2 (MaxReverseLinkBandwidth¹²) between them, and the third is not adjacent to either
 3 the leftmost or the rightmost carrier. The HRPD Reverse Data Channel payload size
 4 corresponds to 256 bits with Termination Target of 4 sub-packets. Configure the
 5 Test Application FMCTAP so that the HRPD Forward Traffic Channel data rate
 6 corresponds to the 2-slot version of 307.2 kbps, and the HRPD ACK Channel is
 7 transmitted at all the slots.
- 8 22. Repeat steps 10 through 14 (Test 4). The occupied bandwidth shall be measured for
 9 each isolated carrier independently.

10 4.6.2.3 Minimum Standard

11 The occupied bandwidth shall be measured separately for each isolated carrier and each
 12 set of adjacent carriers in each band class.

13 The following conditions shall be met for Tests 1, 2, 3 and 4. Whenever there is an isolated
 14 carrier (CDMA or HRPD, with no carriers adjacent to it), the occupied bandwidth for the
 15 isolated carrier shall not exceed 1.48MHz. When there are two or more adjacent carriers,
 16 the occupied bandwidth for a set of N adjacent carriers shall not exceed $(N-1) \times M + 1.48$
 17 MHz where N is the total number of adjacent carriers (including both CDMA and HRPD)
 18 and M is the minimum carrier spacing between the center frequencies in that band class,
 19 which is 1.23 MHz (for Band Class 0) and 1.25 MHz (for all other Band Classes).

20 **Table 4.6.2.3-1. Test Parameters for Testing Occupied Bandwidth at Maximum RF**
 21 **Output Power**

Parameter	Units	Value
\bar{I}_{or}	dBm/1.23 MHz	-75
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

22

23

¹² The maximum separation between the highest and lowest reverse link HRPD CDMA channels within a Band Class that can be assigned to the access terminal in units of 2.5 kHz. See Table 7.9.7.1-1 in **Error! Reference source not found.** for more details.

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5 ENVIRONMENTAL REQUIREMENTS

An CDMA-HRPD-capable access terminal shall satisfy the environmental requirements in Section 5 of [4] and Section 7 of [17] in addition to satisfying the requirements of this section.

5.1 Temperature and Power Supply Voltage

5.1.1 Definition

The temperature and voltage ranges denote the ranges of ambient temperature and power supply input voltages over which the access terminal will operate and meet the requirements of these standards. The ambient temperature is the average temperature of the air surrounding the access terminal. The power supply voltage is the voltage applied at the input terminals of the access terminal. The manufacturer shall specify the temperature range and the power supply voltage over which the equipment is to operate. In order to provide a convenient means for the manufacturer to express the temperature range under which the access terminal conforms to these recommended minimum standards, temperature ranges designated by letters are defined in Table 5.1.1-1.

Table 5.1.1-1. Temperature Ranges

Designator	Range
A	-40°C to +70°C
B	-30°C to +60°C
C	-20°C to +50°C
D	0°C to +45°C

5.1.2 Method of Measurement

The access terminal shall be installed in its normal configuration (i.e., in its normal mounting arrangement fully assembled) and placed in a temperature chamber. The temperature chamber shall be stabilized at the manufacturer's highest specified operating temperature, and the access terminal shall be operated over the power supply input voltage range¹³ specified by the manufacturer or $\pm 10\%$, if the range is not specified. With the access terminal operating, the temperature shall be maintained at the specified test temperature without forced circulation of air from the

¹³ In general, the voltage range will be the useful operating range of the battery used in the access terminal.

1 temperature chamber being directly applied to the access terminal. The
2 measurements specified in 5.1.3 shall then be performed.

3 Turn the access terminal off, stabilize the access terminal in the chamber at room
4 temperature, and repeat the measurements specified in 5.1.3.

5 Turn the access terminal off, stabilize the access terminal in the chamber at the
6 coldest operating temperature specified by the manufacturer, and repeat the
7 measurements specified in 5.1.3.

8 The overall temperature range may be reduced to a lesser range than -30°C to $+60^{\circ}\text{C}$
9 if the manufacturer uses circuitry that automatically inhibits RF transmission when
10 the temperature falls outside the lesser range specified. Measurements shall be made
11 at the specified extremes of the manufacturer's temperature range. The manufacturer
12 shall verify that RF transmission is inhibited outside of the specified temperature
13 range.

14 5.1.3 Minimum Standard

15 The access terminal equipment shall meet all of the minimum standards specified in
16 Sections 3 through 4 under the standard environmental test conditions specified in
17 8.2 of [17] and 6.2 of [4] for all supported band classes. Over the ambient
18 temperature and power supply ranges specified by the manufacturer, the operation of
19 the access terminal equipment shall meet the following minimum standards for all
20 supported band classes unless noted otherwise:

- 21 (a) Receiver sensitivity and dynamic range as specified in 3.3.1 (also 3.4.1 if DB-
22 CDMA-HRPD is supported). The received power, \bar{I}_{or} , used to measure receiver
23 sensitivity may be increased 2 dB at 60°C and higher.
- 24 (b) Waveform quality as specified in 4.1.1 (also 4.2.1 if DB-CDMA-HRPD is
25 supported).
- 26 (c) Maximum RF output power as specified in 4.3.1 (also 4.4.1 if DB-CDMA-HRPD is
27 supported). For Temperature Range Designators A and B, the ERP for a Band
28 Classes 0, 2, 3, 5, 7, 9, 10, 11, and 12, access terminal may drop by 2 dB at 60°C
29 and higher. For Temperature Range Designators A and B, the EIRP for Band
30 Classes 1, 4, 6, and 8 Class II through V, access terminal may drop by 2 dB at
31 60°C and higher. These requirements do not apply other than for coldest, room
32 and highest operating temperature test points.
- 33 (d) Conducted spurious emissions as specified in 4.5.1 (also 4.6.1 if DB-CDMA-HRPD
34 is supported).

35 **5.2 High Humidity**

36 5.2.1 Definition

37 The term "high humidity" denotes the relative humidity at which the access terminal
38 will operate with the specified performance.

5.2.2 Method of Measurement

The access terminal, after having operated normally under standard test conditions, shall be placed, inoperative, in a humidity chamber with the humidity maintained at 0.024/gm H₂O/gm Dry Air at 50°C (40% Relative Humidity) for a period of not less than eight hours. The measurements specified in 3.3.1.3 (also 3.4.1.3 if DB-CDMA-HRPD is supported) and 4.1.1.3 (also 4.2.1.3 if DB-CDMA-HRPD is supported) shall then be performed. No readjustment of the access terminal shall be allowed during this test.

Turn the access terminal off, stabilize the access terminal in the chamber at standard conditions within six hours, and perform the measurements specified in Sections 3 through 4 of this standard.

5.2.3 Minimum Standard

The access terminal equipment shall meet the minimum standards specified in 3.3.1.3 (also 3.4.1.3 if DB-CDMA-HRPD is supported) and 4.1.1.3 (also 4.2.1.3 if DB-CDMA-HRPD is supported) under the high humidity conditions. Once stabilized in standard conditions, the access terminal shall meet all the minimum standards specified in Sections 3 through 4 of this standard.

5.3 Vibration Stability

5.3.1 Definition

The vibration stability is the ability of the access terminal to maintain specified mechanical and electrical performance after being vibrated.

5.3.2 Method of Measurement

Sinusoidal vibration at 1.5 g acceleration swept through the range of 5 to 500 Hz at the rate of 0.1 octave/second shall be applied to the access terminal in three mutually perpendicular directions (sequentially) for a single sweep rising in frequency followed by a single sweep falling in frequency.

5.3.3 Minimum Standard

The access terminal equipment shall meet all the minimum standards specified in Sections 3 through 4 after being subjected to the above vibration tests.

5.4 Shock Stability

5.4.1 Definition

The shock stability is the ability of the access terminal to maintain specified mechanical and electrical performance after being shocked.

5.4.2 Method of Measurement

The access terminal shall be subjected to three test table impacts, in three mutually perpendicular directions and their negatives, for a total of 18 impacts. In all cases,

1 the access terminal shall be secured to the test table by its normal mounting
2 hardware. Each impact shall be a half sine wave, lasting from 7 to 11 ms, with at
3 least 20 g peak acceleration.

4 5.4.3 Minimum Standard

5 The access terminal equipment shall meet all the minimum standards specified in
6 Sections 3 through 4 of this standard and shall not suffer any mechanical damage
7 after being subjected to the above shock tests.

8

1 6 STANDARD TEST CONDITIONS

2 The standard test conditions for CDMA and HRPD are as described in Section 6 of [4]
3 and Section 8 of [17] respectively. The standard test conditions for CDMA-HRPD shall
4 reflect those described in the latest revision and version of [4] and [17]. If the
5 standard test conditions described in [4] and [17] are in disagreement, then the more
6 restrictive test condition shall apply.

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2

1 **ANNEX A SELECTED PERFORMANCE REQUIREMENTS TABLES (NORMATIVE)**

2 **A.1 Demodulation Requirements for HRPD**

3 A.1.1 Demodulation of Forward Traffic Channel in AWGN

4 A.1.1.1 Method of Measurement

5 **Table A.1.1.1-1. Test Parameters for FTC Demodulation in AWGN (Part 1 of 3)**

Parameter	Units	Test 1	Test 2
\hat{I}_{or} / I_{oc}	dB	15.4	13.4
I_{oc}	dBm/1.23 MHz	-70.4	-68.4
Data Rate	kbps	2,457.6	2,457.6
Slots per Physical Layer packet	Slots	1	1
$\frac{\text{Traffic } E_b}{N_t}$	dB	11.14	9.14
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.12	-0.19

6 Note: The Traffic E_b/N_t and Pilot E_c/I_o values are calculated from the parameters set
7 in the table. They are not settable parameter themselves.

8 **Table A.1.1.1-2. Test Parameters for FTC Demodulation in AWGN (Part 2 of 3)**

Parameter	Units	Test 3	Test 4
\hat{I}_{or} / I_{oc}	dB	33.44	20.45
I_{oc}	dBm/1.23 MHz	-88.44	-75.45
Data Rate	kbps	3,072.0	3,072.0
Physical Layer Packet Size	Bits	5,120	5,120
Slots per Physical Layer packet	Slots	1	1
Preamble Length	Chips	64	64
$\frac{\text{Traffic } E_b}{N_t}$	dB	28.21	15.22
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.00	-0.04

9 Note: The Traffic E_b/N_t and Pilot E_c/I_o values are calculated from the parameters set
10 in the table. They are not settable parameter themselves.

1 **Table A.1.1.1-3 Test Parameters for FTC Demodulation in AWGN (Part 3 of 3)**

Parameter	Units	Test 5 ¹⁴	Test 6
\hat{I}_{or} / I_{oc}	dB	33.44	22.1
I_{oc}	dBm/1.23 MHz	-88.44	-77.1
Data Rate	Mbps	3.1	3.1
Physical Layer Packet Size	Bits	5120	5120
Slots per Physical Layer packet	Slots	1	1
Preamble Length	Chips	64	64
Number of active carriers	N/A	3 ¹⁵	3 ¹²
Carrier spacing	MHz	1.25 or 1.23	1.25 or 1.23
$\frac{\text{Traffic } E_b}{N_t}$	dB	28.21	16.87
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.00	-0.026

2 Note: The Traffic E_b/N_t and Pilot E_c/I_o values are calculated from the parameters set
3 in the table. They are not settable parameter themselves.

4

5 A.1.1.2 Minimum Standard for HRPD in SB-CDMA-HRPD

6 **Table A.1.1.2-1. Minimum Standards for Forward Traffic Channel Performance**
7 **in AWGN (Part 1 of 4)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
1	2,457.6	1	10.94	0.03
			11.14	0.01
			11.34	0.005

8

¹⁴ The specified \hat{I}_{or} / I_{oc} applies to access terminals with improved RF noise-floor capable of supporting multi-carriers.

¹⁵For the case of number of forward link CDMA channels greater than 3 will be addressed in future revisions of **Error! Reference source not found.**

1 **Table A.1.1.2-2. Minimum Standards for Forward Traffic Channel Performance**
 2 **in AWGN (Part 2 of 4)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
2	2,457.6	1	8.94	0.03
			9.14	0.01
			9.34	0.005

3
 4 **Table A.1.1.2-3. Minimum Standards for Forward Traffic Channel Performance**
 5 **in AWGN (Part 3 of 4)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
3	3,072.0	1	21.41	0.03
			28.21	0.01
			44.28	0.008

6
 7 **Table A.1.1.2-4. Minimum Standards for Forward Traffic Channel Performance**
 8 **in AWGN (Part 4 of 4)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
4	3,072.0	1	14.52	0.03
			15.22	0.01
			15.35	0.008

9
 10 A.1.1.3 Minimum Standard for HRPD in DB-CDMA-HRPD

11 **Table A.1.1.3-1. Minimum Standards for Forward Traffic Channel Performance**
 12 **in AWGN (Part 1 of 6)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
1	2,457.6	1	10.94	0.03
			11.14	0.01
			11.34	0.005

1 **Table A.1.1.3-2. Minimum Standards for Forward Traffic Channel Performance**
 2 **in AWGN (Part 2 of 6)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
2	2,457.6	1	8.94	0.03
			9.14	0.01
			9.34	0.005

3
 4 **Table A.1.1.3-3. Minimum Standards for Forward Traffic Channel Performance**
 5 **in AWGN (Part 3 of 6)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
3	3,072.0	1	21.41	0.03
			28.21	0.01
			44.28	0.008

6
 7 **Table A.1.1.3-4. Minimum Standards for Forward Traffic Channel Performance**
 8 **in AWGN (Part 4 of 6)**

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
4	3,072.0	1	14.52	0.03
			15.22	0.01
			15.35	0.008

9
 10 **Table A.1.1.3-5. Minimum Standards for Forward Traffic Channel Performance**
 11 **in AWGN (Part 5 of 6)**

Test	Data Rate (Mbps)	Slots	E_b/N_t [dB]	PER
5	3.1	1	21.41	0.03
			28.21	0.01
			44.28	0.008

12

Table A.1.1.3-6. Minimum Standards for Forward Traffic Channel Performance in AWGN(Part 6 of 6)

Test	Data Rate (Mbps)	Slots	E_b/N_t [dB]	PER
6	3.1	1	16.4	0.03
			16.87	0.01
			17.6	0.008

A.2 CDMA Forward Traffic Channel Demodulation Performance Tables

A.2.1 Forward Traffic Channel Performance Requirements in AWGN

These requirements are referenced by 3.4.1.

A.2.1.1 Method of Measurement Test Parameters

Table A.2.1.1-1. Test Parameters for Radio Configuration 1 Forward Fundamental Channel in AWGN

Parameter	Units	Test 5	Test 6	Test 7
I_{or}/I_{oc}	dB	-1		
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-16.3	-15.8	-15.6
I_{oc}	dBm/1.23 MHz	-54		
Data Rate	bps	9600	9600	9600
$\frac{\text{Traffic } E_b}{N_t}$	dB	3.8	4.3	4.5

Note: The Traffic E_b/N_t value is calculated from the parameters in the table. It is not a directly settable parameter.

**Table A.2.1.1-2. Test Parameters for Radio Configuration 2 Forward
Fundamental Channel in AWGN**

Parameter	Units	Test 8	Test 9	Test 10
\bar{I}_{or}/I_{oc}	dB	-1		
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	(1): -13.0 (2): -12.9	(1): -12.7 (2): -12.5	(1): -12.4 (2): -12.3
I_{oc}	dBm/ 1.23 MHz	-54		
Data Rate	bps	14400	14400	14400
$\frac{\text{Traffic } E_b}{N_t}$	dB	(1): 5.3 (2): 5.4	(1): 5.6 (2): 5.8	(1): 5.9 (2): 6.0
(1): Band Group 450 and 800; (2): BC 1, 4, 6, 8, 14 and 15.				

Note: The Traffic E_b/N_t value is calculated from the parameters in the table. It is not a directly settable parameter.

**Table A.2.1.1-3. Test Parameters for Radio Configuration 3 Forward
Fundamental Channel or Forward Dedicated Control Channel with 100% Frame
Activity in AWGN**

Parameter	Units	Test 11	Test 12	Test 13	Test 14	Test 15	Test 16
\bar{I}_{or}/I_{oc}	dB	-1					
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7					
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-17.5	-16.9	-16.7	-16.6	-16.2	-15.9
I_{oc}	dBm/1.23 MHz	-54					
Data Rate	bps	9600 (5 ms)			9600		
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.6	3.2	3.4	3.5	3.9	4.2

Note: The Traffic E_b/N_t value is calculated from the parameters in the table. It is not a directly settable parameter.

1 **Table A.2.1.1-4. Test Parameters for Radio Configuration 4 Forward**
 2 **Fundamental Channel or Forward Dedicated Control Channel with 100% Frame**
 3 **Activity in AWGN**

Parameter	Units	Test 17	Test 18	Test 19	Test 20	Test 21	Test 22
\bar{I}_{or}/I_{oc}	dB	-1					
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7					
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-16.9	-16.4	-16.1	-15.9	-15.4	-15.1
I_{oc}	dBm/1.23 MHz	-54					
Data Rate	bps	9600 (5 ms)			9600		
$\frac{\text{Traffic } E_b}{N_t}$	dB	3.2	3.7	4.0	4.2	4.7	5.0

4 Note: The Traffic E_b/N_t value is calculated from the parameters in the table. It is
 5 not a directly settable parameter.

6
 7 **Table A.2.1.1-5. Test Parameters for Radio Configuration 5 Forward**
 8 **Fundamental Channel or Forward Dedicated Control Channel with 100% Frame**
 9 **Activity in AWGN**

Parameter	Units	Test 23	Test 24	Test 25	Test 26	Test 27	Test 28
\bar{I}_{or}/I_{oc}	dB	-1					
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7					
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-17.5	-17.0	-16.7	-14.2	-13.8	-13.6
I_{oc}	dBm/1.23 MHz	-54					
Data Rate	bps	9600 (5 ms)			14400		
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.6	3.1	3.4	4.1	4.5	4.7

10 Note: The Traffic E_b/N_t value is calculated from the parameters in the table. It is
 11 not a directly settable parameter.

1 A.2.1.2 Minimum Standards Requirements

2 **Table A.2.1.2-1. Minimum Standards for Radio Configuration 1 Forward**
 3 **Fundamental Channel Performance in AWGN**

Test(s)	Data Rate [bps]	Traffic E_b/N_t [dB]	FER
5, 6, 7	9600	3.6	0.05
		3.8	0.03
		4.3	0.01
		4.5	0.005
		4.7	0.003

4

5 **Table A.2.1.2-2. Minimum Standards for Radio Configuration 2 Forward**
 6 **Fundamental Channel Performance in AWGN**

Test(s)	Data Rate [bps]	Traffic E_b/N_t [dB]	FER
8, 9, 10	14400	5.2	0.05
		5.5	0.03
		5.8	0.01
		6.0	0.005
		6.2	0.003

7

1 **Table A.2.1.2-3. Minimum Standards for Radio Configuration 3 Forward**
 2 **Fundamental Channel or Forward Dedicated Control Channel with 100% Frame**
 3 **Activity Performance in AWGN**

Test(s)	Data Rate [bps]	Traffic E_b/N_t [dB]	FER
11, 12, 13	9600 (5 ms)	2.3	0.05
		2.6	0.03
		3.2	0.01
		3.4	0.005
		3.6	0.003
14, 15, 16	9600	3.3	0.05
		3.5	0.03
		3.9	0.01
		4.2	0.005
		4.4	0.003

4
 5 **Table A.2.1.2-4. Minimum Standards for Radio Configuration 4 Forward**
 6 **Fundamental Channel or Forward Dedicated Control Channel with 100% Frame**
 7 **Activity Performance in AWGN**

Test(s)	Data Rate [bps]	Traffic E_b/N_t [dB]	FER
17, 18, 19	9600 (5 ms)	2.9	0.05
		3.2	0.03
		3.7	0.01
		4.0	0.005
		4.2	0.003
20, 21, 22	9600	4.0	0.05
		4.2	0.03
		4.7	0.01
		5.0	0.005
		5.1	0.003

8

1 **Table A.2.1.2-5. Minimum Standards for Radio Configuration 5 Forward**
 2 **Fundamental Channel or Forward Dedicated Control Channel with 100% Frame**
 3 **Activity Performance in AWGN**

Test(s)	Data Rate [bps]	Traffic E_b/N_t [dB]	FER
23, 24, 25	9600 (5 ms)	2.3	0.05
		2.6	0.03
		3.1	0.01
		3.4	0.005
		3.6	0.003
26, 27, 28	14400	3.9	0.05
		4.1	0.03
		4.5	0.01
		4.7	0.005
		4.8	0.003

4