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3RD GENERATION PARTNERSHIP PROJECT 2 "3GPP2"

Recommended Minimum Performance Standards for Extended Cell cdma2000 High Rate Packet Data Access Terminal

Revision History

Revision	Description of Changes	Date
Rev 0 v1.0	Initial publication	December 2011

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NOTES

1. "Access network" refers to the network equipment providing data connectivity between a packet switched data network (typically the Internet) and the access terminals. Connectivity is typically provided at the Link Layer (PPP).
2. "Sector" refers to the part of the access network that provides the land-side modem.
3. This standard uses the following verbal forms: "Shall" and "shall not" identify requirements to be followed strictly to conform to the standard and from which no deviation is permitted. "Should" and "should not" indicate that one of several possibilities is recommended as particularly suitable, without mentioning or excluding others; that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is discouraged but not prohibited. "May" and "need not" indicate a course of action permissible within the limits of the standard. "Can" and "cannot" are used for statements of possibility and capability, whether material, physical, or causal.
4. Unless indicated otherwise, this document presents numbers in decimal form. Binary numbers are distinguished in the text by the use of single quotation marks.
5. Those wishing to deploy systems compliant with this standard should also be compliant with local radio regulations. For example, operation within the United States of America shall comply with Parts 2, 15, 22, 24, and 27 of [6] and with the applicable rules and regulations of local administrations.
6. The following operators define mathematical operations:

   × indicates multiplication.

   / indicates division.

   + indicates addition.

   - indicates subtraction.

   * indicates complex conjugation.

   |x| indicates the absolute value of x: |-17|=17, |17|=17.

7. This Standard supports testing of access terminals compliant with [1] and subsequent revisions.
8. The specification applies only to Band Classes 20 and 21 as defined in [7]. Operation with other band classes and band subclasses may not be supported by this specification.

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NORMATIVE REFERENCES

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

[1] 3GPP2 C.S0098-0, cdma2000 Extended Cell High Rate Packet Data Air Interface Specification.

[2] 3GPP2 C.S0033-C, Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal.

[3] 3GPP2 C.S0029-B, Test Application Specification for cdma2000 High Rate Packet Data Air Interface.

[4] 3GPP2 C.S0011-D, Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations.

[5] ANSI C63.4-2003, American National Standard for Methods of Measurement of Radi-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

[6] CFR Title 47, Code of Federal Regulations, October 2004.

[7] 3GPP2 C.S0057-E, Band Class Specification for cdma2000 Spread Spectrum Systems.

[8] 3GPP2 C.S0002-E, Physical Layer Standard for cdma2000 Spread Spectrum Systems.

[9] 3GPP TS 45.004, Modulation.

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1 INTRODUCTION

1.1 Scope

This Standard details definitions, methods of measurement, and minimum performance characteristics for access terminals. This Standard shares the purpose of [1] by ensuring that an access terminal can obtain service in any system that meets the compatibility requirements of [1].

Compatibility, as used in connection with this Standard and [1], is understood to mean that any access terminal is able to open data connections in any xHRPD system. Conversely, all xHRPD systems are able to open connections with any 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

1.2.1 Definitions

Access Attempt. A sequence of one or more access probe sequences on the Access Channel that contain the same message. See also Access Probe and Access Probe Sequence.

Access Channel. A Reverse Channel used by access terminals for communicating with the access network. The Access Channel is used for sending signaling messages when the access terminal has not been assigned a Traffic Channel. The Access Channel is a slotted random access channel.

Access Channel Preamble. The preamble of an access probe consisting of a sequence of frames of pilot transmission.

Access Network. The network equipment providing data connectivity between a packet switched data network (typically the Internet) and the access terminals. An access network is equivalent to a base station in [8].

Access Probe. One Access Channel transmission consisting of a preamble and a capsule. The transmission is an integer number of frames in length and transmits one Access Channel message. See also Access Probe Sequence and Access Attempt.

Access Probe Sequence. A sequence of one or more access probes on the Access Channel. The same Access Channel message is transmitted in every access probe of an access attempt. See also Access Probe and Access Attempt.

Access Terminal. A device providing data connectivity to a user. An access terminal may be connected to a computing device such as a laptop personal computer or it may be a self-contained data device such as a personal digital assistant. An access terminal is equivalent to a mobile station in [8].

Access Terminal Class. Access terminal classes define access terminals characteristics, such as slotted operation and transmission power.

ACLR. See Adjacent Channel Leakage power Ratio.

Active Set. The set of pilots assigned to a particular access terminal.

Adjacent Channel Leakage Power Ratio (ACLR). The ratio of the on-channel transmit power to the power measured in one of the adjacent channels with no active channel in the adjacent channel.

AWGN. Additive White Gaussian Noise.

Bad Packet. Forward Traffic Channel Physical Layer packet whose preamble was not detected by the access terminal, or whose FCS did not check. The Forward Test Protocol of the Test Application described in [3] has the means to count the number of bad packets during a test.

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

BCMCS. See Broadcast-Multicast Service

bps. Bits per second.

Broadcast-Multicast Service (BCMCS). A service in which data can be sent to multiple access terminals simultaneously.

Broadcast Test Application Protocol (BTAP). A Test Application protocol allowing BCMCS performance characterization. See [3].

BTAP. See Broadcast Test Application Protocol.

Candidate Set. The set of pilots that have been received with sufficient strength by the access terminal to be successfully demodulated, but have not been placed in the Active Set by the access network. See also Active Set and Neighbor Set.

Capsule. When referring to the Control Channel, the capsule is a block of data carried over this channel that contains messages. When referring to the Access Channel, the capsule corresponds to the portion of the probe that carries data.

CDM. Code Division Multiplexing.

CDMA. See Code Division Multiple Access.

CDMA Channel. The set of channels transmitted between the access network and the access terminals within a given CDMA frequency assignment. See also Forward Channel and Reverse Channel.

CDMA Channel Number. A number corresponding to the center of the CDMA frequency assignment.

CDMA Frequency Assignment. A 1.23-MHz segment of spectrum. For Band Classes 20 and 21 the channel is centered on one of the 50 kHz channels.

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

Connection Layer. The Connection Layer provides air link connection establishment and maintenance service. The Connection Layer is defined in [1].

Continuous Operation Mode. An operation mode of the access terminal in which the access terminal monitors the Control Channel at all the cycles.

Control Channel. The portion of the Forward Channel that carries control information.

Control Channel Capsule. A block of data carried over the Control Channel that contains messages. See also Synchronous Control Channel Capsule.

Control Channel Cycle. The Control Channel cycle is defined as a 256-slot period synchronous with System Time, i.e., there is an integer multiple of 256 slots between the beginning of a cycle and the beginning of System Time.

CRC. See Cyclic Redundancy Code.

CW. Continuous Waveform.

Cyclic Redundancy Code (CRC). A class of linear error detecting codes which generate parity check bits by finding the remainder of a polynomial division.

Data Channel Payload Size. The number of information bits in a Reverse Data Channel physical layer packet.

Channel Quality Indicator Channel (CQI Channel). The Channel Quality Indicator Channel is used by the access terminal to indicate the access network the requested Forward Traffic Channel data rate on the Forward Channel.

dBc. The ratio (in dB) of the sideband power of a signal, measured in a given bandwidth at a given frequency offset from the center frequency of the same signal, to the total inband power of the signal. For xHRPD forward link, the total in-band power of the signal is measured in a 1.23 MHz bandwidth around the center frequency of the signal. For xHRPD reverse link, the total in-band power of the signal is measured in a 6.4 kHz or 12.8 kHz bandwidth around the center frequency of the narrowband signal.

dBm. A measure of power expressed in terms of its ratio (in dB) to one milliwatt.

dBm/Hz. A measure of power spectral density. The ratio, dBm/Hz, is the power in one Hertz of bandwidth, where power is expressed in units of dBm.

dBW. A measure of power expressed in terms of its ratio (in dB) to one watt.

CQI Channel. See Channel Quality Indicator Channel.

E_b. Average energy per information bit for the Control Channel or Forward Traffic Channel at the access terminal antenna connector.

$\mathbf{\frac{E_b}{N_t}}$. The ratio of the combined received energy per bit to the effective noise power spectral density for the Control Channel or Forward Traffic Channel at the access terminal antenna connector.

$\mathbf{E_c}$. Average energy per PN chip over its TDM interval for the Pilot Channel, Forward Medium Access Control (MAC) Channel, Control Channel or Forward Traffic Channel.

Effective Data Rate. The rate at which data is transmitted if every packet terminates after a designated number of slots.

Effective Isotropic Radiated Power (EIRP). The product of the power supplied to the antenna and the antenna gain in a direction relative to an isotropic antenna.

Effective Radiated Power (ERP). The product of the power supplied to the antenna and the antenna gain relative to a half-wave dipole in a given direction.

EIRP. See Effective Isotropic Radiated Power.

ERP. See Effective Radiated Power.

FCS. See Frame Check Sequence.

FETAP. See Forward Enhanced Test Application Protocol.

Forward Channel. A CDMA Channel from an access network to access terminals. The Forward Channel is transmitted on a CDMA frequency assignment using a particular pilot PN offset.

Forward Enhanced Test Application Protocol (FETAP). A Test Application protocol allowing enhanced Forward Link performance characterizations. See [3].

Forward MAC Channel (MAC Channel). A Forward Channel used for medium access control. Forward MAC Channel consists of the Reverse Power Control Channels and the Reverse Frequency Control Channel.

Forward Pilot Channel. An unmodulated, direct-sequence spread spectrum signal transmitted every half slot in bursts of 96 chips centered at the middle of the half slot. The Pilot Channel allows an access terminal to acquire the timing of the Forward Channel, provides a phase reference for coherent demodulation, and provides means for signal strength comparisons between sectors.

Forward Test Application Protocol (FTAP). A Test Application protocol allowing Forward Link performance characterizations. See [3].

Forward Traffic Channel (FTC). A Forward Channel used to transport user and signaling traffic from an access network to an access terminal.

Frame. A basic timing interval in the system. For the Control Channel, and Forward Traffic Channel, a frame is 26.66... ms long. For the Access Channel and Reverse Traffic Channel, a frame is 20 ms long.

Frame Check Sequence (FCS). The Frame Check Sequence of the Physical Layer packets is a CRC. See CRC.

Frequency Control Bit. A bit sent once every 12 slots on the Forward MAC Channel that signals the access terminal to increase or decrease its transmit frequency.

FTC. See Forward Traffic Channel.

FTAP. See Forward Test Application Protocol.

GHz. Gigahertz (10^9 Hertz).

Handoff. The act of transferring communication with an access terminal from one sector to another.

Hard Handoff. A handoff characterized by a temporary disconnection of the Traffic Channel. Hard handoffs occur when the access terminal changes to a new CDMA frequency. See also Soft Handoff.

High Rate Packet Data (HRPD). A CDMA technique optimized for data communications [1].

HRPD. See High Rate Packet Data.

Extended-cell High Rate Packet Data (xHRPD). A CDMA technique optimized for data communications over extended cell[1].

xHRPD. See Extended-cell High Rate Packet Data.

Idle Handoff. The act of transferring reception of the Control Channel from one sector to another, when the access terminal is in the *Idle State* of the Default Route Update Protocol.

I_0. The total received power spectral density, including signal and interference, as measured at the access terminal antenna connector.

I_{oc}. The power spectral density of a band-limited white noise source (simulating interference from other cells) as measured at the access terminal antenna connector.

I_{or}. The total transmit power spectral density of the Forward Channel at the sector antenna connector.

$\hat{I}_{or}$. The received power spectral density of the Forward Channel as measured at the access terminal antenna connector.

kbps. Kilobits per second.

kHz. Kilohertz (10^3 Hertz).

km/h. Kilometers per hour.

MAC Channel. See Forward MAC Channel.

MHz. Megahertz (10^6 Hertz).

ms. Millisecond (10^{-3} second).

Neighbor Set. The set of pilots associated with the CDMA Channels that are probable candidates for handoff. See also Active Set, and Candidate Set.

Nominal Data Rate. The rate at which data is transmitted if every packet takes the maximum number of slots to transmit, i.e. no early termination.

ns. Nanosecond (10^{-9} second).

N_t. The effective noise power spectral density at the access terminal antenna connector.

Packet. Physical Layer protocol data unit.

Packet Activity. The ratio of the number of active slots to the total number of slots during channel operation. See also 8.4.3.5.

PER. Packet Error Rate.

Piece-wise Linear PER Curve. A PER-versus-E_b/N_t curve in which the PER vertical axis is in log scale and the E_b/N_t horizontal axis is in linear scale expressed in dB, obtained by interpolating adjacent test data samples with straight lines.

Pilot Channel. An unmodulated, direct-sequence spread spectrum signal transmitted continuously by the access networks. A pilot channel provides a phase reference for coherent demodulation and may provide a means for signal strength comparisons between sectors.

Pilot $\frac{E_c}{I_0}$. The ratio of the combined pilot energy per chip, E_c, to the total received power spectral density (noise and signals), I_0, of at most K usable multipath components at the access terminal antenna connector. K is the number of demodulating elements supported by the access terminal.

Pilot PN Sequence. A pair of modified maximal length PN sequences with period 2^{15} PN chips used to spread the Forward Channel. Different sectors are identified by different pilot PN sequence offsets.

Pilot Strength. The ratio of the received pilot energy to overall received energy. See also Pilot $\frac{E_c}{I_0}$.

RRI Channel. The Reverse Rate Indicator Channel. 2-bit field used to indicate Reverse Traffic Channel data rate within a rate set.

PN Chip. One bit in the PN sequence.

PN Sequence. Pseudo noise sequence. A periodic binary sequence.

PN. Pseudo noise.

Power Control Bit. A bit sent once every 12 slots on the Forward MAC Channel that signals the access terminal to increase or decrease its transmit power. **ppm.** Parts per million.

PPP. Point to Point Protocol.

RETAP. See Reverse Enhanced Test Application Protocol.

Reverse Channel. A 6.4 kHz or 12.8 kHz narrowband channel from the access terminal to the access network.

Reverse Data Channel. The Reverse Data Channel is transmitted on the Reverse Traffic Channel to transport user and signaling traffic from a single access terminal.

Reverse Enhanced Test Application Protocol (RETAP). A Test Application protocol allowing enhanced Reverse Link performance characterizations. See [3].

Reverse Pilot Channel. A known sequence transmitted at fixed locations within a 20 ms frame by the access terminal. A Reverse Pilot Channel provides a phase reference for coherent demodulation and may provide a means for signal strength measurement.

Reverse Power Control Channel (RPC Channel). The Reverse Power Control Channel is transmitted on the Forward MAC Channel to signal the access terminal to increase or decrease its transmit power.

Reverse Frequency Control Channel (RFC Channel). The Reverse Frequency Control Channel is transmitted on the Forward MAC Channel to signal the access terminal to increase or decrease its transmit frequency.

Reverse Rate Indicator Channel (RRI Channel). The Reverse Rate Indicator Channel is transmitted by the access terminal to indicate the rate at which the data is being transmitted on the Reverse Traffic channel.

Reverse Test Application Protocol (RTAP). A Test Application protocol allowing Reverse Link performance characterizations. See [3].

Reverse Traffic Channel. A Reverse Channel used to transport user and signaling traffic from a single access terminal to an access network. The Reverse Traffic Channel consists of the Pilot Channel, the CQI Channel, the RRI Channel, and the Data Channel.

RPC Channel. See Reverse Power Control Channel.

RFC Channel. See Reverse Frequency Control Channel.

RRI Channel. See Reverse Rate Indicator Channel.

RTAP. Reverse Test Application Protocol.

Sector. The part of the access network that provides the land side modem.

Serving Sector. The sector which is responsible for sending data to the access terminal.

Slot. A basic timing interval in the system. A slot is 1.66… ms long.

Slot Cycle. A periodic interval at which an access terminal operating in the slotted mode monitors the Control Channel.

Slotted Operation Mode. An operation mode of access terminal in which the access terminal monitors only selected Control Channel cycles.

Suspended Operation Mode. An operation mode of access terminal in which the access terminal monitors the Control Channel continuously for a period of time and then proceeds to operate in the slotted mode.

Synchronous Control Channel Capsule. A Control Channel capsule transmitted by the sector at the time such that the first slot of the capsule coincides with the first slot of the Control Channel cycle.

System Time. The time reference used by the system. System Time is synchronous to UTC time (except for leap seconds) and uses the same time origin as Global Positioning System (GPS) time. All sectors use the same System Time (within a small error). Access terminals use the same System Time, offset by the propagation delay from the sector to the access terminal. See also Universal Coordinated Time.

TDM. Time Division Multiplexing.

Time Reference. A reference established by the access terminal that is synchronous with the earliest arriving multipath component used for demodulation.

Traffic Channel. A communication path between an access terminal and an access network used for user and signaling traffic. The term Traffic Channel implies a Forward Traffic Channel and Reverse Traffic Channel pair. See also Forward Traffic Channel and Reverse Traffic Channel.

Transmit Format. Defined as ordered 3-tuple (bandwidth assigned in units of 6.4 kHz, transmit duration in units of 20 ms frame, frame size in bits) that describes how a physical layer packet is transmitted on the reverse link.

Universal Coordinated Time (UTC). An internationally agreed-upon time scale maintained by the Bureau International de l'Heure (BIH) used as the time reference by nearly all commonly available time and frequency distribution systems, e.g., WWV, WWVH, LORAN-C, Transit, Omega, and GPS.

UTC. See Universal Coordinated Time.

Walsh function. One of the 2^N time orthogonal binary functions (note that the functions are orthogonal after mapping '0' to 1 and '1' to –1).

μs. Microsecond (10^{-6} second).

1.2.2 Terms

Control_Chip_Bit. Number of PN chips per Control Channel bit, equal to 16 when the data rate is 76.8 kbps and equal to 32 when the data rate is 38.4 kbps.

Traffic_Chip_Bit. The number of PN chips per Forward Traffic Channel bit. The table below specifies the value of Traffic_Chip_Bit for all the Forward Traffic Channel data rates.

Data Rate (kbps)	Slots	Traffic_Chip_Bit
38.4	16	24
76.8	8	12
153.6	4	6
307.2	2	3
614.4	1	3/2
307.2	4	49/16
614.4	2	49/32
1,228.8	1	3/4
921.6	2	49/48
1,843.2	1	1/2
1,228.8	2	49/64
2,457.6	1	3/8
3072	1	3/10

1.3 xHRPD Equations

The equations listed below describe the relationship between various test parameters under different conditions.

1.3.1 Transmit Power of the Sector

All TDM bursts are transmitted at equal power.

1.3.2 Received Signal Strength

$$\text{Pilot}\frac{E_c}{I_o} = \frac{1}{\frac{I_{oc}}{\hat{I}_{or}} + 1}$$

1.3.2.1 Single-Path Case

$$\text{Traffic}\frac{E_b}{N_t} = \text{Traffic\_Chip\_Bit} \cdot \frac{\hat{I}_{or}}{I_{oc}}$$

$$\text{Control}\frac{E_b}{N_t} = \text{Control\_Chip\_Bit} \cdot \frac{\hat{I}_{or}}{I_{oc}}$$

1.3.2.2 Two-Path Case

According to Channel Simulator Configuration 1 and 5 (see 8.4.1.1), these two paths have the same average power ($\hat{I}_{or} = \hat{I}_{or1} + \hat{I}_{or2}$).

$$\text{Traffic}\frac{E_b}{N_t} = \text{Traffic\_Chip\_Bit} \cdot \frac{1}{\frac{I_{oc}}{\hat{I}_{or}} + \frac{1}{2}}$$

1.3.2.3 Three-Path Case

According to Channel Simulator Configuration 4 (see 8.4.1.1), the first two paths have the same average power and the third path has half the average power of the first one ($\hat{I}_{or} = \hat{I}_{or1} + \hat{I}_{or2} + \hat{I}_{or3}$).

$$\text{Traffic}\frac{E_b}{N_t} = \text{Traffic\_Chip\_Bit} \cdot \left(2 \cdot \frac{\frac{2}{5}}{\frac{I_{oc}}{\hat{I}_{or}} + \frac{3}{5}} + \frac{\frac{1}{5}}{\frac{I_{oc}}{\hat{I}_{or}} + \frac{4}{5}} \right)$$

1.4 Tolerances

1.4.1 xHRPD System Parameter Tolerances

xHRPD parameters are specified in [1]. All parameters indicated in all sections are exact unless an explicit tolerance is stated.

1.4.2 Measurement Tolerances

Unless otherwise specified, a measurement tolerance, including the tolerance of the measurement equipment, of ±10% is assumed.

Unless otherwise specified, the $\hat{I}_{or}/I_{oc}$ value shall be within ±0.1 dB of the value specified, and the I_{oc} value shall be within ±5 dB of the value specified.

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

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

2.3 Field-Strength Measurement

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

2.4 Frequency Range of Measurements

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

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

2.5 Test Ranges

2.5.1 30-Meter Test Range

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

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

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

2.5.2 3-Meter Test Range

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

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

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

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

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

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

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

2.6 Radiated Signal Measurement Procedures

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

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

3. Remove the equipment being tested and replace it with a half-wave antenna. The center of the half-wave antenna should be at the same approximate location as the center of the equipment being tested.

4. Feed the half-wave antenna replacing the equipment under test with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to the observed radiated signal, raise and lower the search antenna to obtain a maximum reading on the field-strength measuring meter. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. Record the signal generator power output.

5. Repeat step 4 above with both antennas vertically polarized.

6. Calculate the power into a reference ideal isotropic antenna by:

    a. First reducing the readings obtained in steps 4 and 5 above by the power loss in the cable between the generator and the source antenna, and

    b. Then correcting for the gain of the source antenna used relative to an ideal isotropic antenna. The reading thus obtained is the equivalent effective isotropic radiated power (EIRP) level for the spurious signal being measured.

7. Repeat steps 1 through 6 above for all observed signals from the equipment being tested.

3 PHYSICAL LAYER RECEIVER MINIMUM STANDARDS

3.1 Frequency Coverage Requirements

The access terminal shall meet the requirements in [7].

3.2 Demodulation Requirements

The access terminal receiver shall be capable of detecting the signal defined in [1].

3.2.1 Demodulation of Forward Traffic Channel in AWGN

3.2.1.1 Definition

The performance of the demodulation of Forward Traffic Channel in an AWGN (no fading or multipath) environment is determined by the packet error rate (PER). The PER is calculated for each individual data rate.

3.2.1.2 Method of Measurement

1. Connect the sector and the AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-4.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 3 through 18.
3. Set the access network's forward 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 shall be used. Set the access network’s Control Channel data rate to 38.4 kbps.
4. Set the *SetManagementSameChannelParameters* attribute fields of the Default Route Update Protocol to the values specified below:

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

5. Open a connection so that the Forward Traffic Channel rate corresponds to the rate of the test only.
6. Set the test parameters for Test 1 as specified in Table A.1.1.1-1.
7. From the number of 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.
8. Set the test parameters for Test 2 through 4 as specified in Table A.1.1.1-1 and repeat step 7.
9. Set the test parameters for Tests 5 through 6 as specified in Table A.1.1.1-2 and repeat step 7.

10. Set the test parameters for Tests 7 through 8 as specified in Table A.1.1.1-3 and repeat step 7.
11. Set the test parameters for Tests 9 through 11 as specified in Table A.1.1.1-4 and repeat step 7.
12. Set the test parameters for Tests 12 through 14 as specified in Table A.1.1.1-5 and repeat step 7.
13. Set the test parameters for Tests 15 through 18 as specified in Table A.1.1.1-6 and repeat step 7.
14. Change the SetManagementSameChannelParameters attribute fields of the Default Route Update Protocol to the value specified below:

Field	**Value (Hex)**
PilotDrop	0x20 (-16 dB)

15. Set the test parameters for Tests 19 through 21 as specified in Table A.1.1.1-7 and repeat step 7.
16. Set the test parameters for Tests 22 through 24 as specified in Table A.1.1.1-8 and repeat step 7.
17. Set the test parameters for Tests 25 through 27 as specified in Table A.1.1.1-9 and repeat step 7.
18. Set the test parameters for Tests 28 through 30 as specified in Table A.1.1.1-10 and repeat step 7.

3.2.1.3 . Minimum Standard

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.1.1.1-10.

The PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-1 and Table A.1.1.2-2 with 95% confidence.

The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-3 with 95% confidence.

The PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-4, Table A.1.1.2-5 and Table A.1.1.2-6 with 95% confidence. The PER should not exceed the piecewise linear PER curve specified by the points in Table A.1.1.2-7.

3.2.2 Demodulation of Forward Traffic Channel in Multipath Fading Channel

3.2.2.1 Definition

The performance of the demodulation of Forward Traffic Channel in multipath fading channel is determined by the packet error rate (PER). The PER is calculated for 38.4 kbps and 76.8 kbps data rates. The following table summarizes the fading tests to be performed:

Case	Channel Simulator Configuration Number
1	1
2	2
3	3
4	4
5	2
6	4
7	1
8	3

The above test cases test the demodulation performance by checking the PER at the 38.4 kbps and 76.8 kbps data rates.

Refer to 8.4.1.1 for the standard channel simulator configurations.

3.2.2.2 Method of Measurement

1. Connect the sector, the channel simulator and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-1.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 3 through 20.
3. Set the access network's forward packet activity to 100%. Set the access network's Control Channel data rate to 38.4 kbps.
4. Set the *SetManagementSameChannelParameters* attribute fields of the Default Route Update Protocol to the values specified below:

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

5. Open a connection so that the Forward Traffic Channel rate corresponds to the rate of the test only.
6. Set the test parameters for Test 1 as specified in Table A.1.2.1-1.
7. From the number of 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.
8. Set the test parameters for Tests 2 through 3 as specified in Table A.1.2.1-1 and repeat step 7.
9. Set the test parameters for Tests 4 through 6 as specified in Table A.1.2.1-2 and repeat step 7

10. Set the test parameters for Tests 7 through 9 as specified in Table A.1.2.1-3 and repeat step 7.

11. Set the test parameters for Tests 10 through 12 as specified in Table A.1.2.1-4 and repeat step 7.

12. Set the test parameters for Tests 13 through 15 as specified in Table A.1.2.1-5 and repeat step 7.

13. Set the test parameters for Tests 16 through 18 as specified in Table A.1.2.1-6 and repeat step 7.

14. Set the test parameters for Tests 19 through 21 as specified in Table A.1.2.1-7 and repeat step 7.

15. Set the test parameters for Tests 22 through 24 as specified in Table A.1.2.1-8 and repeat step 7.

16. Change the *SetManagementSameChannelParameters* attribute fields of the Default Route Update Protocol to the value specified below:

Field	Value (Hex)
PilotDrop	0x20 (-16 dB)

17. Set the test parameters for Tests 25 as specified in Table A.1.2.1-9 and repeat step 7.

18. Set the test parameters for Tests 26 as specified in Table A.1.2.1-10 and repeat step 7.

19. Set the test parameters for Tests 27 as specified in Table A.1.2.1-11 and repeat step 7.

20. Set the test parameters for Tests 28 as specified in Table A.1.2.1-12 and repeat step 7.

3.2.2.3 Minimum Standard

The actual power uncertainty due to fading shall be less than or equal to 0.2 dB (see 8.8.2) with the minimum test duration meeting the requirements specified in Table 8.8.2-1. Test durations must be sufficient to meet confidence level requirements.

A minimum confidence level of 95% shall be obtained for the following PER requirements (see 8.8).

The actual E_b/N_t used in each test shall be within ±0.5 dB of the value indicated in each test.

The PER for each test shall not exceed the piece-wise linear PER curve specified by the points in Table A.1.2.2-1 to Table A.1.2.2-4.

The PER for each test shall not exceed the corresponding piece-wise linear PER curve specified by the points in Table A.1.2.2-5 to Table A.1.2.2-8.

3.2.3 Decision of Power Control Bit

3.2.3.1 Definition

This test verifies the access terminal's response to the power control commands.

3.2.3.2 Method of Measurement

1. Connect one sector to the access terminal antenna connector as shown in Figure 8.5.1-1. The AWGN generator is not applicable in this test. The Forward Channel has an arbitrary pilot PN offset index P_1, and is called Channel 1.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 7.
3. Open a connection so that the Reverse Data Channel transmit format is (1,4,192) .
4. Set the test parameters as specified in the table below.

Parameter	**Units**	**Channel 1**
$\hat{I}_{or}$	dBm/1.23 MHz	-55
Channel Simulator Configuration	-	5

5. Send a *TrafficChannelAssignment Message* to the access terminal, specifying the pilot P_1 in the Active Set:
6. After waiting a minimum of 2 sec, begin sending an alternating pattern of one '0' power control bit followed by one '1' power control bit on Channel 1.
7. Measure the output power at the access terminal antenna connector for at least 480 slots (800 ms) for each trial. Perform at least 11 trials.

3.2.3.3 Minimum Standard

In 90% of the trials (each with at least 480 slots), the access terminal output power, measured at the access terminal antenna connector, shall follow the power control bit pattern of alternating '0' and '1' sent on Channel 1.

3.2.4 Decision of Frequency Control Bit

3.2.4.1 Definition

This test verifies the access terminal's response to the frequency control commands.

3.2.4.2 Method of Measurement

1. Connect one sector to the access terminal antenna connector as shown in Figure 8.5.1-1. The AWGN generator is not applicable in this test. The Forward Channel from the sector has an arbitrary pilot PN offset index P_1, and is called Channel 1.

2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 7.
3. Open a connection so that the Reverse Data Channel transmit format is (1,4,192).
4. Set the test parameters as specified in the table below.

Parameter	**Units**	**Channel 1**
$\hat{I}_{or}$	dBm/1.23 MHz	-55
Channel Simulator Configuration	-	5

5. Send a *TrafficChannelAssignment Message* to the access terminal, specifying the pilot P_1 in the Active Set:
6. After waiting a minimum of 2 sec, begin sending an alternating pattern of 200 '0' frequency control bit followed by 200 '1' frequency control bit on Channel 1.
7. Measure the output frequency at the access terminal output for at least 96000 slots (160 s) for each trial. Perform at least 11 trials.

3.2.4.3 Minimum Standard

In 90% of the trials (each with at least 96000 slots), the access terminal output frequency shall follow the frequency control bit pattern of alternating ten '0' and ten '1' sent on Channel 1.

3.2.5 Demodulation of Broadcast Channel

This test only applies to access terminals that support broadcast-multicast packet data service.

3.2.5.1 Definition

The performance of the Broadcast Channel in AWGN and fading environment is determined by the packet error rate (PER) after turbo and Reed-Solomon decoding.

The following table summarizes the tests to be performed:

Case	**Channel Simulator Configuration Number**
1	AWGN
2, 4	4
3, 5	2

3.2.5.2 Method of Measurement

1. Connect the sector, the channel simulator and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-1. The channel simulator does not apply for Case 1.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 23.
3. Set the access network's Synchronous Control Channel data rate to 38.4 kbps which is to be transmitted in interlace 0. Set the access network equipment's forward packet activity to 100%. Set the access terminal's serving rate to 100% in the multiplex-interlace combinations specified below.
4. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 5 to 13.
5. Send a BroadcastOverhead Message to the access terminal, specifying the following field:

Field	**Value**
MultiplexCount	0 (4)
MACPacketsPerECBRow	0

   Also, set the value of OuterCode for each test to the corresponding value specified in Table A.1.3.1-1 and Table A.1.3.1-2.

6. The burst length of all interlace-multiplex pairs shall be 3 slots.
7. Set the test parameters for Test 1 as specified in Table A.1.3.1-1. The broadcast logical channel for this user shall be carried on all interlace-multiplex combinations for interlaces 1, 2 and 3.
8. From the number of packets transmitted and the number of bad packets received, calculate the PER for the test.
9. Set the test parameters for Test 2 as specified in Table A.1.3.1-1. The broadcast logical channel for this user shall be carried on all interlace-multiplex combinations for interlaces 1, 2 and 3. Repeat step 8.
10. Set the test parameters for Test 3 as specified in Table A.1.3.1-1. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,0), (1,1), (1,2), (1,3), (2,0), (2,1) (2,2), (3,0) and (3,1). Repeat step 88.
11. Set the test parameters for Test 4 as specified in Table A.1.3.1-1. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,0), (1,1), (1,2), (1,3), (2,0), (2,1), (2,2), (3,0) and (3,1). Repeat step 88.
12. Set the test parameters for Test 5 as specified in Table A.1.3.1-2. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,1), (1,2), (2,2), (2,3), (3,2) and (3,3). Repeat step 88.

13. Set the test parameters for Test 6 as specified in Table A.1.3.1-2. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,1), (1,2), (2,2), (2,3), (3,2) and (3,3). Repeat step 8.

14. Connect two sectors to the access terminal antenna connector as shown in Figure 8.5.1-3. The Forward Channel from sector 1 has an arbitrary pilot PN offset index called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, and is called Channel 2.

15. For each band class that the terminal supports, configure the access terminal to operate in that band class and perform steps 16 to 21.

16. Send a BroadcastOverhead Message to the access terminal, specifying the following field:

Field	**Value**
MultiplexCount	0 (4)
MACPacketsPerECBRow	0

Also, set the value of OuterCode for each test to the corresponding value specified in Table A.1.3.1-3 and Table A.1.3.1-4.

17. The burst length of all interlace-multiplex pairs shall be 3 slots.

18. Set the test parameters for Test 7 as specified in Table A.1.3.1-3. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,0), (1,1), (2,0), (2,1), (3,0) and (3,1). Repeat step 8.

19. Set the test parameters for Test 8 as specified in Table A.1.3.1-3. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,0), (1,1), (2,0), (2,1), (3,0) and (3,1). Repeat step 88.

20. Set the test parameters for Test 9 as specified in Table A.1.3.1-4. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,2), (1,3), (2,2), (2,3), (3,2) and (3,3). Repeat step 88.

21. Set the test parameters for Test 10 as specified in Table A.1.3.1-4. The broadcast logical channel for this user shall be carried on the following interlace-multiplex combinations: (1,2), (1,3), (2,2), (2,3), (3,2) and (3,3). Repeat step 8.

3.2.5.3 Minimum Standard

A minimum confidence level of 95% shall be obtained for the following PER requirements (see 8.8).

The actual E_b/N_t used in each test of Case 1 shall be within ±0.2 dB of the value indicated in Table A.1.3.1-1.

The PER shall not exceed the piecewise linear PER curve specified by the points in Table A.1.3.2-1 with 95% confidence.

The actual power uncertainty due to fading shall be less than or equal to 0.2 dB (see 8.8.2) with the minimum test duration meeting the requirements specified in Table 8.8.2-1. Test durations must be sufficient to meet confidence level requirements.

The actual E_b/N_t used in each test in Cases 2 to 5 shall be within ±0.5 dB of the value indicated in the corresponding entry in Table A.1.3.1-2 to Table A.1.3.1-4.

The PER shall not exceed the corresponding piecewise linear PER curve specified by the points in Table A.1.3.2-2 to Table A.1.3.2-5 with 95% confidence.

3.3 Receiver Performance

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) does not exceed a specified value. The receiver dynamic range is the input power range at the access terminal antenna connector over which the PER does not exceed a specific value.

3.3.1.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 3 through 9.
3. Open a connection so that the Forward Traffic Channel rate corresponds to the one specified in Table 3.3.1.2-1 for Test 1.
4. Set the test parameters for Test 1 as specified in Table 3.3.1.2-1.
5. From the number of packets transmitted and the number of bad packets received, calculate the PER for this test.
6. Open a connection so that the Forward Traffic Channel rate corresponds to the one specified in Table 3.3.1.2-1 for Test 2.
7. Set the test parameters for Test 2 as specified in Table 3.3.1.2-1 and repeat step 5.
8. Open a connection so that the Forward Traffic Channel rate corresponds to the one specified in Table 3.3.1.2-1 for Test 3.
9. Set the test parameters for Test 3 as specified in Table 3.3.1.2-1 and repeat step 5.

Table 3.3.1.2-1. Test Parameters for Receiver Sensitivity and Dynamic Range

Parameter	Units	Test 1	Test 2	Test 3
$\hat{I}_{or}$	dBm/1.23 MHz	-105.5	-25 or -75[1]	-25 or -75[1]
Forward Traffic Channel Data Rate	kbps	307.2	307.2	2,457.6
	slots/packet	2	2	1

3.3.1.3 Minimum Standard

The PER in 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 (see 8.8).

3.3.2 Single Tone Desensitization

3.3.2.1 Definition

The single tone desensitization is a measure of a receiver's ability to receive a xHRPD signal at its assigned channel frequency in the presence of a single tone spaced at a given frequency offset from the center frequency of the assigned channel. The receiver desensitization performance is measured by the packet error rate (PER).

3.3.2.2 Method of Measurement

1. Connect the sector and an interfering jammer to the access terminal antenna connector as shown in Figure 8.5.1-4. The GMSK tone is modulated as defined in [9].
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 3 through 7.
3. Open a connection so that the Forward Traffic Channel rate corresponds to the 2-slot version of 307.2 kbps.
4. Set the test parameters for Test 1 as specified in Table 3.3.2.2-1 and perform steps 6 and 7. Repeat for Test 5, Test 7 using the parameters as specified in Table 3.3.2.2-1 and perform steps 6 and 7.
5. Set the test parameters for Test 2 as specified in Table 3.3.2.2-1 and perform steps 6 and 7. Repeat for Test 6, Test 8 using the parameters in Table 3.3.2.2-1 and perform steps 6 and 7.
6. Use closed loop power control commands to adjust the access terminal transmit power, as measured at the access terminal antenna connector, to +20 dBm.

[1] Use -25 dBm/1.23 MHz for terrestrial operating environment and -75 dBm/1.23 MHz for satellite operating environment

7. From the number of packets transmitted and the number of bad packets received calculate the PER for this test.

Table 3.3.2.2-1. Test Parameters for Single Tone Desensitization

Parameter	Units	Tests 1, 5, 7	Tests 2, 6, 8
Jammer Offset from Carrier	kHz	+1250 (Test 1) +5000 (Test 5) +10000 (Test 7)	-1250 (Test 2) -5000 (Test 6) -10000 (Test 8)
Jammer Power	dBm	-45 GMSK (Tests 1) -38 GMSK (Tests 5 and 6) -30 GMSK (Tests 7 and 8)	
$\hat{I}_{or}$	dBm/ 1.23 MHz	-95.4	

Note: Positive tone offset is defined as the offset from the center frequency of the highest carrier. Negative tone offset is defined as the offset from the center frequency of the lowest carrier.

3.3.2.3 Minimum Standard

The PER for each test shall not exceed 1.0% with 95% confidence (see 8.8).

3.3.3 Intermodulation Spurious Response Attenuation

This test shall be performed for each xHRPD band class supported by the access terminal.

3.3.3.1 Definition

The intermodulation spurious response attenuation is a measure of a receiver's ability to receive a xHRPD signal on its assigned channel frequency in the presence of two interfering jammers. These jammers are separated from the assigned channel frequency and are separated from each other such that the third order mixing of the two interfering jammers can occur in the non-linear elements of the receiver, producing an interfering signal in the band of the desired signal. The receiver performance is measured by the packet error rate (PER).

3.3.3.2 Method of Measurement

1. Connect the sector and two interfering jammers to the access terminal antenna connector as shown in Figure 8.5.1-4. The GMSK jammer is modulated as defined in [9]. The HRPD or xHRPD interference shall be a signal modulated with a combination of Pilot, MAC and Traffic Channels. For all tests, use closed loop power control commands to adjust the access terminal transmit power, as measured at the access terminal antenna connector, to +20 dBm.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 8.

3. Open a connection so that the Forward Traffic Channel rate corresponds to the 2-slot version of 307.2 kbps.
4. Set the test parameters for Test 1 as specified in Table 3.3.3.2-1 and perform step 8.
5. Set the test parameters for Test 2 as specified in Table 3.3.3.2-1 and perform step 8.
6. Set the test parameters for Test 3 as specified in Table 3.3.3.2-2 and perform step 8.
7. Set the test parameters for Test 4 as specified in Table 3.3.3.2-2 and perform step 8.
8. From the number of packets transmitted and the number of bad packets received calculate the PER for this test.

Table 3.3.3.2-1. Test Parameters for Intermodulation Spurious Response Attenuation (Tests 1 and 2)

		Access terminal Class I		Access terminal Class II through Class V	
Parameter	**Units**	**Test 1**	**Test 2**	**Test 1**	**Test 2**
Jammer 1 Offset from Carrier	MHz	+1.27	-1.27	+1.27	-1.27
Jammer 1 Power (GMSK)	dBm	-44		-44	
Jammer 2 Offset from Carrier	MHz	+2.64	-2.64	+2.64	-2.64
Jammer 2 Power (CW Tone)	dBm	-44		-44	
$\hat{I}_{or}$	dBm/1.23 MHz	-95.4		-95.4	

Table 3.3.3.2-2. Test Parameters for Intermodulation Spurious Response Attenuation (Tests 3 and 4)

Parameter	Units	Access terminal Class I		Access terminal Class II through Class V	
		Test 3	Test 4	Test 3	Test 4
Jammer 1 Offset from Carrier	MHz	+2.5	-2.5	+2.5	-2.5
Jammer 1 Power (CW Tone)	dBm	-46		-46	
Jammer 2 Offset from Carrier	MHz	+4.9	-4.9	+4.9	-4.9
Jammer 2 Power (HRPD or xHRPD Signal)	dBm	-46		-46	
$\hat{I}_{or}$	dBm/1.23 MHz	-102.4		-102.4	

3.3.3.3 Minimum Standard

The PER in Tests 1 and 2 shall not exceed 1.0% with 95% confidence (see 8.8).

The PER in Tests 3 and 4 should not exceed 1.0% with 95% confidence (see 8.8).

3.3.4 Adjacent Channel Selectivity

3.3.4.1 Definition

The adjacent channel selectivity is a measure of the ability to receive a xHRPD signal on the assigned frequency in the presence of another xHRPD, HRPD or CDMA signal that is offset from the center frequency of the assigned channel.

3.3.4.2 Method of Measurement

1. Connect the sector and an interfering HRPD or xHRPD signal to the access terminal antenna connector as shown in Figure 8.5.1-5. For all tests, use closed loop power control commands to adjust the access terminal transmit power, as measured at the access terminal antenna connector, to +20 dBm.
2. For each xHRPD band class that the access terminal supports, configure the access network to operate in that band class and perform steps 3 through 8.
3. Open a connection so that the Forward Traffic Channel rate corresponds to the 2-slot version of 307.2 kbps.
4. Set the test parameters for Test 1 as specified in Table 3.3.4.2-1 and perform step 6.
5. Set the test parameters for Test 2 as specified in Table 3.3.4.2-1 and perform step 6.
6. From the number of packets transmitted and the number of bad packets received calculate the PER for this test.

7. Connect the sector and an interfering CDMA signal to the access terminal antenna connector as shown in Figure 8.5.1-5.

8. Repeat steps 2 through 6

Table 3.3.4.2-1. Test Parameters for Adjacent Channel Selectivity (Tests 1 and 2)

Parameter	Units	Test 1	Test 2
Adjacent HRPD Channel or CDMA Channel Offset from Carrier	MHz	+1.5	-1.5
Adjacent HRPD Channel or CDMA Channel Power	dBm	-52	
$\hat{I}_{or}$	dBm/1.23 MHz	-91.4	

3.3.4.3 Minimum Standard

The PER in each test shall not exceed 1.0% with 95% confidence (see 8.8).

3.3.5 Receiver Blocking Characteristics

3.3.5.1 Definition

The receiver blocking characteristic is a measure of the receiver's ability to receive a xHRPD signal at its assigned channel frequency in the presence of a single tone on frequencies other than those of the adjacent channels, without unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit.

3.3.5.2 Method of Measurement

1. Connect the sector and an interfering CW tone to the access terminal connector as shown in Figure 8.5.1-4.
2. Configure the access network to operate in supported Band Class.
3. Open a connection so that the Forward Traffic Channel rate corresponds to the 2-slot version of 307.2 kbps.
4. Set the test parameters for Test 1 as specified in Table 3.3.5.2-1 and perform steps 7 and 8 using the Default CW Tone Power.
5. Set the test parameters for Test 2 as specified in Table 3.3.5.2-1 and perform steps 7 and 8 using the Default CW Tone Power.
6. Set the test parameters for Test 3 as specified in Table 3.3.5.2-1 and perform steps 7 and 8 using the Default CW Tone Power.
7. Step the CW tone frequency through each inclusive range of frequencies given for the current test in Table 3.3.5.2-1 at 1 MHz intervals and perform step 8.
8. From the number of packets transmitted and the number of bad packets received calculate the PER for this test.

9. If spurious responses occurred in Tests 2 or 3 repeat step 7 and perform step 8 for each spurious response frequency using the Alternate CW Tone Power given in Table 3.3.5.2-1.

Table 3.3.5.2-1. Test Parameters for Receiver Blocking Characteristics (Out-Of-Band)

Parameter	Units	Test 1	Test 2	Test 3
CW Tone Frequency for BC 21 operation	MHz	2121 – 2165 2215 – 2260	2096 – 2120 2261 – 2285	1 – 2095 2286 – 12750
CW Tone Frequency for BC 20 operation	MHz	1466 - 1510 1574 - 1619	1441 - 1465 1620-1644	1 - 1440 1645-12750
Default CW Tone Power	dBm	-44	-30	-15
Alternate CW Tone Power	dBm	-	-44	-44
$\hat{I}_{or}$	dBm/ 1.23 MHz	-102.4		

3.3.5.3 Minimum Standards

The PER in Test 1 shall not exceed 10% with 90% confidence (see 8.8.1). With up to a combined total between Tests 2 and 3 of twenty-four (24) exceptions at spurious response frequencies, the PER in Tests 2 and 3 shall not exceed 10% with 90% confidence (see 8.8.1). For each spurious response exception, the PER shall not exceed 10% with 90% confidence (see 8.8.1) when using the Alternate CW Tone Power for interference at the one or more spurious response frequencies.

3.4 Limitations on Emissions

3.4.1 Conducted Spurious Emissions

3.4.1.1 Definition

The conducted spurious emissions are spurious emissions generated or amplified in a receiver that appear at the access terminal antenna connector.

3.4.1.2 Method of Measurement

1. Connect a spectrum analyzer (or other suitable test equipment) to the access terminal antenna connector.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band and perform steps 3 and 4.
3. Enable the access terminal receiver, so that the access terminal continuously cycles between the *System Determination State* and the *Pilot Acquisition State* of the Default

Initialization State Protocol. Since there is no Forward Channel, the access terminal should not pass the *Pilot Acquisition Substate*.

4. Sweep the spectrum analyzer over a frequency range from the lowest intermediate frequency or lowest oscillator frequency used in the receiver or 1 MHz, whichever is lowest, to at least 6 GHz, and measure the spurious emission levels.

3.4.1.3 Minimum Standard

The mean conducted spurious emissions with ten or more averages for an access terminal shall be:

(a) Less than –76 dBm, measured in a 1 MHz resolution bandwidth at the access terminal antenna connector, for frequencies within the access terminal receive band associated with each xHRPD band class that the access terminal supports.

(b) Less than -61 dBm, measured in a 1 MHz resolution bandwidth at the access terminal antenna connector, for frequencies within the access terminal transmit band associated with each xHRPD band class that the access terminal supports.

(c) Less than -47 dBm, measured in a 30 kHz resolution bandwidth at the access terminal antenna connector, for all other frequencies.

3.4.2 Radiated Spurious Emissions

3.4.2.1 Definition

The radiated spurious emissions are those spurious emissions generated or amplified in a receiver and radiated by the antenna, housing and all power, control, and audio leads connected to the receiver.

3.4.2.2 Method of Measurement

1. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 2 and 3.
2. Enable the access terminal receiver, so that the access terminal continuously cycles between the *System Determination State* and the *Pilot Acquisition State* of the Default Initialization State Protocol. Since there is no Forward Channel, the access terminal should not pass the *Pilot Acquisition Substate*.
3. Use the measurement procedure defined in Section 2 to measure the radiated spurious emissions of the access terminal receiver.

3.4.2.3 Minimum Standard

The mean radiated spurious power levels from the receiver, when measured using the procedure in Section 2, shall not exceed the levels specified in Table 3.4.2.3-1.

Table 3.4.2.3-1. Maximum Allowable Radiated Spurious Emissions

Frequency Range	Maximum Allowable EIRP
30 to 88 MHz	-55 dBm
88 to 216 MHz	-52 dBm
216 to 960 MHz	-49 dBm
960 to 10 GHz	-41 dBm

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4 PHYSICAL LAYER TRANSMITTER MINIMUM STANDARDS

4.1 Frequency Requirements

4.1.1 Frequency Coverage

The frequencies supported shall be as specified in [7].

4.1.2 Frequency Accuracy

4.1.2.1 Definition

The frequency accuracy is the ability of an access terminal transmitter to transmit at an assigned carrier frequency.

4.1.2.2 Method of Measurement

The method of measurement specified in 4.2.2.2 may be used to perform this test.

4.1.2.3 Minimum Standard

The access terminal output carrier frequency while transmitting shall be within ±150 Hz of assigned reverse link frequency in static channel without frequency pre-correction.

4.2 Modulation Requirements

4.2.1 Time Reference

4.2.1.1 Definition

The access terminal time reference is derived from the earliest arriving multipath component being used for demodulation. When receiving the Forward Traffic Channel, the access terminal time reference shall be used as the transmit time of the Reverse Traffic Channel. This test checks the accuracy of the access terminal time reference in static conditions.

4.2.1.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 6.
3. Open a connection so that the Reverse Data Channel transmit format is (1,4,192) .
4. Set $\hat{I}_{or}$ to –75 dBm/1.23 MHz.
5. Determine the access terminal transmit time error at the access terminal antenna connector using the ρ-meter described in 8.4.2.1.
6. Repeat steps 3 through 5 for Reverse Data Channel transmit format (2,4,192).

4.2.1.3 Minimum Standard

The access terminal time reference in steady state conditions shall be within ±22.5 μs of the time of occurrence, as measured at the access terminal antenna connector, of the earliest arriving multipath component being used for demodulation.

4.2.2 Waveform Quality and Frequency Accuracy

4.2.2.1 Definition

The waveform quality factor, $\rho_{Overall}$ (see 8.4.2.1), is measured in this test. The measurement also returns values for $\Delta\hat{f}$ and $\hat{\tau}$, which are used to provide estimates of carrier frequency offset and transmit time offset, respectively.

4.2.2.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 3 through 6.
3. Open a connection so that the Reverse Data Channel transmit format is (1,4,192) . .
4. Set $\hat{I}_{or}$ to –75 dBm/1.23 MHz.
5. Measure the waveform quality factor, $\rho_{Overall}$, frequency error, $\Delta\hat{f}$, and transmit time error, $\hat{\tau}$, at the access terminal antenna connector using the ρ-meter described in 8.4.2.1.
6. Repeat steps 3 through 5 for Reverse Data Channel transmit format (2,4,192).

4.2.2.3 Minimum Standard

The waveform quality factor, $\rho_{Overall}$, shall be greater than 0.97 (excess power is less than 0.13 dB). The frequency error, $\Delta\hat{f}$, shall be within ±150 Hz. The transmit time error, $\hat{\tau}$, shall be within ±22.5 μs.

4.3 RF Output Power Requirements

4.3.1 Range of Closed Loop Power Control

4.3.1.1 Definition

The access terminal provides a closed loop adjustment to its open loop estimate. Adjustments are made in response to the received power control bits. The range of the adjustment is defined by the difference between the maximum access terminal output power and the open loop estimate, and the difference between the minimum access terminal output power and the open loop estimate.

4.3.1.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 21.
3. The default value for power control step size is 0.5 dB as specified in the Default Reverse Traffic Channel MAC Protocol section of [1].
4. Perform steps 5 to 9.
5. Open a connection so that the Reverse Data Channel transmit format is (1,4,192).
6. Set the attenuation in the Forward Channel to yield an open loop output power, measured at the access terminal antenna connector, of -15 dBm (Test 1) and perform steps 8 and 9.
7. Set the attenuation in the Forward Channel to yield an open loop output power, measured at the access terminal antenna connector, of 4 dB below the lower limit for the Band Class and Access Terminal class as shown in Table 4.3.2.3-1 for the AT under test (Test 2) and perform steps 8 and 9.
8. Transmit alternating ‘0’ and ‘1’ power control bits (the last bit is a ‘1’ bit), followed by 120 consecutive ‘0’ power control bits, followed by 120 consecutive ‘1’ power control bits, and followed by 120 consecutive ‘0’ power control bits.
9. Measure the access terminal output power.

4.3.1.3 Minimum Standard

The average rate of change in mean output power requirement specified below applies to access terminal output power up to 3 dB below the lower limit of the maximum output power specified in Table 4.3.2.3-1.

Tests 1:

(a) The closed loop power control range shall be at least ±24 dB around the open loop estimate.

(b) The interval from the end of the first ‘1’ power control bit after the 120 consecutive ‘0’ power control bits to the time the access terminal output power starts to decrease shall be no longer than 40 ms.

(c) The average rate of change in mean output power shall be greater than 12 dB per 640 ms and less than 18 dB per 640 ms.

Test 2:

(a) The interval from the end of the first ‘1’ power control bit after the 120 consecutive ‘0’ power control bits to the time the access terminal output power starts to decrease shall be no longer than 40 ms.

4.3.2 Maximum RF Output Power

4.3.2.1 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.

4.3.2.2 Method of Measurement

1. Configure all of the open loop parameters to their maximum settings. Set the following parameters of the *AccessParameters Message* as specified below:

Parameter	**Value (Decimal)**
OpenLoopAdjust	84 (-84 dB)
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

2. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
3. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 4 through 7.
4. Open a connection so that the Reverse Data Channel transmit format is (1,4,192) . Configure the Test Application FETAP so that the Forward Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps.
5. Set $\hat{I}_{or}$ to -85 dBm/1.23 MHz.
6. Send continuously '0' power control bits to the access terminal.
7. Measure the mean access terminal output power at the access terminal antenna connector.

4.3.2.3 Minimum Standard

The maximum output power of each access terminal class shall be such that the maximum radiated power for the access terminal class using the antenna gain recommended by the access terminal manufacturer is within the limits specified in Table 4.3.2.3-1. The antenna gain is determined using the Radiated Signal Measurement Procedures (see 2.6) and calculating the antenna gain for EIRP or ERP as appropriate.

Table 4.3.2.3-1. Effective Radiated Power at Maximum Output Power

Band Class	Access Terminal Class	Radiating Measurement	Lower Limit	Upper Limit
20 and 21	Class I	EIRP	15 dBW (32W)	18 dBW (63W)
	Class II	EIRP	-7 dBW (0.2 W)	0 dBW (1.0 W)
	Class III	EIRP	-4 dBW (0.4W)	7 dBW (5W)
	Class IV	EIRP	7 dBW (5W)	11dBW (13W)
	Class V	EIRP	-14 dBW (0.04W)	-7 dBW (0.2W)

4.3.3 Minimum Controlled Output Power

4.3.3.1 Definition

The minimum controlled output power of the access terminal is the output power, measured at the access terminal antenna connector, when both closed loop and open loop power control indicate minimum output.

4.3.3.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 5.
3. Open a connection so that the Reverse Data Channel transmit format is (1,4,192) .
4. Set $\hat{I}_{or}$ to –75 dBm/1.23 MHz.
5. Send continuously '1' power control bits to the access terminal.

4.3.3.3 Minimum Standard

With both closed loop and open loop power control set to minimum, the mean output power of the access terminal shall be less than –50 dBm/1.23 MHz centered at the CDMA Channel frequency.

4.3.4 Standby Output Power

4.3.4.1 Definition

The standby output power is the access terminal output power when its transmit functions are disabled, e.g., during the *Initialization State* or during the *Idle State* of the Default Air-Link Management Protocol.

4.3.4.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 5.
3. Measure the output power, at the access terminal antenna connector, during the *Initialization State* or during the *Idle State* of the Default Air-Link Management Protocol.
4. Set $\hat{I}_{or}$ to –75 dBm/1.23 MHz.
5. Send a page to the access terminal and measure the output power, at the access terminal antenna connector, during the time periods between transmission of access probes.

4.3.4.3 Minimum Standard

When the transmitter is disabled, the output noise power spectral density of the access terminal shall be less than -61 dBm, measured in a 1 MHz resolution bandwidth at the access terminal antenna connector, for frequencies within the access terminal transmit band.

4.4 Limitations on Emissions

4.4.1 Conducted Spurious Emissions

4.4.1.1 Definition

The conducted spurious emissions are emissions at frequencies that are outside the assigned Channel, measured at the access terminal antenna connector. This test measures the spurious emissions during continuous transmission.

4.4.1.2 Method of Measurement

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

Parameter	**Value (Decimal)**
OpenLoopAdjust	84 (-84 dB)
ProbeInitialAdjust	15 (15 dB)
PowerStep	15 (7.5 dB/step)

2. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. 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.
3. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class. Perform steps 4 through 8.

4. Open a connection so that the Reverse Data Channel transmit format is (1,1,192) and the Forward Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps.
5. Set $\hat{I}_{or}$ to -85 dBm/1.23 MHz.
6. Send continuously '0' power control bits to the access terminal.
7. Measure the spurious emission levels.
8. Open a connection so that the Reverse Data Channel transmit format is (2,1,768) and the Forward Traffic Channel data rate corresponds to the 2-slot version of 307.2 kbps. Repeat steps 5 to 7.

4.4.1.3 Minimum Standard

The spurious emissions in the mobile station's receive band shall be less than -76 dBm measured in a 1 MHz resolution bandwidth.

When transmitting in Band Classes 20, the spurious emissions with ten or more averages shall be less than the limits specified in Table 4.4.1.3-1.

Table 4.4.1.3-1. Band Classes 20 Transmitter Spurious Emission Limits

Frequency Band	Emission Limit
1559 to 1605 MHz	-40 dBm/MHz
1605 to 1612.5 MHz	-40 to -28.5 dBm/MHz[2]
1612.5 to 1616.5 MHz	-25 to -20 dBm/MHz[2]
1616.5 to 1621.5 MHz	-20 to -16 dBm/MHz[2]
1621.5 to 1624.5 MHz	-30 dBm/30 KHz
1624.5 to 1625 MHz	-30 to -27.5 dBm/30 KHz[2]
1662.5 to 1665.5 MHz	-30 dBm/30 KHz
1665.5 to 1670.5 MHz	-30 dBm/100KHz
1670.5 to 1680.5 MHz	-30 dBm/300KHz
1680.5 to 1690.5 MHz	-30 dBm/1MHz
1690.5 to 2250 MHz	-30 dBm/3MHz

When transmitting in Band Class 21, the spurious emissions with ten or more averages shall be less than -13 dBm/MHz for frequencies greater than 2020 MHz. Additionally,

[2] Linearly interpolated in dBm vs. Frequency

when transmitting in band 2000 to 2010 MHz, the spurious emission in band 2010 to 2020 MHz shall be less than -13 dBm/MHz and vice-versa.

Table 4.4.1.3-2. Band Classes 21 Transmitter Spurious Emission Limits

Frequency Band	Emission Limit
2000 MHz - 2010 MHz	Less than -13 dBm/MHz
2010 MHz - 2020 MHz	Less than -13 dBm/MHz
>2020 MHz	Less than -13 dBm/MHz

Current region-specific radio regulation rules shall also apply.

4.4.2 Radiated Spurious Emissions

Current region-specific radio regulation rules shall apply.

A Band Class 20 (L-band) access terminal operating under US regional requirements shall limit mean radiated spurious wideband emissions to less than –60 dBW/MHz in the GPS band from 1559 to 1605 MHz and linear interpolation from -60 dBW/MHz to -36 dBW/MHz from 1605 to 1610 MHz. The narrowband emmission (discrete emission of less than 700 Hz bandwidth) shall be limited to less than -70 dBW from 1559 to 1605 MHz and linear interpolation from -70 dBW to -46 dBW from 1605 to 1610 MHz.

The out-of-band emission from an access terminal operating in BC 20 (L-band) shall be limited to -37 dBm/4kHz at 1 MHz offset from the edge of the band.

A Band Class 21 (S-band) access terminal operating under US regional requirements shall limit mean radiated spurious wideband emissions to less than –70 dBW/MHz in the GPS band from 1559 to 1610 MHz. The narrowband emmission (discrete emission of less than 700 Hz bandwidth) shall be limited to less than -80 dBW from 1559 to 1610 MHz.

5 MAC LAYER MINIMUM STANDARDS

5.1 Control Channel Supervision

5.1.1 Definition

When entering the *Active State* of the Default Control Channel MAC Protocol described in [1], the access terminal sets the Control Channel supervision timer for $T_{CCMPSupervision}$. If a Control Channel capsule is received while the timer is active, the timer is reset and restarted. If the timer expires the protocol returns a *SupervisionFailed* indication and disables the timer.

This Default Control Channel MAC Protocol's *SupervisionFailed* indication is received by the Default Air-Link Management Protocol of the Connection layer. Upon the reception of a *ControlChannelMAC.SupervisionFailed* indication, the Default Air-Link Management Protocol proceeds as follows:

If the access terminal is in the *Idle State* of the Default Air-Link Management Protocol, it deactivates the Access Channel MAC and transitions to the *Initialization State*.

If the access terminal is in the *Connected State*, of the Default Air-Link Management Protocol, it closes the current connection and transitions to the *Idle State*.

Test 1 verifies that when the access terminal is in the *Idle State* of the Default Air-Link Management Protocol, and the timer $T_{CCMPSupervision}$ expires, the access terminal stops sending access probes.

Test 2 verifies that when the access terminal is in the *Connected State* of the Default Air-Link Management Protocol and the timer $T_{CCMPSupervision}$ expires, the access terminal disables the Reverse Traffic Channel.

5.1.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 11.
3. Set $\hat{I}_{or}$ to –75 dBm.
4. Set the access network to ignore all access attempts.
5. Set the parameter ProbeNumStep to 15 (15 probes/sequence) in the *AccessParameters Message.*
6. Send a page to the access terminal.
7. Wait for at least two seconds and disable the Control Channel right after a Control Channel capsule has been sent.
8. Monitor the access terminal's output power. (Test 1)
9. Open a connection.

10. Wait for at least two seconds and disable the Control Channel right after a Control Channel capsule has been sent.

11. Monitor the access terminal's output power. (Test 2)

5.1.3 Minimum Standard

For Test 1, the access terminal shall transmit access attempts as a response to the page. The access terminal shall stop transmitting access probes between $T_{CCMPSupervision} \times 0.4267$, and $T_{CCMPSupervision} \times 0.4267 + 0.04$ seconds after the Control Channel is disabled.

For Test 2, the access terminal shall disable the Reverse Traffic Channel transmitter between $T_{CCMPSupervision} \times 0.4267$, and $T_{CCMPSupervision} \times 0.4267 + 0.04$ seconds after the Control channel is disabled.

5.2 Data Rate Control Performance

5.2.1 Definition

In the *Variable Rate State* of the Forward Traffic Channel MAC Protocol, the access network transmits at a variable rate, as a function of the access terminal's CQI.

The following table summarizes the tests to be performed:

Test	Channel Simulator Configuration Number
1	N/A (AWGN)

The average throughput and the Forward Traffic Channel PER determine the performance of the data rate control.

Refer to 8.4.1.1 for the standard channel simulator configurations.

5.2.2 Method of Measurement

1. Connect the sector, the channel simulator and an AWGN generator to the access terminal as shown in Figure 8.5.1-1. The channel simulator is not applicable in Test 1.

2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 8.

3. Set the access network’s Control Channel data rate to 38.4 kbps.

4. Set the access network's forward packet activity to 100%. Set the serving rate of the access terminal under test to 100% (all Forward Traffic Channel packets are directed to the access terminal under test).

5. Set one way path delay to 250 ms.

6. Open a connection in the variable rate mode. Set CQIPeriod = 20 (400 ms) and MaxPathDelay = 90 (600 ms).

7. Set the test parameters for Test 1 as specified in Table 5.2.2-1. .
8. Calculate the Forward Traffic Channel throughput and PER. The duration of the test is of at least 10,000 transmitted packets.

Table 5.2.2-1. Test Parameters for CQI Performance (Part 1 of 2)

Parameter	Units	Test 1
$\hat{I}_{or} / I_{oc}$	dB	1.3
I_{oc}	dBm/1.23 MHz	-56.3
Channel Simulator Configuration	N/A	N/A

5.2.3 Minimum Standard

The PER for all the tests shall not exceed 2% with 95% confidence.

The average throughput shall exceed the values in Table 5.2.3-1. .

Table 5.2.3-1. Minimum Standards for CQI Performance

Test	Average Throughput (kbps)
1	547.17

5.3 Supervision Procedures in Variable Rate State

5.3.1 Definition

When in the *Variable Rate State* of the xHRPD Subtype 1 Forward Traffic Channel MAC Protocol, the access terminal performs supervision on the CQI and monitors the *ForwardTrafficValid* bit as follows.

The access terminal sets the CQI supervision timer for $T_{FTCMCQISupervision}$ when it transmits a null rate CQI. If the access terminal requests a non-null rate while the CQI supervision timer is active, the access terminal disables the timer. If the CQI supervision timer expires, the access terminal disables the Reverse Traffic Channel transmitter and sets the Reverse Traffic Channel Restart timer for time $T_{FTCMPRestartTx}$. If the access terminal generates consecutive non-null rate CQI values for more than $N_{FTCMPRestartTx}$ slots, the access terminal disables the Reverse Traffic Channel Restart timer and enables the Reverse Traffic Channel transmitter.

If the Reverse Traffic Channel Restart timer expires, the access terminal returns a *SupervisionFailed* indication.

The access terminal monitors the bit associated with its MACIndex in the *ForwardTrafficValid* field made available by the OverheadMessages Protocol. If this bit is set to 0, the access terminal shall return a *SupervisionFailed* indication.

Test 1 verifies that the access terminal disables its transmitter when the CQI supervision timer expires.

Test 2 verifies that the access terminal disables its transmitter when its corresponding *ForwardTrafficValid* bit is set to 0.

5.3.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 9.
3. Set $\hat{I}_{or}$ to –75 dBm.
4. Open a connection.
5. Wait for at least 2 seconds and disable the forward link.
6. Monitor the access terminal's output power and the access terminal's CQI values received at the access network. (Test 1)
7. Open a connection.
8. In the *QuickConfig Message* set the *ForwardTrafficValid* bit corresponding to the access terminal to 0.
9. Monitor the access terminal's output power. (Test 2)

5.3.3 Minimum Standard

For Test 1, the access terminal shall disable its transmitter between the time interval $T_{FTCMCQISupervision}$ - 0.001667 and $T_{FTCMCQISupervision}$ + 0.04 seconds after the access network received the first null CQI in the sequence of consecutive null CQI received at the access network.

For Test 2, T_1 is the time when the *QuickConfig Message*, with the *ForwardTrafficValid* bit corresponding to the access terminal set to 0, is sent. The access terminal shall disable its transmitter between the time interval T_1 and T_1 + 0.04 seconds.

5.4 Access Probes

5.4.1 Definition

This test verifies the following access parameters: number of access probes in one probe sequence, and the number of probe sequences in one access attempt.

5.4.2 Method of Measurement

1. Set the following fields of the *InitialConfiguration* attribute of the xHRPD Subtype 0 Access Channel MAC Protocol as specified below:

Parameter	Value (Decimal)
ProbeSequenceMax	1 (1 sequence)

2. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.
3. Set $\hat{I}_{or}$ to -75 dBm /1.23 MHz.
4. Set the access network to ignore all access attempts.
5. Send a page to the access terminal.

5.4.3 Minimum Standard

(a) The number of access probes in an access probe sequence shall be five.

(b) There shall be one access probe sequence in the access attempt.

(c) The access probes shall be randomized as specified in the xHRPD Subtype 0 Access Channel MAC Protocol described in [1].

5.5 Reverse Traffic Channel Initial Transmission

5.5.1 Definition

When in the *Idle State* of the Default Air-Link Management Protocol, and upon reception of an *ACAck Message*, the access terminal stops sending access probes. Then, upon reception of a *TrafficChannelAssignment Message*, the access terminal activates the Reverse Traffic Channel MAC Protocol described in [1] and transitions to its *Setup State*.

Upon entering the *Setup State* of the Reverse Traffic Channel MAC Protocol, the access terminal starts transmitting the filler data with transmit format (1,1,40) on the Reverse Traffic Channel.

When entering this *Setup State*, the access terminal sets a timer for $T_{RTCMPATSetup}$ seconds. If the protocol is still in the *Setup State* when the timer expires, the access terminal ceases the transmission on Reverse Traffic Channel.

If the access terminal receives an *RTCAck Message* it starts transmitting data on the Reverse Traffic Channel.

Test 1 verifies that the access terminal: stops sending access probes when it receives an *ACAck Message*, and begins transmission of filler data on Reverse Traffic Channel, upon reception of the *TrafficChannelAssignment Message*.

Test 2 verifies that the access terminal ceases transmitting the filler data when the connection setup timer expires.

5.5.2 Method of Measurement

1. Connect the sector to the access terminal antenna connector as shown in Figure 8.5.1-4. The AWGN generator and the CW generator are not applicable in this test.

2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 8.
3. Set $\hat{I}_{or}$ to –75 dBm.
4. Open a connection.
5. Monitor the reception at the access network. (Test 1)
6. Set the access network so as to not send any *RTCAck Message* to the access terminal.
7. Open a connection.
8. Monitor the receptions at the access network. (Test 2)

5.5.3 Minimum Standard

Test 1:

(a) Upon reception of the *ACAck Message*, the access terminal shall stop sending access probes.

(b) The access terminal shall start transmitting the filler data on the Reverse Traffic Cahnnel. Transmission shall start within 0.16 seconds from the reception of the *TrafficChannelAssignment Message*.

(c) Upon reception of the *RTCAck Message*, the access terminal shall start transmitting data .

Test 2:

(a) The access terminal shall disable its transmitter between the time interval $T_{RTCMPATSetup}$ and $T_{RTCMPATSetup}$ + 0.04 seconds after the beginning of the filler data transmission.

6 CONNECTION LAYER MINIMUM STANDARDS

6.1 Idle Handoff in Continuous Operation Mode

These tests shall be performed for access terminals that can operate in *Continuous Operation* mode (including those that supports suspended mode and currently operating in continuous operation mode) while the access terminal is in the *Idle State* of the xHRPD Subtype 0 Route Update Protocol described in [1].

6.1.1 Definition

When the access terminal is in the *Idle State* of the xHRPD Subtype 0 Route Update Protocol, the access terminal continually searches for Pilot Channel signals on the corresponding CDMA frequency assignment. The access terminal determines that an idle handoff should occur when it detects a Pilot Channel signal sufficiently stronger than the one associated with the Control Channel that is currently monitoring.

Test 1 verifies that the access terminal does not perform alternating idle handoffs between two Pilot Channels associated with two different Control Channels so frequently that the access terminal can not receive Control Channel capsules on either of the Forward Channels. This is accomplished by checking the number of idle handoffs and the Control Channel packet error rate (PER).

Test 2 verifies that the access terminal performs an idle handoff whenever the E_c/I_0 of a pilot in the Neighbor Set exceeds the E_c/I_0 of the pilot in the Active Set by 3 dB, as measured at the access terminal antenna connector, for a period longer than one second. This is accomplished by checking the number of idle handoffs performed and the Control Channel PER.

6.1.2 Method of Measurement

1. Connect two sectors and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-3. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1, and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, and is called Channel 2.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 8.
3. Send, consecutively, control messages in synchronized capsules on the Control Channel of both sectors. Note that the pilot PN offset index P_1 is listed in the *SectorParameters Message* for sector 2 and pilot PN offset index P_2 is listed in the *SectorParameters Message* for sector 1.
4. Set the test parameters for Test 1, as specified in Table 6.1.2-1 and Figure 6.1.2-1.
5. Open a connection and retrieve the parameters *IdleStateElapsedTime*, *IdleStateASPChangeCount* and *ControlChannelPktCount.*
6. Immediately after closing the connection, run the test for at least 10 cycles (20 pilot E_c/I_0 transitions).

7. Open a connection and retrieve the parameters *IdleStateElapsedTime*, *IdleStateASPChangeCount* and *ControlChannelPktCount*.

8. Set the test parameters for Test 2 as specified in Table 6.1.2-1 and Figure 6.1.2-2 and repeat steps 5 through 7.

Table 6.1.2-1 Parameters for Idle Handoff in Continuous Operation Mode

Parameter	Unit	Test 1		Test 2	
		Channel 1	Channel 2	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	3 for S_1 0 for S_2	0 for S_1 3 for S_2	3 for S_1 -16.7 for S_2	0 for S_1 -4.7 for S_2
I_{oc}	dBm/1.23 MHz	-55		-55	
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	15 for S_1 10.25 for S_2	10.25 for S_1 15 for S_2	15 for S_1 -2.9 for S_2	10.25
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	12 for S_1 7.25 for S_2	7.25 for S_1 12 for S_2	12 for S_1 -5.95 for S_2	7.25
$\frac{\text{Pilot } E_c}{I_o}$	dB	-3 for S_1 -6 for S_2	-6 for S_1 -3 for S_2	-3 for S_1 -18 for S_2	-6

Note: The Control E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

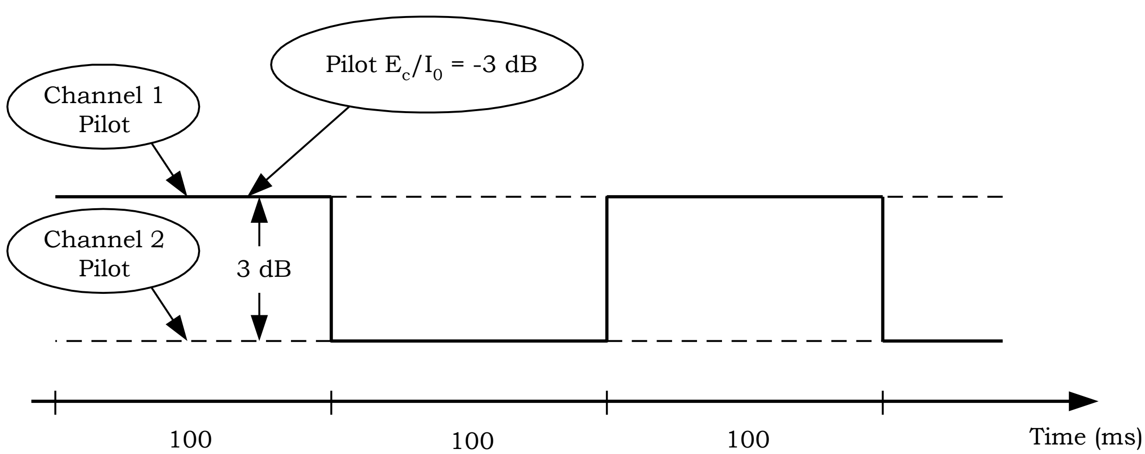

Figure 6.1.2-1 Idle Handoff in Continuous Operation Mode (Test 1)

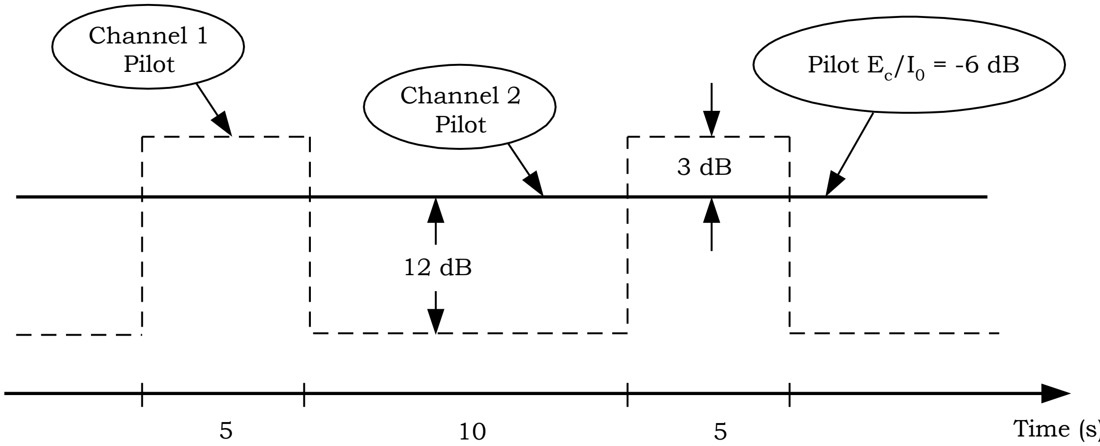

Figure 6.1.2-2 Idle Handoff in Continuous Operation Mode (Test 2)

6.1.3 Minimum Standard

The number of idle handoffs during a test is given by Δ *IdleStateASPChangeCount*, where Δ *IdleStateASPChangeCount* is the increment of the parameter *IdleStateASPChangeCount* during the test.

Refer to 8.6.1 for Control Channel PER calculation.

Test 1: The access terminal should not perform any idle handoff. The Control Channel PER shall be less than or equal to 0.1.

Test 2: The number of idle handoffs shall be equal to the number of Pilot E_c/I_0 transitions. The Control Channel PER shall be less than or equal to 0.1.

Note: These requirements apply regardless of the Control Channel data rate.

6.2 Idle Handoff in Slotted Operation Mode

These tests shall be performed for access terminals that can operate in slotted mode (including those that supports suspended mode and currently operating in slotted operation mode).

6.2.1 Definition

When the access terminal is in the *Idle State* of the xHRPD Subtype 0 Route Update Protocol, the access terminal searches for Pilot Channel signals on the corresponding CDMA frequency assignment. The access terminal determines that an idle handoff should occur when it detects a Pilot Channel signal sufficiently stronger than the one associated with the Control Channel that is currently monitoring.

This test verifies that the access terminal performs an idle handoff whenever the E_c/I_0 of a pilot in the Neighbor Set exceeds the E_c/I_0 of the pilot in the Active Set by 3 dB, as measured at the access terminal antenna connector. This is accomplished by checking the number of idle handoffs.

6.2.2 Method of Measurement

1. Connect two sectors and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-3. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1, and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, and is called Channel 2.
2. Send, consecutively, control messages on the Control Channel of both sectors.
3. Set the test parameters as specified in Table 6.2.2-1 and Figure 6.2.2-1. .
4. Open a connection and retrieve the parameters *IdleStateElapsedTime* and *IdleStateASPChangeCount*.
5. Run the test for exactly 20 Channel 1 pilot E_c/I_0 transitions, starting and ending with the Channel 1 pilot E_c/I_0 at –18 dB. Allow three seconds after the last transition before step 6.
6. Open a connection and retrieve the parameters *IdleStateElapsedTime* and *IdleStateASPChangeCount*.

Table 6.2.2-1 Parameters for Idle Handoff in Slotted Operation Mode

Parameter	**Unit**	**Channel 1**	**Channel 2**
$\hat{I}_{or} / I_{oc}$	dB	3 for S_1 -16.7 for S_2	0 for S_1 -4.7 for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	15 for S_1 -2.9 for S_2	10.25
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	12 for S_1 -5.95 for S_2	7.25
$\frac{\text{Pilot } E_c}{I_o}$	dB	-3 for S_1 -18 for S_2	-6

Note: The Control E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

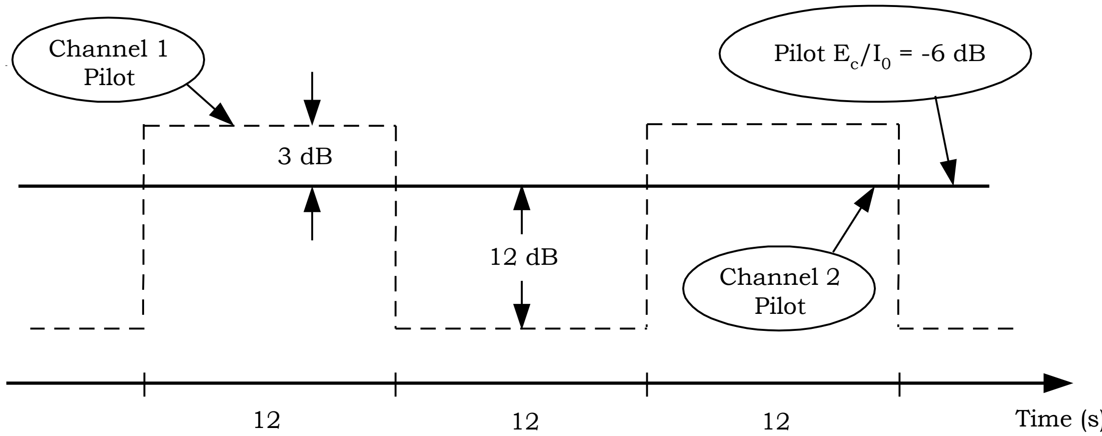

Figure 6.2.2-1. Idle Handoff for Slotted Operation Mode

6.2.3 Minimum Standard

The number of idle handoffs during a test is given by Δ *IdleStateASPChangeCount*, where Δ *IdleStateASPChangeCount* is the increment of the parameter *IdleStateASPChangeCount* during the test.

The number of idle handoffs shall be greater than or equal to 18.

Note: These requirements apply regardless of the Control Channel data rate.

6.3 Neighbor Set Pilot Detection and Incorrect Detection

6.3.1 Definition

A correct detection of a pilot in the Neighbor Set is defined as the acquisition of a pilot with E_c/I_0 above the value defined by PilotAdd. The value of PilotAdd is set to 14 (-7 dB). An incorrect detection of a pilot in the Neighbor Set is defined as the acquisition of a pilot with E_c/I_0 below the value defined by PilotAdd.

This test measures the detection time for a pilot in the Neighbor Set at three values of pilot E_c/I_0. The detection time of a pilot is defined as the time elapsed from the time when the pilot increases to a given E_c/I_0 until the access terminal sends a *RouteUpdate Message* containing this pilot. The accuracy of the Candidate Set pilot PN phase reported in the corresponding *RouteUpdate Message* is also examined.

6.3.2 Method of Measurement

1. Connect two sectors and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-3. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1, and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, and is called Channel 2.

2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 9.

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

Field	Value (Decimal)
PilotDropTimer	1 (1 sec)

4. Set the access network to not send any *TrafficChannelAssignment Messages* as a response to the *RouteUpdate Message* sent by the access terminal.
5. Open a connection.
6. Set the test parameters for Test 1 as specified in Table 6.3.2-1 and change the pilot strength of Channel 2 as specified in Figure 6.3.2-1. with T greater than or equal to 0.8 seconds.
7. Record the transmission times and the contents of each *RouteUpdate Message* sent by the access terminal.
8. Set the test parameters for Test 2 as specified in Table 6.3.2-2 and change the pilot strength of Channel 2 as specified in Figure 6.3.2-1. with T greater than or equal to 0.85 seconds. Repeat step 7.
9. Set the test parameters for Test 3 as specified in Table 6.3.2-3 and change the pilot strength of Channel 2 as specified in Figure 6.3.2-2. with T equal to 15 seconds. Repeat step 7 for 20 cycles of Channel 2 pilot E_c/I_0.

Table 6.3.2-1 Test Parameters for Neighbor Set Pilot Detection (Test 1)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or}/I_{oc}$	dB	1.45 for S_1 -1.8 for S_2	0.45 for S_1 $-\infty$ for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Pilot}\,E_c}{I_o}$	dB	-4	-5 for S_1 $-\infty$ for S_2

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

Table 6.3.2-2 Test Parameters for Neighbor Set Pilot Detection (Test 2)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	0.2 for S_1 -1.8 for S_2	-2.3 for S_1 $-\infty$ for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{Pilot\,E_c}{I_o}$	dB	-4	-6.5 for S_1 $-\infty$ for S_2

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

Table 6.3.2-3 Test Parameters for Neighbor Set Pilot Incorrect Detection (Test 3)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-0.9 for S_1 -1.8 for S_2	-6.4 for S_1 $-\infty$ for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{Pilot\,E_c}{I_o}$	dB	-4	-9.5 for S_1 $-\infty$ for S_2

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

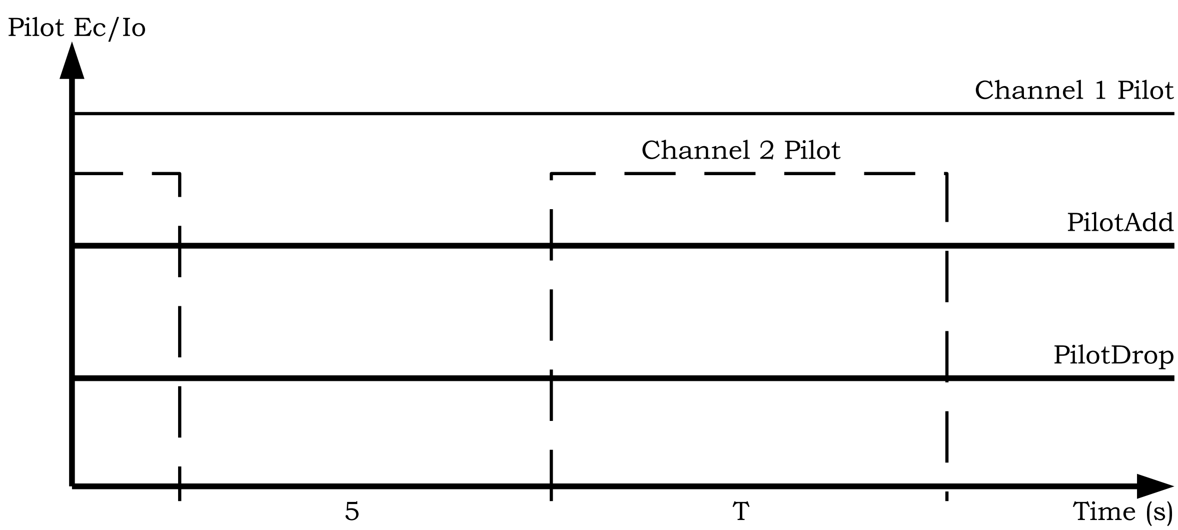

Figure 6.3.2-1. Neighbor Set Pilot Detection (Tests 1 and 2)

Figure 6.3.2-2. Neighbor Set Pilot Incorrect Detection (Test 3)

6.3.3 Minimum Standard

Pilots other than P_1 or P_2 shall not be reported in any of the *RouteUpdate Messages*.

Test 1:

(a) The rate of valid detection within 0.8 seconds shall be greater than 90% with 95% confidence (see 8.8).

(b) The reported pilot PN phase for P_1 in the *RouteUpdate Messages* containing it shall be no greater than ±1 chip from the actual offset.

Test 2:

The rate of valid detection within 0.85 seconds shall be greater than 50% with 95% confidence (see 8.8).

Test 3:

There shall be no more than one *RouteUpdate Message* containing P_1 during this test.

6.4 Candidate Set Pilot Detection and Incorrect Detection

6.4.1 Definition

A correct detection of a pilot in the Candidate Set is defined as the detection of a pilot in the Candidate Set with E_c/I_0 at least [0.5 × PilotCompare] dB above the E_c/I_0 of an Active Set pilot. The value of PilotCompare is set to 5. An incorrect detection of a pilot in the Candidate Set is defined as the detection of a pilot with E_c/I_0 less than [0.5 × PilotCompare] dB above the E_c/I_0 of any Active Set pilot.

This test measures the detection time for a pilot in the Candidate Set. The detection time of a pilot is defined as the time elapsed from the time when the pilot increases to a given E_c/I_0

until the access terminal sends a *RouteUpdate Message* containing this pilot. The accuracy of the Active Set pilot PN phase and Active Set pilot strength, reported in the corresponding *RouteUpdate Message*, is also examined.

6.4.2 Method of Measurement

1. Connect two sectors and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-2. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1 and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2 and is called Channel 2.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 11.
3. Set the access network not to send any *TrafficChannelAssignment Message* as a response to the *RouteUpdate Message* sent by the access terminal.
4. Set the test parameters for Test 1 as specified in Table 6.4.2-1 and change the pilot strength of Channel 2 as specified in Figure 6.4.2-1. .
5. Open a connection.
6. Send *TrafficChannelAssignment Messages* listing only pilot P_1 as specified in Figure 6.4.2-1. .
7. Record the transmission time and contents of each *RouteUpdate Message* sent by the access terminal.
8. Set the test parameters for Test 2 as specified in Table 6.4.2-2 and change the pilot strength of Channel 2 as specified in Figure 6.4.2-2. .
9. Open a connection.
10. Send *TrafficChannelAssignment Messages* listing only pilot P_1 as specified in Figure 6.4.2-2. .
11. Record the transmission time and contents of each *RouteUpdate Message* sent by the access terminal.

Table 6.4.2-1 Test Parameters for Candidate Set Pilot Detection (Test 1)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-3 for S_1 -4.8 for S_2	0 for S_1 -4.8 for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Pilot } E_c}{I_o}$	dB	-7	-4 for S_1 -7 for S_2

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

Table 6.4.2-2 Test Parameters for Candidate Set Pilot Incorrect Detection (Test 2)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-4.15 for S_1 -4.8 for S_2	-2.65 for S_1 -4.8 for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Pilot } E_c}{I_o}$	dB	-7	-5.5 for S_1 -7 for S_2

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves. S_1 and S_2 indicate the two states of the power levels.

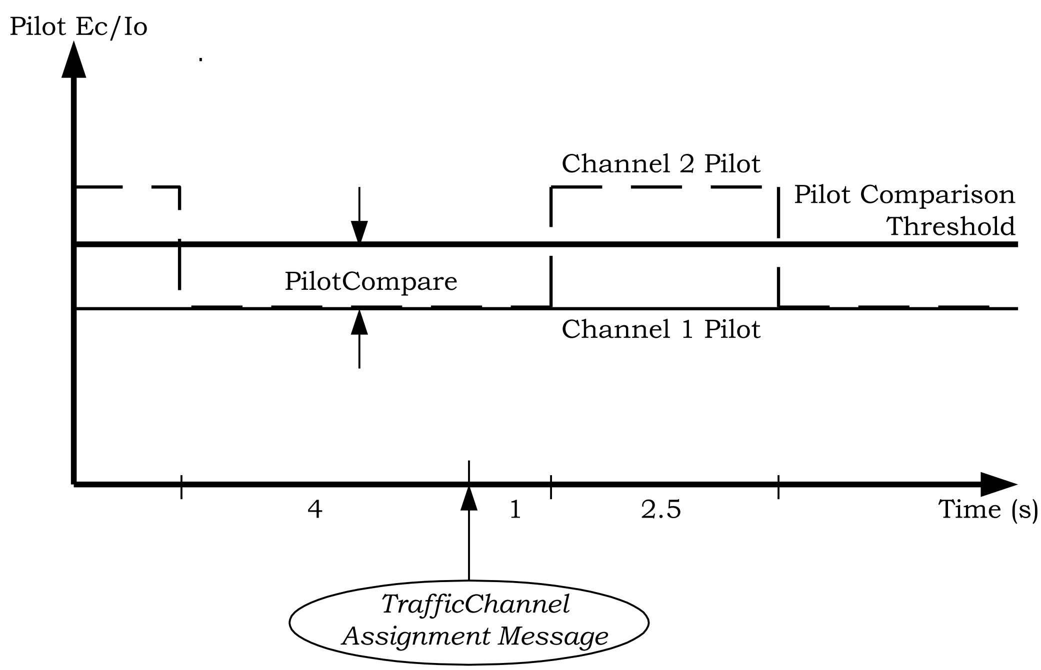

Figure 6.4.2-1. Candidate Set Pilot Detection (Test 1)

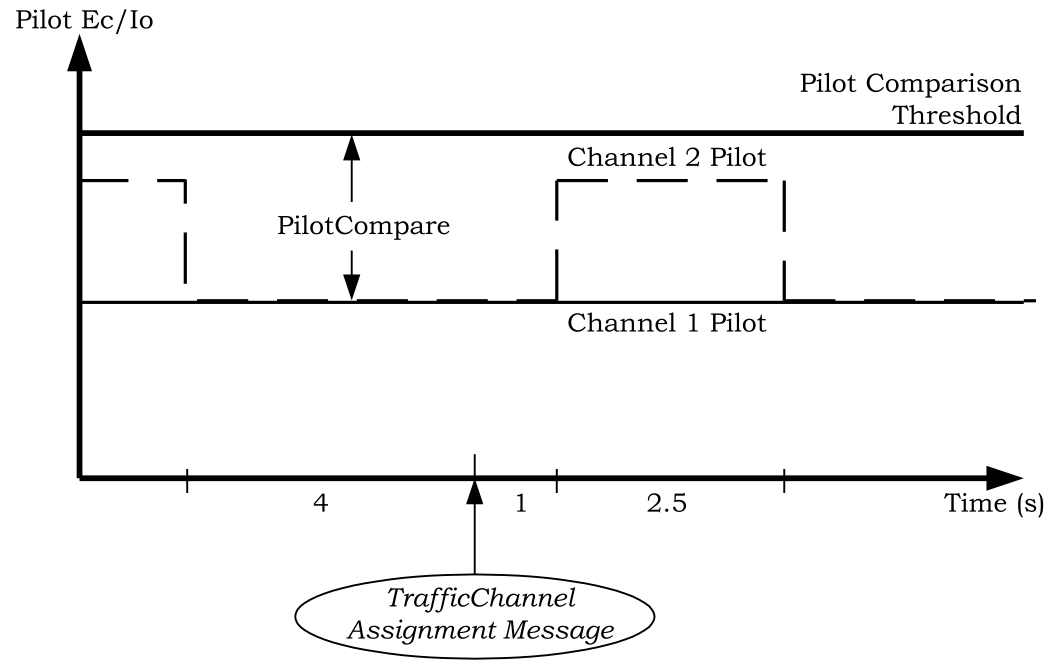

Figure 6.4.2-2. Candidate Set Incorrect Detection (Test 2)

6.4.3 Minimum Standard

Test 1:

(a) The rate of valid detection within 2.5 seconds shall be greater than 90% with 95% confidence (see 8.8).

(b) The reported pilot PN phase for P_1 in the *RouteUpdate Messages* containing it shall be no greater than ±1 chip from the actual offset.

(c) The reported pilot E_c/I_0 value for P_1 in the *RouteUpdate Messages* shall be no greater than ±1.5 dB from the set value. The reported pilot E_c/I_0 value for P_2 in the *RouteUpdate Messages* shall be no greater than ±2 dB from the set value for 90% of the time with 95% confidence.

Test 2: The rate of incorrect detection within 2.5 seconds shall be less than 20% with 95% confidence (see 8.8).

6.5 Active Set Pilot Loss Detection

6.5.1 Definition

The access terminal sends a *RouteUpdate Message* when the pilot E_c/I_0 value of a pilot in the Active Set drops below the value defined by PilotDrop for a period of time defined by PilotDropTimer. The value of PilotDrop is set to 18 (-9 dB). The value of PilotDropTimer is set to 3 (4 seconds).

These tests measure the loss detection time for a diminishing pilot in the Active Set. The loss detection time for a diminishing pilot in the Active Set is defined as the time elapsed from the time when the pilot decreases to a given E_c/I_0 until the access terminal sends a

RouteUpdate Message which does not contain this pilot. The accuracy of the PN phase and strength of Active Set pilots, reported in the *RouteUpdate Message* is also examined.

6.5.2 Method of Measurement

1. Connect two sectors and an AWGN generator to the access terminal antenna connector as shown in Figure 8.5.1-3. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1, and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, and is called Channel 2.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 13.
3. Set the access network to not send any *TrafficChannelAssignment Messages* as a response to the *RouteUpdate Message* sent by the access terminal.
4. Open a connection.
5. Send a *TrafficChannelAssignment Message* to the access terminal, specifying the following pilots in the Active Set:

Parameter	Value (Decimal)
PilotPN	P_1
PilotPN	P_2

6. Set the test parameters for Test 1 as specified in Table 6.5.2-1.
7. Record Reverse Traffic Channel messages for 5 minutes.
8. Set the test parameters for Test 2 as specified in Table 6.5.2-2 and Figure 6.5.2-1. . The value of T for this test is equal to 4 seconds.
9. Send *TrafficChannelAssignment Messages* to the access terminal as specified in Figure 6.5.2-1. , with the following pilots in the Active Set:

Parameter	Value (Decimal)
PilotPN	P_1
PilotPN	P_2

10. Record the transmission time and contents of each *RouteUpdate Message* sent by the access terminal.
11. Set the test parameters for Test 3 as specified in Table 6.5.2-2 and Figure 6.5.2-1. . The value of T for this test is larger or equal to 7 seconds.
12. Send *TrafficChannelAssignment Messages* followed by *Reset Reports* to the access terminal as specified in Figure 6.5.2-1. , with the following pilots in the Active Set:

Parameter	Value (Decimal)
PilotPN	P_1
PilotPN	P_2

13. Record the transmission time and contents of each *RouteUpdate Message* sent by the access terminal.

Table 6.5.2-1 Test Parameters for Active Set Pilot Incorrect Loss Detect (Test 1)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-0.5	-4.5
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4	-8

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves.

Table 6.5.2-2 Test Parameters for Active Set Pilot Loss Detection (Tests 2 and 3)

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-1 for S_1 2.91 for S_2	-7 for S_1 2.91 for S_2
I_{oc}	dBm/1.23 MHz	-55	
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4	-10 for S_1 -4 for S_2

Note: The Pilot E_c/I_0 value is calculated from the parameters set in the table. It is not settable parameter itself. S_1 and S_2 indicate the two states of the power levels.

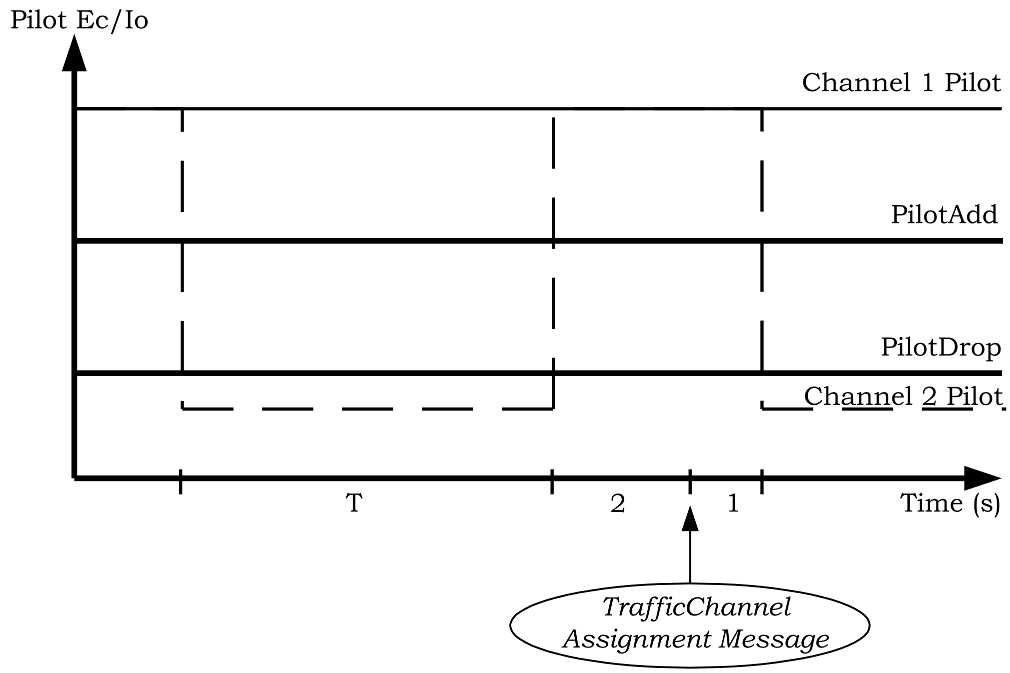

Figure 6.5.2-1. Active Set Pilot Loss Detection (Tests 2 and 3)

6.5.3 Minimum Standard

Test 1:

The access terminal shall not send any *RouteUpdate Messages* during the test.

Test 2:

The rate of incorrect loss detection within 4 seconds shall be less than 5% with 95% confidence (see 8.8).

Test 3:

(a) The rate of loss detection within 7 seconds shall be greater than 80% with 95% confidence (see 8.8).

(b) The reported pilot PN phase for P_1 in the *RouteUpdate Messages* containing it shall be no greater than ±1 chip from the actual offset.

(c) The reported pilot E_c/I_0 value for P_1 in the *RouteUpdate Messages* shall be no greater than ±1.5 dB from the set value. The reported pilot E_c/I_0 value for P_2 in the *RouteUpdate Messages* shall be no greater than ±2 dB from the set value for 90% of the time with 95% confidence.

6.6 Hard Handoff to another Frequency

6.6.1 Definition

The access network directs the access terminal to perform a xHRPD to xHRPD hard handoff by sending a *TrafficChannelAssignment Message* in which the access terminal is transitioned between different frequency assignments. Hard handoff is characterized by a temporary disconnection of the Traffic Channel.

This test measures the time to execute a xHRPD to xHRPD hard handoff between Traffic Channels belonging to different sectors (different pilot PN offset indices) with different CDMA Frequency assignments. This test also verifies that the access terminal disables its transmitter before changing frequency.

6.6.2 Method of Measurement

1. Connect two sectors to the access terminal antenna connector as shown in Figure 8.5.1-3. The AWGN generator is not applicable in this test. The Forward Channel from sector 1 has an arbitrary pilot PN offset index P_1, a CDMA Frequency assignment f_1 (any valid value), and is called Channel 1. The Forward Channel from sector 2 has an arbitrary pilot PN offset index P_2, a CDMA Frequency assignment f_2 (any valid value other than f_1), and is called Channel 2.
2. For each xHRPD band class that the access terminal supports, configure the access terminal to operate in that band class and perform steps 3 through 7.
3. Open a connection with Reverse Traffic Channel rate 9.6 kbps only.
4. Set the test parameters as specified in Table 6.6.2-1.
5. Send a *TrafficChannelAssignment Message* to the access terminal to set the following parameters:

Parameter	**Value (Decimal)**
ChannelIncluded	1 (channel record included)
Frequency	f_2
SystemType	0
PilotPN	P_2

6. Measure T_1, the time elapsed from the transmission time of the *TrafficChannelAssignment Message* to the instant when the access terminal transmit power, as measured at the access terminal antenna connector, on the old CDMA Frequency assignment drops below -61 dBm/MHz.
7. Measure T_2, the time elapsed from the transmission time of the *TrafficChannelAssignment Message* to the instant when the access terminal transmitter is enabled on the new CDMA Frequency assignment.

Table 6.6.2-1 Test Parameters for HRPD to HRPD Hard Handoff

Parameter	Unit	Channel 1	Channel 2
$\hat{I}_{or}$	dBm/1.23 MHz	-75	-75

6.6.3 Minimum Standard

T_1 shall be less than 362 ms. The access terminal transmit power, as measured at the access terminal antenna connector on CDMA frequency f_1, shall remain below –61 dBm/MHz from T_1 ms after the transmission of the *TrafficChannelAssignment Message* until the end of the test.

T_2 shall be less than 500 ms.

7 ENVIRONMENTAL REQUIREMENTS

7.1 Temperature and Power Supply Voltage

7.1.1 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 7.1.1-1.

Table 7.1.1-1. 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

7.1.2 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 range[3] specified by the manufacturer or ±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 temperature chamber being directly applied to the access terminal. The measurements specified in 7.1.3 shall then be performed.

Turn the access terminal off, stabilize the access terminal in the chamber at room temperature, and repeat the measurements specified in 7.1.3.

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

Turn the access terminal off, stabilize the access terminal in the chamber at the coldest operating temperature specified by the manufacturer, and repeat the measurements specified in 7.1.3.

The overall temperature range may be reduced to a lesser range than -30°C to +60°C if the manufacturer uses circuitry that automatically inhibits RF transmission when the temperature falls outside the lesser range specified. Measurements shall be made at the specified extremes of the manufacturer’s temperature range. The manufacturer shall verify that RF transmission is inhibited outside of the specified temperature range.

7.1.3 Minimum Standard

The access terminal equipment shall meet all of the minimum standards specified in Sections 3 through 6 under the standard environmental test conditions specified in 8.2 for all supported band classes. Over the ambient temperature and power supply ranges specified by the manufacturer, the operation of the access terminal equipment shall meet the following minimum standards for all supported band classes unless noted otherwise:

(a) Receiver sensitivity and dynamic range as specified in 3.3.1. The received power, Îor, used to measure receiver sensitivity may be increased 2 dB at 60°C and higher.

(b) Frequency accuracy as specified in 4.1.2.

(c) Waveform quality as specified in 4.2.2.

(d) Range of estimated open loop output power as specified in 4.3.1. For temperatures outside of the range +15°C to +35°C, the test tolerance lower limit may be relaxed to -12.5 dB.

(e) Range of closed loop correction as specified in 4.3.1.

(f) Maximum RF output power as specified in 4.3.2. For Temperature Range Designators A and B, the EIRP Class II through V, access terminal may drop by 2 dB at 60°C and higher. These requirements do not apply other than for coldest, room and highest operating temperature test points.

(g) Minimum controlled output power as specified in 4.3.3.

(h) Conducted spurious emissions as specified in 4.4.1.

7.2 High Humidity

7.2.1 Definition

The term “high humidity” denotes the relative humidity at which the access terminal will operate with the specified performance.

7.2.2 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 H_2O/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 (receiver sensitivity and dynamic range) and 4.2.2

(waveform quality) 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 6 of this standard.

7.2.3 Minimum Standard

The access terminal equipment shall meet the minimum standards specified in 3.3.1.3 and 4.2.2.3 under the high humidity conditions. Once stabilized in standard conditions, the access terminal shall meet all the minimum standards specified in Sections 3 through 6 of this standard.

7.3 Vibration Stability

7.3.1 Definition

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

7.3.2 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.

7.3.3 Minimum Standard

The access terminal equipment shall meet all the minimum standards specified in Sections 3 through 6 after being subjected to the above vibration tests.

7.4 Shock Stability

7.4.1 Definition

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

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

7.4.3 Minimum Standard

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

8 STANDARD TEST CONDITIONS

8.1 Standard Equipment

8.1.1 Basic Equipment

The equipment shall be assembled, and any necessary adjustments shall be made in accordance with the manufacturer's instructions for the mode of operation required. When alternative modes are available, the equipment shall be assembled and adjusted in accordance with the relevant instructions. A complete series of measurements shall be made for each mode of operation.

8.1.2 Associated Equipment

The access terminal equipment may include associated equipment during tests, provided that the associated equipment is normally used in the operation of the equipment under test. For access terminal equipment, this may include power supplies, handsets, cradles, charging stands, control cables, and battery cables.

8.2 Standard Environmental Test Conditions

Measurements under standard atmospheric conditions shall be carried out under any combination of the following conditions:

Temperature:	+15°C to +35°C
Relative humidity:	45% to 75%
Air pressure:	86,000 Pa to 106,000 Pa (860 mbar to 1060 mbar)

If desired, the results of the measurements can be corrected by calculation to the standard reference temperature of 25°C and the standard reference air pressure of 101,300 Pa (1013 mbar).

8.3 Standard Conditions for the Primary Power Supply

8.3.1 General

The standard test voltages shall be those specified by the manufacturer, or an equivalent type that duplicates the voltage, impedance, and ampere hours (if relevant for the measurement) of the recommended supply.

8.3.2 Standard DC Test Voltage from Accumulator Batteries

The standard (or nominal) DC test voltage specified by the manufacturer shall be equal to the standard test voltage of the type of accumulator to be used, multiplied by the number of cells minus an average DC power cable loss value that the manufacturer determines as being typical (or applicable) for a given installation. Since accumulator batteries may or may not be under charge or may be in a state of discharge when the equipment is being operated, the manufacturer shall also test the equipment at anticipated voltage extremes above and below the standard voltage. The test voltages shall not deviate from the stated values by more than ±2% during a series of measurements carried out as part of a single test on the same equipment.

8.3.3 Standard AC Voltage and Frequency

For equipment that operates from the AC mains, the standard AC test voltage shall be equal to the nominal voltage specified by the manufacturer. If the equipment is provided with different input taps, the one designated "nominal" shall be used. The standard test frequency and the test voltage shall not deviate from their nominal values by more than ±2%.

The equipment shall operate without degradation with input voltage variations of up to ±10%, and shall maintain its specified transmitter frequency stability for input voltage variations of up to ±15%. The frequency range over which the equipment is to operate shall be specified by the manufacturer.

8.4 Standard Test Equipment

8.4.1 Standard Channel Simulator

The channel simulator shall support the following channel model parameters:

- All paths are independently faded.
- The fading is Rayleigh. The probability distribution function of power, F(P), is:

$$F(P) = \begin{cases} 1 - e^{-P/P_{ave}} & P > 0 \\ 0 & P \le 0 \end{cases}$$

  where P is the signal power level and P_{ave} is the mean power level.

- The level crossing rate, L(P) is:

$$L(P) = \begin{cases} \sqrt{2\pi P/P_{ave}}\, f_d e^{-P/P_{ave}} & P > 0 \\ 0 & P \le 0 \end{cases}$$

  where f_d is the Doppler frequency offset associated with the simulated vehicle speed given by:

$$f_d = \left(\frac{v}{c}\right) \cdot f_c$$

  f_c is the carrier frequency, v is the vehicle speed, and c is the speed of light in a vacuum.

- The power spectral density, S(f), is:

$$S(f) = \begin{cases} \dfrac{1}{\sqrt{1 - \left(\dfrac{f - f_c}{f_d}\right)^2}} & (f_c - f_d) \le f \le (f_c + f_d) \\ 0 & \text{Otherwise} \end{cases}$$

- The autocorrelation coefficient of the unwrapped phase, $\rho(t)$, is:

$$\rho(\tau) = \frac{3}{2\pi}\sin^{-1}\left[J_0(2\pi f_d \tau)\right] + 6\left\{\frac{1}{2\pi}\sin^{-1}\left[J_0(2\pi f_d \tau)\right]\right\}^2 - \frac{3}{4\pi^2}\sum_{n=1}^{\infty}\frac{\left[J_0(2\pi f_d \tau)\right]^{2n}}{n^2}$$

This autocorrelation coefficient is shown in Figure 8.4.1-1.

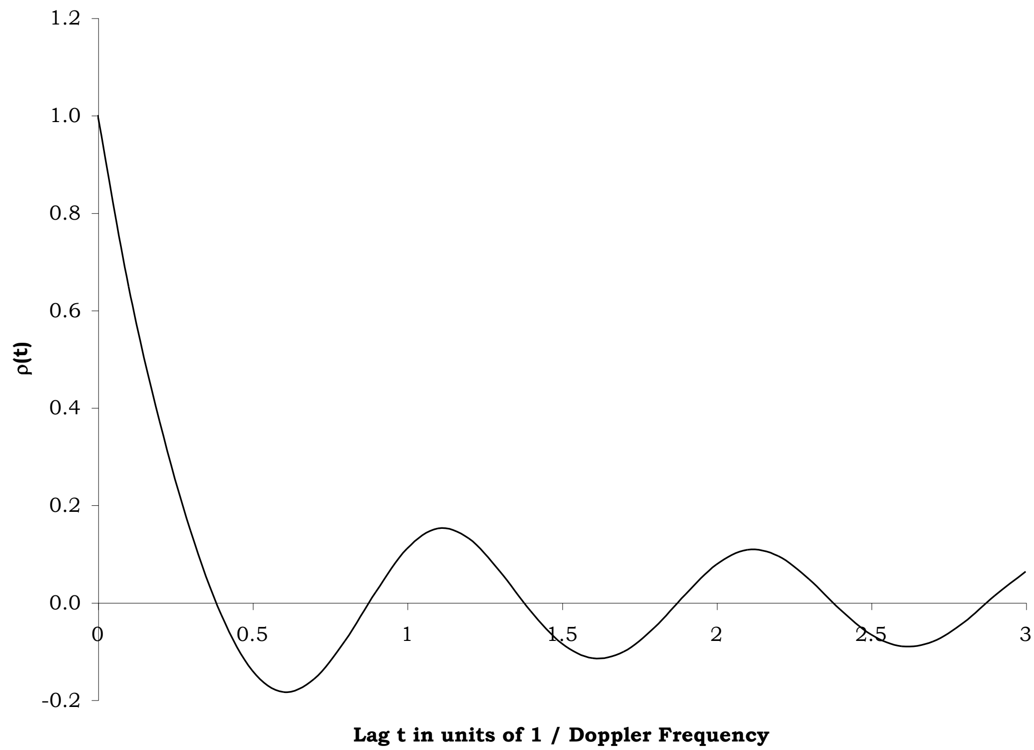

Figure 8.4.1-1. Autocorrelation Coefficient of the Phase

The following standard conditions and tolerances on the channel model parameters shall be supported by the channel simulator:

- Vehicle speed, v: 3 km/h

  Access terminal f_d: $\frac{f_c}{360E6}$ Hz ± 5%

- Vehicle speed, v: 8 km/h

  Access terminal f_d: $\frac{f_c}{135E6}$ Hz ± 5%

- Vehicle speed, v: 30 km/h

  Access terminal f_d: $\frac{f_c}{36E6}$ Hz ± 5%

- Vehicle speed, v: 100 km/h

Access terminal f_d: $\frac{f_c}{10.8E6}$ Hz ± 5%

- Power distribution function, F(P):

  1. The tolerance shall be within ±1 dB of calculated, for power levels from 10 dB above to 20 dB below the mean power level.

  2. The tolerance shall be within ±5 dB of calculated, for power levels from 20 dB above to 30 dB below the mean power level.

- The tolerance shall be within ±10% of calculated, for power levels from 3 dB above to 30 dB below the mean power level.
- Measured power spectral density, S(f), around the carrier, f_c:

  1. At frequency offsets $|f - f_c| = f_d$, the maximum power spectral density S(f) shall exceed $S(f_c)$ by at least 6 dB.

  2. For frequency offsets $|f - f_c| > 2 f_d$, the maximum power spectral density S(f) shall be less than $S(f_c)$ by at least 30 dB.

- Simulated Doppler frequency, f_d, shall be computed from the measured S(f) as

$$f_d = \left[\frac{2\int (f - f_c)^2 S(f)df}{\int S(f)df} \right]^{1/2}$$

- Measured autocorrelation function of the unwrapped phase, $\rho(t)$:

  1. At a lag of $0.05/f_d$, shall be 0.8 ± 0.1.

  2. At a lag of $0.15/f_d$, shall be 0.5 ± 0.1.

8.4.1.1 Standard Channel Simulator Configurations

The standard channel simulator shall support all the configurations specified in Table 8.4.1.1-1.

Table 8.4.1.1-1. Standard Channel Simulator Configurations

Parameters	Channel Simulator Configuration				
	1	2	3	4	5
Vehicle Speed [km/h]	8	3	30	100	0
Number of Paths	2	1	1	3	2
Path 2 Power (Relative to Path 1) [dB]	0	N/A	N/A	0	0
Path 3 Power (Relative to Path 1) [dB]	N/A	N/A	N/A	-3	N/A
Delay from Path 1 to Input [μs]	0	0	0	0	0
Delay from Path 2 to Input [μs]	2	N/A	N/A	2	2
Delay from Path 3 to Input [μs]	N/A	N/A	N/A	14.5	N/A

8.4.2 Waveform Quality Measurement Equipment

8.4.2.1 Rho Meter

Equipment capable of performing waveform cross-correlation shall be used for the measurement of the reverse link frequency tolerance, time tolerance, and waveform compatibility.

During a connection, the Reverse Channel consists of time division multiplexing the Pilot,RRI, the CQI, and the Data symbols in a 20 ms reverse link frame consisting of total of 112 symbols for 6.4 kHz channel assignment and 224 symbols for 12.8 kHz channel assignment.

Various equipment implementations are possible. The equipment used shall provide results equivalent to those produced by equipment that use the following algorithms:

The ideal transmitter signal is given as

$$s(t) = R_i(t)e^{j\omega_c t}$$

where

ω_c is the nominal carrier frequency of the signal,

i is the frame index.

$R_i(t)$ is the complex envelope of the ideal i_{th} frame, given as

$$R_i(t) = \sum_k a_{i,k}\, g(t - kT_s)e^{j\phi_{i,k}}$$

where

$a_{i,k}$ is the amplitude of the i_{th} symbol,

g(t) is the unit impulse response of the transmit filter,

$\phi_{i,k}$ is the phase of the k_{th} symbol for the i_{th} frame, occurring at discrete time $t_k = kT_s$.

T_s is the symbol duration.

Modulation accuracy is the ability of the transmitter to generate the ideal signal s(t).

The actual transmitter signal is given by

$$x(t) = \left[R_i\left(t+\tau_i\right) + E\left(t+\tau_i\right)\right] \cdot e^{j\left[\left(\omega_c + \Delta\omega(t)\right)\left(t+\tau_i\right) + \theta_0\right]}$$

where

τ_i is the time offset of the actual signal relative to the ideal signal,

$\Delta\omega(t) = \Delta\omega_m$, $t \in m^{th}$ frame is the radian frequency offset of the carrier,

$\theta_0(t) = \theta_m$, $t \in m^{th}$ frame is the phase offset of the actual carrier relative to the, ideal, in-phase carrier, and

$E_i(t)$ is the complex envelope of the error (deviation from ideal) of the actual transmit signal for the i_{th} frame.

The average frequency offset in Hertz is $\Delta f = \frac{1}{2\pi}\Delta\omega = \frac{1}{2\pi N}\sum_{m=1}^{N}\Delta\omega_m$ and the average phase offset is $\theta_0 = \frac{1}{2\pi N}\sum_{m=1}^{N}\theta_m$, where N is the number of frames in the measurement interval.

Estimates of the radian frequency offset, $\Delta\omega = 2\pi\Delta f$, the time offset, τ_0, and the phase offset, θ_0, of the Reverse Channel shall be obtained to the accuracy specified below. These estimates, $\Delta\hat{\omega}(t)$, $\hat{\tau}_0$, and $\hat{\theta}_0(t)$, shall be used to compensate x(t) by introducing a time correction and a complex multiplicative factor to produce y(t), a compensated version of x(t):

$$y(t) = x\left(t - \hat{\tau}_0\right) \cdot e^{-j\left[\Delta\hat{\omega}(t)\cdot t + \hat{\theta}_0(t)\right]}$$

The compensated signal, y(t), is down converted to baseband, and shall be passed through a square-root raised cosine filter to remove the inter-symbol interference (ISI).

The idealized output of the receive filter is

$$r(t) = \tilde{R}_i(t)$$

where

$$\tilde{R}_i\left(t_k\right) = a_{i,k}e^{j\phi_{i,k}}$$

The discrete versions of z(t) and r(t) are:

$$z[k] = z(t_k)$$

$$r[k] = r(t_k)$$

where z(t) and r(t) are sampled at the ideal sampling points.

Modulation accuracy is measured by determining the fraction of power in the actual filter output z[k] that correlates with r[k] when the transmitter is modulated by the Pilot,RRI, the CQI Channel, and the Data Channel.

The following waveform quality factor is defined:

$$\rho_{Overall} = \frac{\sum_{j=1}^{N}\left\{\left|\sum_{k=1}^{M} Z_{j,k} R_{j,k}^{*}\right|^{2} \Big/ \sum_{k=1}^{M}\left|R_{j,k}\right|^{2}\right\}}{\sum_{j=1}^{N}\sum_{k=1}^{M}\left|Z_{j,k}\right|^{2}}$$

where $Z_{j,k}$ = z[M(j-1)+k] is the k_{th} sample in the j_{th} frame of the output of the receive filter, and $R_{j,k}$ = r[M(j-1)+k] is the corresponding sample of the ideal output of the receive filter, and M = 112 for 6.4 kHz channel and M = 224 for 12.8 kHz channel.

Modulation accuracy shall be measured by using the MN complex-valued samples, $z(t_k)$, over a time interval of N frames.

The value of N for these measurements shall be at least 20.

The accuracy of the waveform quality measurement equipment shall be as shown in Table 8.4.2.1-1.

Table 8.4.2.1-1. Accuracy of Waveform Quality Measurement Equipment

Parameter	Symbol	Accuracy Requirement
Waveform Quality	ρ	$\pm 1\times 10^{-3}$ from 0.97 to 1.0
Frequency Offset (exclusive of test equipment time base errors)	Δf	±10 Hz
Time Alignment Offset	τ_0	±135 ns

Refer to Figure 8.4.2.1-1 for a functional block diagram of the operations to perform to calculate the waveform quality.

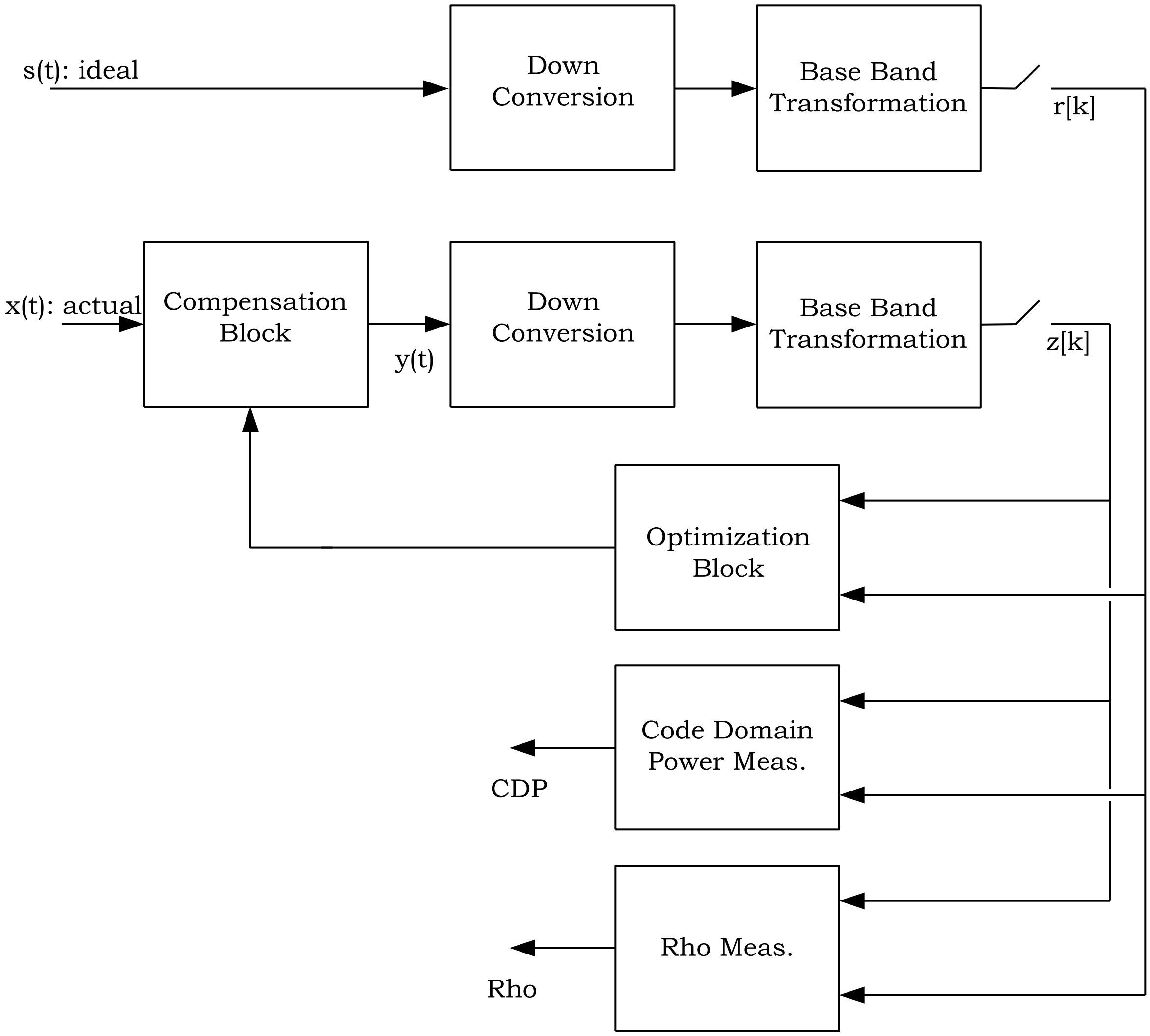

Figure 8.4.2.1-1. Block diagram for Waveform Quality and Code Domain Power Coefficients Calculation

8.4.3 Access Network Simulator

These requirements apply to the test equipment simulating an Access Network Requirements for standard Access Network Simulator are specified in [2].

8.4.3.1 Transmitter

The sector transmitter shall meet the following requirements:

- Frequency range: access network frequencies as specified in [1].
- Frequency accuracy: ±0.2 ppm
- Frequency resolution: 10 Hz
- Output range: 0 to -110 dBm/1.23 MHz

- Amplitude resolution: 0.1 dB for all channels
- Output accuracy (relative levels between any two channels): ±0.1 dB External calibration may be required for this.
- Absolute output accuracy: ±2.0 dB
- Minimum waveform quality factor (ρ): greater than 0.99 (excess power is less than 0.044 dB)
- Source VSWR: 2.0:1

8.4.3.2 Receiver

Input Range -50 to +40 dBm. External attenuators and/or amplifiers may be used to meet these power requirements and may be considered as part of the equipment.

Reporting capability of time of arrival with a resolution of 1/8 chip or shorter in duration.

8.4.3.3 Protocol Support

The access network shall be capable of supplying the protocols required by this document.

8.4.3.4 Timing Signals

The sector shall provide the following system timing signals referenced to the sector antenna port for use as triggers by other measurement equipment:

- 26.67 ms clock: Short sequence rollover.
- 426.67 ms clock: Control Channel Cycle.
- Even second time mark.
- 1.67 ms slot clock.

Signals synchronized to the following events:

- Transmitter disabling (right after a Control Channel capsule has been transmitted).
- Start of power control bit sequences.

8.4.3.5 General Requirements

- The access network shall have the means to generate packets emulating other users so that the Forward Traffic Channel has a determined packet activity. The packet activity is defined as: $\frac{\text{Number of Non - idle slots}}{\text{Total Number of Slots}}$
- Packet activities of 100% and 0% shall be supported.
- When the access terminal under test is in the Connected State and a 100% packet activity is required, the access network shall conform the following rules for the generation of packets:

- All the slots during the test will contain Forward Traffic Channel packets or Control Channel packets (100% packet activity).
- Unless otherwise explicitly stated, the serving rate of the access terminal under test shall be 50%. Therefore, at every slot that a new Forward Traffic Channel packet is to be generated, the access network shall generate a uniformly distributed random number “x” between 0 and 1.
- If x > 0.5, the Forward Traffic Channel packet shall be directed to the access terminal under test.
- Otherwise, the Forward Traffic Channel packet shall be a filling packet emulating other users’ activity.
- The packets emulating other users must be of the same length as the length of the packets generated for the access terminal under test. The Preamble MAC index used for the filling packets shall be any valid MAC index number different to the one used for the access terminal under test.

In addition the following requirement shall be met by the access network:

- The sectors configuration shall be compliant with the default values of SoftHandoffDelay and SofterHandoffDelay for all the tests. Upon reception by a sector of the first DRC in a sequence of DRCs pointing to it, the sector shall not transmit any packet until the time determined by SoftHandoffDelay or SofterHandoffDelay.
- The access network shall be able to generate all the power control bits patterns specified in this Standard. These patterns specify Reverse Power Control Channel bit values or sequence of values. The DRCLock bits of the DRCLock Channel shall not be part of these values or sequence of values.
- The access network shall be configured so that all the Control Channel packets are transmitted over synchronous Control Channel capsules. Each Control Channel capsule shall not span more than one Control Channel packet.

8.4.4 AWGN Generator

The AWGN generator shall meet the following minimum performance requirements:

- Minimum bandwidth: 1.8 MHz
- Frequency ranges[4]:

  For each xHRPD band class under test, the AWGN generator must tune over the range of transmit and receive frequencies for that band class.
- Frequency resolution: 1 kHz.

---

[4] The frequency ranges are based on covering the receive band and frequencies as great as 5 MHz outside the band.

- Output accuracy: ±2 dB for outputs greater than or equal to -80 dBm/1.23 MHz.
- Amplitude resolution: 0.1 dB.
- Output range: -20 to -95 dBm/1.23 MHz.
- The AWGN generator shall be uncorrelated to the ideal transmitter signal. See 8.4.3.1.

8.4.5 CW Generator

The CW generator shall meet the following minimum performance requirements:

- Output frequency range: Tunable over applicable range of radio frequencies.
- Frequency accuracy: ±1 ppm.
- Frequency resolution: 100 Hz.
- Output range: -50 dBm to -10 dBm, and off.
- Output accuracy: ±1.0 dB for above output range and frequencies.
- Amplitude resolution: 0.1 dB.
- Output phase noise: As required.
- Output Phase Noise at –20 dBm Power:

    -144 dBc/Hz at a frequency of 2 GHz as measured at a 635 kHz offset (Band Classes 1, 4, 6 and 8).

8.4.6 Spectrum Analyzer

The spectrum analyzer shall provide the following functionality:

- General purpose frequency domain measurements.
- Integrated channel power measurements (power spectral density in 1.23 MHz).

The spectrum analyzer shall meet the following minimum performance requirements:

- Frequency range: Tunable over the applicable radio frequency range.
- Frequency resolution: 1 kHz.
- Frequency accuracy: ±0.2 ppm.
- Displayed dynamic range: 70 dB.
- Display log scale fidelity: ±1 dB over the above displayed dynamic range.
- Amplitude measurement range for signals from 10 MHz to 6 GHz:
    1. Power measured in 30 kHz resolution bandwidth: -90 to +20 dBm.
    2. Integrated 1.23 MHz channel power: -70 to +40 dBm.
    3. Noise floor: -140 dBm/Hz.

    4. External attenuation may be used to meet the high power end of the range and may be considered as part of the equipment.

- Absolute amplitude accuracy (for integrated channel power measurements):
    1. ±1 dB over the range of -40 dBm to +20 dBm.
    2. ±1.3 dB over the range of -70 dBm to +20 dBm.
- Relative flatness: ±1.5 dB over frequency range 10 MHz to 6 GHz.
- Resolution bandwidth filter: Synchronously tuned or Gaussian (at least 3 poles) with 3 dB bandwidth selections of 1 MHz, 300 kHz, 100 kHz, and 30 kHz.
- Post detection video filters: Selectable in decade steps from 100 Hz to at least 1 MHz.
- Detection modes: Average detection mode.
- RF input impedance: Nominal 50 ohms.

The spectrum analyzer may also provide the functionality of time domain (zero span) measurements with true average power determination. If this functionality is provided, the spectrum analyzer shall meet the following additional minimum performance requirements:

- Time domain sweep time: Selectable from 50 μs to 100 ms.
- Delayed sweep trigger: Selectable from 5 μs to 40 ms.
- External sweep trigger.
- Sufficient bandwidths to make the time domain measurements.

8.4.7 Average Power Meter

The power meter shall provide the following functionality:

- Average power measurements.
- True RMS detection for both sinusoidal and non-sinusoidal signals.
- Absolute power in linear (watt) and logarithmic (dBm) units.
- Relative (offset) power in dB and percentage units.
- Automatic calibration and zeroing.
- Averaging of multiple readings.

The power meter shall meet the following minimum performance requirements:

- Frequency range: 10 MHz to 2 GHz.
- Power range: -70 dBm (100 pW) to + 40 dBm (10 W).
- Different sensors may be required to optimally provide this power range. External attenuation may be used to meet the high power end of the range and may be considered as part of the equipment.

- Absolute and relative power accuracy: ±0.2 dB (5%).
- Excludes sensor and source mismatch (VSWR) errors, zeroing errors (significant at bottom end of sensor range), and power linearity errors (significant at top end of sensor range).
- Power measurement resolution: Selectable between 0.1 or 0.01 dB.
- Sensor VSWR: 1.15:1.

8.5 Functional System Setups

8.5.1 Functional Block Diagrams

Figure 8.5.1-1 through Figure 8.5.1-5 show the functional block diagrams of the set-up for different tests:

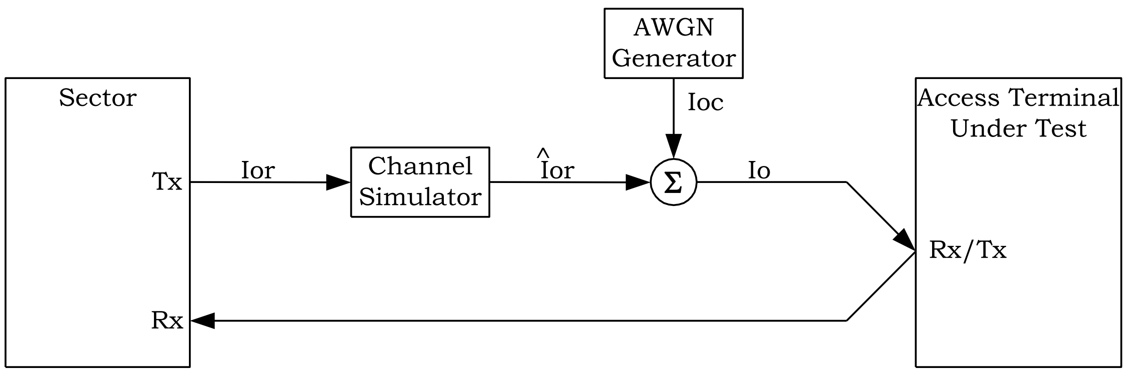

Figure 8.5.1-1. Functional Set-up for Traffic Channel Tests in Fading Channel with Full Packet Activity

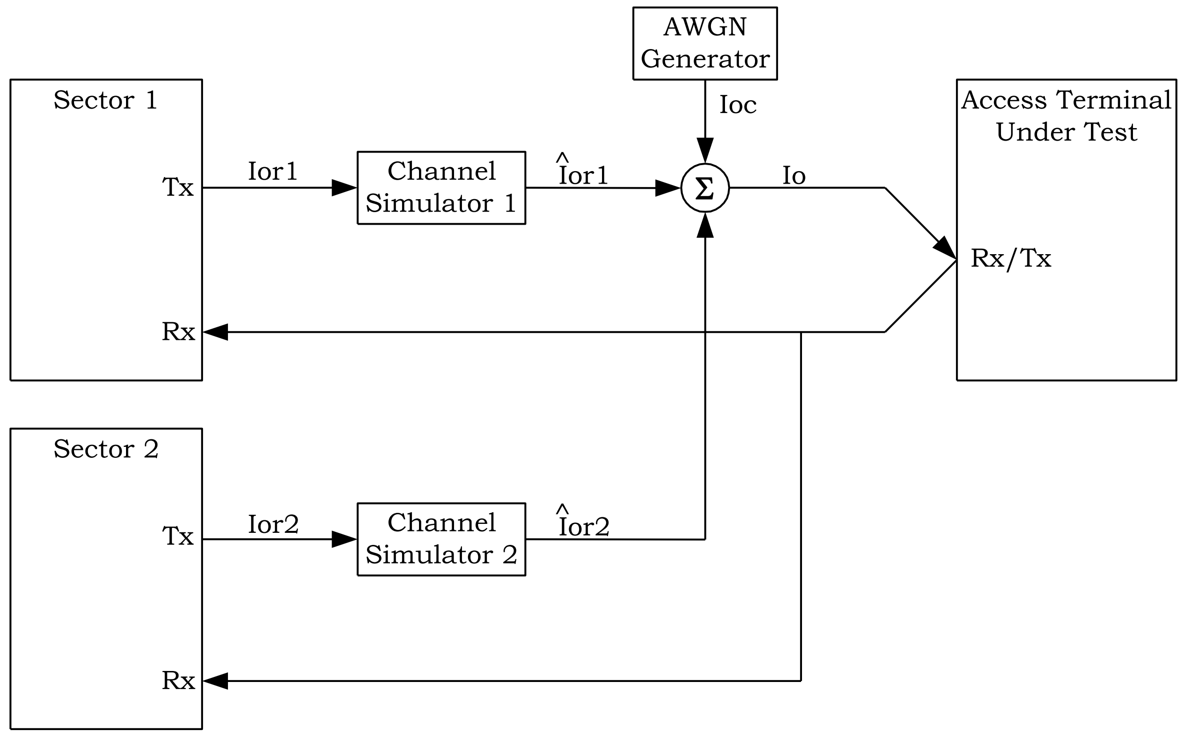

Figure 8.5.1-2. Functional Set-up for Tests with Two Sectors

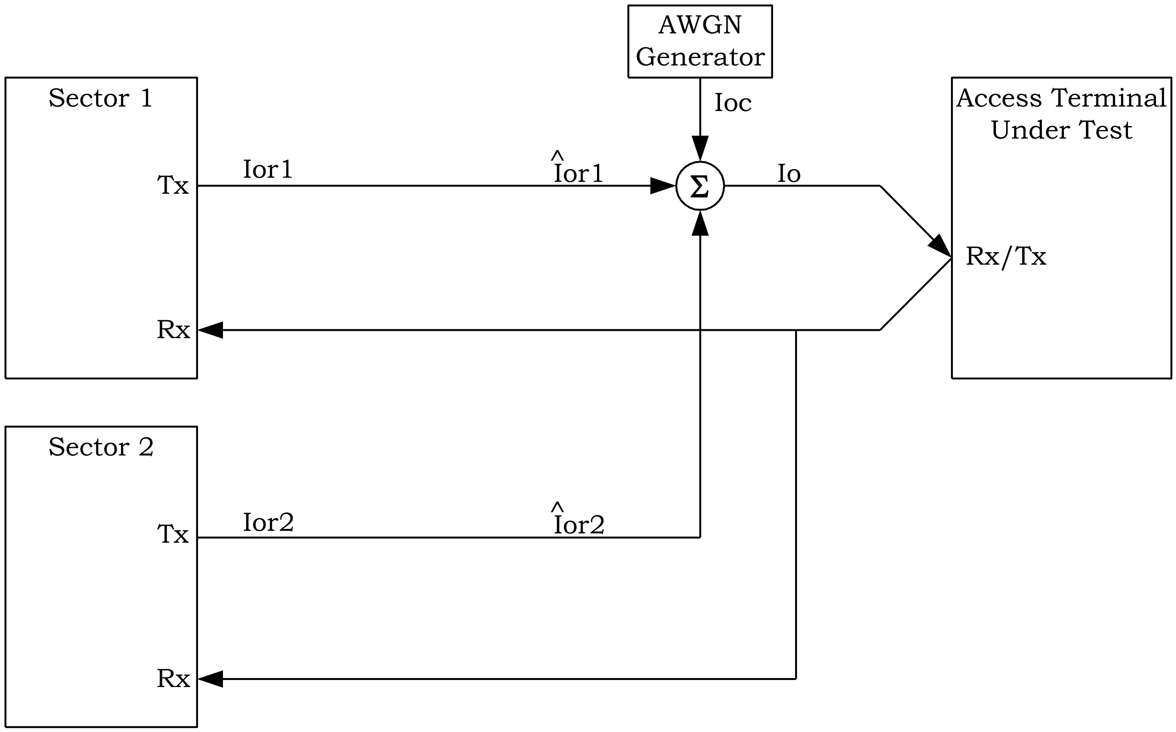

Figure 8.5.1-3. Functional Set-up for Searcher Tests

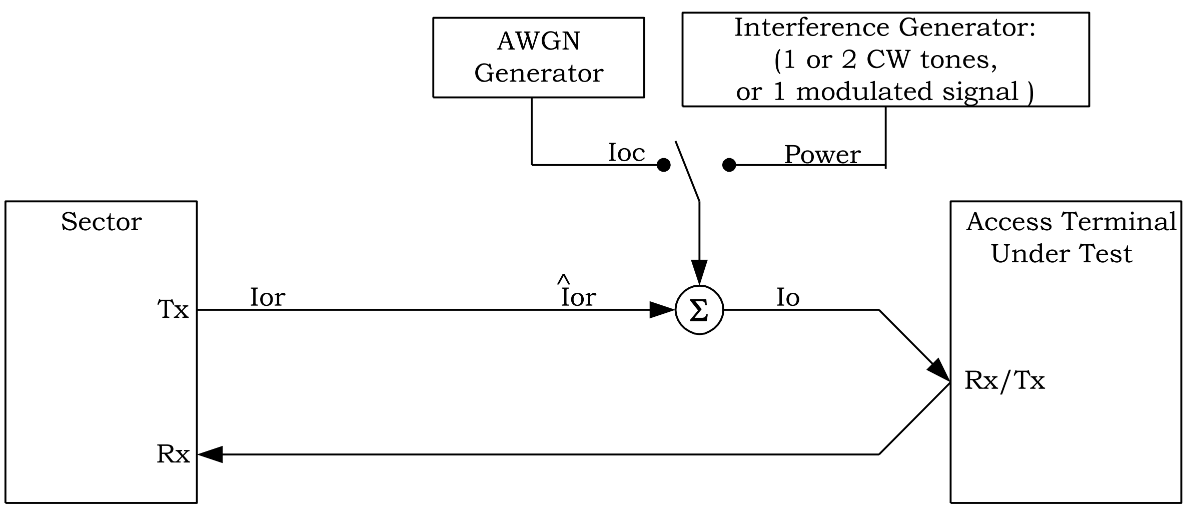

Figure 8.5.1-4. Functional Set-up for Tests without Fading

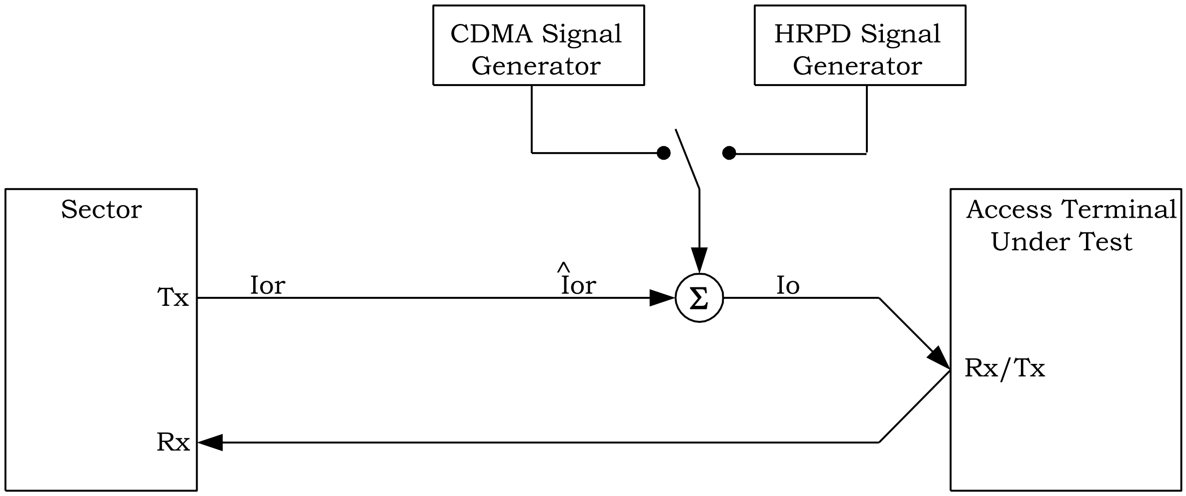

Figure 8.5.1-5. Functional Set-up for Test for Adjacent Channel Selectivity

8.5.2 General Comments

The following comments apply to all tests:

1. During handoff tests, Channel 2 from sector 2 always has a relative delay of 12 microseconds from Channel 1 from sector 1 at the access terminal antenna connector.
2. Pilot PN sequence offset indices are denoted by P_i (i = 1, 2, 3…). The following assumptions hold unless otherwise specified:
   - $0 \le P_i \le 511$
   - $P_i \ne P_j$ if $i \ne j$
   - $P_i \bmod \text{PilotIncrement} = 0$
3. Access networks should be configured for normal operation as specified in [1] unless explicitly stated differently in a specific test.
4. Unless otherwise specified, the Reverse Traffic Channel should be operated at a sufficiently high E_b/N_t to ensure insignificant (for example, less than 10^{-5}) packet error rate.
5. Unless otherwise specified, the Reverse Link overhead channels (ACK, DRC, DSC and RRI) should be operated at a sufficiently high E_s/N_t to ensure insignificant (for example, less then 10^{-5}) symbol error rate and symbol erasure rate. The gains of these overhead channels relative to the Pilot Channel shall be maintained at their respectively specified values for each test.
6. For an access terminal with an integral antenna, the manufacturer shall provide a calibrated RF coupling fixture to provide connection to the standard test equipment.

7. Overhead messages fields should be those needed for normal operation of the access network unless stated differently below or in a specific test.

8. Protocol attributes field values should be those needed for normal operation of the access network unless stated differently below or in a specific test.

Special field values of *AccessParameters Message*:

Field	Value (Decimal)
ProbeInitialAdjust	0 (0 dB)
ProbeNumStep	5 (5 probes per sequence)
PowerStep	0 (0 dB)

Special field values of *SectorParameters Message* for Sector 1:

Field	Value (Decimal)
NumNeighbors	16 (16 neighbors)
NeighborPN	P_2
NeighborChanIncl	0
NeighborPN	P_3
NeighborChanIncl	0
NeighborPN	P_4
NeighborChanIncl	0
NeighborPN	P_5
NeighborChanIncl	0
NeighborPN	P_6
NeighborChanIncl	0
NeighborPN	P_7
NeighborChanIncl	0
NeighborPN	P_8
NeighborChanIncl	0
NeighborPN	P_9
NeighborChanIncl	0
NeighborPN	P_{10}
NeighborChanIncl	0
NeighborPN	P_{11}
NeighborChanIncl	0
NeighborPN	P_{12}
NeighborChanIncl	0
NeighborPN	P_{13}
NeighborChanIncl	0
NeighborPN	P_{14}
NeighborChanIncl	0

Field (cont'd)	Value (Decimal)
NeighborPN	P_{15}
NeighborChanIncl	0
NeighborPN	P_{16}
NeighborChanIncl	0
NeighborPN	P_{17}
NeighborChanIncl	0

Special field values of *SectorParameters Message* for Sector 2:

Field	Value (Decimal)
NumNeighbors	16 (16 neighbors)
NeighborPN	P_1
NeighborChanIncl	0
NeighborPN	P_3
NeighborChanIncl	0
NeighborPN	P_4
NeighborChanIncl	0
NeighborPN	P_5
NeighborChanIncl	0
NeighborPN	P_6
NeighborChanIncl	0
NeighborPN	P_7
NeighborChanIncl	0
NeighborPN	P_8
NeighborChanIncl	0
NeighborPN	P_9
NeighborChanIncl	0
NeighborPN	P_{10}
NeighborChanIncl	0
NeighborPN	P_{11}
NeighborChanIncl	0
NeighborPN	P_{12}
NeighborChanIncl	0
NeighborPN	P_{13}
NeighborChanIncl	0
NeighborPN	P_{14}
NeighborChanIncl	0
NeighborPN	P_{15}
NeighborChanIncl	0
NeighborPN	P_{16}
NeighborChanIncl	0
NeighborPN	P_{17}
NeighborChanIncl	0

Special field values of *PowerParameters* attribute of the Default Reverse Traffic Channel MAC Protocol:

Field	Value (Decimal)
RPCStep	0 (0.5 dB)

Values of time limits and other constants should be as specified in [1]. Values of some time limits and constants are listed below for reference.

Constant	Value
$T_{RTCMPATSetup}$	1.5 secs
$T_{CCMPSupervision}$	12 Control Channel cycles (5.12 secs)
$T_{FTCMDRCSupervision}$	240 ms
$T_{FTCMPRestartTx}$	12 Control Channel cycles (5.12 secs)
$N_{FTCMPRestartTx}$	16 slots

Set the *RateParameters* attribute fields of the Default Reverse Traffic Channel MAC Protocol to the values specified below:

Field	Value
Transition009k6_019k2	0xFF (probability: 1)
Transition019k2_038k4	0xFF (probability: 1)
Transition038k4_076k8	0xFF (probability: 1)
Transition076k8_153k6	0xFF (probability: 1)
Transition019k2_009k6	0xFF (probability: 1)
Transition038k4_019k2	0xFF (probability: 1)
Transition076k8_038k4	0xFF (probability: 1)
Transition153k6_076k8	0xFF (probability: 1)

8.6 Error Rates Measurement

8.6.1 Control Channel PER

The Control Channel PER is calculated as follows:

$$\text{Control Channel PER} = 1 - \frac{\Delta \text{ControlChannelPktCount}}{\Delta \text{IdleStateElapsedTime}/256}$$

where *IdleStateElapsedTime* and *ControlChannelPktCount* are parameters defined in the Test Application FTAP in [3].

8.6.2 Forward Traffic Channel PER

The Forward Traffic Channel PER for data rate "i" is calculated as follows:

$$\text{PER}_i = \frac{(\text{Number of Bad Packets at Rate i})}{(\text{Number of Transmitted Packets at Rate i})}$$

where (# Bad Packets at Rate i) and (# Transmitted Packets at Rate i) are parameters obtained from the Test Application FTAP, as defined in [3].

The average Forward Traffic Channel PER is calculated as follows:

$$\text{PER} = \frac{\sum_i (\text{Number of Bad Packets at Rate i})}{\sum_i (\text{Number of Transmitted Packets at Rate i})}$$

where the summations are done over all the Forward Traffic Channel data rates.

8.6.3 BCMCS PER

The BCMCS PER is calculated as follows:

$$\text{PER} = \frac{(\text{Number of Bad Security Packets})}{(\text{Number of Transmitted Security Packets})}$$

Only Broadcast packets shall be included in the above computation.

8.7 Throughput Calculation

Data rate throughput shall be calculated based only on the packets sent to the access terminal in response to the access terminal’s request. The access network simulator shall count only packets it transmits to the access terminal at the access terminal’s request. The access terminal shall count the number of slots required for the access terminal to decode each packet and report it to the access network simulator. The average Forward Traffic Channel (FTC) throughput can be computed by the access network simulator using

$$\text{Average FTC Throughput (kbps)} = \frac{\sum_i \text{PayloadSize}[i]}{\sum_i \text{DecodeSlots}[i] \times 5/3}$$

where $\text{PayloadSize}[i]$ is the physical layer payload size of the i^{th} packet transmitted to the access terminal under test and $\text{DecodeSlots}[i]$ is the number of slots taken by the access terminal to decode the i^{th} packet. If the i^{th} packet could not be decoded successfully by the access terminal, then $\text{PayloadSize}[i]$ shall be set to 0 and $\text{DecodeSlots}[i]$ shall be set to its nominal length in slots

8.8 Confidence Interval

8.8.1 Confidence Level of Error Rate

When it is required that an error rate (e.g. PER) of a given test be less than a specified value with confidence level C, the procedure for a one-sided confidence limit is applied. This procedure assumes that all errors occur independently, resulting in a Poisson distribution of errors during the test. Since test procedures do not specify either the test duration or the number of errors that are allowed, the error rate at the specified confidence level is computed after the test is completed. Alternatively, if sufficiently few errors occur during the test, the test may be halted when the desired confidence level on the error rate is achieved.

In order to have a confidence level C that the true error rate is less than the specified error rate, the measured error rate shall be less than

$$p' = 2pk/\chi^2(1-C,2k),$$

where p' is the measured error rate, p is the specified error rate, and k is the number of errors that occur during the test. In this expression, $\chi^2(\alpha,n)$ is the value x such that $P(X > x) = \alpha$, where X is a chi-squared distributed random variable with n degrees of freedom. Values for $\chi^2(\alpha,n)$ can be found in various tables. Equivalently stated, satisfying this expression means that the true error rate has probability C of being less than the specified error rate.

Figure 8.8.1-1 and Figure 8.8.1-2 provide curves of the demonstrated performance as a fraction of the targeted specification versus the number of errors measured in the tests for confidence levels of 95% and 90%, respectively. The test duration can be determined by dividing the number of errors by the demonstrated error rate. From the figure, as the number of errors becomes large, the measured error rate becomes very close to the specified error rate. This means that if the true error rate is close to the specified error rate, the test time can become increasingly long.

Figure 8.8.1-3 provides a curve of maximum PER as a function of the number of packets tested for the specified packet error rate of 0.01 with 95% confidence level. Figure 8.8.1-4 provides a curve of maximum FER as a function of the number of packets tested for the specified packet error rate of 0.1 with 90% confidence level.

If no errors occur during a test, the test may be terminated when the test time is sufficient to assure the confidence level on error rate is achieved. This is done by assuming one error could have occurred at the end of the test, and applying the criteria stated above with k = 1.

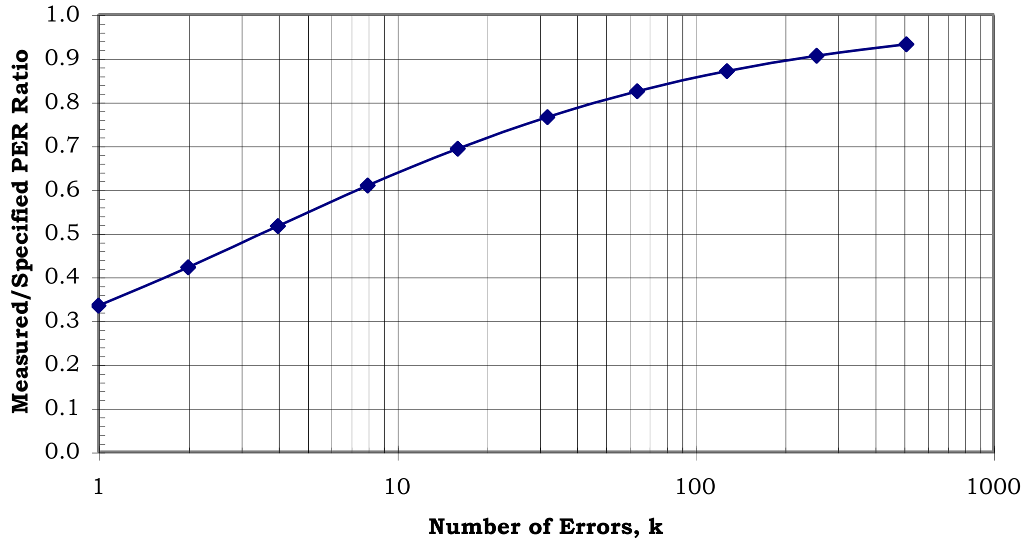

Figure 8.8.1-1. Rate Ratio Bound as a Function of Number of Errors (K) for 95% Confidence

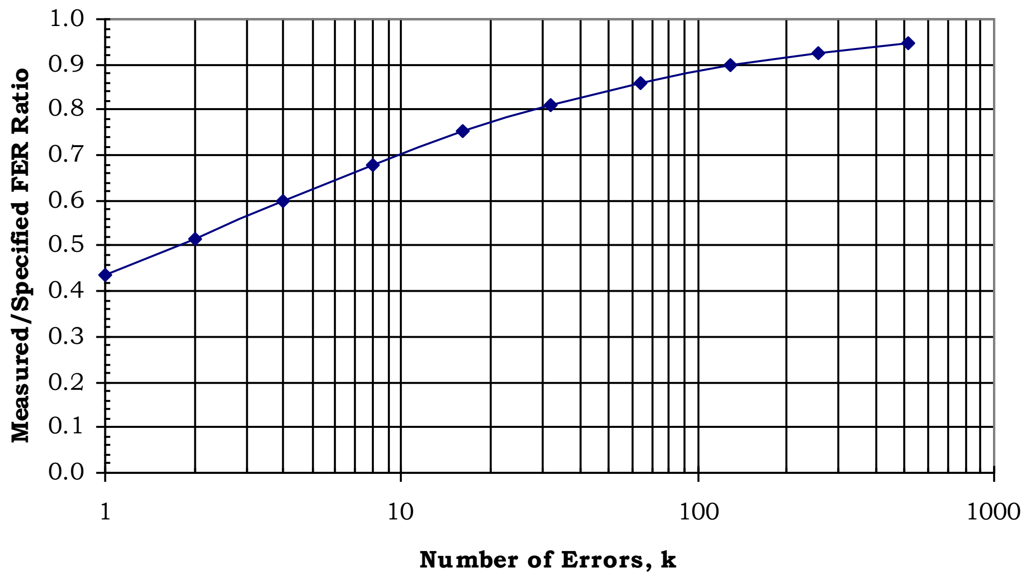

Figure 8.8.1-2. Rate Ratio Bound as a Function of Number of Errors (K) for 90% Confidence

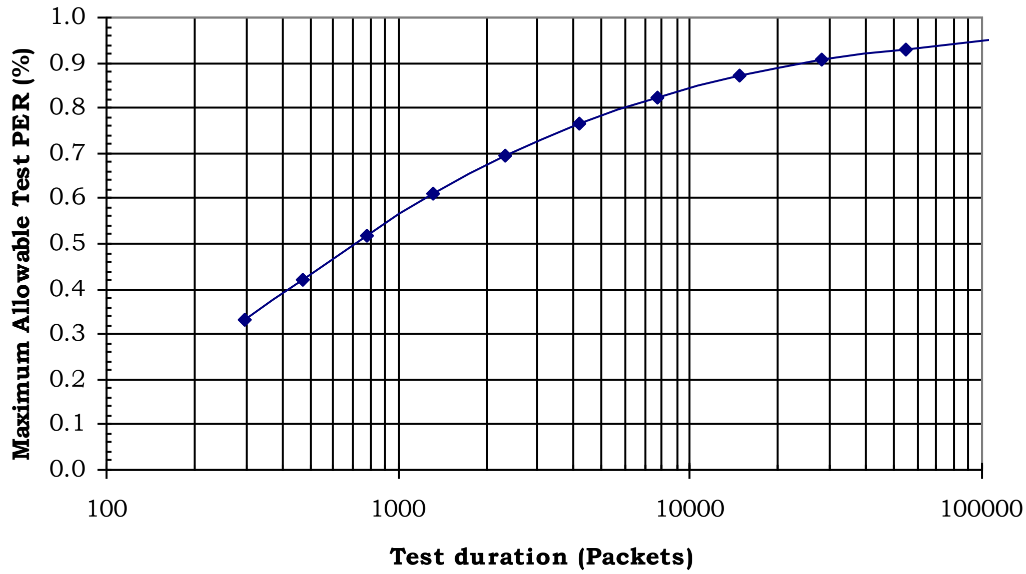

Figure 8.8.1-3. Test Requirement for 95% Confidence of PER = 0.01

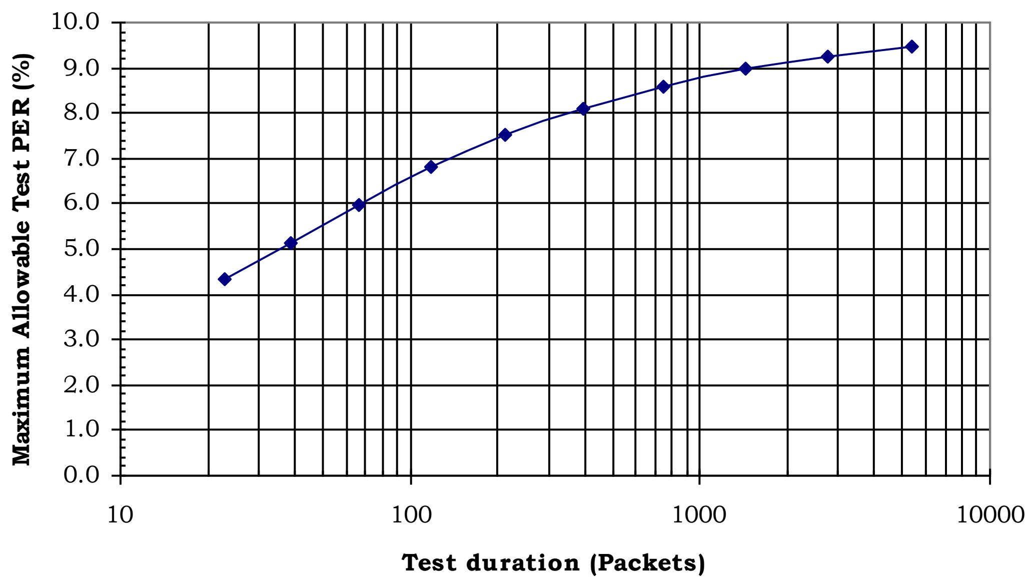

Figure 8.8.1-4. Test Requirement for 90% Confidence of PER = 0.1

8.8.2 Confidence on Power Measurement During Fading

During fading tests, the average power over the test can be estimated based on the assumption that fade samples spaced about one half wavelength apart are independent. Under this assumption, the standard deviation of power decreases as squared root of the number of independent samples in the test. Then at a given speed the time between independent samples is computed as (3600/1000) × (λ /2×v), where λ is the wavelength in meters and v is the vehicle speed in kilometers per hour.

Figure 8.8.2-5 shows the standard deviation of average power as a function of test time (in 20 ms frames) for three fading cases (Cases 1, 3, and 4 from top to bottom) specified in Table 8.4.1.1-1. In these cases the standard deviation of the individual samples depends on the number and amplitudes of the paths specified for each test, and the time between independent samples was determined from the speed specified for the test. The minimum test duration requirements based on a power measurement uncertainty requirement of 0.2 dB are summarized in Table 8.8.2-1.

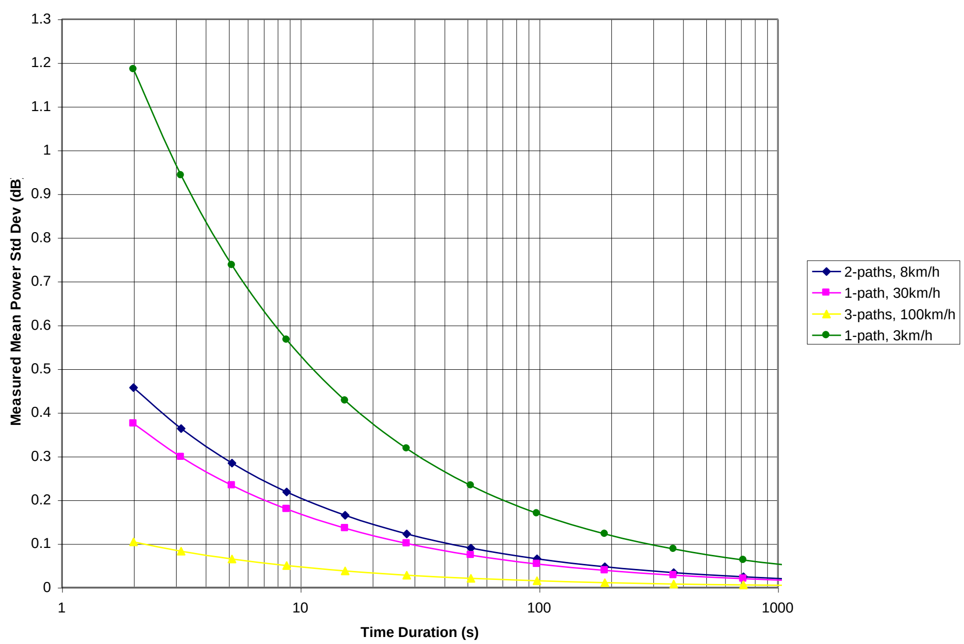

Figure 8.8.2-5. Uncertainty in Power Measurement in Rayleigh Fading

Table 8.8.2-1. Minimum Test Duration Requirements

Channel Simulator Configuration							
1		**3**		**4**		**6**	
seconds	slots	seconds	slots	seconds	slots	seconds	slots
10	6000	7	4200	2	1200	70	42000

One slot corresponds to 1.67 ms.

8.8.3 Confidence level of Detection Time

Several tests involve the successful detection of a strong pilot, or the successful loss detection of a weak pilot. Tests of this type require that the time to have a successful outcome be less than a specified value, T, with probability, p, and confidence level, C. One method to establish a confidence level from the measurements is to declare an error if the time to success exceeds the specified time, T. Assume that k errors occur during N repeated tests. The method used in A.1 can be used to determine the confidence level of the test by replacing p' with k/N. The resulting requirement on k, in order to have a confidence level C that the true error rate is less than the specified error rate, is that k satisfy the relationship:

$$\chi^2(1-C,2k) = 2Np\ .$$

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ANNEX A SELECTED PERFORMANCE REQUIREMENTS TABLES

This annex is normative.

A.1 Demodulation Requirements

A.1.1 Demodulation of Forward Traffic Channel in AWGN

These requirements are referenced by 3.2.1.

A.1.1.1 Method of Measurement

Table A.1.1.1-1. Test Parameters for FTC Demodulation in AWGN (Part 1 of 10)

Parameter	Units	Test 1	Test 2	Test 3	Test 4
$\hat{I}_{or}/I_{oc}$	dB	15.4	13.4	10.8	10.1
I_{oc}	dBm/1.23 MHz	-70.4	-68.4	-65.8	-65.1
Data Rate	kbps	2,457.6	2,457.6	1,843.2	1,843.2
Slots per Physical Layer packet	Slots	1	1	1	1
$\frac{\text{Traffic } E_b}{N_t}$	dB	11.14	9.14	7.79	7.09
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.12	-0.19	-0.35	-0.4

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

Table A.1.1.1-2. Test Parameters for FTC Demodulation in AWGN (Part 2 of 10)

Parameter	Units	Test 5	Test 6
$\hat{I}_{or}/I_{oc}$	dB	5.9	6
I_{oc}	dBm/1.23 MHz	-60.9	-61
Data Rate	kbps	1,228.8	1,228.8
Slots per Physical Layer packet	Slots	2	2
$\frac{\text{Traffic } E_b}{N_t}$	dB	4.74	4.84
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.99	-0.97

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

Table A.1.1.1-3. Test Parameters for FTC Demodulation in AWGN (Part 3 of 10)

Parameter	Units	Test 7	Test 8
$\hat{I}_{or}/I_{oc}$	dB	3.1	3.2
I_{oc}	dBm/1.23 MHz	-58.1	-58.2
Data Rate	kbps	921.6	921.6
Slots per Physical Layer packet	slots	2	2
$\frac{\text{Traffic } E_b}{N_t}$	dB	3.19	3.29
$\frac{\text{Pilot } E_c}{I_o}$	dB	-1.73	-1.7

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

Table A.1.1.1-4. Test Parameters for FTC Demodulation in AWGN (Part 4 of 10)

Parameter	Units	Test 9	Test 10	Test 11
$\hat{I}_{or} / I_{oc}$	dB	5.5	0.5	-2.5
I_{oc}	dBm/1.23 MHz	-60.5	-55.5	-52.5
Data Rate	kbps	1,228.8	614.4	307.2
Slots per Physical Layer packet	slots	1	2	4
$\frac{\text{Traffic } E_b}{N_t}$	dB	4.25	2.35	2.36
$\frac{\text{Pilot } E_c}{I_o}$	dB	-1.08	-2.77	-4.44

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

Table A.1.1.1-5. Test Parameters for FTC Demodulation in AWGN (Part 5 of 10)

Parameter	Units	Test 12	Test 13	Test 14
$\hat{I}_{or} / I_{oc}$	dB	0.6	0.7	0.8
I_{oc}	dBm/1.23 MHz	-55.6	-55.7	-55.8
Data Rate	kbps	614.4	614.4	614.4
Slots per Physical Layer packet	Slots	1	1	1
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.36	2.46	2.56
$\frac{\text{Pilot } E_c}{I_o}$	dB	-2.72	-2.67	-2.63

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

Table A.1.1.1-6. Test Parameters for FTC Demodulation in AWGN (Part 6 of 10)

Parameter	Units	Test 15	Test 16	Test 17	Test 18
$\hat{I}_{or}/I_{oc}$	dB	-2.5	-5.6	-8.6	-11.4
I_{oc}	dBm/1.23 MHz	-52.5	-49.4	-46.4	-43.6
Data Rate	kbps	307.2	153.6	76.8	38.4
Slots per Physical Layer packet	Slots	2	4	8	16
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.27	2.18	2.19	2.4
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4.44	-6.66	-9.16	-11.7

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

Table A.1.1.1-7 Test Parameters for FTC Demodulation in AWGN (Part 7 of 10)

Parameter	Units	Test 19	Test 20	Test 21
$\hat{I}_{or}/I_{oc}$	dB	-2.51	-5.29	-6.93
I_{oc}	dBm/1.23 MHz	-52.50	-49.72	-48.07
Data Rate	kbps	307.2	153.6	76.8
Physical Layer Packet Size	Bits	512	256	128
Slots per Physical Layer packet	Slots	1	1	1
Preamble Length	Chips	64	64	64
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.27	2.50	3.86
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4.44	-6.41	-7.73

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

Table A.1.1.1-8 Test Parameters for FTC Demodulation in AWGN (Part 8 of 10)

Parameter	Units	Test 22	Test 23	Test 24
$\hat{I}_{or}/I_{oc}$	dB	-11.25	-11.00	-9.46
I_{oc}	dBm/1.23 MHz	-43.75	-44.00	-45.54
Data Rate	kbps	38.4	38.4	38.4
Physical Layer Packet Size	Bits	512	256	128
Slots per Physical Layer packet	Slots	8	4	2
Preamble Length	Chips	512	256	128
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.55	2.81	4.34
$\frac{\text{Pilot } E_c}{I_o}$	dB	-11.57	-11.33	-9.93

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

Table A.1.1.1-9 Test Parameters for FTC Demodulation in AWGN (Part 9 of 10)

Parameter	Units	Test 25	Test 26	Test 27
$\hat{I}_{or}/I_{oc}$	dB	-7.93	-10.49	-9.33
I_{oc}	dBm/1.23 MHz	-47.07	-44.51	-45.68
Nominal Data Rate	kbps	19.2	9.6	4.8
Effective Data Rate	kbps	76.8	38.4	38.4
Physical Layer Packet Size	Bits	512	256	128
Slots per Physical Layer packet	Slots	16	16	16
Preamble Length	Chips	1024	1024	1024
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.28	2.73	2.98
$\frac{\text{Pilot } E_c}{I_o}$	dB	-8.58	-10.86	-9.80

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

Table A.1.1.1-10 Test Parameters for FTC Demodulation in AWGN (Part 10 of 10)

Parameter	Units	Test 28	Test 29	Test 30
$\hat{I}_{or}/I_{oc}$	dB	8.11	33.44	20.45
I_{oc}	dBm/1.23 MHz	-63.11	-78.44	-75.45
Data Rate	kbps	1,536.0	3,072.0	3,072.0
Physical Layer Packet Size	Bits	5,120	5,120	5,120
Slots per Physical Layer packet	Slots	2	1	1
Preamble Length	Chips	64	64	64
$\frac{\text{Traffic } E_b}{N_t}$	dB	5.98	28.21	15.22
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.62	-0.00	-0.04

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

A.1.1.2 Minimum Standard

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

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
3	1,843.2	1	7.69	0.03
			7.79	0.01
			7.99	0.005
5 and 6	1,228.8	2	4.64	0.05
			4.74	0.03
			4.84	0.005
7, and 8	921.6	2	3.19	0.05
			3.29	0.01
			3.39	0.003
9	1,228.8	1	4.1	0.03
			4.25	0.01
			4.35	0.005
10	614.4	2	2.25	0.03
			2.35	0.01
			2.45	0.005
11	307.2	4	2.26	0.03
			2.36	0.01

Table A.1.1.2-2. Minimum Standards for Forward Traffic Channel Performance in AWGN (Part 2 of 7)

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
12, 13, and 14	614.4	1	2.36	0.05
			2.46	0.01
			2.56	0.005
			2.66	0.003
15	307.2	2	2.07	0.03
			2.27	0.01
			2.37	0.005
16	153.6	4	1.98	0.03
			2.18	0.01
			2.28	0.005
17	76.8	8	2.09	0.03
			2.19	0.01
			2.29	0.005
18	38.4	16	2.3	0.03
			2.4	0.01
			2.5	0.005

Table A.1.1.2-3. Minimum Standards for Forward Traffic Channel Performance in AWGN (Part 3 of 7)

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
4	1,843.2	1	6.99	0.03
			7.09	0.01
			7.29	0.005

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

Test	Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
19	(512, 1, 64)	2.09	0.03
		2.27	0.01
		2.38	0.005
20	(256, 1, 64)	2.27	0.03
		2.50	0.01
		2.64	0.005
21	(128, 1, 64)	3.56	0.03
		3.86	0.01
		4.01	0.005
22	(512, 8, 512)	2.43	0.03
		2.55	0.01
		2.68	0.005
23	(256, 4, 256)	2.61	0.03
		2.81	0.01
		2.94	0.005
24	(128, 2, 128)	4.03	0.03
		4.34	0.01
		4.48	0.005

Table A.1.1.2-5 Minimum Standards for Forward Traffic Channel Performance in AWGN (Part 5 of 7)

Test	Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
25	(512, 16, 1024)	2.11	0.03 (after 4 slots)
		2.28	0.01 (after 4 slots)
		2.36	0.005 (after 4 slots)
26	(256, 16, 1024)	2.50	0.03 (after 4 slots)
		2.73	0.01 (after 4 slots)
		2.84	0.005 (after 4 slots)
27	(128, 16, 1024)	2.72	0.03 (after 2 slots)
		2.98	0.01 (after 2 slots)
		3.14	0.005 (after 2 slots)

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

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
28	1,536.0	2	5.90	0.03
			5.98	0.01
			6.05	0.005
29	3,072.0	1	21.41	0.03
			28.21	0.01
			44.28	0.008

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

Test	Data Rate (kbps)	Slots	E_b/N_t [dB]	PER
30	3,072.0	1	14.52	0.03
			15.22	0.01
			15.35	0.008

A.1.2 Demodulation of Forward Traffic Channel in Multipath Fading Channel

A.1.2.1 Method of Measurement

Table A.1.2.1-1. Test Parameters for FTC Demodulation in Fading Channel (Case 1, Part 1 of 2)

Parameter	Units	Test 1	Test 2	Test 3
$\hat{I}_{or}/I_{oc}$	dB	-7.4	-5.8	-4.6
I_{oc}	dBm/1.23 MHz	-47.6	-49.2	-50.4
Data Rate	kbps	38.4		
$\frac{\text{Traffic } E_b}{N_t}$	dB	6.02	7.47	8.51
$\frac{\text{Pilot } E_c}{I_o}$	dB	-8.13	-6.81	-5.89

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves.

Table A.1.2.1-2 Test Parameters for FTC Demodulation in Fading Channel (Case 1, Part 2 of 2)

Parameter	Units	Test 4	Test 5	Test 6
$\hat{I}_{or} / I_{oc}$	dB	-3.8	-2.4	-1.5
I_{oc}	dBm/1.23 MHz	-51.2	-52.6	-53.5
Data Rate	kbps	76.8		
$\frac{\text{Traffic } E_b}{N_t}$	dB	6.17	7.29	7.98
$\frac{\text{Pilot } E_c}{I_o}$	dB	-5.31	-4.37	-3.82

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves.

Table A.1.2.1-3. Test Parameters for FTC Demodulation in Fading Channel (Case 2, Part 1 of 2)

Parameter	Units	Test 7	Test 8	Test 9
$\hat{I}_{or} / I_{oc}$	dB	-3.0	0.5	2.3
I_{oc}	dBm/1.23 MHz	-52.0	-55.5	-57.3
Data Rate	kbps	38.4		
$\frac{\text{Traffic } E_b}{N_t}$	dB	10.80	14.30	16.10
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4.76	-2.77	-2.01

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves.

Table A.1.2.1-4. Test Parameters for FTC Demodulation in Fading Channel (Case 2, Part 2 of 2)

Parameter	Units	Test 10	Test 11	Test 12
$\hat{I}_{or} / I_{oc}$	dB	1.0	3.7	6.0
I_{oc}	dBm/1.23 MHz	-56.0	-58.7	-61.0
Data Rate	kbps	76.8		
$\frac{\text{Traffic } E_b}{N_t}$	dB	11.79	14.49	16.79
$\frac{\text{Pilot } E_c}{I_o}$	dB	-2.54	-1.54	-0.97

Note: The Traffic E_b/N_t and Pilot E_c/I_0 values are calculated from the parameters set in the table. They are not settable parameter themselves.

Table A.1.2.1-5. Test Parameters for FTC Demodulation in Fading Channel (Case 3, Part 1 of 2)

Parameter	Units	Test 13	Test 14	Test 15
$\hat{I}_{or} / I_{oc}$	dB	-6.7	-1.8	0.6
I_{oc}	dBm/1.23 MHz	-48.3	-53.2	-55.6
Data Rate	kbps	38.4		
$\frac{\text{Traffic } E_b}{N_t}$	dB	7.10	12.00	14.40
$\frac{\text{Pilot } E_c}{I_o}$	dB	-7.54	-4.00	-2.72

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

Table A.1.2.1-6. Test Parameters for FTC Demodulation in Fading Channel (Case 3, Part 2 of 2)

Parameter	Units	Test 16	Test 17	Test 18
$\hat{I}_{or}/I_{oc}$	dB	-2.5	0.3	2.5
I_{oc}	dBm/1.23 MHz	-52.5	-55.3	-57.5
Data Rate	kbps	76.8		
$\frac{\text{Traffic } E_b}{N_t}$	dB	8.29	11.09	13.29
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4.44	-2.86	-1.94

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

Table A.1.2.1-7. Test Parameters for FTC Demodulation in Fading Channel (Case 4, Part 1 of 2)

Parameter	Units	Test 19	Test 20	Test 21
$\hat{I}_{or}/I_{oc}$	dB	-9.1	-8.1	-7.5
I_{oc}	dBm/1.23 MHz	-45.9	-46.9	-47.5
Data Rate	kbps	38.4		
$\frac{\text{Traffic } E_b}{N_t}$	dB	4.37	5.29	5.83
$\frac{\text{Pilot } E_c}{I_o}$	dB	-9.60	-8.73	-8.21

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

Table A.1.2.1-8. Test Parameters for FTC Demodulation in Fading Channel (Case 4, Part 2 of 2)

Parameter	Units	Test 22	Test 23	Test 24
$\hat{I}_{or}/I_{oc}$	dB	-6.1	-5.6	-5.1
I_{oc}	dBm/1.23 MHz	-48.9	-49.4	-49.9
Data Rate	kbps	76.8		
$\frac{\text{Traffic } E_b}{N_t}$	dB	4.06	4.49	4.91
$\frac{\text{Pilot } E_c}{I_o}$	dB	-7.05	-6.66	-6.27

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

Table A.1.2.1-9 Test Parameters for FTC Demodulation in Fading Channel (Case 5)

Parameter	Units	Test 25
$\hat{I}_{or}/I_{oc}$	dB	7.9
I_{oc}	dBm/1.23 MHz	-62.9
Nominal Data Rate	kbps	19.2
Effective Data Rate	kbps	76.8
Physical Layer Packet Size	Bits	512
Slots per Physical Layer packet	Slots	16
Preamble Length	Chips	1024
$\frac{\text{Traffic } E_b}{N_t}$	dB	18.11
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.65

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

Table A.1.2.1-10 Test Parameters for Forward Traffic Channel Performance in Fading Channel (Case 6)

Parameter	Units	Test 26
$\hat{I}_{or} / I_{oc}$	dB	-6.5
I_{oc}	dBm/1.23 MHz	-48.5
Nominal Data Rate	kbps	9.6
Effective Data Rate	kbps	38.4
Physical Layer Packet Size	Bits	256
Slots per Physical Layer packet	Slots	16
Preamble Length	Chips	1024
$\frac{\text{Traffic } E_b}{N_t}$	dB	6.12
$\frac{\text{Pilot } E_c}{I_o}$	dB	-7.40

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

Table A.1.2.1-11 Test Parameters for Forward Traffic Channel Demodulation in Fading Channel (Case 7)

Parameter	Units	Test 27
$\hat{I}_{or} / I_{oc}$	dB	1.23
I_{oc}	dBm/1.23 MHz	-56.2
Nominal Data Rate	kbps	4.8
Effective Data Rate	kbps	38.4
Physical Layer Packet Size	Bits	128
Slots per Physical Layer packet	Slots	16
Preamble Length	Chips	1024
$\frac{\text{Traffic } E_b}{N_t}$	dB	11.32
$\frac{\text{Pilot } E_c}{I_o}$	dB	-2.44

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

Table A.1.2.1-12 Test Parameters for Forward Traffic Channel Demodulation in Fading Channel (Case 8)

Parameter	Units	Test 28
$\hat{I}_{or}/I_{oc}$	dB	1.6
I_{oc}	dBm/1.23 MHz	-56.6
Nominal Data Rate	kbps	4.8
Effective Data Rate	kbps	38.4
Physical Layer Packet Size	Bits	128
Slots per Physical Layer packet	Slots	16
Preamble Length	Chips	1024
$\frac{\text{Traffic } E_b}{N_t}$	dB	13.85
$\frac{\text{Pilot } E_c}{I_o}$	dB	-2.30

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

A.1.2.2 Minimum Standard

Table A.1.2.2-1. Minimum Standards for Forward Traffic Channel Performance in Fading Channel (Case 1)

Rate	E_b/N_t [dB]	PER
38.4 kbps	5.29	0.05
	6.02	0.03
	7.47	0.01
	8.51	0.005
	9.01	0.003
76.8 kbps	5.67	0.05
	6.17	0.03
	7.29	0.01
	7.98	0.005
	8.41	0.003

Table A.1.2.2-2. Minimum Standards for Forward Traffic Channel Performance in Fading Channel (Case 2)

Rate	E_b/N_t [dB]	PER
38.4 kbps	9.70	0.05
	10.80	0.03
	14.30	0.01
	16.10	0.005
	17.40	0.003
76.8 kbps	10.79	0.05
	11.79	0.03
	14.49	0.01
	16.79	0.005
	18.39	0.003

Table A.1.2.2-3. Minimum Standards for Forward Traffic Channel Performance in Fading Channel (Case 3)

Rate	E_b/N_t [dB]	PER
38.4 kbps	6.20	0.05
	7.10	0.03
	12.00	0.01
	14.40	0.005
	16.00	0.003
76.8 kbps	7.29	0.05
	8.29	0.03
	11.09	0.01
	13.29	0.005
	16.49	0.003

Table A.1.2.2-4. Minimum Standards for Forward Traffic Channel Performance in Fading Channel (Case 4)

Rate	E_b/N_t [dB]	PER
38.4 kbps	4.00	0.05
	4.37	0.03
	5.29	0.01
	5.83	0.005
	6.19	0.003
76.8 kbps	3.89	0.05
	4.06	0.03
	4.49	0.01
	4.91	0.005
	5.24	0.003

Table A.1.2.2-5 Minimum Standards for Traffic Channel Performance in Fading Channel (Case 5)

Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
(512, 16, 1024)	14.91	0.03 (after 4 slots)
	18.11	0.01 (after 4 slots)
	19.96	0.005 (after 4 slots)

Table A.1.2.2-6 Minimum Standards for Traffic Channel Performance in Fading Channel (Case 6)

Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
(256, 16, 1024)	5.57	0.03 (after 4 slots)
	6.12	0.01 (after 4 slots)
	6.48	0.005 (after 4 slots)

Table A.1.2.2-7 Minimum Standards for Traffic Channel Performance in Fading Channel (Case 7)

Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
(128, 16, 1024)	9.45	0.03 (after 2 slots)
	11.32	0.01 (after 2 slots)
	12.01	0.005 (after 2 slots)

Table A.1.2.2-8 Minimum Standards for Traffic Channel Performance in Fading Channel (Case 8)

Packet Format (Physical Layer Packet size (bits), Nominal Transmit Duration (slots), Preamble length (chips))	E_b/N_t [dB]	PER
(128, 16, 1024)	11.05	0.03 (after 2 slots)
	13.85	0.01 (after 2 slots)
	15.40	0.005 (after 2 slots)

A.1.3 Demodulation of Broadcast Channel

A.1.3.1 Method of Measurement

Table A.1.3.1-1 Test Parameters for Broadcast Channel Demod (Part 1)

Parameter	Units	Case 1		Case 2	
		Test 1	Test 2	Test 3	Test 4
$\hat{I}_{or}/I_{oc}$	dB	-4.78	-1.39	-1.2	5.0
I_{oc}	dBm/1.23 MHz	-50.23	-53.61	-53.8	-60.0
Data Rate	kbps	204.8	409.6	204.8	409.6
Slots per Physical Layer packet	Slots	3	3	3	3
Outer Code		3	6	1	2
MACPacketPerECBRow		0	1	0	1
$\frac{\text{Traffic } E_b}{N_t}$	dB	2.28	2.77	4.83	4.70
$\frac{\text{Pilot } E_c}{I_o}$	dB	-6.02	-3.76	-3.63	-1.19

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

Table A.1.3.1-2 Test Parameters for Broadcast Channel Demod (Part 2)

Parameter	Units	Case 3	
		Test 5	Test 6
$\hat{I}_{or}/I_{oc}$	dB	6.7	11.0
I_{oc}	dBm/1.23 MHz	-61.7	-66.0
Data Rate	kbps	204.8	409.6
Slots per Physical Layer packet	Slots	3	3
Outer Code		4	5
MACPacketPerECBRow		0	1
$\frac{\text{Traffic } E_b}{N_t}$	dB	14.39	15.46
$\frac{\text{Pilot } E_c}{I_o}$	dB	-0.85	-0.33

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

Table A.1.3.1-3 Test Parameters for Broadcast Channel Demod (Part 3)

Parameter	Units	Case 4			
		Test 7		Test 8	
		Channel 1	Channel 2	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	-3.2	-3.2	2.7	-0.3
I_{oc}	dBm/1.23 MHz	-51.8		-57.7	
Data Rate	kbps	204.8		409.6	
Slots per Physical Layer packet	Slots	3		3	
Outer Code		2		1	
MACPacketPerECBRow		0		1	
$\frac{\text{Traffic } E_b}{N_t}$	dB	3.02	3.02	4.14	1.14
$\frac{\text{Pilot } E_c}{I_o}$	dB	-4.89	-4.89	-1.87	-3.16

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

Table A.1.3.1-4 Test Parameters for Broadcast Channel Demod (Part 4)

Parameter	Units	Case 5			
		Test 9		Test 10	
		Channel 1	Channel 2	Channel 1	Channel 2
$\hat{I}_{or} / I_{oc}$	dB	4.1	4.1	1.8	-1.2
I_{oc}	dBm/1.23 MHz	-59.1		-56.8	
Data Rate	kbps	409.6		204.8	
Slots per Physical Layer packet	Slots	3		3	
Outer Code		4		5	
MACPacketPerECBRow		1		0	
$\frac{\text{Traffic } E_b}{N_t}$	dB	8.95	8.95	9.12	6.12
$\frac{\text{Pilot } E_c}{I_o}$	dB	-1.42	-1.42	-2.22	-3.68

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

A.1.3.2 Minimum Standard

Table A.1.3.2-1 Minimum Standards for Broadcast Channel Demodulation (Case 1)

Test	E_b/N_t [dB]	PER
1	2.18	0.05
	2.31	0.005
2	2.72	0.05
	2.79	0.005

Table A.1.3.2-2 Minimum Standards for Broadcast Channel Demod (Case 2)

Test	E_b/N_t [dB]	PER
3	4.44	0.05
	4.83	0.01
	4.96	0.005
4	4.33	0.05
	4.70	0.01
	4.82	0.005

Table A.1.3.2-3 Minimum Standards for Broadcast Channel Demod (Case 3)

Test	E_b/N_t [dB]	PER
5	11.18	0.05
	14.39	0.01
	15.53	0.005
6	12.16	0.05
	15.46	0.01
	16.89	0.005

Table A.1.3.2-4 Minimum Standards for Broadcast Channel Demod (Case 4)

Test	Channel 1 E_b/N_t [dB]	PER
7	2.61	0.05
	3.02	0.01
	3.17	0.005
8	3.81	0.05
	4.14	0.01
	4.27	0.005

Table A.1.3.2-5 Minimum Standards for Broadcast Channel Demod (Case 5)

Test	Channel 1 E_b/N_t [dB]	PER
9	6.77	0.05
	8.95	0.01
	9.83	0.005
10	6.87	0.05
	9.12	0.01
	9.87	0.005