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# CDMA2000/1xEV-DO Measurement

Radio Communication Analyzer MT8820B/MT8820C/MT8821C

## Revision History

| Ver. No | Date | Contents | Related product software version |
|---|---|---|---|
| 1.00 | Mar 2015 | MT8820B/20C/21C CDMA2000/1xEV-DO Application Note (Ver 1.00) succeeded MT8820B/20C CDMA2000/1xEV-DO Application Note (Ver 2.00).<br>Changed model name from MT8820B/C to “unit”<br>Added software specification for MT8821C | MX882002C Ver20.03<br>MX882006C Ver20.03<br>MX882102C Ver30.00<br>MX882106C Ver30.00 |
| 1.01 | Jan 2016 | Corrected error in red box in figure | MX882002C Ver23.11<br>MX882006C Ver23.11<br>MX882102C Ver30.13<br>MX882106C Ver30.13 |
| | | | |

# Contents

# 1. CDMA2000 Measurement Software (MX882002C/MX882102C)

## 1.1. Specifications

### 1.1.1. For MT8820B/20C

Functions related to AMPS can only be used when the MT8815B–011/MT8820C–011audio board is installed.

**Table 1.1.1-1 Specifications for MX882002C CDMA2000 Measurement Software (CDMA2000 1X)**

| Item | Specifications | |
|---|---|---|
| Electrical characteristics | Typical values (typ.) are only for reference and are not guaranteed. | |
| Frequency/Modulation measurement | Frequency | 300 to 2700 MHz |
| | Input level | –30 to +35 dBm |
| | Carrier frequency accuracy | ±(Set frequency × Reference oscillator accuracy +10 Hz) |
| | Modulation accuracy | |
| | Residual Waveform Quality | >0.999 |
| Amplitude measurement | Frequency | 300 to 2700 MHz |
| | Input level | –65 to +35 dBm (Main) |
| | Measurement accuracy | (Filtered Power measurement, after Full Cal., Input level setting, 10 to 40°C) |
| | | MT8815B/MT8820B<br>±0.5 dB (–25 to +35 dBm),<br>±0.7 dB (–55 to –25 dBm),<br>±0.9 dB (–65 to –55 dBm) |
| | | MT8820C<br>±0.5 dB (–20 to +35 dBm),<br>typ. ±0.3 dB (–20 to +35 dBm),<br>±0.7 dB (–50 to –20 dBm),<br>±0.9 dB (–60 to –50 dBm) |
| | Linearity | (Filtered Power measurement, Input level setting for reference) |
| | | ±0.2 dB (–40 to 0 dB, ≥ –50 dBm),<br>±0.4 dB (–40 to 0 dB, ≥ –65 dBm) |
| Occupied bandwidth | Frequency | 300 to 2700 MHz |
| | Input level | –10 to +35 dBm (Main1) |
| Code domain power | Can be measured when Reverse-RC is set to RC 3 or RC 4. | |
| | Measurement level range | –30 to +35 dBm |
| | Measurement accuracy | ±0.2 dB (code power ≥ –15 dBc)<br>±0.4 dB (code power ≥ –23 dBc) |
| Error rate<br>FER | FER measurement is enabled at Service Option 2, 9, 55 and 32 (TDSO) | |
| | Indicated items | Confidence Level, FER, Error Frame count, Sample Frame count |

**Table 1.1.1-1 Specifications for MX882002C CDMA2000 Measurement Software (CDMA2000 1X) (Cont'd)**

| Item | Specifications |
|---|---|
| RF signal generator | Output frequency 300 to 2700 MHz (1 Hz steps)<br>Channel Level<br>Pilot Channel –30 to 0 dB, 0.25 dB step or Off<br>SYNCH, PCH –30 to 0 dB, 0.25 dB step or Off<br>QPCH (Relative level to Pilot Channel)<br>–5 to +2 dB, 1 dB step or Off<br>FCH, DCCH, SCH –30 to 0 dB, 0.1 dB step or Off<br>OCNS Auto (0.01 dB step) or Off<br>Channel Level accuracy < ±0.2 dB typ. (≥ –20 dB)<br>PN Offset 0 to 511 can be set.<br>Waveform Quality >0.99 (Pilot only, AWGN Off)<br>AWGN<br>AWGN Level –40 to +12 dB<br>(Relative level to CDMA signal) or Off<br>Maximum output level of CDMA signal at AWGN On<br>–28 dBm (MAIN output)<br>–18 dBm (AUX output) |
| AF input | It is measurable when MT8820C-011 Audio Board is installed.<br>Input frequency<br>Frequency range 50 Hz to 10 kHz<br>Input level<br>Input voltage range 1 mV peak to 5 V peak (AF Input connector)<br>Maximum allowable input voltage<br>30 V rms<br>Frequency measurement accuracy<br>±(Reference oscillator accuracy + 0.5 Hz)<br>Level measurement accuracy<br>±0.2 dB (≥ 10 mV peak)<br>±0.4 dB (≥ 1 mV peak, ≥ 1 kHz)<br>SINAD measurement range<br>Frequency at 1 kHz<br>≥ 60 dB (≥ 1000 mV peak)<br>≥ 54 dB (> 50 mV peak)<br>≥ 46 dB (≥ 10 mV peak)<br>Distortion measurement range<br>Frequency at 1 kHz<br>≤ –60 dB (≥ 1000 mV peak)<br>≤ –54 dB (> 50 mV peak)<br>≤ –46 dB (≥ 10 mV peak)<br>Input impedance 100 kΩ |

**Table 1.1.1-1 Specifications for MX882002C CDMA2000 Measurement Software (CDMA2000 1X) (Cont'd)**

| Item | Specifications | |
|---|---|---|
| AF output | It is measurable when MT8820C-011 Audio Board is installed. | |
| | Output Frequency | |
| | Range | 30 Hz to 10 kHz |
| | Resolution | 1 Hz |
| | Accuracy | ±(Set frequency × reference oscillator accuracy +0.1 Hz) |
| | Output level | |
| | Range | 0 to 5 V peak (AF Output connector) |
| | Resolution | 1 mV (≤ 5 V peak),<br>100 µV (≤ 500 mV peak),<br>10 µV (≤ 50 mV peak) |
| | Accuracy | ±0.2 dB (≥ 10 mV peak, ≥50 Hz)<br>±0.3 dB (≥ 10 mV peak, <50 Hz) |
| | Waveform distortion | (at Band ≤ 30 kHz) |
| | | ≤ –60 dB (≥ 500 mV peak, ≤5 kHz)<br>≤ –54 dB (≥ 70 mV peak) |
| | Output impedance | ≤ 1 Ω |
| | Max. output current | 100 mA |
| Call processing | Band Class | BC 0 to 12, 14, 15, 18, 19, 20, 21 |
| | Call control | Registration, MS call origination, NW call origination, NW call disconnection, MS call disconnection |
| | Handoff | Universal Handoff, Band Class/Channel Handoff, Protocol Revision Handoff, RC/SO Handoff, Analog Handoff (MT8815B-011/MT8820B-011 Audio Board is installed. Not supported by the MT8820C.) |
| | Rev. Closed Loop Power Control modes | Closed Loop, All 1 (All down), Alternate, All 0 (All up) |
| | Usable protocols | J-STD-008C, Korean PCS, ARIB T-53, IS-95B, IS-2000 (SR1) |
| | Radio Configuration | F-RC1+R-RC1, F-RC2+R-RC2,<br>F-RC3+R-RC3, F-RC4+R-RC3, F-RC5+R-RC4 |
| | Service Option | SO 1, 2, 3, 9, 32, 33, 55, 32768 |
| | PCH Data Rate | Full |
| | QPCH Data Rate | Full |
| | Fwd. FCH Data Rate | Full, Half, Quarter or Eighth can be set for RC1 to RC5. |
| | Fwd. FCH Walsh Code | 10, 14, 26, 30, 42, 46, 58, 62 |
| | Fwd. DCCH Data Rate | Full for RC 3 to RC 5 |
| | Fwd. DCCH Walsh Code | 10, 14, 26, 30, 42, 46, 58, 62 |
| | Fwd. SCH | Max. 1 Channel |
| | Fwd. SCH Data Rate | RC 3 : 9.6, 19.2, 38.4, 76.8, 153.6 kbps<br>RC 4 : 9.6, 19.2, 38.4, 76.8, 153.6 kbps<br>RC 5 : 14.4, 28.8, 57.6, 115.2, 230.4 kbps |
| | Access Probe | Access Channel usable |

**Table 1.1.1-2 Specifications for MX882002C-001 CDMA2000 Voice Codec**

| Item | Specifications | |
|---|---|---|
| Function | End-to-end communications test between a handset connected to the MT8820C and Mobile Station. Encode the voice from Audio Input, Output the decoded voice to AF Output. | |
| Voice Codec | EVRC (SO 3) | |
| Codec level control | Encoder input gain | –3.00 to +3.00 dB, 0.01 dB steps |
| | Handset microphone volume | 0, 1, 2, 3, 4, 5 |
| | Handset speaker volume | 0, 1, 2, 3, 4, 5 |

**Table 1.1.1-3 Specifications for MX882002C-002 CDMA2000 External Packet Data**

| Item | Specifications | |
|---|---|---|
| Function | Transferring the packet data between Mobile Station and a server connecting to Ethernet port (10BT) on the MT8820C. | |
| External packet data | Service Option SO 33 | |
| | Radio Configuration | F-RC3+R-RC3, F-RC4+R-RC3 |
| | Signaling Ch | FCH |
| | Supplemental Ch | |
| | Encoding | Convolutional, Turbo |
| | Data Rate | 9.6, 19.2, 38.4, 76.8, 153.6 kbps |
| | RLP (Radio Link Protocol) | RLP3 |
| | Packet Data Mode | RLP Loopback, PPP/IP |
| | RLP Loopback | Loops back the traffic data of Reverse Link signal on RLP3 to the Mobile Station. |
| | PPP/IP | Transfers IP packet data between Mobile Station and a server. |

### 1.1.2. For MT8821C

**Table 1.1.2-1 Specifications for MX882102C CDMA2000 Measurement Software (CDMA2000 1X)**

| Item | Specifications | |
|---|---|---|
| Electrical characteristics | Typical values (typ.) are only for reference and are not guaranteed. | |
| Frequency/Modulation measurement | Frequency | 350 to 2700 MHz<br>For the frequencies below 500 MHz, only the following range meets the specifications:<br>410.000 to 419.975 MHz (CDMA2000 Band Class 5, 11)<br>450.000 to 459.990 MHz (CDMA2000 Band Class 5, 11)<br>479.000 to 483.480 MHz (CDMA2000 Band Class 5, 11) |
| | Input level | –30 to +35 dBm |
| | Carrier frequency accuracy | ±(Set frequency × Reference oscillator accuracy +10 Hz) |
| | Modulation accuracy | |
| | Residual Waveform Quality | > 0.999 |
| Amplitude measurement | Frequency | 350 to 2700 MHz<br>For the frequencies below 500 MHz, only the following range meets the specifications:<br>410.000 to 419.975 MHz (CDMA2000 Band Class 5, 11)<br>450.000 to 459.990 MHz (CDMA2000 Band Class 5, 11)<br>479.000 to 483.480 MHz (CDMA2000 Band Class 5, 11) |
| | Input level | –65 to +35 dBm (Main) |
| | Measurement accuracy | (Filtered Power measurement, after Full Cal, Input level setting, 10 to 40°C)<br>±0.5 dB (–30 to +35 dBm),<br>typ. ±0.3 dB (–30 to +35 dBm),<br>±0.7 dB (–55 to –30 dBm),<br>±0.9 dB (–65 to –55 dBm) |
| | Linearity | (Filtered Power measurement, Input level setting for reference)<br>±0.2 dB (–40 to 0 dB, ≥ –55 dBm),<br>±0.4 dB (–40 to 0 dB, ≥ –65 dBm) |

**Table 1.1.2-1 Specifications for MX882102C CDMA2000 Measurement Software (CDMA2000 1X) (Cont'd)**

| Item | Specifications | |
|---|---|---|
| Occupied bandwidth | Frequency | 350 to 2700 MHz<br>For the frequencies below 500 MHz, only the following range meets the specifications:<br>410.000 to 419.975 MHz<br>(CDMA2000 Band Class 5, 11)<br>450.000 to 459.990 MHz<br>(CDMA2000 Band Class 5, 11)<br>479.000 to 483.480 MHz<br>(CDMA2000 Band Class 5, 11) |
| | Input level | –10 to +35 dBm (Main1/2) |
| Code domain power | Can be measured when Reverse-RC is set to RC 3 or RC 4. | |
| | Measurement level range | –30 to +35 dBm |
| | Measurement accuracy | ±0.2 dB (code power ≥ –15 dBc)<br>±0.4 dB (code power ≥ –23 dBc) |
| Error rate<br>FER | FER measurement is enabled at Service Option 2, 9, 55 and 32 (TDSO) | |
| | Indicated items | Confidence Level, FER, Error Frame count, Sample Frame count |
| RF signal generator | Output frequency | 300 to 2700 MHz (1 Hz steps) |
| | Channel Level | |
| | Pilot Channel | –30 to 0 dB, 0.25 dB step or Off |
| | SYNCH, PCH | –30 to 0 dB, 0.25 dB step or Off |
| | QPCH (Relative level to Pilot Channel) | –5 to +2 dB, 1 dB step or Off |
| | FCH, DCCH, SCH | –30 to 0 dB, 0.1 dB step or Off |
| | OCNS | Auto (0.01 dB step) or Off |
| | Channel Level accuracy | < ±0.2 dB typ. (≥ –20 dB) |
| | PN Offset | 0 to 511 can be set. |
| | AWGN | |
| | AWGN Level | –40 to +12 dB<br>(Relative level to CDMA signal) or Off |
| | Maximum output level of CDMA signal at AWGN On<br>–28 dBm (MAIN output)<br>–18 dBm (AUX output) | |

**Table 1.1.2-1 Specifications for MX882102C CDMA2000 Measurement Software (CDMA2000 1X) (Cont'd)**

| Item | Specifications |
|---|---|
| AF input | It is measurable when MT8821C-011 Audio Board is installed.<br>Input frequency<br>Frequency range 50 Hz to 10 kHz<br>Input level<br>Input voltage range 1 mV peak to 5 V peak (AF Input connector)<br>Maximum allowable input voltage<br>30 V rms<br>Frequency measurement accuracy<br>±(Reference oscillator accuracy + 0.5 Hz)<br>Level measurement accuracy<br>±0.2 dB (≥ 10 mV peak)<br>±0.4 dB (≥ 1 mV peak, ≥ 1 kHz)<br>SINAD measurement range<br>Frequency at 1 kHz<br>≥ 60 dB (≥ 1000 mV peak)<br>≥ 54 dB (> 50 mV peak)<br>≥ 46 dB (≥ 10 mV peak)<br>Distortion measurement range<br>Frequency at 1 kHz<br>≤ –60 dB (≥ 1000 mV peak)<br>≤ –54 dB (> 50 mV peak)<br>≤ –46 dB (≥ 10 mV peak)<br>Input impedance 100 kΩ |
| AF output | It is measurable when MT8821C-011 Audio Board is installed.<br>Output Frequency<br>Range 30 Hz to 10 kHz<br>Resolution 1 Hz<br>Accuracy ±(Set frequency × reference oscillator accuracy +0.1 Hz)<br>Output level<br>Range 0 to 5 V peak (AF Output connector)<br>Resolution 1 mV (≤ 5 V peak),<br>100 µV (≤ 500 mV peak),<br>10 µV (≤ 50 mV peak)<br>Accuracy ±0.2 dB (≥ 10 mV peak, ≥ 50 Hz)<br>±0.3 dB (≥ 10 mV peak, < 50 Hz)<br>Waveform distortion (at Band ≤ 30 kHz)<br>≤ –60 dB (≥ 500 mV peak, ≤ 5 kHz)<br>≤ –54 dB (≥ 70 mV peak)<br>Output impedance ≤ 1 Ω<br>Max. output current 100 mA |

**Table 1.1.2-1 Specifications for MX882102C CDMA2000 Measurement Software (CDMA2000 1X) (Cont'd)**

| Item | Specifications | |
|---|---|---|
| AF output | It is measurable when MT8821C-011 Audio Board is installed. | |
| | Output Frequency | |
| | Range | 30 Hz to 10 kHz |
| | Resolution | 1 Hz |
| | Accuracy | ±(Set frequency × reference oscillator accuracy +0.1 Hz) |
| | Output level | |
| | Range | 0 to 5 V peak (AF Output connector) |
| | Resolution | 1 mV (≤ 5 V peak),<br>100 µV (≤ 500 mV peak),<br>10 µV (≤ 50 mV peak) |
| | Accuracy | ±0.2 dB (≥ 10 mV peak, ≥ 50 Hz)<br>±0.3 dB (≥ 10 mV peak, < 50 Hz) |
| | Waveform distortion | (at Band ≤ 30 kHz) |
| | | ≤ –60 dB (≥ 500 mV peak, ≤ 5 kHz)<br>≤ –54 dB (≥ 70 mV peak) |
| | Output impedance | ≤ 1 Ω |
| | Max. output current | 100 mA |
| Call processing | Band Class | BC 0 to 12, 14, 15, 18, 19, 20, 21 |
| | Call control | Registration, MS call origination, NW call origination, NW call disconnection, MS call disconnection |
| | Handoff | Universal Handoff, Band Class/Channel Handoff, Protocol Revision Handoff, RC/SO Handoff |
| | Rev. Closed Loop Power Control modes | Closed Loop, All 1 (All down), Alternate, All 0 (All up) |
| | Usable protocols | J-STD-008C, Korean PCS, ARIB T-53, IS-95B, IS-2000 (SR1) |
| | Radio Configuration | F-RC1+R-RC1, F-RC2+R-RC2,<br>F-RC3+R-RC3, F-RC4+R-RC3, F-RC5+R-RC4 |
| | Service Option | SO 1, 2, 3, 9, 32, 33, 55, 32768 |
| | PCH Data Rate | Full |
| | QPCH Data Rate | Full |
| | Fwd. FCH Data Rate | Full, Half, Quarter or Eighth can be set for RC1 to RC5. |
| | Fwd. FCH Walsh Code | 10, 14, 26, 30, 42, 46, 58, 62 |
| | Fwd. DCCH Data Rate | Full for RC 3 to RC 5 |
| | Fwd. DCCH Walsh Code | 10, 14, 26, 30, 42, 46, 58, 62 |
| | Fwd. SCH | Max. 1 Channel |
| | Fwd. SCH Data Rate | RC 3 : 9.6, 19.2, 38.4, 76.8, 153.6 kbps<br>RC 4 : 9.6, 19.2, 38.4, 76.8, 153.6 kbps<br>RC 5 : 14.4, 28.8, 57.6, 115.2, 230.4 kbps |
| | Access Probe | Access Channel usable |

**Table 1.1.2-2 Specifications for MX882102C-001 CDMA2000 Voice Codec**

| Item | Specifications |
|---|---|
| Function | End-to-end communications test between a handset connected to the MT8821C and Mobile Station. Encode the voice from Audio Input, Output the decoded voice to AF Output. |
| Voice Codec | SO 3 (EVRC) |
| Codec level control | Encoder input gain –3.00 to +3.00 dB, 0.01 dB steps<br>Handset microphone volume 0, 1, 2, 3, 4, 5<br>Handset speaker volume 0, 1, 2, 3, 4, 5 |

**Table 1.1.2-3 Specifications for MX882102C-002 CDMA2000 External Packet Data**

| Item | Specifications |
|---|---|
| Function | Transferring the packet data between Mobile Station and a server connecting to Ethernet port (10BT) on the MT8821C. |
| External packet data | Service Option SO 33<br>Radio Configuration F-RC3+R-RC3, F-RC4+R-RC3<br>Signaling Ch FCH<br>Supplemental Ch<br>Encoding Convolutional, Turbo<br>Data Rate 9.6, 19.2, 38.4, 76.8, 153.6 kbps<br>RLP (Radio Link Protocol) RLP3<br>Packet Data Mode RLP Loopback, PPP/IP<br>RLP Loopback Loops back the traffic data of Reverse Link signal on RLP3 to the Mobile Station.<br>PPP/IP Transfers IP packet data between the Mobile Station and the server. |

## 1.2. Measurement Specification Table (C.S.0011–C)

| | Items | Comment | |
|---|---|---|---|
| **3** | **CDMA RECEIVER MINIMUM STANDARDS** | | |
| **3.1** | **Frequency Coverage Requirements** | Support Band Class 0–11, 14, 15 | P-Yes |
| **3.2** | **Acquisition Requirements** | | No |
| **3.3** | **Forward Common Channel Demodulation Performance** | | No |
| **3.4** | **Forward Traffic Channel Demodulation Performance** | | |
| 3.4.1 | Demodulation of Forward Fundamental Channel in Additive White Gaussian Noise | | Yes |
| 3.4.2 | Demodulation of Forward Fundamental Channel in Multipath Fading Channel | Requires Fading Simulator | SYS |
| 3.4.3 | Demodulation of Forward Fundamental Channel During Soft Handoff | | No |
| 3.4.4 | Decision of Power Control Bit for Channels Belonging to Different Power Control Sets During Soft Handoff | | No |
| 3.4.5 | Decision of Power Control Bit for Channels Belonging to the Same Power Control Set | | No |
| 3.4.6 | Demodulation of Power Control Subchannel During Soft Handoff | | No |
| 3.4.7 | Demodulation of Forward Traffic Channel in Multipath Fading Channel with Closed Loop Power Control (FPC_MODE = '000') | | No |
| 3.4.8 | Demodulation of Forward Traffic Channel in Multipath Fading Channel with Closed Loop Power Control (FPC_MODE = '010') | | No |
| 3.4.9 | Demodulation of Forward Traffic Channel in Multipath Fading Channel with Outer Loop Power Control and Closed Loop Power Control (FPC_MODE = '000', '001' and '010') | | No |
| 3.4.10 | Demodulation of Forward Traffic Channel in Multipath Fading Channel with Closed Loop Power Control (FPC_MODE = '000') and Transmit Diversity (OTD or STS) | | No |
| 3.4.11 | Demodulation of Forward Traffic Channel in Multipath Fading Channel with Closed Loop Power Control (FPC_MODE = '010') and Transmit Diversity (OTD or STS) | | No |
| 3.4.12 | Demodulation of Power Control Subchannel During Reverse Pilot Channel Gating | | No |
| 3.4.13 | Demodulation of Power Control Subchannel During Reverse Fundamental Channel Gating | | No |
| 3.4.14 | Demodulation of Forward Packet Data Channel in Additive White Gaussian Noise | | No |
| 3.4.15 | Demodulation of Forward Packet Data Channel in Multipath Fading Channel with no Power Control | | No |
| **3.5** | **Receiver Performance** | | |
| 3.5.1 | Receiver Sensitivity and Dynamic Range | | Yes |
| 3.5.2 | Single Tone Desensitization | Requires SG | SYS |
| 3.5.3 | Intermodulation Spurious Response Attenuation | | No |
| 3.5.4 | Adjacent Channel Selectivity | | No |
| 3.5.5 | Receiver Blocking Characteristics | | No |

| | | | |
|---|---|---|---|
| **3.6** | **Limitations of Emissions** | | |
| 3.6.1 | Conducted Spurious Emissions | | No |
| 3.6.2 | Radiated Spurious Emissions | | No |
| **3.7** | **Supervision** | | |
| 3.7.1 | Paging Channel or Forward Common Control Channel | | No |
| 3.7.2 | Forward Traffic Channel | | No |
| 3.7.3 | Forward Traffic Channel with Power Control Subchannel on CPCCH | | No |
| **4** | **CDMA TRANSMITTER MINIMUM STANDARDS** | | |
| **4.1** | Frequency Accuracy | | Yes |
| **4.2** | **Handoff** | | |
| 4.2.1 | CDMA to CDMA Hard Handoff | Only Hard Handoff<br>Cannot make the required timing measurement. | P-Yes |
| 4.2.2 | Transmit Power after Hard Handoff | | No |
| **4.3** | **Modulation Requirements** | | |
| 4.3.1 | Time Reference | | P-Yes |
| 4.3.2 | Reverse Pilot Channel to Code Channel Time Tolerance | | No |
| 4.3.3 | Reverse Pilot Channel to Code Channel Phase Tolerance | | No |
| 4.3.4 | Waveform Quality and Frequency Accuracy | | Yes |
| 4.3.5 | Code Domain Power | | Yes |
| **4.4** | **RF Output Power Requirements** | | |
| 4.4.1 | Range of Open Loop Output Power | Except Enhanced Access Channel | P-Yes |
| 4.4.2 | Time Response of Open Loop Power Control | | Yes |
| 4.4.3 | Access Probe Output Power | Except Enhanced Access Channel | P-Yes |
| 4.4.4 | Range of Closed Loop Power Control | Only Power Control | No |
| 4.4.5 | Maximum RF Output Power | | Yes |
| 4.4.6 | Minimum Controlled Output Power | | Yes |
| 4.4.7 | Standby Output Power and Gated Output Power | Expect Standby Output Power. | P-Yes |
| 4.4.8 | Power Up Function Output Power | | No |
| 4.4.9 | Code Channel to Reverse Pilot Channel Output Power Accuracy | Except Enhanced Access Channel Header, Enhanced Access Channel Data and Reverse Common Control Channel Data. | P-Yes |
| 4.4.10 | Reverse Pilot Channel Transmit Phase Discontinuity | | No |
| 4.4.11 | Reverse Traffic Channel Output Power During Changes in Data Rate | | No |
| **4.5** | **Limitations on Emmisions** | | |
| 4.5.1 | Conducted Spurious Emissions | | SYS |
| 4.5.2 | Radiated Spurious Emissions | | No |
| 4.5.3 | Occupied Bandwidth | | Yes |

Yes**:** Supported | SYS**:** Requires external equipment (SPA or SG) | P-Yes**:** Partially Supported | No**:** Not Supported

## 1.3. Tx/Rx Measurements (CDMA2000)

The following descriptions of measurement procedures assume that the control software is created by GPIB. Refer to the operation manual for details of GPIB commands and manual operations. GPIB commands are written in bold red.
3GPP2 C.S.0011–C specifies the Test Mode for connecting when measuring each test item. The following measurement procedures assume connection in the Fundamental Channel Test Mode. When connecting in other test modes, change the parameters by referring to the connection in 1.3.1 CDMA2000 Connection.

### 1.3.1. CDMA2000 Connection

The following measurements are performed by connecting in the Test Mode.
The Band Class and Channel that can be registered at Location Registration differ according to the mobile terminal being used. Change these values according to the type of mobile terminal.

[Procedure]
1. Execute ***RST** to initialize parameters.
2. Set Band Class and Channel.
   Example: Execute **BANDCLASS 0** to set Band Class to 0.
   Execute **CHAN 500** to set Channel to 500.
3. Set the mobile terminal power to On.
4. Execute **CALLSTAT?** and wait for the response to change to 2 (= Idle (Regist)).
5. Set Radio Configuration.
   Example: Execute **RC 33** to set Radio Configuration to Fwd. RC 3＋Rev. RC.
6. Set Service Option.
   Example: Execute **SO 32** to set Service Option to SO 32.
7. Set Signaling Option.
   Example: Execute **SO32SIGOPT DCCH** to set Signaling Option to DCCH.
8. Execute **CALLSA** to connect.
9. Execute **CALLSTAT?** and wait for the response to change to 6 (= Connected).

About Test Modes

The unit supports the following test modes. The Test Mode is determined by the combination of Radio Configuration, Service Option, and Signalling Options.

**Table 1.3.1–1: Test Modes**

| Test Mode | Radio Configuration | Service Option | Signalling Option |
|---|---|---|---|
| Fundamental Channel Test Mode 1 | Fwd. RC 1＋Rev. RC 1 | SO 2 | Setting not required |
| Fundamental Channel Test Mode 2 | Fwd. RC 2＋Rev. RC 2 | SO 9 | Setting not required |
| Fundamental Channel Test Mode 3 | Fwd. RC 3＋Rev. RC 3 | SO 55 | Setting not required |
| | | SO 32 | FCH |
| Fundamental Channel Test Mode 4 | Fwd. RC 4＋Rev. RC 3 | SO 55 | Setting not required |
| | | SO 32 | FCH |
| Fundamental Channel Test Mode 5 | Fwd. RC 5＋Rev. RC 4 | SO 55 | Setting not required |
| | | SO 32 | FCH |
| Dedicated Control Channel Test Mode 3 | Fwd. RC 3＋Rev. RC 3 | SO 32 | DCCH |
| Dedicated Control Channel Test Mode 4 | Fwd. RC 4＋Rev. RC 3 | SO 32 | DCCH |
| Supplemental Channel Test Mode 3 | Fwd. RC 3＋Rev. RC 3 | SO 32 | Setting not required |
| Supplemental Channel Test Mode 4 | Fwd. RC 4＋Rev. RC 3 | SO 32 | Setting not required |

Signalling Option is enabled only when Service Option is SO 32. No setting is required at other than SO 32. Supplemental Channel Test Mode is enabled when Service Option is SO 32 at Fundamental Channel Test Mode 3, 4, Dedicated Control Channel Test Mode 3, 4 and F–SCH1 output is On. (The default setting is On.)

### 1.3.2. Handoff

[Procedure]
1. Execute **CALLRSLT 13** to clear the Handoff sequence execution flag status.
2. Execute **HOBAND 0** to set Handoff Band Class to 0.
3. Execute **HOCHAN 100** to set Handoff Channel to 100.
4. Execute **HO** to perform Band Class/Channel Handoff.
5. Execute **CALLRSLT? 13** and wait for the response to change to 1,0 (= Handoff executed and terminated normally).
6. Execute **CALLSTAT?** and wait for the response to change to 6 (= Connected).

### 1.3.3. Termination

[Procedure]
1. Execute **CALLSO** to perform disconnection.
2. Execute **CALLSTAT?** and wait for response to change to 2 (= Idle (Regist)).

## 1.3.4. 3.4.1 Demodulation of Forward Fundamental Channel in Additive White Gaussian Noise

Example at Loopback

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

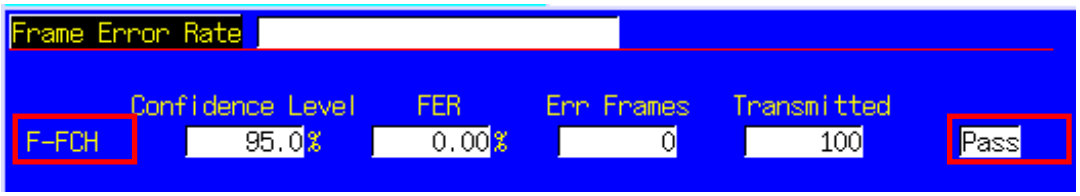
This measurement requires each Test specified in 3GPP2 C.S.0011–C Table A.2.1.1–1 to Table A.2.1.1–10. The following is an example for Test 1. When performing other tests, change the parameters according to Table 1.3.4–1 Parameter Settings for Demodulation of Forward Fundamental Channel in AWGN (Loopback).

**Table 1.3.4–1: Parameter Settings for Demodulation of Forward Fundamental Channel in AWGN (Loopback)**

| Parameter | Setting |
|---|---|
| FER Limit (Procedure 8) | According to 3GPP2 C.S.0011–C Table A.2.1.2–1 to A.2.1.2–5 FER |
| F–FCH Level (Procedure 12) | According to 3GPP2 C.S.0011–C Table A.2.1.1–1 to A.2.1.1–10 Traffic Eb/Ior |
| F–FCH Data Rate (Procedure 13) | According to 3GPP2 C.S.0011–C Table A.2.1.1–1 to A.2.1.1–10 Data Rate |
| Specified FER (Procedure 14) | According to 3GPP2 C.S.0011–C Table A.2.1.2–1 to A.2.1.2–5 FER |

[Procedure]

1. Execute **RC 11** to set Radio Configuration to Fwd. RC1 + Rev. RC1.
2. Execute **SO 2** to set Service Option to SO2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON,OFF** to set only Frame Error Rate to On and other measurement to Off.
6. Execute **FERCONF 95.0** to set Confidence Level to 95%.
7. Execute **FERSTOP ON** to set Meas. Stop Mode to On and other measurement to Off.
8. Execute **UFER 3.0** to set FER Limit to 0.5%.
9. Execute **AWGNLVL ON** to set AWGN to On.
10. Execute **AWGNPWR 1.0** to set AWGN Level to 1.0 dB.
11. Execute **PILOTLVL -7.00** to set F–PICH level to –7.0 dB.
12. Execute **FCHLVL -16.3** to set F–FCH level to –16.3 dB.
13. Execute **DATARATE 0** to set F–FCH Data Rate to 9600.
14. Execute **FER 3.0** to set specified FER to 3.0%.
15. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
16. Execute **OLVL -55.0** to set the Output Level to –55.0 dBm/1.23 MHz.
17. Execute ***OPC?** and check that the response is 1.
18. Wait until the measuring instrument and mobile terminal stabilize
19. Execute **SWP** to perform measurement.
20. Execute **FERPASS? FCH** to read the measurement result.
21. Check that the measurement result is Pass.



Example of TDSO (Test Data Service Option)

The following describes an example using a mobile terminal supporting Test Mode 3. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

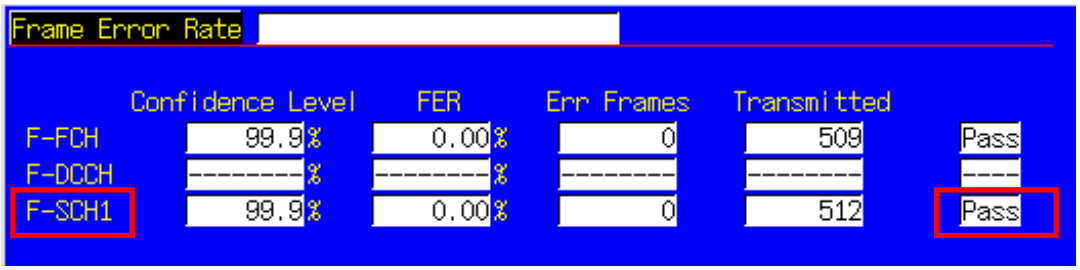
This measurement requires each Test specified in 3GPP2 C.S.0011–C Table A.2.1.1–21 to Table A.2.1.1–24. The following is an example for Test 82. When performing other tests, change the parameters according to Table 1.3.4-2 Parameter Setting of Demoduration of Forward Fundamental Channel in AWGN (TDSO).

**Table 1.3.4-2 Parameter Setting of Demoduration of Forward Fundamental Channel in AWGN (TDSO)**

| Parameter | Setting |
|---|---|
| FER Limit (Procedure 9) | According to 3GPP2 C.S.0011–C Table A.2.1.2–12 to A.2.1.2–15. FER |
| F–FCH Level (Procedure 13) | According to 3GPP2 C.S.0011–C Table A.2.1.1–21 to A.2.1.1–24. Traffic Eb/Ior |
| F–SCH Level (Procedure 14) | According to 3GPP2 C.S.0011–C Table A.2.1.1–21 to A.2.1.1–24. SCH Ec/Ior |
| F–SCH Data Rate (Procedure 15) | According to 3GPP2 C.S.0011–C Table A.2.1.1–21 to A.2.1.1–24. Data Rate |
| Specified FER (Procedure 16) | According to 3GPP2 C.S.0011–C Table A.2.1.2–12 to A.2.1.2–15. FE |

[Procedure]

1. Execute **RC 33** to set Radio Configuration to Fwd. RC3 + Rev. RC3.
2. Execute **SO 32** to set Service Option to SO32.
3. Execute **SO32SIGOPT FCH** to set signalling Option to FCH.
4. Connect with CDMA2000 1X.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **1XALLMEASITEMS OFF, OFF, 1, OFF, 1, OFF, 1, OFF, 1, OFF, 1, ON, OFF** to set only Frame Error Rate to On and other measurement to Off.
7. Execute **FERCONF 95.0** to set Confidence Level to 95%.
8. Execute **FERSTOP ON** to set Meas. Stop Mode to On.
9. Execute **ULFER 5.0** to set FER Limit to 5.0%.
10. Execute **AWGNLVL ON** to set AWGN to On.
11. Execute **AWGNPWR 1.0** to set AWGN Level to 1.0 dB.
12. Execute **PILOTLVL -7.00** to set F–PICH level to –7.0 dB.
13. Execute **FCHLVL -7.0** to set F–FCH level to –7.0 dB.
14. Execute **SCHLVL -13.6** to set F–SCH Level to –13.6 dB.
15. Execute **SCHRATE 1** to set F–SCH Data Rate to 19200 bps.
16. Execute **FER 5.0** to set specified FER to 5.0%.
17. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
18. Execute **OLVL -55.0** to set the Output Level to –55.0 dBm/1.23 MHz.
19. Execute ***OPC?** and check that the response is 1.
20. Wait until the measuring instrument and mobile terminal stabilize.
21. Execute **SWP** to perform measurement.
22. Execute **FERPASS? SCH1** to read the measurement result.
23. Check that the measurement result is Pass.



## 1.3.5. 3.5.1 Receiver Sensitivity and Dynamic Range

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.
This measurement performs measurement for Test 1 and 2 by changing the parameters. The settings change according to the test mode. When testing in other modes, change the parameters according to Table 1.3.5–1 Parameter Settings for Receiver Sensitivity and Dynamic Range.

**Table 1.3.5–1 Parameter Settings for Receiver Sensitivity and Dynamic Range**

| Parameter | Setting |
|---|---|
| F–FCH Level (Procedure 11) | Test Mode 1 or 3: –15.6 dB<br>Test Mode 2 or 5: –12.3 dB |
| F–FCH Data Rate (Procedure 12) | Test Mode 1 or 3: 9600 bps<br>Test Mode 2 or 5: 14400 bps |

[Procedure]

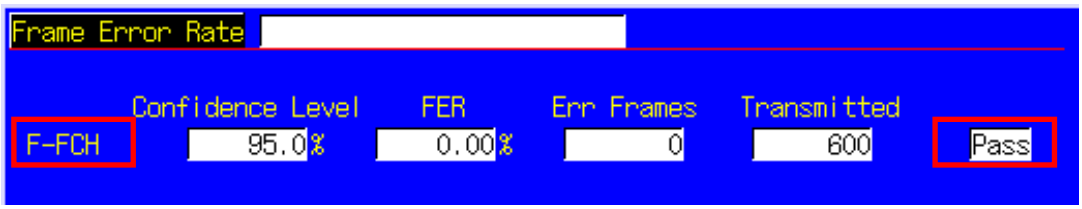
1. Execute **RC 11** to set Radio Configuration to Fwd. RC1 + Rev. RC1.
2. Execute **SO 2** to set Service Option to SO2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON,OFF** to set only Frame Error Rate to On and other measurements to Off.
6. Execute **FERCONF 95.0** to set Confidence Level to 95%.
7. Execute **FERSTOP ON** to set Meas. Stop Mode to On.
8. Execute **ULFER 0.5** to set FER LIMIT to 0.5%.
9. Execute **AWGNLVL OFF** to set AWGN to OFF.
10. Execute **PILOTLVL -7.00** to set F–PICH level to –7.0 dB.
11. Execute **FCHLVL -15.6** to set F–FCH level to –15.6 dB.
12. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
13. Execute **FER 0.5** to set specified FER to 0.5%.
14. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.

[Test 1]

15. Execute **OLVL -104.0** to set Output Level to –104.0 dBm/1.23 MHz.
16. Execute ***OPC?** and check that the response is 1.
17. Wait until the measuring instrument and mobile terminal stabilize.
18. Execute **SWP** to perform measurement.
19. Execute **FERPASS? FCH** to read the measurement result.
20. Check that the measurement result is Pass.

[Test 2]

21. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
22. Repeat procedures 16 to 20.



## 1.3.6. 4.1 Frequency Accuracy

Refer to 1.3.8 4.3.4 Waveform Quality and Frequency Accuracy.

## 1.3.7. 4.3.1 Time Reference

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Execute **RC 11** to set Radio Configuration to Fwd. RC1 + Rev. RC1.
2. Execute **SO 2** to set Service Option to SO2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,OFF,1,ON,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Frame Error Rate to On and other measurement to Off.
6. Execute **PILOTLVL -7.00** to set F–PICH level to –7.0 dB.
7. Execute **FCHLVL -14.0** to set F–FCH level to –14.0 dB.
8. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
9. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
10. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
11. Execute ***OPC?** and check that the response is 1.
12. Wait until the measuring instrument and mobile terminal stabilize.
13. Execute **SWP** and perform measurement.
14. Execute **AVG_TAU?** to read the measurement result.
15. Compare the measurement result with Table 1.3.7–1 Minimum Standards for Time Reference.

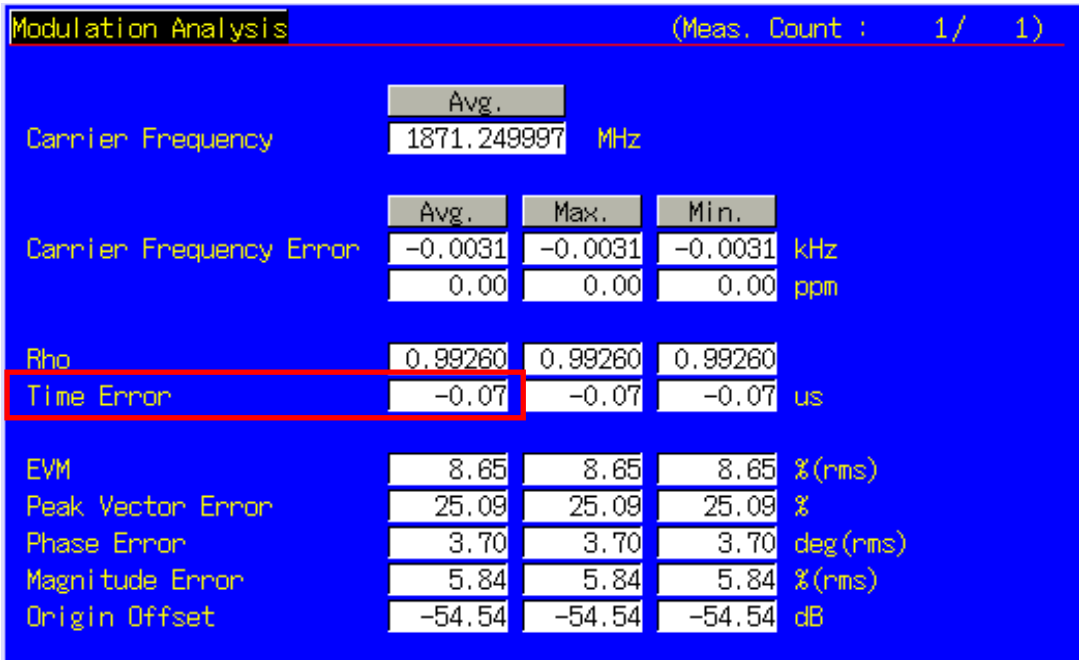



**Table 1.3.7–1 Minimum Standards for Time Reference**

| Item | Limit |
|---|---|
| Time Error | Within ±1.0 μs |

## 1.3.8. 4.3.4 Waveform Quality and Frequency Accuracy

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

In this measurement, the parameter settings change according to the Test Mode. When testing using another Test Mode, change the parameters according to Table 1.3.8–1 Parameter Settings for Waveform Quality and Frequency Accuracy.

**Table 1.3.8–1 Parameter Settings for Waveform Quality and Frequency Accuracy**

| Parameter | Setting |
|---|---|
| Output Level (Procedure 9) | Test Mode 1: –75.0 dBm<br>Test Mode 3: –101.0 dBm |

[Procedure]

1. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
2. Execute **SO 2** to set Service Option to SO 2.
3. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
4. Execute **1XALLMEASITEMS OFF,OFF,1,ON,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Modulation Analysis measurement to On and other measurements to Off. (This sets the number of measurement times to 1.)
5. Execute **PILOTLVL -7.00** to set F–PICH level to –7.00 dB.
6. Execute **FCHLVL -7.4** to set F–FCH level to –7.4 dB.
7. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
8. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
9. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
10. Execute ***OPC?** and check that the response is 1.
11. Wait until the measuring instrument and mobile terminal stabilize.
12. Execute **PCBPAT ALT** to set PCB Pattern to Alternate.
13. Execute **SWP** to perform measurement.
14. Execute **AVG_CARRFERR?** to read the Carrier Frequency Error measurement results.
15. Execute **AVG_RHO?** to read the Rho measurement results.
16. Execute **AVG_TAU?** to read the Time Error measurement results.
17. Compare the measurement results with Table 1.3.8–2 Minimum Standards for Waveform Quality and Frequency Accuracy.

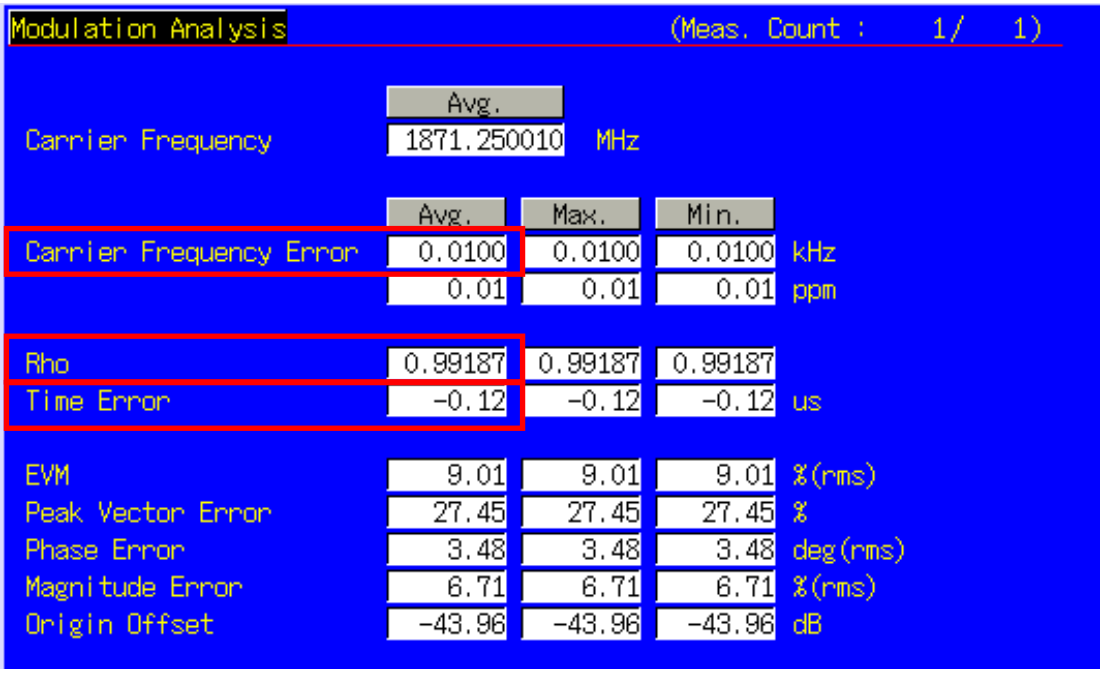



**Table 1.3.8–2 Minimum Standards for Waveform Quality and Frequency Accuracy**

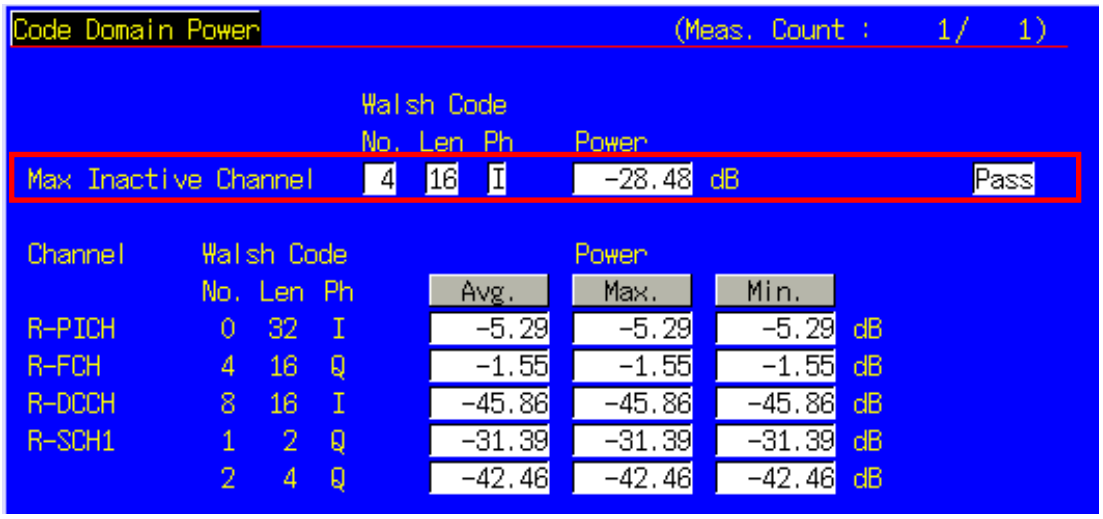
| Item | Limit |
|---|---|
| Carrier Frequency Error | Band Class 0, 2, 3, 5, 7, 9, 10, 11: Within ±300 Hz<br>Band Class 1, 4, 6, 8, 14, 15: Within ±150 Hz |
| Rho | 0.944 to 1.000 |
| Time Error | Within ±1.0 μs |

### 1.3.9. 4.3.5 Code Domain Power

The following describes an example using a mobile terminal supporting Test Mode 3. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Execute **RC 33** to set Radio Configuration to Fwd. RC3 + Rev. RC3.
2. Execute **SO 55** to set Service Option to SO55.
3. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
4. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF,OFF** to set only Code Domain Power measurement to On. (This sets the number of measurements to 1.)
5. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
6. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
7. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
8. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
9. Execute **OLVL -101.0** to set Output Level to –101.0 dBm/1.23 MHz.
10. Execute ***OPC?** and check that the response is 1.
11. Wait until the measuring instrument and mobile terminal stabilize.
12. Execute **SWP** to perform measurement.
13. Execute **MAXINACTCODE? JUDGE** to read the measurement result.
14. Confirm that the measurement result is Pass.



## 1.3.10. 4.4.1 Range of Open Loop Output Power

The following describes a measurement example for a Mobile Station Class II supporting Band Class 1. Change the Band Class and Channel according to the mobile station being used.

This measurement changes the parameters and performs Tests 1 to 3. In addition, the parameter settings change according to the Band Class and mobile terminal Mobile Station Class. When testing using another Band Class, and Mobile Station Class, change the parameters in accordance with Table 1.3.10–1 Parameter Settings for Range of Open Loop Output Power.

**Table 1.3.10–1 Parameter Settings for Range of Open Loop Output Power**

| Parameter | Setting |
|---|---|
| Output Level (Procedure 7, 16, 18) | According to 3GPP2 C.S.0011–C Table 4.4.1.2.1–1<br>(Band Class 1, Mobile Station Class II)<br>Test 1: –25.0 dBm<br>Test 2: –65.0 dBm<br>Test 3: –97.0 dBm |

[Procedure]
1. Execute **BANDCLASS 1** to set Band Class to 1.
2. Perform Registration with CDMA2000 1X.
3. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
4. Execute **1XALLMEASITEMS ON,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Access Probe Power to On.
5. Execute **PAMSZ 16** to set Preamble Length to 16 frames.
6. Execute **MAXRSP 1** to set Max. Response Sequence to 1.

[Test 1]
7. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
8. Execute ***OPC?** and check that the response is 1.
9. Wait until the measuring instrument and mobile terminal stabilize.
10. Execute **SWPANDPG** to perform measurement.
11. Execute **CALLSTAT?** and wait until the response becomes 6 (= Connected).
12. Execute **APPWR?** to read the measurement result.
13. Compare the measurement results with Table 1.3.10–2 Minimum Standards for Range of Open Loop Output Power.
14. Execute **CALLSO** to disconnect.
15. Execute **CALLSTAT?** and wait until the response becomes 2 (= Idle (Regist)).

[Test 2]
16. Execute **OLVL -65.0** to set Output Level to –65.0 dBm/1.23 MHz.
17. Repeat procedures 8 to 15.

[Test 3]
18. Execute **OLVL -98.3** to set Output Level to –98.3 dBm/1.23 MHz.
19. Repeat procedures 8 to 13.

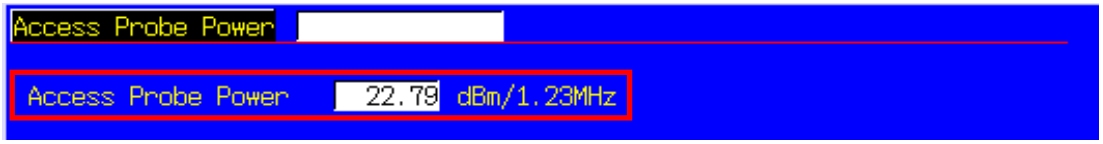



**Table 1.3.10–2 Minimum Standards for Range of Open Loop Output Power**

| Item | Test | Limit |
|---|---|---|
| Access Probe Power | Test 1 | Within –51 dBm ±9.5 dB (Note) |
| | Test 2 | Within –11 dBm ±9.5 dB (Note) |
| | Test 3 | Within 20 dBm ±9.5 dB (Note) |

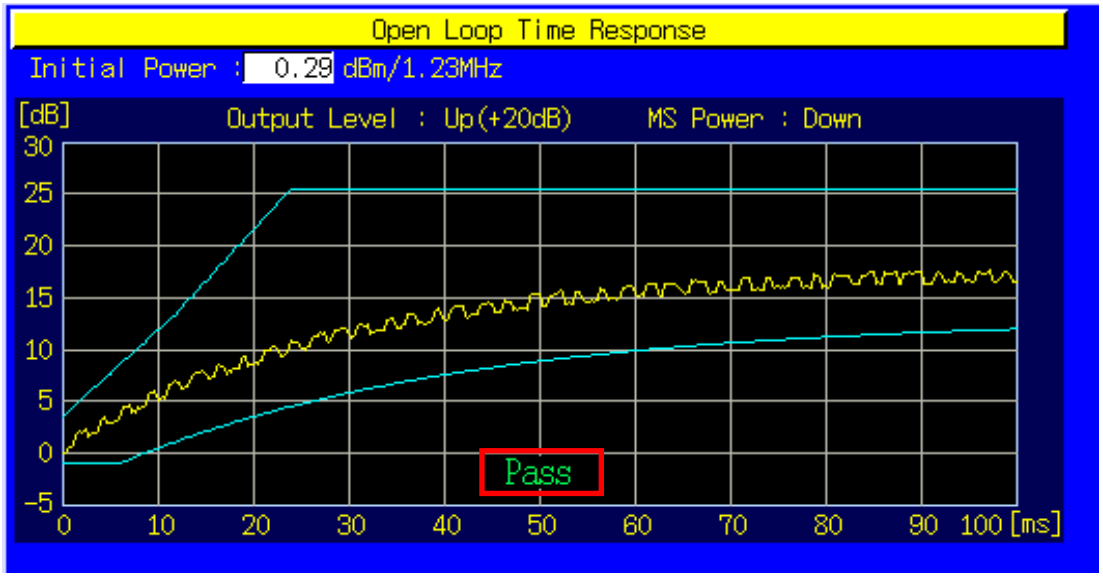
(Note) These reference values are for Band Class 1 and Mobile Station Class II terminals. When performing measurement for another Band Class and Mobile Station Class, follow 3GPP2 C.S.0011–C Table 4.4.1.3–1. Minimum Standards for Range of Open Loop Output Power for the Access Channel.

### 1.3.11. 4.4.2 Time Response of Open Loop Power Control

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
2. Execute **SO 2** to set Service Option to SO 2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL OLTR** to display the Open Loop Time Response screen.
5. Execute **PILOTLVL -7.00** to set F–PICH Level to –7 .00dB.
6. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
7. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
8. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
9. Execute **OLVL -60.0** to set Output Level to –60.0 dBm/1.23 MHz.
10. Execute ***OPC?** and check that the response is 1.
11. Wait until the measuring instrument and mobile terminal stabilize.
12. Execute **STEPUPSA** to perform measurement.
13. Execute **TEMPPASS_OLTR?** to read the measurement result.
14. Confirm that the measurement result is Pass.
15. Execute **STEPDNSA** to perform measurement.
16. Execute **TEMPPASS_OLTR?** to read the measurement result.
17. Confirm that the measurement result is Pass.
18. Execute **STEPDNSA** to perform measurement.
19. Execute **TEMPPASS_OLTR?** to read the measurement result.
20. Confirm that the measurement result is Pass.
21. Execute **STEPUPSA** to perform measurement.
22. Execute **TEMPPASS_OLTR?** to read the measurement result.
23. Confirm that the measurement result is Pass.



### 1.3.12. 4.4.3 Access Probe Output Power

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]
1. Connect with CDMA2000 1X.
2. Execute **SCRSEL APMEAS** to display the Access Probe Measurement screen.
3. Execute **OLVL -65.0** to set Output Level to –65.0 dBm/1.23 MHz.
4. Execute **TIMERREG DISABLEAD** to set Timer-based Registration to Disabled.
5. Execute **PILOTLVL -5.00** to set the F–PICH Level to –5.00 dB.

[Test 1: First Access Attempt]
6. Execute **NUMSTEP 5** to set Number of Steps to 5.
7. Execute **MAXRSP 1** to set Max. Response Sequence to 1.
8. Execute ***OPC?** and check that the response is 1.
9. Execute **SWP** to perform measurement.
10. Execute **PBNUM?** to read the measurement results.
11. Execute **APBLVL? 1, 5** (command for reading results of 5 access probes) to read the measurement result.
12. Compare the measurement results with Table 1.3.12–1 Minimum Standards for Access Probe Output Power (first access attempt).

[Test 2: Second Access Attempt]
13. Execute **NOMPWR 3** to set Nominal Power to 3 dB.
14. Execute **INITPWR 3** to set Initial Power to 3 dB.
15. Execute **PWRSTEP 3** to set Power Step to 3 dB.
16. Execute **NUMSTEP 3** to set Number of Steps to 3.
17. Execute **MAXRSP 3** to set Max. Response Sequence to 3.
18. Execute ***OPC?** and check that the response is 1.
19. Execute **SWP** to perform measurement.
20. Execute **PBNUM?** to read the measurement results.
21. Execute **APBLVL? 1,9** (command for reading results of 9 access probes) to read the measurement results.
22. Compare the measurement results and Table 1.3.12–2 Minimum Standards for Access Probe Output Power (second access attempt).

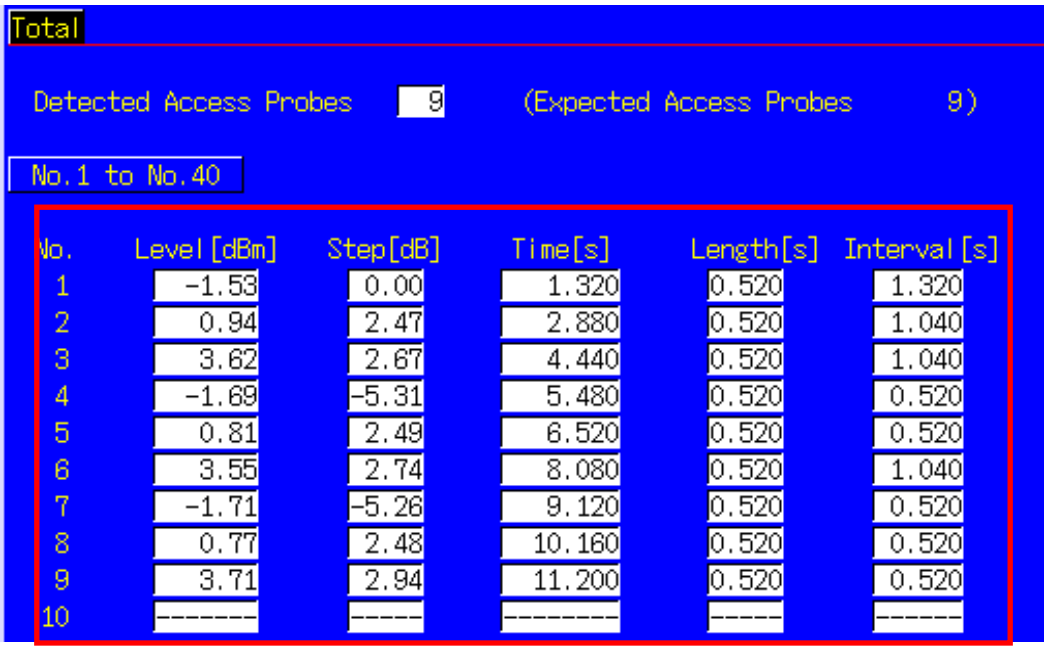



**Table 1.3.12–1 Minimum Standards for Access Probe Output Power (first access attempt)**

| Item | Limit |
|---|---|
| Detected Access Probes | 5 |
| Level | Access Probe No. 1<br>For Band Class 0, 2, 3, 5, 7, 9, 10, 11<br>Within –8.0 dBm ±9.5 dB<br>For Band Class 1, 4, 6, 8, 14, 15<br>Within –11.0 dBm ±9.5 dB |
| | Access Probe No. 2 to 5<br>Access Probe No.1 measurement result Within ±1.2 dB |

**Table 1.3.12–2 Minimum Standards for Access Probe Output Power (second access attempt)**

| Item | Limit |
|---|---|
| Detected Access Probes | 9 |
| Level | Access Probe No. 1<br>Within First Access Attempt Access Probe No.1 measurement result +6.0 dBm ±9.5 dB |
| | Access Probe No. 2, 5, 8<br>Within First Access Attempt Access Probe No.1 measurement result +3 dBm ±1.8 dB |
| | Access Probe No. 3, 6, 9<br>Within First Access Attempt Access Probe No.1 measurement result +6 dBm ±2.4 dB |

### 1.3.13. 4.4.5 Maximum RF Output Power

The following describes an example using a mobile terminal supporting Band Class 1 and Test Mode 1. Change the Band Class, Channel, Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Execute **BANDCLASS 1** to set Band Class to 1.
2. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
3. Execute **SO 2** to set Service Option to SO 2.
4. Connect with CDMA2000 1X.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **1XALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Power Measurement to On and other measurements to Off (This sets the number of measurements to 1.)
7. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
8. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
9. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
10. Execute **PCBPAT ALL0** to set PCB Pattern to All0 (Up).
11. Execute **OLVL -104.0** to set Output Level to –104.0 dBm/1.23 MHz.
12. Execute **ILVL -23.0** to set Input Level to –23.0 dBm.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and mobile terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_POWER** to read the measurement results.
17. Compare the measurement results with Table 1.3.13–1 Minimum Standards for Maximum RF Output Power.

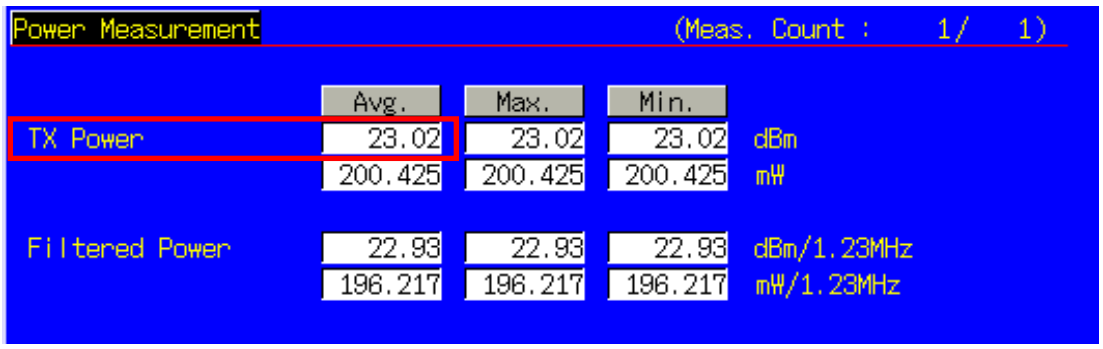



**Table 1.3.13–1 Minimum Standards for Maximum RF Output Power**

| Item | Limit |
|---|---|
| Tx Power | 23 to 30 dBm (Note) |

(Note) These reference values are for Band Class 1 and Mobile Station Class II terminals. When performing measurement for another Band Class and Mobile Station Class, follow 3GPP2 C.S.0011–C Table 4.4.5.3–1 Effective Radiated Power at Maximum Output Power.

## 1.3.14. 4.4.6 Minimum Controlled Output Power

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
2. Execute **SO 2** to set Service Option to SO 2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Power Measurement to On and all other measurements to Off. (This sets the number of measurements to 1.)
6. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
7. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
8. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
9. Execute **PCBPAT ALL1** to set PCB Pattern to All1 (Down).
10. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
11. Execute **ILVL -50.0** to set Input Level to –50.0 dBm.
12. Execute ***OPC?** and check that the response is 1.
13. Wait until the measuring instrument and mobile terminal stabilize.
14. Execute **SWP** to perform measurement.
15. Execute **AVG_FILTPWR?** to read the measurement result.
16. Compare the measurement result with Table 1.3.14–1 Minimum Standards for Minimum Controlled Output Power.

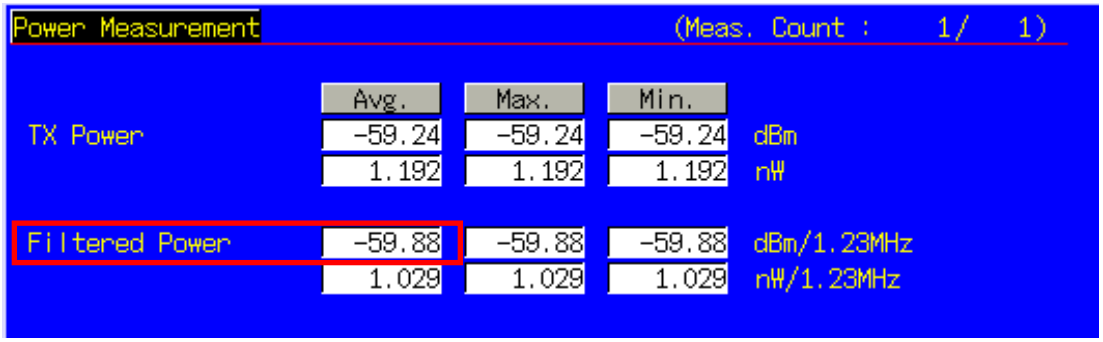



**Table 1.3.14–1 Minimum Standards for Minimum Controlled Output Power**

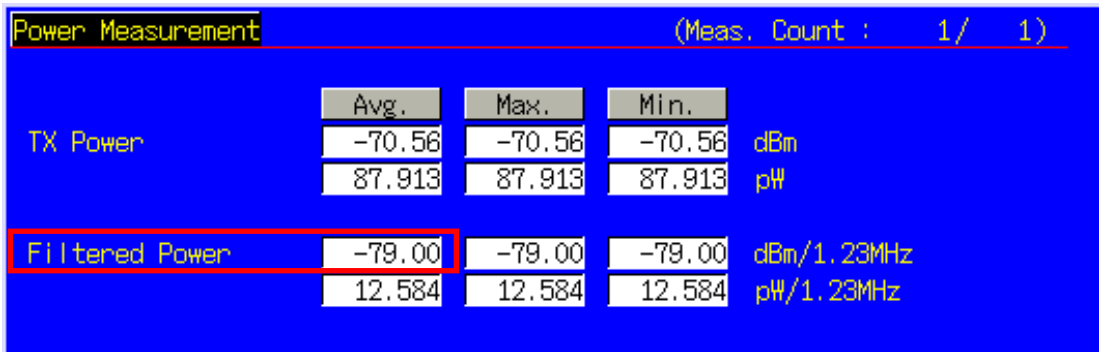
| Item | Limit |
|---|---|
| Filtered Power | –50 dBm max |

## 1.3.15. 4.4.7 Standby Output Power and Gated Output Power

The following describes an example using a mobile terminal supporting Test Mode 1. Change the Radio Configuration and Service Option settings according to the mobile terminal being used.

[Procedure]

1. Perform Registration with CDMA2000 1X.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **1XALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF,OFF** to set only Power measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
5. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
6. Execute **OLVL -75. 0** to set Output Level to –75.0 dBm/1.23 MHz.
7. Execute ***OPC?** and check that the response is 1.
8. Wait about 100 to 200 ms.
9. Execute **SWP** to perform measurement.
10. Execute **AVG_FILTPWR?** to read the measurement result. Perform bandwidth conversion (1 MHz/1.23 MHz).
11. Compare the conversion results with Table 1.3.15–1 Minimum Standards for Standby Output Power and Gated Output Power.
12. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
13. Execute **SO 2** to set Service Option to SO 2.
14. Execute **CALLSA** to perform connection.
15. Execute **CALLSTAT?** and wait until the response becomes 6 (= Connected).
16. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF,ON,100** to set only Gated Power measurement to On. (This sets the number of measurements to 100.)
17. Execute **DATARATE 3** to set F–FCH Data Rate to 1200 bps.
18. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
19. Execute ***OPC?** and check that the response is 1.
20. Wait until the measuring instrument and mobile terminal stabilize.
21. Execute **PCBPAT ALT** to set PCB Pattern to Alternate.
22. Execute **SWP** to perform measurement.
23. Execute **RATIO?** to read the measurement result.
24. Compare the measurement results with Table 1.3.15–1 Minimum Standards for Standby Output Power and Gated Output Power.
25. Execute **TEMPPASS_GPWR?** to read the measurement result.
26. Confirm that the Execute Template Pass/Fail measurement result is Pass.



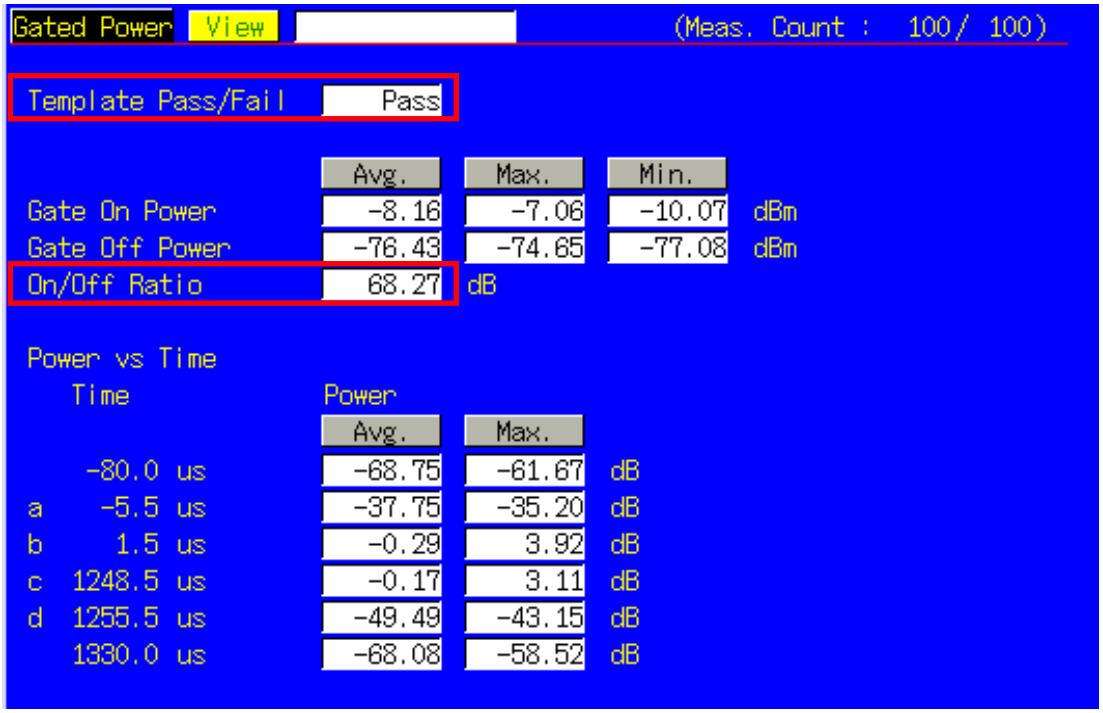




**Table 1.3.15–1 Minimum Standards for Standby Output Power and Gated Output Power**

| Item | Limit |
|---|---|
| Filtered Power | –61 dBm/1 MHz max.(Note) |
| On/Off Ratio | 20 dB min. |

(Note) This reference value is for 1 MHz bandwidth. MT8820C does not support the Filtered Power measurement at 1MHz bandwidth.

## 1.3.16. 4.4.9 Code Channel to Reverse Pilot Channel Output Power Accuracy

The following describes an example using a mobile terminal supporting Test Mode 3. Change the Radio Configuration, and Service Option settings according to the mobile terminal being used.

This measurement changes the parameters and performs Test 1 to 4 measurements.

[Procedure]
1. Execute **RC 33** to set Radio Configuration to Fwd. RC3 + Rev. RC3.
2. Execute **SO 55** to set Service Option to SO55.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF,OFF** to set only Code Domain Power measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
6. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
7. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
8. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
9. Execute **OLVL -65.0** to set Output Level to –65.0 dBm/1.23 MHz.
10. Execute ***OPC?** and check that the response is 1.
11. Wait until the measuring instrument and mobile terminal stabilize.
12. Execute **PCBPAT ALT** to set PCB Pattern to Alternate.

[Test 1]
13. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
14. Execute ***OPC?** and check that the response is 1.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_REVPILOTCDP?** and **AVG_REVFCHCDP?** to read the measurement result and find the difference between the R–PICH Level and R–FCH Level.
17. Compare the measurement result with Table 1.3.16–1 Minimum Standards of Code Channel to Reverse Pilot Channel Output Power Accuracy.

[Test 2]
18. Execute **DATARATE 1** to set F–FCH Data Rate to 4800 bps.
19. Repeat procedures 14 to 17.

[Test 3]
20. Execute **DATARATE 2** to set F–FCH Data Rate to 2700 bps.
21. Repeat procedures 14 to 17.

[Test 4]
22. Execute **DATARATE 3** to set F–FCH Data Rate to 1500 bps.
23. Repeat procedures 14 to 17.

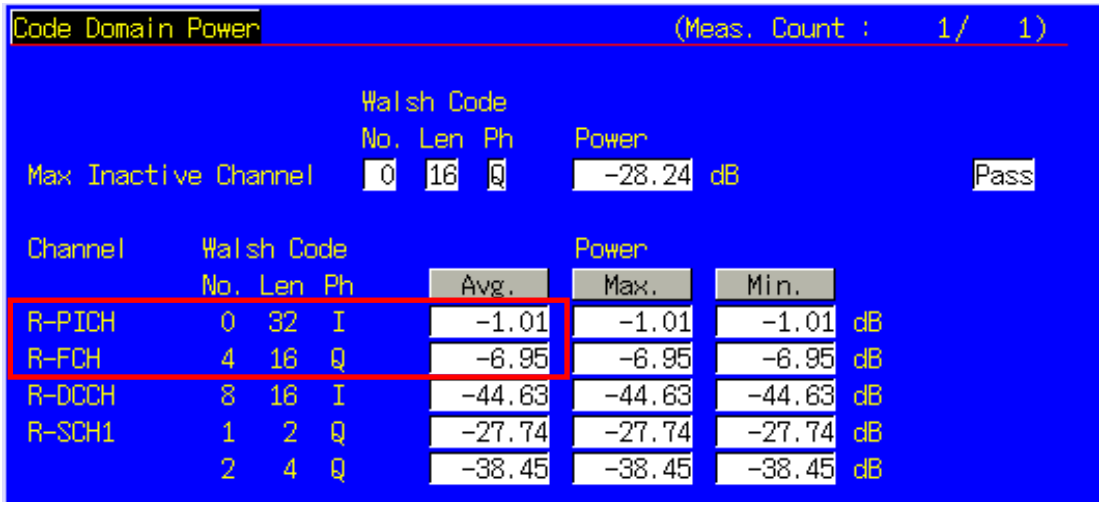



**Table 1.3.16–1 Minimum Standards of Code Channel to Reverse Pilot Channel Output Power Accuracy**

| Item | Test | Limit |
|---|---|---|
| R–FCH Level – R–PICH Level | Test 1 | Within 3.75 ±0.25 dB (Note) |
| | Test 2 | Within –0.25 ±0.25 dB (Note) |
| | Test 3 | Within –2.75 ±0.25 dB (Note) |
| | Test 4 | Within –5.88 ±0.25 dB (Note) |

(Note) This value is only for Fundamental Channel Test Mode 3; when measuring in other test modes, follow 3GPP2 C.S.0011–C Table 4.4.9.3–2 to 4.4.9.3–5.

### 1.3.17. 4.5.1 Conducted Spurious Emissions

The following describes an example using a Test Mode 1. Change the Radio Configuration, and Service Option according to the mobile terminal being used and the test mode.

[Procedure]

1. Execute **BANDCLASS 1** to set Band Class to 1.
2. Execute **RC 11** to set Radio Configuration to Fwd. RC1＋Rev. RC1.
3. Execute **SO 2** to set Service Option to SO 2.
4. Connect with CDMA2000 1X.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,ON,1,OFF,OFF** to set only Spurious Emissions measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
7. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
8. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
9. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
10. Execute **SPR_DBM1M ON** to set Spurious Emission dBm/1 MHz measurement to On.
11. Execute **SPR_DBM1M23 ON** to set Spurious Emission dBm/1.23 MHz measurement to On.
12. Execute **PCBPAT ALL0** to set PCB Pattern to All0 (Up).
13. Execute **OLVL -104.00** to set Output Level to –104.0 dBm/1.23 MHz.
14. Execute ***OPC?** and check that the response is 1.
15. Wait until the measuring instrument and mobile terminal stabilize.
16. Execute **SWP** to perform measurement.
17. Execute **SPRPWR? AB,DBC30K** to read the measurement results.
18. Execute **SPRPWR? BC,DBC30K** to read the measurement results.
19. Execute **SPRPWR? C4M,DBC30K** to read the measurement results.
20. Execute **SPRPWR? AB,DBM1M** to read the measurement results.
21. Execute **SPRPWR? BC,DBM1M** to read the measurement results.
22. Execute **SPRPWR? C4M,DBM1M** to read the measurement results.
23. Execute **SPRPWR? AB,DBM1M23** to read the measurement results.
24. Execute **SPRPWR? BC,DBM1M23** to read the measurement results.
25. Execute **SPRPWR? C4M,DBM1M23** to read the measurement results.
26. Compare the measurement results with Table 1.3.17–1 Minimum Standards for Conducted Spurious Emissions.

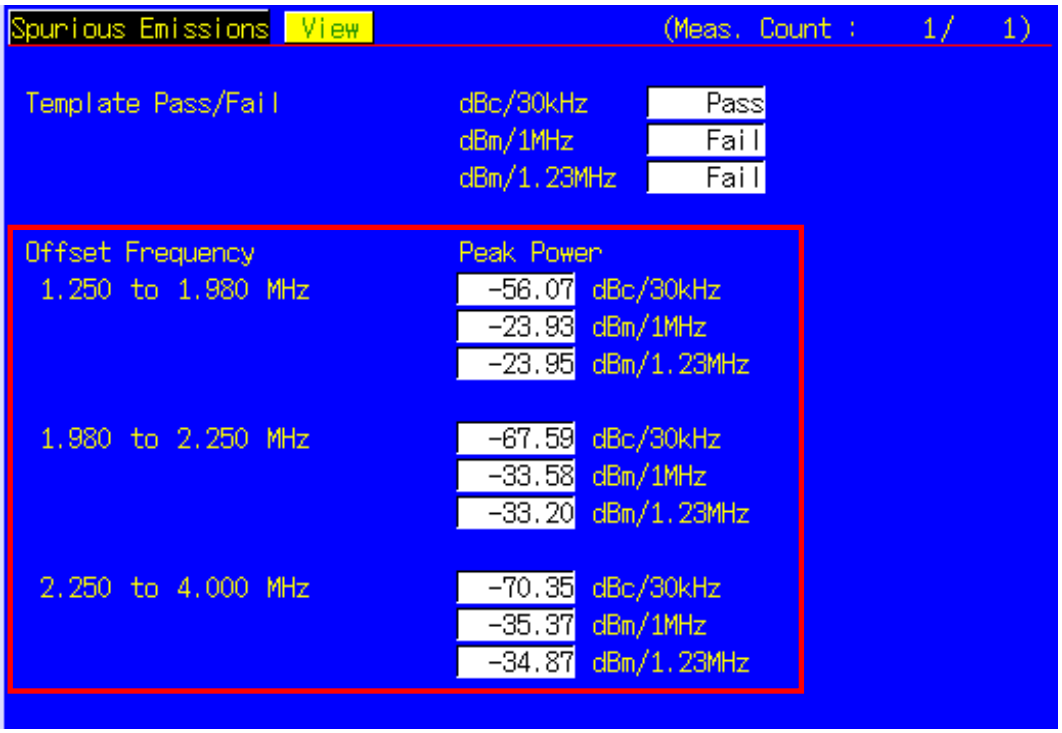



**Table 1.3.17–1 Minimum Standards for Conducted Spurious Emissions**

| Item | Limit |
|---|---|
| Peak Power | Offset Frequency 1.250 to 1.980 MHz<br>Evaluate as best conditions of following<br>–42 dBc/30 kHz max./–54 dBm/1.23 MHz max. (Note)<br>Offset Frequency 1.980 to 2.250 MHz<br>Evaluate as best conditions of following<br>–50 dBc/30 kHz max./–54 dBm/1.23 MHz max. (Note)<br>Offset Frequency 2.250 to 4.000 MHz<br>Evaluate as best conditions of following<br>–50 dBc/30 kHz max./–54 dBm/1.23 MHz max. (Note) |

(Note) This value is only for Band Class 1; when measuring in other Band Class, follow 3GPP2 C.S.0011–C Table 4.5.1.3.1–1 to 4.5.1.3.1–5.

## 1.3.18. 4.5.3 Occupied Bandwidth

The following describes an example using a Test Mode 1. Change the Radio Configuration, Service Option and Signaling Option according to the mobile terminal being used and the test mode.

[Procedure]

1. Execute **RC** 11 to set Radio Configuration to Fwd. RC1＋Rev. RC1.
2. Execute **SO 2** to set Service Option to SO 2.
3. Connect with CDMA2000 1X.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **1XALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,ON,1,OFF,1,OFF,OFF** to set only Occupied Bandwidth measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
6. Execute **PILOTLVL -7.00** to set F–PICH Level to –7.00 dB.
7. Execute **FCHLVL -7.4** to set F–FCH Level to –7.4 dB.
8. Execute **DATARATE 0** to set F–FCH Data Rate to 9600 bps.
9. Execute **PCBPAT ALL0** to set PCB Pattern to All0 (Up).
10. Execute **OLVL -104.0** to set Output Level to –104.0 dBm/1.23 MHz.
11. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
12. Execute ***OPC?** and check that the response is 1.
13. Wait until the measuring instrument and mobile terminal stabilize.
14. Execute **SWP** to perform measurement.
15. Execute **OBW?** to read the measurement result.
16. Compare the measurement result with Table 1.3.18–1 Minimum Standard of Occupied Bandwidth.

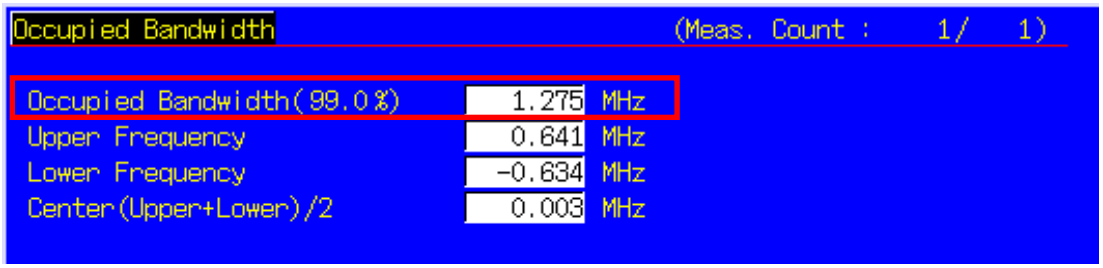


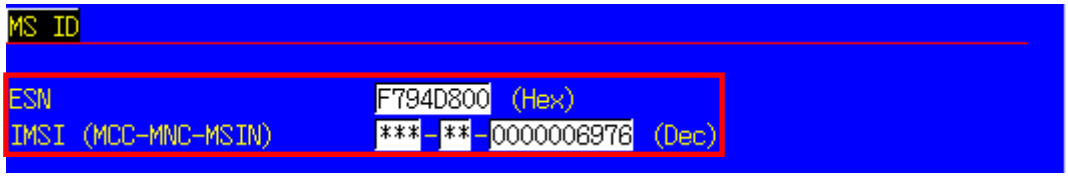

**Table 1.3.18–1 Minimum Standard of Occupied Bandwidth**

| Item | Limit |
|---|---|
| Occupied Bandwidth | 1.48 MHz max. |

## 1.4. MS Report

ESN and IMSI reported by the mobile terminal can be read.

1. Execute **CALLRFR** and initialize the MS Report value.
2. Set the mobile terminal power to On.
3. Execute **CALLSTAT?** and wait until the response becomes 2 (= Idle (Regist)).
4. Execute **MSREP_ESN?** and **MSREP_IMSI?** to read ESN and IMSI.



## 1.5. Function Tests

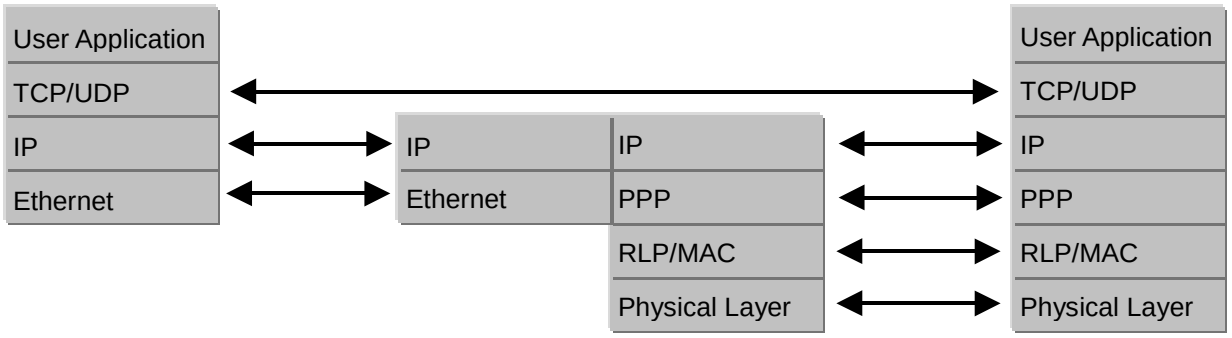
### 1.5.1. Voice Call

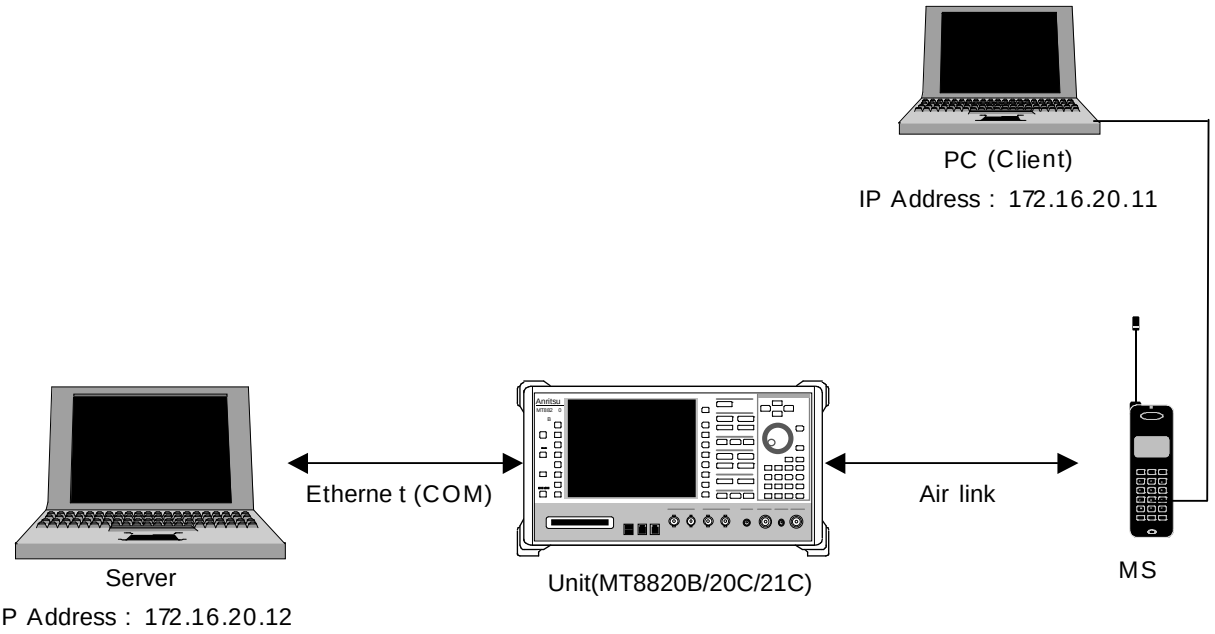
In CDMA2000, the Voice Call (Service Option: SO3) test can be performed with the Call Processing function.
The following describes an example of the Origination test.

1. Turn on the power of the mobile terminal to perform Registration.
2. Set [Radio Configuration] of Call Processing Parameters to [Fwd.RC3 + Rev.RC3].
3. Set [Service Option] of Call Processing Parameters to [SO 3].
4. Make a call from the mobile terminal to any telephone number.
   The Call Processing state changes to [MS Originating].
5. The Call Processing state changes to [Connected] and the MT8820C and the mobile terminal can communicate.
   The Voice Call test can be performed in this state, using echo–back.
6. Terminate the call from the mobile terminal or MT8820C. Press the [End Call] key if terminating from the MT8820C.
   Call Processing state changes to [MS Releasing] or [NW Releasing].

### 1.5.2. External Packet Data

The MX882002C–002 CDMA2000 External Packet Data option supports data transfer between equipment connected via the Ethernet port on the back panel and a mobile station.




1. Move to the System Configuration screen to set [IP Address, Subnet Mask, Default Gateway].
   (e.g. IP Address: 172.16.20.12, Subnet Mask: 255.255.255.0, Default Gateway: 172.16.20.1)
2. Toggle the power off and on to enable the new settings.
3. Move to the Fundamental Measurement screen to set [Service Option] of Call Processing Parameters to [SO33].
4. Set [Packet Data Mode] of Packet Data Option to [PPP/IP].
5. Set [IP Address] of Packet Data Option (e.g. 172.16.20.11).
6. Turn on the power of the mobile terminal to perform Registration.
7. Set the user name and password for dialup of the client PC. Make the dial–up connection.
   (The dial–up user name and password are not checked, so connection can be made even when nothing is input.)
8. The Call Processing state changes to [Connected] and the UNIT and mobile terminal can communicate.
9. Check the connection status using ping command from the client PC or server PC.
10. Disconnect from the client PC.

# 2. 1xEV–DO Measurement Software (MX882006C)

## 2.1. Specifications

### 2.1.1. For MT8820B/20C

**Table 2.1.1-1 Specifications for MX882006C 1xEV-DO Measurement Software**

| Item | Specifications | |
|---|---|---|
| Electrical characteristics | Typical values (typ.) are only for reference and are not guaranteed. | |
| Frequency/Modulation measurement | Frequency | 300 to 2700 MHz |
| | Input level | –30 to +35 dBm (Main1) |
| | Carrier frequency accuracy | ±(Set frequency × Reference oscillator accuracy +10 Hz) |
| | Modulation accuracy | |
| | Residual Waveform Quality | > 0.999 |
| Amplitude measurement | Same as MX882002C | |
| Occupied bandwidth | Same as MX882002C | |
| Code domain power | Measurement level range | 30 to +35 dBm |
| | Measurement accuracy | ±0.2 dB (code power ≥ –15 dBc)<br>±0.4 dB (code power ≥ –23 dBc) |
| PER | PER measurement with FTAP | |
| | Indicated items | Confidence Level, PER, Error Packet count, Sample Packet count |
| RF signal generator | Output frequency | 300 to 2700 MHz (1 Hz steps) |
| | Channel | Pilot channel, MAC channel, Control channel, Traffic channel all 0 dB (Ior reference) |
| | PN Offset | 0 to 511 can be set. |
| | Waveform Quality | (Pilot, AWGN Off)>0.99 |
| | AWGN | |
| | AWGN Level | –40～+12 dB (Relative level to CDMA signal) or Off |
| | Maximum output level of CDMA signal at AWGN On | –28 dBm (MAIN output)<br>–18 dBm (AUX output) |

**Table 2.1.1-1 Specifications for MX882006C 1xEV-DO Measurement Software (Cont'd)**

| Item | Specifications | |
|---|---|---|
| Call processing | Band Class | BC 0 to 12, 14, 15, 18, 19, 20, 21 |
| | Call control | Open Session, Close Session, AT Origination, NW Origination, AT Release, NW Release, Hard Handoff, Softer Handoff |
| | Rev. Closed Loop Power Control modes | Closed Loop, All 1 (All down), Alternate, All 0 (All up) |
| | Test Application Protocol | FTAP (Forward Test Application Protocol), RTAP (Reverse Test Application Protocol), FTAP+RTAP |

**Table 2.1.1-2 Specifications for MX882006C-002 1xEV-DO External Packet Data**

| Item | Specifications | |
|---|---|---|
| Function | Transferring the packet data between Access Terminal and external devices connecting to Ethernet port (10BT) on the MT8820C. | |
| External Packet Data | Application Protocol | Default Packet |
| | Packet Data Mode | PPP/IP (Transfers IP packet data between Access Terminal and a server) |

**Table 2.1.1-3 Specifications for MX882006C-011 1xEV-DO Rev. A Measurement Software**

| Item | Specifications | |
|---|---|---|
| Electrical characteristics | Typical values (typ.) are only for reference and are not guaranteed. | |
| Frequency/Modulation measurement | Same as MX882006C | |
| Amplitude measurement | Same as MX882006C | |
| Occupied bandwidth | Same as MX882006C | |
| Code domain power | Same as MX882006C | |
| PER | PER measurement with FTAP | |
| | Indicated items | Confidence Level, PER, Error Packet count, Sample Packet count |
| RF signal generator | Output frequency | 300 to 2700 MHz, 1 Hz step |
| | Channel | Pilot channel, MAC channel, Control channel, Trafficchannel all 0 dB (Ior reference) |
| | PN Offset | 0 to 511 can be set. |
| | Waveform Quality | (Pilot, AWGN Off) > 0.99 |
| | AWGN | Same as MX882006C |
| Call processing | Band Class | BC 0 to 12, 14, 15, 18, 19, 20, 21 |
| | Call control | Open Session, Close Session, AT Origination, NW Origination, AT Release, NW Release, Hard Handoff, Softer HandoffRev. |
| | Rev.Closed Loop Power Control modes | Closed Loop, All 1 (All down), Alternate, All 0 (All up) |
| | Physical Layer Protocol | Subtype 2 |
| | Enhanced Test Application Protocol | FETAP (Forward Enhanced Test Application Protocol), RETAP (Reverse Enhanced Test Application Protocol), FETAP+RETAP |

### 2.1.2. For MT8821C

**Table 2.1.2-1 Specifications for MX882106C 1xEV-DO Measurement Software**

| Item | Specifications |
|---|---|
| Electrical characteristics | Typical values (typ.) are only for reference and are not guaranteed. |
| Frequency/Modulation measurement | Frequency 350 to 2700 MHz<br>Input level –30 to +35 dBm (Main1)<br>Carrier frequency accuracy ±(Set frequency × Reference oscillator accuracy +10 Hz)<br>Modulation accuracy<br>Residual Waveform Quality > 0.999 |
| Amplitude measurement | Same as MX882102C |
| Occupied bandwidth | Same as MX882102C |
| Code domain power | Measurement level range 30 to +35 dBm<br>Measurement accuracy ±0.2 dB (code power ≥ –15 dBc)<br>±0.4 dB (code power ≥ –23 dBc) |
| PER | PER measurement with FTAP, FETAP<br>Indicated items Confidence Level, PER, Error Packet count, Sample Packet count |
| RF signal generator | Output frequency 300 to 2700 MHz (1 Hz steps)<br>Channel Pilot channel, MAC channel, Control channel, Traffic channel all 0 dB (Ior reference)<br>PN Offset 0 to 511 can be set.<br>AWGN<br>AWGN Level –40 to +12 dB (Relative level to CDMA signal) or Off<br>Maximum output level of CDMA signal at AWGN On<br>–28 dBm (MAIN output)<br>–18 dBm (AUX output) |
| Call processing | Band Class BC 0 to 12, 14, 15, 18, 19, 20, 21<br>Call control Open Session, Close Session, AT Origination, NW Origination, AT Release, NW Release, Hard Handoff, Softer Handoff<br>Rev. Closed Loop Power Control modes Closed Loop, All 1 (All down), Alternate, All 0 (All up)<br>Test Application Protocol FTAP (Forward Test Application Protocol), RTAP (Reverse Test Application Protocol), FTAP+RTAP |

**Table 2.1.2-2 Specifications for MX882106C-002 1xEV-DO External Packet Data**

| Item | Specifications | |
|---|---|---|
| Function | Transferring the packet data between Access Terminal and external devices connecting to Ethernet port (10BT) on the MT8821C. | |
| External Packet Data | Application Protocol | Default Packet |
| | Packet Data Mode | PPP/IP (Transfers IP packet data between Access Terminal and a server) |

## 2.2. Measurement Specification Table (C.S.0033–B)

| | Item | Comment | |
|---|---|---|---|
| **3** | **Physical Layer Receiver Minimum Standards** | | |
| **3.1** | **Frequency Coverage Requirements** | Support Band Class 0–12, 14, 15, 18, 19 | P-Yes |
| **3.2** | **Demodulation Requirements** | | |
| 3.2.1 | Demodulation of Forward Traffic Channel in AWGN | | P-Yes |
| 3.2.2 | Demodulation of Forward Traffic Channel in Multipath Fading Channel | Requires Fading Simulator | SYS |
| 3.2.3 | Decision of Power Control Bit for Channels belonging to Different Power Control Sets during Soft Handoff | | No |
| 3.2.4 | Decision of Power Control Bit for Channels belonging to the Same Power Control Set | | No |
| 3.2.5 | Demodulation of Reverse Power Control Channel during Soft Handoff | | No |
| 3.2.6 | Demodulation of ARQ Channel | | No |
| 3.2.7 | Demodulation of Broadcast Channel | | No |
| **3.3** | **Receiver Performance** | | |
| 3.3.1 | Receiver Sensitivity and Dynamic Range | | Yes |
| 3.3.2 | Single Tone Desensitization | Requires SG | SYS |
| 3.3.3 | Intermodulation Spurious Response Attenuation | | No |
| 3.3.4 | Adjacent Channel Selectivity | | No |
| 3.3.5 | Receiver Blocking Characteristics | | No |
| **3.4** | **Limitations of Emissions** | | |
| 3.4.1 | Conducted Spurious Emissions | | No |
| 3.4.2 | Radiated Spurious Emissions | | No |
| **4** | **Physical Layer Transmitter Minimum Standards** | | |
| **4.1** | **Frequency Requirements** | | |
| 4.1.1 | Frequency Coverage | | Yes |
| 4.1.2 | Frequency Accuracy | | Yes |
| **4.2** | **Modulation Requirements** | | |
| 4.2.1 | Time Reference | | P-Yes |
| 4.2.2 | Waveform Quality and Frequency Accuracy | | Yes |
| **4.3** | **RF Output Power Requirements** | | |
| 4.3.1 | Range of Open Loop Output Power | | No |
| 4.3.2 | Time Response of Open Loop Power Control | | Yes |
| 4.3.3 | Range of Closed Loop Power Control | | No |
| 4.3.4 | Maximum RF Output Power | | Yes |
| 4.3.5 | Minimum Controlled Output Power | | Yes |
| 4.3.6 | Standby Output Power | | No |
| 4.3.7 | RRI Channel Output power | | Yes |
| 4.3.8 | Code Domain Power | | |
| 4.3.8.1 | DRC Channel Output Power | | Yes |
| 4.3.8.2 | ACK Channel Output Power | | Yes |
| 4.3.8.3 | Data Channel Output Power | Support Test 1–5, 8–10 | P-Yes |
| 4.3.8.4 | DSC Channel Output Power | | Yes |
| **4.4** | **Limitations on Emissions** | | |
| 4.4.1 | Conducted Spurious Emissions | | P-Yes |
| 4.4.2 | Radiated Spurious Emissions | | No |
| 4.4.3 | Occupied Bandwidth | | Yes |
| 4.4.3 | Occupied Bandwidth | | Yes |
| **5** | **MAC Layer Minimum Standards** | | |
| **5.5** | **Access Probes Output Power** | When ProbeSequenceMax is changed, Session is necessary to re–open<br>Support Test 1, 2 | P-Yes |

Yes**:** Supported | SYS**:** Requires external equipment (SPA or SG) | P-Yes**:** Partially Supported | No**:** Not Supported

## 2.3. Tx/Rx Measurements (1xEV–DO Rev.0)

### 2.3.1. 1xEV–DO Rev.0 Connection

The following example performs connection and measurement.
The Band Class and Channel that can open the session differ according to the mobile terminal being used.
Change these values according to the type of access terminal being used.

[Procedure]
1. Execute ***RST** to initialize parameters.
2. Execute **C2KSTD EV** to set Standard to 1xEV–DO.
3. Set the Band Class and Channel.
   Example: Execute **BANDCLASS 0** to set Band Class to 0.
   Execute **CHAN 500** to set Channel to 500.
4. Set the access terminal power to On.
5. Execute **CALLSTAT?** and wait for the response to change to 2 (= Idle(Session Opened)).
6. Execute **EVAPLI RTAP** to set Application Protocol to RTAP.
7. Execute **CALLSA** to perform connection.
8. Execute **CALLSTAT?** and wait for the response to change to 6 (= Connected).

### 2.3.2. Handoff

Refer to 1.3.2 Handoff.

### 2.3.3. Changing Parameters during Connection

When changing the following parameters during connection, check the call processing status using **CALLCNCT?** and wait until the parameter change processing terminates.
Use the following procedure.

Parameters: Application Protocol
Data Channel Data Rate
Forward Traffic Channel Data Rate

[When changing Forward Traffic Channel Data Rate when connected by RTAP]
[Procedure]
1. Execute **CALLCNCT?** and wait for the response to change to 3 (= Connected(RTAP)).
2. Execute **TCRATE X1** to set Traffic Channel Data Rate to 38.4 kbps.
3. Execute **CALLCNCT?** and wait until the response changes from 1(= Connected (Config)) to 3 (= Connected (RTAP)).

### 2.3.4. Termination

Refer to 1.3.3 Termination

### 2.3.5. Changing Parameters at Session Opened

When changing the following parameters when the call processing status is Session Opened, the MT8820C opens the Session and received commands are not executed normally during this period. To recover, it is necessary to wait until the session has opened.
Use the following procedure:

Parameters: Call Processing Parameters
- – Protocol Revision
- – Application Protocol
  Session Open recovered only when changing FTAP, RTAP, FTAP+RTAP <==> Default Packet (Rev. 0 only). Session Open not recovered at TAP change.
- – Session Close – State
- – Session Close – Timer
- – Pilot Drop
- – Pilot Drop Timer

Physical Channel Parameters (Rev. A only)
- – RRI Channel Gain PreTransition
- – RRI Channel Gain PostTransition
- – Data Channel Transmission Mode
- – T2P Transition
- – Termination Target
- – TxT2P PreTransition
- – TxT2P PostTransition

[When changing Pilot Drop to –14 dBm at Session Opened]
[Procedure]
1. Execute **CALLSTAT?** and wait for the response to change to 2 (= Idle(Session Opened)).
2. Execute **CALLRSLT 3** to clear the execution flag status for the Opening Session sequence.
3. Execute **PIDROP -14.0** to change Pilot Drop to –14.0 dB.
4. Execute **CALLRSLT? 3** and wait for the response to change to 1, 0(= Opening Session executed and terminated normally).
5. Execute **CALLSTAT?** and wait for the response to change to 2 (= Idle(Session Opened)).

## 2.3.6. 3.2.1 Demodulation of Forward Traffic Channel in AWGN

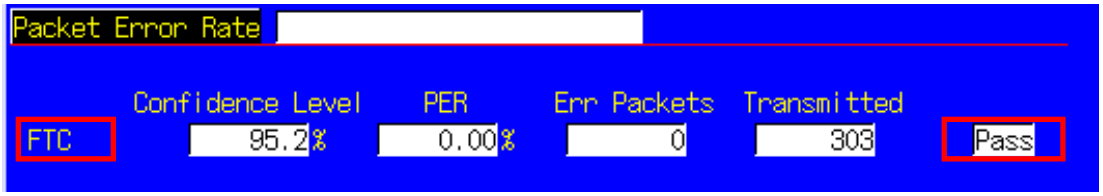
This measurement requires each Test specified in 3GPP2 C.S.0033–B Table A.1.1.1–1 to Table A.1.1.1–6. The following is an example for Test 1. When performing other tests, change the parameters according to Table 2.3.6–1 Parameter Settings for Demodulation of Forward Traffic Channel in AWGN.

**Table 2.3.6–1 Parameter Settings for Demodulation of Forward Traffic Channel in AWGN**

| Parameter | Setting |
|---|---|
| PER Limit (Procedure 11) | According to 3GPP2 C.S.0033–B Table A.1.1.2–1 to A.1.1.2–3. PER |
| Forward Traffic Channel Data Rate (Procedure 14) | According to 3GPP2 C.S.0033–B Table A.1.1.1–1 to A.1.1.1–6. Data Rate |
| AWGN Level (Procedure 17) | According to 3GPP2 C.S.0033–B Table A.1.1.1–1 to A.1.1.1–6. Îor/Ioc |
| Specified FER (Procedure 18) | According to 3GPP2 C.S.0033–B Table A.1.1.2–1 to A.1.1.2–3. PER |

[Procedure]

1. Execute **CCRATE 38K** to set Control Channel Data Rate to 38.4 kbps.
2. Execute **PIDROP -14.0** to set Pilot Drop Level to –14.0 dB.
3. Connect with 1xEV-DO Rev.0.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON** to set only Packet Error Rate to On and all other measurements to Off
6. Execute **EVAPLI FTAP** to set Application Protocol to FTAP.
7. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
8. Execute **PCKTACT 100** to set FTAP Packet Activity to 100%.
9. Execute **PERCONF 95.0** to set Confidence Level to 95%.
10. Execute **PERSTOP ON** to set Meas. Stop Mode to On.
11. Execute **ULPER 1.0** to set PER Limit to 1.0%.
12. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps
13. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
14. Execute **TCRATE XC** to set Forward Traffic Channel Data Rate to 2457.6 kbps.
15. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
16. Execute **AWGNLVL ON** to set AWGN to On.
17. Execute **AWGNPWR -15.4** to set AWGN Level to –15.4 dB.
18. Execute **PER 1.0** to set Specified PER to 1.0%.
19. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
20. Execute **OLVL -55.0** to set Output Level to –55.0 dBm/1.23 MHz.
21. Execute ***OPC?** and check that the response is 1.
22. Wait until the measuring instrument and access terminal stabilize.
23. Execute **SWP** to perform measurement.
24. Execute **PERPASS?** to read the measurement result.
25. Confirm that the measurement result is Pass.



## 2.3.7. 3.3.1 Receiver Sensitivity and Dynamic Range

This measurement changes the parameters and performs Test 1 to 3.

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON** to set only Packet Error Rate measurement to On.
4. Execute **EVAPLI FTAP** to set Application Protocol to FTAP.
5. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
6. Execute **PCKTACT 100** to set FTAP Packet Activity to 100.
7. Execute **PER 0.5** to set Specified PER to 0.5%.
8. Execute **PERCONF 95.0** to set Confidence Level to 95%.
9. Execute **PERSTOP ON** to set Meas. Stop Mode to On.
10. Execute **ULPER 0.5** to set PER Limit to 0.5%.
11. Execute **ILVLUL 21.0** to set Input Level Upper Limit to 21.0 dBm.
12. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
13. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).

[Test 1]

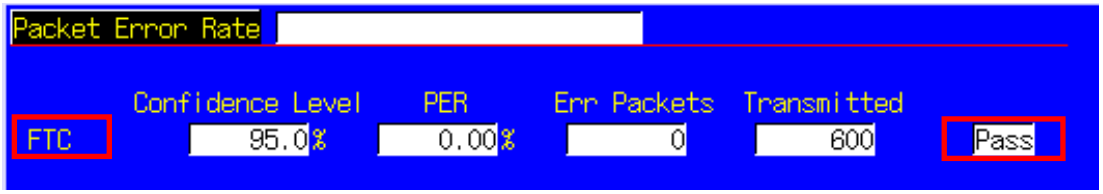
14. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
15. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
16. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
17. Execute **OLVL -105.5** to set Output Level to –105.5 dBm/1.23 MHz.
18. Execute ***OPC?** and check that the response is 1.
19. Wait until the measuring instrument and access terminal stabilize.
20. Execute **SWP** to perform measurement.
21. Execute **PERPASS** to read the measurement result.
22. Check that the measurement result is Pass.

[Test 2]

23. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
24. Repeat procedures 18 to 22.

[Test 3]

25. Execute **TCRATE XC** to set Forward Traffic Channel Data Rate to 2457.6 kbps.
26. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FTAP)).
27. Repeat procedures 18 to 22.




## 2.3.8. 4.1.2 Frequency Accuracy

Refer to 2.3.10 4.2.2 Waveform Quality and Frequency Accuracy.

## 2.3.9. 4.2.1 Time Reference

Refer to 2.3.10 4.2.2 Waveform Quality and Frequency Accuracy.

## 2.3.10. 4.2.2 Waveform Quality and Frequency Accuracy

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,ON,1,OFF,1,OFF,1,OFF,1,OFF** to set only Modulation Analysis measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **VAPLI FTAPRTAP** to set Application Protocol to FTAP + RTAP.
5. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
6. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
7. Execute **CALLCNCT?** and wait for the response to change to 4 (= Connected(FTAP+RTAP)).
8. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
10. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
11. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
12. Execute ***OPC?** and check that the response is 1.
13. Wait until the measuring instrument and access terminal stabilize.
14. Execute **SWP** to perform measurement.
15. Execute **AVG_CARRFERR?** to read the result of Carrier Frequency Error measurement.
16. Execute **AVG_RHO?** to read the result of Rho measurement.
17. Execute **AVG_TAU?** to read the result of Time Error measurement.
18. Compare the measurement result and Table 2.3.10–1 Minimum Standards for Waveform Quality and Frequency Accuracy.

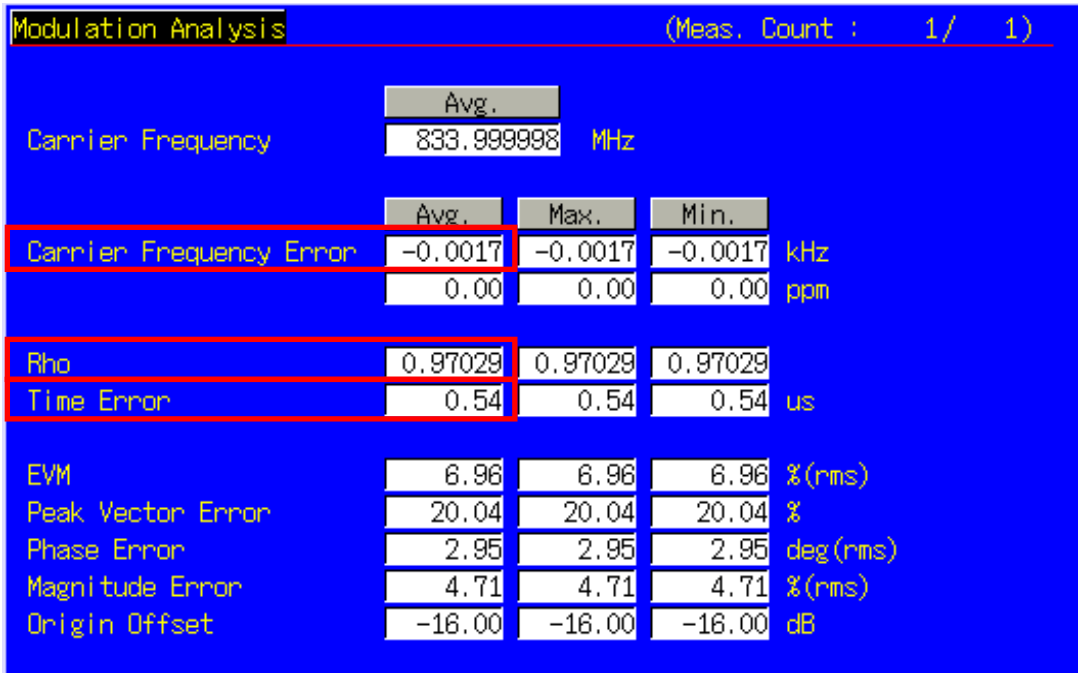


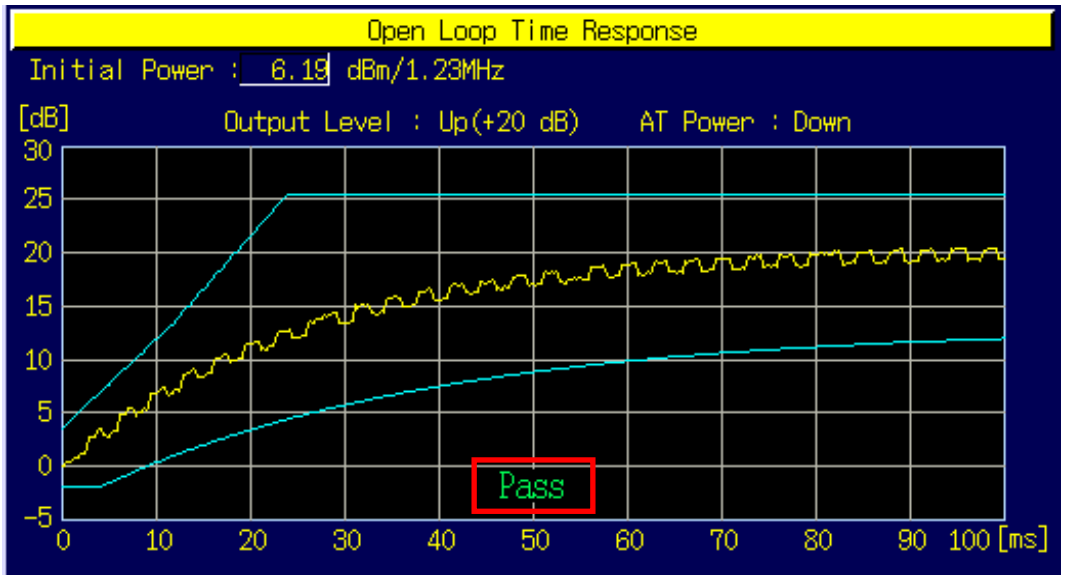

**Table 2.3.10–1 Minimum Standards for Waveform Quality and Frequency Accuracy**

| Item | Limit |
|---|---|
| Carrier Frequency Error | For Band Class 0, 2, 3, 5, 7, 9, 10, 11<br>Within ±300 Hz<br>For Band Class 1, 4, 6, 8, 14, 15<br>Within ±150 Hz |
| Rho | 0.944 to 1.000 |
| Time Error | Within ±1.0 µs |

## 2.3.11. 4.3.2 Time Response of Open Loop Power Control

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL OLTR** to display the Open Loop Time Response screen.
3. Execute **EVAPLI RTAP** to set the Application Protocol to RTAP.
4. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
5. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
6. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
7. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
8. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FTAP)).
9. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
10. Execute **OLVL -60.0** to set Output Level to –60.0 dBm/1.23 MHz.
11. Execute ***OPC?** and check that the response is 1.
12. Wait until the measuring instrument and access terminal stabilize.
13. Execute **STEPUPSA** to perform measurement.
14. Execute **TEMPPASS_OLTR?** to read the measurement results.
15. Check that the measurement result is Pass.
16. Execute **STEPDNSA** to perform measurement.
17. Execute **TEMPPASS_OLTR?** to read the measurement results.
18. Check that the measurement result is Pass.
19. Execute **STEPDNSA** to perform measurement.
20. Execute **TEMPPASS_OLTR?** to read the measurement results.
21. Check that the measurement result is Pass.
22. Execute **STEPUPSA** to perform measurement.
23. Execute **TEMPPASS_ OLTR?** to read the measurement results.
24. Check that the measurement result is Pass.



## 2.3.12. 4.3.4 Maximum RF Output Power

The following describes an example of testing using an access terminal supporting Band Class 0 and Access Terminal Class III. Change the Band Class and Channel according to the access terminal being used.

This measurement sets the parameters according to the Band Class. When testing for other band classes, change the parameters according to Table 2.3.12–1 Parameter Settings for Maximum RF Output Power.

**Table 2.3.12–1 Parameter Settings for Maximum RF Output Power**

| Parameter | Setting |
|---|---|
| Open Loop Adjust (Procedure 7) | For Band Class 0, 2, 3, 5, 7, 9, 10, 11<br>–81 dB<br>For Band Class 1, 4, 6, 8, 14, 15<br>–84 dB |

[Procedure]

1. Execute **BANDCLASS 0** to set Band Class to 0.
2. Connect with 1xEV-DO Rev.0.
3. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
4. Execute **EVALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF** to set only Power Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
5. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP＋RTAP.
6. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
7. Execute **OPNLPADJ -81** to set Open Loop Adjust to –81 dB.
8. Execute **PRBINIADJ 15** to set Probe Initial Adjust to 15 dB.
9. Execute **EVPWRSTEP 7.5** to set Power Step to 7.5 db.
10. Execute **EVRDATARATE 153K6** to set Reverse Data Channel Data Rate to153.6 kbps.
11. Execute **CALLCNCT?** and wait for the response to change to 4 (= Connected (FTAP+RTAP)).
12. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
13. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
14. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
15. Execute **OLVL -85.0** to set Output Level to **–**85.0 dBm/1.23 MHz.
16. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
17. Execute ***OPC?** and check that the response is 1.
18. Wait until the measuring instrument and access terminal stabilize.
19. Execute **SWP** to perform measurement.
20. Execute **AVG_POWER?** to read the measurement results.
21. Compare the measurement results with Table 2.3.12–2 Minimum Standards for Maximum RF Output Power.

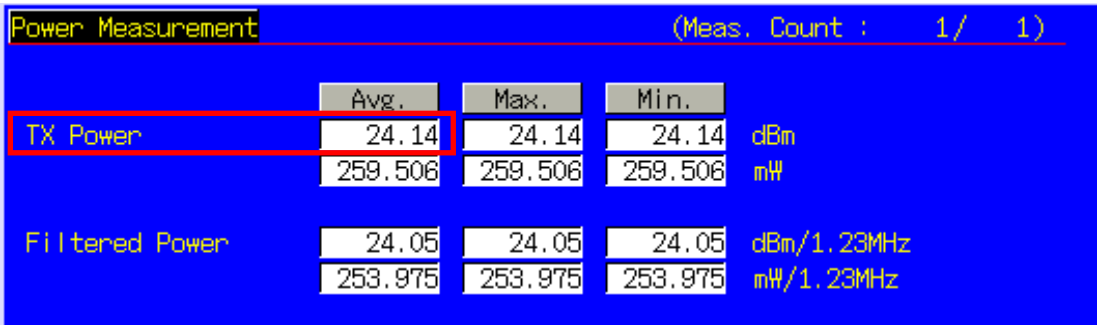



**Table 2.3.12–2 Minimum Standards for Maximum RF Output Power**

| Item | Limit |
|---|---|
| Tx Power | 23 to 30 dBm (Note) |

(Note) This value is only for Band Class 0 and Access Terminal Class III; when measuring in other band classes and access terminal classes modes, follow 3GPP2 C.S.0033–B Table 4.3.4.3–1 Effective Radiated Power at Maximum Output Power.

## 2.3.13. 4.3.5 Minimum Controlled Output Power

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF** to set only Power Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI RTAP** to set Application Protocol to RTAP.
5. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
6. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Rate to 9.6 kbps.
7. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
8. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
10. Execute **PCBPAT ALL1** to set PCB Pattern to All 1 (Down).
11. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
12. Execute **ILVL -50.0** to set Input Level to –50.0 dBm.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_FILTPWR?** to read the measurement results.
17. Compare the measurement results with Table 2.3.13–1 Minimum Standards for Minimum Controlled Output Power.

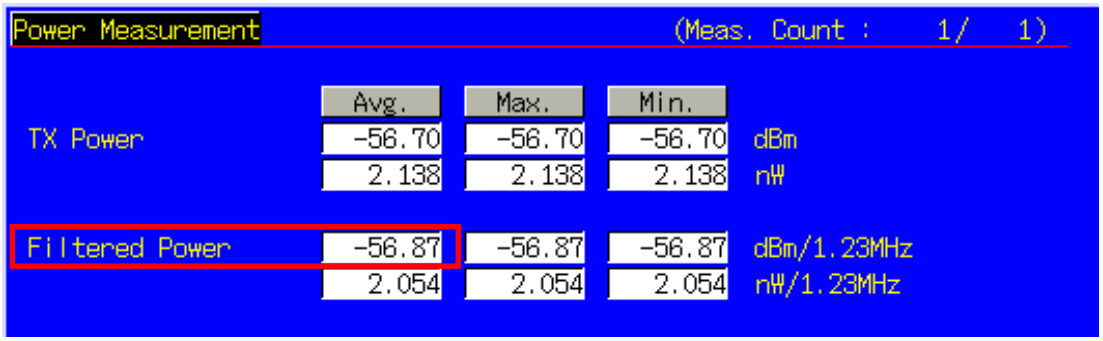



**Table 2.3.13–1 Minimum Standards for Minimum Controlled Output Power**

| Item | Limit |
|---|---|
| Filtered Power | –50 dBm max. |

## 2.3.14. 4.3.7 RRI Channel Output power

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Power Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **CODE_MODE NORMAL** to set Code Domain Power to Normal.
5. Execute **EVAPLI RTAP** to set Application Protocol to RTAP.
6. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
7. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
8. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
9. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
10. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
11. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
12. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_RRICDP? PILOT** to read the measurement results.
17. Compare the measurement result with Table 2.3.14–1 Minimum Standards for RRI Channel Output Power.

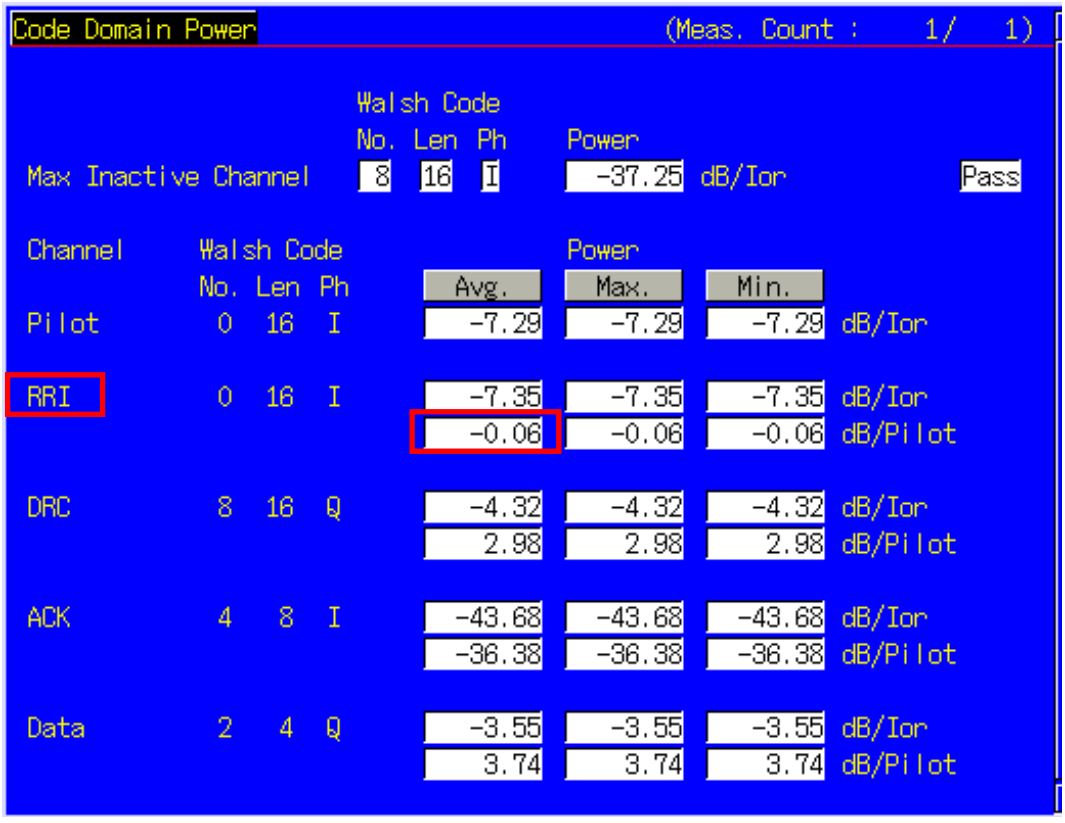



**Table 2.3.14–1 Minimum Standards for RRI Channel Output Power**

| Item | Limit |
|---|---|
| RRI/Pilot | Within 0.0 ±0.25 dB |

## 2.3.15. 4.3.8.1 DRC Channel Output Power

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP＋RTAP.
5. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
6. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
7. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected(RTAP)).
8. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
10. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
11. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.

[Test 1]

12. Execute **DRCPWR 0.0** to set DRC Channel Gain to 0.0 dB.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_DRCCDP? PILOT** to read the measurement results.
17. Compare the measurement results with Table 2.3.15–1 Minimum Standards for DRC Channel Output Power.

[Test 2]

18. Execute **DRCPWR 3.0** to set DRC Channel Gain to 3.0 dB.
19. Repeat procedures 13 to 17.

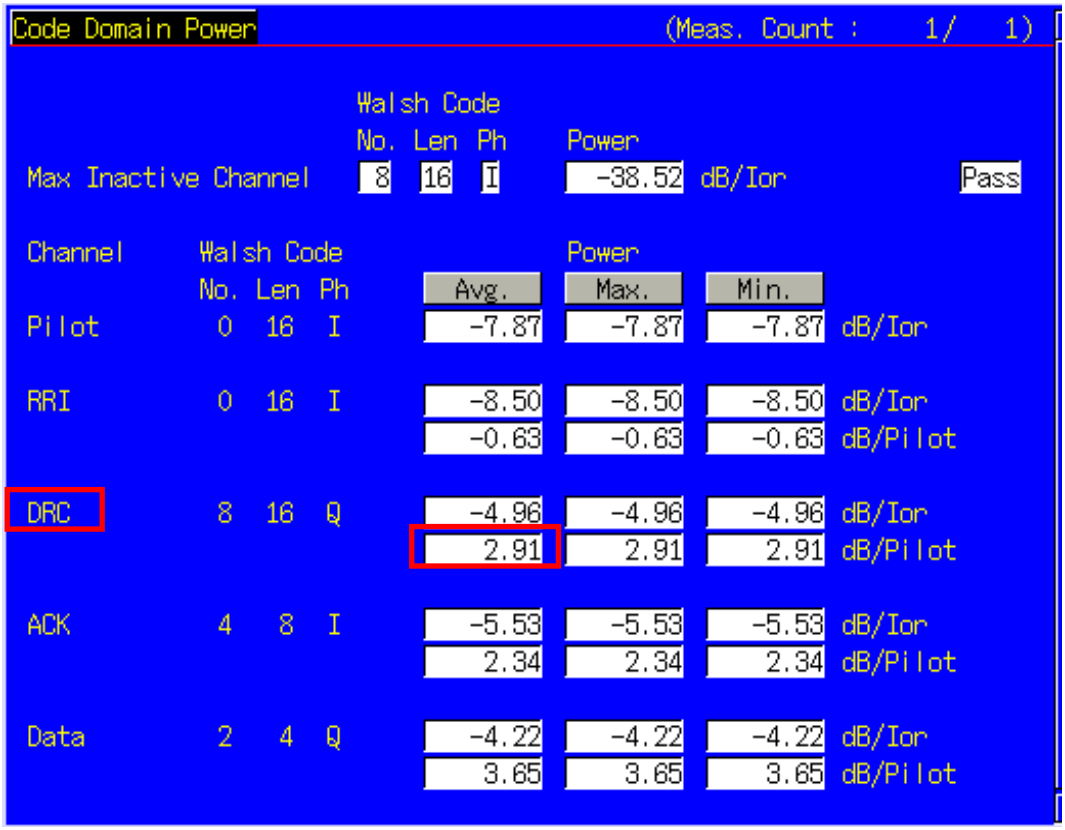



**Table 2.3.15–1 Minimum Standards for DRC Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| DRC/Pilot | Test 1 | Within 0.0 ±0.25 dB |
| | Test 2 | Within 3.0 ±0.25 dB |

## 2.3.16. 4.3.8.2 ACK Channel Output Power

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP＋RTAP.
5. Execute **CALLCNCT?** and wait for the response to change to 4 (= Connected(FTAP+RTAP)).
6. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
7. Execute **CALLCNCT?** and wait until the response becomes (= Connected(RTAP)).
8. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
10. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
11. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.

[Test 1]

12. Execute **ACKPWR 0.0** to set ACK Channel Gain to 0.0 dB.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **ACKCDP? PILOT** to read the measurement results.
17. Compare the measurement results with Table 2.3.16–1 Minimum Standards for ACK Channel Output Power.

[Test 2]

18. Execute **ACKPWR 3.0** to set ACK Channel Gain to 3.0 dB.
19. Repeat procedures 13 to 17.

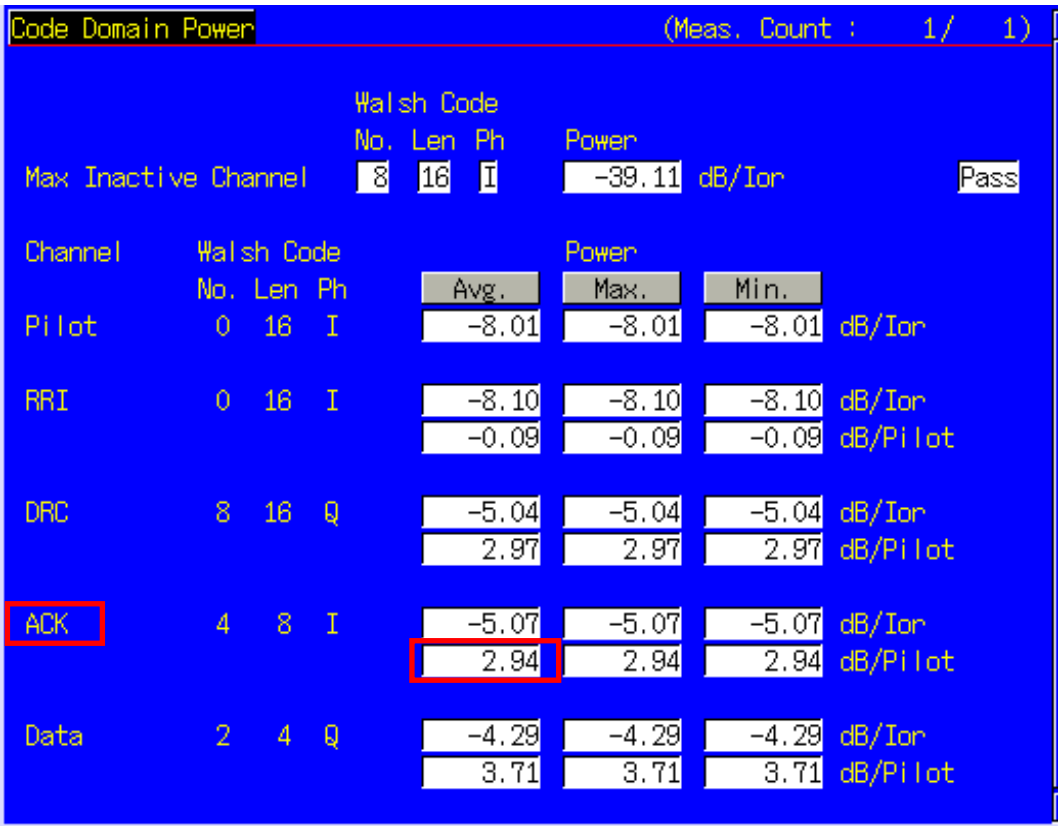



**Table 2.3.16–1 Minimum Standards for ACK Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| ACK/Pilot | Test 1 | Within 0.0 ±0.25 dB |
| | Test 2 | Within 3.0 ±0.25 dB |

## 2.3.17. 4.3.8.3 Data Channel Output Power

This measurement changes the parameters and performs Test 1 to 5.

[Procedure]
1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Measurement to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP＋RTAP.
5. Execute **CALLCNCT?** and wait for the response to change to 4 (= Connected(FTAP+RTAP)).
6. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
7. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
8. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
9. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
10. Execute ***OPC?** and check that the response is 1.
11. Wait until the measuring instrument and terminal stabilize.

[Test 1]
12. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
13. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FTAP＋RTAP)).
14. Execute **SWP** to perform measurement.
15. Execute **AVG_DATACDP? PILOT** to read the measurement results.
16. Compare the measurement results Table 2.3.17–1 Minimum Standards for Data Channel Output Power.

[Test 2]
17. Execute **EVRDATARATE 19K2** to set Reverse Data Channel Data Rate to 19.2 kbps.
18. Repeat procedures 13 to 16.

[Test 3]
19. Execute **EVRDATARATE 38K4** to set Reverse Data Channel Data Rate to 38.4 kbps.
20. Repeat procedures 13 to 16.

[Test 4]
21. Execute **EVRDATARATE 76K8** to set Reverse Data Channel Data Rate to 76.8 kbps.
22. Repeat procedures 13 to 16.

[Test 5]
23. Execute **EVRDATARATE 153K6** to set Reverse Data Channel Data Rate to 153.6 kbps.
24. Repeat procedures 13 to 16.

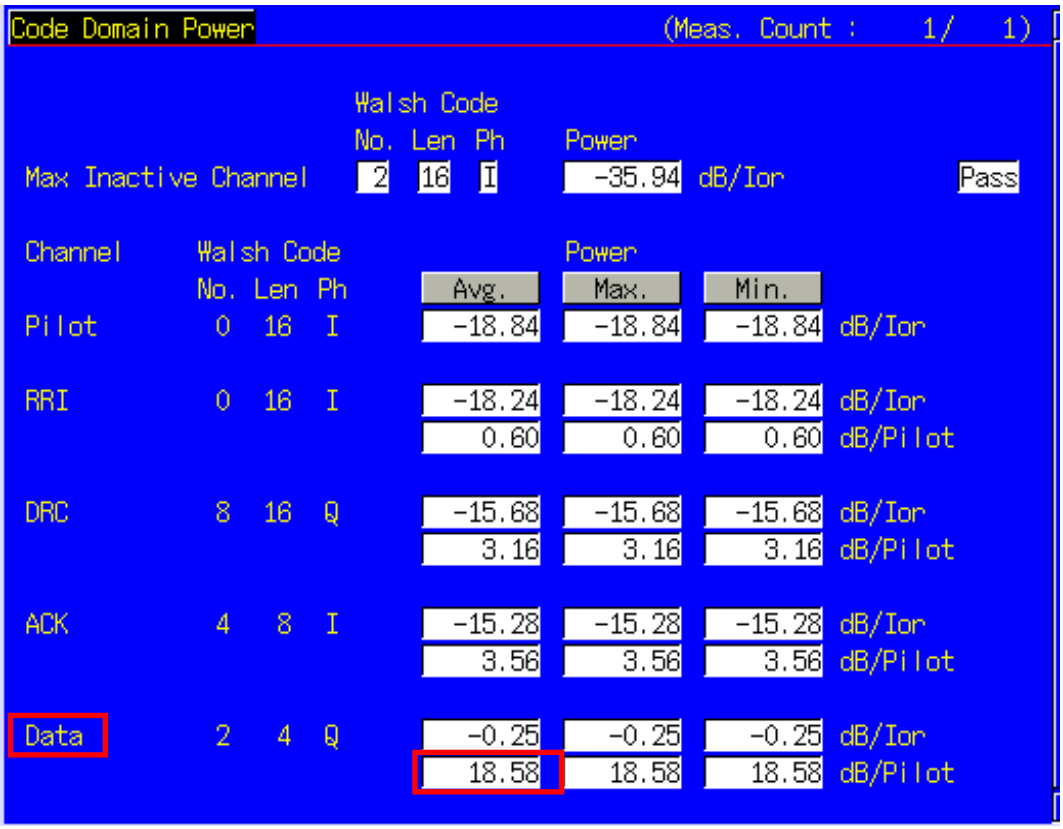



**Table 2.3.17–1 Minimum Standards for Data Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| Data/Pilot | Test 1 | Within 3.75 ±0.25 dB |
| | Test 2 | Within 6.75 ±0.25 dB |
| | Test 3 | Within 9.75 ±0.25 dB |
| | Test 4 | Within 13.25 ±0.25 dB |
| | Test 5 | Within 18.50 ±0.25 dB |

## 2.3.18. 4.4.1 Conducted Spurious Emissions

The following describes an example of testing using an access terminal supporting Band Class 0. Change the Band Class and Channel according to the access terminal being used.

This measurement changes the parameters according to the band class. When using another band class, change the parameters according to Table 2.3.18–1 Parameter Settings for Conducted Spurious Emissions.

**Table 2.3.18–1 Parameter Settings for Conducted Spurious Emissions**

| Parameter | Setting |
|---|---|
| Open Loop Adjust (Procedure 10) | For Band Class 0, 2, 3, 5, 7, 9, 10, 11(, 18, 19)<br>–81 dB<br>For Band Class 1, 4, 6, 8(, 14, 15)<br>–84 dB |

[Procedure]

1. Execute **BANDCLASS 0** to set Band Class to 0.
2. Connect with 1xEV-DO Rev.0.
3. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
4. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,ON,1,OFF** to set only Spurious Emissions to On and other measurements to Off. (This sets the number of measurements to 1.)
5. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP＋RTAP.
6. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
7. Execute **OPNLPADJ -81** to set Open Loop Adjust to –81 dB.
8. Execute **PRBINIADJ 15** to set Probe Initial Adjust to 15 dB.
9. Execute **EVPWRSTEP 7.5** to set Power Step to 7.5 dB.
10. Execute **SPR_DBM1M ON** to set Spurious Emission dBm/1 MHz to On.
11. Execute **SPR_DBM1M23 ON** to set Spurious Emission dBm/1.23 MHz to On.
12. Execute **EVRDATARATE 153K6** to set Reverse Data Channel Data Rate to 153.6 kbps.
13. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
14. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
15. Execute **CALLCNCT?** and wait for the response to change to 4 (= Connected(FTAP+RTAP)).
16. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
17. Execute **OLVL -85.0** to set Output Level to –85.0 dBm/1.23 MHz.
18. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
19. Execute ***OPC?** and check that the response is 1.
20. Wait until the measuring instrument and terminal stabilize.
21. Execute **SWP** to perform measurement.
22. Execute **SPRPWR? AB,DBC30K** to read the measurement results.
23. Execute **SPRPWR? BC,DBC30K** to read the measurement results.
24. Execute **SPRPWR? C4M,DBC30K** to read the measurement results.
25. Execute **SPRPWR? AB,DBM1M** to read the measurement results.
26. Execute **SPRPWR? BC,DBM1M** to read the measurement results.
27. Execute **SPRPWR? C4M,DBM1M** to read the measurement results.
28. Execute **SPRPWR? AB,DBM1M23** to read the measurement results.
29. Execute **SPRPWR? BC,DBM1M23** to read the measurement results.
30. Execute **SPRPWR? C4M,DBM1M23** to read the measurement results.
31. Compare the measurement results with Table 2.3.18–2 Minimum Standards for Conducted Spurious Emissions.

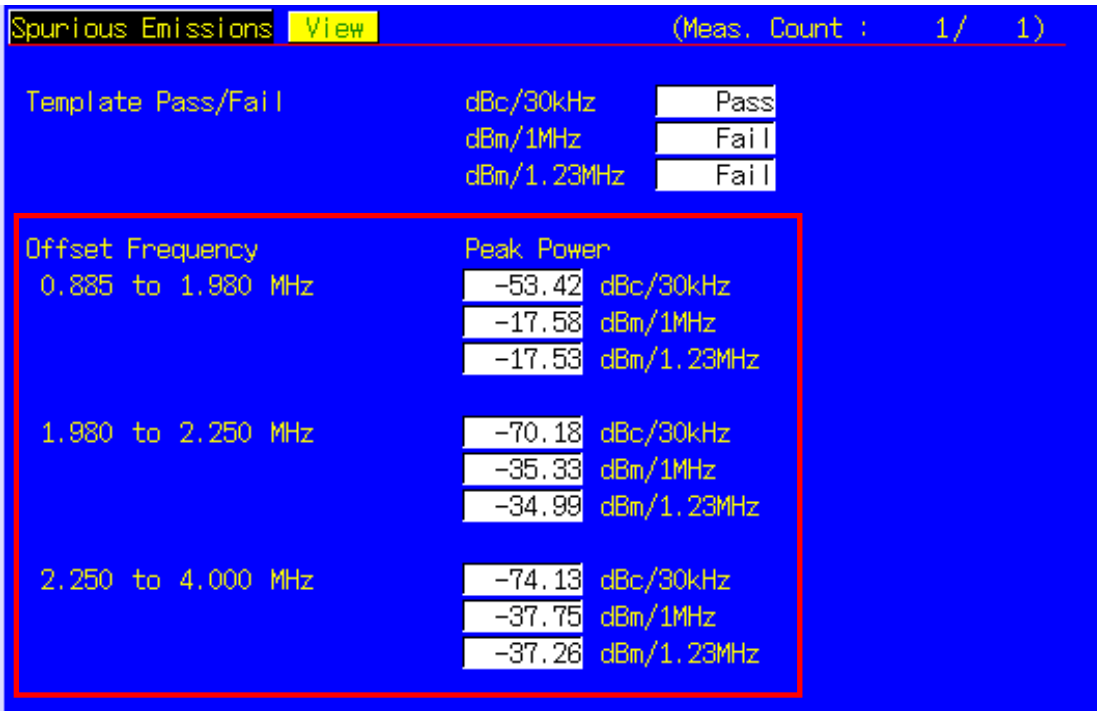



**Table 2.3.18–2 Minimum Standards for Conducted Spurious Emissions**

| Item | Limit |
|---|---|
| Peak Power | Offset Frequency 0.885 to 1.980 MHz<br>Evaluate as best conditions of following<br>–42 dBc/30 kHz max./–54 dBm/1.23 MHz max. (Note)<br>Offset Frequency 1.980 to 2.250 MHz<br>Evaluate as best conditions of following<br>–54 dBc/30 kHz max./–54 dBm/1.23 MHz max. (Note)<br>Offset Frequency 2.250 to 4.000 MHz max.<br>Evaluate as best conditions of following<br>–54 dBc/30 kHz max. /–54 dBm/1.23 MHz max. (Note) |

(Note) These reference values are for Band Class 0. When measuring other band classes, follow 3GPP2 C.S.0033–B Table 4.4.1.3.1–1 to 4.4.1.3.1–5.

## 2.3.19. 4.4.3 Occupied Bandwidth

The following describes an example of testing using an access terminal supporting Band Class 3. Change the Band Class and Channel to match the access terminal being used.

[Procedure]

1. Connect with 1xEV-DO Rev.0.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,ON,1,OFF,1,OFF** to set only Occupied Bandwidth to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI FTAPRTAP** to set Application Protocol to FTAP+RTAP.
5. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
6. Execute **EVRDATARATE 9K6** to set Reverse Data Channel Data Rate to 9.6 kbps.
7. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
8. Execute **TCRATE X4** to set Forward Traffic Channel Data Rate to 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected(FTAP+RTAP)).
10. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
11. Execute **OLVL -105.5** to set Output Level to –105.5 dBm/1.23 MHz.
12. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **OBW?** to read the measurement result.
17. Compare the measurement result with Table 2.3.19–1 Minimum Standards for Occupied Bandwidth.

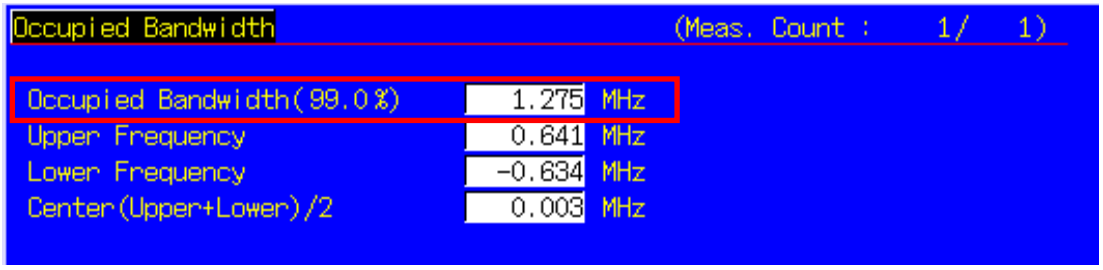



**Table 2.3.19–1 Minimum Standards for Occupied Bandwidth**

| Item | Limit |
|---|---|
| Occupied Bandwidth | 1.48 MHz max. |

### 2.3.20. 5.5 Access Probes Output Power

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]
1. Execute **SSNCLSSTATE OFF** to set Session Close to Off.
2. Execute **PRBSEQMAX 1** to set Probe Sequence Max to 1.
3. Open the Session with 1xEV-DO Rev.0.
4. Execute **SCRSEL APMEAS** to set Access Probe Measurement.

[Test 1: First Access Attempt]
5. Execute **OLVL -65.0** to set Output Level to –65.0 dBm/1.23 MHz.
6. Execute **OPNLPADJ -76** to set Open Loop Adjust to –76 dB.
7. Execute **PRBNUMSTEP 5** to set Probe Num Step to 5.
8. Execute **APMEAS_TIMEOUT 30,EV** to set Access Probe Power Timeout to 30s.
9. Execute **SWP** to perform measurement.
10. Execute **PBNUM?** to read the measurement result.
11. Execute **APBLVL? 1,5** to read the measurement result.
12. Compare the measurement result with Table 2.3.20–1 Minimum Standards for Access Probe Output Power (first access attempt).

[Test 2: Second Access Attempt]
13. Execute **OLVL -68.0** to set Output Level to –68.0 dBm/1.23 MHz.
14. Execute **OPNLPADJ -79** to set Open Loop Adjust to –79 dB.
15. Execute **PRBINIADJ 6** to set Probe Initial Adjust to 6 dB.
16. Execute **PRBNUMSTEP 3** to set Probe Num Step to 3.
17. Execute **EVPWRSTEP 3.0** to set Power Step to 3.0 dB.
18. Execute **PRBSEQMAX 3** to set Probe Sequence Max to 3.
19. Set the access terminal to On to reopen the Session.
20. Execute **CALLSTAT?** and wait until the response becomes 2 (= Idle (Session Opened)).
21. Execute **SWP** to perform measurement.
22. Execute **PBNUM?** to read the measurement result.
23. Execute **APBLVL? 1,9** to read the measurement result.
24. Compare the measurement result with Table 2.3.20–2 Minimum Standards for Access Probe Output Power (second access attempt).

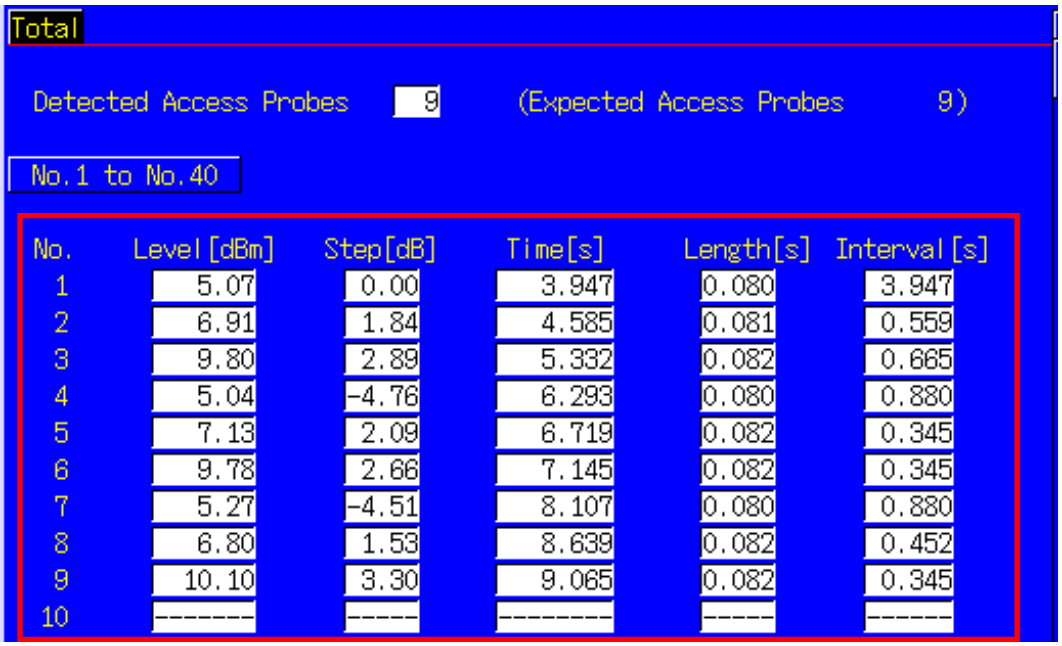



**Table 2.3.20–1 Minimum Standards for Access Probe Output Power (first access attempt)**

| **Item** | **Limit** |
|---|---|
| Detected Access Probes | 5 |
| Level | Access Probe No. 1<br>Within –5.72 dBm ±9.0 dB |
| | Access Probe No. 2 to 5<br>Within Access Probe No.1 measurement result ±1.2 dB |

**Table 2.3.20–2 Minimum Standards for Access Probe Output Power (second access attempt)**

| **Item** | **Limit** |
|---|---|
| Detected Access Probes | 9 |
| Level | Access Probe No. 1, 4, 7<br>Within First Access Attempt Access Probe No.1 measurement result + 6 dBm ±4.0 dB |
| | Access Probe No. 2, 5, 8<br>Within Access Probe No.1 measurement result + 3 dBm ±1.8 dB |
| | Access Probe No. 3, 6, 9<br>Within Access Probe No.1 measurement result + 6 dBm ±2.4 dB |

## 2.4. Tx/Rx Measurement (1xEV–DO Rev. A)

### 2.4.1. 1xEV–DO Rev. A Connection

This example performs connection and measurement as follows.

[Procedure]
1. Execute ***RST** to initialize the parameters.
2. Execute **C2KSTD EV** to set Standard to 1xEV–DO.
3. Execute **EVPREV A** to set Protocol Revision to IS–856–A.
4. Set the Band Class, and Channel.
   Example: Execute **BANDCLASS 0** to set Band Class to 0.
   Execute **CHAN 500** to set Channel to 500.
5. Set the access terminal power to On.
6. Execute **CALLSTAT?** and wait until the response becomes 2 (= Idle (Session Opened)).
7. Execute **EVAPLI FETAP** to set Application Protocol to FETAP.
8. Execute **CALLSA** to perform connection.
9. Execute **CALLSTAT?** and wait until the response becomes 6 (= Connected).

### 2.4.2. Handoff

Refer to 1.3.2 Handoff.

### 2.4.3. Changing Parameters while Connected

When changing the following parameters while connected, it is necessary check the call processing function with **CALLCNCT?** and then wait until the parameter change processing is completed.
Follow the procedure described below.

Parameters: Application Protocol
Traffic Channel Transmission Format
Data Channel Packet Size

[Changing Traffic Channel Transmission Format while connected by RETAP]
[Procedure]
1. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
2. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
3. Execute **CALLCNCT?** and wait until the response changes from 1 (= Connected (Config)) to 3 (= Connected (RETAP)).

### 2.4.4. Termination

Refer to 1.3.3 Termination

### 2.4.5. Changing Parameters at Session Opened

Refer to 2.3.5 Changing Parameters at Session Opened.

## 2.4.6. 3.2.1 Demodulation of Forward Traffic Channel in AWGN

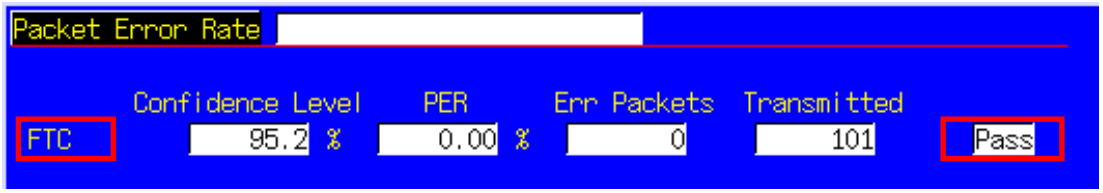
This measurement requires each test specified in 3GPP2 C.S.0033–B Table A.1.1.1–7 to Table A.1.1.1–10. The following is an example for Test 1. When performing other tests, change the parameters according to Table 2.4.6–1 Parameter Settings for Demodulation of Forward Traffic Channel in AWGN.

**Table 2.4.6–1 Parameter Settings for Demodulation of Forward Traffic Channel in AWGN**

| Parameter | Setting |
|---|---|
| PER Limit (Procedure 11) | According to 3GPP2 C.S.0033–B Table A.1.1.2–4 to A.1.1.2–7 PER |
| Traffic Channel Transmission Format (Procedure 14) | According to 3GPP2 C.S.0033–B Table A.1.1.1–7 to A.1.1.1–10 Data Rate, Physical Layer Packet Size, Slots per Physical Layer packet, Preamble Length |
| AWGN Level (Procedure 17) | According to 3GPP2 C.S.0033–B Table A.1.1.1–7 to A.1.1.1–10 Îor/Ioc |
| Specified FER (Procedure 18) | According to 3GPP2 C.S.0033–B Table A.1.1.2–4 to A.1.1.2–7 PER |

[Procedure]

1. Execute **CCRATE 38K** to set Control Channel Data Rate to 38.4 kbps.
2. Execute **PIDROP -16.0** to set Pilot Drop Level to –16.0 dB.
3. Connect with 1xEV-DO Rev.A.
4. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
5. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON** to set only Packet Error Rate to On and other measurements to Off.
6. Execute **EVAPLI FETAP** to set Application Protocol to FETAP.
7. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).
8. Execute **PCKTACT 100** to set FTAP Packet Activity to 100%.
9. Execute **PERCONF 95.0** to set Confidence Level to 95.0%.
10. Execute **PERSTOP ON** to set Meas. Stop Mode to On.
11. Execute **ULPER 3.0** to set PER Limit to 3.0%.
12. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
13. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).
14. Execute **TCFORMAT X6_512_1_64** to set Traffic Channel Transmission Format to 0x06 (512, 1, 64): 307.2 kbps.
15. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).
16. Execute **AWGNLVL ON** to set AWGN to On.
17. Execute **AWGNPWR 2.5** to set AWGN Level to 2.5 dB.
18. Execute **PER 3.0** to set Specified PER to 3.0%.
19. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
20. Execute **OLVL -55.0** to set Output Level to –55.0 dBm/1.23 MHz.
21. Execute ***OPC?** and check that the response is 1.
22. Wait until the measuring instrument and access terminal stabilize.
23. Execute **SWP** to perform measurement.
24. Execute **PERPASS?** to read the measurement results.
25. Check the measurement result is Pass.



## 2.4.7. 3.3.1 Receiver Sensitivity and Dynamic Range

The measurement changes the parameters and performs Tests1 to 3.

[Procedure]

1. Connect with 1xEV-DO Rev.A.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,OFF,1,ON** to set only Packet Error Rate to On and other measurements to Off.
4. Execute **EVAPLI FETAP** to set Application Protocol to FETAP.
5. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).
6. Execute **PCKTACT 100** to set FTAP Packet Activity to 100%.
7. Execute **PER 0.5** to set Specified PER to 0.5%.
8. Execute **PERCONF 95.0** to set Confidence Level to 95.0%.
9. Execute **PERSTOP ON** to set Meas. Stop Mode to On.
10. Execute **ULPER 0.5** to set PER Limit to 0.5%.
11. Execute **ILVLUL 21.0** to set Input Level Upper Limit to 21.0 dBm.
12. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
13. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).

[Test 1]

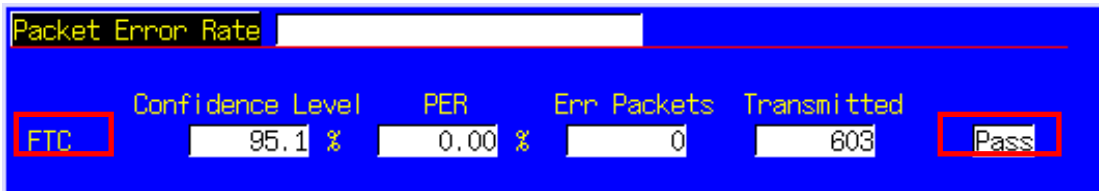
14. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
15. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected (FETAP)).
16. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
17. Execute **OLVL -105.5** to set Output Level to –105.5 dBm/1.23 MHz.
18. Execute ***OPC?** and check that the response is 1.
19. Wait until the measuring instrument and access terminal stabilize.
20. Execute **SWP** to perform measurement.
21. Execute **PERPASS?** to read the measurement results.
22. Check that the measurement result is Pass.

[Test 2]

23. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
24. Repeat procedures 18 to 22.

[Test 3]

25. Execute **TCFORMAT XC_4096_1_64** to set Traffic Channel Transmission Format to 0x0C (4096, 1, 64): 2457.6 kbps.
26. Execute **CALLCNCT?** and wait until the response becomes 2 (= Connected(FETAP)).
27. Repeat procedures 19 to 22.




## 2.4.8. 4.1.2 Frequency Accuracy

Refer to 2.4.10 4.2.2 Waveform Quality and Frequency Accuracy.

## 2.4.9. 4.2.1 Time Reference

Refer to 2.4.10 4.2.2 Waveform Quality and Frequency Accuracy.

## 2.4.10. 4.2.2 Waveform Quality and Frequency Accuracy

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Connect with 1xEV-DO Rev.A.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **EVALLMEASITEMS OFF,OFF,1,ON,1,OFF,1,OFF,1,OFF,1,OFF** to set only Modulation Analysis to On and other measurements to Off. (This sets the number of measurement to 1.)
7. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
8. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
9. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
10. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
11. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
12. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
13. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
14. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
15. Execute ***OPC?** and check that the response is 1.
16. Wait until the measuring instrument and access terminal stabilize.
17. Execute **SWP** to perform measurement.
18. Execute **AVG_CARRFERR?** to read the Carrier Frequency Error measurement results.
19. Execute **AVG_RHO?** to read the Rho measurement results.
20. Execute **AVG_TAU?** to read the Time Error measurement results.
21. Compare the measurement results with Table 2.4.10–1 Minimum Standards for Waveform Quality and Frequency Accuracy.

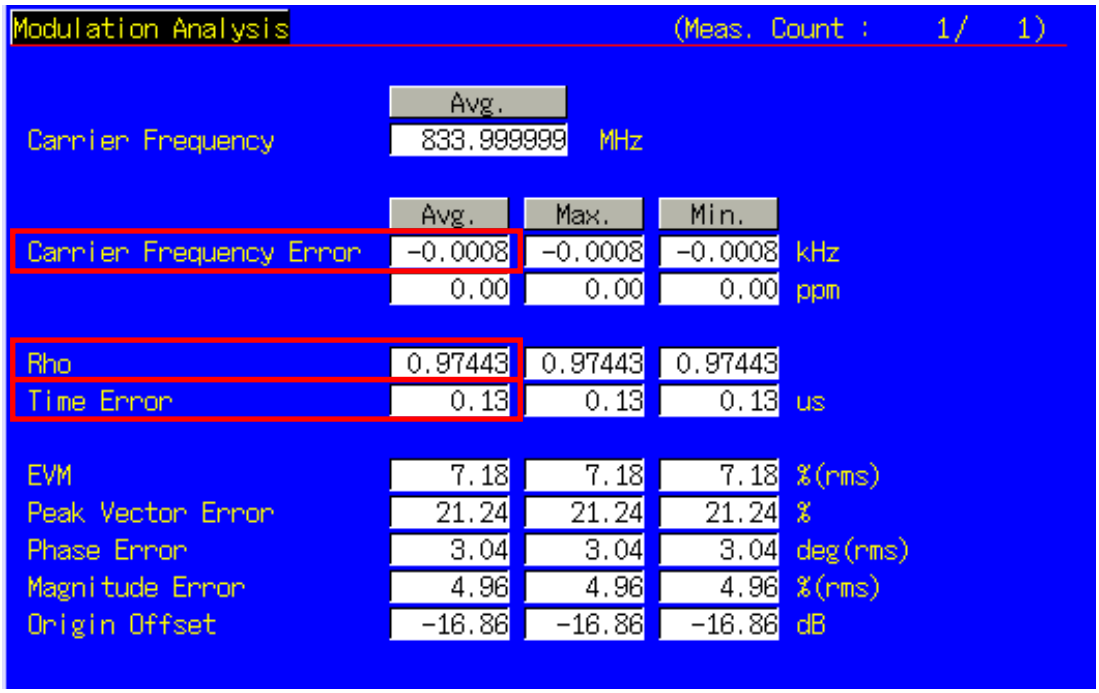


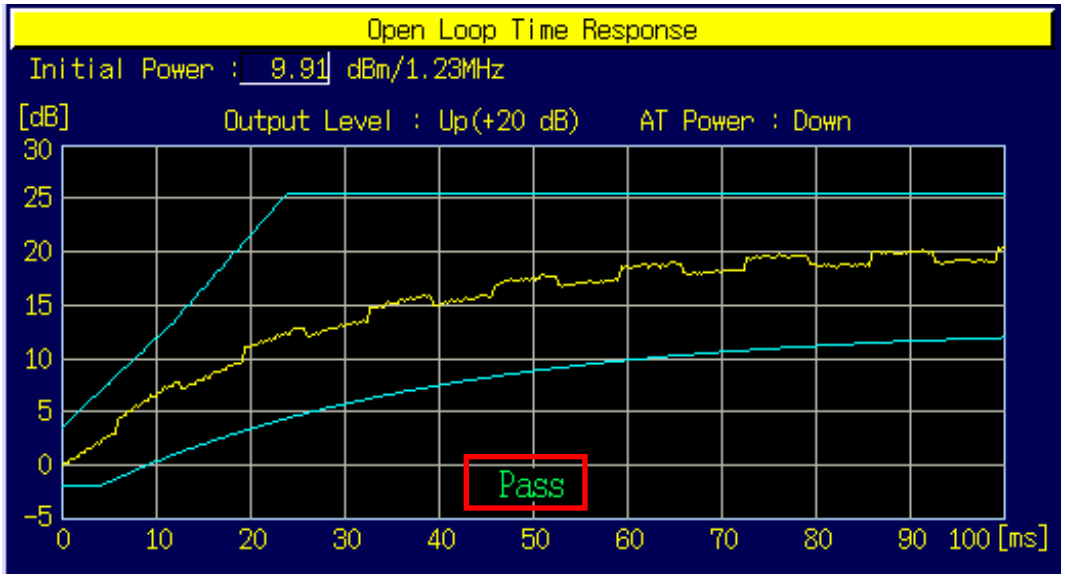

**Table 2.4.10–1 Minimum Standards for Waveform Quality and Frequency Accuracy**

| Item | Limit |
|---|---|
| Carrier Frequency Error | For Band Class 0, 2, 3, 5, 7, 9, 10, 11<br>Within ±300 Hz<br>For Band Class 1, 4, 6, 8, 14, 15<br>Within ±150 Hz |
| Rho | 0.944 to 1.000 |
| Time Error | Within ±1.0 μs |

## 2.4.11. 4.3.2 Time Response of Open Loop Power Control

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Connect with 1xEV-DO Rev.A.
5. Execute **SCRSEL OLTR** to display the Open Loop Time Response screen.
6. Execute **EVAPLI RETAP** to set Application Protocol to RETAP.
7. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
8. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
9. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
10. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
11. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
12. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
13. Execute **OLVL -60.0** to set Output Level to –60.0 dBm/1.23 MHz.
14. Execute ***OPC?** and check that the response is 1.
15. Wait until the measuring instrument and access terminal stabilize.
16. Execute **STEPUPSA** to perform measurement.
17. Execute **TEMPPASS_OLTR?** to read the measurement results.
18. Check that the measurement result is Pass.
19. Execute **STEPDNSA** to perform measurement.
20. Execute **TEMPPASS_OLTR?** to read the measurement results.
21. Check that the measurement result is Pass.
22. Execute **STEPDNSA** to perform measurement.
23. Execute **TEMPPASS_OLTR?** to read the measurement results.
24. Check that the measurement result is Pass.
25. Execute **STEPUPSA** to perform measurement.
26. Execute **TEMPPASS_OLTR?** to read the measurement results.
27. Check that the measurement result is Pass.



## 2.4.12. 4.3.4 Maximum RF Output Power

The following describes an example of testing using an access terminal supporting Band Class 0 and Access Terminal III. Change the Band Class and Channel according to the access terminal being used.

This measurement changes the parameter settings according to the Band Class. When testing another class, change the parameters according to Table 2.4.12–1 Parameter Setting of Maximum RF Output Power.

**Table 2.4.12–1 Parameter Setting of Maximum RF Output Power**

| Parameter | Setting |
|---|---|
| Open Loop Adjust (Procedure 10) | For Band Class 0, 2, 3, 5, 7, 9, 10, 11(, 18, 19)<br>–81 dB<br>For Band Class 1, 4, 6, 8(, 14, 15)<br>–84 dB |

[Procedure]

1. Execute **BANDCLASS 0** to set Band Class to 0.
2. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
3. Execute **TERMTGT 4096,3** to set Data Channel Packet Size 4096 bits Termination Target to 3 (16 slots).
4. Execute **T2PTRANS 4096,3** to set Data Channel Packet Size 4096 bits T2P Transition to 3 (16 slots).
5. Connect with 1xEV-DO Rev.A.
6. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
7. Execute **EVALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF** to set Power to On and other measurement to Off. (This sets the number of measurements to 1.)
8. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
10. Execute **OPNLPADJ -81** to set Open Loop Adjust to –81 dB.
11. Execute **PRBINIADJ 15** to set Probe Initial Adjust to 15 dB.
12. Execute **EVPWRSTEP 7.5** to set Power Step to 7.5 dB.
13. Execute **DATAPCKTSIZE 4096** to set Data Channel Packet Size to 4096 bits.
14. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
15. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
16. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
17. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
18. Execute **OLVL -85.0** to set Output Level to –85.0 dBm/1.23 MHz.
19. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
20. Execute ***OPC?** and check that the response is 1.
21. Wait until the measuring instrument and access terminal stabilize.
22. Execute **SWP** to perform measurement.
23. Execute **AVG_POWER?** to read the measurement results.
24. Compare the measurement results with Table 2.4.12–2 Minimum Standards for Maximum RF Output Power.

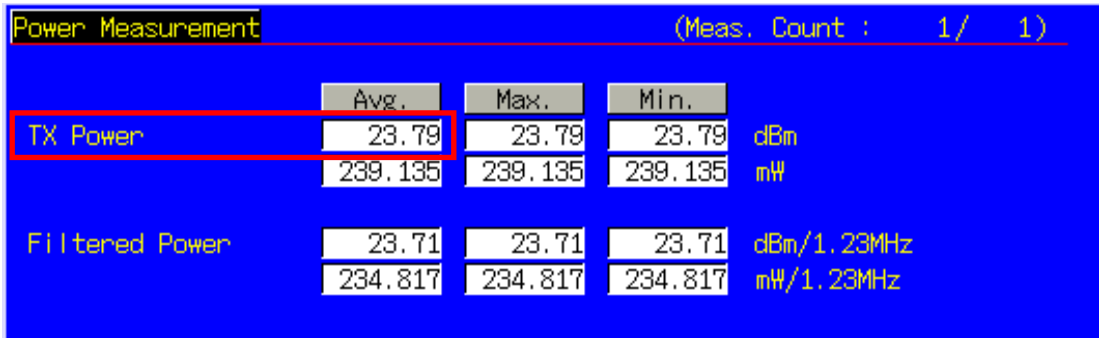



**Table 2.4.12–2 Minimum Standards for Maximum RF Output Power**

| Item | Limit |
|---|---|
| Tx Power | 23 to 30 dBm (Note) |

(Note) This reference value is for Band Class 0, Access Terminal Class III. When measuring other band classes and access terminals, follow 3GPP2 C.S.0033–B Table 4.3.4.3–1. Effective Radiated Power at Maximum Output Power.

## 2.4.13. 4.3.5 Minimum Controlled Output Power

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Connect with 1xEV-DO Rev.A.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **EVALLMEASITEMS OFF,ON,1,OFF,1,OFF,1,OFF,1,OFF,1,OFF** to set only Power to On and other measurements to Off. (This sets the number of measurements to 1.)
7. Execute **EVAPLI RETAP** to set Application Protocol to RETAP.
8. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
9. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
10. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
11. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
12. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
13. Execute **PCBPAT ALL1** to set PCB Pattern to All 1 (Down).
14. Execute **OLVL -25.0** to set Output Level to –25.0 dBm/1.23 MHz.
15. Execute **ILVL-50.0** to set Input Level to –50.0 dBm.
16. Execute ***OPC?** and check that the response is 1.
17. Wait until the measuring instrument and access terminal stabilize.
18. Execute **SWP** to perform measurement.
19. Execute **AVG_FILTPWR?** to read the measurement results.
20. Compare the measurement results with Table 2.4.13–1 Minimum Standards for Minimum Controlled Output Power.

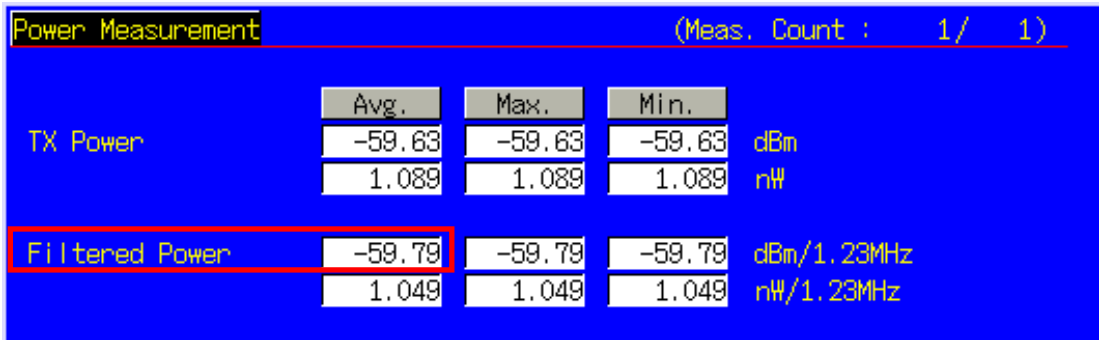



**Table 2.4.13–1 Minimum Standards for Minimum Controlled Output Power**

| Item | Limit |
|---|---|
| Filtered Power | –50 dBm max. |

## 2.4.14. 4.3.7 RRI Channel Output power

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Execute **RRIGAINPRE 3, -6** to set RRI Channel Gain PreTransition 3 to –6 dB.
5. Connect with 1xEV-DO Rev.A.
6. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
7. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurement to 1.)
8. Execute **EVAPLI RETAP** to set Application Protocol to RETAP.
9. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
10. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
11. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
12. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
13. Execute **CALLCNCT?** and wait until the response becomes 3 (= Connected (RETAP)).
14. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
15. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
16. Execute ***OPC?** and check that the response is 1.
17. Wait until the measuring instrument and access terminal stabilize.
18. Execute **SWP** to perform measurement.
19. Execute **AVG_RRICDP? PILOT** to read the measurement results.
20. Compare the measurement results with Table 2.4.14–1 Minimum Standards for RRI Channel Output Power.

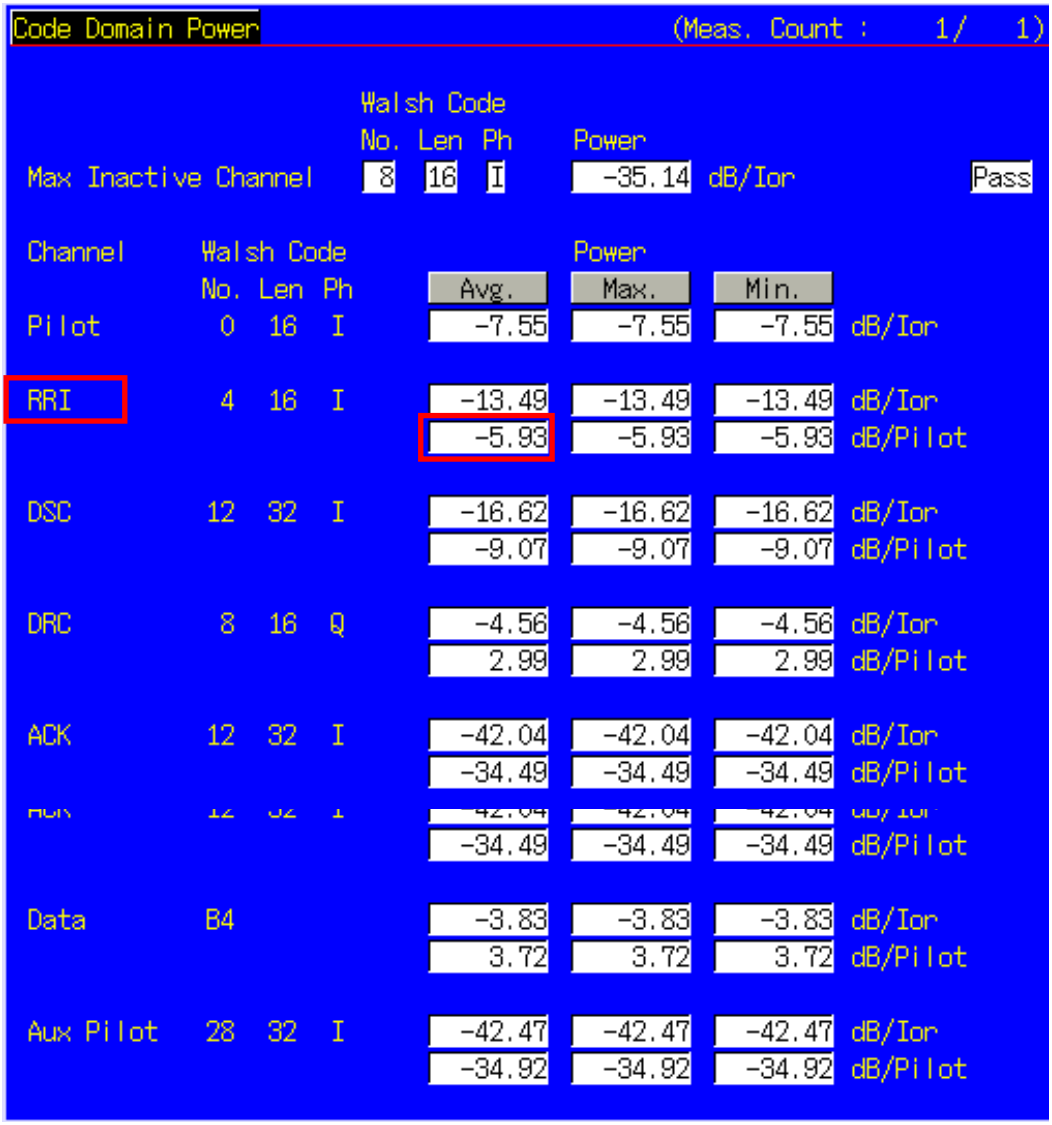



**Table 2.4.14–1 Minimum Standards for RRI Channel Output Power**

| Item | Limit |
|---|---|
| RRI/Pilot | –6.25 to –5.75 dB |

## 2.4.15. 4.3.8.1 DRC Channel Output Power

The following describes an example of testing using an access terminal supporting Band Class 0. Change the Band Class and Channel according to the access terminal being used.

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]
1. Connect with 1xEV-DO Rev.A.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurements to 1.)
4. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
5. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
6. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
7. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
8. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
10. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.

[Test 1]
11. Execute **DRCPWR 0.0** to set DRC Channel Gain to 0.0 dB.
12. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and access terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **AVG_DRCCDP? PILOT** to read the measurement results.
17. Compare the measurement results with Table 2.4.15–1 Minimum Standards for DRC Channel Output Power.

[Test 2]
18. Execute **DRCPWR 3.0** to set DRC Channel Gain to 3.0 dB.
19. Repeat procedures 13 to 17.

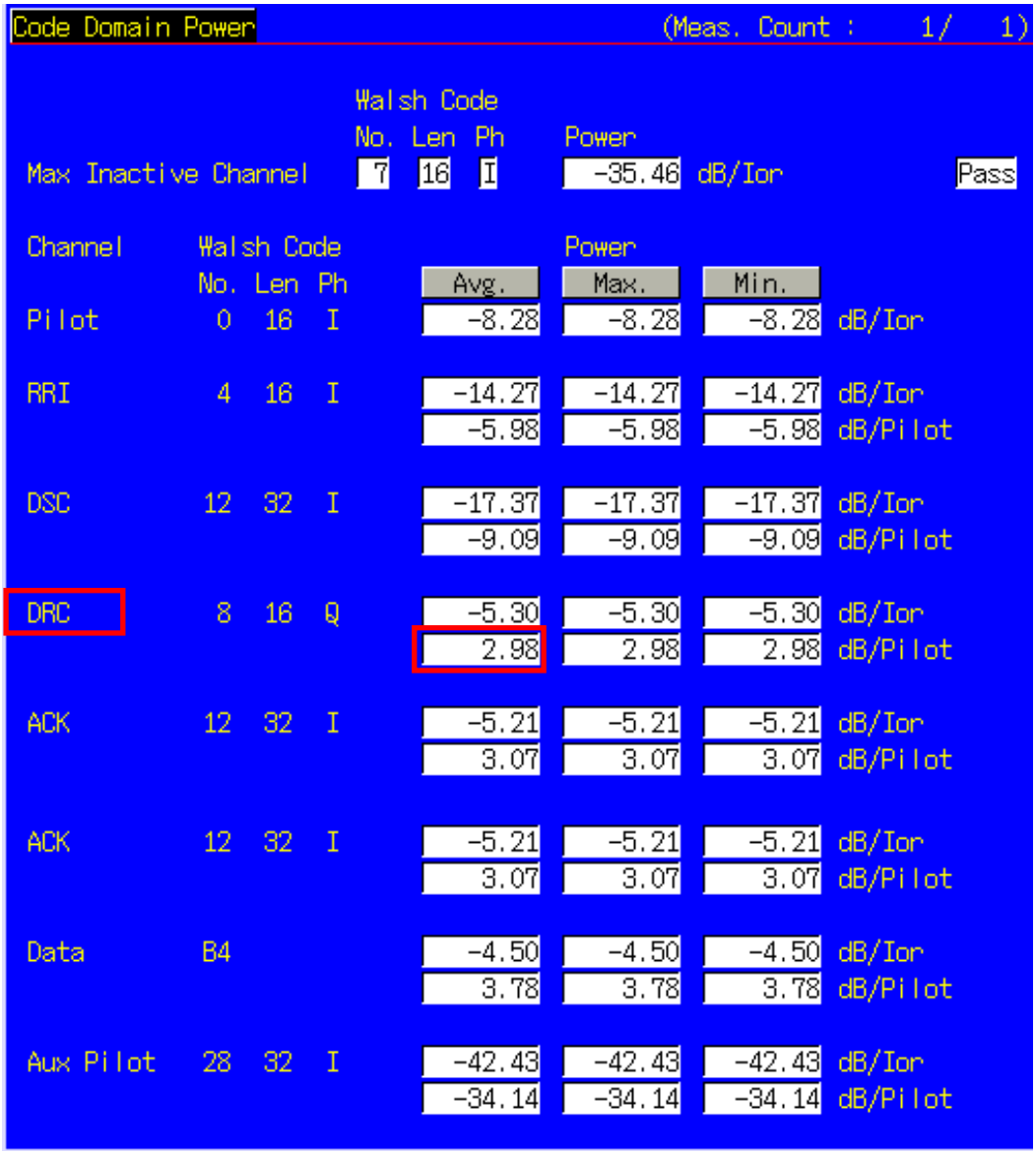



**Table 2.4.15–1 Minimum Standards for DRC Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| DRC/Pilot | Test 1 | Within 0.0 ±0.25 dB |
| | Test 2 | Within 3.0 ±0.25 dB |

## 2.4.16. 4.3.8.2 ACK Channel Output Power

The following describes an example of testing using an access terminal supporting Band Class 0. Change the Band Class and Channel according to the access terminal being used.

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]

1. Connect with 1xEV-DO Rev.A.
2. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
3. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurement to 1.)
4. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
5. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
6. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
7. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
8. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
10. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
11. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.

[Test 1]

12. Execute **ACKPWR 0.0** to set ACK Channel Gain to 0.0 dB.
13. Execute ***OPC?** and check that the response is 1.
14. Wait until the measuring instrument and access terminal stabilize.
15. Execute **SWP** to perform measurement.
16. Execute **ACKCDP? PILOT** to read the measurement results.
17. Compare the measurement results with Table 2.4.16–1 Minimum Standards for ACK Channel Output Power.

[Test 2]

18. Execute **ACKPWR 3.0** to set ACK Channel Gain to 3.0 dB.
19. Repeat procedures 15 to 19.

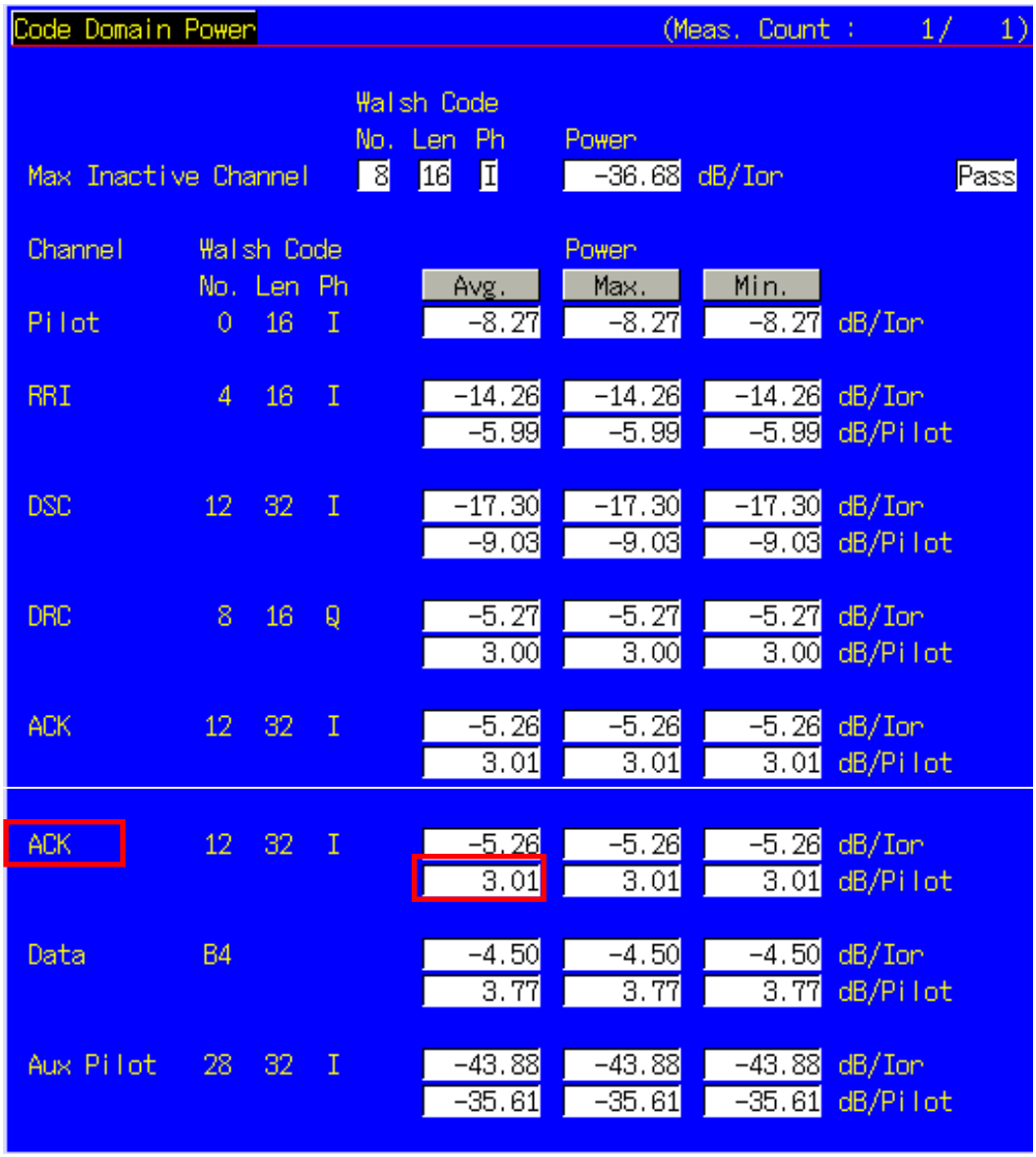



**Table 2.4.16–1 Minimum Standards for ACK Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| ACK/Pilot | Test 1 | Within 0.0 ±0.25 dB |
| | Test 2 | Within 3.0 ±0.25 dB |

## 2.4.17. 4.3.8.3 Data Channel Output Power

This measurement changes the parameters and performs Tests 1 to 5, and Tests 8 to 10.

Example: Tests 1 to 5

[Procedure]
1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Execute **TERMTGT 512,3** to set Data Channel Packet Size 512 bits Termination Target to 3 (16 slots).
5. Execute **T2PTRANS 512,3** to set Data Channel Packet Size 512 bits T2P Transition to 3 (16 slots).
6. Execute **TERMTGT 1024,3** to set Data Channel Packet Size 1024 bits Termination Target to 3 (16 slots).
7. Execute **T2PTRANS 1024,3** to set Data Channel Packet Size 1024 bits T2P Transition to 3 (16 slots).
8. Execute **TERMTGT 2048,3** to set Data Channel Packet Size 2048 bits Termination Target to 3 (16 slots).
9. Execute **T2PTRANS 2048,3** to set Data Channel Packet Size 2048 bits T2P Transition to 3 (16 slots).
10. Execute **TERMTGT 4096,3** to set Data Channel Packet Size 4096 bits Termination Target to 3 (16 slots).
11. Execute **T2PTRANS 4096,3** to set Data Channel Packet Size 4096 bits T2P Transition to 3 (16 slots).
12. Connect with 1xEV-DO Rev.A.
13. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
14. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurement to 1.)
15. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
16. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
17. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
18. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
19. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
20. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
21. Execute ***OPC?** and check that the response is 1.
22. Wait until the measuring instrument and access terminal stabilize.

[Test 1]
23. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
24. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP＋RETAP)).
25. Execute **SWP** to perform measurement.
26. Execute **AVG_DATACDP? PILOT** to read the measurement results.
27. Compare the measurement results with Table 2.4.17–1 Minimum Standards for Data Channel Output Power.

[Test 2]
28. Execute **DATAPCKTSIZE 512** to set Data Channel Packet Size to 512 bits.
29. Repeat procedures 24 to 27.

[Test 3]
30. Execute **DATAPCKTSIZE 1024** to set Data Channel Packet Size to 1024 bits.
31. Repeat procedures 24 to 27.

[Test 4]
32. Execute **DATAPCKTSIZE 2048** to set Data Channel Packet Size to 2048 bits.
33. Repeat procedures 24 to 27.

[Test 5]
34. Execute **DATAPCKTSIZE 4096** to set Data Channel Packet Size to 4096 bits.
35. Repeat procedures 24 to 27.

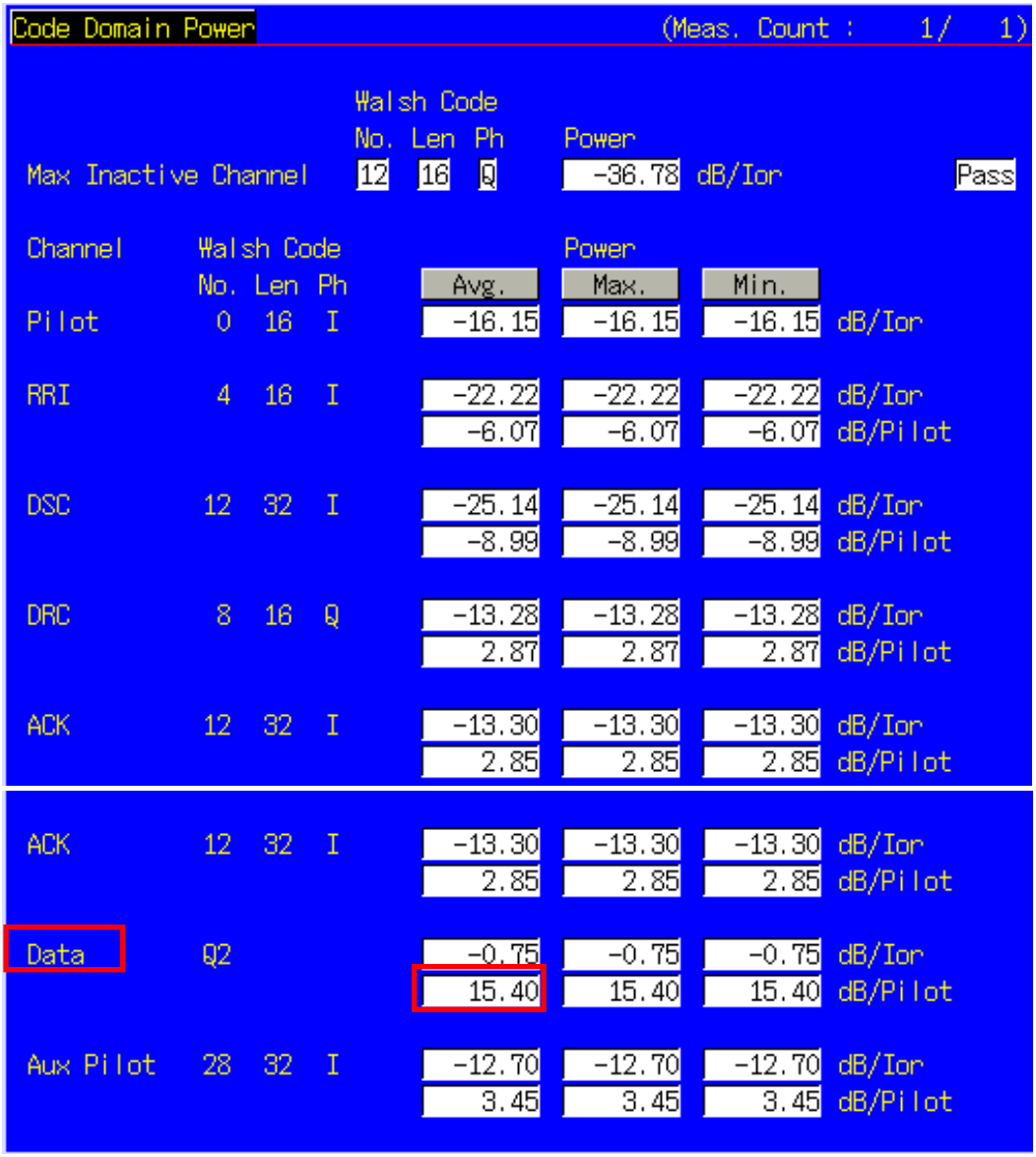



**Table 2.4.17–1 Minimum Standards for Data Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| Data/Pilot | Test 1 | Within 3.75 ±0.25 dB |
| | Test 2 | Within 7.00 ±0.25 dB |
| | Test 3 | Within 10.00 ±0.25 dB |
| | Test 4 | Within 13.00 ±0.25 dB |
| | Test 5 | Within 15.50 ±0.25 dB |

Example: Tests 8 to 10

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 3072,3** to set Data Channel Packet Size 3072 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 3072,3** to set Data Channel Packet Size 3072 bits T2P Transition to 3 (16 slots).
4. Execute **TERMTGT 6144,3** to set Data Channel Packet Size 6144 bits Termination Target to 3 (16 slots).
5. Execute **T2PTRANS 6144,3** to set Data Channel Packet Size 6144 bits T2P Transition to 3 (16 slots).
6. Execute **TERMTGT 12288,3** to set Data Channel Packet Size 12288 bits Termination Target to 3 (16 slots).
7. Execute **T2PTRANS 12288,3** to set Data Channel Packet Size 12288 bits T2P Transition to 3 (16 slots).
8. Connect with 1xEV-DO Rev.A.
9. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
10. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurement to 1.)
11. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
12. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
13. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
14. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
15. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
16. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.
17. Execute ***OPC?** and check that the response is 1.
18. Wait until the measuring instrument and access terminal stabilize.

[Test 8]

19. Execute **DATAPCKTSIZE 3072** to set Data Channel Packet Size to 3072 bits.
20. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP＋RETAP)).
21. Execute **SWP** to perform measurement.
22. Execute **AVG_DATACDP? PILOT** to read the measurement results.
23. Execute **AVG_EVAUXPILOTCDP? PILOT** to read the measurement results.
24. Compare the measurement results with Table 2.4.17–2 Minimum Standards for Data Channel Output Power.

[Test 9]

25. Execute **DATAPCKTSIZE 6144** to set Data Channel Packet Size to 6144 bits.
26. Repeat procedures 20 to 24.

[Test 10]

27. Execute **DATAPCKTSIZE 12288** to set Data Channel Packet Size to 12288 bits.
28. Repeat procedures 20 to 24.

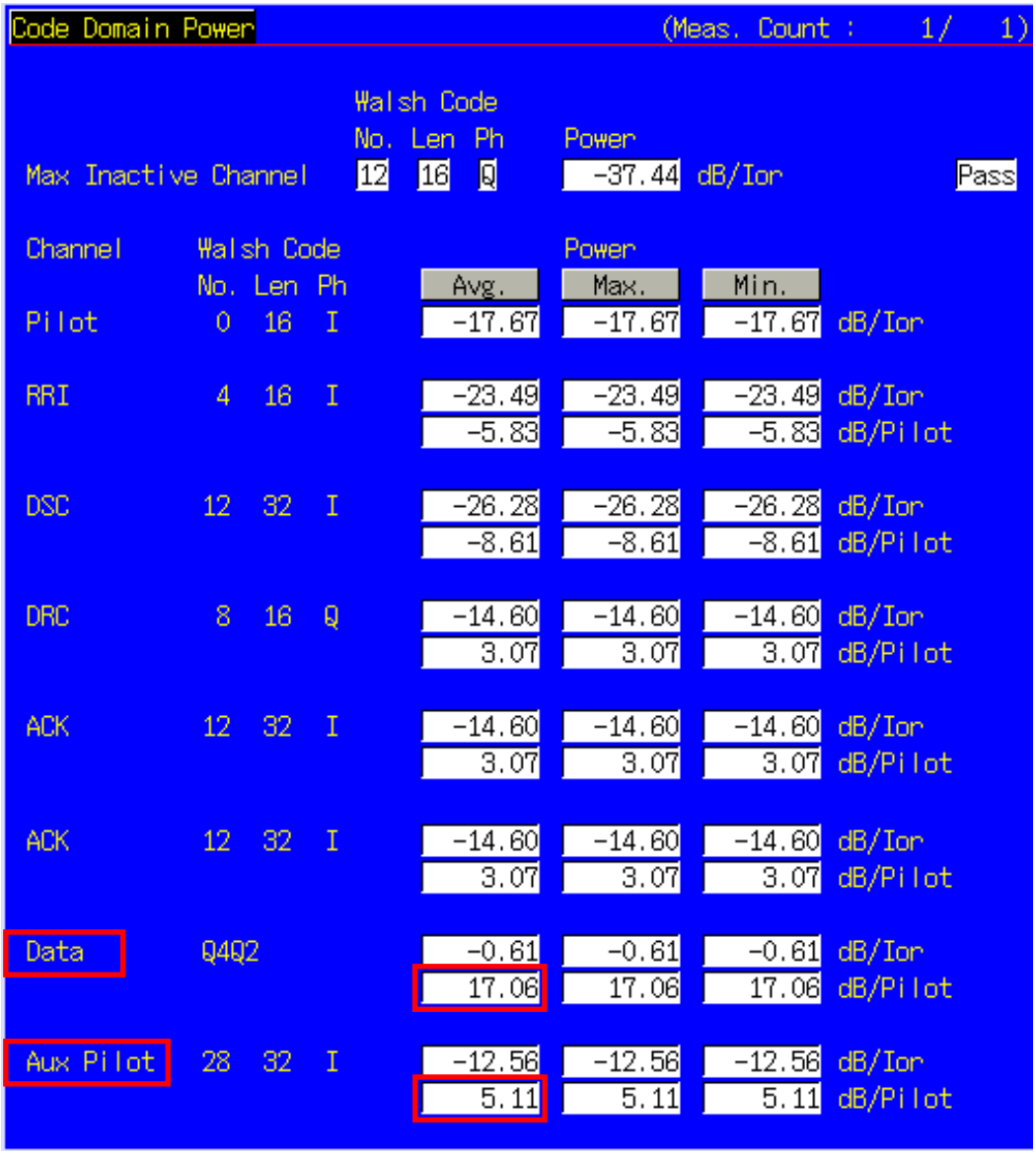



**Table 2.4.17–2 Minimum Standards for Data Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| Data/Pilot | Test 8 | Within 14.25 ±0.25 dB |
| | Test 9 | Within 17.00 ±0.25 dB |
| | Test 10 | Within 21.25 ±0.25 dB |
| Auxiliary Pilot Gain | Test 8 | Within 2.25 ±0.25 dB |
| | Test 9 | Within 5.00 ±0.25 dB |
| | Test 10 | Within 9.25 ±0.25 dB |

## 2.4.18. 4.3.8.4 DSC Channel Output Power

This measurement changes the parameters and performs Test 1 and 2.

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Connect with 1xEV-DO Rev.A.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,ON,1,OFF,1,OFF,1,OFF** to set only Code Domain Power to On and other measurements to Off. (This sets the number of measurement to 1.)
7. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
8. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
9. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
10. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
11. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
12. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
13. Execute **PCBPAT CLP** to set PCB Pattern to Closed Loop.
14. Execute **OLVL -75.0** to set Output Level to –75.0 dBm/1.23 MHz.

[Test 1]

15. Execute **DSCGAIN -9.0** to set DSC Channel Gain to –9.0 dB.
16. Execute ***OPC?** and check that the response is 1.
17. Wait until the measuring instrument and access terminal stabilize.
18. Execute **SWP** to perform measurement.
19. Execute **AVG_DSCCDP? PILOT** to read the measurement results.
20. Compare the measurement results with Table 2.4.18–1 Minimum Standards for DSC Channel Output Power.

[Test 2]

21. Execute **DSCGAIN –12.0** to set DSC Channel Gain to –12.0 dB.
22. Repeat procedures 16 to 20.

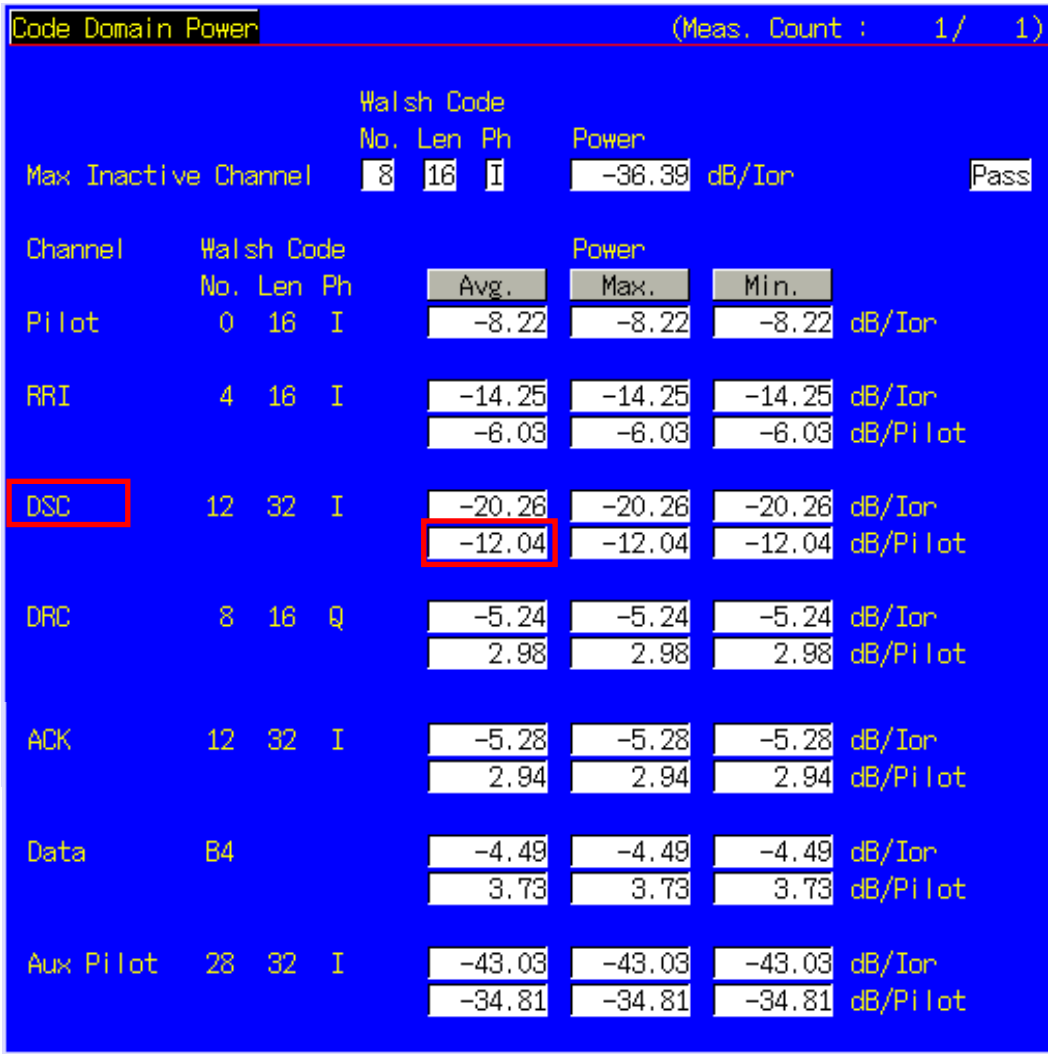



**Table 2.4.18–1 Minimum Standards for DSC Channel Output Power**

| Item | Test | Limit |
|---|---|---|
| DCS/Pilot | Test 1 | Within –9.0 ±0.25 dB |
| | Test 2 | Within –12.0 ±0.25 dB |

## 2.4.19. 4.4.1 Conducted Spurious Emissions

The following describes an example of testing using an access terminal supporting Band Class 0. Change the Band Class and Channel according to the access terminal being used.

This measurement is for Band Class 0. For testing other band classes, change the parameters according to Table 2.4.19–1 Parameter Settings for Conducted Spurious Emissions.

**Table 2.4.19–1 Parameter Settings for Conducted Spurious Emissions**

| Parameter | Setting |
|---|---|
| Open Loop Adjust (Procedure 14) | For Band Class 0, 2, 3, 5, 7, 9, 10, 11(, 18, 19)<br>–81 dB<br>For Band Class 1, 4, 6, 8(, 14, 15)<br>–84 dB |

[Procedure]

1. Execute **BANDCLASS 0** to set Band Class to 0.
2. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
3. Execute **TERMTGT 4096,3** to set Data Channel Packet Size 4096 bits Termination Target to 3 (16 slots).
4. Execute **T2PTRANS 4096,3** to set Data Channel Packet Size 4096 bits T2P Transition to 3 (16 slots).
5. Connect with 1xEV-DO Rev.A.
6. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
7. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,OFF,1,ON,1,OFF** to set only Spurious Emissions to On and other measurements to Off. (This sets the number of measurement to 1.)
8. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
9. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
10. Execute **OPNLPADJ -81** to set Open Loop Adjust to –81 dB.
11. Execute **PRBINIADJ 15** to set Probe Initial Adjust to 15 dB.
12. Execute **EVPWRSTEP 7.5** to set Power Step to 7.5 dB.
13. Execute **DATAPCKTSIZE 4096** to set Data Channel Packet Size to 4096 bits.
14. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
15. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
16. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
17. Execute **SPR_DBM1M ON** to set Spurious Emission dBm/1 MHz to On.
18. Execute **SPR_DBM1M23 ON** to set Spurious Emission dBm/1.23 MHz to On.
19. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
20. Execute **OLVL -60.0** to set Output Level to –60.0 dBm/1.23 MHz.
21. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
22. Execute ***OPC?** and check that the response is 1.
23. Wait until the measuring instrument and access terminal stabilize.
24. Execute **SWP** to perform measurement.
25. Execute **SPRPWR? AB,DBC30K** to read the measurement results.
26. Execute **SPRPWR? BC,DBC30K** to read the measurement results.
27. Execute **SPRPWR? C4M,DBC30K** to read the measurement results.
28. Execute **SPRPWR? AB,DBM1M** to read the measurement results.
29. Execute **SPRPWR? BC,DBM1M** to read the measurement results.
30. Execute **SPRPWR? C4M,DBM1M** to read the measurement results.
31. Execute **SPRPWR? AB,DBM1M23** to read the measurement results.
32. Execute **SPRPWR? BC,DBM1M23** to read the measurement results.
33. Execute **vSPRPWR? C4M,DBM1M23** to read the measurement results.
34. Compare the measurement results with Table 2.4.19–2 Minimum Standards for Conducted Spurious Emissions.

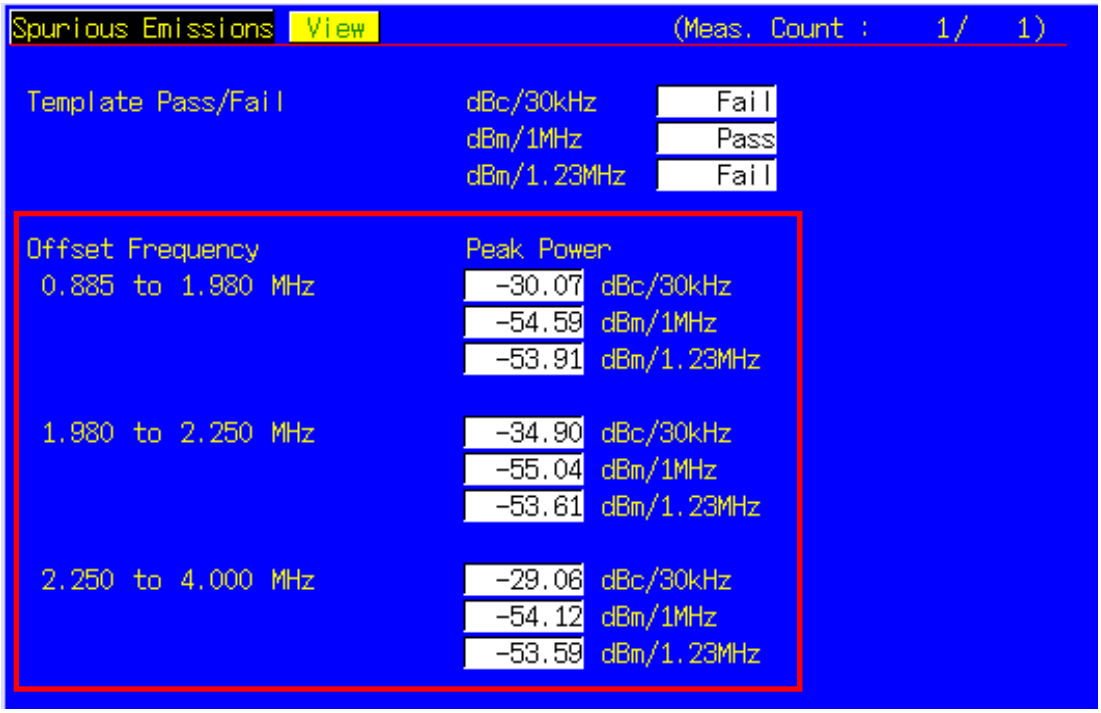



**Table 2.4.19–2 Minimum Standards for Conducted Spurious Emissions**

| Item | Limit |
|---|---|
| Peak Power | Offset Frequency 0.885 to 1.980 MHz<br>Evaluate as best conditions of following<br>–42 dBc/30 kHz max. /–54 dBm/1.23MHz max. (Note)<br>Offset Frequency 1.980 to 2.250 MHz<br>Evaluate as best conditions of following<br>–54 dBc/30 kHz max. /–54 dBm/1.23MHz max. (Note)<br>Offset Frequency 2.250 to 4.000 MHz<br>Evaluate as best conditions of following<br>–54 dBc/30 kHz max. /–54 dBm/1.23MHz max. (Note) |

(Note) These reference values are only for Band Class 0. When measuring other band classes, follow 3GPP2 C.S.0033–B Table 4.4.1.3.1–1 to 4.4.1.3.1–5.

## 2.4.20. 4.4.3 Occupied Bandwidth

[Procedure]

1. Execute **DATATRANSMODE HICAP** to set Data Channel Transmission Mode to High Capacity.
2. Execute **TERMTGT 256,3** to set Data Channel Packet Size 256 bits Termination Target to 3 (16 slots).
3. Execute **T2PTRANS 256,3** to set Data Channel Packet Size 256 bits T2P Transition to 3 (16 slots).
4. Connect with 1xEV-DO Rev.A.
5. Execute **SCRSEL FMEAS** to display the Fundamental Measurement screen.
6. Execute **EVALLMEASITEMS OFF,OFF,1,OFF,1,OFF,1,ON,1,OFF,1,OFF** to set only Occupied Bandwidth to On and other measurements to Off. (This sets the number of measurement to 1.)
7. Execute **EVAPLI FETAPRETAP** to set Application Protocol to FETAP＋RETAP.
8. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
9. Execute **DATAPCKTSIZE 256** to set Data Channel Packet Size to 256 bits.
10. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
11. Execute **TCFORMAT X4_1024_2_128** to set Traffic Channel Transmission Format to 0x04 (1024, 2, 128): 307.2 kbps.
12. Execute **CALLCNCT?** and wait until the response becomes 4 (= Connected (FETAP+RETAP)).
13. Execute **PCBPAT ALL0** to set PCB Pattern to All 0 (Up).
14. Execute **OLVL -105.5** to set Output Level to –105.5 dBm/1.23 MHz.
15. Execute **ILVL 23.0** to set Input Level to 23.0 dBm.
16. Execute ***OPC?** and check that the response is 1.
17. Wait until the measuring instrument and access terminal stabilize.
18. Execute **SWP** to perform measurement.
19. Execute **OBW?** to read the measurement results.
20. Compare the measurement results with Table 2.4.20–1 Minimum Standards for Occupied Bandwidth.

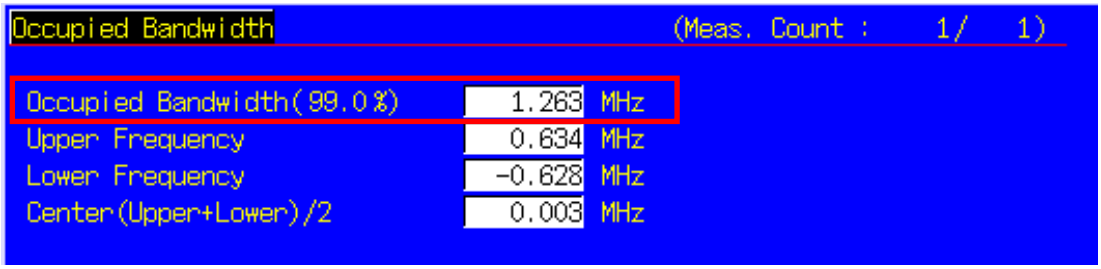


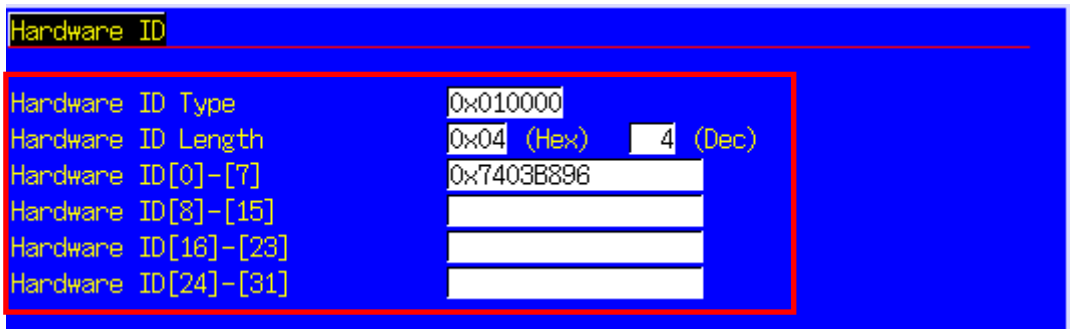

**Table 2.4.20–1 Minimum Standards for Occupied Bandwidth**

| Item | Limit |
|---|---|
| Occupied Bandwidth | 1.48 MHz max. |

## 2.5. AT Report

Hardware ID Type, Hardware ID Length, and Hardware ID reported by the access terminal can be read.

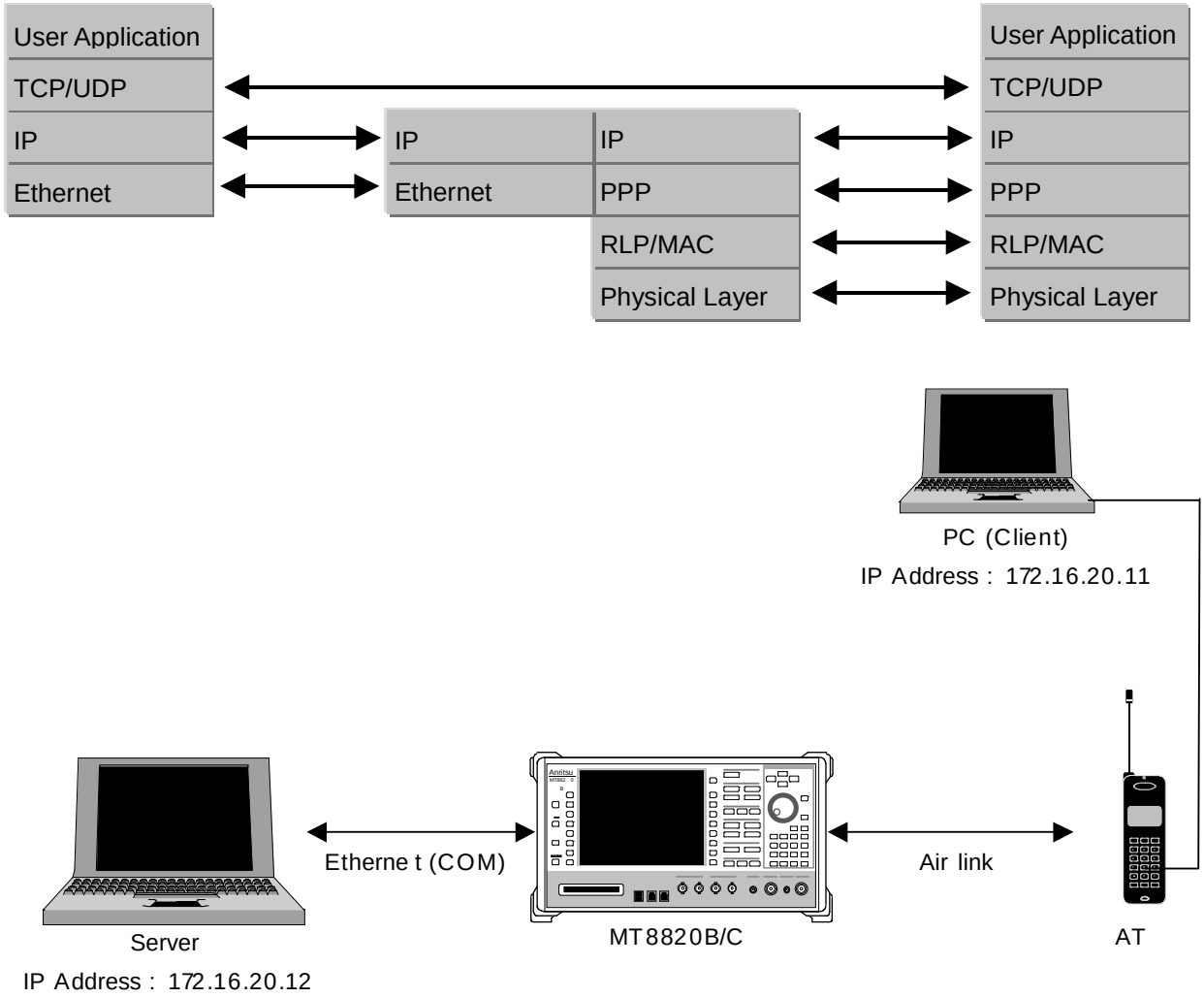
1. Execute **CALLRFR** to initialize the AT Report value.
2. Set the access terminal power to On to open a Session.
3. Execute **ATREP_HDIDTYPE?**, **ATREP_HDIDLEN?**, and **ATREP_HDID?** to set Hardware ID Type, Hardware ID Length, and Hardware ID.



## 2.6. Function Tests

### 2.6.1. External Packet Data (Rev. 0)

By using the MX882006C–002 –1xEV–DO External Packet Data option, data can be transferred between equipment connected to the back–panel Ethernet port and the access terminal.

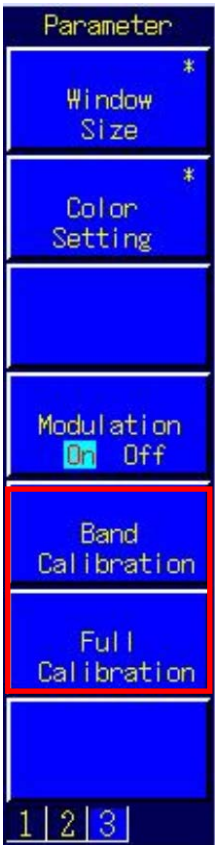



1. Move to the System Configuration screen to set [IP Address, Subnet Mask, Default Gateway].
   (e.g. IP Address: 172.16.20.12, Subnet Mask: 255.255.255.0, Default Gateway: 172.16.20.1)
2. Set the IP Address of Packet Data Option (Example: 172.16.20.11).
3. To enable the settings, toggle the power Off and On.
4. Move to the Fundamental Measurement screen to set [Protocol Revision] of the Call Processing Parameters to [IS–856–0] and [Application Protocol] to [Default Packet].
5. Set the access terminal power to On to Open a Session.
6. Set the user name and password for dial-up of the client PC. Perform dial–up connection.
   (This measuring instrument does not verify the user name and password, so nothing need be input.)
7. The Call Processing state changes to [Connected] and the UNIT and access terminal can communicate.
8. Check the connection status using ping command from the client PC or server PC.
9. Disconnect from the client PC.

# 3. Others

## 3.1. Calibration

Drift in the level accuracy due to internal temperature changes is calibrated to ensure flat frequency characteristics for the input and output level accuracy. There are two commands to perform calibration using a standalone MT8820C: Band Calibration (**BANDCAL**) and Full Calibration (**FULLCAL**). Band Calibration performs calibration in the CDMA2000 1x band, or all Band Classes supported by this measurement software. Full Calibration performs calibration in the MT8820C input/output band (30 to 2700 MHz).
Full Calibration includes the contents executed by Band Calibration but takes more time than Band Calibration. Use Full Calibration after seasonal temperature changes and software version upgrades. When performing Full Calibration, wait at least 1 hour after power-on to warm-up. Use Band Calibration at intervals when temperature changes can be ignored. For example, perform Band Calibration once when measuring a mobile terminal.

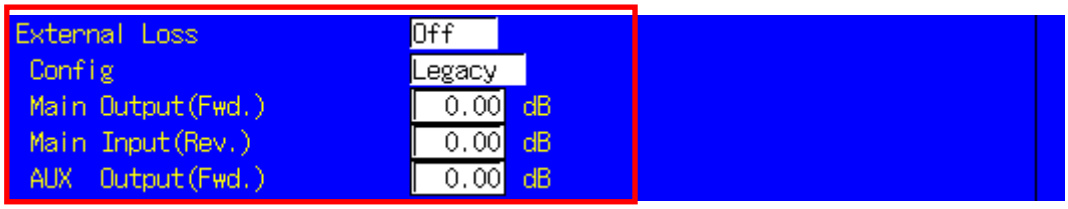



## 3.2. Dynamic Range

The MT8820C measurement linearity is guaranteed in the range of –40 dB up to the Input Level. In addition, a peak level of +10 dB over the Input Level is treated as Level Over. As a consequence, set the MT8820C for an input level range of –40 to +5 dB.

## 3.3. External Loss

The MT8820C can set an offset value for External Loss, such as cable loss.
Main Output (Fwd.), Main Input (Rev.), and Aux Output (Fwd.) can each be set for External Loss. The External Loss values are enabled when External Loss is On. In addition, the values can be saved in each Band Class.
Moreover, when External Loss is set to Common, the settings at the Common External Loss screen are used.




For example, use the following procedure to set the loss value for Main Output (Fwd.) to 3.0 dB and Main Input (Rev.) loss to 5 dB for Band Class 0.

1. Execute **EXTLOSSW ON** to enable Main Output (Fwd.), Main Input (Rev.), and Aux Output (Fwd.) for External Loss.
2. Execute **OEXTLOSS 0,3.0** to set the Main Output (Fwd.) loss to 3 dB.
3. Execute **IEXTLOSS 0,5.0** to set the Main Input (Fwd.) loss to 5 dB.

*The operation when setting External Loss differs according to the version.
Sometimes, the I/O level may be changed unexpectedly when setting parameters at tracking operation.
After setting the measurement conditions (external loss, frequency, etc.), always set the I/O level before starting measurement (W/G, TDS only)
The specifications have been changed for version V20.00 and later so the I/O level does not change when changing the external loss and frequency settings.

## 3.4. Synchronizing MT8820C and External PC Controller

When multiple GPIB commands are sent from a PC controller to a connected MT8820C, commands may be queued in the MT8820Cuffer after sending from the PC has been completed and some considerable time may be required to complete processing of queued commands. At this time, if a query such as **ESR?** is executed after the command is sent, the GPIB driver waits until the query response is returned, so it is possible to confirm that command processing is completed at the MT8820C.

For example, when the RSSI value is read by the mobile terminal after the MT8820C Output Level is changed, such as at adjustment at RSSI measurement, control of the MT8820C and reading of the measured result from the mobile terminal must be synchronized using the procedure shown below.

1. Set the channel, etc.
2. Execute **OLVL –90.0** to set Output Level to –90.0 dBm/1.23 MHz.
3. Execute **ESR?** to wait until the response is returned.
4. Wait for the time required for RSSI measurement at the mobile terminal.
5. Get the RSSI value from the mobile terminal.

However, even when Phone1 and Phone2 are controlled simultaneously using Parallelphone, processing for one side sometimes keeps the other side waiting, so we recommend using a program that always sends the query and waits for the response after the command has been sent.

## 3.5. Speeding Up Control Software

The simplest method for speeding up the control software is to set the MT8820C screen to off by executing the **SCREEN OFF** command.

**Note**

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Specifications are subject to change without notice.


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