Product Brochure

For MT8820B Radio Communication Analyzer

MX882002C
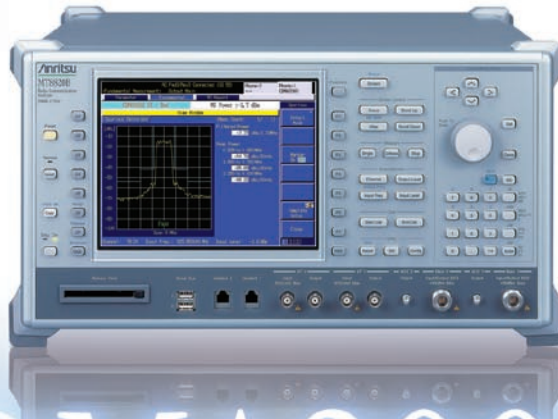CDMA2000 Measurement Software

MX882006C
1xEV-DO Measurement Software

MX882006C-011
1xEV-DO Rev. A Measurement Software

Advanced High-speed Measurement Method and Batch Measurement Supporting the Manufacture of CDMA2000 Terminals

The MX882002C CDMA2000 Measurement Software is for measuring the Rx and Tx performance of the widespread, CDMA2000 1X (IS-2000) compliant, 3G mobile terminal technology. It uses advanced DSP and parallel measurement to cut manufacturing inspection times for mobile terminals. Multiple measurements can be selected for simultaneous processing and individual sample sizes can be set for each measurement.
User-selected measurements can be grouped and measured with just one function, offering fast Pass/Fail evaluation and reliable repeatability optimized for high-speed production.
The built-in GPIB interface supports easy configuration of automated test systems for CDMA2000 1X terminal manufacturing, R&D, and application development.

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● **CDMA2000 1X Measurement Items**

Tests	3GPP2 C.S0011-C (Release C)	Test items
Receiver	3. 4. 1	Demodulation of Forward Traffic Channel in Additive White Gaussian Noise (Test 1 to 12, 16 to 21, 25 to 30, and 34 to 39 for FCH & SCH)
	3. 5. 1	Receiver Sensitivity and Dynamic Range
Transmitter	4. 1	Frequency Accuracy
	4. 3. 5	Code Domain Power
	4. 4. 1	Range of Open Loop Output Power (Expected Enhanced Access Channel)
	4. 4. 2	Time Response of Open Loop Power Control
	4. 4. 3	Access Probe Output Power
	4. 4. 5	Maximum RF Output Power (Expected Enhanced Access Channel)
	4. 4. 6	Minimum Controlled Output Power
	4. 4. 9	Code Channel to Reverse Pilot Channel Output Power Accuracy
	4. 5. 3	Occupied Bandwidth

∗ Since Band Class 5 and Band Class 11 Forward Link and Reverse Link are separated by only 10 MHz, accurate Minimum Controlled Output Power measurement may not be possible if the call connection is cut for some reason.

MX882002C CDMA2000 Measurement Software

Transmitter Measurements

Transmitter Power

The CDMA2000 1X terminal transmit power can be measured with the power control bits set to maximum or minimum, alternating bits, or with closed loop power control.
In addition, maximum, minimum, and average values of measured power results are displayed when the number of measurement samples is 2 or more. This is very useful for evaluating statistical variations in mobile terminal characteristics. This feature also supports other measurements.

Access Probe Power

The first access probe from the CDMA2000 1X terminal is captured by the level trigger to measure average power.
This value is held after terminating the probe measurement once even in the Continuous Measurement mode, which is convenient for the Open Loop Output Power measurement described in C.S0011 of the 3GPP2 standard.
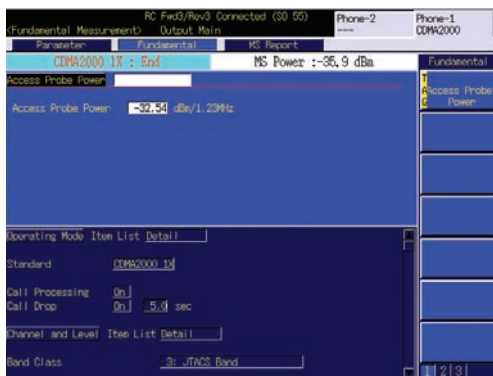

Modulation Analysis

Frequency, frequency error (in kHz and ppm), ρ (waveform quality), τ (time error), EVM, peak vector error, phase error, magnitude error and origin offset are measured simultaneously.


Code Domain Power

The CDMA2000 1X terminal code domain power and error are measured when Reverse RC is set to 3 or more.
The R-PICH, R-FCH, and R-SCH powers are all displayed along with the maximum power and channel numbers for inactive channels. In addition, Pass/Fail evaluation is performed to determine whether or not the inactive channel power satisfies the specifications.
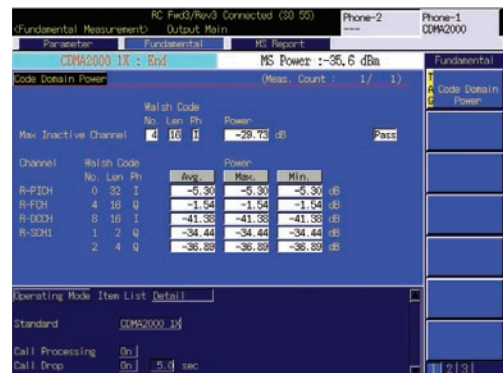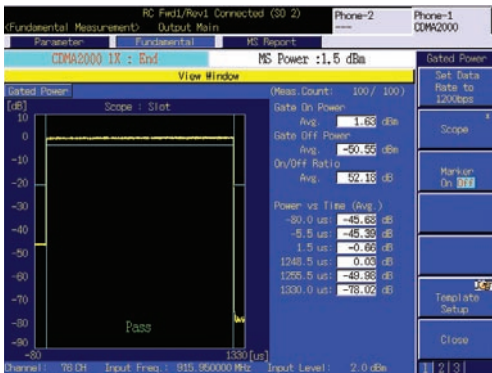
Occupied Bandwidth

Occupied bandwidth measurement can be user-defined in the range of 80% to 99.9% for the ratio of in-band power to total power.
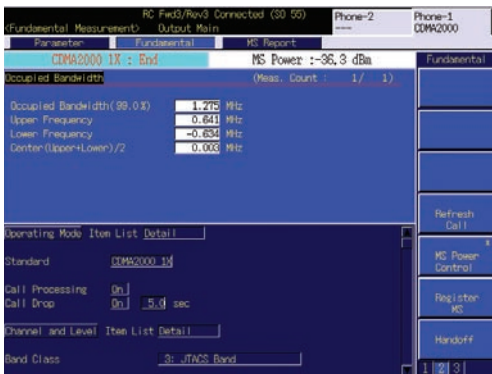
Gated Power Measurement

Gated Power is measured at RC1 or 2.
Gated On Power, Gated Off Power and the On/Off Ratio are measured simultaneously on screen.

Spurious Emission

Pass/Fail evaluation of spurious emissions is easy.
Spurious levels within ±4 MHz of the center frequency are compared with the template. The default for each band is a standard 3GPP2 template, saving setup time. In addition, the templates can be customized for any requirement and either 1 or 1.23 MHz bandwidth measurements can be performed as necessary.

A graph of the spurious emission waveform offers an at-a glance check of whether the waveform satisfies the 3GPP2 standard template.
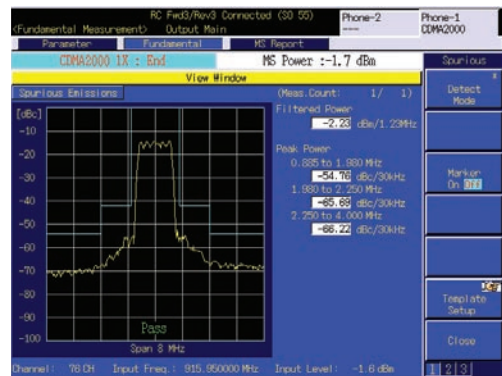
Access Probe Power Measurement

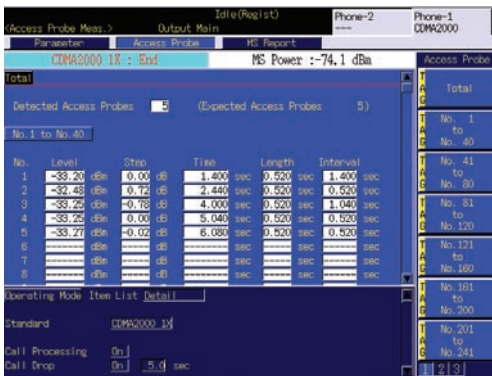The Access Probe Power screen measures the Access Probe transmitted continuously from a CDMA2000 1X terminal. (During measurement, Ack is not returned to the Access Probe from a CDMA2000 1X terminal.)
In addition to the level of each probe, the difference from the last probe level, probe detection time, probe transmission time and probe interval are measured simultaneously.

Open Loop Time Response Screen

The Open Loop Time Response screen is used to measure the time response of the CDMA2000 1X terminal open loop power control. Changes in the mobile terminal transmit power are measured between 100 ms from the point where the power of the forward link signal power changed.

Receiver Measurements

Frame Error Rate

The Frame Error Rate (FER) and Pass/Fail evaluation can be performed in SO2, SO9, SO55 and SO32 (TDSO) to display the FER, error frame count, transmit frame count, confidence level and Pass/Fail results.

Call Processing

Connection Test

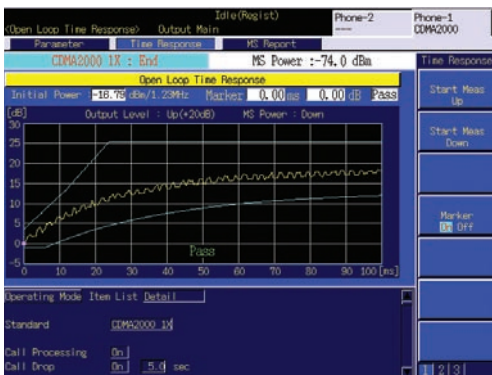The Call Processing function supports connection tests, such as location registration, origination, termination, disconnection from network, and disconnection from mobile terminal. Service Options 1, 2, 3, 9, 33, 55, and 32768 are supported. A basic voice function can be tested by using loopback during a call.

Handoff Function

The Handoff window is used to set parameters after Handoff [Band Class Channel, Protocol Revision (P_REV), Radio Configuration Service Option], and to perform Handoff according to the preset parameters.

Mobile Terminal Report Monitor

This screen displays the periodically reported CDMA2000 1X terminal status.

Specifications

● **MT8820B-003 CDMA2000 Measurement Hardware, MX882002C CDMA2000 Measurement Software**

Amplitude Measurement	Frequency: 300 to 2700 MHz Input level: –65 to +35 dBm (Main) Measurement accuracy: ±0.5 dB (–25 to +35 dBm), ±0.7 dB (–55 to –25 dBm), ±0.9 dB (–65 to –55 dBm) 　　　　　　　　　　(Filtered Power measurement, after Full cal, Input Level Setting) Linearity: ±0.2 dB (0 to –40 dB, ≥–55 dBm), ±0.4 dB (0 to –40 dB, ≥–65 dBm) 　　　　　　(Filtered Power measurement, Input Level Setting for reference)
Frequency/Modulation Measurement	Frequency: 300 to 2700 MHz Input level: –30 to +35 dBm Carrier frequency accuracy: ± (Set frequency x reference oscillator accuracy + 10 Hz) Residual waveform quality: >0.999
Occupied Bandwidth	Input level: –10 to +35 dBm
Code Domain Power	Can be measured at Reverse RC3/RC4 Input level: –30 to +35 dBm Measurement accuracy: ±0.2 dB (code power: ≥–15 dBc), ±0.4 dB (code power: ≥–23 dBc)
RF Signal Generator	Output frequency: 300 to 2700 MHz (1 Hz step) Channel level [Relative level to Ior (total level)] 　Pilot channel: –30 to 0 dB, 0.25 dB step or off 　FCH, DCCH, SCH: –30 to 0 dB, 0.1 dB step or off 　SYNC, PCH: –30 to 0 dB, 0.25 dB step or off 　OCNS: Auto, 0.01 dB step or off 　QPCH (relative level to pilot channel): –5 to +2 dB (1 dB step) or off Channel level accuracy: <±0.2 dB (typ.) (≥–20 dB) PN offset: 0 to 511 Waveform quality: >0.99 (pilot only, AWGN off) AWGN 　AWGN level: –40 to +12 dB (relative level to CDMA signal) or off 　Maximum CDMA signal output level at AWGN On: –28 dBm (at Main output), –18 dBm (at AUX output)
Error Rate Measurement	FER (Frame Error Rate) measurement: FER measurement with service option 2, 9, 55 and 32 (TDSO) Display items: FER, Confidence level, Sample frame count, Error frame count
Call Processing	Band class: BC 0 to 12, 14, 15, 18 to 20 Call control: Location registration, Origination, Termination, Disconnection from network, 　　　　　　　　　Disconnection from mobile terminal Radio configuration: F-RC1 + R-RC1, F-RC2 + R-RC2, 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, eighth (RC1 to 5) Fwd. FCH Walsh Code: 10, 14, 26, 30, 42, 46, 58, 62 Fwd. DCCH Data Rate: Full (RC3, RC4, RC5) Fwd. DCCH Walsh Code: 10, 14, 26, 30, 42, 46, 58, 62 Fwd. SCH: Max. 1 channel Fwd. SCH data rate 　RC3: 9.6, 19.2, 38.4, 76.8, 153.6 kbps 　RC4: 9.6, 19.2, 38.4, 76.8, 153.6 kbps 　RC5: 14.4, 28.8, 57.6, 115.2, 230.4 kbps Access probe: Access channel Rev. closed loop power control mode: Closed loop, All 1 (all down), Alternate, All 0 (all up) Supported protocols: IS-95B, J-STD-008C, ARIB T-53, Korean PCS, IS-2000 (SR1) Handoff: Universal Handoff, Band Class/Channel Handoff, Protocol Revision Handoff, RC/SO Handoff, 　　　　　Analog Handoff (only when the MT8815B/MT8820B-011 audio board is installed.)

MX882002C-001 CDMA2000 Voice Codec

Real-time Voice Encoding/Decoding Functions

MX882002C-001 CDMA2000 Voice Codec

The MX882002C-001 CDMA2000 Voice Codec supports real-time voice encoding and decoding in software, so end-to-end communication with terminals can be tested by installing this option and the MT8820B-011 Audio Board. In addition, the audio signal input from an AF1 input connector of MT8820B and the audio signal output to an AF1 output connector of MT8820B.

End-to-End Communications Test

This supports the end-to-end communications test between a handset connected to the RJ11 connector on the MT8820B and a CDMA2000 terminal.

RF (connection cable)

Handset

CDMA2000 1X terminal
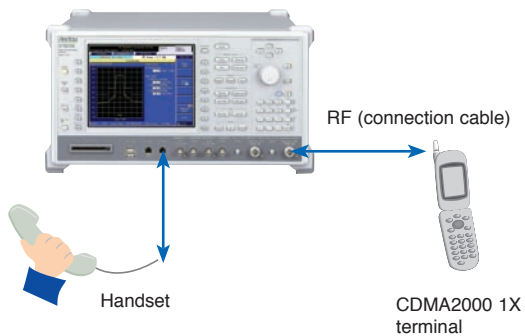
Specifications

- **MT8820B-011 Audio Board,
  MX882002C-001 CDMA2000 Voice Codec**

Voice Codec	EVRC (SO 3)
Codec Level Control	Encoder input gain: −3.00 to +3.00 dB, 0.01 dB step Handset microphone volume: 0, 1, 2, 3, 4, 5 Handset speaker volume: 0, 2, 3, 4, 5

MX882002C-002 CDMA2000 External Packet Data

Direct RF Connection Between CDMA2000 1X Terminal and Application Server

MX882002C-002
CDMA2000 External Packet Data

The MX882002C-002 CDMA2000 External Packet Data is an optional software application that adds CDMA2000 1X packet data communications to the MX882002C Measurement Software option.
It supports transfer of packet data between a local or network application server and an Internet-enabled CDMA2000 1X terminal via an Ethernet connection to the MT8820B.
The following two packet data transfer modes are supported.

Data Loopback Mode

In this test mode, Radio Link Protocol (RLP) data is looped back to the RLP stack in the MT8820B and transmitted via forward link.

IP Data Communications Mode

This mode provides a predictable and controllable test "pipe" between the Internet (or other local application server) and CDMA2000 1X terminal in the native RF environment that is simulated by the base station emulator in the MT8820B hardware. This mode provides an IP network connection to a CDMA2000 1X terminal and supports the CDMA2000 Packet Data Service Option (SO33), RLP, Point to Point Protocol (PPP), Internet Protocol (IP), and direct Ethernet connection.
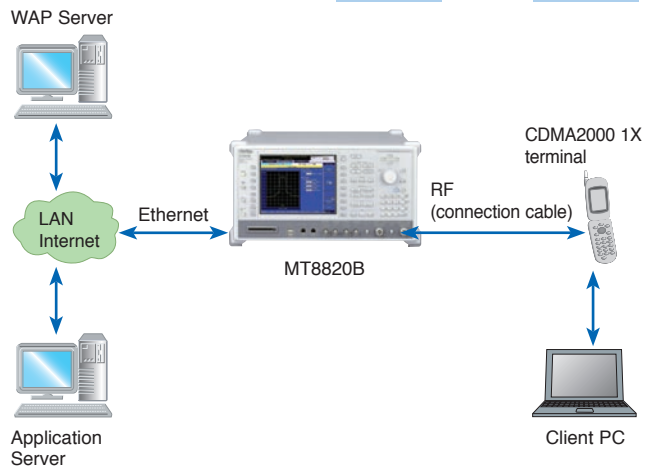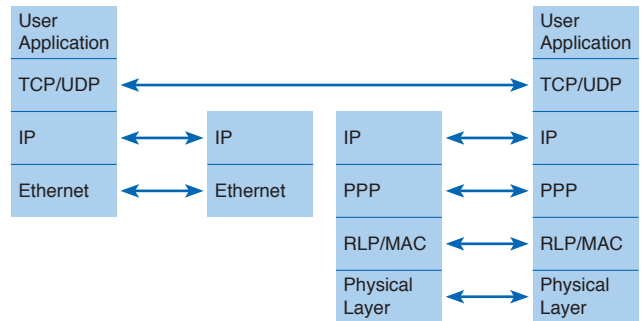
Example of IP Data Communications Mode

Specifications

● MX882002C-002 CDMA2000 External Packet Data

Service Option	SO33
Radio Configuration	F-RC3 + R-RC3, F-RC4 + R-RC3
Signaling ch	FCH
Supplemental ch	Encoding: Convolutional, Turbo Data rates: 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 the
	   Mobile Station and the server

Advanced Mobile Phone Service (AMPS)

Transmitter Measurements

When the MX882002C CDMA2000 Measurement Software is installed in a main frame with the MT8820B Audio Board (Option 011), measurement of the RF characteristics of AMPS terminals as well as output and measurement of audio signals (requires MT8820B-011) are supported.

Transmitter Power

This function measures the transmit power of an AMPS terminal.
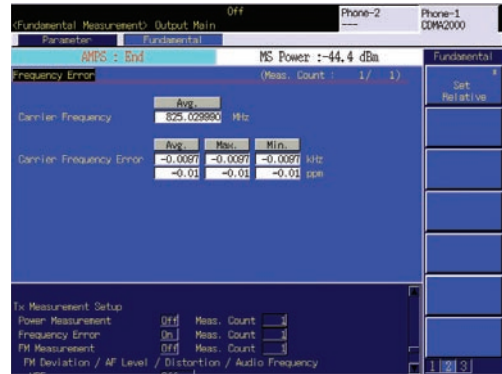

FM Measurement

The FM Deviation, AF Level, Distortion, and Audio Frequency are measured simultaneously on one screen.
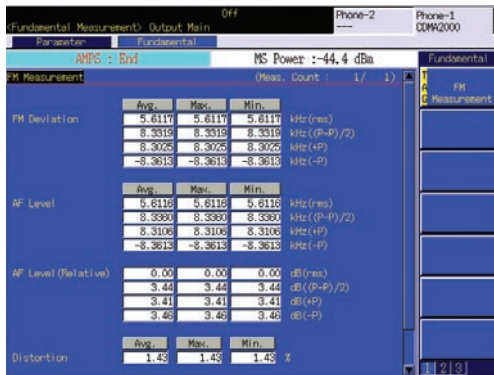
Frequency Error

The Frequency (kHz) and frequency error (ppm) are measured simultaneously on one screen.

Audio Measurement

Frequency, Level, SINAD (Signal to Noise And Distortion) and Distortion are measured simultaneously on one screen.

Specifications

● **MT8820B-011 Audio Board, MX882002C CDMA Measurement Software (requires option 003)**

Frequency/Amplitude Measurement	Frequency range: 800 to 960 MHz
	Measurement level range: –65 to +35 dBm (Main)
	Accuracy: (After calibration, at Input Level setting value)
	  ±0.5 dB (–25 to +35 dBm), ±0.7 dB (–55 to –25 dBm), ±0.9 dB (–65 to –55 dBm)
	Linearity: (referenced to Input Level setting value)
	  ±0.2 dB (0 to –40 dB, ≥–55 dBm), ±0.4 dB (0 to –40 dB, ≥–65 dBm)

RF Frequency	Measurement level range: –30 to+35 dBm Carrier frequency accuracy: ± (set frequency x reference oscillator accuracy + 10 Hz)
FM Measurement	Measurement level range: –30 to +35 dBm Measurement deviation: 0 Hz to 20 kHz Demodulation frequency range: 30 Hz to 20 kHz
Deviation Measurement	Accuracy: Indicated value ± (2% + residual FM) (at 1 kHz demodulation frequency) Frequency response: ±0.5 dB (demodulation frequency 30 Hz to 20 kHz, referenced to 1 kHz, 5 kHz deviation) Residual FM: <10 Hz rms (demodulation frequency 300 Hz to 3 kHz)
Demodulation Distortion	Demodulation distortion: <0.3% (demodulation frequency: 1 kHz, demodulation bandwidth 0.3 to 3 kHz, deviation 5 kHz)

Analog RF Signal Generator (FM)	Output frequency range: 800 to 960 MHz, 1 Hz steps
	Deviation: 0 to 20 kHz, 5 Hz steps
	Modulation signal: Internal modulation only, sine wave, setting frequency range 20 Hz to 10 kHz, (5 Hz steps)
	Deviation accuracy: ± (3.5% + 10 Hz)
	              (at 1 kHz modulation frequency, demodulation bandwidth 300 Hz to 3 kHz)
	Frequency response: ±0.5 dB (modulation frequency: 0.3 to 3 kHz)
	              ±1.0 dB (modulation frequency: 20 Hz to 10 kHz)
	              (4 kHz deviation, modulation frequency: referenced to 1 kHz)
	Modulation deviation: ≤–50 dB
	              (modulation frequency: 1 kHz, deviation: ≥4 kHz, demodulation bandwidth: at 0.3 to 3 kHz)

Analog RF Signal Generator (SAT)	Modulation frequency: 5970, 6000, 6030 Hz, Off Deviation: 2 kHz fixed

AF Measurement	Input frequency
	  Frequency range: 50 Hz to 10 kHz
	Input level
	  Input voltage range: 1 mVpeak to 5 Vpeak (AF Input connector)
	  Maximum allowable input voltage: 30 V rms
	Frequency measurement
	  ± (reference oscillator accuracy + 0.5 Hz)
	Level measurement
	  Accuracy: ±0.2 dB (≥10 mVpeak), ±0.4 dB (≥1 mVpeak, ≥1 kHz)
	SINAD measurement
	  Measurement range: ≥60 dB (≥1000 mVpeak), ≥54 dB (≥50 mVpeak), ≥46 dB (≥10 mVpeak)
	  (At Frequency: 1 kHz)
	Distortion ratio measurement
	  Measurement range (At Frequency: 1 kHz):
	  ≤–60 dB (≥1000 mVpeak), ≤–54 dB (>50 mVpeak), ≤–46 dB (≥10 mVpeak)
	Input impedance: 100 kΩ

AF Output	Output frequency
	  Frequency range: 30 Hz to 10 kHz, 1 Hz step
	  Accuracy: ± (Set frequency x reference oscillator accuracy + 0.1 Hz)
	Output level
	  Set range: 0 to 5 Vpeak (AF Output connector)
	  Set resolution: 1 mV (≤5 Vpeak), 100 μV (≤500 mVpeak), 10 μV (≤50 mVpeak)
	  Accuracy: ±0.2 dB (≥10 mVpeak, ≥50 Hz), ±0.3 dB (≥10 mVpeak, <50 Hz)
	Waveform distortion (At Band ≤30 kHz)
	  ≤–60 dB (≥500 mVpeak, ≤5 kHz)
	  ≤–54 dB (≥70 mVpeak)
	Output impedance: ≤1 Ω
	Maximum output current: 100 mA

MX882006C 1xEV-DO Measurement Software

Advanced High-speed Measurement Method and Batch Measurement Supporting the Manufacture of 1xEV-DO Revision 0 (IS-856-0) Terminals

The MX882006C 1xEV-DO Measurement Software∗ is for measuring the performance of mobile terminals conforming to the 1xEV-DO IS-856-0 standard (CDMA2000 1X Evolution Data Only defined in the 3GPP2 standard).
It uses advanced DSP and parallel measurements to cut manufacturing and inspection times for 1xEV-DO Rev. 0 terminals. Several measurement items can be selected freely for batch measurement and a one-touch operation allows each selected batch measurement item to be executed repeatedly for the specified number of times.
Pass/Fail evaluation of the main measurement items, including transmit frequency, modulation accuracy, transmit power, code domain power, and PER, is quick and easy.
The built-in GPIB interface supports easy configuration of automated test systems for 1xEV-DO Rev. 0 production lines and on-site maintenance.

∗: Requires MT8820B-003, MT8820B-005 and MX882002C

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● Measurement Software and Protocol Revision

Model	Protocol Revision
MX882006C	IS-856-0 (1xEV-DO Rev. 0)
MX882006C-002	IS-856-0 (1xEV-DO Rev. 0)
MX882006C-011	IS-856-A (1xEV-DO Rev. A)

● 1xEV-DO Measurement Items

Tests	3GPP2 C.S0033-A V1.0	Test items
Receiver	3.1	Frequency Coverage Requirement
	3.3.1	Receiver Sensitivity and Dynamic Range
Transmitter	4.1.1	Frequency Coverage
	4.1.2	Frequency Accuracy
	4.2.2	Waveform Quality and Frequency Accuracy
	4.3.2	Time Response of Open Loop Power Control
	4.3.4	Maximum RF Output Power
	4.3.5	Minimum Controlled Output Power
	4.3.7	RRI Channel Output power
	4.3.8.1	DRC Channel Output power
	4.3.8.2	ACK Channel Output power
	4.3.8.3	Data Channel Output power (Test 1-5, 8-10)
	4.4.3	Occupied Bandwidth

∗ Since Band Class 5 and Band Class 11 Forward Link and Reverse Link are separated by only 10 MHz, accurate Minimum Controlled Output Power measurement may not be possible if the call connection is cut for some reason.

Transmitter Measurements

Code Domain Power

The 1xEV-DO Rev. 0 terminal code domain error is measured. The PICH (pilot-ch), RRI, DRC, ACK and Data powers are all displayed along with the maximum power and channel numbers of inactive channels on one screen.
In addition, Pass/Fail evaluation is performed to determine whether or not the inactive channel power satisfies the specifications.

Access Probe Power

The first access probe from the 1xEV-DO Rev. 0 terminal is captured by the level trigger to measure the average power. This value is held after terminating the probe measurement once even in the Continuous Measurement mode, which is convenient for the Open Loop Output Power measurement described in C.S0033 of the 3GPP2 standard.
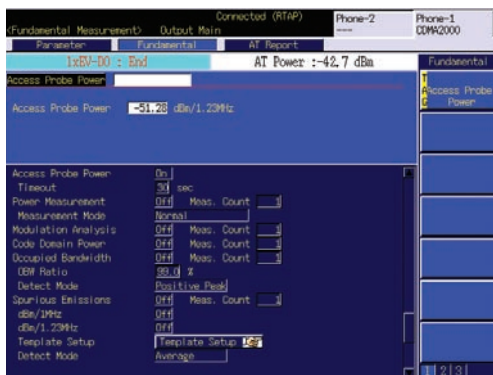
Open Loop Time Response Screen

The Open Loop Time Response screen is used to measure the time response of the 1xEV-DO Rev. 0 terminal open loop power control. Changes in the terminal transmit power are measured between 100 ms from the point where the power of the forward link signal changed.

∗ Output power, Modulation analysis, Occupied bandwidth, etc., can be measured similarly to the MX882002C.

Receiver Measurement

Packet Error Rate

PER (Packet Error Rate) measurement and Pass/Fail evaluation can be performed in FTAP to display the PER, error packet count, transmission packet count, confidence level, and Pass/Fail results.
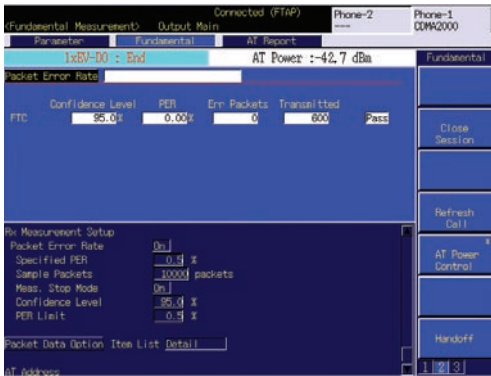
Call Processing

Connection Test

The Call Processing function supports connection tests, such as Open Session, Closed Session, AT Origination, AN Release, and AT Release.
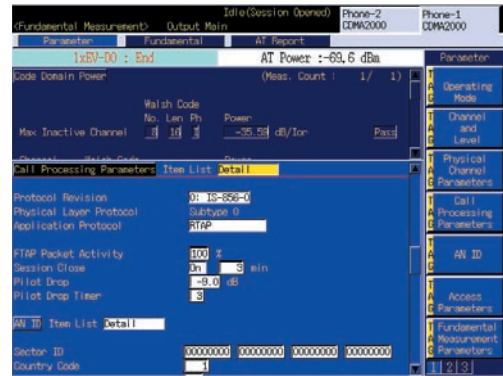
Mobile Terminal Report Monitor

This screen displays the periodically reported 1xEV-DO Rev. 0 terminal status.

Specifications

● **MT8820B-005 1xEV-DO Measurement Hardware, MX882006C 1xEV-DO Measurement Software**

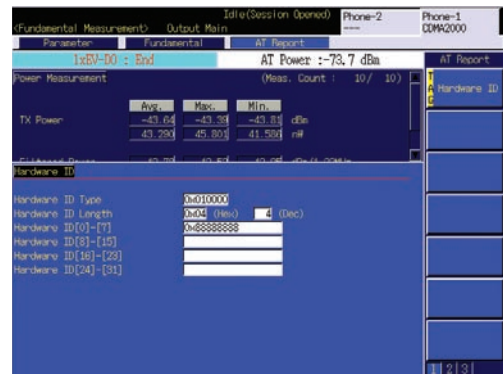|	
Amplitude Measurement	Dependent on the performance of MX882002C
Modulation Analysis	Frequency: 300 to 2700 MHz Input level: –30 to +35 dBm Carrier frequency accuracy: (Set frequency x reference oscillator accuracy + 10 Hz) Residual waveform quality: >0.999
Occupied Bandwidth	Dependent on the performance of MX882002C
Code Domain Power	Input level: –10 to +35 dBm Measurement accuracy: ±0.2 dB (code power ≥–15 dBc), ±0.4 dB (code power ≥–23 dBc)

RF Signal Generator	Output frequency: 300 to 2700 MHz (1 Hz step)
	Channel level: Pilot channel, MAC channel, Control channel, Traffic channel, All 0 dB (reference Ior)
	PN offset: 0 to 511
	Wave quality: >0.99 (pilot only, AWGN Off)
	AWGN:
	  AWGN Level: –40 to +12 dB (relative to CDMA signal) or Off
	  Maximum output level of CDMA signal at AWGN on: –28 dBm (at Main output)
	         –18 dBm (at AUX output)

Error Rate Measurement	PER (Packet Error Rate) measurement: PER measurement with FTAP Display items: PER, Confidence level, Sample packet count, Error packet count
Call Processing	Band class: BC 0 to 12, 14, 15, 18 to 20 Call control: Open Session, Close Session, AT Origination, NW Origination, AT Release, NW Release, Hard Handoff, Softer Handoff Rev. closed loop power control mode: Closed loop, Alternate, All 0 (all up), All 1 (all down) Test application protocol: RTAP, FTAP, FTAP + RTAP

MX882006C-002 1xEV-DO External Packet Data

**Direct RF Connection Between 1xEV-DO Terminal and Application Server**

MX882006C-002
1xEV-DO External Packet Data

The MX882006C-002 1xEV-DO External Packet Data is an optional software application that adds 1xEV-DO external packet data communications to the MX882006C 1xEV-DO Measurement Software option.

It supports transfer of packet data between a local or network application server and an Internet-enabled CDMA2000 1xEV-DO (Rev. 0) terminal via an Ethernet connection to the MT8820B. The IP data communications mode is supported as described below.

IP Data Communications Mode

This mode provides a predictable and controllable test "pipe" between the Internet (or other local application server) and 1xEV-DO (Rev. 0) terminal in the native RF environment that is simulated by the base station simulator in the MT8820B hardware. This mode provides an IP network connection to a 1xEV-DO (Rev. 0) terminal and supports Default Packet Point to Point Protocol (PPP), Internet Protocol (IP), and direct Ethernet connection.
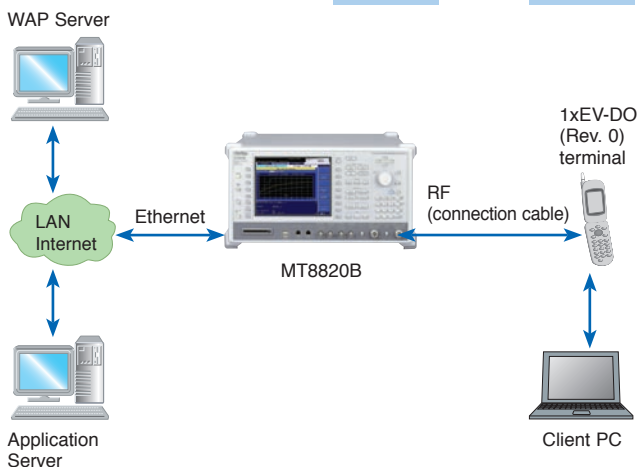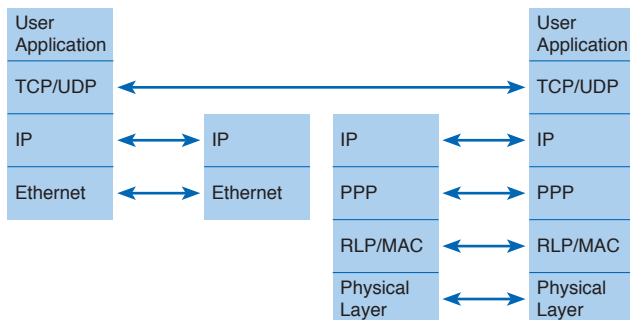
Specifications

● **MX882006C-002 1xEV-DO External Packet Data**

Application Protocol Packet Data Mode	Default Packet PPP/IP (The mode to transfers IP packet data between 1xEV-DO Rev. 0 terminal and a server)

Example of IP Data Communications Mode

MX882006C-011 1xEV-DO Rev. A Measurement Software

Fastest & Batch Measurement For CDMA2000 1xEV-DO Revision A (IS-856-A) Terminal Manufacturing

MX882006C-011 1xEV-DO Rev. A Measurement Software

The MX882006C-011 1xEV-DO Rev. A Measurement Software[1] supports Rx/Tx measurements of CDMA2000 1xEV-DO (Rev. A) terminals. The MX882006C-011 supports the same measurement items as the MX882006C, which can send and receive signals supporting the Enhanced Test Application Protocol (ETAP) to perform RF tests of 1xEV-DO (Rev. A) terminals.

[1]: Requires MT8820B-003, MT8820B-005 and MX882006C

1xEV-DO Rev. A (IS-856-A) Parameters

IS-856-A can be selected as the DUT signal for Rx/Tx measurements.
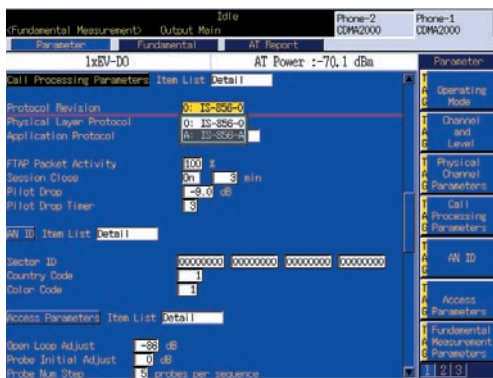
Tx Measurements

Code Domain

Code domain powers of 1xEV-DO Rev. A mobile terminals add DSC and AUX Pilot power. PICH, RRI, DRC, ACK, Data, DSC, Aux Pilot powers are batch displayed on-screen.
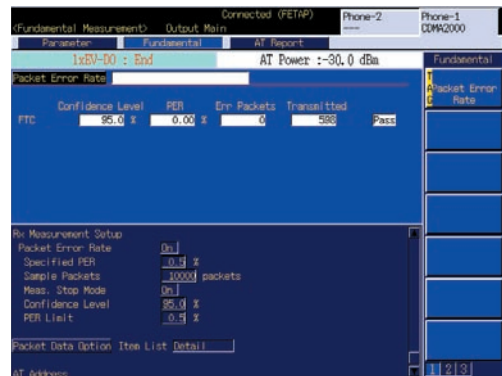

*: Measurements such as Tx power, modulation analysis, occupied bandwidth, etc., are the same as the MX882006C.

Rx Measurements

Packet Error Rate

Go/No-Go evaluation of FETAP PER measurements is supported. PER, error-packet count, sent-packet count, Confidence Level, and Go/No-Go evaluation results are displayed.

* PER Measurement can test with FETAP. However, Anritsu approves Rx measurement in the Non-Call processing mode.

Specifications

- **MT8820B-005 1xEV-DO Measurement Software, MX882006C 1xEV-DO Measurement Software, MX882006C 1xEV-DO Measurement Software**

Amplitude Measurement	Depends on MX882006C performance
Frequency/Modulation Measurement	Depends on MX882006C performance
Occupied Bandwidth	Depends on MX882006C performance
Code Domain Power	Depends on MX882006C performance
PER	FETAP PER measurements Display items: Confidence Level, PER, Error Packet count, Sample Packet count
RF Signal Generator	Depends on MX882006C performance
Call Processing	Band Class: BC 0 to 12, 14, 15, 18 to 20 Call Processing: 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) Physical Layer Protocol: Subtype 2 Enhanced Test Application Protocol: FETAP (Forward Enhanced Test Application Protocol), RETAP (Reverse Enhanced Test Application Protocol), FETAP + RETAP

CDMA2000 1X/1xEV-DO Synchronous Function

For Functional Tests of CDMA2000 1X and 1xEV-DO

By using the MX882002C and MX882006C with two MT8820B units or one MT8820B unit with the Parallelphone[1] measurement option, the CDMA2000 1X and 1xEV-DO (Rev. 0) forward link signals can be output with synchronized system times, supporting function tests of terminals for both CDMA2000 1X and 1xEV-DO (Rev. 0) systems[2, 3]

[1]: Parallelphone is the registered trademark of Anritsu Corporation
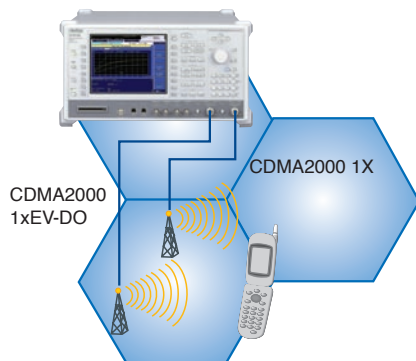[2]: This function cannot be used when MX882000C W-CDMA Measurement Software or MX882007C TD-SCDMA Measurement Software is loaded.
    Please perform unload, when MX882000C is loaded.
[3]: Installing the MX882006C-011 option supports the UE-connection test with ETAP only.
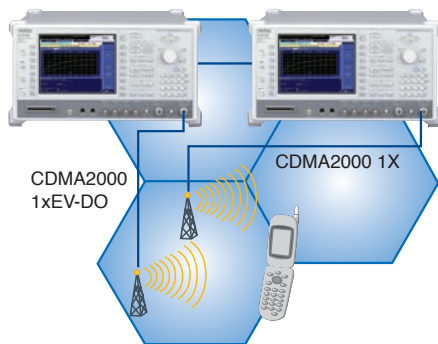
Sample MT8820B connection: when MT8820B is two sets

**Sample MT8820B connection: when MT8820B is one set
(Parallelphone measurement correspondence)**

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name
	Main frame
MT8820B	Radio Communication Analyzer
	Standard accessories
Z0956A	Power Cord, 2.6 m : 1 pc
CA68ADP	ANR-CFX40T256 (CF card, 256 MB) : 1 pc
W2778AE	PC Card Adapter : 1 pc
	MT8815B/MT8820B Operation Manual (CD-ROM): 1 copy
	Options
MT8820B-001	W-CDMA Measurement Hardware
MT8820B-002	TDMA Measurement Hardware
MT8820B-003	CDMA2000 Measurement Hardware
MT8820B-004	1xEV-DO Measurement Hardware*1
MT8820B-005	1xEV-DO Measurement Hardware*1
MT8820B-011	Audio Board
MT8820B-012	Parallel Phone Measurement Hardware
MT8820B-031	W-CDMA Measurement Hardware Lite
MT8820B-032	TDMA Measurement Hardware Lite
MT8820B-043	CDMA2000 Time Offset CAL For GPS SG (requires MT8820B-003 and MX882002C)
MT8820B-101	W-CDMA Measurement Hardware Retrofit
MT8820B-102	TDMA Measurement Hardware Retrofit
MT8820B-103	CDMA2000 Measurement Hardware Retrofit
MT8820B-104	1xEV-DO Measurement Hardware Retrofit*1
MT8820B-105	1xEV-DO Measurement Hardware Retrofit*1
MT8820B-111	Audio Board Retrofit
MT8820B-112	Parallel Phone Measurement Hardware Retrofit
MT8820B-131	W-CDMA Measurement Hardware Lite Retrofit
MT8820B-132	TDMA Measurement Hardware Lite Retrofit
MT8820B-143	CDMA2000 Time Offset CAL For GPS SG Retrofit (requires MT8820B-003 and MX882002C)
	Softwares
MX882000C	W-CDMA Measurement Software (requires MT8820B-001 and MX88205xC)
MX882000C-001	W-CDMA Voice Codec (requires MT8820B-011 and MX882000C)
MX882000C-011	HSDPA Measurement Software (requires MT8820B-001, MX882000C and MX882050C)
MX882000C-012	HSDPA H-Set 6 Throughput Test (requires MT8820B-001, MX882000C, MX882000C-011 and MX882050C)
MX882000C-021	HSUPA Measurement Software (requires MT8820B-001, MX882000C, MX882000C-011 and MX882050C)
MX882001C	GSM Measurement Software (requires MT8820B-002)
MX882001C-001	GSM Voice Codec (requires MT8820B-011 and MX882001C)
MX882001C-002	GSM External Packet Data (requires MX882001C)
MX882001C-011	EGPRS Measurement Software (requires MX882001C)
MX882002C	CDMA2000 Measurement Software (requires MT8820B-003)
MX882002C-001	CDMA2000 Voice Codec (requires MT8820B-011 and MX882002C)
MX882002C-002	CDMA2000 External Packet Data (requires MX882002C)
MX882003C	1xEV-DO Measurement Software (requires MT8820B-003, MT8820B-004 and MX882002C)
MX882003C-002	1xEV-DO External Packet Data (requires MX882003C)
MX882005C	PHS Measurement Software (requires MT8820B-002)
MX882005C-011	Advanced PHS Measurement Software (requires MX882005C)
MX882006C	1xEV-DO Measurement Software (requires MT8820B-003, MT8820B-005 and MX882002C)
MX882006C-002	1xEV-DO External Packet Data (requires MX882006C)
MX882006C-011	1xEV-DO Rev. A Measurement Software (requires MX882006C)
MX882010C	Parallel Phone Measurement Software*2 [requires MT8820B-012, the two same measurement hardware (2 board/set) and one measurement software]
MX882030C	W-CDMA Measurement Software Lite (requires MT8820B-031)
MX882030C-001	W-CDMA Voice Codec (requires MT8820B-011 and MX882030C)
MX882030C-009	W-CDMA Band IX*3 (requires MX882030C-050)
MX882030C-011	HSDPA Measurement Software (requires MX882030C)
MX882030C-040	W-CDMA High-speed Adjustment (requires MX882030C)
MX882030C-050	W-CDMA Call Processing Software (requires MX882030C)
MX882031C	GSM Measurement Software Lite (requires MT8820B-032)
MX882031C-001	GSM Voice Codec (requires MT8820B-011 and MX882031C)
MX882031C-011	EGPRS Measurement Software (requires MX882031C)

Model/Order No.	Name
MX882031C-040	EGPRS Predistortion Adjustment (requires MX882031C)
MX882031C-050	GSM Call Processing Software (requires MX882031C)
MX882050C	W-CDMA Call Processing Software*3 (requires MX882000C)
MX882050C-002	W-CDMA External Packet Data*3, *4 (requires MX882050C)
MX882050C-003	W-CDMA Video Phone Test*3 (requires MX882050C)
MX882050C-009	W-CDMA Band IX*3 (requires MX882050C)
MX882050C-011	HSDPA External Packet Data*3 (requires MX882000C-001)
MX882070C	W-CDMA Ciphering Software*3 (requires MX882050C)
MX882051C	W-CDMA Call Processing Software*3 (requires MX882000C)
MX882051C-002	W-CDMA External Packet Data*3 (requires MX882051C)
MX882051C-003	W-CDMA Video Phone Test*3 (requires MX882051C)
MX882071C	W-CDMA Ciphering Software*3 (requires MX882051C)
	Warranty
MT8820B-ES210	Extended Two Year Warranty Service
MT8820B-ES310	Extended Three Year Warranty Service
MT8820B-ES510	Extended Five Year Warranty Service
	Application parts
P0019	TEST USIM001*5
P0027	W-CDMA/GSM Test USIM
A0013	Handset
J1249	CDMA2000 Cable [D-Sub (15pin, P-type) · D-Sub (15pin, P-type), used in combination with J1267 (sold separately)]
J1267	CDMA2000 Cross Cable [D-Sub (9pin, P-type) · D-Sub (9pin, P-type), reverse cable used in combination with J1249 (sold separately)]
J0576B	Coaxial Cord (N-P · 5D-2W · N-P), 1 m
J0576D	Coaxial Cord (N-P · 5D-2W · N-P), 2 m
J0127A	Coaxial Cord (BNC-P · RG58A/U · BNC-P), 1 m
J0127C	Coaxial Cord (BNC-P · RG58A/U · BNC-P), 0.5 m
J0007	GPIB Cable, 1 m
J0008	GPIB Cable, 2 m
MN8110B	I/O Adapter (for call processing I/O)
B0332	Joint Plate (4 pcs/set)
B0333G	Rack Mount Kit
B0499	Carrying Case (hard type, with protective cover and casters)
B0499B	Carrying Case (hard type, with protective cover, without casters)
W2776AE	MT8815B/MT8820B Operation Manual (booklet)
W2765AE	MX882000C Operation Manual (booklet)
W2771AE	MX882001C Operation Manual (booklet)
W2790AE	MX882002C Operation Manual Panel Operation (booklet)
W2791AE	MX882002C Operation Manual Remote Control (booklet)
W2793AE	MX882003C Operation Manual Panel Operation (booklet)
W2794AE	MX882003C Operation Manual Remote Control (booklet)
W2769AE	MX882005C Operation Manual (booklet)
W2930AE	MX882006C Operation Manual (booklet)
W2931AE	MX882006C Operation Manual Remote Control (booklet)
W2894AE	MX882030C Operation Manual (booklet)
W2895AE	MX882031C Operation Manual (booklet)
W2767AE	MX88205xC Operation Manual (booklet)
W2773AE	MX88207xC Operation Manual (booklet)

*1: The MT8820B-004 hardware supports IS-856-0 (1xEV-DO Rev. 0) RF measurements but does not support IS-856-A (1xEV-DO Rev. A) measurements.
The MT8820B-005 hardware supports both IS-856-0 (1xEV-DO Rev. 0) and IS-856-a (1xEV-DO Rev. A) RF measurements.

*2: The following measurement hardware supports the Parallelphone measurement option: MT8820B-001, MT8820B-002, MT8820B-003, MT8820B-004 (or MT8820B-005). All the measurement hardware can be installed simultaneously.
However, the MT8820B-004 and MT8820B-005 cannot be installed simultaneously.

*3: For terminal connectivity, contact your Anritsu sales representative.

*4: MX882050C preinstalls the integrity protection function.

*5: This Test USIM can be worked on only W-CDMA mode.
When the connection of GSM is necessary, P0027 can be applied.

· Parallelphone™ is a registered trademark of Anritsu Corporation.
· CF® card is a registered trademark of SanDisk Corporation in the United States and is licensed to CFA (Compact Flash Association).

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