Product Brochure

For MT8820A Radio Communication Analyzer

MX882002A
CDMA2000 Measurement Software

MX882003A
1xEV-DO Measurement Software
# MX882002A

## CDMA2000 Measurement Software

Advanced high-speed measurement system and batch measurements support CDMA2000® terminal manufacturing

The MX882002A CDMA2000 Measurement Software is for measuring Rx and Tx performance of mobile terminals conforming to the IS-2000 standard, today’s most widespread 3G 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

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Transmitter Measurements

Transmitter Power

The CDMA2000 1X terminal Tx 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), \( \rho \) (waveform quality), \( \tau \) (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.

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.

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.

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 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 terminal open loop power control. Changes in the mobile terminal Tx 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, Tx 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.

### Mobile Terminal Report Monitor

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

### 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.

### Fast and Easy GPIB Control

Measurement results can be captured and settings can be changed easily without changing screens, regardless of which screen is currently displayed. The time savings are especially useful during plot captures.

### Streamlined Interface

Measurement results can be captured and settings can be changed easily without changing screens, regardless of which screen is currently displayed. The time savings are especially useful during plot captures.

### Fast Batch Measurements

Batch measurement results can be read using the “ALLMEAS?” command, although commands for specific measurement targets, such as “ALLMEAS? MOD” (Modulation Analysis) are provided too. This reduces the number of GPIB commands required for typical test sequences, resulting in less overhead for the PC controller and higher test throughput. In addition, GPIB control programs are easier to maintain and port because they are smaller.
## Specifications

**MT8820A-03 CDMA2000 Measurement Hardware, MX882002A CDMA2000 Measurement Software**

| **Amplitude measurement** | Frequency: 300 to 2200 MHz  
|                           | Input level: −65 to +35 dBm (Main Input/Output)  
|                           | Measurement accuracy: ±0.5 dB (−25 to +35 dBm), ±0.7 dB (−55 to −25 dBm), ±0.9 dB (−65 to −55 dBm)  
|                           | Linearity: ±0.2 dB (0 to −40 dB, ≥−55 dBm), ±0.4 dB (0 to −40 dB, ≥−65 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 2200 MHz  
|                                      | Input level: −30 to +35 dBm  
|                                      | Carrier frequency accuracy: ±(Set frequency x reference oscillator accuracy + 10 Hz)  
|                                      | Residual waveform quality: >0.999  
|                                      | Residual EVM: < 2% rms  

| **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 2200 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, 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  
|                        | OQPH channel level (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: −20 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 10  
|                     | Call control: Location registration, Origination, Termination, Disconnection from network, Disconnection from mobile terminal  
|                     | Paging channel data rate: Full  
|                     | Radio configuration: F-RC1 + R-RC1, F-RC2 + R-RC2, F-RC3 + R-RC3, F-RC4 + R-RC4  
|                     | Service option: SO 1, 2, 3, 9, 32, 33, 55, 32768  
|                     | PCH Data Rate: Full  
|                     | OQPH Data Rate: Full  
|                     | Fwd. FCH Data Rate: Full, half, quarter, eighth  
|                     | 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 channel: Access Ch.  
|                     | Rev. closed loop power control mode: Closed loop, All 1 (all down), Alternate, All 0 (all up)  
|                     | Handoff: Universal Handoff, Band Class/Channel Handoff, Protocol Revision Handoff, RC/SO Handoff, Analog Handoff (only when the MT8815A/MT8820A-11 audio board is installed.)
The MX882002A-02 CDMA2000 External Packet Data is an optional software application that adds CDMA2000 1X packet data communications to the MX882002A 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 MT8820A. 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 MT8820A 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 MT8802A 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.

![Diagram showing the connection between application servers, MT8820A, and CDMA2000 1X terminal.]
### Specifications

**MX882002A-02 CDMA2000 external packet data**

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<td>RLP loopback:</td>
<td>RLP loopback: The mode to loopback the RLP data unit received in reverse link to forward link.</td>
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<td>PPP/IP:</td>
<td>PPP/IP: The mode to transfer IP packet data between a CDMA2000 1X terminal and a server.</td>
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American Mobile Phone System (AMPS)

Transmitter Measurement

When the MX882002A CDMA2000 Measurement Software is installed in a main frame with the MT8820A Audio Board (Option 11), measurement of the RF characteristics of AMPS terminals as well as output and measurement of audio signals (requires MT8820A-11) are supported.

**Transmitter Power**

This function measures the output power of an AMPS terminal.

**Frequency Error**

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

**FM Measurement**

The FM Deviation, AF Level, Distortion, and Audio Frequency 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

**MT8820A-11 Audio board, MX882002A CDMA Measurement Software (requires option 03)**

| Frequency/Amplitude measurement | Frequency range: 800 to 960 MHz  
| | Measurement level range: –65 to +35 dBm (Main Input/Output)  
| | 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)  
| | *MAIN Input/Output, after calibrated by internal power meter*  
| | Linearity: (Filter Power measurement, 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 Hz 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 mV peak to 5 V peak (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 mV peak), ±0.4 dB (≥1 mV peak, ≥1 kHz)  
| | SINAD measurement  
| | Measurement range: ≥60 dB (≥1000 mV peak), ≥54 dB (≥50 mV peak), ≥46 dB (≥10 mV peak)  
| | (At Frequency: 1 kHz)  
| | Distortion ratio measurement  
| | Measurement range (At Frequency: 1 kHz):  
| | ≤–60 dB (≥1000 mV peak), ≤–54 dB (≥50 mV peak), ≤–46 dB (≥10 mV peak)  
| | 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 V peak (AF Output connector)  
| | Set resolution  
| | 1 mV (≤5 V peak), 100 µV (≤500 mV peak), 10 µV (≤50 mV rms)  
| | Accuracy: ±0.2 dB (≥10 mV peak, ≥50 Hz), ±0.3 dB (≥10 mV peak, <50 Hz)  
| | Waveform distortion (At Band ≤30 kHz)  
| | ≤–60 dB (≥500 mV peak, ≤5 kHz)  
| | ≤–54 dB (≥70 mV peak)  
| | Output impedance: ≤1 Ω  
| | Maximum output current: 100 mA  

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**MX882003A**

**1xEV-DO Measurement Software**

Advanced high-speed measurement system and batch measurements support 1xEV-DO terminal manufacturing

The MX882003A 1xEV-DO Measurement Software is for measuring the performance of mobile terminals conforming to the 1xEV-DO 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 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 transmission frequency, modulation accuracy, output 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 production lines and on-site maintenance.

\*1: Requires MT8820A-03, MT8820A-04 and MX882002A

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**• 1xEV-DO Measurement Items**

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<td>3.1.1.3.1</td>
<td>Receiver Sensitivity and Dynamic Range</td>
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<td>Standby Output Power</td>
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<td>Conducted Spurious Emissions</td>
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<td>3.1.2.4.3</td>
<td>Occupied Bandwidth</td>
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</table>
Transmission Measurement

**Code Domain Power**

The 1xEV-DO 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.

**Open Loop Time Response Screen**

The Open Loop Time Response screen is used to measure the time response of the 1xEV-DO terminal open loop power control. Changes in the mobile terminal transmitted 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 MX882002A.*

**Access Probe Power**

The first access probe from the 1xEV-DO 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.
**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.

**Connection Test**

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

**Terminal Report Monitor**

This screen displays the periodically reported 1xEV-DO terminal status.
**Fast and Easy GPIB Control**

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**Control without Measurement Window**

Measurement results can be read and changed even when not displayed, saving time that would be lost by displaying the relevant measurement window.

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**Fast Batch Measurements**

Batch measurement results can be read using the “ALLMEAS?” command, although commands for specific measurement targets, such as “ALL MEAS? MOD” (Modulation Analysis) are supported too. This reduces the number of GPIB commands required for typical test sequences, resulting in less overhead for the PC controller and higher test throughput. In addition, control programs are easier to maintain and port because they are smaller.
## Specifications

**MT8820A-04 1xEV-DO Measurement Hardware, MX882003A 1xEV-DO Measurement Software**

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<th>Specification</th>
<th>Details</th>
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<td><strong>Amplitude measurement</strong></td>
<td>Dependent on the performance of MX882002A</td>
</tr>
<tr>
<td><strong>Modulation analysis</strong></td>
<td><strong>Frequency:</strong> 300 to 2200 MHz&lt;br&gt;<strong>Input level:</strong> −30 to +35 dBm&lt;br&gt;<strong>Carrier frequency accuracy:</strong> reference oscillator accuracy + 10 Hz&lt;br&gt;<strong>Residual waveform quality:</strong> &gt;0.999&lt;br&gt;<strong>Residual EVM:</strong> &lt; 2% rms</td>
</tr>
<tr>
<td><strong>Code domain power</strong></td>
<td><strong>Input level:</strong> −10 to +35 dBm&lt;br&gt;<strong>Measurement accuracy:</strong> ±0.2 dB (code power ≥−15 dBc), ±0.4 dB (code power ≥−23 dBc)</td>
</tr>
<tr>
<td><strong>RF signal generator</strong></td>
<td><strong>Output frequency:</strong> 300 to 2200 MHz (1 Hz step)&lt;br&gt;<strong>Channel level:</strong> Pilot channel, MAC channel, Control channel, Traffic channel, All 0 dB (reference Ior)&lt;br&gt;<strong>PN offset:</strong> 0 to 511&lt;br&gt;<strong>Wave quality:</strong> &gt;0.99 (pilot only, AWGN Off)&lt;br&gt;<strong>AWGN:</strong>&lt;br&gt;  − AWGN Level: −20 to +12 dB (relative to CDMA signal) or Off&lt;br&gt;  − Maximum output level of cdma signal at AWGN on:&lt;br&gt;  −28 dBm (at Main output)&lt;br&gt;  −18 dBm (at AUX output)</td>
</tr>
<tr>
<td><strong>Error rate measurement</strong></td>
<td><strong>PER (Packet Error Rate) measurement:</strong> PER measurement with FTAP&lt;br&gt;<strong>Display items:</strong> PER, Confidence level, Sample packet count, Error packet count</td>
</tr>
<tr>
<td><strong>Call processing</strong></td>
<td><strong>Band class:</strong> BC0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10&lt;br&gt;<strong>Call control:</strong> Close session, Open session origination, Termination, Disconnection from network, Disconnection from mobile terminal&lt;br&gt;<strong>Rev. closed loop power control mode:</strong> Closed loop, Alternate, All 0 (all up), All 1 (all down)&lt;br&gt;<strong>Test application protocol:</strong> RTAP, FTAP, FTAP + RTAP</td>
</tr>
</tbody>
</table>
The MX882003A-02 1xEV-DO External Packet Data is an optional software application that adds 1xEV-DO external packet data communications to the MX882003A 1xEV-DO External Measurement Software option. It supports transfer of packet data between a local or network application server and an Internet-enabled CDMA2000 1xEV-DO terminal via an Ethernet connection to the MT8820A. 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 terminal in the native RF environment that is simulated by the base station simulator in the MT8820A hardware. This mode provides an IP network connection to a 1xEV-DO terminal and supports Default Packet Point to Point Protocol (PPP), Internet Protocol (IP), and direct Ethernet connection.

**Example of IP Data Communications Mode**

**Specifications**

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<td>Application Protocol Packet Data Mode</td>
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CDMA2000 1X/1xEV-DO Synchronous Function

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

By using the MX882002A and MX882003A with two MT8820A units or one MT8820A unit with the Parallelphone\(^*1\) measurement option, the CDMA2000 1X and 1xEV-DO forward link signals can be output with synchronized system times, supporting function tests of mobile terminals for both CDMA2000 1X and 1xEV-DO systems\(^*2\).

\(^*1\): Parallelphone is the registered trademark of Anritsu Corporation.

\(^*2\): This function cannot be used when MX882000B W-CDMA Measurement Software is loaded. Please perform unload, when MX882000B is loaded.
Please specify the model/order number, name, and quantity when ordering.

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Model/Order No.</th>
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<td>MT8820A-32</td>
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Application parts

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<tr>
<td>P0027</td>
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<td>A0012</td>
<td>Handset</td>
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<td>J1249</td>
<td>CDMA2000 Cable [D-sub (15 pin, P-type) - D-sub (15 pin, P-type), used with J1267 (sold separately)]</td>
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<td>J1267</td>
<td>CDMA2000 cross-over cable [D-sub (9 pin, P-type) - D-sub (9 pin, P-type), reverse cable, used with J1249 (sold separately)]</td>
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<td>Coaxial Cord (BNC-P - RG58/U - BNC-P), 0.5 m</td>
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<td>MN8110B</td>
<td>I/O Adapter (for call processing I/O)</td>
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<td>Joint Plate (4 pcs/set)</td>
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<td>B0333G</td>
<td>Rack Mount Kit</td>
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<td>B0499</td>
<td>Carrying Case (hard with protective cover and casters)</td>
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*1: Parallelphone is supported by the MT8820A-01, MT8820A-02, MT8820A-03, and MT8820A-04 hardware, which can be used simultaneously.  
*2: For supported UE connections, contact your Anritsu sales representative.  
*3: The MX882050A preinstalls the integrity protection function.  
*4: On CDROM  
*5: This Test USIM operates only in the W-CDMA mode. When GSM is required, use the P0027.  
*6: Parallelphone™ is a registered trademark of Anritsu Corporation.  
*7: CF card is a registered trademark of SanDisk Corporation in the USA and is licensed to the CFA (Compact Flash Association).