MX882002A

CDMA2000 Measurement Software

Designed for CDMA2000 Mobile Communications Systems

MX882002A

CDMA2000 Measurement Software

Advanced High-speed Measurement System & Batch Measurements Support CDMA2000 Terminal Manufacturing

The MX882002A CDMA2000 Measurement Software supports transmission and reception measurements of mobile terminals conforming to the CDMA2000 1X (IS-2000), the most spread third-generation terminal. Advanced DSP & parallel measurement technologies greatly reduce manufacturing and test time for wireless devices. In addition, multiple measurement items can be selected freely for batch processing while the number of repetitive measurements can be set individually for each measurement. The selected measurement items can be batch-measured with just one touch of a button, thus pass/fail evaluation on major test items such as transmission power, transmission frequency, waveform quality, code domain power and FER can be conducted simply and quickly.

The standard GPIB enables the instrument to configure automated test systems in maintenance site as well as to be configured in automated production lines.

Tests	3GPP2 C.S0011	Test items
Receiver tests	3. 4. 1	Demodulation of Forward Traffic Channel in Additive White Gaussian Noise
	3. 5. 1	Receiver Sensitivity and Dynamic Range
Transmitter tests	4. 1	Frequency Accuracy
	4. 3. 1	Time Reference
	4. 3. 4	Waveform Quality and Frequency Accuracy
	4. 3. 5	Code Domain Power
	4. 4. 1	Range of Open Loop Output Power (Access Channel)
	4. 4. 3	Access Probe Output Power
	4. 4. 4	Range of Closed Loop Power Control
	4. 4. 5	Maximum RF Output Power
	4. 4. 6	Minimum Controlled Output Power
	4. 4. 9	Code Channel to Reverse Pilot Channel Output Power Accuracy (2.2)
	4. 5. 1	Conducted Spurious Emissions
	4. 5. 3	Occupied Bandwidth

Transmission Measurement

Transmission Power

Transmission power for a CDMA2000 terminal is measured. The terminal transmission power can be measured on maximum, minimum or any power control. Maximum, average and minimum values for measured results are displayed by setting the number of repetitive measurements to 2 or above, so the variations in terminal characteristics can be assessed. This repetitive measurement function is also equipped for other measurements.

Modulation Analysis

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

Access Probe Power Measurement

The first access probe from the mobile station is captured with the level trigger to measure the average power. The measurement value is also held by terminating the probe measurement once in continuous measurement mode. This plays a beneficial role in 4.4.1 Range of Open Loop Output Power measurement in C.S0022 of the 3GPP2 measurement standards.

Code Domain Power Measurement

The CDMA 2000 terminal code domain error is measured. It can be measured when the Reverse-RC is set to 3 or above. The PICH (pilot-ch), FCH and SCH powers are all displayed on the screen. In addition, the maximum power and the channel numbers for inactive channels are obtained and displayed on screen, while the pass/fail evaluation is performed to check whether the inactive channel power is below the specification value and then displayed.

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Occupied Bandwidth Measurement

The occupied bandwidth measurement is a mandatory measurement item for Band Class 3 and 6 compatible CDMA2000 terminals. It is measured by changing the bandwidth ratio to total power 80 to 99%.


Spurious Emission Measurement

A pass/fail evaluation for spurious emission of a CDMA2000 terminal is performed. This checks the existence of frequency components that exceed the standard line set by the 3GPP2 standard within a frequency range at ±4 MHz of the center frequency. A template for each band class is automatically set, thus no time or labour is lost on setting the standard line. In addition, the standard line can be edited.
BW 1 MHz and BW 1.23 MHz measurements can be performed if required.

Reception Measurement

Frame Error Rate Measurement

FER (Frame Error Rate) measurement and pass/fail evaluation can be performed in the SO2, SO9 and SO55. The FER, error frame count, transmission frame count, Confidence Level and pass/fail evaluation results are displayed.

4

Call Processing Function

Connection Test

The call processing function allows the connection tests such as location registration, origination, termination, terminal call disconnection and network call disconnection, etc. In addition, simple voice communication tests can be performed, as voice from the terminal can be echo-backed to Forward signal while communicating.
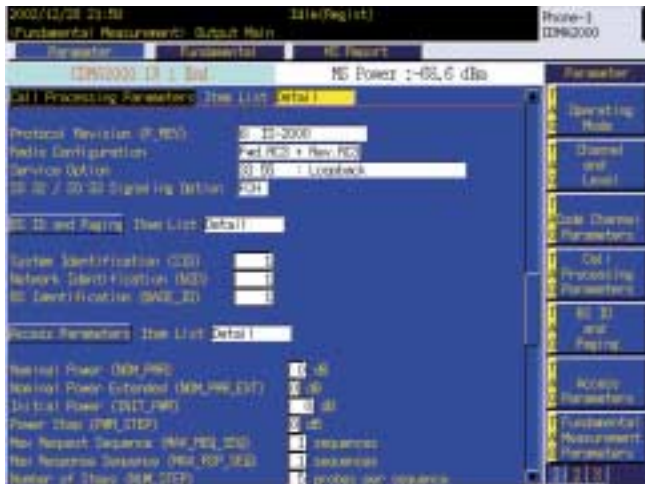
High-speed, User-friendly GPIB Controls

Eliminating Dependence on Measurement Screen

Readout and changes of settings can be performed freely without having to change screens, even when no items that exist on screen are currently being displayed. This controls loss time effects, critical to screen plotting

Batch Measurement Results Readout Command

All results for batch measurements can be read out with one "ALLMEAS?" command. In addition, measurement target such as "ALLMEAS? MOD" (Modulation Analysis) is specified and the desired measurement results can be selected for readout. Decreases in the number of GPIB commands lower the load on the MT8820A and controller PC while enhancing measurement throughput. Since the step size of a control program is reduced, it's effective in creating a control program with high maintainability that's easy to view.

Specifications

MT8820A-03 CDMA2000 Measurement Hardware, MX882002A CDMA2000 Measurement Software

Amplitude measurement	Frequency: 300 to 2200 MHz Input level: −65 to +35 dBm (Main connector) Measurement accuracy: ±0.5 dB (−25 to +35 dBm), ±0.7 dB (−55 to −25 dBm), ±0.9 dB (−65 to −55 dBm) 　　　　　*After calibration, at filtered power measurement Linearity: ±0.2 dB (0 to −40 dB, ≥ −55 dBm), ±0.4 dB (0 to −40 dB, ≥ −65 dBm)
Frequency/Modulation measurement	Frequency: 300 to 2200 MHz Input level: −30 to +35 dBm Carrier frequency accuracy: ±(reference oscillator accuracy +10 Hz) Residual waveform quality: > 0.999 Residual EVM: < 2 % rms
Code Domain Power	Can be measured at Reverse RC3/RC4. Frequency: 300 to 2200 MHz 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: 　　Pilot Ch　　　　　　−30 dB to 0 dB, 0.25 dB step or off 　　FCH, SCH　　　　　−30 dB to 0 dB, 0.1 dB step or off 　　SYNC, PCH　　　　−30 dB to 0 dB, 0.25 dB step or off 　　OCNS　　　　　　　Auto, 0.01 dB step or off QPCH channel level (relative level to pilot channel): −5 to +2 dB (1 dB step) or off Channel level accuracy: < ±0.2 dB (≥ −20 dB) PN offset: 0 to 511 settable 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. Display items: FER, confidence level, sample frame count, error frame count
Call processing	Band class: Conforms to BC 0 to 10 Call control: Location registration, origination, termination, network disssconnect, terminal disconnect Paging channel data rate: Full Radio configuration:　　　　　F-RC1+R-RC1, F-RC2+R-RC2, F-RC3+R-RC3, F-RC4+R-RC3, 　　　　　　　　　　　　　　　　F-RC5+R-RC4 Service option:　　　　　　　Conforms to SO 1, 2, 3, 9, 33, 55, 32768. Fwd. FCH data rate:　　　　　Full, half, quarter, eighth settable Fwd. SCH:　　　　　　　　　Max. 1 channel Fwd. SCH data rate:　　　　　RC3: 9.6 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps, 153.6 kbps 　　　　　　　　　　　　　　　RC4: 9.6 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps, 153.6 kbps 　　　　　　　　　　　　　　　RC5: 14.4 kbps, 28.8 kbps, 57.6 kbps, 115.2 kbps, 230.4 kbps Access channel:　　　　　　Conforms to access Ch. Rev. closed loop power control mode: closed loop, alternate, All 0 (all up), All 1 (all down) Conformed protocol:　　　　IS-95B, J-STD-008C, ARIB T-53, Korean PCS, IS-2000 (SR1)

MX882002A-02 CDMA2000 External Packet Data

Achieves Packet Data Communication Tests between Application Servers & Terminal

The MX882002A-02 CDMA2000 External Packet Data is a software option for adding packet data communications functions to CDMA2000 measurement software. Install this software to enable packet data transfer between the local or network application server connected to the Ethernet connector (10BT connector) on the rear panel of the MT8820A mainframe and a terminal.
The following are two supported packet data transfer modes.

Data Loopback Mode

The RLP data unit received with Reverse Link is looped back on the RLP (Radio Link Protocol 3) stack inside the MT8820A and transmitted by Forward Link.

IP Data Communications Mode

By establishing PPP connection with an RF-connected CDMA2000 terminal, the IP packet data transfer can be performed between the terminal and the network server. This enables to test various applications that use IP packets such as Web browsers using WAP and mail reception. In addition, the tests such as file transfer to a PC via data port and data download can be performed.

WAP Server

LAN Internet

MT8820A

CDMA2000 terminal

Cliant PC

Application Server

Example of IP Data Communications Mode

Specifications

MX882002A-02 CDMA2000 external packet data

Electrical characteristics	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 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps, 153.6 kbps
	RLP (Radio Link Protocol)	RLP3
	Packet data mode	RLP loopback, PPP/IP RLP loopback : The mode to loopback the RLP data unit received in reverse link to forward Link. PPP/IP : The mode to transfer IP packet data between a terminal and a server.

Ordering Information

Please specify the model/order number, name and quantity when ordering.

Model/Order No.	Name
	Main frame
MT8820A	Radio Communication Analyzer
	Standard accessories
	Power cord, 2.6 m : 1 pc
HB288064C5	CF card (64MB) : 1 pc
CA68ADP	PC card adapter : 1 pc
W1940AE	MT8820A operation manual (CD-ROM) : 1 copy
	Options
MT8820A-01	W-CDMA measurement hardware
MT8820A-02	TDMA measurement hardware
MT8820A-03	CDMA2000 measurement hardware
MT8820A-11	Audio board
MT8820A-21	W-CDMA measurement hardware retrofit
MT8820A-22	TDMA measurement hardware retrofit
MT8820A-23	CDMA2000 measurement hardware retrofit
MT8820A-31	Audio board retrofit
	Software
MX882000A	W-CDMA measurement software (requires MT8820A-01)
MX882000A-01	W-CDMA voice codec (requires MT8820A-11 and MX882000A)
MX882001A	GSM measurement software (requires MT8820A-02)
MX882001A-01	GSM voice codec (requires MT8820A-11 and MX882001A)
MX882002A	CDMA2000 measurement software (requires MT8820A-03)
MX882002A-02	CDMA2000 external packet data (requires MX882002A)

Model/Order No.	Name
	Warranty
MT8820A-90	Extended three year warranty service
MT8820A-91	Extended five year warranty service
	Application parts
P0019	TEST USIM001
A0012	Handset
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 connection cable, 1 m
J0008	GPIB connection cable, 2 m
MN8110A	I/O adapter (for call processing I/O)
B0332	Coupler (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 and without casters)

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