

For MT8820A Radio Communication Analyzer

MX882001A

GSM Measurement Software

MX882001A-11

EGPRS Measurement Software



MX882001A

GSM Measurement Software

Utilizing an advanced high-speed measuring method and offering batch measurements to support GSM/GPRS/EGPRS terminal production

The MX882001A GSM Measurement Software supports transmission and reception measurements of digital mobile terminals that conform to GSM/GPRS/EGPRS (MX882001A-11 is required for EGPRS measurement), the most widely used digital mobile standard in the world. With the MX882001A GSM and MX882000B W-CDMA Measurement Softwares installed in the MT8820A mainframe, the user can fully evaluate all the major transmission and reception characteristics of digital mobile terminals for all major GSM standards throughout the world. Anritsu's advanced DSP (Digital Signal Processing) and parallel-measurement technologies greatly reduce the time required for the production and testing of mobile terminals. Combinations of parameters for batch measurements are freely selectable, and the number of repetitions for each measurement can be set independently. In GSM measurement, selected items for measurement can be batch-processed through one-touch operation, enabling easy, high-speed Pass/Fail evaluation on major test items including transmission frequency, modulation accuracy, transmission power, adjacent channel leakage power and BER.

In GPRS measurement, transmission frequency, modulation accuracy and transmission power are measured when Test Mode A is selected, and Test Mode B or BLER measurement that matches each Multislot class and coding scheme is performed when BLER Measurement is selected, both at high speed.

In EGPRS measurement, transmission frequency, modulation accuracy and transmission power are measured when Test Mode A is selected, and BLER measurement that matches each Multislot class and Multi coding scheme is performed when BLER Measurement is selected, and transmission and reception test is performed by loopback at physical layer when SRB loopback is selected.

The standard GPIB interface enables the MT8820A to be easily incorporated into existing automated production lines or to configure automatic test systems in maintenance sites.

• GSM measurement item

Transmission measurement	Transmission power
	Power versus time (template mask evaluation)
	Frequency error
	Phase error (rms and peak)
	Output spectrum
Reception measurement	FER, BER and CRC error rates
Call processing	Location registration, terminal call origination, network call origination, communication, handover, disconnection from mobile terminal, disconnection from network
	Mobile terminal report monitor (reception level, reception quality, etc)

• EGPRS measurement item

Transmission measurement	Transmission power
	Power versus time (template mask evaluation)*1
	Frequency error
	Phase error (GMSK)
	Modulation accuracy (8PSK)
	Output spectrum*1
Reception measurement	BLER, BER
Call processing	Test Mode A, BLER SRB loopback, communication, disconnection
	Mobile terminal report monitor (Multi Slot Class, etc)

*1 Can be measured up to two uplink slot.

• GPRS measurement item

Transmission measurement	Transmission power
	Power versus time (template mask evaluation)*1
	Frequency error
	Phase error (rms and peak)
	Output spectrum*1
Reception measurement	BLER
Call processing	Test Mode A, B, BLER connection, communication, disconnection
	Mobile terminal report monitor (Multi Slot Class, etc)

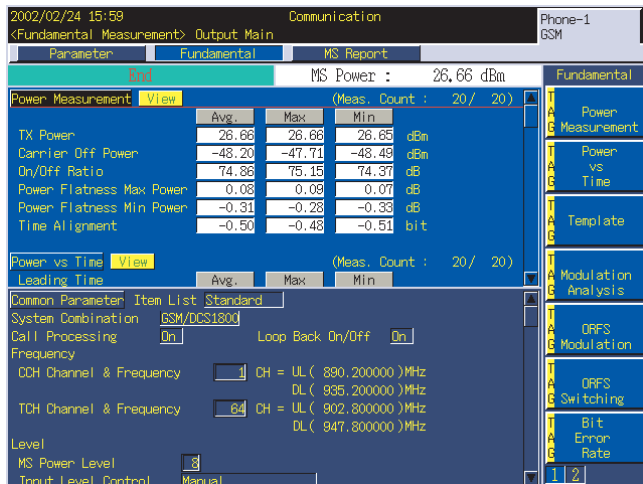
*1 Can be measured up to two uplink slot.

GSM

Transmission Measurement

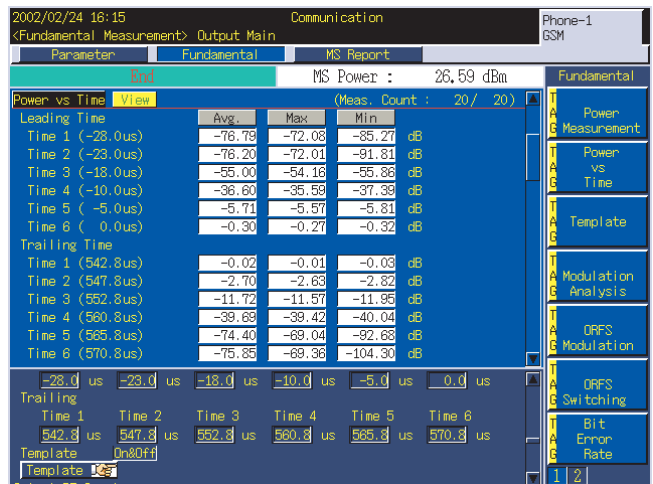
Transmission Power

When the number of measurement repetitions is set to two or more, the GSM terminal transmission power; maximum, average and minimum values of measured results are displayed, enabling the distribution of the GSM terminal characteristics to be evaluated. This repeat measurement function is also available for other measurements.



Power versus Time

Power at six measuring points for each burst rise/fall edge can be measured, with measuring time set in increments of 0.1 μs resolution.

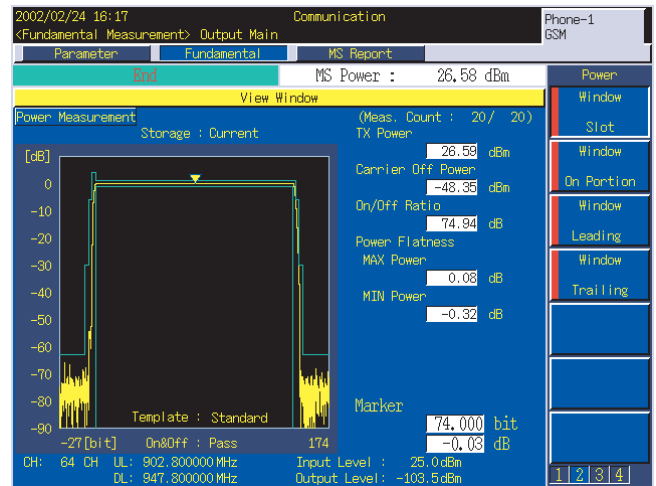


Burst Waveform Display

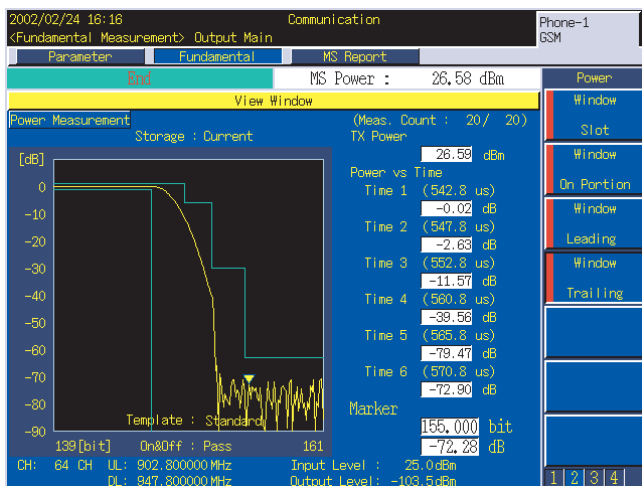
Graphical display of the burst waveform is also available. Magnified display of the entire time slot and the burst-on area as well as the rising/falling edges enables users to confirm at a glance whether or not the burst waveform meets the GSM standard template.



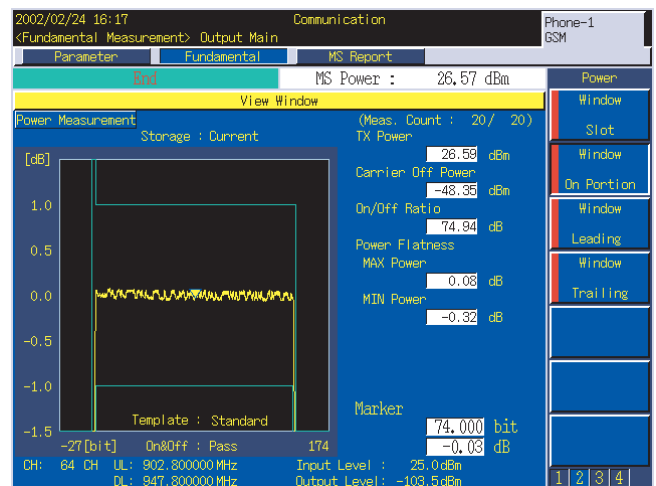
Rising edge



Entire time slot



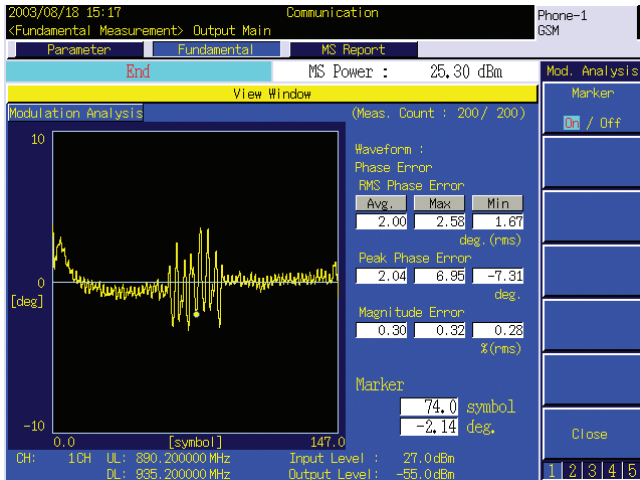
Falling edge



Burst on area

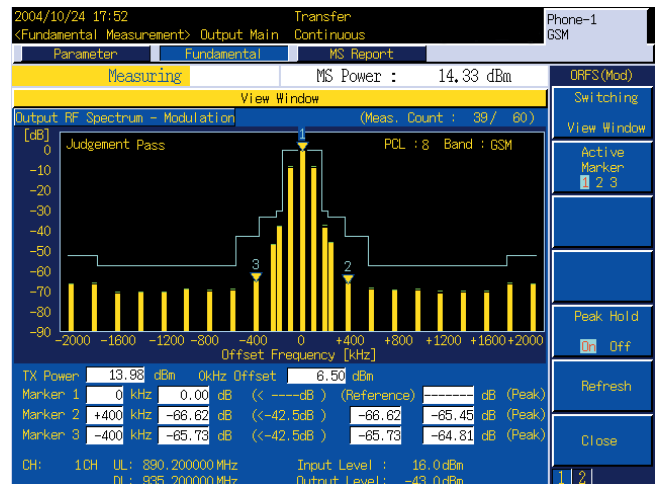
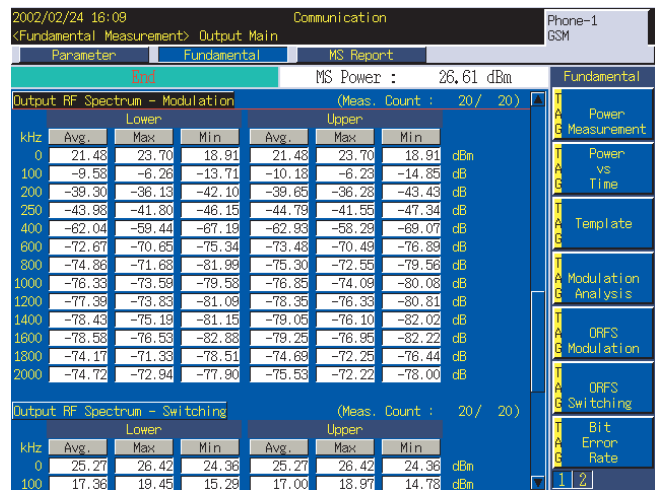
Modulation Analysis

Simultaneous measurement of frequency, frequency error (in kHz and ppm), phase error and peak phase error are performable. Amplitude error at the burst-on area can also be measured.



Output RF Spectrum

Power spectrum is measured at a total of 25 frequency points within the range of ± 2 MHz from the carrier frequency. "Modulation" is the spectrum resulting from the modulation signal around the center of burst signal, while "Switching" is the spectrum resulting from the rise and fall of the burst signal. In addition to the advanced DSP technology, high-speed measurement is achieved as the output spectrum can be processed in parallel with other measurements.



Reception Measurement

Error Rate Test

By controlling GSM terminals to the loopback conditions, the uplink RF signal, which is looped back from the GSM terminal, is demodulated to measure frame error rate, bit error rate and CRC error rate. These measurements can be processed in parallel with the transmission measurements.

2002/02/24 16:22 Communication Phone-1 GSM
 <Fundamental Measurement> Output Main
 Parameter Fundamental MS Report
 MS Power : 26,56 dBm
 Fundamental

1400	-51.08	-46.78	-55.71	-51.02	-47.06	-56.78	dBm
1800	-51.40	-46.68	-56.06	-51.50	-46.69	-56.98	dBm
1800	-52.18	-48.16	-57.04	-52.58	-49.06	-56.45	dBm
2000	-52.68	-49.13	-57.42	-52.80	-48.24	-58.71	dBm

 Bit Error Rate: 0.96%

Ratio	Event	Received	Sample
0.96%	96	10000	10000

 RX Measurement Parameter Item List Standard
 Number of Sample: 500
 FER/CRC: 88000
 CIB: 39000
 CII: 10000
 FAST: 130000
 BER(Ext. BER Input): RF Loop Back
 Measurement Input: C(FAST)
 Loop Back Type: Positive
 Output Level: -103.8 dBm

Call Processing Function

Connection Test

The call processing function enables to perform various connection tests including location registration, terminal call origination, network call origination, disconnection from mobile terminal and disconnection from network. During a call, the user's speech can be looped back from the GSM terminal to provide a simple voice communication test.

2002/02/24 16:28 Communication Phone-1 GSM
 <Fundamental Measurement> Output Main
 Parameter Fundamental MS Report
 MS Power : 26,54 dBm
 Fundamental
 Call Processing Parameter Item List Standard
 Network ID
 NCC: 1
 BCC: 1
 Location ID
 MCC: 1
 MNC: 1
 LAC: 0001
 Neighbour Cell Allocation

1	Off	Off	Off	Off	Off	Off	Off
Off	Off	Off	Off	Off	Off	Off	Off

 BS-PA-MFMS: 0
 Handover Type: Intra Cell
 Mobile Station ID: 001010123456789
 Paging IMSI: Auto
 TX Measurement Parameter Item List Standard
 Measurement Slot: 2
 Bit Offset: 0 bit
 Power Measurement

Mobile Terminal Report Monitor

GSM terminal status can be displayed as the periodical report that the GSM terminal sends back to the tester. "RX Level" monitoring shows the downlink RF signal level received by the GSM terminal.

2002/02/24 16:29 Communication Phone-1 GSM
 <Fundamental Measurement> Output Main
 Parameter Fundamental MS Report
 MS Power : 26,55 dBm
 MS Report
 MS Power Class: 4
 IMSI: 001010123456789
 IMEI: 490522300543090
 NW Phone No:
 Meas Report Level: 6
 Quality: 3

Ordered	Actual	Cell	ARFCN	RXLEV	MCC	BCC
MS Power Level: 3	3	1	7	1	1	1
Timing Advance: 0	0 bit					

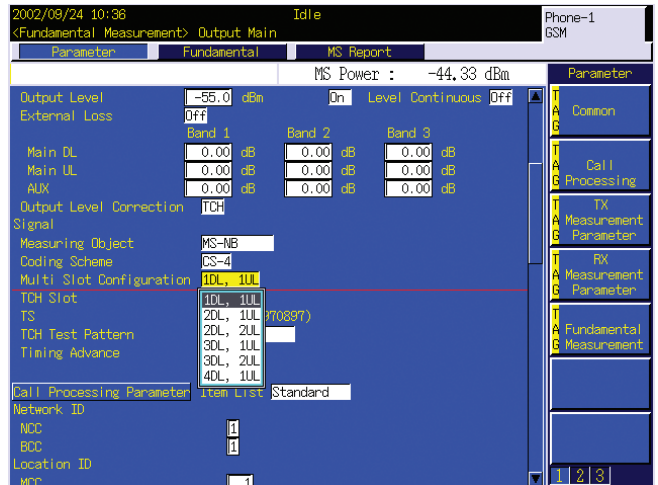
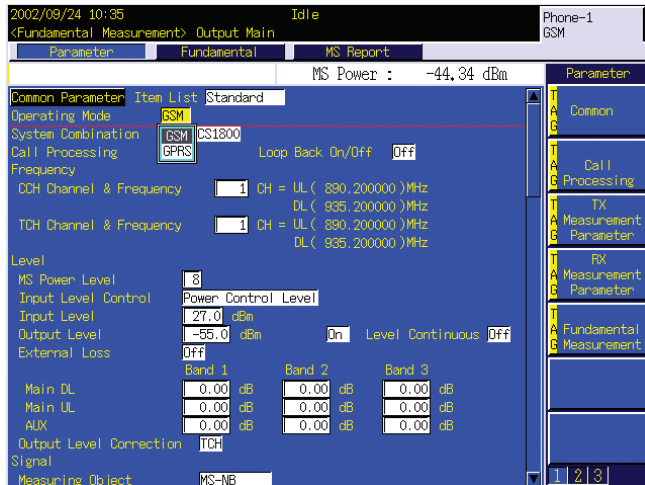
GPRS

GPRS Measurement Function

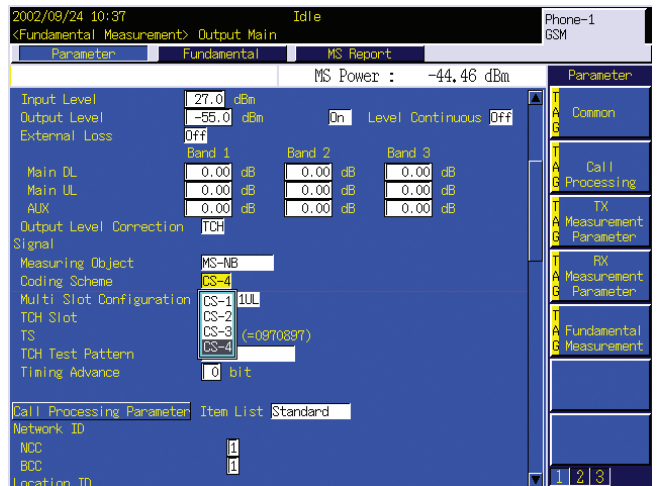
The MX882001A GSM Measurement Software is equipped with GPRS measurement function. Measurement functions can be switched between GSM and GPRS through one-touch operation without reinstalling measurement software in the MT8820A. Thus, both GSM and GPRS terminals can be tested at high speed.

Multislot Class and Channel Coding Scheme

The combinations of uplink/downlink slots can be selected in GPRS terminals of class 1 to 10 (except class 7).



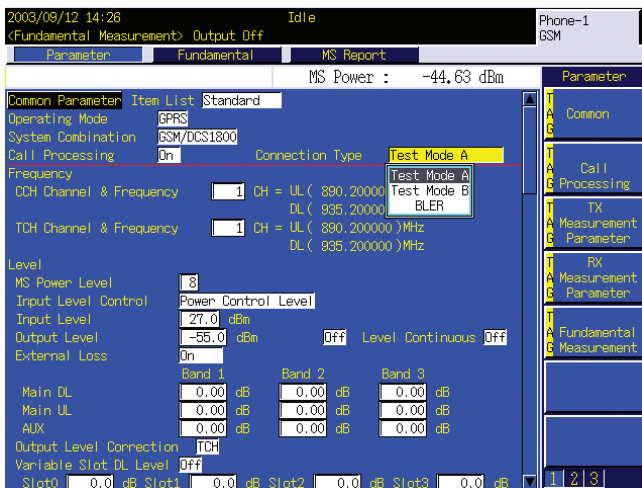
All coding schemes, CS-1 to CS-4, are supported.



Connection Type

Test Mode A/B or BLER is selectable for connection type. In Test Mode A, selected for transmission measurement, the GPRS terminal generates the uplink slot inserting pseudo random pattern in PDTCH.

In BLER, selected for BLER measurement, the GPRS terminal counts the number of blocks in received downlink data and reports the number of received blocks with uplink slot. The MT8820A performs the BLER measurement on the basis of this report.



Transmission Measurement

Similarly to GSM measurement, the transmission measurement for the following items is carried out for 1 slot specified when Test Mode A is selected.

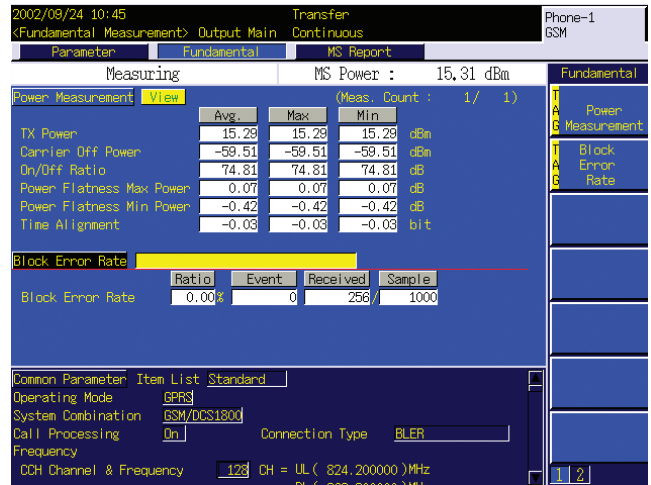
- Power versus Time (template mask evaluation)*1
- Frequency error
- Phase error (rms and peak)
- Output RF spectrum*1

*1 Can be measured up to two uplink slot.

Reception Measurement

Block Error Rate

When BLER is selected, the number of blocks received from the GPRS terminal is counted for block error rate measurement.



Call Processing Function

The following functions are tested when call processing is set to ON.

- Location registration
- Connection
- Communication
- Disconnection

After connection, GPRS terminal generates uplink slot, enabling Transmission measurement and BLER measurement.

High-speed, Easy-to-use GPIB Control

Controllable without Displaying the Measurement Window

Items not currently displayed on the measurement window can be read out or changed freely without requiring display. This dramatically saves time that would otherwise be lost by displaying the relevant measurement window.

Batch Readout Command for Measured Results

All results obtained by batch measurement can be read out with the single command: "ALLMEAS?". If required, only desired measurement results can be read out using commands such as "ALL MEAS? MOD" (modulation analysis). A decrease in the number of GPIB commands reduces the GPIB traffic on both the MT8820A and control PC, contributing to the increase in measurement throughput. Besides, the step size of the control program is reduced, which provides a real benefit to the user for the creation of a control program that is easy to read and maintain.

Specifications

• MT8820A-02 TDMA Measurement Hardware, MX882001A GSM Measurement Software

Frequency/modulation measurement	<p>Frequency: 300 to 2200 MHz Input level: -30 to +40 dBm (average power of burst signal, MAIN Input/Output) Measurement items: Normal burst, RACH Carrier frequency accuracy: reference oscillator accuracy + 10 Hz at normal burst measurement reference oscillator accuracy + 20 Hz at RACH measurement Residual phase error: $\leq 0.5^\circ$ rms, 2° peak</p>
Amplitude measurement	<p>Frequency: 300 to 2200 MHz Input level: -30 to +40 dBm (average power of burst signal, MAIN Input/Output) Measurement items: Normal burst, RACH Measurement accuracy: ± 0.5 dB (-20 to +40 dBm), ± 0.7 dB (-30 to -20 dBm) *After calibration Linearity: ± 0.2 dB (0 to -40 dB, ≥ -30 dBm) Carrier-off power: ≥ 65 dB (input level ≥ -10 dBm), ≥ 45 dB (input level ≥ -30 dBm) Burst waveform display: Rise, fall, time slot, burst-on</p>
Output RF spectrum measurement	<p>Frequency: 300 to 2200 MHz Input level: -10 to +40 dBm (average power of burst signal, MAIN Input/Output) Measurement item: Normal burst Measurement points: ± 100 kHz, ± 200 kHz, ± 250 kHz, ± 400 kHz, ± 600 kHz, ± 800 kHz, ± 1000 kHz, ± 1200 kHz, ± 1400 kHz, ± 1600 kHz, ± 1800 kHz, ± 2000 kHz Measurement range in modulation area: ≤ -55 dB (≤ 250 kHz offset), ≤ -66 dB (≥ 400 kHz offset) *Average of 10-time measurement Measurement range in transient area: ≤ -57 dB (≥ 400 kHz offset)</p>
RF signal generator	<p>Output frequency: 300 to 2200 MHz (1 Hz step) Phase error: $\leq 1^\circ$ rms, $\leq 4^\circ$ peak Output patterns: CCH, TCH, CCH + TCH TCH data: PN9, PN15, ALL 0, ALL 1, Fixed Pattern (PAT0-PAT9)</p>
Error rate measurement	<p>Function: Error rate measurement of frame, bit and CRC Measurement items: GSM Loopback data inserted in uplink TCH Serial data inputted through the call processing I/O port on the rear panel GPRS The number of blocks received from the mobile terminal and inserted in uplink TCH The number of USF reception blocks of a mobile terminal</p>
Call processing	<p>Call controlling: GSM Location registration, mobile terminal call origination, network call origination, disconnection from network, disconnection from mobile terminal GPRS Connection, disconnection, data transfer Terminal controlling: GSM Output level, time slot, timing advance, loopback on/off GPRS Test Mode A, Test Mode B, BLER</p>
Channel coding	FS, EFS, HS0, HS1, AFS, AHS0, AHS1, CS-1, CS-2, CS-3, CS-4
Frequency bands	GSM450, GSM480, GSM850, P-GSM, E-GSM, R-GSM, DCS1800, PCS1900

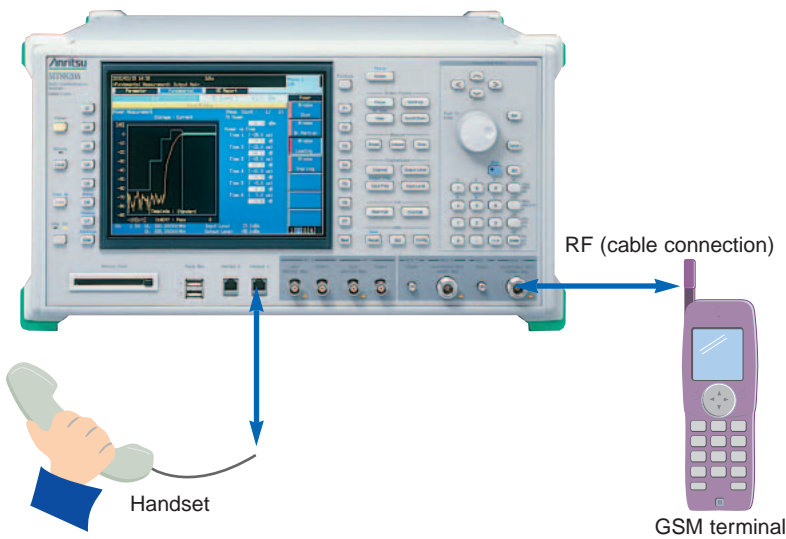
MX882001A-01 GSM Voice Codec

Real-time voice encoding and decoding, audio measurement function

The MX882001A-01 GSM Voice Codec is optional software that brings real-time voice encoding and decoding to the GSM Measurement Software. The installation of this option and MT8820A Option11 Audio Board enables end-to-end communication testing with a handset. Also, transmission/reception audio measurement is performable in call processing state.

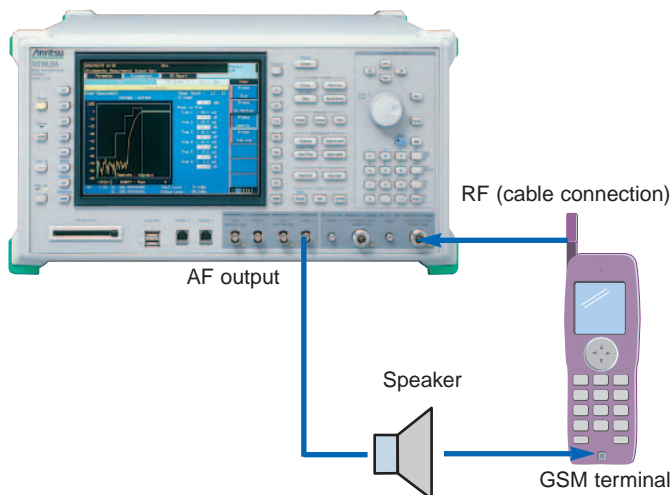
End-to-end Communications Testing

Connection of a handset to the MT8820A RJ11 connector enables end-to-end communications testing between the MT8820A and a GSM terminal.



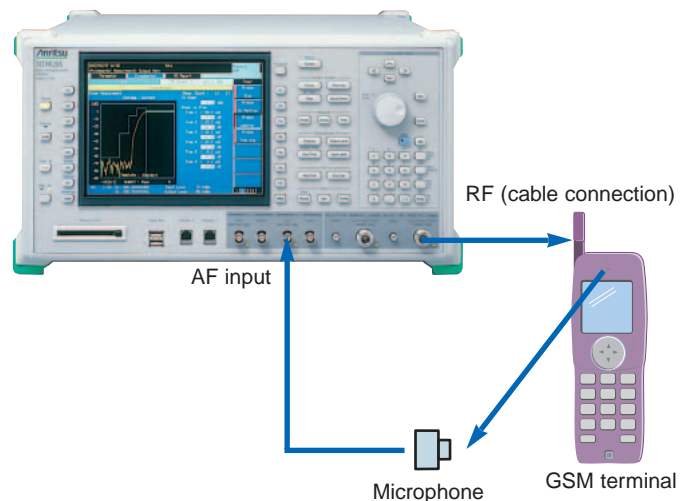
Transmission Audio Measurement

The tone signal outputted from AF Output connector is inputted to the GSM terminal microphone. Then the MT8820A demodulates uplink RF signal and measures the level, frequency and distortion rate of demodulated tone signal. This function achieves the evaluation of audio characteristic on transmitter side of GSM terminals.



Reception Audio Measurement

The tone signal demodulated by the GSM terminal is inputted to AF Input connector of the MT8820A. The audio characteristic on receiver side of GSM terminal can be evaluated by measuring the level, frequency and distortion rate of the tone signal inputted to AF Input connector.



Specifications

• MT8820A-11 Audio Board, MX882001A-01 GSM Voice Codec

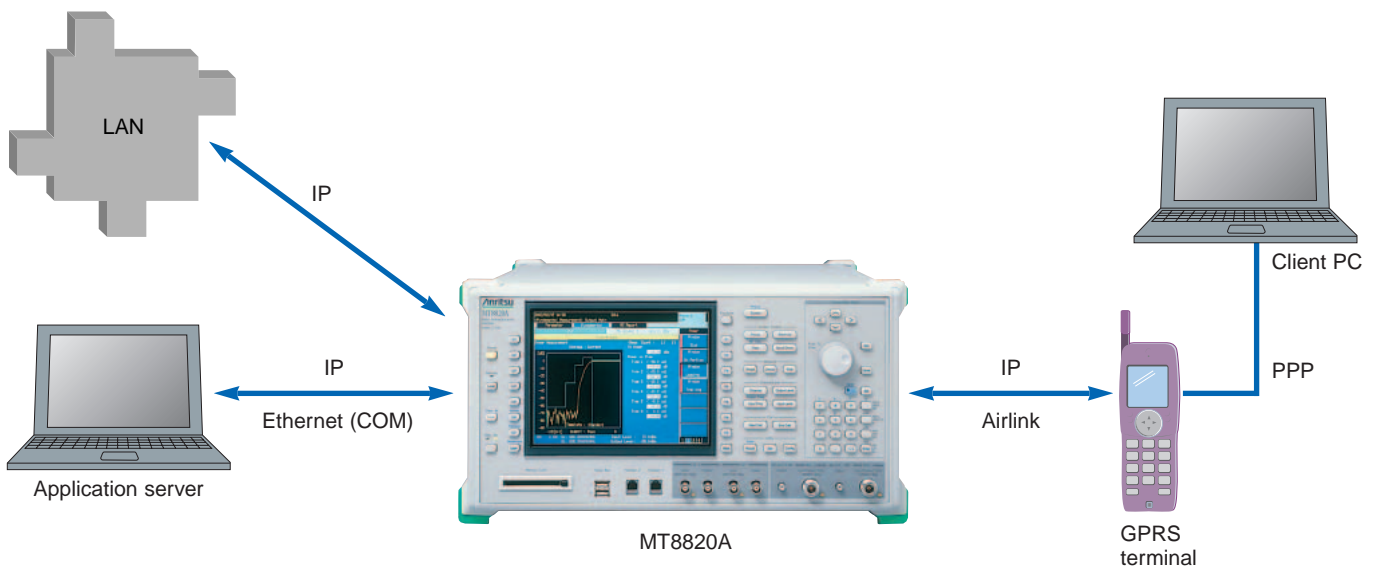
Voice codec	GSM_EFR, GSM_AMR
Codec level adjustment	Encoder input gain: -3 to +3 dB, 0.01 dB step Handset microphone volume: 0, 1, 2, 3, 4, 5 Handset speaker volume: 0, 1, 2, 3, 4, 5
AF output	Frequency range: 30 Hz to 10 kHz, 1 Hz step Setting range: 0 to 5 V _{peak} (AF Output) Setting resolution: 1 mV (≤ 5 V _{peak}), 100 μ V (≤ 500 mV _{peak}), 10 μ V (≤ 50 mV _{peak}) Accuracy: ± 0.2 dB (≥ 10 mV _{peak} , ≥ 50 Hz), ± 0.3 dB (≥ 10 mV _{peak} , < 50 Hz) Waveform distortion: In ≤ 30 kHz band, ≤ -60 dB (≥ 500 mV _{peak} , ≤ 5 kHz), ≤ -54 dB (≥ 70 mV _{peak}) Output impedance: $\leq 1 \Omega$ Max. output current: 100 mA
AF input	Frequency range: 50 Hz to 10 kHz Input voltage range: 1 mV _{peak} to 5 V _{peak} (AF Input) Max. allowable input voltage: 30 V _{rms} Input impedance: 100 k Ω
Frequency measurement	Accuracy: Reference oscillator accuracy + 0.5 Hz
Level adjustment	Accuracy: ± 0.2 dB (≥ 10 mV _{peak}), ± 0.4 dB (≥ 1 mV _{peak} , ≥ 1 kHz)
SINAD measurement	At frequency 1 kHz in ≤ 30 kHz band, ≥ 60 dB (≥ 1000 mV _{peak}), ≥ 54 dB (> 50 mV _{peak}), ≥ 46 dB (≥ 10 mV _{peak})
Distortion rate measurement	At frequency 1 kHz in ≤ 30 kHz band, ≤ -60 dB (≥ 1000 mV _{peak}), ≤ -54 dB (> 50 mV _{peak}), ≤ -46 dB (≥ 10 mV _{peak})

MX882001A-02 GSM External Packet Data

Verification test function for GPRS packet communication data transfer

The MX882001A-02 GSM External Packet Data option enables data transfer to/from external equipment by using the Ethernet port. Installing the MX882001A-02 enables End-to-End data transfer between an application server connected to the MT8820A and GSM/GPRS terminal or equipment connected to LAN network and GSM/GPRS terminal under near-actual operating environment.

External Packet Test



Sample MT8820A connection

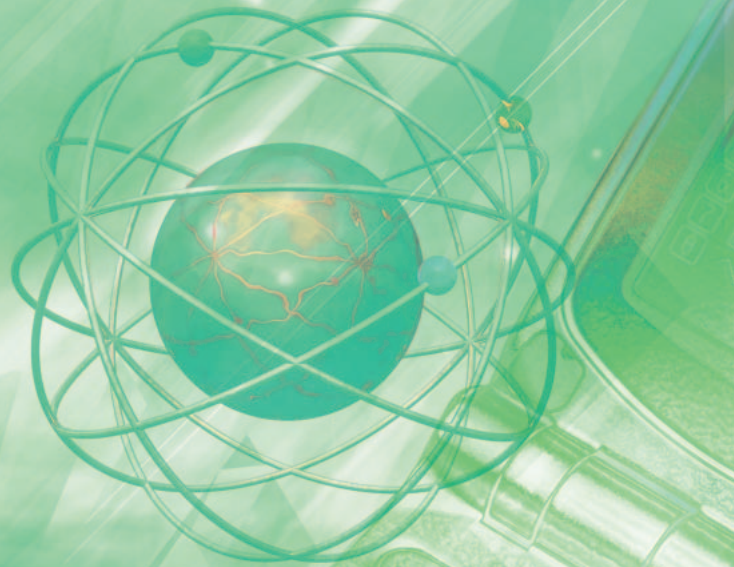
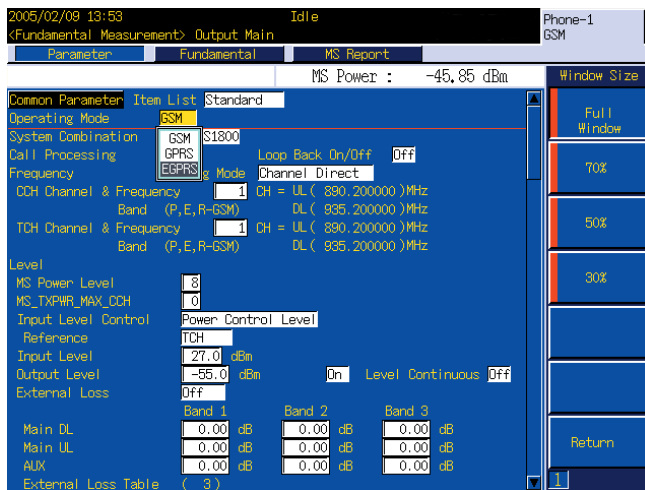
MX882001A-11

EGPRS Measurement Software

Utilizing an advanced high-speed measuring method and offering batch measurements to support EGPRS terminal production

The MX882001A-11 EGPRS Measurement Software supports transmission and reception measurements of mobile terminals conforming to EGPRS which is the advanced system of GPRS. MX882001A-11 EGPRS Measurement Software supports coding scheme of MCS1-MCS4 which uses the modulation type of GMSK and coding scheme of MCS5-MCS9 which uses the modulation type of 8PSK.

MCS5-MCS-9 which uses the modulation type of 8PSK. After installing MX882001A-11 EGPRS Measurement Software, “EGPRS” can be selected from the “Operating Mode” setting on the GSM Measurement Software.



EGPRS

Transmission Measurement

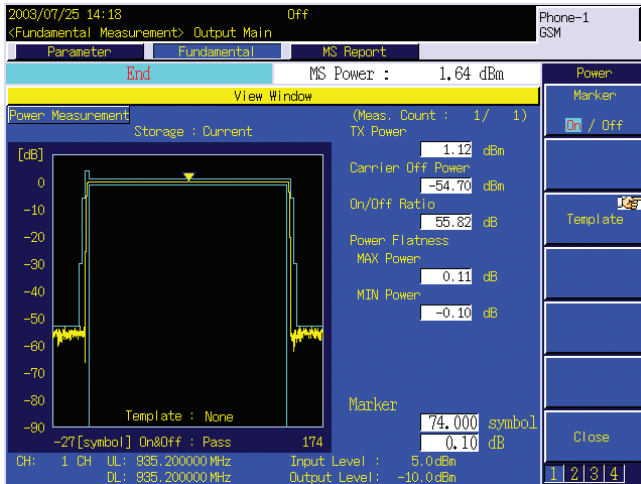
Transmission Power

When the number of measurement repetitions is set to two or more, the EGPRS terminal transmission power; maximum, average and minimum values of measured results are displayed, enabling the distribution of the terminal characteristics to be evaluated. This repeat measurement function is also available for other measurements.

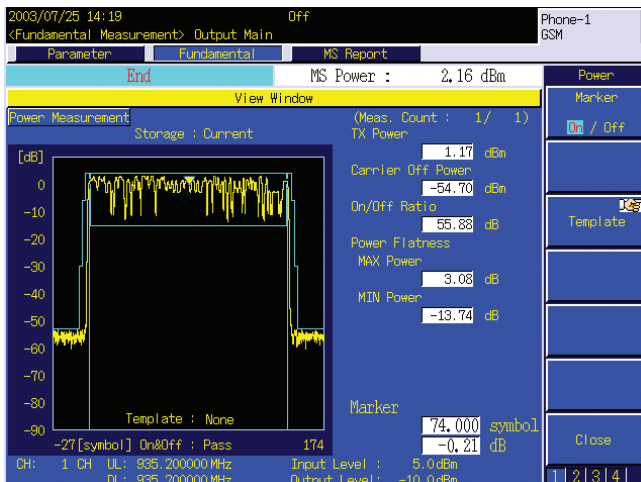
Power versus Time

Power at five measuring points for each burst rise/ fall edge can be measured, with measuring time set in increments of 0.1 μ s resolution.

Graphical display of the burst waveform is also available. Magnified display of the entire time slot and the burst-on area as well as the rising/falling edges enables users to confirm at a glance whether or not the burst waveform meets the GSM standard template.



Entire time slot of GSMK

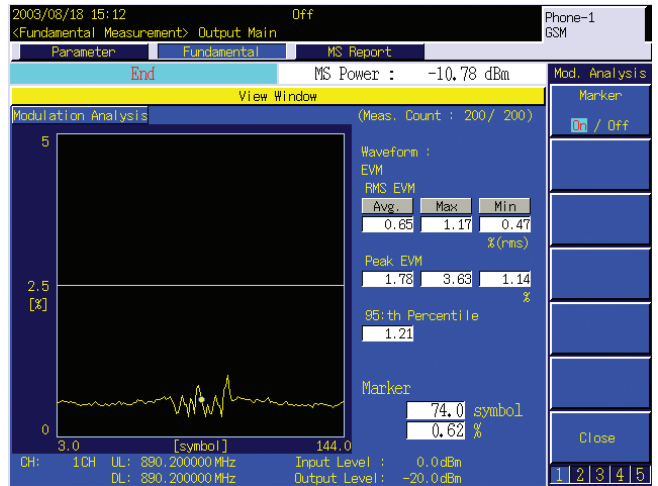


Entire time slot of 8PSK

Modulation Analysis

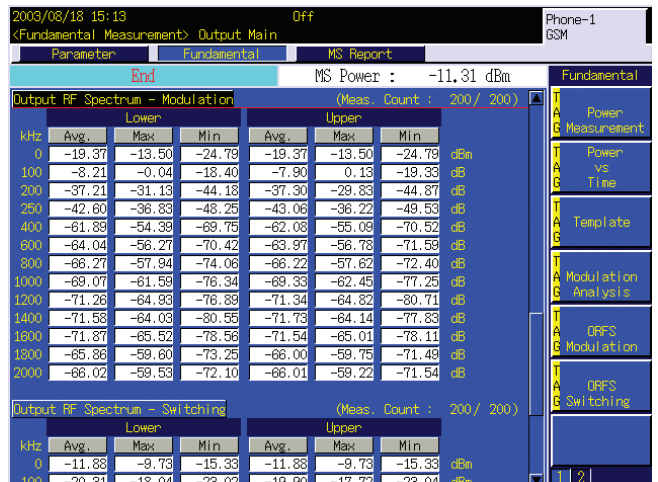
Simultaneous measurement of frequency, frequency error (in kHz and ppm), phase error and peak phase error are performable for GMSK modulated signal.

Amplitude error at the burst-on area can also be measured. Measurement of EVM, PEAK EVM, 95th percentile EVM, origin off-set, are performable for 8PSK modulated signal.



Output RF Spectrum

Power spectrum is measured at a total of 25 frequency points within the range of ± 2 MHz from the carrier frequency. "Modulation" is the spectrum resulting from the modulation signal around the center of burst signal, while "Switching" is the spectrum resulting from the rise and fall of the burst signal. In addition to the advanced DSP technology, high-speed measurement is achieved as the output spectrum can be processed in parallel with other measurements.



Reception Measurement

Error Rate Test

By controlling EGPRS terminals to the loopback conditions (Equivalent to EGPRS switched Radio Block Loopback Mode), the uplink RF signal, which is looped back from the EGPRS terminal, is demodulated to measure bit error rate. These measurements can be processed in parallel with the transmission measurements.

2009/08/18 15:15 Off Phone-1 GSM
 <Fundamental Measurement> Output Main
 MS Power : -11,50 dBm

Time	Power	Power	Power	Power	Power	Power
800	-75.04	-72.18	-79.29	-75.18	-70.22	-79.37
800	-77.42	-73.78	-80.37	-77.60	-72.93	-81.27
1000	-80.66	-77.31	-83.80	-80.57	-76.43	-84.06
1200	-82.44	-79.24	-85.63	-82.54	-78.96	-86.14
1400	-82.51	-78.29	-86.27	-82.92	-78.53	-86.18
1600	-82.68	-79.74	-85.11	-82.88	-79.74	-86.00
1800	-82.63	-79.06	-85.61	-82.92	-79.89	-85.68
2000	-82.55	-79.22	-85.33	-82.71	-78.71	-86.07

Item	Ratio	Event	Received	Sample
SRB Loopback	0.00%	0	400000	400000
- 1st Slot	0.00%	0	400000	
- 2nd Slot				

Block Error Rate Test

Block error rate can be measured by counting the number of ACK blocks when BLER is selected.

2006/02/09 13:11 Transfer Phone-1 GSM
 <Fundamental Measurement> Output Main
 MS Power : -45,54 dBm

Time	Power	Power	Power	Power	Power	Power
0	10.84	10.84	10.84	10.84	10.84	10.84
100	7.05	7.05	7.05	6.45	6.45	6.45
200	-18.58	-18.58	-18.58	-20.06	-20.06	-20.06
250	-28.29	-28.29	-28.29	-29.53	-29.53	-29.53
400	-46.54	-46.54	-46.54	-46.97	-46.97	-46.97
600	-52.30	-52.30	-52.30	-53.41	-53.41	-53.41
800	-52.66	-52.66	-52.66	-54.65	-54.65	-54.65
1000	-55.16	-55.16	-55.16	-54.27	-54.27	-54.27
1200	-52.19	-52.19	-52.19	-56.28	-56.28	-56.28
1400	-55.00	-55.00	-55.00	-55.39	-55.39	-55.39
1600	-53.68	-53.68	-53.68	-54.24	-54.24	-54.24
1800	-55.44	-55.44	-55.44	-53.26	-53.26	-53.26
2000	-52.05	-52.05	-52.05	-53.90	-53.90	-53.90

Item	Ratio	Event	Received	Sample
Block Error Rate	0.00%	0	1000	1000
- 1st Slot	0.00%	0	500	
- 2nd Slot	0.00%	0	500	
- 3rd Slot				
- 4th Slot				

Call Processing

Call Processing Function

The following functions are tested when call processing is set to ON.

- Location registration
- Connection
- Communication
- Disconnection

After connection, EGPRS terminal generates uplink slot, enabling Transmission measurement and BLER measurement.

Mobile Terminal Report Monitor

EGPRS terminal status can be displayed as the periodical report that the EGPRS terminal sends back to the tester. The informations of Multislot Class, BEP (Bit Error Probability), etc can be checked.

2006/02/08 21:17 Transfer Phone-1 GSM
 <Fundamental Measurement> Output Main
 MS Power : 10,36 dBm

MS Report

MS Power Class: 4
 IMSI: 001010123456789
 IMEI: 855008005826350
 NW Phone No: [redacted]

RXLEV: [redacted] (---- to ---- dBm)
 RXQUAL: [redacted] (--- to ---BER)

Ordered	Actual	Call	APPCN	RXLEV	NCC	BCC
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

MS Power Level: 3
 Timing Advance: 0 bit

Multislot Class: 10 (Max, Rx:4, Tx:2, Sum:5)
 C Value: 35 (-76 to -75 dBm)
 Signal Variance: [redacted] (---- to ----)

Interference Level:

Slot	Level	Slot	Level
Slot0	[redacted] (---- to ---- dB)	Slot1	[redacted] (---- to ---- dB)
Slot2	[redacted] (---- to ---- dB)	Slot3	[redacted] (---- to ---- dB)
Slot4	[redacted] (---- to ---- dB)	Slot5	[redacted] (---- to ---- dB)
Slot6	[redacted] (---- to ---- dB)	Slot7	[redacted] (---- to ---- dB)

MEAN BEP: 31 CV BEP: 17

Ordering Information

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

Model/Order No.	Name
MT8820A	Main frame Radio Communication Analyzer
	Standard accessories
	Power cord, 2.6 m : 1 pc
HB28B064C8H	CF card (64 MB) : 1 pc
CA68ADP	PC card adapter : 1 pc
W2458AE	MT8820A/MT8815A operation manual (CD-ROM) : 1 copy
	Options
MT8820A-01	W-CDMA Measurement Hardware
MT8820A-02	TDMA Measurement Hardware
MT8820A-03	CDMA2000 Measurement Hardware
MT8820A-04	1xEV-DO Measurement Hardware
MT8820A-11	Audio Board
MT8820A-12	Parallel Phone Measurement Hardware
MT8820A-21	W-CDMA Measurement Hardware retrofit
MT8820A-22	TDMA Measurement Hardware retrofit
MT8820A-23	CDMA2000 Measurement Hardware retrofit
MT8820A-24	1xEV-DO Measurement Hardware retrofit
MT8820A-31	Audio Board retrofit
MT8820A-32	Parallel Phone Measurement Hardware retrofit
	Softwares
MX882000B	W-CDMA Measurement Software (requires MT8820A-01 and MX88205xA)
MX882000B-01	W-CDMA Voice Codec (requires MT8820A-11 and MX882000B)
MX882000B-11	HSDPA Measurement Software (requires MT8820A-01, MX882000B and MX882050A)
MX882001A	GSM Measurement Software (requires MT8820A-02)
MX882001A-01	GSM Voice Codec (requires MT8820A-11 and MX882001A)
MX882001A-02	GSM External Packet Data (requires MX882001A)
MX882001A-11	EGPRS Measurement Software (requires MX882001A)
MX882002A	CDMA2000 Measurement Software (requires MT8820A-03)
MX882002A-02	CDMA2000 External Packet Data (requires MX882002A)
MX882003A	1xEV-DO Measurement Software (requires MT8820A-03, MT8820A-04 and MX882002A)
MX882003A-02	1xEV-DO External Packet Data (requires MX882003A)
MX882004A	PDC Measurement Software (requires MT8820A-02)
MX882005A	PHS Measurement Software (requires MT8820A-02)
MX882005A-11	ADVANCED PHS Measurement Software (requires MX882005A)
MX882010A	Parallel Phone Measurement Software*1 [requires MT8820A-12, the two same measurement hardware (2 board/set) and one measurement software]
MX882022A	CDMA2000 Wireless Application Test Software (requires MT8820A-03)
MX882050A	W-CDMA Call Processing Software*2 (requires MX882000B)
MX882050A-02	W-CDMA External Packet Data*2, *3 (requires MX882050A)
MX882050A-03	W-CDMA Video Phone Test*2 (requires MX882050A)
MX882050A-09	W-CDMA Band IX*2 (requires MX882050A)
MX882050A-11	HSDPA External Packet Data*2 (requires MX882000B-11)
MX882070A	W-CDMA Cipherring Software*2 (requires MX882050A)
MX882051A	W-CDMA Call Processing Software*2 (requires MX882000B)
MX882051A-02	W-CDMA External Packet Data*2 (requires MX882051A)
MX882051A-03	W-CDMA Video Phone Test*2 (requires MX882051A)
MX882071A	W-CDMA Cipherring Software*2 (requires MX882051A)

Model/Order No.	Name
W2477AE	MX882000B operation manual*4 (attached to MX882000B)
W2463AE	MX882001A operation manual*4 (attached to MX882001A)
W2472AE	MX882002A operation manual*4 (attached to MX882002A)
W2473AE	MX882003A operation manual*4 (attached to MX882003A)
W2464AE	MX882004A operation manual*4 (attached to MX882004A)
W2465AE	MX882005A operation manual*4 (attached to MX882005A)
W2484AE	MX882022A operation manual*4 (attached to MX882022A)
W2480AE	MX88205xA operation manual*4 (attached to MX88205xA)
W2478AE	MX88207xA operation manual*4 (attached to MX88207xA)
	Warranty
MT8820A-90	Extended three year warranty service
MT8820A-91	Extended five year warranty service
	Application parts
P0019	TEST USIM001*5
P0027	W-CDMA/GSM Test USIM
A0012	Handset
J1249	CDMA2000 cable [D-sub (15 pin, P-type) - D-sub (15 pin, P-type), used in combination with J1267 (sold separately)]
J1267	CDMA2000 cross cable [D-sub (9 pin, P-type) - D-sub (9 pin, 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)
W2457AE	MT8820A operation manual (booklet)
W2476AE	MX882000B operation manual (booklet)
W2466AE	MX882001A operation manual (booklet)
W2470AE	MX882002A operation manual panel operation (booklet)
W2471AE	MX882002A operation manual remote control (booklet)
W2474AE	MX882003A operation manual panel operation (booklet)
W2475AE	MX882003A operation manual remote control (booklet)
W2467AE	MX882004A operation manual (booklet)
W2468AE	MX882005A operation manual (booklet)
W2482AE	MX882022A operation manual panel operation (booklet)
W2483AE	MX882022A operation manual remote control (booklet)
W2481AE	MX88205xA operation manual (booklet)
W2479AE	MX88207xA operation manual (booklet)

*1: The Measurement Hardwares applied to Parallel Phone Measurement are MT8820A-01, MT8820A-02, MT8820A-03, MT8820A-04. And these hardwares can be implemented all together.

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

*3: MX882050A preinstalls the integrity protection function.

*4: Supplied by CD-ROM

*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).

Note:

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