ME7876A
Mobile Communication Test System

Automatic Test System for W-CDMA, GSM/GPRS/EGPRS,
cdma2000 1x and cdma2000 1xEV-DO
mobile equipment in development and manufacturing

Automatic High-Speed Test System for 3GPP Mobile Equipment

The ME7876A Mobile Communication Test System is based on the MT8820A Radio Communication Analyzer and an external PC.
The system enables automatic testing of the transmission/reception characteristics of W-CDMA, GSM/GPRS/EGPRS and cdma2000® mobile equipment conforming to 3GPP standards.
It uses measurement methods based on the open standards of 3GPP TS 34.121/TS51.010 and 3GPP2 C.S0011/C.S0033, as well as conventional high-speed measurements.

cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA – USA). When applied to goods and services, the cdma2000® mark certifies their compliance with cdma2000® standards.

● Versatile Measurement System

The MT8820A Radio Communication Analyzer high-speed measurement capabilities reduce test time.
MX78760xA/20A Test System Software facilitates making measurement procedure files without difficult programming. This software will enable automating the production and testing process. Moreover, MX787610A RCA Test System Software (RCATS) enables faster measurements that are not based on the performance of the PC.

● Call Processing Function

The Call Processing Function enables the ME7876A to perform various connection tests including location registration, origination, termination, disconnection from mobile station, and disconnection from network. Also, simple voice communication tests can be performed in the communication state, enabling echo-back of the audio signal from the mobile equipment to the downlink signal.

● MX78760xA/20A Test Software

Test Software enables everyone to measure mobile equipment without knowing how to set detailed parameters or operate the MT8820A, and without familiarity with 3GPP/3GPP2 measurement methods. Also, batch measurement or specified-item measurement is easily selected and controlled by an external PC, and it is easy to make measurement result reports.

● MX787610A RCA Test System Software

RCATS reduces measurement time. The software has various functions that are important for manufacturing use, enabling it to control fixtures for mobile phones. It can also control MT8820A parallel phone measurement, which saves time and space by measuring two mobile phones at the same time.

MX78760xA/MX787620A (Test Software)

Versatile Windows-Based Interface Screens

● Main Screen Focused on Visibility and Operability

The tool bar at the top of the screen controls operation of the main screen, using icons for easy understanding. Test sequence items are displayed on the left hand side of the central pane; various detailed information is displayed in the middle of the center pane; and a graphical window appears at the right hand side of center pane (supported on W-CDMA/cdma2000 test software). Measurement results appear at the bottom of the screen. All main screen items appear in real time during the test, allowing users to confirm all the necessary information for testing.
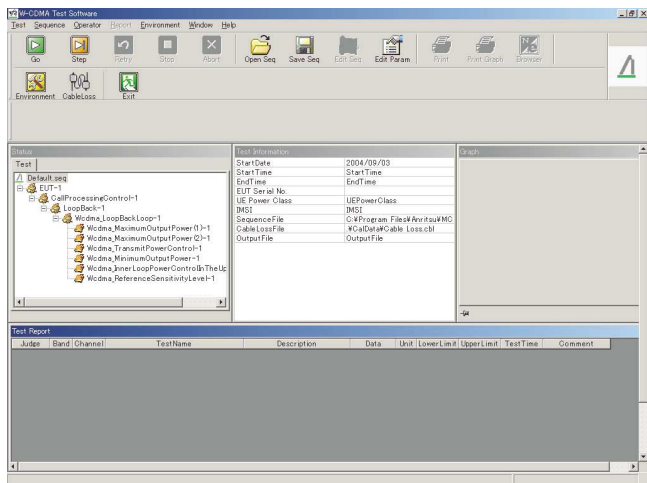

Main Screen

● Flexible Test Method

A variety of tests can be specified easily depending on each customer's needs. Examples include automated batch measurement for all test items, manual selection measurement for selected items only, and step measurement on an item-by-item basis.

● Call Processing / Serial Control Test

Test items can be selected in arbitrary frequency channels for loop-back testing or serial control testing. Continuous testing of selected items can also be performed.
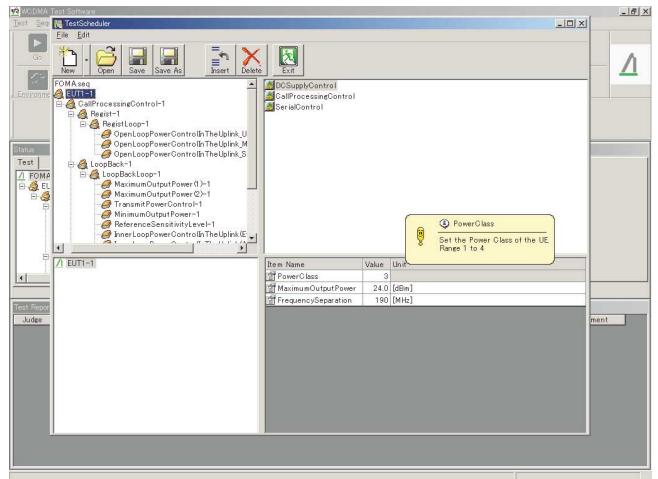
Measurement Item Setup window

● Wide Flexibility in Parameter Setup

A wide range of parameter setups is available, such as specification setup on item-by-item basis and average count setup including the test date. Testing is performed under optimum parameters depending on the model of the device under test and the purpose of the test.
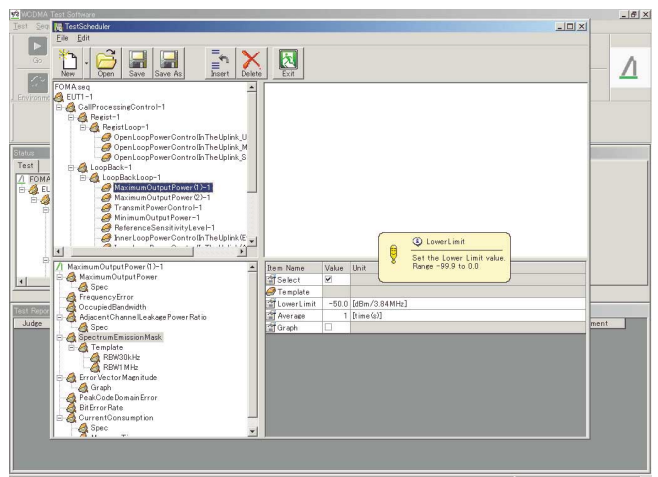
Parameter Setup window

● Test Parameter Administrative Functions

Operational conditions for testing that are changed by users can be saved to a file and recalled whenever necessary.

3

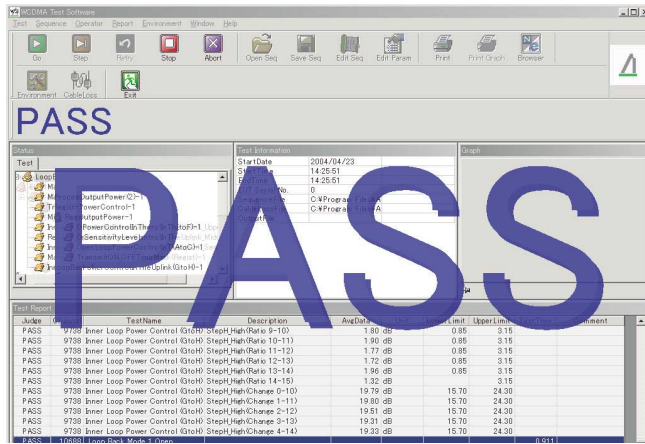## ● Evaluation Result Screen Easily Visible from a Distance

The Pass/Fail result can be confirmed even from distant points because the evaluation result is displayed in a large font over the entire screen after testing is completed for all selected items. Also, the result window at the bottom of the main screen displays detailed test results for each item.

Test PASS Screen

Test FAIL Screen

● Measured Data Administrative Functions

Measurement results acquired from this test unit can be displayed on a browser screen and printed. Various sorts of information can be stored as files, including items such as the test starting time and the input to the header portion of the measurement report.
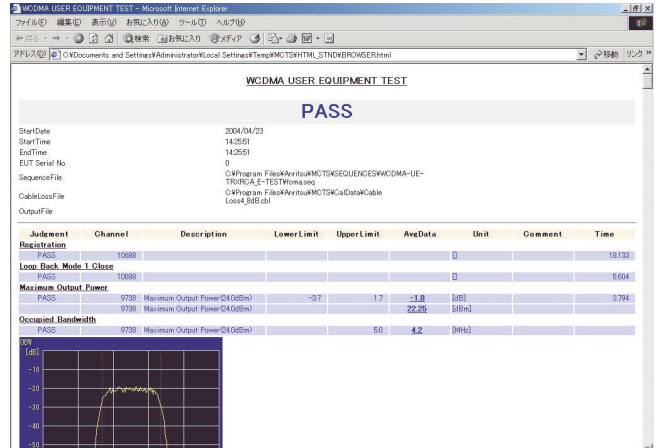
HTML Format
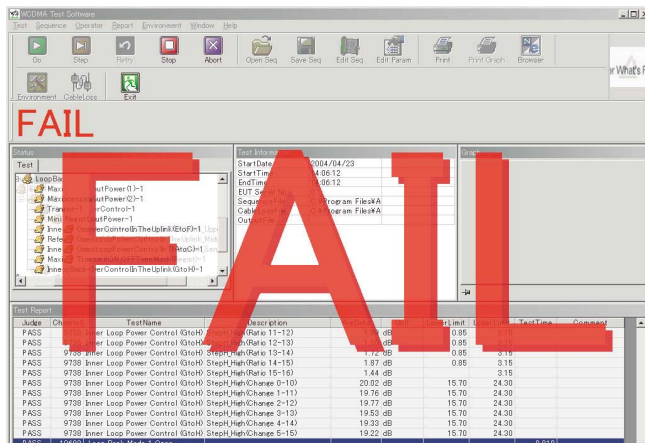
```
[Header]
Date, 2000/12/2222: 46:38
TxChannel, 1100
RxChannel, 900.00
Serial No., Fixed SN
Operator, anritsu
Antenna, 10
Select, &&&&& [TotalJudgement] Pass [TestData]
Channel, TestName,Description, Data, Unit
10550, Frequency Error,, –0.02, ppm
10550, Frequency Error,, 2109.999952, MHz
10550, Maximum Output Power,, –99.5,%
```

CSV Forms

MX787610A (RCATS) + MX78790xA
High-Speed Measurements & Easy-to-Use Operation Screen for Manufacturing

● User-Friendliness on the Product Line

Clicking one button enables the transfer of measurement procedure files created with the MX78760xA / MX787620A Test Software installed on a server PC, using a computer network. Also, it's easy to upload the measurement result files.
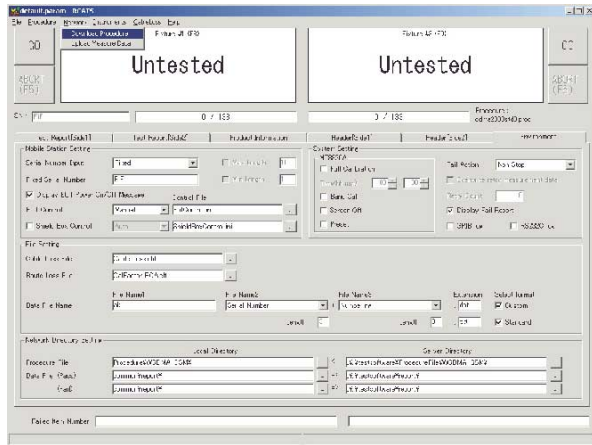
Environment Window

● Flexible System Configuration Support

Checking all the test items, the software controls 1 fixture with MT8820A single phone measurement up to 4 fixtures with parallel phone measurement. (It measures up to 2 mobile phones directly, and ME7413A external coaxial switches are necessary for controlling 4 mobile phones.)

Fixture Setting Window

● Production Lot Analysis

Selecting the Product Information tag enables checking current progress and acceptability rate on a per-lot basis. Checking the acceptability rate per fixture is useful for early detection of fixture problems.
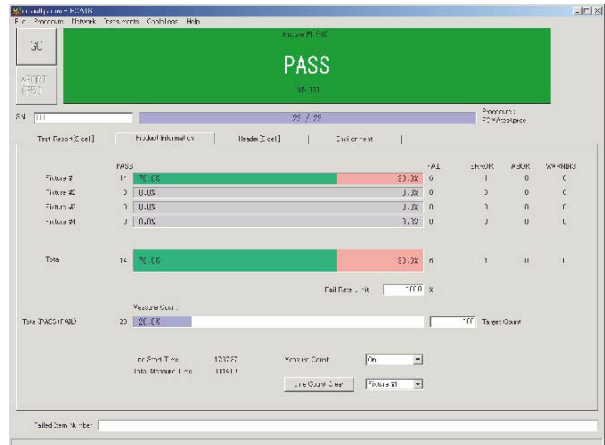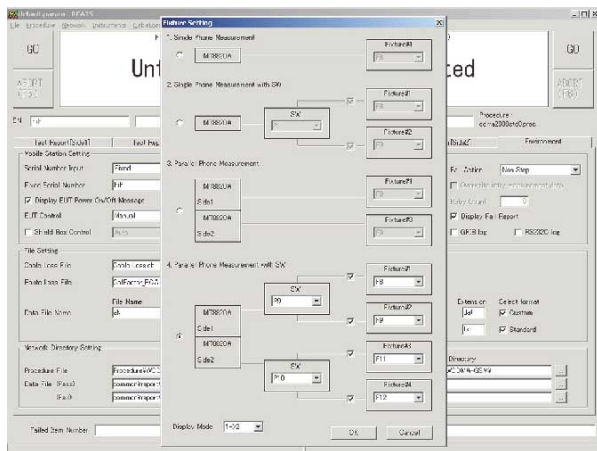
Product Information Window

● Additional Test Software Functions

If you want to set the cable loss per mobile phone, it's easy to create a cable loss file with MX787610A RCATS.
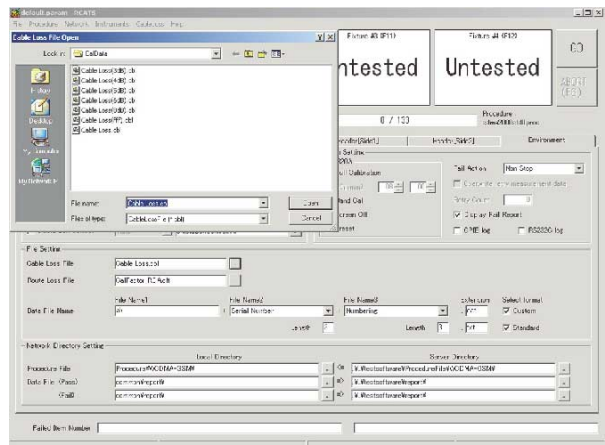
Cable Loss File Selection Window

● Automatic Route Correction with Optional Software

Installation of the optional MX787615A RCA Level Correction & Calibration Software in a production line PC enables running route correction automatically with an extra signal generator and power meter. For more information about this function, please contact our sales representatives.

Sample Connection

MX78760xA/20A Test Software

[Quality Assurance / Product Engineering]

MX78760xA/20A Test Software

MX787610A RCATS

PASS

Procedure File

[Product Line]

Result File

LAN

MX787610A RCATS
+
MX78790xA
Measurement
DLL

MX787610A RCATS
+
MX78790xA
Measurement
DLL

MX787610A RCATS
+
MX78790xA
Measurement
DLL

Shield Box

ME7413A
Coaxial Switch

ME7413A
Coaxial Switch

Shield Box

Shield Box × 4

Measurement Items

The following items can be tested with this unit.

● **W-CDMA Mobile Radio Measurement (Reference: 3GPP TS 34.121)**

No.	3GPP TS 34.121	
TRANSMITTER CHARACTERISTICS		
5.2	Maximum Output Power	✓
5.3	Frequency Error	✓
5.4.1	Open Loop Power Control in the Uplink	✓
5.4.2	Inner Loop Power Control in the Uplink	✓
5.4.3	Minimum Output Power	✓
5.4.4	Out-of-synchronisation handling of output power	–
5.5.1	Transmit OFF Power	✓
5.5.2	Transmit ON/OFF Time Mask	✓
5.6	Change of TFC	✓
5.7	Power Setting in Uplink Compressed Mode	–
5.8	Occupied Bandwidth (OBW)	✓
5.9	Spectrum Emission Mask	✓
5.10	Adjacent Channel Leakage Power Ratio (ACLR)	✓
5.11	Spurious Emissions	–
5.12	Transmit Intermodulation	–
5.13.1	Error Vector Magnitude	✓
5.13.2	Peak Code Domain Error	✓
5.13.3	UE Phase Discontinuity	✓
5.13.4	PRACH Preamble Quality	✓[*1]
RECEIVER CHARACTERISTICS		
6.2	Reference Sensitivity Level	✓
6.3	Maximum Input Level	✓
6.4	Adjacent Channel Selectivity (ACS)	–
6.5	Blocking Characteristics	–
6.6	Spurious Response	–
6.7	Intermodulation Characteristics	–
6.8	Spurious Emissions	–

∗1 : RACH sub-channel and PRACH signature are fixed values.

● **Other Tests (W-CDMA)**

Test Item	Remarks
Call Processing Test	Location registration, Origination, Termination, Disconnection from network, Disconnection from mobile station
Communication Test	Echo Back
Current Consumption Test∗	In communication state / In waiting state

∗: The measurement can be performed with recommended DC power supply.

● GSM/GPRS Mobile Radio Measurement (Reference: 3GPP TS51.010)

No.	3GPP TS 51.010	
TRANSCEIVER		
12.1	Conducted spurious emissions	–
12.2	Radiated spurious emissions	–
12.3	Conducted spurious emissions for MS supporting the R-GSM frequency band	–
12.4	Radiated spurious emissions for MS supporting the R-GSM frequency band	–
13.1	Frequency error and phase error	✓*2
13.2	Frequency error under multipath and interference conditions	–
13.3	Transmitter output power and burst timing	✓
13.4	Output RF spectrum	✓*1*2
13.6	Frequency error and phase error in HSCSD multislot configurations	–
13.7	Transmitter output power and burst timing in HSCSD configurations	–
13.8	Output RF spectrum in HSCSD multislot configuration	–
13.9	Output RF spectrum for MS supporting the R-GSM band	✓*2
13.16.1	Frequency error and phase error in GPRS multislot configuration	✓*2
13.16.2	Transmitter output power in GPRS multislot configuration	✓
13.16.3	Output RF spectrum in GPRS multislot configuration	✓*2
RECEIVER		
14.1.1	Bad frame indication - TCH/FS	–
14.1.2	Bad frame indication - TCH/HS	–
14.1.3	Bad frame indication - TCH/FS - Frequency hopping and downlink DTX - Phase 2 MS in a phase 1 network	–
14.1.4	Bad frame indication - TCH/HS - Frequency hopping and downlink DTX - Phase 2 MS in a phase 1 network	–
14.1.5	Bad frame indication - TCH/AFS (Speech frame)	–
14.1.6	Bad frame indication - TCH/AHS	–
14.2.1	Reference sensitivity - TCH/FS	✓*3
14.2.2	Reference sensitivity - TCH/HS (Speech frames)	✓*3
14.2.3	Reference sensitivity - FACCH/F	–
14.2.4	Reference sensitivity - FACCH/H	–
14.2.5	Reference sensitivity - full rate data channels	–
14.2.6	Reference sensitivity - half rate data channels	–
14.2.7	Reference sensitivity - TCH/EFS	✓*3
14.2.8	Reference sensitivity - full rate data channels in multislot configuration	–
14.2.9	Reference sensitivity - TCH/FS for MS supporting the R-GSM band	✓*3
14.2.10	Reference sensitivity - TCH/AFS	✓*3
14.2.18	Reference sensitivity - TCH/AHS	✓*3
14.2.19	Reference sensitivity - TCH/AFS-INB	–
14.2.20	Reference sensitivity - TCH/AHS-INB	–
14.3	Usable receiver input level range	✓*3
14.4.1	Co-channel rejection - TCH/FS	–
14.4.2	Co-channel rejection - TCH/HS	–
14.4.3	Co-channel rejection - TCH/HS (SID frames)	–
14.4.4	Co-cha el rejectio - FACCH/F	–
14.4.5	Co-channel rejection - FACCH/H	–
14.4.6	Co-channel rejection - TCH/EFS	–
14.4.7	Receiver performance in the case of frequency hopping and Co-channel interference on one carrier	–

No.	3GPP TS 51.010	
14.4.8	Co-channel rejection - TCH/AFS	−
14.4.16	Co-channel rejection - TCH/AHS	−
14.4.17	Co-channel rejection - TCH/AFS-INB	−
14.4.18	Co-channel rejection - TCH/AHS-INB	−
14.5.1	Adjacent channel rejection - speech channels	−
14.5.2	Adjacent channel rejection - control channel	−
14.6.1	Intermodulation rejection - speech channels	−
14.6.2	Intermodulation rejection - control channels	−
14.7.1	Blocking and spurious response - speech channels	−
14.7.2	Blocking and spurious response - control channels	−
14.7.3	Blocking and spurious response - speech channels for MS supporting the R-GSM band	−
14.7.4	Blocking and spurious response - control channels for MS supporting the R-GSM band	−
14.8.1	AM suppression – speech channels	−
14.8.2	AM suppression – control channels	−
14.9	Paging performance at high input levels	−
14.10.1	Performance of the Codec Mode Request Generation – TCH/AFS	−
14.10.2	Performance of the Codec Mode Request Generation – TCH/AHS	−
14.16.1	Minimum Input level for Reference Performance	✓*2*3
14.16.2	Co-channel rejection	−

∗1: Measurement items not supported for spectrum due to modulation at 2 MHz to 6 MHz offsets.
   Measurement items not supported for spurious emissions in the MS receive bands.
∗2: Measurement items not supported for frequency hopping.
∗3: Measurement items not supported for fading tests.

● Other Tests (GSM/GPRS)

Test Item	Remarks
Call Processing Test	GSM: Location registration, Origination, Termination, Disconnection from network, Disconnection from mobile station
	GPRS: Attach, Dettach, Connect, Disconnect
Communication Test (GSM)	Echo Back
Current Consumption Test∗	In communication and data transfer state / In waiting state

∗: The measurement can be performed with recommended DC power supply.

● EGPRS Mobile Radio Measurement (Reference: 3GPP TS 51.010)

No.	3GPP TS 51.010	
TRANSCEIVER		
13.17.1	Frequency error and Modulation accuracy in EGPRS Configuration	✓
13.17.2	Frequency error under multipath and interference conditions	–
13.17.3	EGPRS Transmitter output power	✓
13.17.4	Output RF spectrum in EGPRS configuration	✓
RECEIVER		
14.18.1	Minimum Input level for Reference Performance	✓ [*1]
14.18.2	Co-channel rejection	–
14.18.3	Adjacent channel rejection	–
14.18.4	Intermodulation rejection	–
14.18.5	Blocking and spurious response	–
14.18.6	EGPRS Usable receiver input level range	✓ [*1]
14.18.7	Incremental Redundancy Performance	–

∗1: Measurement items not supported for fading tests.

● Other Tests (EGPRS)

Test Item	Remarks
Call Processing Test	Attach, Dettach, Connect, Disconnect
Current Consumption Test∗	In data transfer state / In waiting state

∗: The measurement can be performed with recommended DC power supply.

● cdma2000 1x Mobile Radio Measurement (Reference: 3GPP2 C.S0011)

No.	3GPP2 C.S 0011	
CDMA RECEIVER MINIMUM STANDARDS		
3.1	Frequency Coverage Requirements	✓*1
3.2	Acquisition Requirements	–
3.3	Forward Common Channel Demodulation Performance	–
3.4.1	Demodulation of Forward Fundamental Channel in Additive White Gaussian Noise	✓
3.5.1	Receiver Sensitivity and Dynamic Range	✓
3.5.2	Single Tone Desensitization	–
3.5.3	Intermodulation Spurious Response Attenuation	–
3.5.4	Adjacent Channel Selectivity (ACS)	–
3.5.5	Receiver Blocking Characteristics	–
3.6.1	Conducted Spurious Emissions	–
3.6.2	Radiated Spurious Emissions	–
3.7.1	Paging Channel or Forward Common Control Channel	–
3.7.2	Forward Traffic Channel	–
CDMA TRANSMITTER MINIMUM STANDARDS		
4.1	Frequency Accuracy	✓
4.2.1	CDMA to CDMA Hard Handoff	✓*2
4.2.2	Transmit Power after Hard Handoff	–
4.3.1	Time Reference	✓*3
4.3.2	Reverse Pilot Channel to Code Channel Time Tolerance	–
4.3.3	Reverse Pilot Channel to Code Channel Phase Tolerance	–
4.3.4	Waveform Quality and Frequency Accuracy	✓
4.3.5	Code Domain Power	✓
4.4.1	Range of Open Loop Output Power	✓*4
4.4.2	Time Response of Open Loop Power Control	✓
4.4.3	Access Probe Output Power	✓
4.4.4	Range of Closed Loop Power Control	✓*5
4.4.5	Maximum RF Output Power	✓
4.4.6	Minimum Controlled Output Power	✓
4.4.7	Standby Output Power and Gated Output Power	✓*6
4.4.8	Power Up Function Output Power	–
4.4.9	Code Channel to Reverse Pilot Channel Output Power Accuracy	✓*7
4.4.10	Reverse Pilot Channel Transmit Phase Discontinuity	–
4.4.11	Reverse Traffic Channel Output Power During Changes in Data Rate	–
4.5.1	Conducted Spurious Emissions	✓*8
4.5.2	Radiated Spurious Emissions	–
4.5.3	Occupied Bandwidth (OBW)	✓

*1: Supported Band Class 0 to 10.
*2: Not supported timing measurement.
*3: Not supported Slew Rate measurement.
*4: Not supported SR1 and Enhanced Access Channel measurement.
*5: Supported that Power Control Step size is 1dB and Test1(a).
    Not supported Timing measurement.

*6: Supported Gated Output Power measurement for RC1/RC2.
    Not supported Pilot Gating/FCH Gating measurement for RC3/RC4.
*7: Not supported the test item No4.9.9.2.1.
*8: Supported spurious measurement in 4MHz offset from carrier
    frequency.

● Other Tests (cdma2000 1x)

Test Item	Remarks
Call Processing Test	Location registration, Origination, Termination, Disconnection from network, Disconnection from mobile station
Communication Test	Echo Back
Current Consumption Test*	In communication state / In waiting state

*: The measurement can be performed with recommended DC power supply.

● cdma2000 1xEV-DO Mobile Radio Measurement (Reference: 3GPP2 C.S.0033)

No.	3GPP2 C.S 0011	
RECEIVER		
3.1.1.2.1	Demodulation of Forward Traffic Channel in AWGN	✓
3.1.1.3.1	Receiver Sensitivity and Dynamic Range	✓
3.1.1.3.2	Single Tone Desensitization	−
3.1.1.3.3	Intermodulation Spurious Response Attenuation	−
3.1.1.3.4	Adjacent Channel Selectivity	−
3.1.1.4.1	Conducted Spurious Emissions	−
3.1.1.4.2	Radiated Spurious Emissions	−
TRANSMITTER		
3.1.2.1.2	Frequency Accuracy	✓
3.1.2.2.2	Waveform Quality and Frequency Accuracy	✓
3.1.2.3.1	Range of Open Loop Output Power	✓
3.1.2.3.2	Time Response of Open Loop Power Control	✓
3.1.2.3.3	Range of Closed Loop Power Control	−
3.1.2.3.4	Maximum RF Output Power	✓
3.1.2.3.5	Minimum Controlled Output Power	✓
3.1.2.3.6	Standby Output Power	✓
3.1.2.3.7	RRI Channel Output Power	✓
3.1.2.3.8	Code Domain Power	✓
3.1.2.4.1	Conducted Spurious Emissions	✓[*1]
3.1.2.4.2	Radiated Spurious Emissions	−
3.1.2.4.3	Occupied Bandwidth	✓

∗1: Spurious measurement supported within 4 MHz offset from carrier frequency.

● Other Tests (cdma2000 1xEV-DO)

Test Item	Remarks
Call Processing Test	Close session, Open session, Origination, Termination, Network disconnect, Terminal disconnect
Current Consumption Test∗	In data transfer state / In waiting state

∗: The measurement can be performed with recommended DC power supply.

Specifications

(1) MX787600A W-CDMA Test Software, MX787620A W-CDMA/GSM Test Software*1

Frequency/Modulation measurement	Frequency: 300 to 2200 MHz Input level: −30 to +35 dBm (MAIN connector) Carrier frequency accuracy: Reference oscillator accuracy + 10 Hz [after executing full calibration of MT8820A] Modulation accuracy (residual vector error): ≤2.5% (at input of 1-DPCCH and 1) [after executing full calibration of MT8820A]

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)
	               [compared to input level after executing full calibration of MT8820A]
	Linearity: ±0.2 dB (−40 to 0 dB, ≥−55 dBm), ±0.4 dB (−40 to 0 dB, ≥−65 dBm)
	               [compared to input level after executing full calibration of MT8820A]
	Measurement object: DPCH, PRACH

Occupied Bandwidth	Frequency: 300 to 2200 MHz Input level: −10 to +35 dBm (MAIN connector)
Adjacent Channel Leakage Power	Frequency: 300 to 2200 MHz Input level: −10 to +35 dBm (MAIN connector) Measurement points: ±5 MHz, ±10MHz Measurement range: ≥50 dB (at ±5 MHz), ≥55 dB(at ±10 MHz)
RF Signal Generator	Output frequency: 300 to 2200 MHz (in increments of 1 Hz step) Channel level (CPICH, P-CCPCH, SCH, PICH, DPCH, S-CCPCH, AICH): off, −30.0 to 0.0 dB [0.1 dB step, relative level for Ior (total level)] Channel level (OCNS): Auto-setting or off Channel level accuracy: ±0.2 dB (Relative level accuracy for Ior) AWGN level: Off, −20 to +5 dB (0.1 dB step) AWGN level accuracy: ±0.2 dB (Relative level accuracy for Ior)
Bit Error Rate Measurement	Functions: Insert PN9 or PN15 pattern in DTCH. Measurement items: BER, BLER Measurement object: Loop-back data imposed on up-link DTCH (BER, BLER)

Call Processing	Origination control:
	  Registration, origination, termination, handover, disconnection from network, disconnection from Mobile station
	  (executes each processing conforming to 3GPP standards and performs Pass/fail evaluation)
	Mobile station control:
	  Output level, loop-back (executes each mobile function control conforming to 3GPP standards)

*1: Applied in the case of selecting W-CDMA

(2) MX787601A GSM Test Software, MX787620A W-CDMA/GSM Test Software[*1]

Frequency / Modulation Measurement	Frequency: 300 to 2200 MHz
	Input level: −30 to +40 dBm (average power of burst signal, MAIN connector)
	Measurement items: Normal burst, RACH
	Carrier frequency accuracy: [after executing full calibration of MT8820A]
	  Reference oscillator accuracy +10 Hz at normal burst measurement
	  Reference oscillator accuracy +20 Hz at RACH measurement
	Residual phase error: ≤0.5° rms, ≤2° peak [after executing full calibration of MT8820A]

Amplitude Measurement	Frequency: 300 to 2200 MHz Input level: −30 to +40 dBm (average power of burst signal, MAIN connector) Measurement items: Normal burst, RACH Measurement accuracy: ±0.5 dB (−20 to +40 dBm), ±0.7 dB (−30 to −20 dBm) [compared to input level after executing full calibration of MT8820A] Linearity: ±0.2 dB (−40 to 0 dB, ≥−30 dBm) [compared to input level after executing full calibration of MT8820A] Carrier-off power: ≥65 dB (−10 to +40 dBm), ≥45 dB (−30 to −10 dBm) Burst waveform display: Rise, fall, time slot, burst-on

Output RF Spectrums Measurement	Frequency: 300 to 2200 MHz
	Input level: −10 to +40 dBm (average power of burst signal, MAIN connector)
	Measurement items: 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 points in transient area: ±400 kHz, ±600 kHz, ±1200 kHz, ±1800 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)

RF Signal Generator	Output frequency: 300 to 2200 MHz (in increments of 1 Hz step) Phase error: ≤1° rms, ≤4° peak Output patterns: CCH, TCH, CCH + TCH Channel coding: FS, EFS, HS0, HS1, AFS, AHS0, AHS1, CS-1, CS-2, CS-3, CS-4 TCH data: PN9, PN15, ALL 0, ALL 1, Fixed Pattern (PAT0 — PAT9) USF: 0 to 7 (at GPRS)

Error Rate Measurement	Functions: Error rate measurement of frame, bit and CRC
	Measurement items: GSM
	                  Loop-back data inserted in up-link TCH
	                  GPRS
	                  The number of blocks received from the terminal and inserted in up-link TCH
	                  The number of USF blocks received from the terminal

Call Processing	Call controlling: GSM
	                  Location registration, terminal call origination, network call origination,
	                  Network disconnect, terminal disconnect
	                  GPRS
	                  Connection, disconnection, data transfer
	Terminal controlling: GSM
	                    Output level, time slot, timing advance, loop-back on / off
	                    GPRS
	                    Test Mode A, Test Mode B, BLER
	Channel Coding: FS, EFS, HS0, HS1, AFS, AHS, CS-1, CS-2, CS-3, CS-4
	Frequency Bands: GSM450, GSM480, GSM850, P-GSM, E-GSM, R-GSM, DCS1800, PCS1900

∗1: Applied in the case of selecting GSM

(3) MX787601A-001, MX787620A-001 EGPRS Test Software

Frequency/modulation measurement	Frequency: 300 to 2200 MHz
	Input level: −30 to +40 dBm (average power of burst signal, MAIN connector)
	Measurement items: Normal burst (GMSK, 8PSK), RACH
	Carrier frequency accuracy:
	reference oscillator accuracy + 10 Hz at normal burst measurement
	reference oscillator accuracy + 20 Hz at RACH measurement
	Residual phase error (GMSK) : ≤0.5° rms, 2° peak
	Residual EVM (8PSK) : ≤1.5% rms
	Waveform display: phase error VS. bit number, Amplitude error VS. bit number, EVM VS. bit number
Amplitude measurement	Frequency: 300 to 2200 MHz
	Input level: −30 to +40 dBm (average power of burst signal, MAIN connector)
	Measurement items: Normal burst (GMSK,8PSK), 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
Output RF spectrum measurement	Frequency: 300 to 2200 MHz
	Input level: −10 to +40 dBm (average power of burst signal, MAIN connector)
	Measurement item: Normal burst (GMSK, 8PSK)
	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 measurements
	Measurement range in transient area: ≤−57 dB (≥400 kHz offset)
RF signal generator	Output frequency: 300 to 2200 MHz (in increments of 1 Hz)
	Phase error: ≤1° rms, ≤4° peak
	Modulation accuracy (8PSK): ≤3% rms
	Output patterns: OCH, TCH, OCH + TCH
	TCH data: PN9, PN15, ALL 0, ALL 1, Fixed Pattern (PAT0-PAT9)
Error rate measurement	Function: Error rate measurement of bit, CRC
	Measurement items: Loopback data inserted in uplink TCH
	The number of blocks received from the terminal and inserted in uplink TCH
Call Processing	Test Mode A, BLER, SRB Loopback
Coding scheme	MCS1-MCS4 (GMSK), MCS5-MCS9 (8PSK)
Puncturing scheme	P1, P2, P3

(4) MX787602A CDMA2000 Test 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) 　[At filtered power measurement, compared to input level after executing full calibration of MT8820A] Linearity: ±0.2 dB (–40 to 0 dB, ≥–55 dBm), ±0.4 dB (–40 to 0 dB, ≥–65 dBm) 　[At filtered power measurement, compared to input level after executing full calibration of MT8820A]
Frequency / Modulation Analysis	Frequency: 300 to 2200 MHz Input level: –30 to +35 dBm (MAIN connector) Carrier frequency accuracy: ±(reference oscillator accuracy + 10 Hz) [after executing full calibration of MT8820A] Residual waveform quality: >0.999 [after executing full calibration of MT8820A] Residual EVM: <2% rms [after executing full calibration of MT8820A]
Occupied Bandwidth	Input level: –10 to +35 dBm (MAIN connector)
Code Domain Power	In Reverse RC3, RC4 Input level: –30 to +35 dBm (MAIN connector) 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: (reference Ior) 　Pilot Channel:　　　–30 to 0 dB, 0.25 dB step or Off 　FCH, SCH, DCCH: –30 to 0 dB, 0.1 dB step or Off 　SYNCCH, PCH:　　–30 to 0 dB, 0.25 dB step or Off 　OCNS:　　　　　　Auto, 0.01 dB step or Off QPCH Channel level: (reference Pilot Channel) –5 to +2 dB, 1 dB step or Off Channel level accuracy: ±0.2 dB typ. (≥–20 dB) PN Offset: can be set up 0 to 511 Waveform quality: >0.99 (pilot only, AWGN Off) AWGN: 　AWGN level: –20 to +12 dB (relative level with a 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	FER (Frame Error Rate) measurement: Service Option 2, 9, 55 Display items: FER, Confidence Level, Sample Frame count, Error Frame count
Call Processing	Band class: BC0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Call control: Close Session, Open Session, Origination, Termination, Network disconnect, 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: SO1, 2, 3, 9, 32, 33, 55, 32768 Fwd. FCH Data Rate: Full, Half, Quarter, Eighth 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 Modes: Closed Loop, Alternate, All0(All up), All1(All down) Protocol: IS-95B, J-STD-008C, ARIB T-53, Korean PCS, IS2000(SR1) Handoff: Universal Handoff, Band Class/Channel Handoff, Protocol Revision Handoff, RC/SO Handoff, Analog Handoff

(5) MX787602A-001 1xEV-DO Test 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), ±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% rm
Occupied bandwidth	Frequency: 300 to 2200 MHz
	Input level: −10 to +35 dBm
Occupied bandwidth	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, MAC channel, Control channel, Traffic channel, all 0 dB (reference Ior)
	PN offset: Can be setup 0 to 511
	Wave quality: >0.99 (pilot only, AWGN Off)
	AWGN:
	AWGN Level: −20 to +12 dB (relative level with a 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: BC0, support to 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
	Call control: Close Session, Open Session Origination,Termination, Network disconnect, Terminal disconnect
	Rev. Closed Loop Power Control Mode: Closed Loop, Alternate, All 0 (All up), All 1 (All down)
	Test Application Protocol: support to RTAP, FTAP, FTAP + RTAP

(6) Common

DC Power Supply[*1] (Recommended spec.)	Output voltage
	  Range: DC 0 to +15 V
	  Accuracy: ± (0.05%+10 mV)
	Output current
	  Range: ≤5 A (0 to 9 V), ≤3 A (9 to 15 V)
	Recommended DC power: Keithley 2303 (Operation confirmed by Anritsu)
	                   : Keithley 2306 (for using 2CH ports with RCATS software)

Current Consumption Measurement[*2]	Measurement range: ≤5 A (0 to 9 V), ≤3 A (9 to 15 V) Accuracy: ± (0.2%+400 µA) (5 A range), ± (0.2%+1 µA) (5 mA range)

Personal Computer [*1]
 	
(recommended specifications)
	(1) MCTS
	OS: Microsoft Windows® 2000 Professional SP3 or later, Microsoft Windows® XP Professional SP1 or later
	    (MCTS version 3.1 or later for Windows® XP)
	CPU: Pentium 3 1.6 GHz or higher
	Memory: 512 Mbyte or more
	Hard disk: 1 Gbyte or more
	Resolution: XGA 1024 × 768 dots or more
	Input/Output bus: USB × 1, PCMCIA(PC card) × 1
	GPIB interface: PCMCIA-GPIB (National Instruments Corp.) or PCI-GPIB (National Instruments Corp.)
	CD-ROM: required for installing software
	
	(2) RCATS
	OS: Microsoft Windows® 2000 Professional SP3 or later, Microsoft Windows® XP Professional SP1 or later
	CPU: Pentium 3 700 MHz or higher
	Memory: 256 Mbyte or more
	Hard disk: 1 Gbyte or more
	Resolution: XGA 1024 × 768 dots or more
	Input/Output bus: USB × 1, PCMCIA(PC card) × 1
	GPIB interface: PCMCIA-GPIB (National Instruments Corp.) or PCI-GPIB (National Instruments Corp.)
	CD-ROM: required for installing software
	Parallel port: PO-32B(PCI)H (CONTEC Corp.) or PO-32B(PCI) (CONTEC Corp.)
	              (Required for using ME7876A-008 or ME7876A-009)

[*1]: Customers shall prepare DC Power Supply and Personal Computer above.
[*2]: Current consumption measurement can be performed with recommended DC power (Keithley 2303/2306).
[*3]: Windows® 2000/XP is a registered trademark of Microsoft Corporation in US and other countries.

(7) Dimensions/Mass/Power Consumption/Operating conditions (MT8820A)

Dimensions and Mass	426(W) × 221.5(H) × 498(D) mm (except protuberance), ≤27 kg (with Option 01), ≤34 kg (with all Options)
Power Supply	Power: AC100 to 120 V/200 to 240 V (–15/+15%, 250 V max.), 47.5 to 63 Hz, ≤300 VA (with Option 01), ≤600 VA (with all Options)
Operating temperature conditions	0 to +50˚C

Ordering Information

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

Model/Order No.	Name
	— Mainframe —
ME7876A	Mobile Communication Test System
	— Standard accessories —
	Test Stand License : 1 pc
	Software Key : 1 pc
W2519AE	ME7876A operation manual (CD-ROM): 1 copy
	— Configurations —
MT8820A	Radio Communication Analyzer
MT8820A-01	W-CDMA measurement hardware
MT8820A-02	TDMA measurement hardware
MT8820A-03	CDMA2000 measurement hardware
MT8820A-04	1xEV-DO measurement hardware
MX882000B	W-CDMA measurement software
MX882050A	W-CDMA Call Processing software*1
MX882051A	W-CDMA Call Processing software*1
MX882001A	GSM measurement software
MX882001A-11	EGPRS measurement software
MX882002A	CDMA2000 measurement software
MX882003A	1xEV-DO measurement software
MX787600A	W-CDMA test software
MX787601A	GSM test software
MX787602A	CDMA2000 test software
MX787620A	W-CDMA / GSM test software
MX787610A	RCA test system software
MX787900A	W-CDMA measurement DLL
MX787901A	GSM measurement DLL
MX787902A	CDMA2000 measurement DLL
MX787615A	RCA Level Correction & Calibration Software
W2637AE	MX787600/601/620/720/800A Operation Manual (CD-ROM, included with MX787600A, MX787601A and MX787620A)
W2675AE	MX787601/20A-001 Operation Manual (CD-ROM, included with MX787601A-001 and MX787620A-001)
W2525AE	MX787602A Operation Manual (CD-ROM, included with MX787602A)
W2676AE	MX787602A-001 Operation Manual (CD-ROM, included with MX787602A-001)
W2529AE	MX787610A Operation Manual (CD-ROM, included with MX787610A)
W2531AE	MX787615A Operation Manual (CD-ROM, included with MX787615A)

Model/Order No.	Name
	— Options —
ME7876A-008	1 × 2 measurement function (required MX787610A, ME7413A)
ME7876A-009	2 × 2 measurement function (required MX787610A, ME7413A)
ME7876A-080	1 × 2 measurement function setup (required ME7876A-008)
ME7876A-090	2 × 2 measurement function setup (required ME7876A-009)
ME7876A-010	MCTS Platform Version Upgrade
MX787601A-001	EGPRS Test Software
MX787602A-001	1xEV-DO Test Software
MX787620A-001	EGPRS Test Software
	— Application parts —
J0576B	Coaxial cord (N-P - 5D-2W - N-P), 1 m
J0576D	Coaxial cord (N-P - 5D-2W - N-P), 2 m
J0007	GPIB Cable, 1 m
J0008	GPIB Cable, 2 m
ME7413A	Coaxial switch
J1174	4 branch cable (attached to ME7876-008/009A)
J1279	KU-1818-084 (attached to ME7876-008/009A)

*1: For W-CDMA terminal connectivity, contact your Anritsu sales representative.

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/Inritsu

Specifications are subject to change without notice.

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