

For MT8820C Radio Communication Analyzer

MX882007C TD-SCDMA Measurement Software

MX882007C-011 TD-SCDMA HSDPA Measurement Software

MX882007C-012 TD-SCDMA HSDPA Evolution Measurement Software

MX882007C-021 TD-SCDMA HSUPA Measurement Software



for TD-SCDMA/HSPA/ HSDPA Evolution

All-in-one Solution Supporting TD-SCDMA Terminal Development and Manufacturing

The MT8820C Radio Communication Analyzer with MX882007C TD-SCDMA Measurement Software offer powerful support for the R&D and manufacturing phases of 3G TD-SCDMA mobile terminals (1.28 Mcps TDD) now making good market progress mainly in China. Evaluation of the mobile RF characteristics is easy because 3GPP-compliant Tx and Rx measurements of TD-SCDMA mobiles are fully supported and optional support for HSDPA*¹ permits throughput tests too. Then, it supports uplink high speed communication for TD-SCDMA HSUPA*² and can test RF measurement. In addition, built-in functions support voice connections and two-way voice tests as well as audio tests*³ providing easy voice evaluation. Videophone functions*⁴ are also supported. One-touch settings for 3GPP-compliant testing, and automation of complex tests, such as Closed loop power control (CLPC), Out-of-sync handling make manual operation easy. Moreover, executing selected Tx and Rx test items sequentially using the Test Plan function permits batch testing and evaluation using just one MT8820C without a PC controller. When the optional MX882001C GSM Measurement Software is installed, one unit supports call processing and all the main Tx and Rx characteristics tests for dual TD-SCDMA/GSM mobile terminals entering service soon. Terminal manufacturing and inspection test times are greatly reduced by running multiple Tx and Rx measurements in parallel, and even greater time savings can be made at handover from TD-SCDMA to GSM systems*⁵. Downlink signal and fast power measurement at terminal RF adjustment are supported and the built-in GPIB and Ethernet interface simplifies incorporation into automated production lines as well as configuration of automatic maintenance evaluation systems. This full range of powerful and versatile functions for cutting test times makes the MT8820C the perfect solution for developing and manufacturing TD-SCDMA terminals.

*1: Require MX882007C-011 TD-SCDMA HSDPA Measurement Software.
 *2: Require MX882007C-021 TD-SCDMA HSUPA Measurement Software.
 *3: Require MX882007C-001 TD-SCDMA Voice Codec.
 *4: Require MX882007C-003 TD-SCDMA Video Phone Test.
 *5: Require MX882001C GSM Measurement Software.

Test	3GPP TS 34.122* ⁶	Test Item
Transmitter Tests	5.2	User Equipment maximum output power
	5.3	UE frequency stability
	5.4.1.3	Open loop power control (1.28 Mcps TDD Option)
	5.4.1.4	Closed loop power control (1.28 Mcps TDD Option)
	5.4.2	Minimum output power
	5.4.3	Transmit OFF power
	5.4.4	Transmit ON/OFF Time mask
	5.4.5	Out-of-synchronisation handling of output power for continuous transmission
	5.4.6	Out-of-synchronisation handling of output power for discontinuous transmission
	5.5.1	Occupied bandwidth
	5.5.2.1	Spectrum emission mask
	5.5.2.2	Adjacent Channel Leakage power Ratio (ACLR)
	5.7.1	Error Vector Magnitude
5.7.2	Peak code domain error	
Receiver Tests	6.2	Reference sensitivity level
	6.3	Maximum Input Level
Performance Test	7.2* ⁷	Demodulation in static propagation conditions

*6: Ver. 11.5.0, Only 1.28 Mcps TDD

*7: Support Test1 (12.2 kbps) only

MX882007C TD-SCDMA Measurement Software

TD-SCDMA Terminal Tx and Rx Measurements with Call Processing

The MX882007C TD-SCDMA Measurement Software supports TD-SCDMA terminals (1.28 Mcps TDD) in the frequency range from 300 MHz to 2.7 GHz (UARFCN: 1500 to 13500) not only are the current band supported, but any new bands within this frequency will be supported easily.

Frequency Band (currently TS 34.122 Ver. 11.8.0)

Operating Band	Uplink/Downlink [MHz]	UARFCN
a	1900 to 1920	9504 to 9596
	2010 to 2025	10054 to 10121
b	1850 to 1910	9254 to 9546
	1930 to 1990	9654 to 9946
c	1910 to 1930	9554 to 9646
d	2570 to 2620	12854 to 13096
e	2300 to 2400	11504 to 11996
f	1880 to 1920	9404 to 9596

Voice, Test-loop (RMC 12.2 kbps) Call processing, and all main Tx and Rx test items

[Transmitter Measurement]

- Transmit power
- Power template
- Frequency error
- Occupied bandwidth
- Spectrum emission mask
- Adjacent channel leakage power ratio
- Modulation accuracy
- Peak code domain error
- Open loop power control
- Closed loop power control
- Out-of-sync handling of output power

[Receiver Measurement]

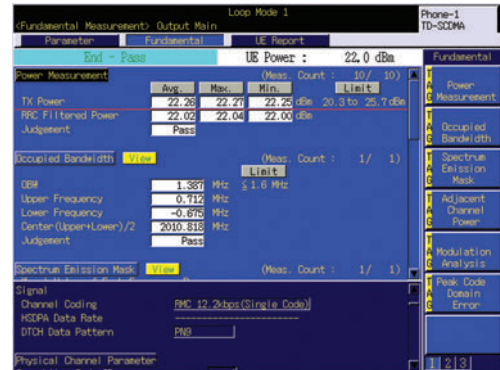
- Bit error rate (BER)
- Block error rate (BLER)

The both mobile terminal report monitor and spectrum monitor functions are supported.

Transmitter Measurement

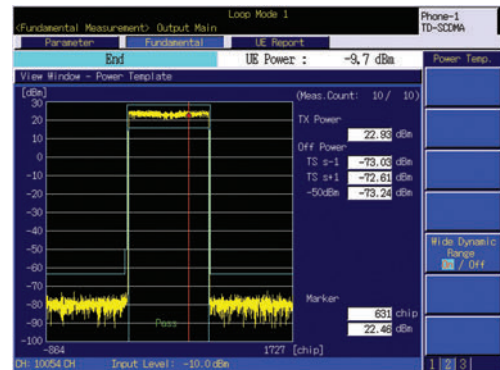
Transmit Power

This measures the transmit power TD-SCDMA terminals under max., min. or any arbitrary power conditions. Both Single Code and Multi Code RMC 12.2 kbps connections are supported and can be switched during call processing.



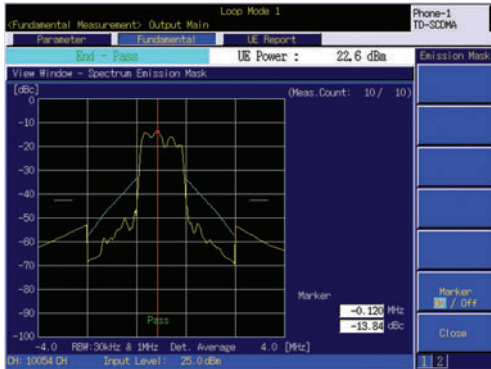
Power Template

This evaluates the TD-SCDMA terminal burst-waveform off power and rising/falling template Pass/Fail conformance, which can be displayed as a graph too. Using the wide dynamic range function displays the on-to-off burst waveform at maximum output on a single screen.



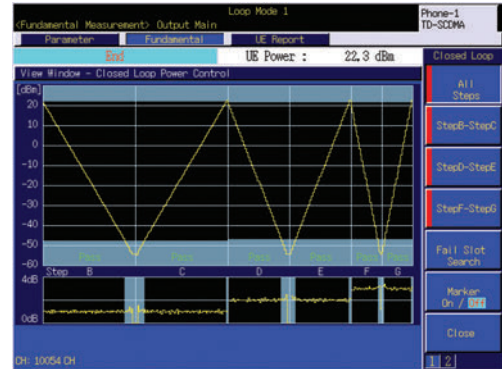
Spectrum Emission Mask

This evaluates the TD-SCDMA terminal spectrum emission mask conformance to check whether or not the spectrum within ± 4.0 MHz of the center frequency satisfies the 3GPP standards. Both the worst value and mask margin in each frequency range can be displayed.



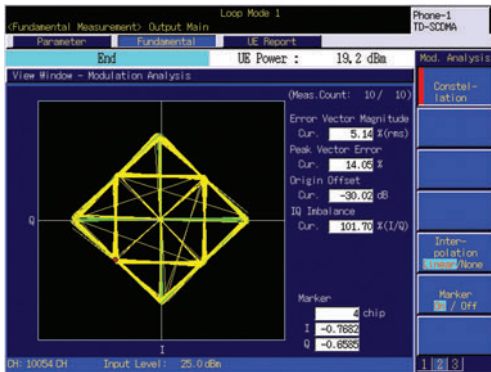
Closed Loop Power Control (CLPC)

This measurement sends a TPC (power control) bit stream to the TD-SCDMA terminal to monitor and Pass/Fail evaluate the transmit power response on the measurement screen. Automated measurement makes 3GPP-compliant testing easy and the Fail Slot Search function simplifies Fail location as well.



Modulation Analysis

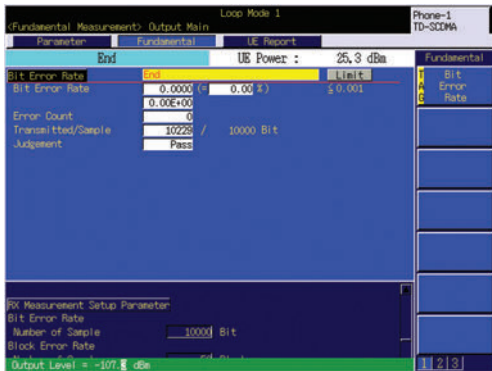
This performs TD-SCDMA terminal modulation measurements such as error vector magnitude (EVM), phase error, magnitude error, origin offset, IQ Imbalance and waveform quality (Rho). EVM, phase error, amplitude, and constellation graphs are supported too.



Receiver Measurement

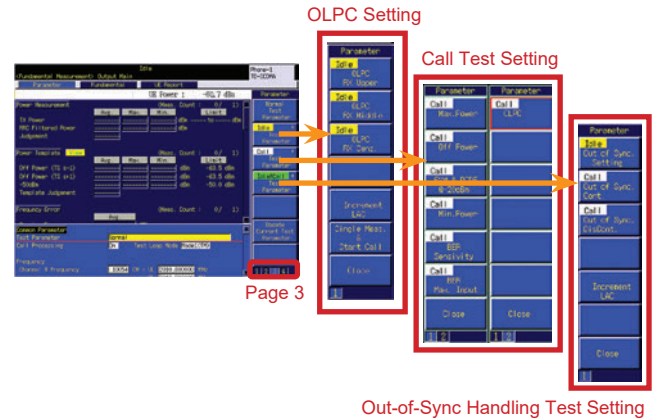
Bit Error Rate (BER)

3GPP-compliant BER Measurement using Test Loop Mode.

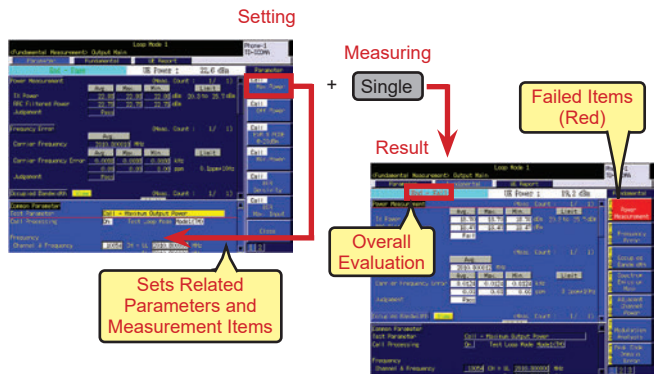


One-touch Setting of Tx/Rx Test Item

Settings for 3GPP-compliant main Tx and Rx tests are made by one-touch operation. Evaluation starts when measurement is completed by pressing "Single", continuously, allowing even novices to perform accurate measurements successfully. In addition, control programs can be created simply and test speed can be faster using relevant GPIB commands.



For example, pressing **Call Power** automatically sets related parameters controlling the mobile terminal maximum output level, and measurement items. After measurement, overall evaluation, Pass and Fail items (displayed in red) can be seen at a glance.



One-touch 3GPP TS 34.122 Settings

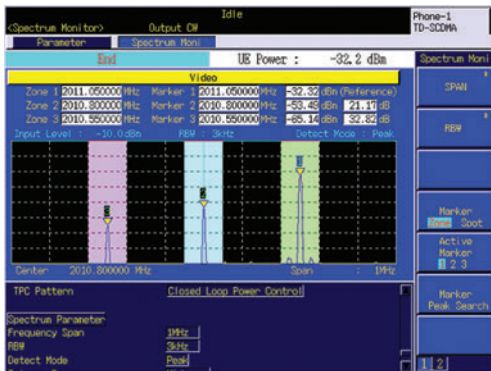
Mobile Terminal Report Monitor

This function monitors the power class reported from the TD-SCDMA terminal and the Primary CCPCH level received at the terminal.



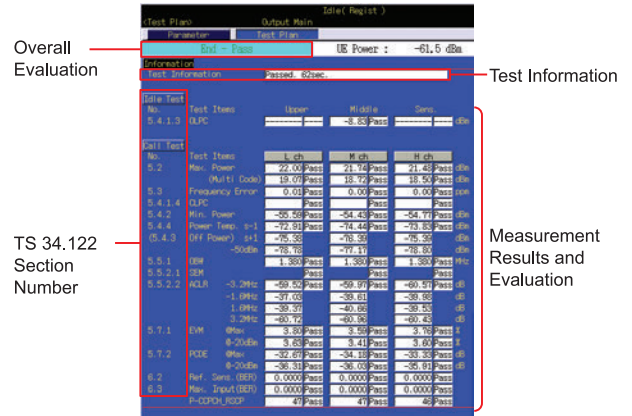
Spectrum Monitor

This function monitors the spectrum of the RF signal in the center frequency $\pm 12.5, 2.5, 0.5, 0.125$ MHz range. Three markers and the zone/spot mode make it easy to compare peak search levels for adjusting terminal IQ and carrier leak.



Test Plan

This one-touch function runs 3GPP-compliant test items, including call processing, as a batch to display each measurement result and perform Pass/Fail evaluation of the whole test sequence. In addition, easy on-screen test sequence editing supports execution and evaluation using a single MT8820C, eliminating the need for an external PC controller.



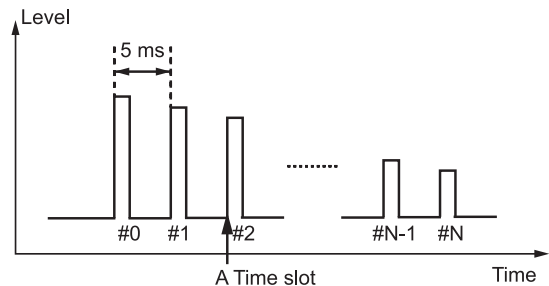
Intersystem Handover Control

RF Adjustment Function

The Downlink RF Signal Generation function for terminal RF adjustment without call processing is supported, and the Multi power Measurement Function for speedy Tx output level adjustment cuts RF adjustment times.

Multi Power Measurement

The Multi Power Measurement provides fast adjustment of transmitter output level of the TD-SCDMA terminal in synchronization with the chipset adjustment function. The MT8820C measures the Tx powers of each power level from the TD-SCDMA terminal in a single sweep.

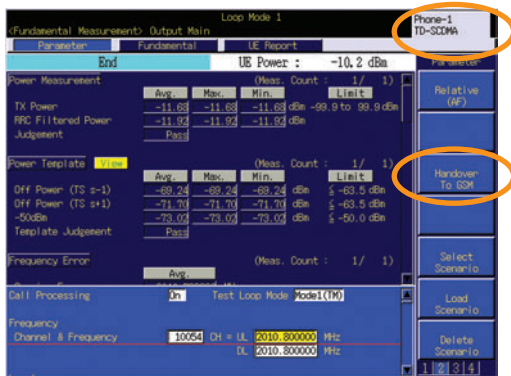
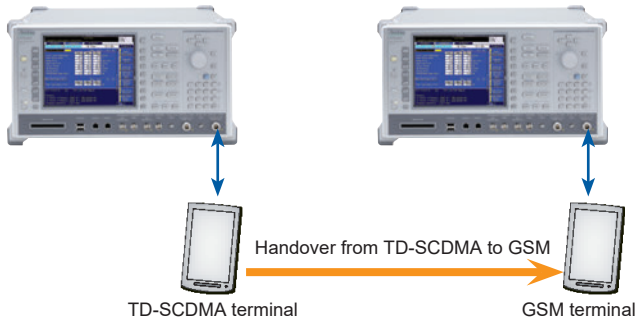


Higher Productivity

Reducing Test Time for TD-SCDMA/GSM Dual-mode Terminals

Intersystem Handover Control

Both the TD-SCDMA and GSM Tx and Rx characteristics of dual-mode TD-SCDMA/GSM terminals can be measured and voice handover from TD-SCDMA to GSM can be tested using the intersystem handover function, because the MT8820C application software switches quickly while the dual-mode terminal is handing over.



TD-SCDMA Measurement (Test loop mode or Voice communications)

High-speed system change
from TD-SCDMA to GSM



GSM Measurement (Loopback mode or Voice communications)

* Requires MT8820C-002 + MX882001C.

MX882007C-001 TD-SCDMA Voice Codec

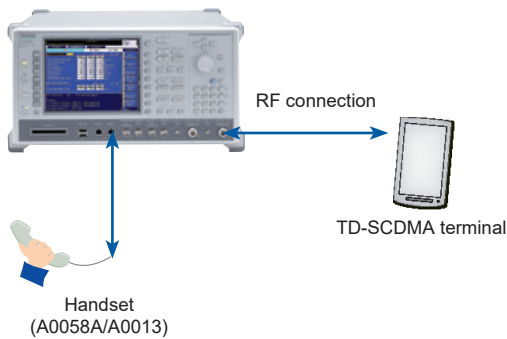
Real-time Voice Encoding/Decoding and Audio Measurement Functions

The MX882007C-001 TD-SCDMA Voice Codec supports real-time voice encoding and decoding in software, so end-to-end communication with terminals can be tested by installing this option and the MT8820C-011 Audio Board option. In addition, the audio transmitter and receiver can be tested while calling.

End-to-End Communications Test

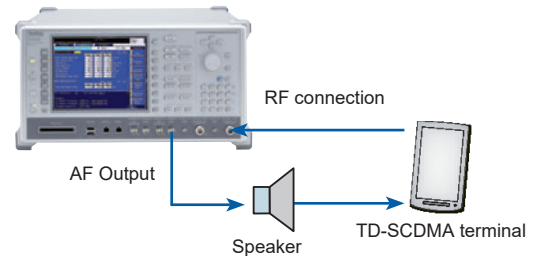
This supports the end-to-end communications test between an Anritsu handset (A0058A/A0013) connected to the RJ11 connector on the MT8820C and a TD-SCDMA terminal.

This option supports voice tests by dividing Tx and Rx paths.



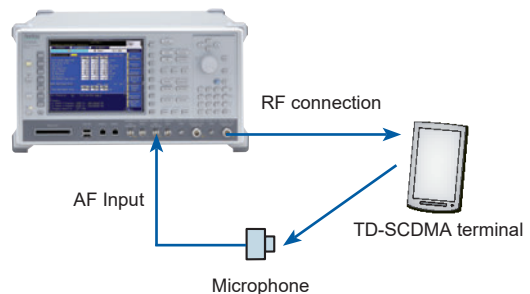
Audio Transmitter Measurement

The tone signal from the MT8820C AF Output connector is supplied to the microphone of the TD-SCDMA terminal and the audio transmitter characteristics of the TD-SCDMA terminal can be measured using the MT8820C to demodulate the uplink RF signal and measure the level, frequency, and distortion of demodulated tone signal.



Audio Receiver Measurement

The tone signal demodulated by the TD-SCDMA terminal is supplied to the MT8820C AF Input connector and the audio receiver characteristics of the TD-SCDMA terminal can be measured by using the MT8820C to measure the level, frequency, and distortion of the tone signal at the AF Input.



* Requires MT8820C-001, MT8820C-007, MT8820C-011, MX882007C, and MX882007C-001.

MX882007C-003 TD-SCDMA Video Phone Test

Videophone Loopback/End-to-End Test

The MX882007C-003 TD-SCDMA Video Phone Test supports end-to-end videophone tests between TD-SCDMA terminals by using the Ethernet port on the rear panel of the MT8820C and video loopback test using one TD-SCDMA terminal. When the ParallelPhone option is installed in the MT8820C, end-to-end videophone tests are supported using one MT8820C.

Videophone Loopback Test

When a videophone is connected, this function loops the video call data received by the MT8820C back to the terminal, supporting videophone test using one TD-SCDMA terminal.

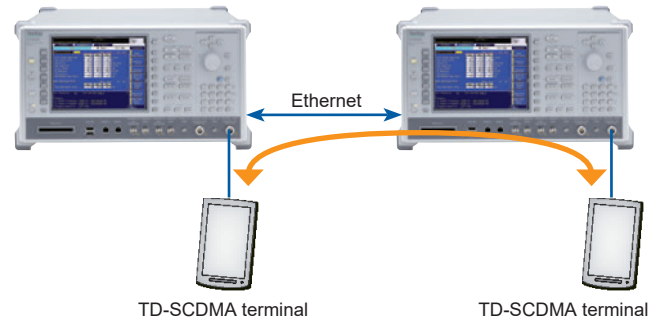


TD-SCDMA terminal

Videophone Loopback Configuration

End-to-End Videophone Test

End-to-end videophone tests between two TD-SCDMA terminals are executed via the Ethernet port on the rear panel of the MT8820C. When the ParallelPhone option is installed in the MT8820C, end-to-end videophone tests are supported using one MT8820C.



End-to-end Videophone Test Setup using Two MT8820C units



End-to-end Videophone Test Setup using One MT8820C
(when MT8820C configured for Parallelphone measurement)

* Requires MT8820C-001, MT8820C-007, MX882007C, and MX882007C-003.

MX882007C-011 TD-SCDMA HSDPA Measurement Software

Utilizing an Advanced High-speed Measuring Method and Offering Batch Measurements to Support TD-SCDMA HSDPA Terminal Production

The MX882007C-011 TD-SCDMA HSDPA Measurement Software supports call processing, Throughput measurements, and CQI (Channel Quality Indicator) functions for HSDPA terminals. The related 3GPP standards are listed below.

Test	3GPP TS 34.122*1	Test Item
Transmitter Test	5.2B	User Equipment maximum output power with HS-SICH and DPCH
	5.5.2.1B	Spectrum emission mask
	5.5.2.2B	Adjacent Channel Leakage power Ratio (ACLR) with HS-SICH and DPCH
	5.7.1B	Error Vector Magnitude with HS-SICH and DPCH
Receiver Test	6.3A	Maximum Input Level for HS-PDSCH Reception (16QAM)
Performance Tests	9.3.1	HS-DSCH throughput for Fixed Reference Channels*2
	9.3.2	HS-DSCH throughput for Variable Reference Channels*2
	9.3.3	Reporting of HS-DSCH Channel Quality Indicator*2
	9.3.4	HS-SCCH Detection Performance*2

*1: Ver. 11.5.0

*2: Fading not supported

Throughput tests for both Reference Measurement Channel (RMC) signals supporting all HSDPA categories and for maximum data rate (2.8 Mbps) category-15 are supported.

The signals for HSDPA throughput measurement are listed in the table below.

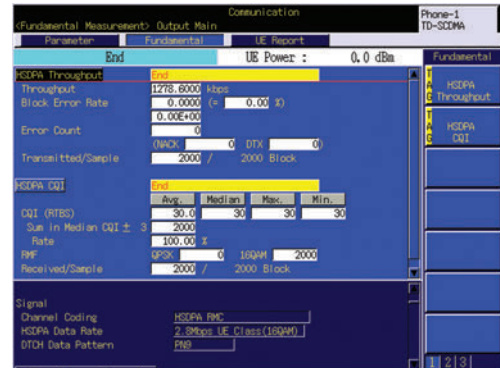
Parameter (HSDPA Data Rate)	Max. Data Rate	HS-DSCH Category	Modulation	Remarks
0.5 Mbps UE Class (QPSK)	199.2 kbps	1/2/3	QPSK	RMC
1.1 Mbps UE Class (QPSK)	199.2 kbps	4/5/6	QPSK	RMC
1.1 Mbps UE Class (16QAM)	578.6 kbps	4/5/6	16QAM	RMC
1.6 Mbps UE Class (QPSK)	357.4 kbps	7/8/9	QPSK	RMC
1.6 Mbps UE Class (16QAM)	634.6 kbps	7/8/9	16QAM	RMC
2.2 Mbps UE Class (QPSK)	539 kbps	10/11/12	QPSK	RMC
2.2 Mbps UE Class (16QAM)	782.2 kbps	10/11/12	16QAM	RMC
2.8 Mbps UE Class (QPSK)	621 kbps	13/14/15	QPSK	RMC
2.8 Mbps UE Class (16QAM)	1278.6 kbps	13/14/15	16QAM	RMC
Category 12, Max	2224.8 kbps	12	16QAM	Max. Data Rate
Category 15, Max	2808.6 kbps	15	16QAM	Max. Data Rate
Category 15, 4slot	2158.4 kbps	15	16QAM	—
Category 15, 4slot QPSK	621 kbps	15	QPSK	—
Category 15, 4slot 16QAM	1278.6 kbps	15	16QAM	—

* Requires MT8820C-001, MT8820C-007, MX882007C, and MX882007C-011.

Receiver Measurement

HSDPA Throughput/CQI Measurement

The HSDPA throughput can be measured by counting the number of ACK blocks from the HSDPA terminal. And statistical analysis can be performed on CQI values reported by the HSDPA terminal.



MX882007C-012 TD-SCDMA HSDPA Evolution Measurement Software

RF Measurement of TD-SCDMA HSDPA Evolution Terminal

The MX882007C-012 TD-SCDMA HSDPA Evolution Measurement Software supports call processing, Throughput measurements, and CQI functions for HSDPA terminals.

Throughput tests for both Reference Measurement Channel (RMC) signals supporting all HSDPA categories and for maximum data rate (4.2 Mbps) category-24 are supported.

The signals for HSDPA throughput measurement are listed in the table below.

Parameter (HSDPA Data Rate)	Max. Data Rate	HS-DSCH Category	Modulation	Remarks
Category 16-18 UE (64QAM)	1249.6 kbps	16/17/18	64QAM	RMC
Category 19-21 UE (64QAM)	1697.6 kbps	19/20/21	64QAM	RMC
Category 22-24 UE (64QAM)	2046.4 kbps	22/23/24	64QAM	RMC
Category 18, Max	2526.4 kbps	18	64QAM	Max. Data Rate
Category 21, Max	3371.2 kbps	21	64QAM	Max. Data Rate
Category 24, Max	4214.4 kbps	24	64QAM	Max. Data Rate

Receiver Measurement

HSDPA Throughput/CQI Measurement

The HSDPA throughput can be measured by counting the number of ACK blocks from the HSDPA terminal. And statistical analysis can be performed on CQI values reported by the HSDPA terminal.

* Requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011, and MX882007C-012.

MX882007C-021 TD-SCDMA HSUPA Measurement Software

Transmitter Measurement and Performance Measurement of TD-SCDMA HSUPA Terminal

The MX882007C-021 HSUPA Measurement Software supports Tx measurements of HSUPA terminals. It can generate the signals used for testing HSUPA terminals with RMC category 1 to 6 (2.23 Mbps UE Class).

Test	3GPP TS 34.122*1	Test Item
Transmitter Test	5.2A	User Equipment maximum output power with E-DCH
	5.5.2.1A	Spectrum emission mask
	5.5.2.2A	Adjacent Channel Leakage power Ratio (ACLR) with E-DCH
	5.7.1A	Error Vector Magnitude with E-DCH16QAM
Performance Tests	11.1	Detection of E-DCH HARQ ACK Indicator Channel (E-HICH)*2
	11.2	Demodulation of E-DCH Absolute Grant Channel (E-AGCH)*2

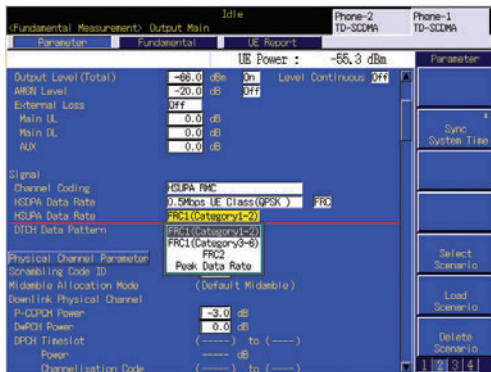
*1: Ver. 11.5.0

*2: Fading not supported

HSUPA Parameter

HSUPA RF Tx Measurement Signals

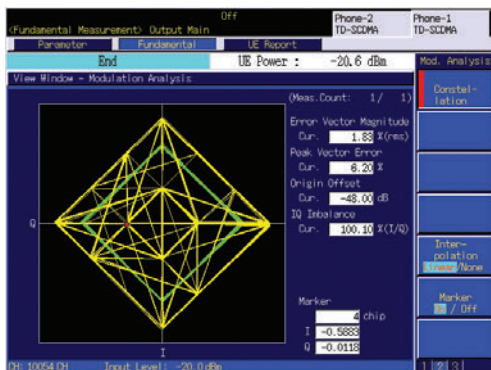
Categories 1 to 6 can be selected as Data Rates including HSUPA RMC signal for Tx measurements of HSUPA terminal.



Transmitter Measurement

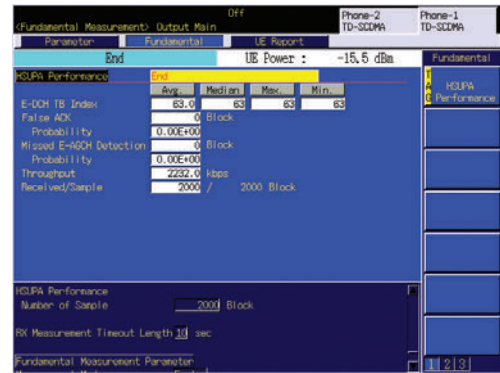
Modulation Analysis

This performs TD-SCDMA HSUPA terminal modulation measurements such as error vector magnitude (EVM), magnitude error, phase error, origin offset, and constellation graphs are supported too.



Performance Measurement

HSUPA performance measurement is calculated using the information about bit rate by detecting E-DCH TB (Transport Block size) Index included E-UCCH sent from the mobile terminal to MT8820C.



Specifications

* Typical values are for reference only; specifications are not guaranteed.

• MT8820C-001 W-CDMA Measurement Hardware, MT8820C-007 TD-SCDMA Measurement Hardware, MX882007C TD-SCDMA Measurement Software

Modulation Analysis	Frequency: 300 MHz to 2.7 GHz Input level: -30 to +35 dBm (Main) Carrier frequency accuracy: \pm (Setting frequency \times Reference oscillator accuracy + 10 Hz) Modulation accuracy (residual vector error): $\leq 2.5\%$ (when Single Code is input)
RF Power	Frequency: 300 MHz to 2.7 GHz Input level: -70 to +35 dBm (Main) Measurement accuracy: ± 0.3 dB (typ.), ± 0.5 dB (-25 to +35 dBm), ± 0.7 dB (-55 to -25 dBm), ± 0.9 dB (-70 to -55 dBm) *After calibration, 10° to 40°C Linearity: ± 0.2 dB (-40 to 0 dB, ≥ -55 dBm), ± 0.4 dB (-40 to 0 dB, ≥ -65 dBm) Measurement object: DPCH, UpPCH
Occupied Bandwidth	Frequency: 300 MHz to 2.7 GHz Input level: -10 to +35 dBm (Main)
Adjacent Channel Leakage Power Ratio	Frequency: 300 MHz to 2.7 GHz Input level: -10 to +35 dBm (Main) Ratio measurement points: ± 1.6 MHz, ± 3.2 MHz Measurement range: ≥ 50 dB (± 1.6 MHz), ≥ 55 dB (± 3.2 MHz)
RF Signal Generator	Output frequency: 300 MHz to 2.7 GHz (1 Hz step) Channel level (DPCH): -30 to 0 dB [0.1 dB step, relative level for Ior (total level)] Channel level accuracy: ± 0.2 dB (relative level accuracy for Ior) AWGN level: Off, -20 to +5 dB [0.1 dB step, relative level for Ior (total level)] AWGN level accuracy: ± 0.2 dB (relative level accuracy for Ior)
Error Rate Measurement	Functions: Insert PN9 or PN15 pattern in DTCH Measurement items: BER, BLER Measurement objective: Loopback data imposed on uplink DTCH (BER, BLER)
Call Processing	Origination controlling: Registration, Origination, Termination, Network disconnect, Terminal disconnect, Handover (executes each processing conforming to 3GPP standards and performs Pass/Fail evaluation) Mobile terminal controlling: Output level, Loopback (executes each mobile terminal control conforming to 3GPP standards)

• MT8820C-011 Audio Board, MX882007C-001 TD-SCDMA Voice Codec

Voice Codec	AMR 12.2 kbps
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 Carrier frequency accuracy: \pm (Setting frequency \times Reference oscillator accuracy + 0.1 Hz) Setting range: 0 to 5 Vpeak (AF Output) Setting resolution: 1 mV (≤ 5 Vpeak), 100 μ V (≤ 500 mVpeak), 10 μ V (≤ 50 mVpeak) Accuracy: ± 0.2 dB (≥ 10 mVpeak, ≥ 50 Hz), ± 0.3 dB (≥ 10 mVpeak, < 50 Hz) Waveform distortion: ≤ 30 kHz band ≤ -60 dB (≥ 500 mVpeak, ≤ 5 kHz), ≤ -54 dB (≥ 70 mVpeak) Output impedance: $\leq 1 \Omega$ Max. output current: 100 mA
AF Input	Frequency range: 50 Hz to 10 kHz Input voltage range: 1 mVpeak to 5 Vpeak (AF Input) Max. allowable input voltage: 30 Vrms Input impedance: 100 k Ω
Frequency Measurement	Accuracy: \pm (Reference oscillator accuracy + 0.5 Hz)
Level Measurement	Accuracy: ± 0.2 dB (≥ 10 mVpeak, ≥ 50 Hz), ± 0.4 dB (≥ 1 mVpeak, ≥ 1 kHz)
SINAD Measurement	Frequency: 1 kHz ≥ 60 dB (≥ 1000 mVpeak), ≥ 54 dB (> 50 mVpeak), ≥ 46 dB (≥ 10 mVpeak)
Distortion Rate Measurement	Frequency: 1 kHz ≤ -60 dB (≥ 1000 mVpeak), ≤ -54 dB (> 50 mVpeak), ≤ -46 dB (≥ 10 mVpeak)

• MX882007C-003 TD-SCDMA Video Phone Test

Channel Coding	Audio&Visual
Maximum Transfer	64 kbps

• **MT8820C-001 W-CDMA Measurement Hardware, MT8820C-007 TD-SCDMA Measurement Hardware, MX882007C-011 TD-SCDMA HSDPA Measurement Software**

Reference Channel	Transferring RMC 0.5 Mbps UE Class (QPSK), RMC 1.1 Mbps UE Class (QPSK), RMC 1.1 Mbps UE Class (16QAM), RMC 1.6 Mbps UE Class (QPSK), RMC 1.6 Mbps UE Class (16QAM), RMC 2.2 Mbps UE Class (QPSK), RMC 2.2 Mbps UE Class (16QAM), RMC 2.8 Mbps UE Class (QPSK), and RMC 2.8 Mbps UE Class (16QAM)
Throughput Measurement	Functions: Transmit HS-SCCH, HS-PDSCH based on Fixed Reference Channel Measurement items: Throughput Measurement object: ACK and NACK data imposed on uplink HS-SICH
CQI Measurement	Measurement object: Periodically reported CQI value applied to HS-SICH
Call Processing	Origination controlling: Registration, Call processing for Fixed Reference Channel (executes each processing conforming to 3GPP standards and performs Pass/Fail evaluation) Mobile terminal controlling: Output level (executes each mobile terminal control conforming to 3GPP standards)

• **MT8820C-001 W-CDMA Measurement Hardware, MT8820C-007 TD-SCDMA Measurement Hardware, MX882007C-012 TD-SCDMA HSDPA Evolution Measurement Software**

Reference Channel	Transferring RMC Category 16-18 UE (64QAM), RMC Category 19-21 UE (64QAM), RMC Category 22-24 UE (64QAM), RMC Category 18 Max, RMC Category 21 Max, and RMC Category 24 Max
Throughput Measurement	Function: Transferring HS-SCCH and HS-PDSCH according to fixed reference channel Measurement item: Throughput Measurement object: ACK and NACK applied to HS-SICH
CQI Measurement	Measurement object: Periodically reported CQI value applied to HS-SICH
Call Processing	Call control: Location registration, Fixed reference channel (Execution of the operation conforming to the 3GPP standard and pass/fail judgment can be performed.) UE control: Output level (UE control conforming to the 3GPP standard can be performed.)

• **MT8820C-001 W-CDMA Measurement Hardware, MT8820C-007 TD-SCDMA Measurement Hardware, MX882007C-021 TD-SCDMA HSUPA Measurement Software**

Modulation Analysis	Dependent on the performance of MX882007C (when HSUPA RMC Code is input)
Call Processing	Origination controlling: Registration, Call processing for FRC1, FRC2 (executes each processing conforming to 3GPP standards and performs Pass/Fail evaluation) Mobile terminal controlling: Output level (executes each mobile terminal control conforming to 3GPP standards)

Ordering Information

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

Model/Order No.	Name	Model/Order No.	Name
MT8820C	Main frame Radio Communication Analyzer	MX882010C	Parallel Phone Measurement Software*5 [requires MT8820C-012, the two same measurement hardware (2 board/set) and one measurement software]
	Standard accessories	MX882012C	LTE FDD Measurement Software*2 (requires MT8820C-008)
	Power Cord: 1 pc	MX882012C-006	LTE FDD IP Data Transfer*2 (requires MX882012C)
	CF Card: 1 pc	MX882012C-011	LTE FDD 2x2 MIMO DL*2, *6 (requires MT8820C-012 and MX882012C)
	PC Card Adapter (For CF card): 1 pc	MX882012C-016	LTE FDD CS Fallback to W-CDMA/GSM*7 (requires MX882012C)
W3320AE	MT8820C Operation Manual (CD-ROM): 1 pc	MX882012C-021	LTE-Advanced FDD DL CA Measurement Software*2, *8 (requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, and MX882012C)
	Options	MX882012C-026	LTE-Advanced FDD DL CA IP Data Transfer*9 (requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882012C, MX882012C-006, MX882012C-021)
MT8820C-017	Extended RF Hardware*1	MX882012C-031	LTE-Advanced FDD DL CA 3CCs Measurement Software*2, *10 (requires MT8820C 2 sets. One is required MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882012C and MX882012C-021. The other is required MT8820C-008, MX882012C.)
MT8820C-001	W-CDMA Measurement Hardware	MX882013C	LTE TDD Measurement Software*2 (requires MT8820C-008)
MT8820C-002	TDMA Measurement Hardware	MX882013C-006	LTE TDD IP Data Transfer*2 (requires MX882013C)
MT8820C-007	TD-SCDMA Measurement Hardware	MX882013C-011	LTE TDD 2x2 MIMO DL*2, *6 (requires MT8820C-012 and MX882013C)
MT8820C-008	LTE Measurement Hardware	MX882013C-016	LTE TDD CS Fallback to W-CDMA/GSM*11 (requires MX882013C)
MT8820C-011	Audio Board	MX882013C-018	LTE TDD CS Fallback to TD-SCDMA/GSM*11 (requires MX882013C)
MT8820C-012	Parallel Phone Measurement Hardware	MX882013C-021	LTE-Advanced TDD DL CA Measurement Software*2, *8 (requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, and MX882013C)
MT8820C-018	Extended RF 3.4 GHz to 3.8 GHz (requires MT8820C-017, MT8820C-119, or MT8820C-120)	MX882013C-026	LTE-Advanced TDD DL CA IP Data Transfer*9 (requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882013C, MX882013C-006, MX882013C-021)
MT8820C-101	W-CDMA Measurement Hardware Retrofit	MX882013C-031	LTE-Advanced TDD DL CA 3CCs Measurement Software*2, *10 (requires MT8820C 2 sets. One is required MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882013C, MX882013C-006, MX882013C-021. The other is required MT8820C-008, MX882013C.)
MT8820C-102	TDMA Measurement Hardware Retrofit	MX882032C	CDMA2000 Measurement Software Lite*2
MT8820C-107	TD-SCDMA Measurement Hardware Retrofit	MX882036C	1xEV-DO Measurement Software Lite*2
MT8820C-108	LTE Measurement Hardware Retrofit	MX882036C-011	1xEV-DO Rev. A Measurement Software*2
MT8820C-111	Audio Board Retrofit	MX882042C	LTE FDD Measurement Software Lite*2
MT8820C-112	Parallel Phone Measurement Hardware Retrofit	MX882043C	LTE TDD Measurement Software Lite*2
MT8820C-119	Extended RF Hardware for SPM Retrofit	MX882050C	W-CDMA Call Processing Software*2, *12 (requires MX882000C)
MT8820C-120	Extended RF Hardware for PPM Retrofit	MX882050C-002	W-CDMA External Packet Data*2 (requires MX882050C)
MT8820C-177	TD-SCDMA Measurement Retrofit (requires MT8820C-001)	MX882050C-003	W-CDMA Video Phone Test*2 (requires MX882050C)
	Software options	MX882050C-007	W-CDMA Band XII, XIII, XIV, XIX, XX, XXI*2, *13 (requires MX882050C)
MX882000C	W-CDMA Measurement Software (requires MT8820C-001 and MX88205xC)	MX882050C-008	W-CDMA Band XI*2 (requires MX882050C)
MX882000C-001	W-CDMA Voice Codec (requires MT8820C-011 and MX882000C)	MX882050C-009	W-CDMA Band IX*2 (requires MX882050C)
MX882000C-011	HSDPA Measurement Software (requires MT8820C-001, MX882000C, and MX882050C)	MX882050C-011	HSDPA External Packet Data*2 (requires MX882000C-011)
MX882000C-013	HSDPA High Data Rate (requires MT8820C-001, MX882000C, MX882000C-011, and MX882050C)	MX882051C	W-CDMA Call Processing Software*2 (requires MX882000C)
MX882000C-021	HSUPA Measurement Software (requires MT8820C-001, MX882000C, MX882000C-011, and MX882050C)	MX882051C-002	W-CDMA External Packet Data*2 (requires MX882051C)
MX882000C-031	HSPA Evolution Measurement Software*2 (requires MT8820C-001, MX882000C, MX882000C-011, MX882000C-021, and MX882050C)	MX882051C-003	W-CDMA Video Phone Test*2 (requires MX882051C)
MX882000C-032	DC-HSDPA Measurement Software*2, *3 (requires MT8820C-001 (2 sets), MT8820C-012, MX882000C, MX882000C-011, MX882000C-021, MX882000C-031, MX882010C, and MX882050C)	MX882070C	W-CDMA Ciphering Software*2 (requires MX882050C)
MX882000C-033	DC-HSUPA Measurement Software*2, *4 (requires MT8820C-001 (2 sets), MT8820C-012, MX882000C, MX882000C-011, MX882000C-021, MX882000C-031, MX882000C-032, MX882010C, MX882050C)	MX882071C	W-CDMA Ciphering Software*2 (requires MX882051C)
MX882000C-034	4C-HSDPA Measurement Software*2, *4 (requires MT8820C-001 (2 sets), MT8820C-012, MX882000C, MX882000C-011, MX882000C-021, MX882000C-031, MX882000C-032, MX882010C, MX882050C)		Warranty
MX882001C	GSM Measurement Software (requires MT8820C-002)	MT8820C-ES210	2 years Extended Warranty Service
MX882001C-001	GSM Voice Codec (requires MT8820C-011 and MX882001C)	MT8820C-ES310	3 years Extended Warranty Service
MX882001C-002	GSM External Packet Data (requires MX882001C)	MT8820C-ES510	5 years Extended Warranty Service
MX882001C-011	EGPRS Measurement Software (requires MX882001C)		Application parts
MX882001C-041	GSM High-speed Adjustment (requires MX882001C)	P0035B	W-CDMA/GSM Test USIM
MX882005C	PHS Measurement Software (requires MT8820C-002)	P0035B7	W-CDMA/GSM Test USIM*14
MX882005C-011	Advanced PHS Measurement Software (requires MX882005C)	P0135A6	Anritsu Test UICC GA (Nano UICC size)*15
MX882007C	TD-SCDMA Measurement Software (requires MT8820C-001 and MT8820C-007)	P0135A7	Anritsu Test UICC GA (Micro UICC size)*15
MX882007C-001	TD-SCDMA Voice Codec (requires MT8820C-011 and MX882007C)	P0250A6	Anritsu Test UICC GT (Nano UICC size)*15
MX882007C-003	TD-SCDMA Video Phone Test (requires MX882007C)	P0250A7	Anritsu Test UICC GT (Micro UICC size)*15
MX882007C-011	TD-SCDMA HSDPA Measurement Software*2 (requires MT8820C-001, MT8820C-007, and MX882007C)	P0260A6	Anritsu Test UICC GM (Nano UICC size)*15
MX882007C-012	TD-SCDMA HSDPA Evolution Measurement Software*2 (requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011)	P0260A7	Anritsu Test UICC GM (Micro UICC size)*15
MX882007C-021	TD-SCDMA HSUPA Measurement Software*2 (requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011)	P0135B6	Anritsu Test UICC GA (Nano UICC size)*15
		P0135B7	Anritsu Test UICC GA (Micro UICC size)*15
		P0250B6	Anritsu Test UICC GT (Nano UICC size)*15
		P0250B7	Anritsu Test UICC GT (Micro UICC size)*15
		P0260B6	Anritsu Test UICC GM (Nano UICC size)*15
		P0260B7	Anritsu Test UICC GM (Micro UICC size)*15
		A0058A	Handset

Model/Order No.	Name
J1195A J1249	PP2S Output Cable CDMA2000 Cable [D-Sub (15 pin, P-type) · D-Sub (15 pin, P-type), used in combination with J1267 (sold separately)]**16
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)]
J1606A	Cable*16
J0576B	Coaxial Cord, 1 m (N-P · 5D-2W · N-P)
J0576D	Coaxial Cord, 2 m (N-P · 5D-2W · N-P)
J0127A	Coaxial Cord, 1 m (BNC-P · RG58A/U · BNC-P)
J0127C	Coaxial Cord, 0.5 m (BNC-P · RG58A/U · BNC-P)
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)
B0643A	Rack Mount Kit (MT8820C)
B0499	Carrying Case (Hard type) (with protective cover and casters)
B0499B	Carrying Case (Hard type) (with protective cover, without casters)

*1: MT8820C-017 has been a standard option that MT8820C are shipped with until July 2012 (Simultaneous order is required MT8820C and MT8820C-017).

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

*3: MX882000C-032 is required a Parallelphone measurement configuration of W-CDMA HSPA Evolution.

For use MT8820C 2 units, contact your Anritsu sales representative.

*4: MX882000C-033 (034) is required W-CDMA DC-HSDPA configuration.

*5: The following measurement hardware supports the Parallelphone measurement option: MT8820C-001, MT8820C-002, MT8820C-007, MT8820C-008.
All the measurement hardware can be installed simultaneously.

*6: MX882012C-011 is required MT8820C-012.

*7: The MX882012C-016 LTE FDD CS Fallback to W-CDMA/GSM requires a separate MT8820C with the W-CDMA/GSM configuration. Contact your Anritsu sales representative for the CS Fallback function test configuration.

*8: MX882012C (12C)-021 is required a Parallelphone measurement configuration of LTE FDD (TDD).

For Use MT8820C 2 units, contact your Anritsu sales representative.

*9: MX882012C (13C)-026 function test is required external server PCs (2 sets).
LTE Advanced FDD (TDD) DL CA IP Data Transfer (2CCs, 2Layer) is required MT8820C LTE 2x2 MIMO DL configuration (2 sets) and external server PCs (2 sets).

*10: One is required LTE FDD (TDD) ParallelPhone Configuration.

The other is required LTE FDD Single Phone Configuration.

For use MT8820C 3 units, contact your Anritsu sales representative.

A synchronized cable is required too.

*11: The MX882013C-016 (018) LTE TDD CS Fallback to W-CDMA/GSM (TD-SCDMA/GSM) requires a separate MT8820C with the W-CDMA/GSM (TD-SCDMA/GSM) configuration. Contact your Anritsu sales representative for the CS Fallback function test configuration.

*12: These options preinstall the integrity protection function.

*13: MX882050C-007 supports W-CDMA Band 12, 13, 14, 19, 20, 21.

*14: The P0035B7 MicroSIM is a cut-down P0035B W-CDMA/GSM Test USIM. The P0035B7 Test USIM is a microSIM. It CANNOT be used in a normal size USIM card slot. A commercial SIM adapter CANNOT be used with the P0035B7. If used, it may jam and break in the terminal.

*15: Refer to the P0135Ax/P0250Ax/P0260Ax leaflet for details.

*16: J1267 (J1606A) cable can use for LTE-Advanced DLCA synchronized cable.
Contact your Anritsu sales representative for details.

• 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).