/Anritsu

For MT8820C Radio Communication Analyzer

MX882005C
PHS Measurement Software

MX882005C-011
Advanced PHS Measurement Software

Solution for PHS Terminals and Base Stations Production Lines

The MX882005C PHS Measurement Software supports transmitter and receiver measurements of PHS mobile terminals now spreading worldwide centered on Asia, including Japan.
Installing the MX882005C PHS Measurement Software in one MT8820C main frame supports evaluation of major transmitter and receiver characteristics of PHS terminals and base stations. Advanced DSP and parallel measurement technologies greatly reduce manufacturing and test times for PHS terminals and base stations.
In addition, multiple measurement items can be selected freely for batch processing, while the number of repeat measurements can be set for each individual measurement.
At PHS measurement, selected items can be batch-measured by one touch for quick and simple Pass/Fail evaluation of major items, such as transmit frequency, modulation accuracy, transmit power, adjacent channel power and BER.
The standard GPIB and Ethernet interface allows the MT8820C to be built into automated production lines and test systems at service and repair depots.
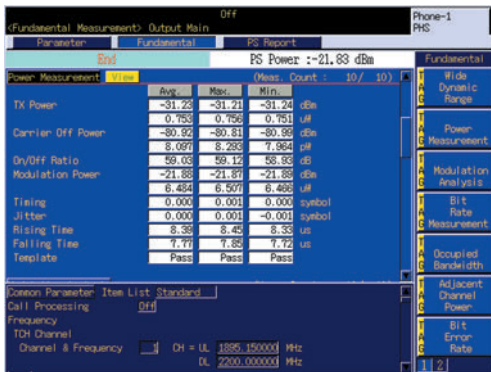
● PHS Measurement

Transmitter Tests	Output Power
	Modulation Accuracy
	Occupied Bandwidth
	Adjacent Channel Power
	Transmission Rate
Receiver Tests	Bit Error Ratio

MX882005C PHS Measurement Software

## Transmitter Measurement

Transmit Power

The RF power and carrier-off leakage power of PHS terminals and base stations are measured and the max., average and min. values are displayed by setting the number of repeat measurements to 2 or more, so variations in PHS terminal characteristics can be assessed.
This repeat measurement function is also supported for other measurements.

Normal Measurement

Wide Dynamic Range Mode

The absolute value and On/Off ratio of carrier-off leakage power are measured. When the carrier-off level is low, measurement can be performed in the wide dynamic range mode.
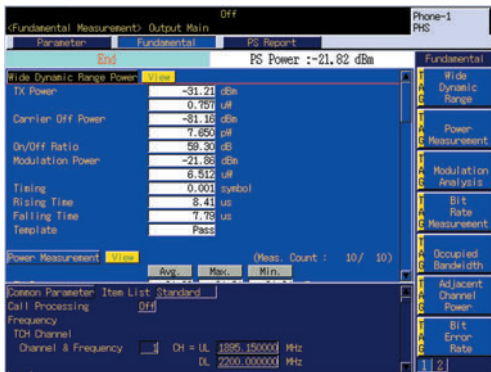

Wide Dynamic Range Mode

Modulation Accuracy

The frequency, frequency errors (kHz and ppm), modulation accuracy, phase error, amplitude error and origin offset of PHS terminals and base stations are measured simultaneously. A waveform display function is also provided.
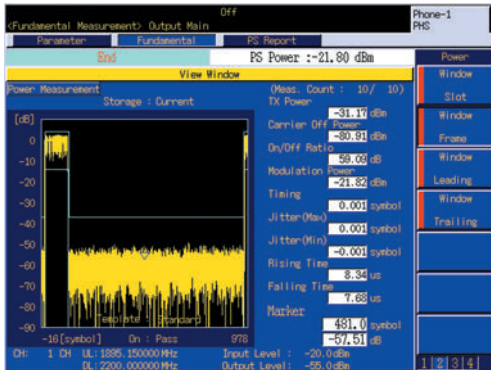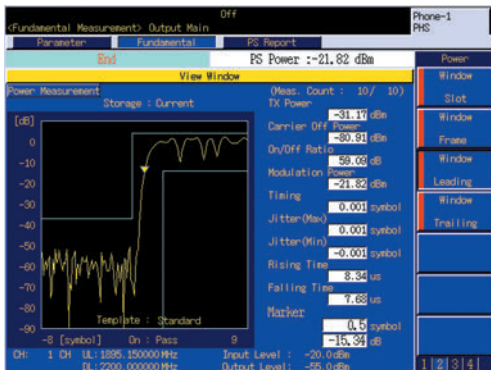
Burst Waveform Display

The burst waveform can be displayed graphically.
Magnified display of the entire time slot and whole frame as well as the rising/falling edges enables users to easily check whether or not the burst waveform meets the PHS standard template.
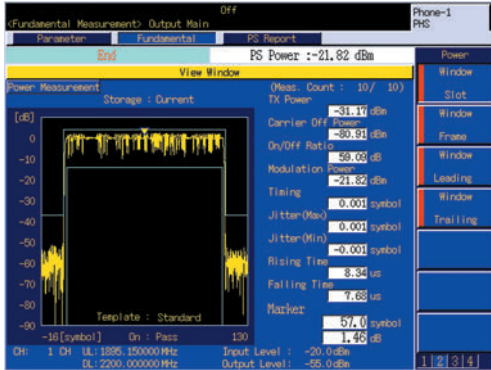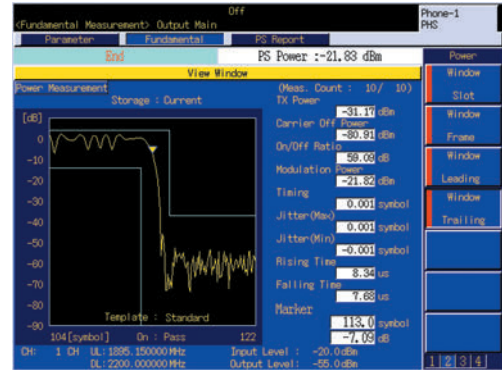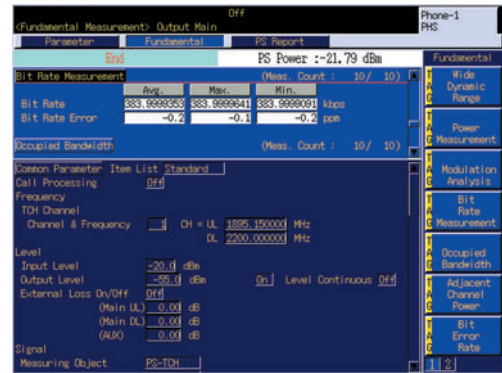

Entire Time Slot

Whole Frame

**Rising Edge**

Falling Edge

Transmission Rate

Transmission rate and transmission speed error of PHS terminals and base stations can be measured.

Occupied Bandwidth

Occupied bandwidth of PHS terminals and base stations is measured.
The bandwidth ratio for total power can be changed within the range of 80.0 to 99.9%. Measurements can be performed in the high-speed mode. Waveform can be displayed in the normal mode.
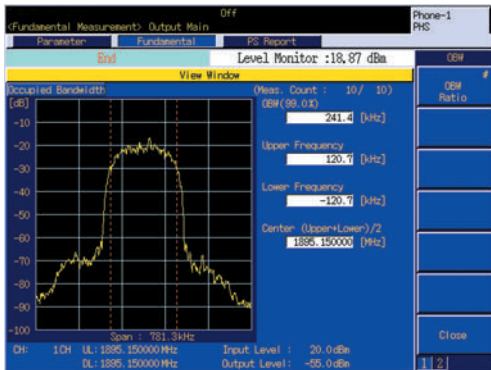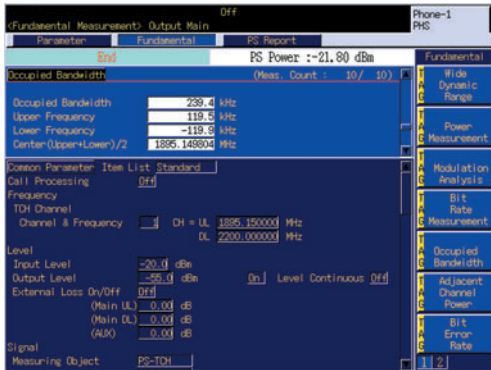
Adjacent Channel Power

The adjacent channel power of PHS terminals and base stations is measured. The power spectrum is measured at four frequency points (–900, –600, +600 and +900 kHz) offset from the carrier frequency. Advanced DSP technology and parallel processing of the power spectrum with other measurements enable high-speed measurement. And the waveforms can be displayed too.
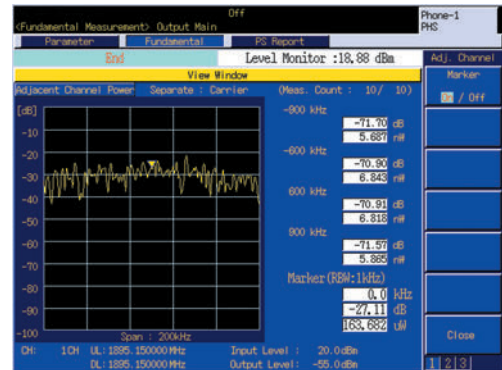
Receiver Measurement

Bit Error Rate (BER)

The bit error rate can be measured on receipt of demodulation data and clocks output from a PHS terminal/base station by controlling the PHS terminal with an external PC etc.
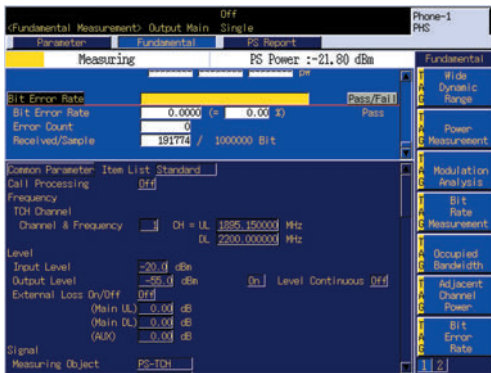
This measurement can be performed in parallel with transmitter measurement.

Bit Error Rate

Connection with DUT

TRx Measurement

∗: Provide by user

Call Processing Function

Connection Test

The call processing function supports various connection tests, including location registration, terminal call origination, network call origination, call communication, network disconnection, terminal disconnection, and handover.

During a call, the user's voice can be echoed back from the PHS terminal to provide a simple voice communication test.

Mobile Terminal Report Monitor

Mobile terminal information reported by a PHS terminal is displayed on the screen. This information includes the identification code (PS-ID) and phone number of the PHS terminal, as well as the dial network number.

Sequence Monitor

The functions of a PHS terminal can be operated and verified using the call processing function. The MT8820C simulates the PHS base station and displays the sequence screen, so Pass/Fail results of the connection test for location registration, call origination, call termination, communication, handover (for THC switch type), network disconnection, terminal disconnection, etc., can be checked at a glance.

Transmitter Test in Communication State
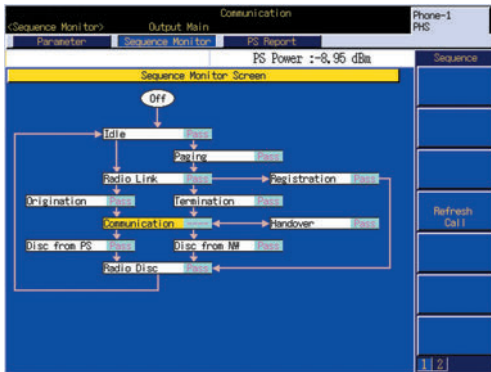
A transmission test can be performed in the communication state. As well as conducting evaluations during actual communications with the base station, transmission measurement can be performed regardless of restrictions on test controls, which vary with carrier and manufacturer.
This function greatly improves production and maintenance efficiency.

Measurement Result Evaluation Function

The upper and lower limits of the normal value can be specified for each item and Pass/Fail can be displayed for measurement results. This function is useful for identifying faults at service centers and repair depots.

for Advanced PHS

Advanced High-speed and Batch Measurement Methods Supporting Advanced PHS Base Station Production Lines

The MX882005C-011 Advanced PHS Measurement Software∗ is a software option to enable Advanced PHS measurements in compliance with the PHS measurement specification (ARIB RCR-STD-28 edition 5.0). It evaluates the transmitter and receiver characteristics of Advanced PHS terminals and base stations. Transmitter and receiver measurement is accomplished by installing the MX882005C-011 Advanced PHS Measurement Software in the MT8820C main frame and selecting the required modulation method from π/4DQPSK, 8PSK, and 16QAM.

∗: Requires MT8820C-002 and MX882005C

• Advanced PHS Measurement

Transmitter Tests	Output Power
	Modulation Accuracy
	Occupied Bandwidth
	Adjacent Channel Power
	Transmission Rate
Receiver Tests	Bit Error Ratio
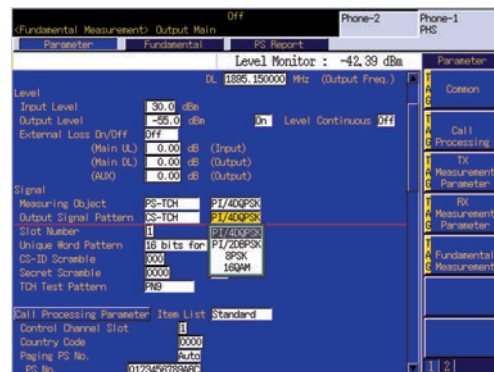
Modulation Type Select Pop-up Window
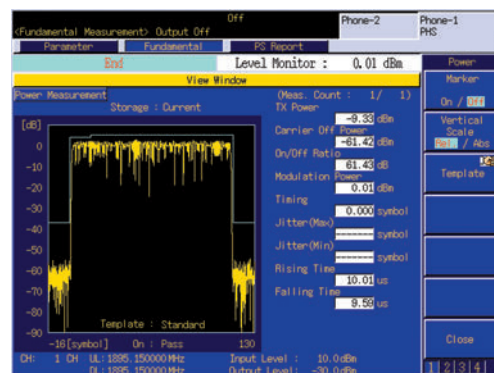
Burst Waveform (Entire Time Slot: 8PSK)

MX882005C-011 Advanced PHS Measurement Software

Transmitter Measurement

Modulation Accuracy

The frequency, frequency errors (kHz and ppm), modulation accuracy, phase error, amplitude error, and origin offset of Advanced PHS terminals and base stations are measured simultaneously.
A waveform display function is also provided.

The output power, wide dynamic range mode, burst waveform display, transmission rate, occupied bandwidth and adjacent channel power operations are similar to the MX882005C.

Receiver Measurement

Bit Error Rate (BER)

The bit error rate can be measured on receipt of demodulation data and clocks output from an Advanced PHS terminal/base station by controlling the PHS terminal with an external PC etc.
This measurement can be performed in parallel with transmission measurement.

Bit Error Rate (8PSK)

Call Processing Function

Connection Test

The call processing function enables various connection tests including location registration, terminal call origination, network call origination, call communication, network disconnection, terminal disconnection, and handover.
The added π/2DBPSK voice communication function is based on the existing PHS standard (ARIB RCR-STD-28, π/4DQPSK modulation). During a call, the user's voice can be echoed back from the advanced PHS terminal to provide a simple voice communication test.

The mobile terminal report monitor, sequence monitor, transmission test in communication state, and measurement result evaluation operations are similar to the MX882005C.

Specifications

• MT8820C-002 TDMA Measurement Hardware, MX882005C PHS Measurement Software

Frequency/Modulation	Frequency: 300 MHz to 2.7 GHz Input level (Average power within burst, Main): 　−30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) 　−30 to +35 dBm (Measurement object: Continuous wave) Carrier frequency accuracy: ± (setting frequency x accuracy of the reference oscillator + 10 Hz) Modulation accuracy: ± (2% of indicated value + 0.7%) Origin offset accuracy: ±0.5 dB to signal level of −30 dBc Transmission rate: ±1 ppm (Measurement range 384 kbps ±100 ppm)
Amplitude measurement	Frequency: 300 MHz to 2.7 GHz Input level (Average in-burst power, Main): 　−30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) 　−30 to +35 dBm (Measurement object: Continuous wave) Measurement accuracy (After calibration): ±0.5 dB (−20 to +40 dBm), ±0.7 dB (−30 to −20 dBm) ∗After calibration, 10° to 40°C Linearity: ±0.2 dB (−40 to 0 dB, ≥ −30 dBm) Carrier-off power measurement range: 　≥55 dB 　≥ (Magnitude measurement value [dBm] + 70) dB, (Wide dynamic range power measurement)
Occupied bandwidth	Frequency: 300 MHz to 2.7 GHz Input level (Average in-burst power, Main): 　−10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) 　−10 to +35 dBm (Measurement object: Continuous wave)
Adjacent channel power	Frequency: 300 MHz to 2.7 GHz Input level (Average in-burst power, Main): 　−10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) 　−10 to +35 dBm (Measurement object: Continuous wave) Measurement range: ≤−60 dB (600 kHz offset), ≤−65 dB (900 kHz offset)
RF signal generator	Output frequency: 300 MHz to 2.7 GHz, 1 Hz step Modulation accuracy: ≤3% rms Modulation data: PN9, PN15
Error rate	Function: Bit error rate measurement Measurement object: Serial data inputted from the Call Proc. I/O terminal of a rear panel
Call processing	Call control: Location registration, Call origination, Call termination, Call communication, Network disconnection, 　　　　　Terminal disconnection, Handover

• MT8820C-002 TDMA Measurement Hardware, MX882005C-011 ADVANCED PHS Measurement Software

Measurement object	The specifications are the same as for the MX882005C. The measurement objects are as follows:. Measurement object: 　PS-TCH (π/4DQPSK, π/2DBPSK, 8PSK, 16QAM) 　PS-SYNC (π/4DQPSK, π/2DBPSK) 　PS-SCCH (π/2DBPSK) 　CS-TCH (π/4DQPSK, π/2DBPSK, 8PSK, 16QAM) 　CS-SYNC (π/4DQPSK, π/2DBPSK) ∗ For modulation measurement Guaranteed only when no bias in symbol point when measurement object modulation type is 16QAM.
Call processing	Call control with π/4DQPSK or π/2DBPSK: 　Location registration, Call origination, Call termination, Call communication, Network disconnection, Terminal disconnection, 　Handover

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
Main frame	
MT8820C	Radio Communication Analyzer
Standard accessories	
	Power Cord: 1 pc
	CF Card: 1 pc
	PC Card Adapter (For CF card): 1 pc
W3320AE	MT8820C Operation Manual (CD-ROM): 1 pc
Options	
MT8820C-017	Extended RF Hardware*1
MT8820C-001	W-CDMA Measurement Hardware
MT8820C-002	TDMA Measurement Hardware
MT8820C-007	TD-SCDMA Measurement Hardware
MT8820C-008	LTE Measurement Hardware
MT8820C-011	Audio Board
MT8820C-012	Parallel Phone Measurement Hardware
MT8820C-018	Extended RF 3.4 GHz to 3.8 GHz
	(requires MT8820C-017, MT8820C-119, or MT8820C-120)
MT8820C-101	W-CDMA Measurement Hardware Retrofit
MT8820C-102	TDMA Measurement Hardware Retrofit
MT8820C-107	TD-SCDMA Measurement Hardware Retrofit
MT8820C-108	LTE Measurement Hardware Retrofit
MT8820C-111	Audio Board Retrofit
MT8820C-112	Parallel Phone Measurement Hardware Retrofit
MT8820C-119	Extended RF Hardware for SPM Retrofit
MT8820C-120	Extended RF Hardware for PPM Retrofit
MT8820C-177	TD-SCDMA Measurement Retrofit (requires MT8820C-001)
Software options	
MX882000C	W-CDMA Measurement Software
	(requires MT8820C-001 and MX88205xC)
MX882000C-001	W-CDMA Voice Codec (requires MT8820C-011 and MX882000C)
MX882000C-011	HSDPA Measurement Software
	(requires MT8820C-001, MX882000C, and MX882050C)
MX882000C-013	HSDPA High Data Rate (requires MT8820C-001, MX882000C, MX882000C-011, and MX882050C)
MX882000C-021	HSUPA Measurement Software (requires MT8820C-001, MX882000C, MX882000C-011, and MX882050C)
MX882000C-031	HSPA Evolution Measurement Software*2
	(requires MT8820C-001, MX882000C, MX882000C-011, MX882000C-021, and MX882050C)
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)
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)
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)
MX882001C	GSM Measurement Software (requires MT8820C-002)
MX882001C-001	GSM Voice Codec (requires MT8820C-011 and MX882001C)
MX882001C-002	GSM External Packet Data (requires MX882001C)
MX882001C-011	EGPRS Measurement Software (requires MX882001C)
MX882001C-041	GSM High-speed Adjustment (requires MX882001C)
MX882005C	PHS Measurement Software (requires MT8820C-002)
MX882005C-011	Advanced PHS Measurement Software (requires MX882005C)
MX882007C	TD-SCDMA Measurement Software
	(requires MT8820C-001 and MT8820C-007)
MX882007C-001	TD-SCDMA Voice Codec (requires MT8820C-011 and MX882007C)
MX882007C-003	TD-SCDMA Video Phone Test (requires MX882007C)
MX882007C-011	TD-SCDMA HSDPA Measurement Software*2
	(requires MT8820C-001, MT8820C-007, and MX882007C)
MX882007C-012	TD-SCDMA HSDPA Evolution Measurement Software*2
	(requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011)
MX882007C-021	TD-SCDMA HSUPA Measurement Software*2
	(requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011)

Model/Order No.	Name
MX882010C	Parallel Phone Measurement Software*5
	[requires MT8820C-012, the two same measurement hardware (2 board/set) and one measurement software]
MX882012C	LTE FDD Measurement Software*2 (requires MT8820C-008)
MX882012C-006	LTE FDD IP Data Transfer*2 (requires MX882012C)
MX882012C-011	LTE FDD 2×2 MIMO DL*2, *6 (requires MT8820C-012 and MX882012C)
MX882012C-016	LTE FDD CS Fallback to W-CDMA/GSM*7 (requires MX882012C)
MX882012C-021	LTE-Advanced FDD DL CA Measurement Software*2, *8
	(requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, and MX882012C)
MX882012C-026	LTE-Advanced FDD DL CA IP Data Transfer*9
	(requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882012C, MX882012C-006, MX882012C-021)
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.)
MX882013C	LTE TDD Measurement Software*2 (requires MT8820C-008)
MX882013C-006	LTE TDD IP Data Transfer*2 (requires MX882013C)
MX882013C-011	LTE TDD 2×2 MIMO DL*2, *6 (requires MT8820C-012 and MX882013C)
MX882013C-016	LTE TDD CS Fallback to W-CDMA/GSM*11 (requires MX882013C)
MX882013C-018	LTE TDD CS Fallback to TD-SCDMA/GSM*11 (requires MX882013C)
MX882013C-021	LTE-Advanced TDD DL CA Measurement Software*2, *8
	(requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, and MX882013C)
MX882013C-026	LTE-Advanced TDD DL CA IP Data Transfer*9
	(requires MT8820C-008 (2 sets), MT8820C-012, MX882010C, MX882013C, MX882013C-006, MX882013C-021)
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-021.
	The other is required MT8820C-008, MX882013C.)
MX882032C	CDMA2000 Measurement Software Lite*2
MX882036C	1xEV-DO Measurement Software Lite*2
MX882036C-011	1xEV-DO Rev. A Measurement Software*2
MX882042C	LTE FDD Measurement Software Lite*2
MX882043C	LTE TDD Measurement Software Lite*2
MX882050C	W-CDMA Call Processing Software*2, *12 (requires MX882000C)
MX882050C-002	W-CDMA External Packet Data*2 (requires MX882050C)
MX882050C-003	W-CDMA Video Phone Test*2 (requires MX882050C)
MX882050C-007	W-CDMA Band XII, XIII, XIV, XIX, XX, XXI*2, *13 (requires MX882050C)
MX882050C-008	W-CDMA Band XI*2 (requires MX882050C)
MX882050C-009	W-CDMA Band IX*2 (requires MX882050C)
MX882050C-011	HSDPA External Packet Data*2 (requires MX882000C-011)
MX882051C	W-CDMA Call Processing Software*2 (requires MX882000C)
MX882051C-002	W-CDMA External Packet Data*2 (requires MX882051C)
MX882051C-003	W-CDMA Video Phone Test*2 (requires MX882051C)
MX882070C	W-CDMA Ciphering Software*2 (requires MX882050C)
MX882071C	W-CDMA Ciphering Software*2 (requires MX882051C)
Warranty	
MT8820C-ES210	2 years Extended Warranty Service
MT8820C-ES310	3 years Extended Warranty Service
MT8820C-ES510	5 years Extended Warranty Service
Application parts	
P0035B	W-CDMA/GSM Test USIM
P0035B7	W-CDMA/GSM Test USIM*14
P0135A6	Anritsu Test UICC GA (Nano UICC size)*15
P0135A7	Anritsu Test UICC GA (Micro UICC size)*15
P0250A6	Anritsu Test UICC GT (Nano UICC size)*15
P0250A7	Anritsu Test UICC GT (Micro UICC size)*15
P0260A6	Anritsu Test UICC GM (Nano UICC size)*15
P0260A7	Anritsu Test UICC GM (Micro UICC size)*15
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	PP2S Output Cable
J1249	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 2×2 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).