Radio Communication Analyzer

MT8820C
30 MHz to 2.7 GHz (3.4 GHz to 3.8 GHz)
Supports Multi-communication Systems

The Radio Communication Analyzer MT8820C platform covers a frequency range of 30 MHz to 2.7 GHz (3.4 GHz to 3.8 GHz: with MT8820C-018).
When the dedicated optional measurement software and hardware is installed, the major Tx and Rx characteristics of LTE (FDD/TDD), LTE-Advanced (FDD/TDD), W-CDMA/HSPA/HSPA Evolution/DC-HSDPA, GSM/GPRS/EGPRS, CDMA2000 1X, PHS/Advanced PHS, and TD-SCDMA/HSPA Systems can be measured using a single MT8820C unit.

Advanced Digital Signal Processing and Batch Measurement

Manufacturing and inspection test times have been dramatically cut by incorporating advanced DSP and parallel measurement technologies. Furthermore, several measurement items can be selected freely for batch measurement, and the number of measurements for each measurement item can be configured separately.
The one-touch operation supports easy and quick measurement of Tx and Rx characteristics, including transmit frequency, modulation accuracy, transmit power, spectrum emission mask, adjacent channel leakage power ratio, occupied bandwidth, and BER.

Parallelphone Measurement

When the Parallelphone Measurement option is installed in the MT8820C main frame, two different mobile terminals can be connected and tested simultaneously with a single MT8820C using its second RF, AF, GPIB, and Ethernet port. This functionality significantly improves manufacturing efficiency by reducing production costs (return on investment and energy saving) and space.

MT8820A/B Compatibility

All functions, performance, remote commands are backwards compatible with the MT8820A/B, so customers can easily retask control software and knowledge from the MT8820A/B.

CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).

Parallelphone™ is a registered trademark of Anritsu Corporation.
Supports Multi-communication Systems

LTE (FDD/TDD), LTE-Advanced (FDD/TDD)

**LTE-Advanced FDD/TDD CA Measurement**

**Transmitter Measurement**
The transmit power can be measured.

**Receiver Measurement**
The LTE throughput can be measured by counting the number of ACK blocks from the LTE-Advanced FDD/TDD CA terminal. In addition, statistical analysis can be performed based on CQI values reported by the LTE-Advanced FDD/TDD CA terminal.

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**LTE FDD/TDD Measurement**

3GPP-compliant measurements of Tx characteristic of 3.9G LTE FDD/TDD terminals.

**Transmitter Measurement**
The transmit power, frequency error, occupied bandwidth, spectrum emission mask, adjacent channel leakage power ratio, modulation accuracy, and constellation can be measured. In addition, it supports Modulation Analysis with setting of PUSCH-EVM with exclusion period.

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**Transmitter Measurement (EVM)**

![Diagram](image1.png)

**Example of LTE-Advanced FDD DL CA (2CC, SISO) Options Stack (LTE-Advanced FDD)**

MT8820C Connection Example

![Diagram](image2.png)

**MT8820C Main frame**

**Example of LTE-Advanced FDD DL CA Measurement Software MX882012C-021**

**LTE Measurement Software MX882012C**

**Parallel Phone Software MX882010C**

**LTE Measurement Hardware MT8820C-008**

**Parallel Phone Measurement Hardware MT8820C-012**

---

**Receiver Measurement (LTE FDD)**

![Diagram](image3.png)

**MT8820C Main frame**

**Example of LTE-Advanced FDD DL CA Measurement Software MX882012C-021**

**LTE Measurement Software MX882012C**

**Parallel Phone Software MX882010C**

**LTE Measurement Hardware MT8820C-008**

**Parallel Phone Measurement Hardware MT8820C-012**

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**MT8820C Connection Example**

![Diagram](image4.png)

**Example of LTE-Advanced FDD DL CA Measurement Software MX882012C-021**

**LTE Measurement Software MX882012C**

**Parallel Phone Software MX882010C**

**LTE Measurement Hardware MT8820C-008**

**Parallel Phone Measurement Hardware MT8820C-012**

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**Requires MT8820C-008 and MX882012C (MX882013C) for the main Tx and Rx characteristics of LTE FDD/TDD terminal with Call Processing function.**

**Requires MX882042C (MX882043C) for the main Tx characteristics of LTE FDD/TDD terminal without Call Processing function.**

**MX882042C (MX882043C) is non-Call Processing product.**

**Refer to the MX882012C/13C/42C/43C catalog for detail.**

**For terminal connectivity, contact your Anritsu sales representative.**
W-CDMA Measurement
3GPP-compliant measurements of Tx and Rx characteristics of 3G W-CDMA terminals.

Transmitter Measurement
The transmit power, frequency error, occupied bandwidth, spectrum emission mask, adjacent channel leakage power ratio, modulation accuracy, and peak code domain error can be measured.

Receiver Measurement
The Bit Error Rate (BER) can be measured using the 3GPP-compliant loopback test mode. In addition, feeding the demodulated data and clock signals from the W-CDMA terminal directly to the MT8820C supports bit error rate measurement. Both PN9 and PN15 can be set as the downlink RF signal data pattern.

HSPA Measurement
3GPP-compliant measurement of Tx and Rx characteristics of 3.5G HSPA (HSDPA/HSUPA) terminals is supported.

HSDPA Measurement
HSDPA call-processing functions, including Tx/Rx items, such as transmit power, spectrum emission mask, and adjacent channel leakage power ratio of the HS-DPCCH transmission slot are measured. At measurement in the time domain, the power step at the HS-DPCCH slot boundary, modulation, and code domain power are measured. Moreover, HSDPA throughput with 64QAM can be measured by counting the number of ACK blocks from the terminal.

Refer to the MX882000C catalog for details.

★ Requires MT8820C-001, MX882000C, and MX88205xC
★ MT8820C-001, MX882000C, MX882000C-011, and MX882050C required for HSDPA measurements
★ MT8820C-001, MX882000C, MX882000C-011, MX882000C-021, and MX882050C required for HSUPA measurements

Supports Multi-communication Systems
W-CDMA/HSPA/HSPA Evolution/DC-HSDPA
HSPA Evolution Measurement
3GPP-compliant measurements of Tx and Rx characteristics, throughput and CQI of enhanced 3.5G HSPA Evolution terminals. FRC H-Set 8 (64QAM) and HS-DSCH Category 14 (21 Mbps class) test signals can be transmitted for HSPA Evolution throughput measurements.

Transmitter Measurement
At measurement in the time domain, mobile terminal relative code domain power accuracy for HS-DPCCH and E-DCH with 16QAM are measured.

Receiver Measurement
The HSDPA throughput with 64QAM can be measured by counting the number of ACK blocks from the terminal.

DC-HS-PDA Measurement
Measurement of key Rx characteristics, throughput and CQI is supported for 3GPP-compliant DC-HS-PDA terminals.

Receiver Measurement
DC-HSDPA call processing can be measured using the two RF ports of the MT8820C. Moreover, the number of ACK blocks sent from the mobile terminal can be counted and two-cell throughput can be measured. Measurement of the highest throughput (42 Mbps) in HS-DSCH category 24 is supported.

MT8820C Connection Example
※ Requires MT8820C-001, MX882000C, MX882000C-011, MX882000C-021, MX882000C-031, and MX882050C
※ For terminal connectivity, contact your Anritsu sales representative.

MT8820C-012, MT8820C-001 2 sets, MX882000C, MX882000C-011, MX882000C-021, MX882000C-031, MX882000C-032, MX882050C, and MX882010C required for DC-HSDPA measurements (MT8820C 1 unit)

Refer to the MX882000C catalog for details.
GSM/GPRS Measurement
Measures Tx and Rx characteristics of GSM/GPRS terminals — world’s most common digital mobile standard.

Transmitter Measurement
At GSM/GPRS measurement, the transmit frequency, phase error (RMS and peak), transmit power, power vs. time (template mask), and output RF spectrum can be measured.

Receiver Measurement
The uplink RF signal, which is looped back from GSM terminal, is demodulated by controlling the GSM terminal in the loopback condition to measure the frame error, bit error, and CRC error rates. And FAST BER measurement is supported. The block error rate can be measured with the BLER and Test Mode B connection by controlling the GPRS terminal in the loopback condition. The above receiver measurements can be performed in parallel with transmitter measurements.

EGPRS Measurement
Measures Tx and Rx characteristics of enhanced GPRS system (EGPRS) terminals.

Transmitter Measurement
At EGPRS measurement, the transmit frequency, EVM (RMS and peak), origin offset, transmit power, power vs. time (template mask), and output RF spectrum can be measured.

Receiver Measurement
The uplink RF signal, which is looped back from EGPRS terminal, is demodulated by controlling the EGPRS terminal in the loopback condition to measure the block error rate or bit error. The above receiver measurements can be performed in parallel with transmitter measurements.

*B* Requires MT8820C-002 and MX882001C

*Requires MT8820C-002, MX882001C, and MX882000C-011

Refer to the MX882001C catalog for details.
Supports Multi-communication Systems

CDMA2000 1X

CDMA2000 1X Measurement
3GPP2-compliant measurements of Tx and Rx characteristics of 3G CDMA2000 1X terminals.

Transmitter Measurement
The transmit power, modulation analysis, occupied bandwidth, code domain power, spurious emission, and access probe power can be measured.

Receiver Measurement
The Frame Error Rate (FER) and Pass/Fail evaluation can be performed in SO2, SO9, SO55, and SO32 (TDSO) to display the FER, error frame count, Tx frame count, confidence level, and Pass/Fail results.

Modulation Analysis

TD-SCDMA/HSPA

TD-SCDMA Measurement
3GPP-compliant measurements of the main Tx and Rx characteristics of 3G TD-SCDMA (1.28 Mcps TDD) and 3.5G HSDPA/HSUPA mobile terminals is supported.

Transmitter and Receiver Measurement
3GPP-compliant measurement of TD-SCDMA with call-processing functions, including Tx/Rx items such as 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, BER, and BLER, is supported. In addition, one-touch setting of main Tx/Rx test items and closed loop power control offer easy configuration of automated 3GPP-compliant test systems.

Power Template

TD-SCDMA HSDPA Measurement
3GPP-compliant Throughput, and CQI measurements of TD-SCDMA HSDPA terminals are supported. The signals for Throughput measurement include RMC signals for all TD-SCDMA HS-DSCH categories as well as maximum category-15 data rates (2.8 Mbps).

TD-SCDMA HSUPA Measurement
3GPP-compliant Tx measurement and Performance test of TD-SCDMA HSUPA with call-processing are measured. The signals for Tx measurement include HSUPA RMC category 1 to 6 (2.23 Mbps UE class) terminals can be transmitted. And, HSUPA performance measurement is calculated the information about bit rate by detecting E-DCH TB (Transport Block size). Index include E-UCCH sent from the mobile terminal to MT8820C.

FER

* Requires MT8820C-001, MT8820C-007, and MX882007C for TD-SCDMA measurements.
* Requires MT8820C-001, MT8820C-007, MX882007C, and MX882007C-011 for TD-SCDMA HSDPA measurements.
* Requires MT8820C-001, MT8820C-007, MX882007C, MX882007C-011, and MX882007C-021 for TD-SCDMA HSUPA measurements.
* For terminal connectivity, contact your Anritsu sales representative.

Refer to the MX882007C catalog for details.
PHS/Advanced PHS

PHS/Advanced PHS Measurement

Measures Tx and Rx characteristics of PHS terminals/Advanced PHS terminals and base stations in compliance with ARIB RCR-STD-28 edition 5.0 supporting π/4DQPSK, 8PSK, and 16QAM modulation methods.

Transmitter Measurement

The transmit frequency, modulation accuracy, transmit power, transmission rate, occupied bandwidth, adjacent channel leakage power of PHS terminals/Advanced PHS terminals and base stations are measured simultaneously.

Receiver Measurement

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

* Requires MT8820C-002 and MX882005C for PHS measurements.
* Requires MT8820C-002, MX882005C, and MX882005C-011 for Advanced PHS measurements.

Refer to the MX882005C catalog for details.
**Supports All Function Tests**

**Real-time Voice Encoding and Decoding**
Voice tests with a handset are supported by the real-time voice encoding and decoding function of the W-CDMA (GSM, CDMA2000 1X, TD-SCDMA) Measurement Software. In addition, the call Tx and Rx audio can be measured using the audio measurement function.

**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 mobile terminal.

**Audio Transmitter and Receiver Measurement**
The tone signal from the MT8820C AF Output connector is supplied to the microphone of the mobile terminal and the audio transmitter characteristics of the mobile terminal can be measured using the MT8820C to demodulate the uplink RF signal and measure the level, frequency, and distortion of the demodulated tone signal.

**Packet Communication Data Transfer Test**
End-to-End Data Transfer Test
Using the External Packet Data Software option supports end-to-end data transfer between a mobile terminal (W-CDMA, HSDPA, GPRS, CDMA2000 1X) and an application server connected to the MT8820C, or a PC client connected to the terminal, and various application tests. The IP data transfer software option supports end-to-end data transfer with an LTE FDD/TDD terminal.

**LTE-Advanced FDD/TDD DL CA plus MIMO Receiver Measurement**
With three MT8820Cs, capable of throughput testing of DL CA 3CCs 2×2 MIMO PHY layer.

★ Requires MT8820C-011, MX882000C-001, MX882001C-001, MX882002C-001 or MX882007C-001
★ Audio Transmitter and Receiver Measurement supports W-CDMA, GSM, TD-SCDMA
★ Audio Transmitter and Receiver Measurement does not support CDMA2000 1X

Refer to the MX882000C, MX882001C, MX882002C and MX882007C catalog for details.

★ Packet Communication Data Transfer Test requires either MX882012C-006 (MX882013C-006), MX882050C-002, MX882050-011, MX882050C-002, MX882001C-002, or MX882002C-002
★ MIMO Test requires MT8820C 3 set of LTE FDD (TDD) Configuration, MT8820C #1 requires MT8820C-012, MT8820C-008, MX882012C (13C), MX882012C (13C)-011, MX882012C (13C)-021 and MX882012C (13C)-031. MT8820C #2 and #3 require MT8820C-012, MT8820C-008, MX882012C (13C), MX882012C (13C)-011.
★ Frequency #1 (Primary CC)
★ Frequency #2 (Secondary CC 1)
★ Frequency #3 (Secondary CC 2)
★ LTE-Advanced CA UE (UE Category 4/6/9)
★ ACK/NACK in UL
★ LTE-Advanced CA UE
Video Phone Test

End-to-End Video Phone Test

The MT8820C supports two-ways tests between W-CDMA (TD-SCDMA) terminals with video functions via the MT8820C Ethernet port.

Two-way video phone tests require either two MT8820C units or one unit with the Parallelphone option.

Sample MT8820C connection: when MT8820C is two sets

Sample MT8820C connection: when MT8820C is one set (Parallelphone measurement correspondence)

* Requires MX88205xC-003 or MX882007C-003

Refer to the MX882000C and MX882007C catalog for details.
Higher Productivity

High Production Efficiency and Smaller Equipment Footprint using Parallelphone Measurement

Simultaneous Measurement of Two Mobile Terminals
Installing the Parallelphone Measurement option supports simultaneous measurement of two terminals using the second RF, AF, GPIB, or Ethernet port of a single MT8820C unit.

![Diagram of Parallelphone Measurement](image)

GSM Terminal
GSM Terminal
RF1 (connection cable)
RF2 (connection cable)

Case of GSM Parallel Phone Measurements

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>Required number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT8820C</td>
<td>Radio Communication Analyzer</td>
<td>1</td>
</tr>
<tr>
<td>MT8820C-002</td>
<td>TDMA Measurement Hardware</td>
<td>2</td>
</tr>
<tr>
<td>MT8820C-012</td>
<td>Parallel Phone Measurement Hardware</td>
<td>1</td>
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<tr>
<td>MX882001C</td>
<td>GSM Measurement Software</td>
<td>1</td>
</tr>
<tr>
<td>MX882010C</td>
<td>Parallel Phone Measurement Software</td>
<td>1</td>
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</table>

Parallel Phone Measurement Software MX882010C Specifications

<table>
<thead>
<tr>
<th>Main2 Input/Output</th>
<th>Aux2 Output</th>
<th>Required number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identical to Main1 Input/Output and Aux1 Output specified by the MT8820C and the measurement software installed in the MT8820C.</td>
<td>1</td>
</tr>
<tr>
<td>AF2 Input/Output</td>
<td>Identical to AF1 Input and Output specified by the measurement software. These are enabled only when the MT8820C-011 Audio Board is installed.</td>
<td>1</td>
</tr>
</tbody>
</table>

* The Parallel Phone Measurement Hardware MT8820C-012 requires the Parallel Phone Measurement Software MX882010C as well as installation of the required measurement software and two measurement hardware units.

Supports Multi-system Call Processing Test

Call Processing Test

Connection Test
Various connection tests, such as registration, origination, termination, handover, terminal disconnect, and network disconnect, can be tested using the call processing functionality. Moreover, voice from the mobile terminal can be echoed back while calling to test simple voice communications.

Sequence Monitor (W-CDMA)

Mobile Terminal Report Monitor
The mobile terminal status can be displayed as a periodic report sent by the mobile terminal to the MT8820C. The downlink RF signal level at the mobile receiver can be checked with the Rx level reported from the mobile terminal.

Mobile Terminal Report Monitor (GSM)
Radio Communication Analyzer MT8820C Panel Layout

Front Panel

1. **Power Switch**
   - Switches mode between power-on and standby

2. **Copy Key**
   - Copies screen

3. **Local Key**
   - Switches remote control to manual control

4. **Remote Lamp**
   - Lit while in remote control mode

5. **Preset Key**
   - Starts initializing

6. **User function keys**
   - Execute user menu contents displayed in the left most area of the screen, when the common window is enabled

7. **Function Key**
   - Executes function menu displayed on right of screen

8. **Functions**
   - Displays function menu on screen

9. **Screen Switch Key**
   - Switches screen

10. **Screen Control**
    - Switches display window for manual operation

11. **Measure**
    - Starts and stops measurement

12. **Channel/Level**
    - Sets channel, frequency, and level

13. **Call**
    - Connects and disconnects call

14. **Utility**
    - Saves and recalls parameters, and displays configuration

15. **Cursor/Data Entry**
    - Moves cursor and sets parameters

16. **Page Switch Key**
    - Switches function menu displayed on right of screen

17. **Main Input/Output Connector**
    - Outputs RF signal for RF testing mobile terminal (N-type connector)

18. **AUX Output Connector**
    - Outputs RF signal for RF testing mobile terminal (SMA connector)

19. **AF Input/Output Connector**
    - For audio measurement

20. **Handset Connector**
    - For testing end-to-end voice communication between MT8820C and mobile terminal using an Anritsu handset (A0058A/A0013)

21. **Memory Card Slot**
    - For saving/recalling measurement parameters and update software to/from PCMCIA-compliant PC-card-type memory card (Type II)
Rear Panel

22 GPIB Connector
For remote control of MT8820C

23 1000Base-T/100Base-TX/10Base-T port
Interface for packet and LTE communication tests (for LTE) (enabled when LTE measurement hardware installed in MT8820C)

24 Trigger Output Connector
Outputs event-timing signal to external equipment (BNC connector)

25 Trigger Input Connector
Inputs trigger signal from external equipment to measure uplink signal from mobile equipment by synchronizing (BNC connector)

26 100Base-TX/10Base-T Port
RJ-45 connector for the remote control via Ethernet (100Base-TX/10Base-T)

27 10Base-T Port
Interface for packet and W-CDMA video communication test

28 RS-232C Port
Interface for packet communication test

29 Frequency Adjust
Adjusts frequency of internal reference oscillator

30 Call Processing Input/Output Port
Interface for BER measurement and synchronization

31 Reference Signal Output Connector
Outputs 10-MHz reference signal of MT8820C (BNC connector)

32 Reference Signal Input Connector
Inputs 10/13-MHz reference signal (BNC connector)
## Radio Communication Analyzer MT8820C Specifications

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

| General | Frequency range: 30 MHz to 2.7 GHz  
3.4 GHz to 3.8 GHz (with MT8820C-018)  
Max. input level: +35 dBm (Main)  
Main I/O  
Impedance: 50 Ω  
VSWR: ≤1.2 (<1.6 GHz), ≤1.25 (1.6 GHz to 2.2 GHz), ≤1.3 (>2.2 GHz)  
Connector: N type  
AUX output  
Impedance: 50 Ω  
VSWR: ≤1.3 (5G Output level: ≤–10 dBm)  
Connector: SMA type  
Reference oscillator  
Frequency: 10 MHz  
Level: TTL  
Startup characteristics: ≤±5 × 10⁻⁸ (10 min after startup referenced to frequency 24 h after startup)  
Aging rate: ≤±2 × 10⁻⁸/day, ≤±1 × 10⁻⁷/year (referenced to frequency 24 h after startup)  
Temperature characteristics: ≤±5 × 10⁻⁸  
Connector: BNC type  
External reference input  
Frequency: 10 MHz or 13 MHz (±1 ppm)  
Level: ≥0 dBm  
Impedance: 50 Ω  
Connector: BNC type |
|---|---|
| RF Signal Generator | Frequency  
Frequency range: 30 MHz to 2.7 GHz (setting range: 400 kHz to 2.7 GHz)  
3.4 GHz to 3.8 GHz (with MT8820C-018)  
Setting resolution: 1 Hz  
Accuracy: Due to reference oscillator accuracy  
Output level  
Level range: –140 to –10 dBm (Main), –130 to 0 dBm (AUX)  
Resolution: 0.1 dB  
Accuracy: Main: ±1.0 dB, ±0.7 dB typ. (Output frequency: ≥50 MHz), ±1.5 dB (Output frequency: <50 MHz)  
(–120 to –10 dBm, after calibration, 10° to 40°C)  
AUX: ±1.0 dB, ±0.7 dB typ. (Output frequency: ≥50 MHz), ±1.5 dB (Output frequency: <50 MHz)  
(–110 to 0 dBm, after calibration, 10° to 40°C)  
Signal purity  
Non-harmonic spurious: ≤–40 dBc (Offset frequency: ≥100 kHz)  
Harmonics: ≤–25 dBc  
Uninterrupted level variation  
Variable range: –30 to 0 dB  
Setting resolution: 1 dB |
| Others | Display  
Color 8.4-inch TFT LCD, 640 × 480 dots  
External control  
GPIB: Control from external host with main unit as device (excluding some functions such as power-on), No external device control  
Interface functions: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2  
Ethernet (100Base-TX/10Base-T): Controlled by an external controller, assuming the MT8820C as a device  
(except some functions such as power switch etc.). No controller function |
| Power Supply | 100 V(ac) to 120 V(ac)/200 V(ac) to 240 V(ac) (250 V max.), 50 Hz/60 Hz, ≤750 VA (with all Options) |
| Dimensions and Mass | 426 (W) × 221.5 (H) × 498 (D) mm (excluding projections), ≤30 kg (with all Options) |
| Environmental Conditions | Operating temperature and humidity: 0° to +50° C, ≤95% (no condensation)  
Storage temperature and humidity: –20° to +60° C, ≤95% (no condensation)  
EMC: EN61326-1, EN61000-3-2  
LVD: EN61010-1 |
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.

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Main frame</th>
<th>Name</th>
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<tbody>
<tr>
<td>MT8820C</td>
<td>Radio Communication Analyzer</td>
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</table>

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<tbody>
<tr>
<td>Options</td>
<td>W-CDMA Measurement Hardware</td>
<td>TDMA Measurement Hardware</td>
<td>CDMA2000 Measurement Hardware</td>
<td>TD-SCDMA Measurement Hardware</td>
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<tr>
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<td>LTE Measurement Hardware</td>
<td>Audio Board</td>
<td>Parallel Phone Measurement Hardware</td>
<td>Extended RF Hardware for PPM Retrofit</td>
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<td>CDMA2000 Time Offset CAL for GPS SG</td>
<td>Requires MT8820C-007, MX882000C-011</td>
<td>Requires MT8820C-001, MX882000C-011</td>
<td>Requires MT8820C-001, MX882000C-011</td>
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<table>
<thead>
<tr>
<th>Software options</th>
<th>W-CDMA Measurement Software (requires MT8820C-001 and MX882050C)</th>
<th>W-CDMA Voice Codec (requires MT8820C-001 and MX882050C)</th>
<th>CDMA2000 Measurement Hardware Retrofit</th>
<th>TD-SCDMA Measurement Hardware Retrofit</th>
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<tbody>
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<tr>
<th>Model/Order No.</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>MX882010C</td>
<td>Parallel Phone Measurement Software*1</td>
</tr>
<tr>
<td>MX882012C</td>
<td>LTE FDD Measurement Software** (requires MT8820C-008)</td>
</tr>
<tr>
<td>MX882012C-006</td>
<td>LTE FDD IP Data Transfer** (requires MX882012C)</td>
</tr>
<tr>
<td>MX882012C-011</td>
<td>LTE FDD 2×2 MIMO DL*4, 6</td>
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<tr>
<td>MX882012C-016</td>
<td>LTE FDD CS Fallback to W-CDMA/GSM** (requires MX882012C)</td>
</tr>
<tr>
<td>MX882012C-020</td>
<td>LTE FDD CS Fallback to CDMA2000** (requires MX882012C)</td>
</tr>
<tr>
<td>MX882012C-027</td>
<td>LTE Advanced FDD DL CA Measurement Software** (requires MT8820C-008, MX882012C)</td>
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<td>MX882012C-026</td>
<td>LTE Advanced FDD DL CA IP Data Transfer** (requires MT8820C-008, MX882012C)</td>
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<td>MX882012C-031</td>
<td>LTE Advanced FDD DL CA 3CCs Measurement Software** (requires MT8820C-008)</td>
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<td>MX882013C</td>
<td>LTE TDD Measurement Software** (requires MT8820C-008)</td>
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<td>MX882013C-006</td>
<td>LTE TDD IP Data Transfer** (requires MX882013C)</td>
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<td>MX882013C-011</td>
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| W-CDMA Band IX*2, XIII, XIV, XIX, XX, XXI*2, 13 (requires MX882050C) |
| W-CDMA Video Phone Test*2 (requires MX882050C) |
| W-CDMA External Packet Data** (requires MX882050C) |
| W-CDMA Video Phone Test** (requires MX882050C) |
| W-CDMA Band XII, XIII, XIV, XIX, XX, XXI*2, 13 (requires MX882050C) |

| 1xEV-DO Measurement Software Lite*2 |
| 1xEV-DO Measurement Software Lite*2 |
| 1xEV-DO Rev. A Measurement Software*2 |

| HDMI Evolution Measurement Software*2 |
| DC-HSUPA Measurement Software** |
| DC-HSUPA Measurement Software** |

| 5 years Extended Warranty Service |
| 3 years Extended Warranty Service |
| 2 years Extended Warranty Service |

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