Vector Signal Generator

MG3710E

100 kHz to 2.7 GHz
100 kHz to 4.0 GHz
100 kHz to 6.0 GHz
The MG3710E is a vector signal generator with 6-GHz upper frequency limit and 160-MHz*/120-MHz wide RF modulation baseband generator. It outputs various radio systems signals for cellular communications, such as 5G, LTE FDD/TDD, W-CDMA, GSM as well as narrowband communications, such as WLAN, Bluetooth and GPS.

Cuts Equipment Costs

The dual waveform memory cuts equipment costs for tests, such as ACS, Blocking and IM, which require two modulation signal sources. The dual RF cuts MIMO equipment costs and reduces workloads for phase synchronization between equipment.

It is important for tests using separate signals, such as MSR and multi-band.

Dual Waveform Memory
One RF output supports two waveform memories! Combine wanted and interference signals in baseband and output at one RF.

RF Modulation Bandwidth: 160 MHz*/120 MHz
Can generate and output signals for 160-MHz bandwidth max. wireless LAN (IEEE 802.11ac) and for 120-MHz bandwidth.

Dual RF
One unit supports two RF outputs! Ideal for Multi-band, MIMO and MSR evaluations.

Multi-Band
Multi-System
Multi-Channel

Cut Costs for New Wireless Tests

Improves Yield
The high quality signal generator ACLR and SSB phase noise reduces the effect on wideband and narrow-band measurements to improve test margins and yields.

-68 dBC @W-CDMA, TestModel1, 64DPCH, 2 GHz
<-140 dBC/Hz (nom.) @100 MHz, 20 kHz offset, CW

Cuts Tact Time
The List/Sweep mode switches the frequency and level faster than 600 µs. Moreover, the 4-GB waveform memory upgrade can load many waveform patterns while instantaneous switching eliminates time wasted reloading waveform patterns.

*: Supports firmware version 2.00.00 and later. Can generate 160-MHz bandwidth signals (Wireless LAN IEEE 802.11ac) only when using WLAN IQproducer MX370111A and 802.11ac (160 MHz) option MX370111A-002. The latest version can be downloaded from the Anritsu homepage. <https://my.anritsu.com/home>
Vector Signal Generator MG3710E

HDD
- W-CDMA
- GSM/EDGE
- CDMA2000
- CDMA2000 1xEV-DO
- PDC
- PHS
- WLAN
- Digital Broadcast
- LTE FDD/TDD

1stRF ARB memory size
- 256 MB × 1 pc = 64 Msamples (Std.)
- 1 GB × 1 pc = 256 Msamples × 1 pc (Option 045)
- 1 GB × 2 pcs = 256 Msamples × 2 pcs (Option 045 + Option 048)
- 4 GB × 1 pc = 1024 Msamples × 1 pc (Option 046)
- 4 GB × 2 pcs = 1024 Msamples × 2 pcs (Option 046 + Option 048)

2ndRF ARB memory size
- 256 MB × 1 pc = 64 Msamples (Std.)
- 1 GB × 1 pc = 256 Msamples × 1 pc (Option 075)
- 1 GB × 2 pcs = 256 Msamples × 2 pcs (Option 075 + Option 078)
- 4 GB × 1 pc = 1024 Msamples × 1 pc (Option 076)
- 4 GB × 2 pcs = 1024 Msamples × 2 pcs (Option 076 + Option 078)

Standard waveform patterns saved on MG3710E hard disk
- DFS (FCC, Japan MIC) MX37073B
- DFS (ETSI) MX370075A etc.

Download

Optional waveform patterns are saved in the MG3710E once and then loaded to waveform memory for use.

Output signal
Waveform patterns are selected from both ARB memories A and B for output by one of the following methods:
- A only
- B only
- A + B

Note) ARB memory B: Using two memories with one RF requires the following options:
- Option 048 (1st RF)
- Option 078 (2nd RF)

Standard accessories
- W-CDMA IQproducer
- AWGN IQproducer
- 5G NR TDD sub-6 GHz IQproducer MX370113A etc.

The embedded Windows application IQproducer saves generated arbitrary waveform pattern files to the internal hard disk and signals are output simply by selecting the waveform pattern.

Waveform patterns are selected from both ARB memories A and B for output by one of the following methods:
- A only
- B only
- A + B

ADB memory A

ADB memory B

From IQproducer

ARM memory A

ARM memory B

Output signal

Download

DFS (FCC, Japan MIC) MX37073B

DFS (ETSI) MX370075A etc.

*1: 1stRF ARB memory size
*2: 2ndRF ARB memory size

Download
Vector Signal Generator MG3710E

Key Features

Dual RF & Dual Waveform Memory
One Unit Supports Two RF Outputs Max.
Frequency Range
1stRF: 100 kHz to 2.7/4.0/6.0 GHz [Option 032/034/036]
2ndRF: 100 kHz to 2.7/4.0/6.0 GHz [Option 062/064/066]
Independent Baseband and RF Outputs
Output Two Signals from One RF Out [Option 048/078]
The baseband signal combine option installs two waveform memories for either the 1stRF (or 2ndRF) SG to combine two waveform patterns as the baseband for output, eliminating the need for two separate and expensive vector signal generators.
- Wanted Signal + Interfering Signal
- Wanted Signal + Delayed Signal, etc.

Basic Performance
ACLR Performance
-68 dBc @W-CDMA, TestModel1, 64 DPCH, 2 GHz
High-power Output [Option 041/071]
+23 dBm @CW, 400 MHz to 3 GHz
High-speed Switching
<600 µs @List/Sweep mode
High Level Accuracy
Absolute Level Accuracy: ±0.5 dB
Linearity: ±0.2 dB (typ.)
Choice of Reference Oscillators
Standard
Aging rate ±1 × 10⁻⁶/year, ±1 × 10⁻⁷/day
High Stability Reference Oscillator [Option 002]
Aging rate ±1 × 10⁻⁷/year, ±1 × 10⁻⁸/day
Rubidium Reference Oscillator [Option 001]
Aging rate ±1 × 10⁻¹⁰/month
SSB Phase Noise Performance
<-140 dBc/Hz (nom.) @100 MHz, 20-kHz offset, CW
<-131 dBc/Hz (typ.) @1 GHz, 20-kHz offset, CW
<-125 dBc/Hz (typ.) @2 GHz, 20-kHz offset, CW

High All-purpose Baseband Performance
Wide Vector Modulation Bandwidth
160 MHz* / 120 MHz (using internal baseband signal generator)
160 MHz (using External IQ input)
*: Supports firmware version 2.00.00 and later. Can generate 160-MHz bandwidth signals (Wireless LAN IEEE 802.11ac) only when using WLAN IQproducer MX370111A and 802.11ac (160 MHz) option MX370111A-002.
Large-capacity Waveform Memory
64 Msamples [with 1stRF, 2ndRF]
256 Msamples [Option 045/075]
1024 Msamples [Option 046/076]
Arbitrary Waveform Generation
ASCII IQ sample data created using general-purpose signal generation software (such as MATLAB) can be converted to waveform patterns for the MG3710E. Data produced during R&D simulations can be converted using IQproducer.

Expandability
BER Test Function [Option 021]
This option measures BER using Data/Clock/Enable demodulated at the DUT to display the results on the MG3710E screen.
Input bit rate: 100 bps to 40 Mbps
Analog/Pulse Modulation Functions [Standard]
Supports built-in analog modulation (AM/FM/ΦM) functions and pulse modulation (PM) functions.
Adding additional analog modulation input options (Option 050/080) supports modulation by external signal input.
AWGN Generator [Option 049/079]
This option generates AWGN internally for the required waveform.
Absolute CN Ratio: ≤40 dB
USB Power Sensors [Sold separately]
Up to two USB power sensors can be connected to the MG3710E and the results are displayed on the MG3710E screen.
Frequency Range: 50 MHz to 6 GHz [MA24106A]
10 MHz to 18 GHz [MA24118A]
10 MHz to 26 GHz [MA24126A] etc.
Local Signal I/O for MIMO Signal Source [Option 017]
Local signals, baseband clocks and trigger signals can be shared between up to four MG3710E units to output phase coherency signals with synchronized signal output timing for configuring even 8×8 MIMO systems.
**Operability**

**Simple Touch-panel Operation**
Touching the easy-to-use GUI with hierarchical menus fetches related function and numeric input keys for simple fast settings.

**Signal Flowcharts with Signal Block Diagrams**
Two intuitive Hardware Block Chart and ARB Info screens make it easy to grasp settings, data and signal paths at a glance.

**Frequency Channel Table**
A built-in channel table with presets for popular communications systems simplifies frequency settings by using channel numbers.

**Connections with External Equipment**

**Remote Control Interfaces**
GPIB, Ethernet (1000BASE-T), and USB (Type B) interfaces on the rear panel offer versatile choices for operation by remote control.

**USB Connections**
Two Type A USB2.0 connectors on each of the front and rear panels offer convenient connections for keyboard, mouse and USB memory.

**Analog IQ Input/Output [Option 018]**
This option installs analog IQ input and output connectors on the front and rear panels, respectively.
- Input: I Input, Q Input
- Output: I Output, T Output, Q Output, Q Output

**Trigger Input**
Start and Frame trigger connectors are built-in as standard for outputting waveform patterns synchronized with externally input trigger signals.

**Marker Output Editing**

**Marker 1 output [Standard]**

**Marker 2 and 3 output [Requires AUX Conversion Adapter J1539A]**
This standard function outputs trigger signals at specific positions in the waveform pattern (Frame header, Burst header, etc.) for synchronizing and measuring signal generator waveform patterns with external equipment. Preset markers can be set at both the pre-installed waveform patterns and waveforms generated using IQproducer and any set markers can be output with the MG3710E marker editing function.

**Security**
The standard OS in MG3710E is Windows 7 (WES7).

**User Data Storage on 2ndary HDD [Option 011]**
This option is useful for saving sensitive waveform pattern data, etc., used at evaluation that cannot be allowed to leave the laboratory, workplace, factory, etc. The 2ndary HDD can be removed from/installed in the rear-panel slot when wanting to keep this saved data secure when the MG3710E is sent for service, used by third parties, etc.

**Pre-installed Key Waveform Patterns**

**Waveform Patterns [Pre-installed]**
Waveform patterns for the world’s main communications systems (below) are pre-installed in the MG3710E for license-free use.
- LTE FDD (E-TM1.1 to E-TM3.3)
- LTE TDD (E-TM1.1 to E-TM3.3)
- W-CDMA/HSDPA
- GSM/EDGE
- CDMA2000 1X/1xEV-DO
- Bluetooth®
- GPS
- PDC
- PHS
- Digital Broadcast (ISDB-T/BS/CS/CATV)
- WLAN (IEEE 802.11a/11b/11g)

**Waveform Pattern Options and Generation**

**Optional Waveform Pattern [Optional License]**
- DFS Radar Pattern (For FCC & Japan MIC)
- DFS (ETSI) Waveform Pattern
- ISDB-Tmm Waveform Pattern

**IQproducer Waveform Generation Software [Optional License]**
- 5G NR TDD sub-6 GHz
- 5G NR FDD sub-6 GHz
- LTE FDD/LTE-Advanced FDD
- LTE TDD/LTE-Advanced TDD
- HSDPA/HSUPA/W-CDMA
- TD-SCDMA
- CDMA2000 1xEV-DO
- WLAN 11a/b/g/n/j/p/ac
- TDMA (PDC, PHS, Public Radio System.)
- DVB-T/H
- Multi-carrier
- Fading
Dual VSG: Two RF Outputs
The MG3710E supports two RF outputs (1stRF/2ndRF) max. in one unit. Moreover, different frequencies can be set independently at 1stRF and 2ndRF. Not only different frequencies but also different levels and waveform patterns can be set independently at each SG while each is tracking the other. This is convenient in the R&D phase for evaluating interference between different systems using different frequency bands. Notes: Supported frequency bands cannot be changed after shipment. IQ input is supported only by SG1 (1stRF) and requires Option 017.

Dual Waveform Memory: Four Waveform Outputs Max.
In the standard configuration, one VSG (1stRF or 2ndRF) has one waveform memory. However, adding the baseband signal combine option (Option 048/078) upgrades to two memories for one VSG. In other words, models with two VSGs (1stRF and 2ndRF) installed can have a maximum of four waveform memories. Two waveform patterns can be set easily on-screen for one VSG, each with different frequency offset, level offset and delay time settings to output a combined baseband RF signal. With this setup, one MG3710E supports the following test environment — a setup that previously required two expensive signal generators:

- Wanted Signal + Interference Signal
- Wanted Signal + Delayed Signal

Synthesizing Signals with Different Sampling Rates
~ Rate Matching Function ~
When signals with different sampling rates are set in memory A and memory B, a synthesized signal maintaining each of the different sampling rates can be output. This is useful when synthesizing signals for standards with different rates, such as multi-standard signals. However, depending on the combination of waveform sampling rates, sometimes it may not be possible to match rates due to internal operation clock limitations. The Mismatch warning dialog is displayed in this case.

Waveform Pattern A
Example: Wanted Signal

Waveform Pattern B
Example: Interference Signal, Delayed Signal

Level Setting
Setting Range: –80 to +80 dB
Resolution: 0.01 dB

Frequency Offset Setting
Setting Range: –100 to +100 MHz
Resolution: 1 Hz

Center Frequency Selection
A: Pattern A center
B: Pattern B center
Baseband DC: Centered at baseband DC position

Time Offset Setting
Setting Range: 0 – pattern B sampling data count – 1

Baseband Signal Combine Example
Example of Baseband Signal Combine Output

Wanted + Modulated Interference Signals

Spectrum of Wanted + Modulated Interference Signals

Wanted + Delayed Signals

Delay Profile of Wanted + Delayed Signals
Vector Signal Generator MG3710E

Basic Performance

Vector Accuracy (EVM)

W-CDMA (Test Model 4)
Output Frequency: 800 MHz to 900 MHz, 1.8 GHz to 2.2 GHz
≤0.62%(rms)
≤0.6%(rms) (typ.)

LTE (20 MHz Test Model 3.1)
Output Frequency: 600 MHz to 2.7 GHz, 3.4 GHz to 3.8 GHz
≤0.82%(rms)
≤0.8%(rms) (typ.)

High-power Output [Option 041*1/071*2]
*1: High Power Extension for 1stRF [Option 041]
*2: High Power Extension for 2ndRF [Option 071]

Level Accuracy is assured at high levels (CW)

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Standard</th>
<th>Option 041/071</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz ≤ f &lt; 10 MHz</td>
<td>+5 dBm</td>
<td>+5 dBm</td>
</tr>
<tr>
<td>10 MHz ≤ f &lt; 50 MHz</td>
<td>+10 dBm</td>
<td>+10 dBm</td>
</tr>
<tr>
<td>50 MHz ≤ f &lt; 400 MHz</td>
<td></td>
<td>+20 dBm</td>
</tr>
<tr>
<td>400 MHz ≤ f ≤ 3 GHz</td>
<td>+13 dBm</td>
<td>+20 dBm</td>
</tr>
<tr>
<td>3 GHz &lt; f ≤ 4 GHz</td>
<td>+13 dBm</td>
<td>+23 dBm</td>
</tr>
<tr>
<td>4 GHz &lt; f ≤ 5 GHz</td>
<td></td>
<td>+20 dBm</td>
</tr>
<tr>
<td>5 GHz &lt; f ≤ 6 GHz</td>
<td>+11 dBm</td>
<td>+13 dBm</td>
</tr>
</tbody>
</table>

These options expand the MG3710E RF output upper limit. They are used when compensating for level losses of parts in the measurement path.
SSB Phase Noise

<-140 dBc/Hz (nom.) @100 MHz, 20-kHz offset, CW
<-131 dBc/Hz (typ.) @1 GHz, 20-kHz offset, CW
<-125 dBc/Hz (typ.) @2 GHz, 20-kHz offset, CW

SSB phase noise is an important performance index for signal generators. For example, when using a signal generator for the following purposes, it is important to pre-confirm that the signal generator performance satisfies the measurement specifications.

- Communications with narrow bandwidth of several kHz
- OFDM Signals with narrow subcarrier gap
- CW interference waveforms

High-speed Switching

<600 µs @List/Sweep mode

To shorten tact times on production lines the MG3710E supports two standard modes each with high-speed frequency and level switching.

Sweep Mode
In this mode, the dwell time per point or number of points is split between the frequency range and level range (Start/Stop). This mode is used when matching dwell time per point and frequency/level steps.

List Mode
In this mode, the frequency, level and dwell time can be set for each of up to 500 points. This mode is used when wanting to set any dwell time, and frequency/level step per point.
High Level Accuracy

Absolute Level Accuracy: $\pm 0.5 \text{ dB}^*1$
Linear: $\pm 0.2 \text{ dB (typ.)}^*2$

*1: 400 MHz to 3 GHz, $-110$ to $+10 \text{ dBm}$
*2: 50 MHz to 3 GHz, $-110$ to $-1 \text{ dBm}$

Excellent level accuracy and linearity are key factors with a large impact on measurement accuracy.

Supports Rubidium Reference Oscillator (Option)

Three reference oscillator options are supported. Select the high-stability reference oscillator option [Option 002] when requiring high accuracy depending on the measurement conditions; for even higher accuracy, select the rubidium reference oscillator [Option 001]. However, if external high-accuracy reference signals are available, selecting the standard reference oscillator option helps reduce unnecessary costs.

Reference Oscillator

- Standard
  - Aging Rate: $\pm 1 \times 10^{-6}/\text{year}, \pm 1 \times 10^{-7}/\text{day}$
  - Temperature Stability: $\pm 2.5 \times 10^{-6}$ (5°C to 45°C)

- High Stability Reference Oscillator [Option 002]
  - Aging Rate: $\pm 1 \times 10^{-7}/\text{year}, \pm 1 \times 10^{-8}/\text{day}$
  - Temperature Stability: $\pm 2 \times 10^{-8}$ (5°C to 45°C)
  - Start-up Characteristics*: $\pm 5 \times 10^{-7}$ (2 minutes after power-on)
    $\pm 5 \times 10^{-8}$ (5 minutes after power-on)

- Rubidium Reference Oscillator [Option 001]
  - Aging Rate: $\pm 1 \times 10^{-10}/\text{month}$
  - Temperature Stability: $\pm 2 \times 10^{-9}$ (5°C to 45°C)
  - Start-up Characteristics*: $\pm 1 \times 10^{-9}$ (7.5 minutes after power-on)

*: Compared to frequency after 24-h warm-up at 23°C
Wide Vector Modulation Bandwidth

160 MHz*/120 MHz (using Internal baseband signal generator)
160 MHz (using External IQ input)

Using the standard internal baseband signal generator offers a wide vector modulation bandwidth of 160 MHz.

*: Supports firmware version 2.00.00 and later. Can generate 160-MHz bandwidth signals (Wireless LAN IEEE 802.11ac) only when using WLAN IQproducer MX370111A and 802.11ac (160 MHz) option MX370111A-002. The latest version can be downloaded from the Anritsu homepage. [https://my.anritsu.com/home]

Large-capacity Waveform Memory

64 Msamples (256 MB) [with 1stRF, 2ndRF]
256 Msamples (1 GB) [Option 045*/075*]
1024 Msamples (4 GB) [Option 046*/076*]

*1: ARB Memory Upgrade 256 Msample for 1stRF (Option 045)
ARB Memory Upgrade 1024 Msample for 1stRF (Option 046)

*2: ARB Memory Upgrade 256 Msample for 2ndRF (Option 075)
ARB Memory Upgrade 1024 Msample for 2ndRF (Option 076)

Memory size is the most important specification for arbitrary waveform memory. If the memory is small, large waveform patterns cannot be handled and the number of cases when multiple waveform patterns cannot be loaded increases. When this happens, the time to reload another waveform pattern wastes evaluation time and lowers efficiency. The MG3710E has a large 64 Msamples memory as standard and this can be upgraded to either 4 times (256 Msamples) or 16 times (1024 Msamples) by adding these options.

Point:
Adding the baseband signal combine function (Option 048/078) supports waveform memories which can either be used separately or linked to multiply the memory size.

*: When attempting to load a waveform pattern exceeding the size of one memory, the memories are linked automatically to load the large pattern. However, in this case, other waveform patterns cannot be loaded into any remaining free space.

When dealing with many waveform patterns, we recommend upgrading the ARB memory size. If the waveform pattern can be handled by one memory, other waveform patterns can be loaded into the remaining free space and the other memory.
The maximum size per waveform pattern supported by the MG3710E varies with the IQproducer version.

Maximum Waveform Pattern Size and Required Options for Simultaneous Use

1stRF (Option 032/034/036)

<table>
<thead>
<tr>
<th>Combination of Baseband Signal (Option 048)</th>
<th>ARB Memory Upgrade 256 Msample (Option 045)</th>
<th>ARB Memory Upgrade 1024 Msample (Option 046)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/O</td>
<td>W/O</td>
<td>W/O</td>
</tr>
<tr>
<td>With Option 045</td>
<td>With Option 045</td>
<td>With Option 046</td>
</tr>
<tr>
<td>64 Msamples × 1 pc</td>
<td>256 Msamples × 1 pc</td>
<td>1024 Msamples × 1 pc</td>
</tr>
<tr>
<td>128 Msamples × 2 pcs</td>
<td>512 Msamples × 2 pcs</td>
<td></td>
</tr>
<tr>
<td>1024 Msamples × 1 pc*1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2ndRF (Option 062/064/066)

<table>
<thead>
<tr>
<th>Combination of Baseband Signal (Option 078)</th>
<th>ARB Memory Upgrade 256 Msample (Option 075)</th>
<th>ARB Memory Upgrade 1024 Msample (Option 076)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/O</td>
<td>W/O</td>
<td>W/O</td>
</tr>
<tr>
<td>With Option 075</td>
<td>With Option 075</td>
<td>With Option 076</td>
</tr>
<tr>
<td>64 Msamples × 1 pc</td>
<td>256 Msamples × 1 pc</td>
<td>1024 Msamples × 1 pc</td>
</tr>
<tr>
<td>128 Msamples × 2 pcs</td>
<td>512 Msamples × 2 pcs</td>
<td></td>
</tr>
<tr>
<td>1024 Msamples × 1 pc*1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: The maximum size per waveform pattern supported by the MG3710E varies with the IQproducer version.

*2: The Baseband Signal Combine option supports two ARB memories and can either set two different waveform patterns or combine them as one memory to support one large waveform pattern.

Free Waveform Generation

ASCII-format IQ sample data files created by other general-purpose EDA tools, such as MATLAB, can be converted into MG3710E waveform pattern files. Support for customer waveform pattern file creation makes the MG3710E ideal for R&D simulation applications too.
BER Test Function [Option 021]
This option installs a BER measurement function for measuring error rates between 100 bps and 40 Mbps using the DUT demodulated Data/Clock/Enable signals. The results are displayed on the MG3710E screen.

Input Bit Rate: 100 bps to 40 Mbps
Input Signal: Data, Clock, Enable (Polarity reversal supported)
Input Level: TTL

Measured Patterns:
PN9/11/15/20/23, ALL1, ALL0, Alternate (0101...), User Data, PN9fix/11fix/15fix/20fix/23fix

Count Mode
Data: Measures until specified Data count
Error: Measures until specified Error count

Measurable Bit Count: ≤2^{31} – 1 (4,294,967,295 bits)

Measurement Mode
Single: Measures specified measurement bit count once
Continuous: Repeats Single measurement
Endless: Continues measurement to upper limit of measurement bits

BER Measurement Upper Limit
The table below shows one example of a BER measurement that indicates SyncLoss. Actual results depend on the specific communication systems and data rate, and will not necessarily match the measurement values below.

<table>
<thead>
<tr>
<th>Error Rate</th>
<th>PN9</th>
<th>PN11</th>
<th>PN15</th>
<th>PN20</th>
<th>PN23</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0%</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5.0%</td>
<td>ok</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4.0%</td>
<td>ok</td>
<td>ok</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3.0%</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2.5%</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>–</td>
</tr>
<tr>
<td>2.0%</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
</tr>
<tr>
<td>1.0%</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
</tr>
</tbody>
</table>

AM/FM/ΦM/PM Function
This option supports the following modulation functions as standard. Analog modulations (AM/FM/ΦM) are performed on CW signals or arbitrary (ARB) waveform pattern signals. Pulse modulation can be performed at any cycle or timing and also supports modulation using an external input signal.

Amplitude Modulation (Internal Modulation Source)
Depth: 0 to 100% (Linear)
0 to 10 dB (Exponential)
Modulation Frequency: 0.1 Hz to 50 MHz

Frequency Modulation (Internal Modulation Source)
Deviation: 0 to 40 MHz
Modulation Frequency: 0.1 Hz to 40 MHz, or (50 MHz-FM Rate), whichever smaller

Φ-Modulation (Internal Modulation Source)
Deviation angle: 0 to 160 rad.
(40 MHz/ΦM Deviation) rad., whichever smaller
Modulation Frequency: 0.1 Hz to 40 MHz, or (40 MHz/ΦM Deviation), whichever smaller

Pulse Modulation (Internal Modulation Source)
Modulation Frequency: 0.1 Hz to 10 MHz
Modulation Period: 10 ns to 20 s

Additional Analog Modulation Input [Option 050/080]
Adding additional analog modulation input options (Option 050/080) extends to two internal modulation sources (AM/FM/ΦM) and one external modulation source supporting simultaneous two-signal modulation.

* AM + FM
* AM + ΦM
* Internal 1 + Internal 2
* Internal + External

*: FM + ΦM does not support.
AWGN Generator [Option 049*1/079*2]

*1: AWGN for 1stRF [Option 049]
*2: AWGN for 2ndRF [Option 079]

This option adds internally generated AWGN to the wanted signal. The AWGN output is switched on and off just by pressing the On/Off button.

Absolute C/N Ratio: ≤40 dB

USB Power Sensors [Sold separately]

Up to two USB power sensors can be connected to the MG3710E to display the measurement results on the MG3710E screen.

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Dynamic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA24104A*</td>
<td>600 MHz to 4 GHz</td>
<td>+3 to +51.76 dBm</td>
</tr>
<tr>
<td>MA24105A</td>
<td>350 MHz to 4 GHz</td>
<td>+3 to +51.76 dBm</td>
</tr>
<tr>
<td>MA24106A</td>
<td>50 MHz to 6 GHz</td>
<td>–40 to +23 dBm</td>
</tr>
<tr>
<td>MA24108A</td>
<td>10 MHz to 8 GHz</td>
<td>–40 to +20 dBm</td>
</tr>
<tr>
<td>MA24118A</td>
<td>10 MHz to 18 GHz</td>
<td>–40 to +20 dBm</td>
</tr>
<tr>
<td>MA24126A</td>
<td>10 MHz to 26 GHz</td>
<td>–40 to +20 dBm</td>
</tr>
</tbody>
</table>

*: MA24104A has been discontinued. Replacement model is MA24105A.

Level Offset: –100 to +100 dB
Average: 1 to 2048
Unit: dBm, W
COM Port: 2 to 8

Local Signal I/O for MIMO Signal Source [Option 017]

The Sync Multi SG function shares local, baseband and trigger signals between multiple MG3710E units to output phase coherency signals synchronized with the signal output timing.

An 8×8 MIMO test system is configured easily from four MG3710E units composed of one master and three slaves.

Synchronization mode: Master, Slave, SG1 & 2
Number of Slaves: 1 to 3
Slave Position: 1 to 3
Local Synchronization: On/Off
IQ Phase Adjustment: –360 deg. to +360 deg., Resolution 0.01 deg.
IQ Delay: –400 ns to +400 ns, Resolution 1 ps

Common Setting
Number of Slaves: 3
LO Sync: On

Note:
Option-017 is not required when synchronizing the local signal and baseband clock of SG1 (1stRF) and SG2 (2ndRF) installed in one MG3710E unit.
Easy Touch-panel Operation
Simply touching parts of the screen display with a finger fetches related function keys and numeric inputs, offering a fast and easy way of navigating through multilayer menus.
Operability

Two Signal Flowcharts
Pressing the on-screen button toggles instantly between the Hardware Block Chart and the ARB Info screens. The Hardware Block Chart is a quick-and-easy way to grasp the status of each block (ARB, AWGN, I/Q, Analog Mod, Pulse Mod, Local) at a glance. The ARB Info screen displays more details about the ARB/AWGN block showing the baseband signal combine status of memory A + memory B, memory A + AWGN, etc.

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARB</td>
<td>On/Off</td>
<td>ARB block</td>
</tr>
<tr>
<td>2</td>
<td>AWGN</td>
<td>On/Off</td>
<td>AWGN block</td>
</tr>
<tr>
<td>3</td>
<td>Analog Mod</td>
<td>On/Off</td>
<td>Analog Modulation block</td>
</tr>
<tr>
<td>4</td>
<td>I/Q</td>
<td>I/Q</td>
<td>I/Q block</td>
</tr>
<tr>
<td>5</td>
<td>Local Oscillator</td>
<td>Local Oscillator block</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pulse Mod</td>
<td>On/Off</td>
<td>Pulse Modulation block</td>
</tr>
<tr>
<td>7</td>
<td>—</td>
<td>—</td>
<td>Indicates that inputs from two function blocks of the left side and bottom side are combined and output to the function block of the right side</td>
</tr>
<tr>
<td>8</td>
<td>—</td>
<td>—</td>
<td>Indicates that the input Local signal from the bottom side is modulated with the input signal from the left side and output to the function block of the right side</td>
</tr>
<tr>
<td>9</td>
<td>—</td>
<td>—</td>
<td>Indicates the RF Output is On</td>
</tr>
<tr>
<td>10</td>
<td>Analog I/Q Out</td>
<td></td>
<td>Indicates the Analog I/Q signal is set to the external output</td>
</tr>
<tr>
<td>11</td>
<td>Analog I/Q In</td>
<td></td>
<td>Indicates the Analog I/Q signal is set to the external input</td>
</tr>
<tr>
<td>12</td>
<td>LO In (For SG1)</td>
<td></td>
<td>Indicates the SG1 Local signal source is set to Ext (input from the rear LO Input connector)</td>
</tr>
<tr>
<td>13</td>
<td>SG1 (For SG2)</td>
<td></td>
<td>Indicates the SG2 Local signal source is set to Sync and the signal is input from SG1</td>
</tr>
<tr>
<td>14</td>
<td>—</td>
<td>—</td>
<td>Click to switch Hardware Block Chart and ARB Info display</td>
</tr>
</tbody>
</table>

Frequency Channel Table
Sometimes frequencies need setting by Channel No. The built-in frequency channel table where frequencies are set by channel number is ideal for this application. Once set and saved, these pre-settings can be read whenever needed.

Channel Table Setting
- Group: 1 to 19
- Start Channel: 0 to 20000
- End Channel: (Start Channel) to 20000
- Start Frequency
- Channel Spacing
Remote Control Interfaces

The MG3710E has GPIB, Ethernet and USB interfaces as standard, supporting the following functions:

• Control all functions, except power switch
• Read all status conditions and settings
• Interrupts and serial polls

While in the Local status, the interface is determined automatically by the communication start command from the external controller (PC). To change the interface, put the MG3710E into the Local status again by pressing the Local key on the front panel and then send a command via the desired interface.

**GPIB: Conforms to IEEE488.1/IEEE488.2 standards**

SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2

**Ethernet: Conforms to VXI-11 protocol using TCP/IP Control programs**

SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0

**USB: Conforms to USBTMC-USB488 protocols**

SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0

USB Connections

The two type-A USB2.0 connectors on the front and rear panels support keyboard, mouse and USB memory connections. Supported USB power sensors can be connected too.

**USB Power Sensor [Sold separately]**

Frequency Range:
- 600 MHz to 4 GHz [MA24104*A]
- 350 MHz to 4 GHz [MA24105A]
- 50 MHz to 6 GHz [MA24106A]
- 10 MHz to 8 GHz [MA24108A]
- 10 MHz to 18 GHz [MA24118A]
- 10 MHz to 26 GHz [MA24126A]

*: MA24104A has been discontinued. Replacement model is MA24105A.

Analog IQ Input/Output [Option 018]

This option adds analog IQ input and output connectors to the front and rear panels, respectively. It only supports SG1 (1stRF).

Input: I Input, Q Input
Output: I Output, I Output, Q Output, Q Output,

Analog IQ Input/Output Setting Screen

Remote control command is in common with the MG3710A and the MG3710E. Either select the SCPI mode command format defined by the SCPI Consortium, or select backwards compatible modes supporting earlier MG3700A, MS269xA, and MS2830A commands

**Analog IQ Input Adjustment**

Setting Range: –100 mV to +100 mV

**Analog IQ Output Adjustment**

Output Voltage: 0.0 to 120.0%
In-phase DC offset: –2.5 V to +5.0 V
Differential DC offset: –50 mV to +50 mV


**Connection with External Equipment**

**Trigger Input**
Start and Frame triggers are installed as standard for outputting waveform patterns synchronized with externally input trigger signals.

**Start Trigger Operation**
At Start Trigger operation, after the waveform pattern is selected, output is started and continued by the rise timing of the first external trigger signal. Second and subsequent input external trigger signals are disabled. This is used when receiving a Start Trigger signal and reference frequency signal from the DUT at the MG3710E.

**Frame Trigger Operation**
At Frame Trigger operation, one frame of the waveform pattern is output at the rise timing of the external trigger signal. When frame output is finished, the trigger wait state is returned. This is used when receiving a Frame Trigger signal from the DUT at the MG3710E.

Frame Trigger supports three operations as follows:

1. **(1) No Retrigger**
   Ignores triggers received during pattern output (default setting)

2. **(2) Buffered Trig**
   Holds triggers received during pattern output until current pattern output completed and then outputs next frame

3. **(3) Restart on Trig**
   Immediately restarts pattern when trigger received during pattern output

**Marker Output Editing**

**Marker 1 Output [Standard]**

**Marker 2 & Marker 3 Output [ Requires AUX Conversion Adapter J1539A]**
When the Marker Setup function Edit Mode is Off, a marker signal combining the preset waveform pattern with marker information is output. When the Edit Mode is On, any marker for output can be set at the MG3710E screen. Up to 12 markers can be set for SG1/SG2, memory A/B and Marker 1 to 3.

There are three output connectors: Marker 1 Output on the rear panel and the AUX connector (Marker 2 Output and Marker 3 Output). The connector output signal layout can be selected freely.

**SG2 Marker Setup Screen**
Memory A (1A/2A/3A), Memory B (1B/2B/3B)

**SG2 Marker Setup Screen**
Memory A (1A/2A/3A), Memory B (1B/2B/3B)

**Marker Signal**
- SG1
  - Memory A: Marker 1, Marker 2, Marker 3
  - Memory B: Marker 1, Marker 2, Marker 3

**Marker Output**
- Marker 1 Output (Standard)
- Marker 2 Output
  - (AUX Connector J1539A optional)
- Marker 3 Output

**The defaults are as follows:**
- **Marker Signal**
  - SG1/Memory A/Marker 1
  - SG1/Memory A/Marker 2
  - SG1/Memory A/Marker 3
- **Connector**
  - Marker 1 Output
  - Marker 2 (@AUX)
  - Marker 3 (@AUX)
Waveform Generation Software (Separate license)
The IQproducer system provides an easy-to-use GUI for setting parameters according to each communications method. The parameter setting results file can be saved as a file for easy recall later.
* For detail, refer to the IQproducer catalog.

IQproducer Options

<table>
<thead>
<tr>
<th>Model/Name</th>
<th>MG3710E/MG3710A</th>
<th>MG3700A</th>
<th>MS269xA</th>
<th>MS2830A</th>
<th>MG3740A</th>
</tr>
</thead>
<tbody>
<tr>
<td>****01A HSDPA/HSUPA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****02A TDMA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****03A CDMA2000 1xEV-DO</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****04A Multi-carrier</td>
<td>1024 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****05A DVB-T/H</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****06A Fading</td>
<td>1024 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****07A LTE</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****08A LTE TDD</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****09A TD-SCDMA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****10A 5G NR TDD sub-6 GHz</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****11A 5G NR FDD sub-6 GHz</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
</tbody>
</table>

*1: Requires MX370108A
*2: Requires MX370110A
*3: Requires MX370111A. Only for MG3710E/MG3710A

If a license is not installed in the MG3710E, characters are displayed in red. Without a license, the IQproducer functions can still be tested but a license must be installed to actually output created waveform patterns.

The following table shows the maximum size for each waveform pattern generated using IQproducer. The maximum usable size (load) depends on the ARB memory expansion option installed in the main frame.

<table>
<thead>
<tr>
<th>IQproducer Model/Name</th>
<th>MG3710E/MG3710A</th>
<th>MG3700A</th>
<th>MS269xA</th>
<th>MS2830A</th>
<th>MG3740A</th>
</tr>
</thead>
<tbody>
<tr>
<td>****01A HSDPA/HSUPA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****02A TDMA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****03A CDMA2000 1xEV-DO</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****04A Multi-carrier</td>
<td>1024 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****05A DVB-T/H</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****06A Fading</td>
<td>1024 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****07A LTE</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
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<td>****08A LTE TDD</td>
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<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
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<td>****09A TD-SCDMA</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****10A 5G NR TDD sub-6 GHz</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
<tr>
<td>****11A 5G NR FDD sub-6 GHz</td>
<td>512 Msamples</td>
<td>256 Msamples</td>
<td>256 Msamples</td>
<td>512 Msamples</td>
<td></td>
</tr>
</tbody>
</table>

****: MX3701 or MX2699
IQproducer Waveform Generation Software

IQproducer
IQproducer supports the following functions free-of-charge as secondary waveform pattern creation functions.

- Convert
- AWGN
- Clipping
- CCDF/FFT/Time Domain
- Transfer & Setting/Transfer & Setting Wizard Combination File Edit

Operating Environment

<table>
<thead>
<tr>
<th>PC</th>
<th>OS</th>
<th>CPU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows 2000 Professional<em>1, Windows XP</em>4, Windows Vista*4, Windows 7 Enterprise (32-bit)*5, Windows 7 Professional (32-bit/64-bit)<em>5, Windows 10</em>4</td>
<td>Pentium III 1 GHz equivalent or faster</td>
</tr>
<tr>
<td></td>
<td>Memory</td>
<td>512 MB or more</td>
</tr>
<tr>
<td></td>
<td>Hard Disk</td>
<td>5 GB or more free space on the drive where this software is to be installed.</td>
</tr>
</tbody>
</table>

Peripheral Device

Display Displays with a resolution of 1024 x 768 pixels are best viewed using a small font setting

*1: Does not support IQproducer Version 13.00 and later
*2: Supports IQproducer Version 12.00 and later
*3: Support IQproducer Version 12.00 to Version 16.01
*4: Supports IQproducer Version 17.00 and later

Convert: Data Format Conversion

(1) ASCII-format IQ data created with other software, such as simulation software, can be converted to waveform pattern files used by the MG3710E.

IQ Data Convert Waveform Pattern

(2) Data files captured with Anritsu MS269xA Signal Analyzers and the capture function of the MS2830A Signal Analyzer can be converted to waveform pattern files used by the MG3710E.

Digitized Data Convert Waveform Pattern

(3) Waveform patterns created by other Anritsu vector signal generators (MG3700A, MS269xA-020, MS2830A-020/021) can be converted to waveform pattern files used by the MG3710E and vice versa.

MG3700A etc. Convert MG3710E
Clipping
This function clips each type of waveform pattern. The clipped waveform pattern is created by setting the filter, bandwidth, and repetition times.

AWGN Waveform Generation
This function establishes the sampling rate and bandwidth, allowing any AWGN waveform pattern to be created. In addition, when the first combined waveform pattern (Wanted Signal) is selected, the Wanted Signal bandwidth and sampling rate are set automatically. The resulting AWGN waveform pattern can be combined with an existing waveform pattern, which is useful for base-station dynamic-range measurements.

Main setting parameters
(1) Wanted Signal Bandwidth:
   Setting range: 0.0010 MHz to 120.0000 MHz

(2) AWGN BW (B)/Wanted Signal BW (A):
   Magnification of AWGN to Wanted Signal
   Setting range: 1.0, 1.5, 2.0, 2.5

(3) Sampling Rate:
   Setting range: 0.0200 MHz to 160.0000 MHz
   Note: Same value as wanted signal

(4) AWGN Bandwidth (B):
   Calculated automatically from (1) and (2) under following items:
   Limit range: 0.001 MHz to 20.000 MHz: Sampling rate/2 max.
   20.001 MHz to 120.000 MHz: Sampling rate max.

CCDF/FFT/Time Domain Graphical Displays

CCDF (Complementary Cumulative Distribution Function)
Up to 8 created waveform patterns are read and displayed simultaneously as CCDF graphs.

FFT (Fast Fourier Transform)
Up to 4 created waveform patterns are read, FFT-processed and displayed simultaneously as FFT graphs.

Time Domain
Up to 4 created waveform patterns are read, and displayed simultaneously as Time Domain graphs.
Transfer and Settings: Data Transfer
Waveform pattern files, graphics files, firmware version upgrades, etc., can be moved between a LAN-connected PC and MG3710E. When several MG3710E units are connected via LAN, waveform patterns can be transferred by a single operation, helping cut work times. Moreover, waveform pattern files saved on the hard disk of a remote-controlled MG3710E can be opened in arbitrary waveform memory to select and output the waveform pattern.

Combination File Edit Function
The Combination File Edit function is a Transfer & Setting Edit function. The following parameters are set automatically by selecting the Combination File:
• Waveform pattern
• Repetition times
• Interference waveform pattern (memory B)
• Frequency offset used when memory A and B added
• Level ratio (This value represents CN when memory A and B are added, or the relative level between elements when using only memory A.)

Using Combination Files that place the wanted and interference waveforms in separate memories makes it easy to measure receiver characteristics.

Combination files can also be used to create waveform sequences. Receive signal status transitions can be verified by using Sequence Mode Combination files defining switching and repetition times for multiple waveform patterns. Required waveform patterns and combination are saved to memory. Moreover, external triggers can be used to repeat each waveform pattern any number of times.

→ Efficient memory use
→ Validate response status transitions
→ Manual control of sequences
Hardware (Common)

Rubidium Reference Oscillator MG3710E-001
Rubidium Reference Oscillator Retrofit MG3710E-101
Installs 10 MHz reference crystal oscillator with excellent frequency
stability startup characteristics of $\pm 1 \times 10^{-9}$ at 7.5 minutes after power-on.

Aging Rate: $\pm 1 \times 10^{-10}$/month
Temperature stability: $\pm 2 \times 10^{-9}$ (5°C to 45°C)
Start-up characteristics*: $\pm 1 \times 10^{-9}$ (7.5 minutes after power-on)
*: at 23°C, compared to frequency after 24 h warm-up

High Stability Reference Oscillator MG3710E-002
High Stability Reference Oscillator Retrofit MG3710E-102
Installs 10 MHz reference oscillator with better frequency stability as follows:

Aging Rate: $\pm 1 \times 10^{-7}$/year, $\pm 1 \times 10^{-8}$/day
Temperature stability: $\pm 2 \times 10^{-8}$ (5°C to 45°C)
Start-up characteristics*: $\pm 5 \times 10^{-7}$ (2 minutes after power-on), $\pm 5 \times 10^{-8}$ (5 minutes after power-on)
*: at 23°C, compared to frequency after 24 h warm-up

2ndary HDD MG3710E-011
2ndary HDD Retrofit MG3710E-111
User installable/removable HDD

Universal Input/Output MG3710E-017
Universal Input/Output Retrofit MG3710E-117
Installs following signal I/O connectors on rear panel of main frame.
Required for local frequency sync for MIMO applications

- Baseband Reference Clock Input/Output
- Sweep Output (only supports SG1)
- Local Signal Input/Output

* Also provides AUX Conversion Adapter J1539A for Option 017/117 to use rear-panel AUX connector

BER Test Function MG3710E-021
BER Test Function Retrofit MG3710E-121
Installs BER measurement function

* Also provides AUX Conversion Adapter J1539A for Option 021/121 to use rear-panel AUX connector

Hardware (For 1stRF)

1stRF 100 kHz to 2.7 GHz MG3710E-032
1stRF 100 kHz to 4 GHz MG3710E-034
1stRF 100 kHz to 6 GHz MG3710E-036
Selects 1stRF frequency range
The frequency range cannot be changed after installation.

Analog IQ Input/Output MG3710E-018
Analog IQ Input/Output Retrofit MG3710E-118
Installs analog I/Q input connector on front panel and output
connector on rear panel of main unit

High Power Extension for 1stRF MG3710E-041
High Power Extension for 1stRF Retrofit MG3710E-141
Extends signal output setting range upper limit
Option 041/141 installed and Option 043/143 not installed
Level setting range: Hi limit $+30$ dBm (Standard $+17$ dBm)
Option 041/141 not installed and Option 043/143 not installed
Level setting range: Hi limit $+25$ dBm (Standard $+17$ dBm)

Low Power Extension for 1stRF MG3710E-042
Low Power Extension for 1stRF Retrofit MG3710E-142
Extends signal output setting range lower limit
Level setting range: Lo limit $-144$ dBm (Standard $-110$ dBm)

Reverse Power Protection for 1stRF MG3710E-043
Reverse Power Protection for 1stRF Retrofit MG3710E-143
Protects signal output connector against reverse input power
(Standard: 2 W nom.)
Max reverse input: 20 W (nom.) (1 MHz < f ≤ 2 GHz)
10 W (nom.) (2 GHz < f ≤ 6 GHz)

ARB Memory Upgrade 256 Msample for 1stRF MG3710E-045
ARB Memory Upgrade 256 Msample for 1stRF Retrofit MG3710E-145
Upgrades ARB size to 256 Msamples (1 GB)
With Option 048/148 not installed, installs 1 x 256 Msamples
With Option 048/148 installed, installs 2 x 256 Msamples

ARB Memory Upgrade 1024 Msample for 1stRF MG3710E-046
ARB Memory Upgrade 1024 Msample for 1stRF Retrofit MG3710E-146
Upgrades ARB size to 1024 Msamples (4 GB)
With Option 048/148 not installed, installs 1 x 1024 Msamples
With Option 048/148 installed, installs 2 x 1024 Msamples

Combination of Baseband Signal for 1stRF MG3710E-047
Combination of Baseband Signal for 1stRF Retrofit MG3710E-147
Two internal waveform memories. Selects two waveform patterns per
one RF output for setting mutual frequency offset, level offset, delay
time, etc., to output 2 signals from 1 RF connector

AWGN for 1stRF MG3710E-049
AWGN for 1stRF Retrofit MG3710E-149
Internal AWGN addition function. Adjusts AWGN bandwidth range
setting as follows for selected waveform pattern:

- Band limit: waveform pattern sampling rate $\times 0.2$
to waveform pattern sampling rate $\times 0.8$
- CN: $\leq 40$ dB

Additional Analog Modulation Input for 1st RF MG3710E-050
Additional Analog Modulation Input for 1st RF Retrofit MG3710E-150
Adds additional analog modulation inputs function for 1stRF. Extends
to two internal modulation sources (AM/FM/ΦM), and one external
modulation source supporting simultaneous two-signal modulation.
Installs external signal input connector on rear panel of main unit.
Options (Hardware)

Hardware (For 2ndRF)

- 2ndRF 100 kHz to 2.7 GHz
- 2ndRF 100 kHz to 4 GHz
- 2ndRF 100 kHz to 6 GHz
- 2ndRF 100 kHz to 2.7 GHz Retrofit
- 2ndRF 100 kHz to 4 GHz Retrofit
- 2ndRF 100 kHz to 6 GHz Retrofit

Selects 2ndRF frequency range. The frequency range cannot be changed after installation. Can only be retrofitted when 2ndRF not installed.

High Power Extension for 2ndRF

High Power Extension for 2ndRF Retrofit

Extends signal output setting range upper limit.

- Option 071/171 installed and Option 073/173 not installed
  - Level setting range: Hi limit +30 dBm (Standard +17 dBm)
- Option 071/171 not installed and Option 073/173 not installed
  - Level setting range: Hi limit +25 dBm (Standard +17 dBm)

Low Power Extension for 2ndRF

Low Power Extension for 2ndRF Retrofit

Extends signal output setting range lower limit.

- Level setting range: Lo limit –144 dBm (Standard –110 dBm)

Reverse Power Protection for 2ndRF

Reverse Power Protection for 2ndRF Retrofit

Protects signal output connector against reverse input power. (Standard: 2 W nom.)

- Max reverse input: 20 W (nom.) (1 MHz < f ≤ 2 GHz),
  - 10 W (nom.) (2 GHz < f ≤ 6 GHz)

ARB Memory Upgrade 256 Msample for 2ndRF

ARB Memory Upgrade 256 Msample for 2ndRF Retrofit

Upgrades ARB size to 256 Msamples (1 GB).

- (standard is 64 Msamples/256 MB)
  - With Option 078/178 not installed, installs 1 × 256 Msamples
  - With Option 078/178 installed, installs 2 × 256 Msamples

ARB Memory Upgrade 1024 Msample for 2ndRF

ARB Memory Upgrade 1024 Msample for 2ndRF Retrofit

Upgrades ARB size to 1024 Msamples (4 GB).

- (standard is 64 Msamples/256 MB)
  - With Option 078/178 not installed, installs 1 × 1024 Msamples
  - With Option 078/178 installed, installs 2 × 1024 Msamples

Combination of Baseband Signal for 2ndRF

Combination of Baseband Signal for 2ndRF Retrofit

Two internal waveform memories. Selects two waveform patterns per one RF output for setting mutual frequency offset, level offset, delay time, etc., to output 2 signals from 1 RF connector.

AWGN for 2ndRF

AWGN for 2ndRF Retrofit

Internal AWGN addition function. Adjusts AWGN bandwidth range setting as follows for selected waveform pattern:

- Band limit: waveform pattern sampling rate × 0.2
- to waveform pattern sampling rate × 0.8
- CN: ≤40 dB

Additional Analog Modulation Input for 2nd RF

Additional Analog Modulation Input for 2nd RF Retrofit

Adds additional analog modulation inputs function for 2ndRF. Extends to two internal modulation sources (AM/FM/QM), and one external modulation source supporting simultaneous two-signal modulation. Installs external signal input connector on rear panel of main unit.
Waveform Patterns & License

DFS Radar Pattern MX370073B
Sets pulse signals for testing 5-GHz band WLAN DFS functions. The MX370073B supports the waveform patterns for the FCC and Japan MIC test specifications. Pulse signals are output simply by selecting the pattern.

DFS (ETSI) Waveform Pattern MX370075A
Sets pulse signals for testing 5-GHz band WLAN DFS functions. The MX370075A supports the waveform patterns for the ETSI specifications. Pulse signals are output simply by selecting the pattern.

IQproducer License
IQproducer is PC application software for generating waveform patterns. The parameters are set using IQproducer and the waveform pattern is created to output the signal by selection at the MG3710E. This one software application includes all the following systems. Since it runs on any PC, the supported functions and parameter range can be verified before purchase.
When outputting a waveform pattern from the MG3710E, no signal is output unless a license for that system is installed in the main frame.
* Read the “IQproducer catalog” for details.

HSDPA/HSUPA IQproducer MX370101A
Sets parameters according to HSDPA/HSUPA (Uplink and Downlink) specifications, and generates HSDPA/HSUPA waveform patterns including Fixed Reference Channel (3GPP TS 25.101 Annex A.7).

TDMA IQproducer MX370102A
Sets required parameters for TDMA waveform patterns and generates various waveform patterns. Setting parameters include Modulation, Frame, Slot, Data, Filter, etc. Supports wide application range including public wireless.

CDMA2000 1xEV-DO IQproducer MX370103A
Sets parameters according to CDMA2000 1xEV-DO Forward/Reverse specifications and generates 1xEV-DO waveform patterns.

Multi-carrier IQproducer MX370104A
Generates multi-carrier waveform patterns combination files using MG3710E Baseband Signal Combine function (requires Option 048/078).

DVB-T/H IQproducer MX370106A
Sets parameters according to ETSI EN 300 744 V1.5.1 (2004-11) physical layer standard and generates DVB-T/H waveform patterns. Generated waveform patterns can be used for device TRx characteristics evaluation tests (Error Correction, BER graphics).

Fading IQproducer MX370107A
Performs IQ channel fading processing, correlation matrix calculation, AWGN combination. Input data file created by selecting waveform pattern file created with other IQproducer software, and IQ data (ASCII) created with other general-purpose simulation tools.

LTE IQproducer MX370108A
Generates wanted waveform patterns with parameters modified according to 3GPP TS 36.211, TS 36.212, TS 36.213 LTE FDD specifications.

LTE-Advanced FDD Option MX370108A-001
Installing in the MX370108A supports simple generation of carrier aggregation signals added by 3GPP Rel. 10. Additionally, clustered SC-FDMA signals can be generated at Uplink.
*: Requires MX370108A

LTE TDD IQproducer MX370110A
Generates wanted waveform patterns with parameters modified according to 3GPP TS 36.211, TS 36.212, TS 36.213 LTE TDD specifications.

LTE-Advanced TDD Option MX370110A-001
Installing in the MX370110A supports simple generation of carrier aggregation signals added by 3GPP Rel. 10. Additionally, clustered SC-FDMA signals can be generated at Uplink.
*: Requires MX370110A

What is DFS?
5-GHz band wireless LAN devices like meteorological radar, marine radar, etc., have a Dynamic Frequency Selection (DFS) function for switching to an empty channel when detecting a radio wave. At testing, pulse, chirping and hopping signals like those used by radar are output from the SG to the WLAN equipment to check that it does not output signals in that channel.

ISDB-Tmm Waveform Pattern MX370084A
Archive of ARIB STD-B46 waveform patterns. Supports MER and spectrum evaluation of Tx characteristics tests and sensitivity/simple BER tests at Rx characteristics tests.
### Options (Software)

#### WLAN IQproducer
**MX370111A**
Generates waveform patterns for IEEE Std 802.11-2007 and IEEE Std 802.11n-2009 IEEE 802.11a/b/g/j/n/p specifications.

#### 802.11ac (160 MHz) Option
**MX370111A-002**
Installing the MX370111A supports waveform patterns generation compliant with IEEE 802.11ac specifications.

*: Requires MX370111A. Only for MG3710E.

#### TD-SCDMA IQproducer
**MX370112A**
Generates wanted waveform patterns with parameters modified according to TD-SCDMA specifications standardized by TRx characteristics evaluation tests (excluding performance tests) for 3GPP TS 25.221, TS 25.222, TS 25.223, TS 25.105, TS 25.142

#### 5G NR TDD sub-6 GHz IQproducer
**MX370113A**
Generates 3GPP TS 38.211, TS 38.212, and TS 38.213 defined waveform patterns in compliance with the 5G NR sub-6 GHz specifications.

#### 5G NR FDD sub-6 GHz IQproducer
**MX370114A**

---

### Vector Signal Generator series

#### Supported LTE-Advanced Carrier Aggregation Modes

<table>
<thead>
<tr>
<th>Carrier Aggregation Mode</th>
<th>Vector Signal Generator Series</th>
<th>Vector Signal Generator</th>
<th>Vector Signal Generator Option for Signal Analyzer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-band contiguous Carrier Aggregation</td>
<td>MG3710E/MG3710A*1</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Intra-band non-contiguous Carrier Aggregation</td>
<td>MG3700A*1</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Inter-band non-contiguous Carrier Aggregation</td>
<td>MS2690A series Option 020*2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>MS2830A Option 020/021*2</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*: Requires MX370111A. Only for MG3710E.

---

#### Supported WLAN IEEE 802.11ac Signal Bandwidth

<table>
<thead>
<tr>
<th>IEEE 802.11ac Signal Bandwidth</th>
<th>Vector Signal Generator Series</th>
<th>Vector Signal Generator</th>
<th>Vector Signal Generator Option for Signal Analyzer</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 MHz/40 MHz/80 MHz</td>
<td>MG3710E/MG3710A*1</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>MG3700A*1</td>
<td>(1 unit)</td>
<td>(1 unit)</td>
</tr>
<tr>
<td>160 MHz</td>
<td>MS2690A series Option 020*2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>MS2830A Option 020/021*2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>80 MHz + 80 MHz (non-contiguous)</td>
<td>MG3710E-062</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>(2 RF 1 unit*4, or 1 RF 2 units)</td>
<td>(2 units)</td>
<td>(2 units)</td>
</tr>
</tbody>
</table>

*: Requires MX370111A and 802.11ac (160 MHz) Option MX370111A-002 installed.  
*: Requires MX370111A and 802.11ac (80 MHz) Option MX370111A-001 installed.  
*: Requires MX370111A and 802.11ac (80 MHz) Option MX269911A-001 installed.  
*: Requires MG3710E-062 (2.7 GHz)/064 (4 GHz)/066 (6 GHz) 2ndRF Option installed.
Supports SSB Phase Noise Performance $-140 \text{ dBC/Hz}$ nom. (@100 MHz)

Phase noise performance affects measurement results at narrow bandwidths of several kHz. In particular, high phase-noise performance is required for interference waveforms. Improved SSB phase noise supports wider specification margins and stable measurements to improve yields.

- $-140 \text{ dBC/Hz}$ (nom.) @100 MHz, 20-kHz offset, CW
- $-131 \text{ dBC/Hz}$ (typ.) @1 GHz, 20-kHz offset, CW
- $-125 \text{ dBC/Hz}$ (typ.) @2 GHz, 20-kHz offset, CW

TDMA IQproducer [MX370102A] Supports Following Modulation Methods

- BPSK, DBPSK, PI/2DBPSK, QPSK, DQPSK, PI/4DQPSK, 8PSK, D8PSK, 16QAM, 32QAM, 256QAM, ASK, 2FSK, 4FSK

The TDMA IQproducer PC software generates waveform patterns with any frame format or filter settings. One software package supports various narrowband digital communications.

Two modulation signals can be output from one RF output using the baseband signal combine function (Option 048/078). The level ratio (CN = 80 dB) and the frequency offset (±80 MHz max.) can be set as well. Usually, tests using two modulation signals, such as adjacent channel selectivity (ACS) and intermodulation characteristics (IM) require two signal generators as well as a software license for each signal generator. The MG3710E has two waveform memories for each RF output for setting and outputting different waveform data. One RF outputs the combined wanted + interference signals for a baseband bandwidth. Not only are equipment costs greatly reduced, but fewer external equipment, such as couplers, level adjusters, etc., as well as less setup time are required.

Supports BER Measurement Function [Option 021]

The BER can be measured using the DUT-demodulated Data/Clock/Enable. The measurement results are displayed on the MG3710E screen. Input Bit Rate: 100 bps to 40 Mbps
The MG3710E can save up to 1024 Msamples (4 GB) per RF. Memory size is one of the most important specifications for an arbitrary waveform signal generator. Small memory cannot save multiple waveform data and requires time-wasting reloading and measurement to output different signals each time.

With large waveform memory:
- Switch loaded waveform data instantaneously
- Load multiple test waveforms
  → Reduce number of reloads → Cuts times

License-free Pre-installed Waveform Patterns
WLAN 11a/b/g, Bluetooth, GPS, etc.
The following waveform patterns are available as options.
- ISDB-T/mm (MX370084A)
Optional waveform generation tools are also available (license separately sold):
- DVB-T/H (MX370106A)
- WLAN 11a/b/g/n/j/p (MX370111A)
- WLAN 11ac (MX370111A-002)

Two RF outputs can be installed as an option. Additionally, two RF output models with different frequencies can be installed. For example, if WLAN 11b/g are the wanted waveforms, mobile signals for LTE FDD, LTE TDD, W-CDMA, GSM, etc., are considered interference signals. Generally, these tests have high hardware and software costs because two separate signal generators are required. Using the MG3710E, the total investment costs for interference tests under simulated service conditions, such as WLAN + LTE FDD, or ISDB-T + W-CDMA, are reduced by selecting models with different frequencies for the 1stRF and 2ndRF outputs.
Two modulation signals can be output from one RF output using the baseband signal combine function (Option 048/078). The level ratio (CN = 80 dB) and the frequency offset (±80 MHz max.) can be set as well. Tests using two modulation signals, such as Adjacent Channel Selectivity (ACS), Blocking, and Intermodulation (IM), etc., require two separate signal generators and a license for each, greatly increasing equipment costs and setting work loads.

The MG3710E has two waveform memories for each RF output for setting and outputting different waveform data. One RF outputs the combined wanted + interference signals for a baseband bandwidth. Not only are equipment costs greatly reduced, but fewer external equipment, such as couplers, level adjusters, etc., as well as less setup time are required. In comparison to previous Anritsu instruments, frequency offsets can be set for both memory A and B, and the sampling rate for memory A and B can be adjusted automatically.

Installing the BER measurement (Option 021) and AWGN Generation (Option 049/079) options supports the extra functions required for Rx tests of each type of communications system.
The following table shows the recommended option combinations.

<table>
<thead>
<tr>
<th>Type</th>
<th>Option No</th>
<th>Retrofit</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1stRF</td>
<td>MG3710E-032</td>
<td>1stRF 100 kHz to 2.7 GHz</td>
<td>*1</td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-034</td>
<td>1stRF 100 kHz to 4 GHz</td>
<td>*1</td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-036</td>
<td>1stRF 100 kHz to 6 GHz</td>
<td>*1</td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-018</td>
<td>Analog IQ Input/Output</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-041</td>
<td>High Power Extension for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-042</td>
<td>Low Power Extension for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-043</td>
<td>Reverse Power Protection for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-045</td>
<td>ARB Memory Upgrade 256 Msample for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-046</td>
<td>ARB Memory Upgrade 1024 Msample for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-048</td>
<td>Combination of Baseband Signal for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-049</td>
<td>AWGN for 1stRF</td>
<td></td>
</tr>
<tr>
<td>1stRF</td>
<td>MG3710E-050</td>
<td>Additional Analog Modulation Input for 1stRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-062</td>
<td>2ndRF 100 kHz to 2.7 GHz</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-064</td>
<td>2ndRF 100 kHz to 4 GHz</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-066</td>
<td>2ndRF 100 kHz to 6 GHz</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-071</td>
<td>High Power Extension for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-072</td>
<td>Low Power Extension for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-073</td>
<td>Reverse Power Protection for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-075</td>
<td>ARB Memory Upgrade 256 Msample for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-076</td>
<td>ARB Memory Upgrade 1024 Msample for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-078</td>
<td>Combination of Baseband Signal for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-079</td>
<td>AWGN for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>2ndRF</td>
<td>MG3710E-080</td>
<td>Additional Analog Modulation Input for 2ndRF</td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>MG3710E-001</td>
<td>Rubidium Reference Oscillator</td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>MG3710E-002</td>
<td>High Stability Reference Oscillator</td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>MG3710E-011</td>
<td>2ndary HDD</td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>MG3710E-017</td>
<td>Universal Input/Output</td>
<td></td>
</tr>
</tbody>
</table>

*1: Only one of 2.7 GHz, 4 GHz, and 6 GHz options. Install any one 1stRF option. Retrofitting one of these options disables previously installed option.
*2: Only one of 2.7 GHz, 4 GHz, and 6 GHz options. Retrofitting one of these options disables previously installed option. Install any one 2ndRF option. Can be retrofitted only when 2ndRF not installed.
*3: Select any one. Selected memory size enabled and all others disabled.
Easy-to-use Panel

1. **Power Switch**
   Switches between standby status in which AC power is supplied, and operating power-on status. At standby the key lamp is orange; at power-on it is green. To supply power press the switch for 2 seconds or more.

2. **HDD Lamp**
   Lit when internal hard disk being accessed.

3. **Copy Key**
   Copies screen display to file.

4. **Recall Key**
   Displays menu for recalling parameter files.

5. **Save Key**
   Displays menu for saving parameter files.

6. **Cal Key**
   Displays menu for performing calibration.

7. **Local Key/Remote Lamp**
   Local Key: Return remote control via GPIB, Ethernet, USB (B) to local control and enables panel setting.
   Remote Lamp: Lit while MG3710E under remote control.

8. **Preset Key**
   Displays Preset menu to initialize parameter settings.

9. **Q Input Connector**
   Input for external Q phase signal. Requires Option 018 and only supports SG1 (1stRF); does not support SG2 (2ndRF).

10. **I Input Connector**
    Input for external I phase signal. Requires Option 018 and only supports SG1 (1stRF); does not support SG2 (2ndRF).

11. **Function Keys**
    Select and execute functions displayed at right edge of display. Displayed functions menus are multi-level with page hierarchy.

12. **SG1/SG2/IQpro Keys**
    SG1: Switches setting target to SG1
    SG2: Switches setting target to SG2
    IQpro: Starts IQproducer on main frame. IQproducer may not start running for a few seconds to minutes after pressing this key.

13. **Main Function Keys**
    Displays menus for setting and executing main functions: Frequency, [Level], [Sweep/List], [Mode], [AM], [FM/ΦM], [Pulse], [I/Q], [Load], [Select], [AUX Fctn], [Utility]

14. **Arrow/Enter/Cancel/Help/Incr Set/Context/Windows Keys**
    Help: Pressing function key after Help key displays help for pressed function key
    Incr Set: Sets increment/decrement steps for each parameter
    Context: Performs same operation and right mouse click
    Windows: Performs same operation as Windows key

15. **Ten Key Pad**
    Input numeric values for each parameter setting screen.

16. **Rotary Knob**
    Selects and sets displayed items.

17. **2nd RF Output [Option 062/064/066]**
    Mod On/Off: Switched 1stRF/2ndRF modulation On/Off.
    Lamp lit during modulation.
    On/Off: Switches RF output On/Off.

18. **RF Output [Option 032/034/036]**

19. **USB Connector (Type A)**

20. **Tab/Alt/BS/Ctrl/Shift/Alt-Tab Key**
    Shift key: Executes panel operation indicated by blue characters. Press Shift key and then required key.
**Easy-to-use Panel**

1. **LO Input**  
   Connector for inputting external Local signal.  
   Requires Option 017.

2. **LO Output**  
   Outputs Local signal. Requires Option 017.

3. **BB REF CLK Input**  
   Connector for inputting reference clock signal for sampling clock of built-in arbitrary waveform generator.  
   Requires Option 017.

4. **BB REF CLK Output**  
   Connector for outputting arbitrary waveform generator sampling clock signal. Requires Option 017.

5. **Sweep Output**  
   Connector for outputting either 10 V Sweep Signal synchronized with Sweep or Sweep Status signal.  
   Requires Option 017.

6. **Reserve 1**  
   Terminal for future extension.

7. **Reserve 2**  
   Terminal for future extension.

8. **Ext Mod Input SG1**  
   Option connector for inputting external signal for additional analog modulation input for the SG1. Requires Option 050.

9. **Ext Mod Input SG2**  
   Option connector for inputting external signal for additional analog modulation input for the SG2. Requires Option 080.

10. **I Output/Q Output/T Output/Q Output**  
    Connector for outputting internal baseband I/Q signal or inverse I/Q signal. Requires Option 018.

11. **AC Inlet**

12. **REF Input**  
    Connector for inputting external reference frequency signal (5/10/13 MHz).

13. **Buffer Output**  
    Connector for outputting built-in reference frequency signal (10 MHz).

14. **Start Frame TRIG Input**  
    Connector (pulled up internally) for inputting external trigger signal.

15. **Marker 1 Output**  
    Connector for outputting Marker 1 signal. (Marker 2/3 output from AUX connector).  
    Requires AUX Conversion Adapter J1539A.

16. **Pattern TRIG 1 Input**  
    Connector (pulled up internally) for inputting external trigger signal.

17. **GPIB**  
    Connector used for remote control via GPIB.

18. **USB Connector (Type A)**  
    Connector for USB memory, keyboard, mouse, etc.

19. **USB Connector (Type B)**  
    Connector used for remote control via USB.

20. **LAN**  
    Connector for personal computer and network.

21. **Monitor Output**  
    RGB connector for external display.

22. **HDD (Opt)**  
    Slot for hard disk option. Requires Option 011.

23. **AUX**  
    Connector for following I/O signals.
    Requires AUX Conversion Adapter J1539A.  
    - BER Measurement Signal (Input): Data, CLK, Enable  
    - Marker Signal (Output): Marker 2, Marker 3  
    - Pulse Signal for external Pulse Modulation (Input): Pulse Mod  
    - Signal synchronized with Pulse Modulation signal at PM (Output): Pulse Sync, Pulse Video Out  
    - Trigger signal at timing of internal Baseband Ref Clock based on Start/Frame trigger (Out): Sync Trigger Out

24. **HDD**  
    Hard disk slot
### Vector Signal Generator MG3710E

#### Specifications

Refer to the Data Sheet for specification details such as guaranteed setting ranges, etc.

### Frequency Setting Range

- **1stRF**
  - MG3710E-032: 9 kHz to 2.7 GHz
  - MG3710E-034: 9 kHz to 4 GHz
  - MG3710E-036: 9 kHz to 6 GHz

- **2ndRF**
  - MG3710E-062: 9 kHz to 2.7 GHz
  - MG3710E-064: 9 kHz to 4 GHz
  - MG3710E-066: 9 kHz to 6 GHz

### Switching Speed (List Mode)

- **Frequency**: ≤600 µs
- **Level**: ≤600 µs

### Amplitude Setting Range

<table>
<thead>
<tr>
<th>Options</th>
<th>Setting Range [dBm]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Reverse Power Protection</td>
</tr>
<tr>
<td>Standard</td>
<td>–110 to +17</td>
</tr>
<tr>
<td>with High-power Extension</td>
<td>–110 to +30</td>
</tr>
<tr>
<td>with Low-power Extension</td>
<td>–144 to +17</td>
</tr>
<tr>
<td>with High-power Extension and Low-power Extension</td>
<td>–144 to +30</td>
</tr>
</tbody>
</table>

**Level Accuracy is assured at high levels (CW)**

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Standard</th>
<th>Option 041/071</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz ≤ f &lt; 10 MHz</td>
<td>+5 dBm</td>
<td>+5 dBm</td>
</tr>
<tr>
<td>10 MHz ≤ f &lt; 50 MHz</td>
<td>+10 dBm</td>
<td>+10 dBm</td>
</tr>
<tr>
<td>50 MHz ≤ f &lt; 400 MHz</td>
<td>+13 dBm</td>
<td>+20 dBm</td>
</tr>
<tr>
<td>400 MHz ≤ f ≤ 3 GHz</td>
<td>–23 dBm</td>
<td>+20 dBm</td>
</tr>
<tr>
<td>3 GHz &lt; f ≤ 4 GHz</td>
<td>+13 dBm</td>
<td>+11 dBm</td>
</tr>
<tr>
<td>4 GHz &lt; f ≤ 5 GHz</td>
<td>+11 dBm</td>
<td>+11 dBm</td>
</tr>
<tr>
<td>5 GHz &lt; f ≤ 6 GHz</td>
<td>+11 dBm</td>
<td>+11 dBm</td>
</tr>
</tbody>
</table>

### Harmonics

- <–30 dBc

**Non-Harmonics**

- Output level ≤+5 dBm, CW, Frequency offset ≥10 kHz
  - ≤-62 dBc (100 kHz ≤ f ≤ 187.5 MHz)
  - ≤-68 dBc (187.5 MHz < f ≤ 750 MHz)
  - ≤-62 dBc (750 MHz < f ≤ 1.5 GHz)
  - ≤-56 dBc (1.5 GHz < f ≤ 3 GHz)
  - ≤-50 dBc (3 GHz < f ≤ 6 GHz)

**Single Sideband Phase Noise (at CW, 20 kHz offset)**

- ≤–140 dBc/Hz (nom.)
- ≤–131 dBc/Hz (typ.)
- ≤–125 dBc/Hz (typ.)

**Absolute Level Accuracy (at CW, 18°C to 28°C, –110 to +5 dBm)**

- ±0.5 dB (typ.) (100 kHz ≤ f < 50 MHz)
- ±0.5 dB (50 MHz ≤ f ≤ 3 GHz)
- ±0.7 dB (3 GHz < f ≤ 4 GHz)
- ±0.8 dB (4 GHz < f ≤ 6 GHz)

**Non-Harmonics**

- Output level ≤+5 dBm, CW, Frequency offset ≥10 kHz
  - ≤–62 dBc (100 kHz ≤ f ≤ 187.5 MHz)
  - ≤–68 dBc (187.5 MHz < f ≤ 750 MHz)
  - ≤–62 dBc (750 MHz < f ≤ 1.5 GHz)
  - ≤–56 dBc (1.5 GHz < f ≤ 3 GHz)
  - ≤–50 dBc (3 GHz < f ≤ 6 GHz)

**Single Sideband Phase Noise (at CW, 20 kHz offset)**

- ≤–140 dBc/Hz (nom.)
- ≤–131 dBc/Hz (typ.)
- ≤–125 dBc/Hz (typ.)

### Analog Modulation

#### Amplitude Modulation (Internal Modulation Source)

- Depth: 0 to 100% (Linear)
  - 0 to 10 dB (Log)

#### Frequency Modulation (Internal Modulation Source)

- Deviation: 0 Hz to 40 MHz
- Modulation Frequency: 0.1 Hz to 40 MHz, or (50-MHz FM Rate), whichever smaller

#### Φ-Modulation (Internal Modulation Source)

- Deviation angle: 0 to 160 rad., or (40 MHz/ΦM Rate) rad., whichever smaller

#### Pulse Modulation (Internal Modulation Source)

- Modulation Frequency: 0.1 Hz to 10 MHz
- Modulation Period: 10 ns to 20 s

### Baseband Performance

#### RF Modulation Bandwidth

160 MHz*/120 MHz (using Internal baseband signal generator)

#### ARB Memory Size

- 64 Msamples (256 MB) [with 1stRF, 2ndRF]
- 256 Msamples (1 GB) [Option 045/075]
- 1024 Msamples (4 GB) [Option 046/076]

#### Sampling Rate

- 20 kHz to 200 MHz*/160 MHz

#### DAC Resolution

- 14/15/16 bits

### EVM Performance

18°C to 28°C, after CAL

- **W-CDMA (Test Model 4):**
  - Output Frequency: 800 MHz to 900 MHz, 1.8 GHz to 2.2 GHz
  - ≤0.62%(rms)
  - ≤0.6%(rms) (typ.)

- **GSM:**
  - Output Frequency: 800 MHz to 900 MHz, 1.8 GHz to 1.9 GHz
  - ≤0.84%(rms)
  - ≤0.8%(rms) (typ.)

- **EDGE:**
  - Output Frequency: 800 MHz to 900 MHz, 1.8 GHz to 1.9 GHz
  - ≤0.84%(rms)
  - ≤0.8%(rms) (typ.)

- **LTE (20 MHz Test Model 3.1):**
  - Output Frequency: 600 MHz to 2.7 GHz
  - ≤0.82%(rms)
  - ≤0.8%(rms) (typ.)

### Dimensions, Weight

- 177 (H) × 426 (W) × 390 (D) mm
- ≤13.7 kg (with 1stRF, excluding other option)

### Power Requirements

- 100 V(ac) to 120 V(ac), 200 V(ac) to 240 V(ac)
- 50 Hz to 60 Hz

### EU Standards (CE Marking)

- EMC: 2014/30/EU, EN61326-1, EN61000-3-2
- LVD: 2014/35/EU, EN61010-1
- RoHS: 2011/65/EU, EN50581

Refer to the Data Sheet for specification details such as guaranteed setting ranges, etc.
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.

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710E-001</td>
<td>Rubidium Reference Oscillator</td>
<td>Select when ordering main frame, requisite for use with high-stability reference oscillator.</td>
</tr>
<tr>
<td>MG3710E-002</td>
<td>High-Stability Reference Oscillator</td>
<td>Select when ordering main frame, requisite for use with high-stability reference oscillator.</td>
</tr>
<tr>
<td>MG3710E-011</td>
<td>2ndary HDD</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
</tr>
<tr>
<td>MG3710E-017</td>
<td>Universal Input/Output</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
</tr>
<tr>
<td>MG3710E-021</td>
<td>BER Test Function</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
</tr>
<tr>
<td>MG3710E-032</td>
<td>1stRF 100 kHz to 2.7 GHz</td>
<td>Select when ordering main frame, select 1stRF frequency range, frequency cannot be changed after installation</td>
</tr>
<tr>
<td>MG3710E-036</td>
<td>1stRF 100 kHz to 4 GHz</td>
<td>Select when ordering main frame, select 1stRF frequency range, frequency cannot be changed after installation</td>
</tr>
<tr>
<td>MG3710E-041</td>
<td>High Power Extension for 1stRF</td>
<td>Select when ordering main frame, increases upper limit of output signal power setting range</td>
</tr>
<tr>
<td>MG3710E-042</td>
<td>Low Power Extension for 1stRF</td>
<td>Select when ordering main frame, increases lower limit of output signal power setting range</td>
</tr>
<tr>
<td>MG3710E-043</td>
<td>Reverse Power Protection for 1stRF</td>
<td>Select when ordering main frame, prevents damage caused by reverse input to output connector</td>
</tr>
<tr>
<td>MG3710E-045</td>
<td>ARB Memory Upgrade 256 Mb for 1stRF</td>
<td>Select when ordering main frame, expands ARB memory capacity</td>
</tr>
<tr>
<td>MG3710E-046</td>
<td>ARB Memory Upgrade 1024 Mb for 1stRF</td>
<td>Select when ordering main frame, expands ARB memory capacity</td>
</tr>
<tr>
<td>MG3710E-048</td>
<td>Combination of Baseband Signal for 1stRF</td>
<td>Select when ordering main frame, adds baseband combine function</td>
</tr>
<tr>
<td>MG3710E-049</td>
<td>AWGN for 1stRF</td>
<td>Select when ordering main frame, adds AWGN function</td>
</tr>
<tr>
<td>MG3710E-050</td>
<td>Additional Analog Modulation Input for 1stRF</td>
<td>Select when ordering main frame, installs IQ input/output BNC connector in mainframe</td>
</tr>
<tr>
<td>MG3710E-051</td>
<td>Analog IQ Input/Output</td>
<td>Select when ordering main frame, installs IQ input/output BNC connector in mainframe</td>
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<tr>
<td>MG3710E-101</td>
<td>Rubidium Reference Oscillator Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
</tr>
<tr>
<td>MG3710E-102</td>
<td>High-Stability Reference Oscillator Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
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<td>MG3710E-111</td>
<td>2ndary HDD Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
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<td>MG3710E-117</td>
<td>Universal Input/Output Retrofit</td>
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<tr>
<td>MG3710E-121</td>
<td>BER Test Function Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
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<tr>
<td>MG3710E-062</td>
<td>2ndRF 100 kHz to 2.7 GHz</td>
<td>Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation</td>
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<tr>
<td>MG3710E-064</td>
<td>2ndRF 100 kHz to 4 GHz</td>
<td>Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation</td>
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<tr>
<td>MG3710E-066</td>
<td>2ndRF 100 kHz to 6 GHz</td>
<td>Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation</td>
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<tr>
<td>MG3710E-071</td>
<td>High Power Extension for 2ndRF</td>
<td>Select when ordering main frame, increases upper limit of output signal power setting range</td>
</tr>
<tr>
<td>MG3710E-072</td>
<td>Low Power Extension for 2ndRF</td>
<td>Select when ordering main frame, increases lower limit of output signal power setting range</td>
</tr>
<tr>
<td>MG3710E-073</td>
<td>Reverse Power Protection for 2ndRF</td>
<td>Select when ordering main frame, prevents damage caused by reverse input to output connector</td>
</tr>
<tr>
<td>MG3710E-075</td>
<td>ARB Memory Upgrade 256 Mb for 2ndRF</td>
<td>Select when ordering main frame, expands ARB memory capacity</td>
</tr>
<tr>
<td>MG3710E-076</td>
<td>ARB Memory Upgrade 1024 Mb for 2ndRF</td>
<td>Select when ordering main frame, expands ARB memory capacity</td>
</tr>
<tr>
<td>MG3710E-077</td>
<td>Combination of Baseband Signal for 2ndRF</td>
<td>Select when ordering main frame, adds baseband combine function</td>
</tr>
<tr>
<td>MG3710E-079</td>
<td>AWGN for 2ndRF</td>
<td>Select when ordering main frame, adds AWGN function</td>
</tr>
<tr>
<td>MG3710E-080</td>
<td>Additional Analog Modulation Input for 2ndRF</td>
<td>Select when ordering main frame, installs IQ input/output BNC connector in mainframe</td>
</tr>
<tr>
<td>MG3710E-162</td>
<td>2ndRF 100 kHz to 2.7 GHz Retrofit</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
</tr>
<tr>
<td>MG3710E-164</td>
<td>2ndRF 100 kHz to 4 GHz Retrofit</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
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<tr>
<td>MG3710E-166</td>
<td>2ndRF 100 kHz to 6 GHz Retrofit</td>
<td>Retrofitted to shipped MG3710E when 2ndRF not installed</td>
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<tr>
<td>MG3710E-171</td>
<td>High Power Extension for 2ndRF Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
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<tr>
<td>MG3710E-172</td>
<td>Low Power Extension for 2ndRF Retrofit</td>
<td>Retrofitted to shipped MG3710E</td>
</tr>
<tr>
<td>MG3710E-173</td>
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<td>Retrofitted to shipped MG3710E</td>
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<tr>
<td>MG3710E-175</td>
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<tr>
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<td>ARB Memory Upgrade 1024 Mb for 2ndRF Retrofit</td>
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<td>MG3710E-180</td>
<td>Additional Analog Modulation Input for 2ndRF Retrofit</td>
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Maintenance Service

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<tr>
<th>Model/Order No.</th>
<th>Service</th>
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<tbody>
<tr>
<td>MG3710E-ES210</td>
<td>2 Years Extended Warranty Service</td>
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<tr>
<td>MG3710E-ES310</td>
<td>3 Years Extended Warranty Service</td>
</tr>
<tr>
<td>MG3710E-ES510</td>
<td>5 Years Extended Warranty Service</td>
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### Ordering Information

**Model/Order No.**

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<thead>
<tr>
<th>Sowares</th>
<th>Name</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>MX370073B</td>
<td>DFS Radar Pattern</td>
<td>License for waveform patterns</td>
</tr>
<tr>
<td>MX370075A</td>
<td>DFS (ETSI) Waveform Pattern</td>
<td>License for waveform patterns, manual (PDF)</td>
</tr>
<tr>
<td>MX370084A</td>
<td>ISDB-Tmm Waveform Pattern</td>
<td>License for waveform patterns, manual (PDF)</td>
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</tbody>
</table>

**Softwares (IQproducer)**

<table>
<thead>
<tr>
<th>Sowares</th>
<th>Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX370101A</td>
<td>HSDPA/HSUPA IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370102A</td>
<td>TDMA IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370103A</td>
<td>CDMA2000 1XEV-DO IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370104A</td>
<td>Multi-carrier IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370106A</td>
<td>DVB-T/H IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370107A</td>
<td>Fading IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370108A</td>
<td>LTE IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370108A-001</td>
<td>LTE-Advanced FDD Option</td>
<td>IQproducer software, license for main frame, manual (PDF), Requires MX370108A.</td>
</tr>
<tr>
<td>MX370110A</td>
<td>LTE TDD IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370110A-001</td>
<td>LTE-Advanced TDD Option</td>
<td>IQproducer software, license for main frame, manual (PDF), Requires MX370110A.</td>
</tr>
<tr>
<td>MX370111A</td>
<td>WLAN IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370111A-002</td>
<td>802.11ac (160 MHz) Option</td>
<td>Only for MG3710E/MG3710A. Requires MX370111A.</td>
</tr>
<tr>
<td>MX370112A</td>
<td>TD-SCDMA IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370113A</td>
<td>5G NR TDD sub-6 GHz IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
</tr>
<tr>
<td>MX370114A</td>
<td>5G NR FDD sub-6 GHz IQproducer</td>
<td>IQproducer software, license for main frame, manual (PDF)</td>
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</table>

**Optional Accessories**

<table>
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<tr>
<th>Sowares</th>
<th>Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3580AE</td>
<td>MG3710A/MG3710E/MG3740A Operation Manual (Main Unit)</td>
<td>Booklet, for MG3710A/MG3710E/MG3740A Main Frame (Operation, Remote Control)</td>
</tr>
<tr>
<td>W2496AE</td>
<td>MG3710A/MG3710E/MG3740A Operation Manual (IQproducer)</td>
<td>Booklet, for IQproducer (Operation for Common Parts)</td>
</tr>
<tr>
<td>W3581AE</td>
<td>MG3710A/MG3710E/MG3740A Operation Manual (Pre-installed Waveform Patterns)</td>
<td>Booklet, for Pre-installed Waveform Patterns (Usage, Detailed Parameters)</td>
</tr>
<tr>
<td>W3986AE</td>
<td>MX370073B Operation Manual</td>
<td>Booklet, for DFS (for FCC and Japan MIC) Waveform Patterns</td>
</tr>
<tr>
<td>W3597AE</td>
<td>MX370075A Operation Manual</td>
<td>Booklet, for DFS (ETSI) Waveform Patterns</td>
</tr>
<tr>
<td>W3508AE</td>
<td>MX370084A Operation Manual</td>
<td>Booklet, for ISDB-Tmm Waveform Patterns</td>
</tr>
<tr>
<td>W2915AE</td>
<td>MX370101A Operation Manual</td>
<td>Booklet, for HSDPA/HSUPA IQproducer</td>
</tr>
<tr>
<td>W2916AE</td>
<td>MX370102A Operation Manual</td>
<td>Booklet, for TDMA IQproducer</td>
</tr>
<tr>
<td>W2505AE</td>
<td>MX370103A Operation Manual</td>
<td>Booklet, for CDMA2000 1XEV-DO IQproducer</td>
</tr>
<tr>
<td>W2917AE</td>
<td>MX370104A Operation Manual</td>
<td>Booklet, for Multi-carrier IQproducer</td>
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<tr>
<td>W2798AE</td>
<td>MX370106A Operation Manual</td>
<td>Booklet, for DVB-T/H IQproducer</td>
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<td>W2995AE</td>
<td>MX370107A Operation Manual</td>
<td>Booklet, for Fading IQproducer</td>
</tr>
<tr>
<td>W3023AE</td>
<td>MX370108A Operation Manual</td>
<td>Booklet, for LTE IQproducer/LTE-Advanced FDD Option</td>
</tr>
<tr>
<td>W3221AE</td>
<td>MX370110A Operation Manual</td>
<td>Booklet, for LTE TDD IQproducer/LTE-Advanced TDD Option</td>
</tr>
<tr>
<td>W3488AE</td>
<td>MX370111A Operation Manual</td>
<td>Booklet, for WLAN IQproducer/802.11ac Option</td>
</tr>
<tr>
<td>W3582AE</td>
<td>MX370112A Operation Manual</td>
<td>Booklet, for TD-SCDMA IQproducer</td>
</tr>
<tr>
<td>W3984AE</td>
<td>MX370113A Operation Manual</td>
<td>Booklet, for 5G NR TDD sub-6 GHz IQproducer</td>
</tr>
<tr>
<td>W4033AE</td>
<td>MX370114A Operation Manual</td>
<td>Booklet, for 5G NR FDD sub-6 GHz IQproducer</td>
</tr>
<tr>
<td>J1539A</td>
<td>AUX Conversion Adapter</td>
<td>Converts MG3710E/MG3710A rear-panel AUX connector to BNC connector</td>
</tr>
<tr>
<td>Z1622A</td>
<td>Installation Kit</td>
<td>Required when retrofitting hardware options or installing IQproducer (MX3701xxA)</td>
</tr>
<tr>
<td>Z1594A</td>
<td>Standard Waveform Pattern for Backup</td>
<td>Latest MG3710E/MG3710A Pre-installed waveform pattern set for backup</td>
</tr>
<tr>
<td>MA24105A</td>
<td>Inline Peak Power Sensor</td>
<td>Latest MG3710E/MG3710A Pre-installed waveform pattern set for backup</td>
</tr>
<tr>
<td>MA24106A</td>
<td>USB Power Sensor</td>
<td>50 MHz to 6 GHz, with USB A to mini-B Cable</td>
</tr>
<tr>
<td>MA24108A</td>
<td>Microwave USB Power Sensor</td>
<td>10 MHz to 8 GHz, with USB A to micro-B Cable</td>
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<td>MA24118A</td>
<td>Microwave USB Power Sensor</td>
<td>10 MHz to 18 GHz, with USB A to micro-B Cable</td>
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<tr>
<td>MA24126A</td>
<td>Microwave USB Power Sensor</td>
<td>10 MHz to 26 GHz, with USB A to micro-B Cable</td>
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<td>K2408</td>
<td>Power Divider (K connector)</td>
<td>DC to 26.5 GHz, K; 50 Ohm, 1 Wmax</td>
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<td>J0568</td>
<td>Four-Port Junction Pad</td>
<td>5 MHz to 3 GHz, N-J</td>
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<td>J0576D</td>
<td>Coaxial Cord, 1.0 m</td>
<td>N-P · SD-W2 · N-P</td>
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<td>J0127A</td>
<td>Coaxial Cord, 0.5 m</td>
<td>BNC-P · RG-58A/U · BNC-P</td>
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<tr>
<td>J0322A</td>
<td>Coaxial Cord, 0.5 m</td>
<td>SMA-P · SMA-P, DC to 18 GHz, 50Q</td>
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<tr>
<td>J0322B</td>
<td>Coaxial Cord, 1.0 m</td>
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<tr>
<td>J0332C</td>
<td>Coaxial Cord, 1.5 m</td>
<td>SMA-P · SMA-P, DC to 18 GHz, 50Q</td>
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<tr>
<td>J0332D</td>
<td>Coaxial Cord, 2.0 m</td>
<td>SMA-P · SMA-P, DC to 18 GHz, 50Q</td>
</tr>
<tr>
<td>J0004</td>
<td>Coaxial Adapter</td>
<td>N-P · SMA-J Conversion Adapter, DC to 12.4 GHz</td>
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<tr>
<td>J1261B</td>
<td>Ethernet Cable (Shield Type)</td>
<td>Straight-through, 3 m</td>
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<tr>
<td>J1261D</td>
<td>Ethernet Cable (Shield Type)</td>
<td>Crossover, 3 m</td>
</tr>
<tr>
<td>J0008</td>
<td>GPB Cable, 2.0 m</td>
<td>EIA</td>
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<td>B0635A</td>
<td>Rack Mount Kit</td>
<td>JIS</td>
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<tr>
<td>B0636C</td>
<td>Carrying Case</td>
<td>Hard Type. With Casters and Front Cover B0671A</td>
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<td>B0671A</td>
<td>Front Cover for 1MW4U</td>
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<tr>
<td>Z0975A</td>
<td>Keyboard (USB)</td>
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<tr>
<td>Z0541A</td>
<td>USB Mouse</td>
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The following option is installed as standard when ordering the MG3710E. It does not require a separate order.

MX371099A MG3710A Standard Waveform Pattern
Ordering Information

AUX Conversion Adapter J1539A
USB Power Sensor MA24106A
Carrying Case 80636C
(Hard type, with casters)
MG3710E with Front Cover
Front Cover for 1MW4U 80671A

Typical (typ.): Performance not warranted. Must products meet typical performance.
Nominal (nom.): Values not warranted. Included to facilitate application of product.
Measured (meas): Performance not warranted. Data actually measured by randomly selected measuring instruments.

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