



SIGNAL GENERATORS

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Synthesizer Selection Guide (Measurement Function)

Group	Model	Functions																Remarks															
		Frequency Extensions		Level Extensions				Modulation				Others																					
		8 MHz to 2 GHz	8 MHz to 2.2 GHz	0.1 Hz to 10 MHz	mmWave (50 GHz to 500 GHz) signal source	110 dB step attenuator (<20 GHz)	110 dB step attenuator (<40 GHz)	90 dB step attenuator (>40 GHz)	23 dBm high power (<20 GHz, Without Option 4 or 5)	19 dBm high power (<40 GHz, Without Option 4 or 5)	13 dBm high power (<50 GHz, Without Option 4 or 5)	9 dBm high power (<67 GHz, Without Option 4 or 5)	AM modulation (external)	FM/ΦM modulation (external)	Pulse modulation (external, <40 GHz)	Pulse modulation (external, >40 GHz)	For AM/FM/ΦM modulation (internal signal source)		For pulse modulation (internal signal source)	Low phase noise	Premium phase noise	Analog sweep	High stability time base	User-defined modulation waveform software	Rear panel RF output (<40 GHz)	Rear panel RF output (>40 GHz)	Delete front panel	Rack mount kit	Ultra-stable phase tracking				
Main frame	MG3692C	✓	✓	✓	✓	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2 GHz to 20 GHz	
	MG3694C	✓	✓	✓	*	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2 GHz to 40 GHz	
	MG3695C	✓	✓	✓	*		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2 GHz to 50 GHz	
	MG3697C	✓	✓	✓	*		✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2 GHz to 67 GHz (setting range: 2 GHz to 70 GHz)	
Options	1A																												✓		Either selection Option 1A comes with slides. Option 1B does not include slides.		
	1B																												✓				
	2A					✓																											Choose corresponding to main frame frequency range
	2B						✓																										
	2C							✓																									
	3																		✓													Ultra and premium versions available. Consult the TDS for more information. Not available with Option 3X.	
	3X																			✓												Not available with Option 3.	
	4		✓																														Starts at 10 MHz. Not available with Option 5.
	5	✓																															Not available with Option 4.
	6																				✓												When used with Option 4, analog sweep capability is limited to ≥500 MHz
	9K																																
	9V																																
	10																																Requires Option 27 or 28
	12																																
	14																				✓												For internal modulation capability, requires addition of a LF Generator, Option 27
	15A								✓																								
	15B									✓																							
	15C										✓																						
	15D											✓																					
	16																																
17																																	
22			✓																													Only available with Options 1A or 1B	
26A																																	
26B																																	
27																																	
28A																																	
28B																																	
36																																	
CE																																	

*: The maximum of frequency required for frequency extension to mmWave is 20 GHz.

RF/Microwave Signal Generator

MG3690C Series

0.1 Hz to 70 GHz/500 GHz

Remote Control
GPIB | LAN

The Ideal Microwave Signal Generator



Value Without Compromise

The MG3690C series of RF/Microwave signal generators cover the audio, HF, VHF, UHF, RF, and microwave frequencies and provide coverage from 0.1 Hz to 70 GHz with a single coaxial output (up to 500 GHz with external multipliers). With excellent phase noise, fast switching speeds, and a full suite of analog modulation capabilities (including high-performance pulse modulation), the MG3690C series is an optimal signal source solution for the design and testing of components and systems for a wide variety of industries - wireless communications, aerospace and defense, and consumer and computer electronics.

Key Features

Basic CW generators configurable to full-featured signal generators.

- Broad frequency coverage in a single output: 0.1 Hz to 70 GHz
 - Four Models, 2 to 20, 40, 50 and 67 GHz (operational to 70 GHz)
 - 8 MHz Coverage Optional (Analog or Digital Down-Conversion)
 - 0.1 Hz Coverage Optional
- mmW Coverage up to 500 GHz, in Waveguide
- Ultra-Low SSB Phase Noise Option
- -109 dBc/Hz (typ.) at 1 kHz Offset, 10 GHz Carrier
- Excellent Harmonics and Spurious Response
- High Output Power Option
 - +26 dBm to 10 GHz
 - +23 dBm to 20 GHz
 - +19 dBm to 40 GHz
 - +9 dBm to 67 GHz
- CW and Step Sweep Modes; Analog Sweep Optional
- <5 ms Switching Time (typ.) for <100 MHz steps
- 0.01 Hz standard Frequency Resolution
- Phase Offset Capability
- AM, FM/ΦM Modulations Optional
 - Internal LF Generator Optional
- Pulse Modulation Optional
 - 100 ns Leveled Width, ≥1 GHz
 - Internal Pulse Generator Optional
- Intuitive, Menu-driven Front Panel
- Proven Reliability with 3 Year Standard Warranty
- Completely Configurable and Upgradable

High-Performance Signal Generators

The ultimate in full-function signal generation, including comprehensive, high-performance modulation for signal simulation applications. Additional features in these units include:

- Internal pulse generator with swept delay capability for moving target simulation
- Flexible pulse triggering including free-run, delayed, gated, and composite
- 0 to 90% AM, log or linear over DC to 100 kHz rates
- Four FM modes for up to 10 MHz deviation at 8 MHz rates or 100 MHz deviation at 100 Hz rates
- Phase modulation (ΦM) up to 400 radians deviation at 1 MHz rates
- Internal AM, FM, and ΦM generators, each with 7 modulating waveforms
- Optional user-defined complex modulation

Automatic Test Equipment

The MG3690C is an ideal signal generator for an ATE system. It packs the highest performance in a 13.3 cm (3u) package with a 450 mm depth that minimizes rack space. High output power assures adequate signal strength to the device under test, even after ATE switching and cabling losses. Accurately leveled output power to -115 dBm in 0.01 dB steps facilitates receiver sensitivity measurements. Fast 5 ms switching time maximizes system throughput. Internal list mode frees the A.T.E. controller to perform measurement analysis tasks. Free application drivers, including the IVI-COM driver and National Instruments LabView® drivers, save you time and money in code generation and maintenance. For additional cost savings, Option 17 eliminates the complete front panel, including circuitry.

Interchangeable Virtual Instruments Standard

The IVI Foundation defines a standard instrument driver model that enables instrument interchangeability and interoperability without software changes. Anritsu's IVI-driver supported synthesizer minimizes instrument development and maintenance cost through the use of IVI-standard interfaces as well as instrument-specific interfaces for unique instrument features. The IVI standard provides a single driver that supports the common application development environments such as Visual Basic, Visual C++, and Labview.

Anritsu Corporation leads the way with IVI technology, having released the first COM-based IVI driver supporting the Signal Generator instrument class, and includes the driver with every MG3690C series synthesizer. As an active member of the IVI Foundation, Anritsu supports the Foundation's drive toward instrument driver standardization as a powerful means of delivering interchangeable ATE instrumentation solutions.

Specifications

For detailed and most up-to-date specifications, please refer to the MG3690C data sheet, p/n 11410-00515. The latest version of this data sheet is available for down-loading in pdf format from the MG3690C product page on the Anritsu website www.anritsu.com.

CW Mode	Accuracy	Same as internal or external 10 MHz time base
	Internal Time Base Stability	With aging: $<2 \times 10^{-9}/\text{day}$ ($<5 \times 10^{-10}/\text{day}$ with Option 16) With temperature: $<2 \times 10^{-8}/^{\circ}\text{C}$ over 0°C to 55°C ($<2 \times 10^{-10}/^{\circ}\text{C}$ with Option 16)
	Resolution	0.01 Hz
	Internal Time Base Calibration	The internal time base can be calibrated via the System Cal menu to match an external reference (10 MHz ± 50 Hz).
	External 10 MHz Reference Input	Accepts external 10 MHz ± 50 Hz (typ.), 0 to +20 dBm time base signal Automatically disconnects the internal high-stability time-base option (if installed) Rear panel BNC (50 Ω impedance) Selectable bandwidth for best phase noise immunity or best phase tracking performance
	10 MHz Reference Output	1 V _{p-p} into 50 Ω , AC coupled; rear panel BNC (50 Ω impedance)
	Phase Offset	Adjustable in 0.1° steps
Phase-Locked Step Sweep Mode	Electronic Frequency Control (EFC)	-4 V to +4 V input range 0.2 ppm/V (typ.) sensitivity (0.08 ppm/V (typ.) for Option 3x) ≤ 250 Hz modulation bandwidth Rear panel BNC (high impedance)
	Sweep Width	Independently selected, 0.01 Hz to full range; every frequency step in sweep range is phase-locked
	Accuracy	Same as internal or external 10 MHz time base
	Resolution (Minimum Step Size)	0.01 Hz
	Linear/Log Sweep	User-selectable linear or log sweep; in log sweep, step size logarithmically increases with frequency
	Steps	User-selectable number of steps or the step size
	Number of Steps	Variable from 1 to 10,000
	Step Size	0.01 Hz to the full frequency range of the instrument If the step size does not divide into the selected frequency range, the last step is truncated
Alternate Sweep Mode	Dwell Time Per Step	Variable from 1 ms to 99 s
	Fixed Rate Sweep	Variable from 30 ms to 99 s
Analog Sweep Mode (Option 6)	Sweeps alternately in step sweep between any two sweep ranges. Each sweep range may be associated with a power level.	
	Sweep Width	Independently selected from 1 MHz to full frequency range For units with Option 4 (Digital Down Converter), the start frequency during analog sweep is limited to ≥ 2.2 GHz for stop frequencies > 20 GHz. For stop frequencies ≤ 20 GHz, the start frequency is limited to ≥ 500 MHz. A range error will be displayed if any of these analog sweep start/stop limits are exceeded. Analog sweep is not available < 10 MHz with Option 22.
	Accuracy	The lesser of ± 30 MHz or ± 2 MHz +0.25% of sweep width for sweep speeds of ≤ 50 MHz/ms (typ.).
Manual Sweep Mode	Sweep Time Range	30 ms to 99 s
	Provides stepped, phase-locked adjustment of frequency between sweep limits. User-selectable number of steps or step size.	
List Sweep Mode	Under GPIB or Ethernet control, or via the front panel, up to 4 tables with 2000 non-sequential frequency/power sets can be stored and then addressed as a phase-locked step sweep. One table of 2000 points is stored in non-volatile memory. All other tables are stored in volatile memory.	
Programmable Frequency Agility	Under GPIB or Ethernet control, up to 3202 non-sequential frequency/power sets can be stored and then addressed as a phase-locked step sweep. Data is stored in volatile memory.	
Markers	Up to 20 independent, settable markers (F0 to F9 and M0 to M9)	
	Video Markers	+5 V or -5 V marker output, selectable from system menus; AUX I/O connector, rear panel
	Marker Accuracy	Same as sweep frequency accuracy
	Intensity Markers	Produces an intensity dot on analog display traces, obtained by a momentary dwell in RF sweep, in analog sweeps of < 1 second.
Sweep Triggering	Marker Resolution	Analog Sweep: 1 MHz or Sweep Width/4096, whichever is greater Step Sweep: 0.01 Hz
	Sweep triggering is provided for Analog Frequency Sweep, Step Frequency Sweep, List Frequency Sweep, and CW Power Sweep.	
Sweep Triggering	Auto	Triggers sweep automatically
	External	Triggers a sweep on the low-to-high transition of an external TTL signal; AUX I/O connector, rear panel
	Single	Triggers, aborts, and resets a single sweep; reset sweep may be selected to be at the top or bottom of the sweep

Continued on next page

General	Stored Setups	Stores front panel settings and nine additional front-panel setups in a non-volatile RAM. A system menu allows for saving and recalling instrument setups. Whenever the instrument is turned on, control settings come on at the same functions and values existing as when it was last turned off.
	Memory Sequencing Input	Accepts a TTL low-level signal to sequence through ten stored setups AUX I/O connector, rear panel
	Self-Test	Instrument self-test is performed when Self-Test soft-key is selected. If an error is detected, an error message is displayed in a window on the LCD identifying the probable cause and remedy.
	Secure Mode	Disables all frequency and power level state displays. Stored setups saved in secure mode remain secured when recalled. Mode selectable from a system menu and via GPIB or Ethernet.
	Parameter Entry	Instrument-controlled parameters can be entered in three ways: keypad, rotary data knob, or the touch pads of the cursor-control key. Controlled parameters are frequency, power level, sweep time, dwell time, and number of steps. Keypad entries are terminated by pressing the appropriate soft key. Edits are terminated by exiting the edit menu
	Reset	Returns all instrument parameters to predefined default states or values. Any pending GPIB or Ethernet I/O is aborted. Selectable from the system menu.
	Master/Slave Operation	Allows two output signals to be swept with a user-selected frequency offset. One instrument controls the other via AUX I/O and SERIAL I/O connections. Requires a Master/Slave Interface Cable Set (Part No. ND36329).
	User Level Flatness Correction	Allows user to calibrate out path loss due to external switching and cables via entered power table from a GPIB power meter or calculated data. When user level correction is activated, entered power levels are delivered at the point where calibration was performed. Supported power meters are Anritsu ML2437A, ML2438A, ML2480A/B, ML2490A, and ML4803A and HP 437B, 438A, and 70100A. Five user tables are available with up to 801 points/table.
	Warm Up Time	From Standby: 30 minutes From Cold Start (0°C): 120 hours to achieve specified frequency stability with aging Instruments disconnected from AC line power for more than 72 hours require 30 days to return to specified frequency stability with aging
	Power	85 VAC to 264 VAC, 48 Hz to 440 Hz, 250 VA (max.)
	Standby	With AC line power connected, unit is placed in standby when front panel power switch is released from the OPERATE position
	Dimensions	429 (W) × 133 (H) × 450 (D) mm
	Mass	18 kg (max.)
Remote Operation	All instrument functions, settings, and operating modes (except for power on/standby) are controllable using commands sent from an external computer via Ethernet (VXI-11 over TCP/IP) or GPIB (IEEE-488 interface bus). Note: For users who wish to use a USB control interface, the following adapter available from National Instruments is recommended: USB: NI GPIB-USB-MS	
	Ethernet Port	10/100 Base-T
	Ethernet Address	DHCP with Auto-IP 169.254.90.55 (default) or static 192.168.0.254
	GPIB Address	Selectable from a system menu
	GPIB Commands	Native, SCPI
	IEEE-488 Interface Function Subset	Source Handshake: SH1 Acceptor Handshake: AH1 Talker: T6 Listener: L4 Service Request: SR1 Remote/Local: RL1 Parallel Poll: PP1 Device Clear: DC1 Device Trigger: DT1 Controller Capability: C0, C1, C2, C3, C28 Tri-State Driver: E2
	GPIB Status Annunciators	When the instrument is operating in Remote, the GPIB status annunciators (listed below) will appear in a window on the front panel LCD
	Remote	Operating on the GPIB or via Ethernet, all instrument front panel keys are ignored (except for the SYSTEM key and the RETURN TO LOCAL soft key)
	LLO (Local Lockout)	Disables the RETURN TO LOCAL soft key. Instrument can be placed in local mode only via Ethernet or GPIB, or by cycling line power
	Emulations	The instrument responds to the published GPIB commands and responses of the Anritsu Models 6600, 6700, and 6XX00-series signal sources. When emulating another signal source, the instrument will be limited to the capabilities, mnemonics, and parameter resolutions of the emulated instrument.
Environmental (MILOPRF-28800F, class3)	Temperature Range	0°C to +50°C (Operating), -40°C to +75°C (Storage)
	Relative Humidity	5 to 95% at +40°C (non-condensing)
	Altitude	4,600 m, 43.9 cm Hg
	Vibration	Random, 5 Hz to 500 Hz, 0.015 to 0.0039 g ² /Hz PSD; Sinusoidal, 5 Hz to 55 Hz, 0.33 mm displacement
	CE	EMC: 2014/30/EU, EN61326-1, EN61000-4-2 LVD: 2014/35/EU, EN61010-1
	RCM	Australia and New Zealand RCM AS/NZS 4417:2012
	KCC	South Korea KCC-REM-A21-0004
Regulatory Compliance	European Union	EMC 2014/30/EU, EN 61326:2013, CISPR 11/EN 55011, IEC/EN 61000-4-2/3/4/5/6/8/11 Low Voltage Directive 2014/35/EU Safety EN 61010-1:2010 RoHS directive 2011/65/EU applies to instruments with CE marking and noted as Rev. 2 or above on the rear panel
	Australia and New Zealand	RCM AS/NZS 4417:2012
	South Korea	KCC-REM-A21-0004

Signal Purity

All specifications apply at the lesser of +10 dBm output or maximum specified leveled output power unless otherwise noted.

Harmonic and Harmonic-Related

Frequency Range	Standard
0.1 Hz to 10 MHz (Option 22)	<-30 dBc
10 MHz to ≤100 MHz (Option 4)	<-40 dBc
>100 MHz to ≤2.2 GHz (Option 4)	<-50 dBc
10 MHz to ≤50 MHz (Option 5)	<-30 dBc
>50 MHz to <2 GHz (Option 5)	<-40 dBc
2 GHz (>2.2 GHz w/Option 4) to ≤20 GHz	<-60 dBc*1
>20 GHz to ≤40 GHz	<-40 dBc*1, *2
>40 GHz to ≤50 GHz (MG3695C)	<-40 dBc*1
>40 GHz to ≤67 GHz (MG3697C)	<-25 dBc

*1: -30 dBc (typ.) with high power Option 15

*2: 20 GHz to 21 GHz, and 39 GHz to 40 GHz, -20 dBc (typ., Option 15 only)

Non-Harmonic

Frequency Range	Standard
0.1 Hz to 10 MHz (Option 22)	<-30 dBc
10 MHz to ≤2.2 GHz (Option 4)	<-60 dBc
10 MHz to ≤2 GHz (Option 5)	<-40 dBc
>2 GHz (2.2 GHz w/Option 4) to ≤67 GHz	<-60 dBc

Power Line and Fan Rotation Spurious Emissions (dBc)

Frequency Range	Offset from Carrier		
	300 Hz	300 Hz to 1 kHz	>1 kHz to 3 kHz
≥10 MHz to ≤500 MHz (Option 4)	<-68	<-72	<-72
>500 MHz to ≤1050 MHz (Option 4)	<-62	<-72	<-72
>1050 MHz to ≤2200 MHz (Option 4)	<-56	<-66	<-66
0.01 GHz to ≤8.4 GHz	<-50	<-60	<-60
>8.4 GHz to ≤20 GHz	<-46	<-56	<-60
>20 GHz to ≤40 GHz	<-40	<-50	<-54
>40 GHz to ≤67 GHz	<-34	<-44	<-48

Residual FM (CW and Step Sweep modes, 50 Hz to 15 kHz BW, typ.)

Note: Residual FM is not applicable with FM locked mode.

Frequency Range	Residual FM (Hz RMS)	
	Option 3/3X	Standard
≤8.4 GHz	<40	<120
>8.4 GHz to ≤20 GHz	<40	<220
>20 GHz to ≤40 GHz	<80	<440
>40 GHz to ≤67 GHz	<160	<880

Residual FM

(Analog Sweep and Unlocked FM modes, 50 Hz to 15 kHz BW, typ.)

Note: Residual FM is not applicable with FM locked mode.

Frequency Range	Residual FM (kHz RMS)	
	Unlocked Narrow FM mode	Unlocked Wide FM mode or Analog Sweep (typ.)
0.01 GHz to ≤20 GHz	<10	<25
>20 GHz to ≤40 GHz	<20	<50
>40 GHz to ≤67 GHz	<40	<100

AM Noise Floor

Typically <-145 dBm/Hz at 0 dBm output and offsets >5 MHz from carrier.

Single-Sideband Phase Noise

Phase noise is specified and guaranteed only with internal reference. In External Reference mode, the phase noise of the external supplied reference, and the selected external reference bandwidth, will dictate the instrument phase noise performance. Phase noise is not degraded when adding high power Option 15. Phase noise measured at +10 dBm <5 GHz and +6 dBm >5 GHz.

Single-Sideband Phase Noise (dBc/Hz): (Typ.)

Frequency Range	Offset from Carrier					
	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz
0.1 Hz to <10 MHz (Option 22)	-80 (-100)	-90 (-110)	-120 (-125)	-130 (-139)	-130 (-141)	-130 (-141)
10 MHz to 15.625 MHz (Option 4)	-102 (-113)	-128 (-133)	-142 (-149)	-145 (-152)	-145 (-153)	-145 (-153)
>15.625 MHz to 31.25 MHz (Option 4)	-97 (-109)	-125 (-130)	-142 (-147)	-144 (-149)	-144 (-153)	-145 (-155)
>31.25 MHz to 62.5 MHz (Option 4)	-92 (-104)	-122 (-128)	-140 (-146)	-142 (-146)	-143 (-150)	-145 (-155)
>62.5 MHz to 125 MHz (Option 4)	-87 (-98)	-114 (-118)	-133 (-139)	-130 (-140)	-130 (-143)	-145 (-155)
>125 MHz to 250 MHz (Option 4)	-82 (-93)	-108 (-113)	-126 (-134)	-124 (-134)	-124 (-138)	-145 (-153)
>250 MHz to 500 MHz (Option 4)	-75 (-87)	-102 (-109)	-120 (-128)	-118 (-127)	-118 (-130)	-143 (-149)
>500 MHz to 1050 MHz (Option 4)	-70 (-80)	-94 (-100)	-115 (-123)	-115 (-122)	-116 (-126)	-138 (-144)
>1050 MHz to 2200 MHz (Option 4)	-65 (-74)	-86 (-96)	-113 (-117)	-111 (-116)	-114 (-120)	-133 (-139)
10 MHz to <2000 MHz (Option 5)	-62 (-72)	-85 (-95)	-100 (-104)	-102 (-106)	-102 (-106)	-111 (-114)
2 GHz to 6 GHz	-54 (-64)	-81 (-88)	-102 (-109)	-103 (-110)	-106 (-114)	-128 (-133)
>6 GHz to 10 GHz	-52 (-62)	-75 (-85)	-98 (-106)	-104 (-109)	-106 (-113)	-126 (-132)
>10 GHz to 20 GHz	-45 (-55)	-69 (-78)	-92 (-101)	-98 (-103)	-98 (-106)	-124 (-131)
>20 GHz to 40 GHz	-38 (-48)	-62 (-72)	-86 (-94)	-92 (-100)	-92 (-100)	-118 (-124)
>40 GHz to 67 GHz	-32 (-42)	-56 (-66)	-80 (-88)	-87 (-94)	-82 (-91)	-112 (-118)

Single-Sideband Phase Noise (dBc/Hz) - Option 3: (Typ.)

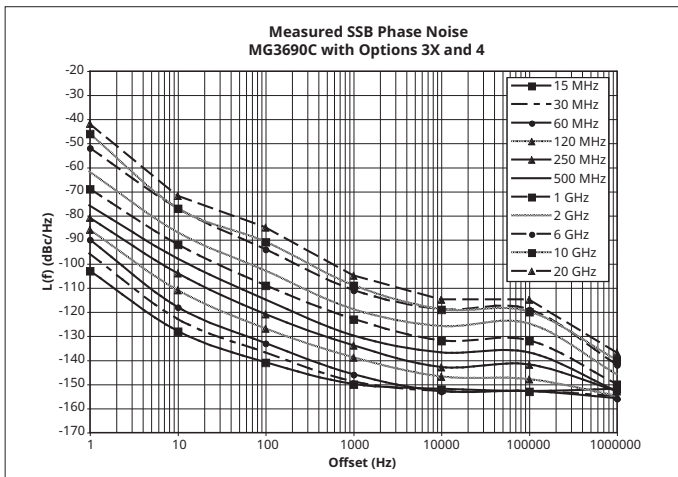
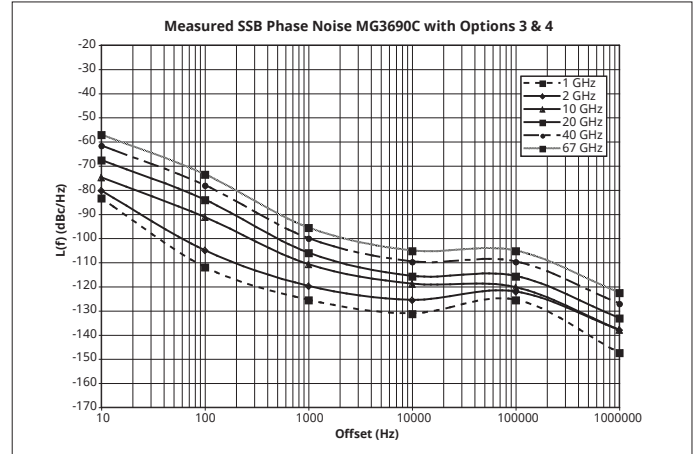
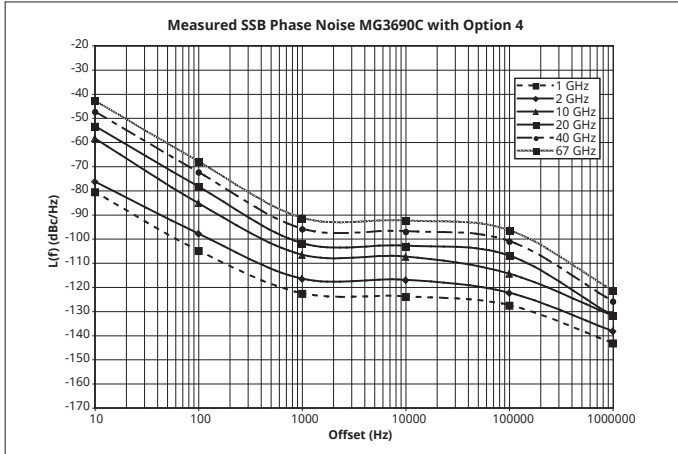
Frequency Range	Offset from Carrier					
	10 Hz	100 Hz	1 kHz*	10 kHz*	100 kHz	1 MHz
0.1 Hz to <10 MHz (Option 22)	-80 (-100)	-90 (-110)	-120 (-125)	-130 (-139)	-130 (-141)	-130 (-141)
10 MHz to 15.625 MHz (Option 4)	-102 (-120)	-128 (-140)	-142 (-150)	-145 (-152)	-148 (-153)	-148 (-152)
>15.625 MHz to 31.25 MHz (Option 4)	-97 (-108)	-125 (-128)	-142 (-149)	-145 (-153)	-148 (-153)	-148 (-155)
>31.25 MHz to 62.5 MHz (Option 4)	-92 (-109)	-122 (-131)	-140 (-146)	-145 (-153)	-148 (-153)	-148 (-156)
>62.5 MHz to 125 MHz (Option 4)	-87 (-98)	-114 (-118)	-134 (-139)	-142 (-147)	-143 (-148)	-148 (-155)
>125 MHz to 250 MHz (Option 4)	-82 (-93)	-108 (-113)	-129 (-134)	-138 (-143)	-137 (-142)	-148 (-153)
>250 MHz to 500 MHz (Option 4)	-77 (-91)	-102 (-114)	-124 (-130)	-132 (-137)	-128 (-137)	-144 (-153)
>500 MHz to 1050 MHz (Option 4)	-72 (-83)	-98 (-103)	-119 (-123)	-126 (-132)	-122 (-132)	-139 (-150)
>1050 MHz to 2200 MHz (Option 4)	-66 (-77)	-92 (-101)	-113 (-119)	-121 (-126)	-117 (-125)	-135 (-146)
10 MHz to <2000 MHz (Option 5)	-64 (-72)	-85 (-95)	-100 (-104)	-102 (-106)	-102 (-106)	-111 (-114)
2 GHz to 6 GHz	-54 (-77)	-82 (-93)	-106 (-111)	-115 (-119)	-112 (-119)	-136 (-140)
>6 GHz to 10 GHz	-52 (-73)	-75 (-88)	-102 (-109)	-113 (-119)	-115 (-120)	-134 (-140)
>10 GHz to 20 GHz	-52 (-66)	-69 (-82)	-100 (-105)	-109 (-115)	-109 (-115)	-130 (-137)
>20 GHz to 40 GHz	-45 (-59)	-63 (-75)	-94 (-98)	-104 (-108)	-103 (-109)	-122 (-131)
>40 GHz to 67 GHz	-40 (-51)	-58 (-68)	-89 (-91)	-97 (-103)	-97 (-103)	-118 (-125)

Single-Sideband Phase Noise (dBc/Hz) - Option 3X: (Typ.)

Frequency Range	Offset from Carrier						
	1 Hz	10 Hz	100 Hz	1 kHz*	10 kHz*	100 kHz	1 MHz
0.1 Hz to <10 MHz (Option 22)	-60 (-70)	-80 (-100)	-90 (-110)	-120 (-125)	-130 (-139)	-130 (-141)	-130 (-141)
10 MHz to 15.625 MHz (Option 4)	-94 (-103)	-118 (-128)	-136 (-141)	-142 (-150)	-145 (-152)	-148 (-153)	-148 (-152)
>15.625 MHz to 31.25 MHz (Option 4)	-88 (-96)	-113 (-123)	-130 (-137)	-142 (-149)	-145 (-153)	-148 (-153)	-148 (-155)
>31.25 MHz to 62.5 MHz (Option 4)	-83 (-90)	-109 (-118)	-125 (-133)	-140 (-146)	-145 (-153)	-148 (-153)	-148 (-156)
>62.5 MHz to 125 MHz (Option 4)	-77 (-86)	-103 (-111)	-119 (-127)	-134 (-139)	-142 (-147)	-143 (-148)	-148 (-155)
>125 MHz to 250 MHz (Option 4)	-71 (-81)	-97 (-104)	-113 (-121)	-129 (-134)	-138 (-143)	-137 (-142)	-148 (-153)
>250 MHz to 500 MHz (Option 4)	-67 (-76)	-91 (-98)	-107 (-115)	-124 (-130)	-132 (-137)	-128 (-137)	-144 (-153)
>500 MHz to 1050 MHz (Option 4)	-60 (-69)	-84 (-92)	-101 (-109)	-119 (-123)	-126 (-132)	-122 (-132)	-139 (-150)
>1050 MHz to 2200 MHz (Option 4)	-53 (-62)	-77 (-87)	-95 (-103)	-113 (-119)	-121 (-126)	-117 (-125)	-135 (-146)
10 MHz to <2000 MHz (Option 5)	-38 (-45)	-68 (-78)	-85 (-95)	-100 (-104)	-102 (-106)	-102 (-106)	-111 (-114)
2 GHz to 6 GHz	-46 (-52)	-70 (-77)	-86 (-94)	-106 (-111)	-115 (-119)	-112 (-119)	-136 (-140)
>6 GHz to 10 GHz	-38 (-46)	-68 (-77)	-83 (-91)	-102 (-109)	-113 (-119)	-115 (-120)	-134 (-140)
>10 GHz to 20 GHz	-35 (-42)	-64 (-72)	-80 (-85)	-100 (-105)	-109 (-115)	-109 (-115)	-130 (-137)
>20 GHz to 40 GHz	-29 (-36)	-58 (-65)	-74 (-79)	-94 (-98)	-104 (-108)	-103 (-109)	-122 (-131)
>40 GHz to 67 GHz	-23 (-30)	-53 (-59)	-69 (-73)	-89 (-91)	-97 (-103)	-97 (-103)	-118 (-125)

*: When fitted with Option 36 and when multiple units are connected for purposes of Ultra-Stable Phase Tracking, phase noise may be degraded by up to 4 dB at 1 kHz and 10 kHz offsets.

Typical MG3690C single sideband phase noise at 10 GHz carrier.



RF Output

Power level specifications apply at 25°C ± 10°C.

Maximum Levelled Output Power*1

Model Number	Configuration	Frequency Range (GHz)	Output Power (dBm)	Output Power with Step Attenuator (dBm)
MG3692C	w/opt 4 or 5	<2*2	+19	+18
	STD	≥2*3 to ≤10	+19	+18
	STD	>10 to ≤20	+17	+15
MG3694C	w/opt 4 or 5	<2*2	+15	+14
	STD	≥2*3 to ≤10	+15	+14
	STD	>10 to ≤20	+12	+10
MG3695C	STD	>20 to ≤40	+9	+6
	w/opt 4 or 5	<2*2	+12	+10
	STD	≥2*3 to ≤20	+10	+8
MG3697C	STD	>20 to ≤40	+6	+3
	STD	>40 to ≤50	+3	+0
	w/opt 4 or 5	<2*2	+12	+10
	STD	≥2*3 to ≤20	+10	+8
	STD	>20 to ≤40	+6	+3
	STD	>40 to ≤67	+3	+0*4

*1: For output power with Option 22, 0.1 Hz to 10 MHz coverage, derate all specifications by 2 dB

*2: ≤2.2 GHz with Option 4

*3: >2.2 GHz with Option 4

*4: Typical 60 GHz to 67 GHz

Maximum Leveled Output Power with Option 15 (High Power) Installed*1

Model Number	Configuration	Frequency Range (GHz)	Output Power (dBm)	Output Power with Step Attenuator (dBm)
MG3692C	w/opt 4 or 5	<2*2	+19	+18
	w/opt 4 or 5	2*3 to 10	+25	+24
	w/opt 4 or 5	>10 to 16	+22	+20
	w/opt 4 or 5	>16 to 20	+21	+19
MG3694C	w/o opt 4 or 5	2 to 10	+26	+25
	w/o opt 4 or 5	>10 to 16	+25	+23
	w/o opt 4 or 5	>16 to ≤20	+23	+21
	w/opt 4 or 5	<2*2	+17	+16
MG3694C	w/opt 4 or 5	≥2*3 to ≤20	+21	+19
	w/opt 4 or 5	>20 to ≤40	+17	+15
	w/o opt 4 or 5	≥2 to ≤20	+23	+21
MG3695C	w/o opt 4 or 5	>20 to ≤40	+19	+17
	w/o opt 4 or 5	>40 to ≤50	+13	+10
	w/opt 4 or 5	<2*2	+16	+14
	w/opt 4 or 5	≥2*3 to ≤20	+21	+19
MG3695C	w/opt 4 or 5	>20 to ≤40	+17	+15
	w/opt 4 or 5	>40 to ≤50	+11	+8
	w/o opt 4 or 5	≥2 to ≤20	+23	+21
	w/o opt 4 or 5	>20 to ≤40	+19	+17
MG3697C	w/o opt 4 or 5	>40 to ≤50	+13	+10
	w/opt 4 or 5	<2*2	+16	+15
	w/opt 4 or 5	≥2*3 to ≤20	+19	+18
	w/opt 4 or 5	>20 to ≤40	+16	+14
MG3697C	w/opt 4 or 5	>40 to ≤67	+9	+6*4
	w/opt 4 or 5	>67 to ≤70	+3*5	0*5
	w/o opt 4 or 5	≥2 to ≤20	+21	+19
	w/o opt 4 or 5	>20 to ≤40	+19	+16
MG3697C	w/o opt 4 or 5	>40 to ≤67	+9	+6*4
	w/o opt 4 or 5	>67 to ≤70	+3*5	0*5

*1: For output power with Option 22, 0.1 Hz to 10 MHz coverage, derate all specifications by 2 dB

*2: ≤2.2 GHz with Option 4

*3: >2.2 GHz with Option 4

*4: Typical 60 GHz to 67 GHz

*5: Typical

Minimum Settable Power	Without an Attenuator	-20 dBm
	With an Attenuator	-120 dBm
Minimum Leveled Output Power	Without an Attenuator	-15 dBm (-20 dBm, typ.)
	With an Attenuator	-115 dBm (MG3692C and MG3694C) -105 dBm (MG3695C and MG3697C)
Unleveled Output Power Range (Typ.)	Without an Attenuator	>40 dB below max. power
	With an Attenuator	>130 dB below max. power
Power Level Switching Time (to within specified accuracy)	Without Change in Step Attenuator	<3 ms (typ.)
	With Change in Step Attenuator	<20 ms (typ.)
	With Change in Electronic Step Attenuator	<3 ms (typ.) Power level changes across -70 dB step will result in 20 ms delay
Step Attenuator (Option 2)	Adds a 10 dB/step attenuator, with 110 dB range on models ≤40 GHz and 90 dB range on models >40 GHz.	

Accuracy and Flatness	Flatness is included within the accuracy specification																																																										
	Step Sweep and CW Modes	<p>Attenuation Below Max. Power</p> <table border="1"> <thead> <tr> <th rowspan="2">Accuracy</th> <th colspan="4">Frequency Range</th> </tr> <tr> <th>≤40 GHz*2</th> <th>40 GHz to 50 GHz</th> <th>50 GHz to 60 GHz</th> <th>60 GHz to 67 GHz</th> </tr> </thead> <tbody> <tr> <td>0 to 25 dB</td> <td>±1.0 dB</td> <td>±1.5 dB</td> <td>±1.5 dB</td> <td>±1.5 dB</td> </tr> <tr> <td>25 to 60 dB</td> <td>±1.0 dB</td> <td>±1.5 dB</td> <td>±3.5 dB*1</td> <td>N/A</td> </tr> <tr> <td>60 to 100 dB</td> <td>±1.0 dB</td> <td>±2.5 dB*1</td> <td>±3.5 dB*1</td> <td>N/A</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Flatness</th> <th colspan="4">Frequency Range</th> </tr> <tr> <th>≤40 GHz*2</th> <th>40 GHz to 50 GHz</th> <th>50 GHz to 60 GHz</th> <th>60 GHz to 67 GHz</th> </tr> </thead> <tbody> <tr> <td>0 to 25 dB</td> <td>±0.8 dB</td> <td>±1.1 dB</td> <td>±1.1 dB</td> <td>±1.1 dB</td> </tr> <tr> <td>25 to 60 dB</td> <td>±0.8 dB</td> <td>±1.1 dB</td> <td>±3.1 dB*1</td> <td>N/A</td> </tr> <tr> <td>60 to 100 dB</td> <td>±0.8 dB</td> <td>±2.1 dB*1</td> <td>±3.1 dB*1</td> <td>N/A</td> </tr> </tbody> </table>	Accuracy	Frequency Range				≤40 GHz*2	40 GHz to 50 GHz	50 GHz to 60 GHz	60 GHz to 67 GHz	0 to 25 dB	±1.0 dB	±1.5 dB	±1.5 dB	±1.5 dB	25 to 60 dB	±1.0 dB	±1.5 dB	±3.5 dB*1	N/A	60 to 100 dB	±1.0 dB	±2.5 dB*1	±3.5 dB*1	N/A	Flatness	Frequency Range				≤40 GHz*2	40 GHz to 50 GHz	50 GHz to 60 GHz	60 GHz to 67 GHz	0 to 25 dB	±0.8 dB	±1.1 dB	±1.1 dB	±1.1 dB	25 to 60 dB	±0.8 dB	±1.1 dB	±3.1 dB*1	N/A	60 to 100 dB	±0.8 dB	±2.1 dB*1	±3.1 dB*1	N/A									
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Other RF Output Power Specifications	Output Units	Output units selectable as either dBm or mV. Selection of mV assumes 50Ω load. All data entry and display are in the selected units.																																																									
	Output Power Resolution	0.01 dB or 0.001 mV																																																									
	Source Impedance	50Ω (nom.)																																																									
	Source SWR (Internal Leveling)	<2.0 (typ.)																																																									
	Power Level Stability with Temperature	±0.04 dB/°C (typ.)																																																									
	Level Offset	Offsets the displayed power level to establish a new reference level																																																									
	Output On/Off	Toggles the RF output between an Off and On state. During the Off state, the RF oscillator is turned off. The On or Off state is indicated by two LEDs located below the OUTPUT ON/OFF key on the front panel																																																									
	RF On/Off Between Frequency Steps	System menu selection of RF On or RF Off during frequency switching in CW, Step Sweep, and List Sweep modes																																																									
	RF On/Off During Retrace	System menu selection of RF On or RF Off during retrace																																																									
	Internal Leveling	Power is leveled at the output connector in all modes																																																									
External Leveling	<p>External Detector: Levels output power at a remote detector location. Accepts a positive or negative 0.5 mV to 500 mV input signal from the remote detector. L1 adjusts the input signal range to an optimum value. BNC connector, rear panel.</p> <p>External Power Meter: Levels output power at a remote power meter location. Accepts a ±1 V full scale input signal from the remote power meter. L1 adjusts the input signal range to an optimum value. BNC connector, rear panel.</p> <p>External Leveling Bandwidth: 30 kHz (typ.) in Detector mode. 0.7 Hz (typ.) in Power Meter mode.</p> <p>User Level Flatness Correction Number of points: 2 to 801 points per table Number of tables: 5 available Entry modes: GPIB power meter or computed data</p>																																																										
CW Power Sweep	Range	Sweeps between any two power levels at a single CW frequency																																																									
	Resolution	0.01 dB/step (Log) or 0.001 mV (Linear)																																																									
	Accuracy	Same as CW power accuracy																																																									
	Log/Linear Sweep	Power sweep selectable as either log or linear. Log sweep is in dB; linear sweep is in mV.																																																									
	Step Size	User-controlled, 0.01 dB (Log) or 0.001 mV (Linear) to the full power range of the instrument																																																									
	Step Dwell Time	Variable from 1 ms to 99 seconds. If the sweep crosses a step attenuator setting, there will be a sweep dwell of approximately 20 ms to allow setting of the step attenuator.																																																									
Sweep Frequency/Step Power	A power level step occurs after each frequency sweep. Power level remains constant for the length of time required to complete each sweep.																																																										

*1: Typical

*2: With high power Option 15, Accuracy and Flatness are ±1.5 dB. Below 20 MHz, with or without Option 15 they are +1.5 dB.

Frequency/Phase Modulation (Option 12)

Option 12 adds frequency and phase modulation, driven externally via a rear panel BNC connector, 50Ω. For internal modulation, add Internal LF and Pulse Generators Option 27. Frequency/Phase Modulation is not available <10 MHz with Option 22.

For the most accurate FM and ΦM measurements, Bessel Null methods are used. When verifying FM and ΦM, the use of the "carrier null" technique is recommended. Measured residual FM effects must be subtracted from modulation meter measurements.

Frequency Generator Multiplication/Division Ratios	Frequency Range	Divide Ratio, n
	<10 MHz (Option 22)	Modulation not available
≥10 MHz to ≤15.625 MHz (Option 4)	256	
>15.625 MHz to ≤31.25 MHz (Option 4)	128	
>31.25 MHz to ≤62.5 MHz (Option 4)	64	
>62.5 MHz to ≤125 MHz (Option 4)	32	
>125 MHz to ≤250 MHz (Option 4)	16	
>250 MHz to ≤500 MHz (Option 4)	8	
>500 MHz to ≤1050 MHz (Option 4)	4	
>1050 MHz to ≤2200 MHz (Option 4)	2	
>10 MHz to ≤2000 MHz (Option 5)	1	
>2 GHz to ≤20 GHz	1	
>20 GHz to ≤40 GHz	1/2	
>40 GHz to ≤67 GHz	1/4	

Frequency Modulation:

Parameter	Modes	Conditions	Specifications	Conditions	Specifications
		For all Frequencies other than <2.2 GHz with Option 4	For Frequencies <2.2 GHz with Option 4	For all Frequencies other than <2.2 GHz with Option 4	For Frequencies <2.2 GHz with Option 4
Deviation	Locked	Rate = 1 kHz to 8 MHz	± [Lesser of 10 MHz or (300 * mod rate)]/n	Rate = 1 kHz to Lesser of 8 MHz or (0.03 * F _{carrier})	± [Lesser of 10 MHz or (300 * mod rate)]/n
	Locked Low-noise	Rate = 50 kHz to 8 MHz	± [Lesser of 10 MHz or (3 * mod rate)]/n	Rate = 50 kHz to Lesser of 8 MHz or (0.03 * F _{carrier})	± [Lesser of 10 MHz or (3 * mod rate)]/n
	Unlocked Narrow	Rate = DC to 8 MHz	±10 MHz/n	Rate = DC to Lesser of 8 MHz or (0.03 * F _{carrier})	±10 MHz/n
	Unlocked Wide	Rate = DC to 100 Hz	±100 MHz/n	Rate = DC to 100 Hz	±100 MHz/n
Bandwidth (3 dB)	Locked		1 kHz to 10 MHz		1 kHz to Lesser of 10 MHz or (0.03 * F _{carrier})
	Locked Low-noise		30 kHz to 10 MHz		30 kHz to Lesser of 8 MHz or (0.03 * F _{carrier})
	Unlocked Narrow		DC to 10 MHz		DC to Lesser of 10 MHz or (0.03 * F _{carrier})
	Unlocked Wide		DC to 100 Hz		DC to 100 Hz
Flatness	Locked	Rate = 10 kHz to 1 MHz	±1 dB relative to 100 kHz	Rate = 10 kHz to Lesser of 1 MHz or (0.01 * F _{carrier})	±1 dB relative to 100 kHz
Deviation Accuracy	Locked and Low-noise Unlocked Narrow	Rate = 100 kHz sinewave Int. or 1 V _{pk} Ext.	10% (5% typ.)	Rate = 100 kHz sinewave Int. or 1 V _{pk} Ext.	10% (5% typ.)
Incidental AM	Locked and Low-noise Unlocked Narrow	1 MHz Rate, ±1 MHz Dev.	<2% (typ.)	Rate and Dev. = Lesser of 1 MHz or (0.01 * F _{carrier})	<2% (typ.)
Harmonic Distortion	Locked	10 kHz Rate, ±1 MHz Dev.	<1%	Rate = 10 kHz, Dev. = ±1 MHz/n	<1%
External Sensitivity	Locked Locked Low-noise Unlocked Narrow Unlocked Wide	±1 V maximum input	± (10 kHz/V to 20 MHz/V)/n ± (10 kHz/V to 20 MHz/V)/n ± (10 kHz/V to 20 MHz/V)/n ± (100 kHz/V to 100 MHz/V)/n	±1 V _{pk} maximum input	± (10 kHz/V to 20 MHz/V)/n ± (10 kHz/V to 20 MHz/V)/n ± (10 kHz/V to 20 MHz/V)/n ± (100 kHz/V to 100 MHz/V)/n

Phase Modulation:

Parameter	Modes	Conditions	Specifications	Conditions	Specifications
		For all Frequencies other than <2.2 GHz with Option 4	For Frequencies <2.2 GHz with Option 4	For all Frequencies other than <2.2 GHz with Option 4	For Frequencies <2.2 GHz with Option 4
Deviation	Narrow	Rate = DC to 8 MHz	± [Lesser of 3 rad or (5 MHz/mod rate)]/n	Rate = DC to Lesser of 8 MHz or (0.03 * F _{carrier})	± [Lesser of 3 rad or (5 MHz/mod rate)]/n
	Wide	Rate = DC to 1 MHz	± [Lesser of 400 rad or (10 MHz/mod rate)]/n	Rate = DC to Lesser of 1 MHz or (0.03 * F _{carrier})	± [Lesser of 400 rad or (10 MHz/mod rate)]/n
Bandwidth (3 dB)	Narrow		DC to 10 MHz		DC to Lesser of 10 MHz or (0.03 * F _{carrier})
	Wide		DC to 1 MHz		DC to Lesser of 1 MHz or (0.03 * F _{carrier})
Flatness	Narrow	Rate = DC to 1 MHz	±1 dB relative to 100 kHz	Rate = DC to Lesser of 1 MHz or (0.01 * F _{carrier})	±1 dB relative to 100 kHz rate
	Wide	Rate = DC to 500 kHz	±1 dB relative to 100 kHz	Rate = DC to Lesser of 500 kHz or (0.01 * F _{carrier})	±1 dB relative to 100 kHz rate
Accuracy	Narrow and Wide	100 kHz Internal or 1 V _{pk} External, sine	10%	100 kHz Internal or 1 V _{pk} External, sine	10%
External Sensitivity	Narrow Wide	±1 V maximum input	± (0.0025 rad/V to 5 rad/V)/n ± (0.25 rad/V to 500 rad/V)/n	±1 V _{pk} maximum input	± (0.0025 rad/V to 5 rad/V)/n ± (0.25 rad/V to 500 rad/V)/n

Amplitude Modulation (Option 14)

Option 14 adds amplitude modulation, driven externally via a rear panel BNC connector 50Ω. For internal modulation, add Internal LF and Pulse Generators Option 27. All amplitude modulation specifications apply at 50% depth, 1 kHz rate, with RF level set 6 dB below maximum specified leveled output power, unless otherwise noted. Amplitude Modulation is not available <10 MHz with Option 22.

AM Depth (typ.)	0 to 90% linear; 20 dB log
AM Bandwidth (3 dB)*	DC to 50 kHz minimum, DC to 100 kHz (typ.)
Flatness (DC to 10 kHz rates)	±0.3 dB
Accuracy	Reading ±5%
Distortion	<5% (typ.)
Incidental Phase Modulation (30% depth, 10 kHz rate)	<0.2 radians (typ.)
External AM Input	Log AM or Linear AM input, rear panel BNC (50Ω input impedance). For internal modulation, add LF Generator Option 27. Sensitivity Log AM: Continuously variable from 0 dB per volt to 25 dB per volt. Linear AM: Continuously variable from 0% per volt to 100% per volt. Maximum Input: ±1 V _{pk}

*: Typical below 2.2 GHz, when ordered with Options 4 and 15.

Pulse Modulation (Option 26)

Option 26 adds pulse modulation, driven externally via a rear panel BNC connector, TTL. For internal modulation, add Internal LF and Pulse Generators Option 27. Pulse modulation specifications apply at maximum rated power, unless otherwise noted. Pulse modulation is not available <10 MHz with Option 22.

On/Off Ratio	>80 dB or >70 dB with high power Option 15; >70 dB with Option 4 or 5 and without Option 2 at 500 MHz			
Minimum Leveled Pulse Width	100 ns, ≥1 GHz 1 μs, <1 GHz			
Minimum Unleveled Pulse Width	<10 ns			
Level Accuracy Relative to CW (100 Hz to 1 MHz PRF)	±0.5 dB, ≥1 μs pulse width ±1.0 dB, <1 μs pulse width			
Pulse Delay (typ.)	External Mode: 50 ns			
PRF Range	DC to 10 MHz, unleveled 100 Hz to 5 MHz, leveled			
Frequency Range	Rise & Fall Time (10 to 90%)	Overshoot	Pulse Width Compression*1	Video Feedthrough*1
≥10 to <31.25 MHz (Option 4)	400 ns*1	33%*1	40 ns	±70 mV
≥31.25 to <125 MHz (Option 4)	90 ns*1	22%*1	12 ns	±130 mV
≥125 to <500 MHz (Option 4)	33 ns*1	11%*1	12 ns	±70 mV
≥500 to <2200 MHz (Option 4)	15 ns	10%*1	12 ns	±50 mV
≥10 to <1000 MHz (Option 5)	15 ns/10 ns*1	10%*1	8 ns	±30 mV
≥1 to <2 GHz (Option 5)	10 ns/5 ns*1	10%*1	8 ns	±30 mV
≥2 to ≤67 GHz*2	10 ns/5 ns*1	10%*3	8 ns	±30 mV
External Input	Rear panel BNC. For internal modulation, add Pulse Generator Option 27. Drive Level: TTL compatible input Input Logic: Positive-true or negative-true, selectable from modulation menu.			

*1: Typical

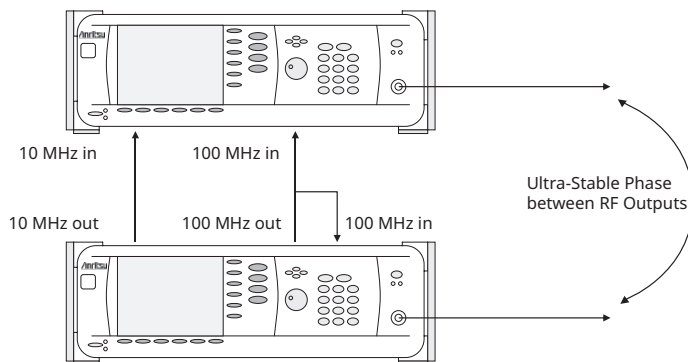
*2: Rise time and Pulse Width Compression, >20 GHz, degrades by 2 ns with High Power Option 15.

*3: For 50 and 67 GHz units, overshoot >40 GHz is 20% typical at rated power.

Ultra-Stable Phase Tracking (Option 36)

Option 36 enables up to three MG3690C units fitted with option 3 or 3X to phase track with a very high degree of stability. Option 36 provides additional rear panel connectors to link internal reference signals together.

100 MHz Reference Output	Provides the reference signal to drive up to two other MG3690C. This signal is only intended for use with other Option 36 instruments.
100 MHz Reference Input	Accepts the 100 MHz reference signal from another MG3690C fitted with Option 36. This input is only intended for use with other Option 36 instruments.
Phase Drift	<±1° over 5 seconds (typ.); <±1.5° over 100 seconds (typ.), after 24 hours warm-up time



Internal LF and Pulse Generators (Option 27)

An internal pulse generator and two internal waveform generators are added, one providing a frequency or phase modulating signal and the other an amplitude modulating signal. This Internal LF and Pulse Generators option can only be ordered in combination with either FM/ΦM, AM, or Pulse options 12, 14, and 26 respectively.

Waveforms	Sinusoid, square-wave, triangle, positive ramp, negative ramp, Gaussian noise, uniform noise. (Check Option 10 for User-Defined)	
Rate	0.1 Hz to 10 MHz sinusoidal 0.1 Hz to 100 kHz square-wave, triangle, ramps	
Resolution	0.1 Hz	
Accuracy	Same as instrument timebase ±0.014 Hz	
Waveform Output	Two BNC connectors on the rear panel, FM/ΦM OUT and AM OUT	
Pulse Triggers	Free run, triggered, gated, delayed, triggered with delay, swept-delay	
Pulse Modes	Singlet, doublet, triplet, quadruplet.	
Pulse Parameter	Selectable Clock Rate	
	Narrow (100 MHz)	Wide (10 MHz)
Pulse Width	10 ns to 160 ms	100 ns to 1.6 s
Pulse Period*	100 ns to 160 ms	600 ns to 1.6 s
Variable Delay	0 to 160 ms	
	0 to 1.6 s	
	0 to 160 ms	300 ns to 1.6 s
	100 ns to 160 ms	300 ns to 1.6 s
Resolution	10 ns	100 ns
Accuracy	10 ns (5 ns, typ.)	
Pulse Inputs/Outputs	Video pulse and sync out, rear panel BNC connectors	

*: Period must be longer than the sum of delay and width by 5 clock cycles minimum.

Millimeter-Wave Multiplier 2000-1694-R Series

External waveguide output multipliers 2000-1694-R series are available for banded frequency coverage up to 500 GHz. These external multipliers require at a minimum an MG3692C with 20 GHz coverage. The output power required to drive the modules is +10 dBm. They can be powered from an external power supply (+12 VDC, 1.5 A typ.) using the supplied double banana power cord, or from the 40-187-R DC Power Supply and 2000-1710-R Millimeter-wave Power Supply Adapter (both included with the modules). 2000-1694-R series multipliers have a saturated, unlevelled, output power, yet their inherent flatness is exceptional. Modulating the input drive will indeed modulate the output, except for the case of Amplitude

Modulation. Since the output is saturated, Amplitude Modulation is not recommended with these millimeter-wave modules. Frequency and Phase Modulation is possible, but the achieved deviation will be multiplied based on the multiplication factor of the module. Pulse modulation is also possible, with even sharper rise and fall times than the input. All modulation performances are not specified. For ease of operation, the MG3690C allows the user to enter a frequency scaling factor, the module's multiplication factor, which will be used only for purposes of displaying the proper frequency at the output of the millimeter-wave module, on the MG3690C front panel display.

Multiplier P/N*1, *2, *3	2000-1694-15-R	2000-1694-12-R	2000-1694-10-R	2000-1694-08-R	2000-1694-06-R	2000-1694-05-R	2000-1694-03-R	2000-1694-02-R
Waveguide Input Frequency	12.5 GHz to 18.8 GHz	10 GHz to 15 GHz	12.5 GHz to 18.4 GHz	11.2 GHz to 17.5 GHz	9.1 GHz to 14.2 GHz	11.6 GHz to 18.4 GHz	12.2 GHz to 18.1 GHz	10.8 GHz to 16.7 GHz
Waveguide Output Frequency	50 GHz to 75 GHz	60 GHz to 90 GHz	75 GHz to 110 GHz	90 GHz to 140 GHz	110 GHz to 170 GHz	140 GHz to 220 GHz	220 GHz to 325 GHz	325 GHz to 500 GHz
Waveguide Band	WR-15	WR-12	WR-10/ WM-2540	WR-08/ WM-2032	WR-06/ WM-1651	WR-05/ WM-1295	WR-03/ WM-864	WR-02.2/ WM-570
Flange*4	(008)	(009)	(010)	(M08)	(M06)	(M05)	(M03)	(M02.2)
Output Power (typ.)	+8 dBm	+6 dBm	+7 dBm	-5 dBm	-9 dBm	-15 dBm	-25 dBm*5	-27 dBm*5
Output Flatness (typ.) (Unlevelled)	±2 dB	±2 dB	±3 dB	—	—	—	—	—
Output Match	>11.7 dB	>11.7 dB	>11.7 dB	>11.7 dB	>11.7 dB	>11.7 dB	6 dB (typ.)	6 dB (typ.)
Multiplication Factor (m)	×4	×6	×6	×8	×12	×12	×18	×30
Frequency Accuracy	(Synthesizer Accuracy × m)							
Frequency Resolution	(Synthesizer Resolution × m)							
Manual Adjustable Attenuator*6	25 dB min							—
Harmonics & Spurious*7, *8	-20 dBc (typ.)							—
Input Power Required	+10 dBm							
RF Input Connector	SMA (female)							
DC Power	12 VDC, 1.5 A (double-banana power cord included)*2							
Dimensions	145 × 110 × 72 mm (not including feet, interfaces, or optional manual attenuation adjuster)							
Mass	<1 kg							
Temperature	+20°C to +30°C							

*1: These millimeter-wave modules are produced by OML Inc. (Oleson Microwave Labs), located in Morgan Hill, CA., with mutual collaborative experiences over many years. For detailed and up-to-date specifications, please call OML, Inc. or visit their website at <http://www.omlinc.com>.

*2: Multipliers require power from an external power supply (+12 VDC, 1.5 A typ.) using the supplied double banana power cord, or from the DC Power Supply 40-187-R and Millimeter-wave Power Supply Adapter 2000-1710-R (both included with the modules).

*3: Warranty period for the 2000-1694 Series is one year.

*4: Waveguide output flanges are per MIL-DTL-3922/67D (UG387/U-M).

*5: Output power is estimated.

*6: Available as an option. To order, add "A" to multiplier module part number (for example, 2000-1694-15A-R). Not available with 2000-1694-02-R.

*7: In-band mixing products typically ≤ -15 dBc in the lower 10% of the waveguide band.

*8: As relates to multiplied output frequencies.

Inputs and Outputs*1

EXT ALC IN	Provides for leveling the RF output signal externally with either a detector or power meter. Signal requirements are shown in the RF Output specifications.
RF OUTPUT (Option 9)*2	Provides for RF output from 50Ω source impedance. Option 9 moves the RF Output connector to the rear panel. K Connector (female) $f_{max} < 40$ GHz. V Connector (female) $f_{max} > 40$ GHz.
10 MHz REF IN	Accepts an external 10 MHz ± 50 Hz, 0 to +20 dBm time-base signal. Automatically disconnects the internal high-stability time-base option, if installed. 50Ω impedance. BNC type, rear panel.
10 MHz REF OUT	Provides a 1 V _{p-p} , AC coupled, 10 MHz signal derived from the internal frequency standard. 50Ω impedance. BNC type, rear panel.
100 MHz REF IN (Option 36)	Accepts the 100 MHz signal from an MG3690C with Option 36 for ultra-stable phase tracking.
100 MHz REF OUT (Option 36)	Provides the 100 MHz signal for an MG3690C with Option 36 ultra-stable phase tracking.
HORIZ OUT (Horizontal Sweep Output)	Provides 0 V at beginning and +10 V at end of sweep, regardless of sweep width. In CW mode, the voltage is proportional to frequency between 0 V at low end and +10 V at the high end of range. In CW mode, if CW RAMP is enabled, a repetitive, 0 to +10 V ramp is provided. BNC type, rear panel.
EFC IN	Provides the capability to frequency modulate the internal crystal oscillator, allowing phase locking the synthesizer inside an external lock loop. BNC type, rear panel.
AUX I/O (Auxiliary Input/Output)	Provides for most of the rear panel BNC connections through a single, 25-pin, D-type connector. Supports master-slave operation with another synthesizer or allows for a single-cable interface with the Model Scalar Network Analyzer 56100A and other Anritsu instruments. Also provides an Ethernet factory default IP address reset function via pin 19. 25 pin D-type, rear panel.
SERIAL I/O (Serial Input/Output)	Provides access to RS-232 terminal ports to support service and calibration functions and master slave operations. RJ45 type, rear panel.
ETHERNET (10/100 Base-T LAN) I/O	Provides input/output connections for Ethernet interface. RJ45 type, rear panel.
IEEE-488 GPIB	Provides input/output connections for the General Purpose Interface Bus (GPIB). Type 57, rear panel.
PULSE TRIG IN (Option 26)	Accepts an external TTL compatible signal to pulse modulate the RF output signal or to trigger or to gate the optional internal pulse generator. BNC type, rear panel.
PULSE SYNC OUT (Option 27)	Provides a TTL compatible signal, synchronized to the internal pulse modulation output. BNC type, rear panel.
PULSE VIDEO OUT (Option 27)	Provides a video modulating signal from the internal pulse generator. BNC type, rear panel.
AM IN (Option 14)	Accepts an external signal to amplitude modulate the RF output signal. 50Ω impedance. BNC type, rear panel.
FM/ΦM IN (Option 12)	Accepts an external signal to frequency or phase modulate the RF output signal. 50Ω impedance. BNC type, rear panel.
AM OUT (Option 27)	Provides the amplitude modulation waveform from the internal LF generator. BNC type, rear panel.
FM/ΦM OUT (Option 27)	Provides the frequency or phase modulation waveform from the internal LF generator. BNC type, rear panel.

*1: Connectors may be available but not active if option not ordered.

*2: Options (7), (8 & 9) are mutually exclusive, as they share the same rear panel space.

Ordering Information

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

Model/Order No.	Name
MG3692C MG3694C MG3695C MG3697C	Main Frame 2 GHz to 20 GHz CW Generator 2 GHz to 40 GHz CW Generator 2 GHz to 50 GHz CW Generator 2 GHz to 67 GHz CW Generator (operational to 70 GHz)
11410-00976 2000-1732-R	Standard Accessories (included) Product documentation and software brochure CAT-7 shielded, twisted-pair, Ethernet cable, 10 ft.
	Miscellaneous Power cord with plug-type and rating determine by destination country. 3 year factory warranty Options and Accessories. 2 year factory warranty for 2000-1694-R series.
MG3690C/1A	Options and Accessories Rack Mount with slides – Rack mount kit containing a set of track slides, mounting ears, and front panel handles to let the instrument be mounted in a standard 19-inch equipment rack.
MG3690C/1B	Rack Mount without slides – Modifies rack mounting hardware to install unit in a console that has mounting shelves. Includes mounting ears and front panel handles.
MG3690C/2X	Mechanical Step Attenuator – Adds a 10 dB/step attenuator. Rated RF output power is reduced. (This option comes in different versions, based on instrument configuration.)
MG3690C/3*1	Ultra Low Phase Noise – Adds new modules to significantly reduce SSB phase noise. (Not available with Option 3X.)
MG3690C/3X*1	Premium Phase Noise, improves Option 3 (<1 kHz offset). (Not available with Option 3)
MG3690C/4	8 MHz to 2.2 GHz RF coverage, Ultra-Low Phase Noise version – Uses a digital down converter to significantly reduce SSB phase noise.*2
MG3690C/5	8 MHz to 2 GHz RF coverage – Uses an analog down converter.*2
MG3690C/6	Analog Sweep Capability (limited to ≥500 MHz when used with Option 4)
MG3690C/9X	Rear Panel Output – Moves the RF output connector to the rear panel. (This option comes in different versions, based on instrument configuration.)
MG3690C/10	User-Defined Modulation Waveform Software – External software package provides the ability to download user-defined waveforms into the memory of the internal waveform generator, serially or via GPIB. External PC and an instrument with LF Generator, Option 27, are required. This external software package can only be used with Option 10 enabled instruments.
MG3690C/12	Frequency and Phase Modulation – External, via a rear panel BNC connector. For internal modulation capability, requires additionally LF Generator, Option 27.
MG3690C/14	Amplitude Modulation – External, via a rear panel BNC connector. For internal modulation capability, requires additionally LF Generator, Option 27.
MG3690C/15X	High Power – Adds high-power RF components to the instrument to increase its output power level. (This option comes in different versions, based on instrument configuration.)
MG3690C/16	High Stability Time Base – Adds an ovenized, 10 MHz crystal oscillator as a high-stability time base.
MG3690C/17	Delete Front Panel – Deletes the front panel for use in remote control applications where a front panel display and keyboard control are not needed.
MG3690C/22	0.1 Hz to 10 MHz Audio coverage – Uses a DDS for coverage down to approximately DC. When adding Option 22, the output power is derated by 2 dB. The frequency resolution below 10 MHz is 0.02 Hz. No modulation is available in the 0.1 Hz to 10 MHz band (Not available without Option 4 or 5.)
MG3690C/26X*3	Pulse Modulation – External, via a rear panel BNC connector. For internal modulation capability, requires additionally Pulse Generator, Option 27. (This option comes in different versions, based on instrument configuration.)
MG3690C/27	Internal LF and Pulse Generators – Provides modulation waveforms for internal AM, FM, FM, and Pulse. (Not available without Option 12, 14, or 26.)
MG3690C/28X*3	Analog Modulation Suite – For ease of ordering and package pricing, this option bundles Options 12, 14, 26 and 27, offering internal and external AM, FM, FM, and Pulse Modulation. (This option comes in different versions, based on instrument configuration.)

Model/Order No.	Name
MG3690C/36	Ultra-Stable Phase Tracking - Provides the capability for ultra-stable phase tracking between instruments using the internal 100 MHz reference. (Requires Option 3 or 3X)
MG3690C/CE MG3690C/98	CE Compliance with CE mark. Standard Calibration to ISO17025 and ANSI/NCSL Z540-1 Provides a calibration certificate, decal, and "Calibration void if removed" tamper seals.
MG3690C/99	Premium Calibration to ISO17025 and ANSI/NCSL Z540-1 Provides everything included with Option 98 plus test report and uncertainty data.
34RKNF50	Accessories DC to 20 GHz, Ruggedized Type N female adapter for units with a K Connector Output
ND36329 63270 2300-469 806-97	Master/Slave Interface Cable Set Transit Case IVI Driver, includes LabView® driver Aux I/O Cable, 25 pin to BNC: Provides BNC access to V/GHz and Sequential Sync connections and other AUX I/O data lines
2000-1694-15-R	Millimeter Wave Accessories*4 50 GHz to 75 GHz V band Multiplier Source Module, WR-15
2000-1694-12-R	60 GHz to 90 GHz E band Multiplier Source Module, WR-12
2000-1694-10-R	75 GHz to 110 GHz W band Multiplier Source Module, WR-10
2000-1694-08-R	90 GHz to 140 GHz F band Multiplier Source Module, WR-08
2000-1694-06-R	110 GHz to 170 GHz D band Multiplier Source Module, WR-06
2000-1694-05-R	140 GHz to 220 GHz G band Multiplier Source Module, WR-05
2000-1694-03-R	220 GHz to 325 GHz H band Multiplier Source Module, WR-03
2000-1694-02-R 40-187-R 2000-1710-R	325 GHz to 500 GHz Multiplier Source Module, WR-02.2 DC Power Supply (Included with Multiplier Source Module) Millimeter wave Power Supply Adapter (Included with Multiplier Source Module)
	Upgrades Economical upgrades are available to upgrade any model to any higher performing model. Consult Anritsu for details.

- *1: Phase Noise performance is controlled by United States Export Control regulations. For solutions that do not require export licenses, please consult your Anritsu Sales Representative.
- *2: All specifications for Options 4 and 5 apply ≥10 MHz.
- *3: Pulse Modulation performance is controlled by United States Export Control regulations, >31.8 GHz. For Pulse Modulation solutions that do not require export licenses, please consult with your Anritsu sales representative.
- *4: To order a multiplier with an optional manually adjustable attenuator, add an "A" to the multiplier module part number (for example, 2000-1694-15A-R). Not available with 200-1694-02-R

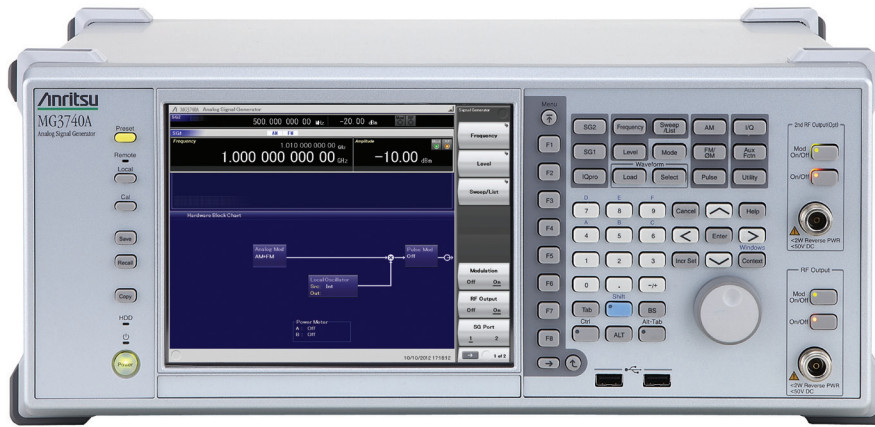
Analog Signal Generator

MG3740A

100 kHz to 2.7 GHz/4.0 GHz/6.0 GHz

Remote Control
 GPIB | Ethernet | USB

Excellent RF Performance, Versatile Modulation Functions, Built-in Dual RF Outputs



The Analog Signal Generator MG3740A has excellent RF specifications, including SSB Phase Noise, output level, etc., and versatile modulation functions (AM/FM/ΦM/Pulse).

High-Purity Signal Source for Testing Analog Radio

The excellent SSB phase noise performance supports narrowband radio Rx sensitivity suppression tests.

<-140 dBc/Hz (nominal) [100 MHz, 20 kHz offset, CW]

Excellent level accuracy over a wide level range, the MG3740A is the solution for accurate tests of radio Rx sensitivity and amplifier distortion characteristics.

Setting Range: -144 to +25 dBm

(CW, Option 041/071, 042/072, 043/073 installed)

Cuts Tact Time

To shorten tact times on production lines the MG3740A supports two standard modes.

The List/Sweep mode switches the frequency and level faster than 600 μs.

Cut Equipment Costs

The dual RF outputs supporting wanted + interference waves for tests of Rx characteristics, evaluation of wireless and amplifier intermodulation characteristics, and output of RF/LO signals for mixer tests, cut test costs by eliminating the need for two signal generators.

Extendible Narrowband Digital Modulation Function

Adding the digital modulation option adds a digital modulation signal generator function providing a cost-effective solution for testing public safety digital radio systems.

Digital Modulation Performance

- RF Modulation Bandwidth: 2 MHz
- Sampling Rate: 20 kHz to 8 MHz

Main Applications

- Testing Rx characteristics of analog radio
- Testing amplifier distortion and intermodulation characteristics
- RF/LO Signal source for evaluating mixer characteristics
- Testing Rx characteristics of narrowband digital radio

Key Features

Basic Performance

- 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-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

Dual RF

- 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

Expandability

- Analog modulation (AM/FM/ΦM) functions and pulse modulation (PM) functions [Standard]
- Additional analog modulation input options [Option 050/080]
- USB Power Sensors [Sold separately]

Operability

- Simple Touch-panel Operation
- Signal Flowcharts with Signal Block Diagrams
- Frequency Channel Table

Connections with External Equipment

- Remote Control Interfaces
- USB Connections

Expansion to Digital Modulation Signal Generator

- Digital Modulation [Option 020]
 - Adding the digital modulation option [Option 020] supports generation of digital modulation signals by outputting narrowband digital modulation signals.
 - Digital Modulation Performance
 - RF Modulation Bandwidth: 2 MHz
 - Sampling Rate: 20 kHz to 8 MHz
 - Waveform generation software: IQproducer (License sold separately)
 - TDMA IQproducer
 - Fading IQproducer
- BER Test Function [Option 021]
- Output Two Signals from One RF Out [Option 048/078]
 - Wanted Signal + Interfere Signal
 - Wanted Signal + Delayed Signal, etc.

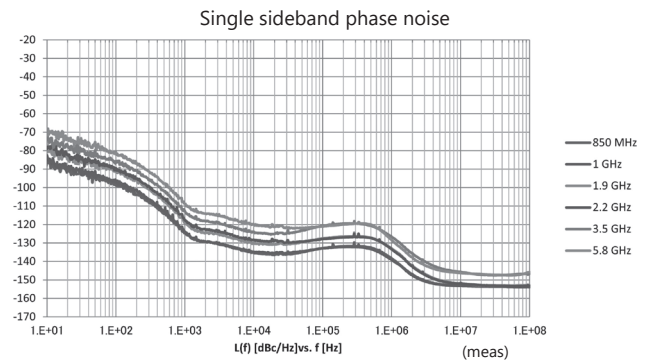
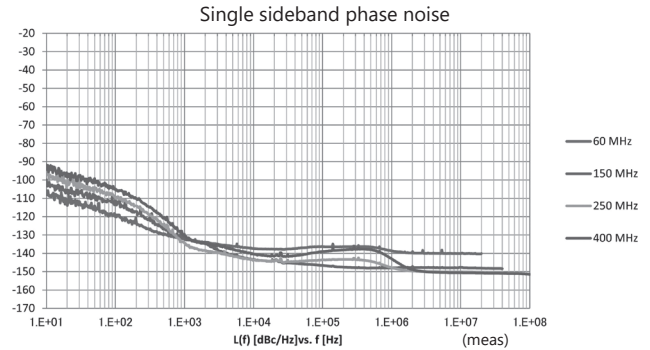
Basic Performance

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
- CW interference waveforms
- Full range of reference and local signals



Example: SSB Phase Noise
(Phase Noise Optimization <200 kHz, CW, Optimize S/N Off, with Option 002)

Low-power Output [Option 042*1/072*2]

- *1: Low Power Extension for 1stRF [Option 042]
- *2: Low Power Extension for 2ndRF [Option 072]

Amplitude Setting Range

Options	Setting Range [dBm]	
	without Reverse Power Protection*3	with Reverse Power Protection*3
Standard	-110 to +17	-110 to +17
with High-power Extension	-110 to +30	-110 to +25
with Low-power Extension	-144 to +17	-144 to +17
with High-power Extension and Low-power Extension	-144 to +30	-144 to +25

*3: Reverse Power Protection for 1stRF/2ndRF [Option 043/073]

The MG3740A supports a convenient option for extending the lower RF output limit when performing high-sensitivity Rx tests.

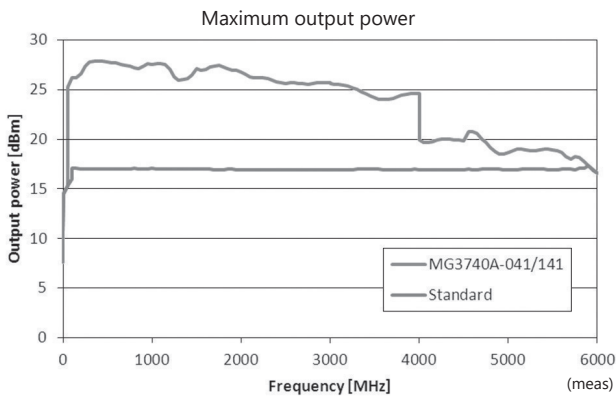
High-power Output [Option 041*1/071*2]

*1: High Power Extension for 1stRF [Option 041]
 *2: High Power Extension for 2ndRF [Option 071]

Level Accuracy is assured at high levels (CW)

Frequency Range	Standard	Option 041/071
100 kHz ≤ f < 10 MHz	+5 dBm	+5 dBm
10 MHz ≤ f < 50 MHz	+10 dBm	+10 dBm
50 MHz ≤ f < 400 MHz	+13 dBm	+20 dBm
400 MHz ≤ f ≤ 3 GHz		+23 dBm
3 GHz < f ≤ 4 GHz		+20 dBm
4 GHz < f ≤ 5 GHz		+13 dBm
5 GHz < f ≤ 6 GHz	+11 dBm	+11 dBm

These options expand the MG3740A RF output upper limit. They are used when compensating for level losses of parts in the measurement path.



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

High Stability Reference Oscillator [Option 002]

Aging Rate: $\pm 1 \times 10^{-7}$ /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)

Rubidium Reference Oscillator [Option 001]

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)

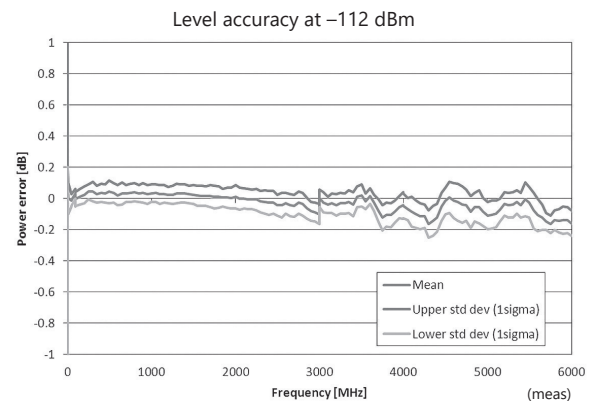
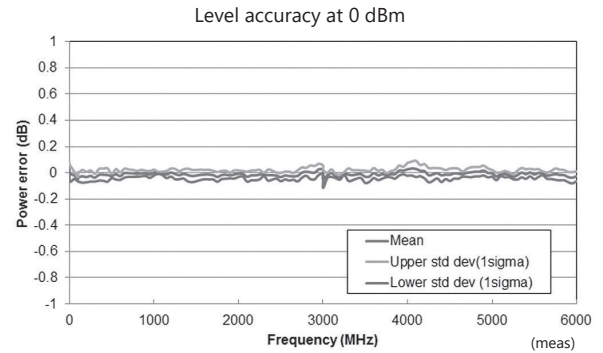
*: Compared to frequency after 24-h warm-up at 23°C

High Level Accuracy

Absolute Level Accuracy: ± 0.5 dB*1
 Linearity: ± 0.2 dB (typ.)*2

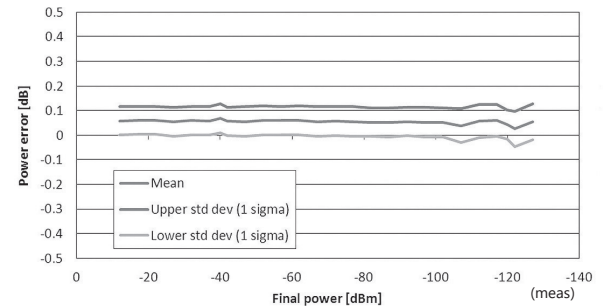
*1: 400 MHz to 3 GHz, -110 to +10 dBm
 *2: 50 MHz to 3 GHz, -110 to -1 dBm

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

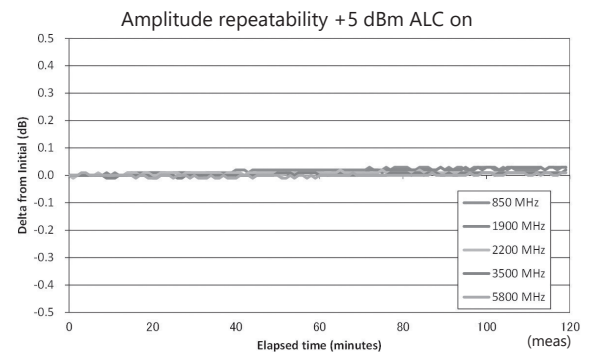


Frequency Characteristic

Relative level accuracy at 850 MHz initial power +10 dBm



Linearity



Aging

High-speed Switching

<600 μs @List/Sweep mode

To shorten tact times on production lines the MG3740A 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.

Frequency Range: 499.5000000 MHz to 500.5000000 MHz

Level Range: -10.00 dBm to -20.00 dBm

Points: 10

Dwell Time: 500 μs

Step Shape: Sawtooth, Triangle

Waveform 1: Triangle

Waveform 2: SawTooth

10 points, 500-μs Dwell Time

• 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.

pt	Frequency	Level	Dwell
1	499.5000000 MHz	-10.00 dBm	500 μs
2	499.8000000 MHz	-20.00 dBm	1 ms
3	500.0000000 MHz	-20.00 dBm	2 ms
4	500.1000000 MHz	-40.00 dBm	3 ms
5	500.4000000 MHz	-20.00 dBm	5 ms

5 points, Any Dwell Time

Dual VSG: Two RF Outputs

The MG3740A 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 modulations can be set independently at each SG while each is tracking the other. The all-in-one MG3740A eliminates the need for two conventional signal generators when requiring wanted + interference waveforms for evaluating Rx signal characteristics, testing intermodulation characteristics of radio equipment and amplifiers, and generating RF/LO signals for evaluating mixers.

Notes: Supported frequency bands cannot be changed after shipment. IQ input is supported only by SG1 (1stRF) and requires Option 017.

2ndRF
Frequency Range:
100 kHz to 2.7 GHz [Option 062]
100 kHz to 4.0 GHz [Option 064]
100 kHz to 6.0 GHz [Option 066]
* Whether or not install and the frequency model can be selected at any time.

1stRF
Frequency Range:
100 kHz to 2.7 GHz [Option 032]
100 kHz to 4.0 GHz [Option 034]
100 kHz to 6.0 GHz [Option 036]
* Must install any one of these.

Expandability

AM/FM/ΦM/Pulse Function

This option supports the following modulation functions as standard. Analog modulation (AM/FM/ΦM) is supported using both CW and internal modulation signals.

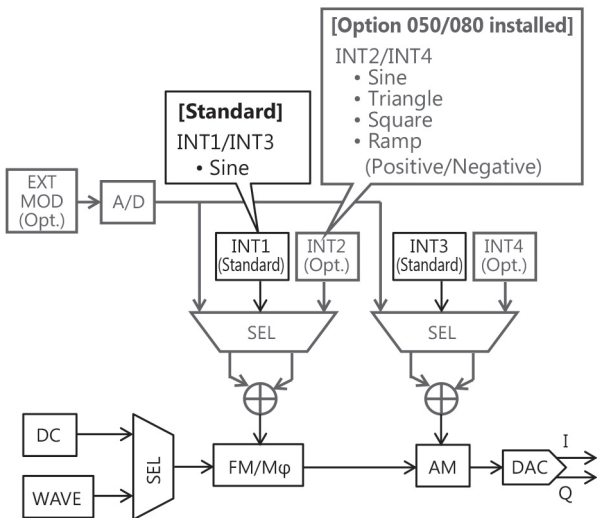
Pulse modulation can be performed at any cycle or timing and also supports modulation using an external input signal.

- 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.
 - or (40 MHz/ΦM Rate) 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. This is used when superimposing tone squelch signals.

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

*: FM + ΦM does not support.



USB Power Sensors [Sold separately]

Up to two USB power sensors can be connected to the MG3740A to display the measurement results on the MG3740A screen.

Compatible USB power sensors

Model	Frequency Range	Dynamic Range
MA24104A*	600 MHz to 4 GHz	+3 to +51.76 dBm
MA24105A	350 MHz to 4 GHz	+3 to +51.76 dBm
MA24106A	50 MHz to 6 GHz	-40 to +23 dBm
MA24108A	10 MHz to 8 GHz	-40 to +20 dBm
MA24118A	10 MHz to 18 GHz	-40 to +20 dBm
MA24126A	10 MHz to 26 GHz	-40 to +20 dBm

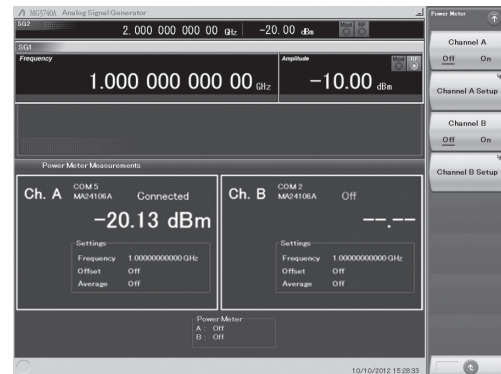
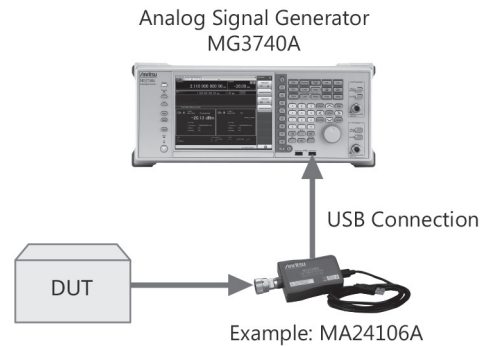
*: MA24104A has been discontinued. Replacement model is MA24105A.

Level Offset: -100 to +100 dB

Average: 1 to 2048

Unit: dBm, W

COM Port: 2 to 8

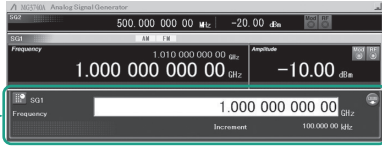
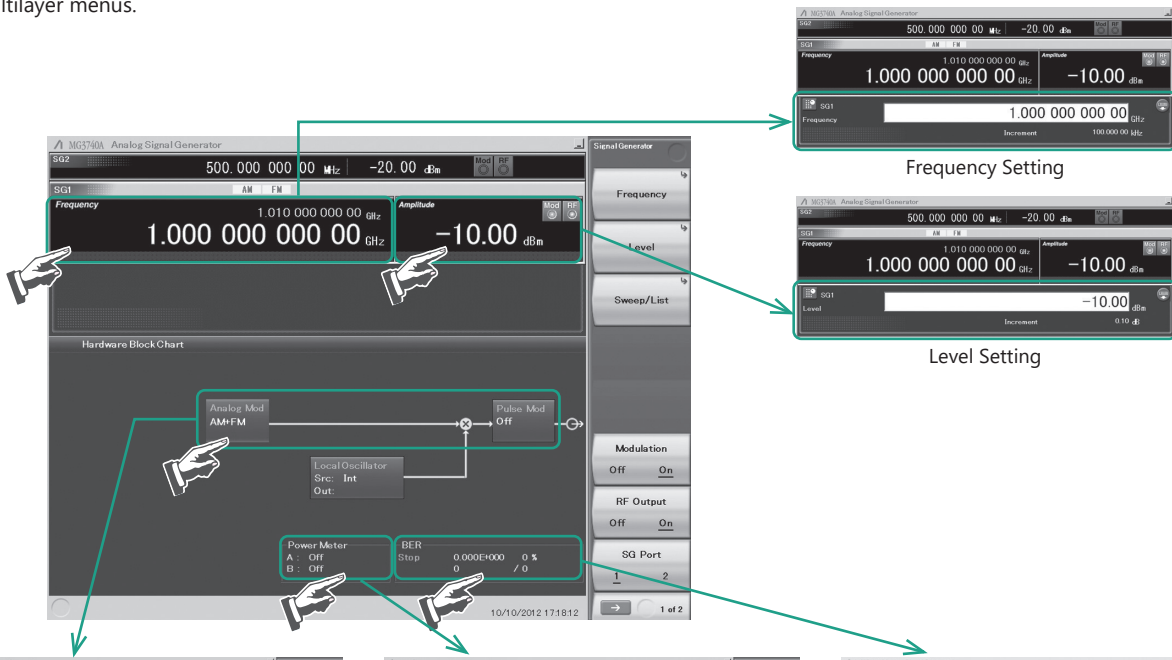


Power Meter Measurement Screen

Operability

Easy Touch-panel Operation

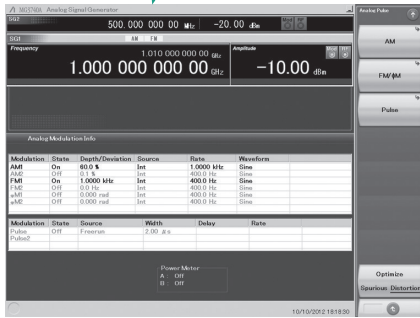
Simply touching parts of the screen display with a finger fetches related function keys and numeric inputs, offering a fast and easy way of navigating through multilayer menus.



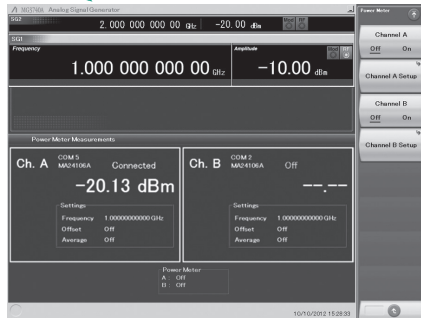
Frequency Setting



Level Setting



AM/FM/ΦM/Pulse Function



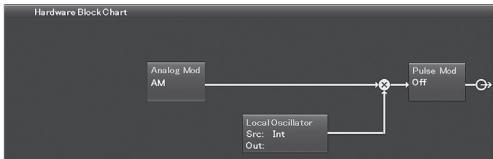
Power Meter Function



BER Function [Option 021]

Signal Flowcharts

The Hardware Block Chart provides an intuitive at-a-glance understanding of the settings and signals for each block (Analog Mod, Pulse Mod, Local, etc.)



Hardware Block Chart Screen

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

Connection with External Equipment

Remote Control Interfaces

The MG3740A has GPIB, Ethernet and USB interfaces as standard, supporting the following functions:

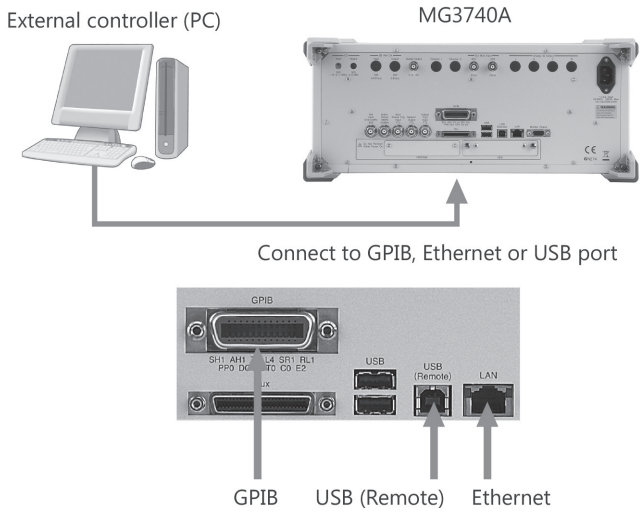
- Control all functions, except power switch
- Read all status conditions and settings
- Interrupts and serial polls

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 MG3740A into the Local status again by pressing the Local key on the front panel and then send a command via the desired interface.

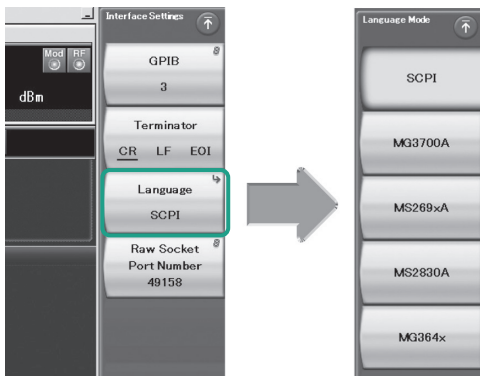
- GPIB: Conforms to IEEE 488.1/IEEE 488.2 standards
SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2
- Ethernet: Conforms to VXI-11 protocol using TCP/IP Control programs
SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0
- USB: Conforms to USBTMC-USB488 protocols
SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0n

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.

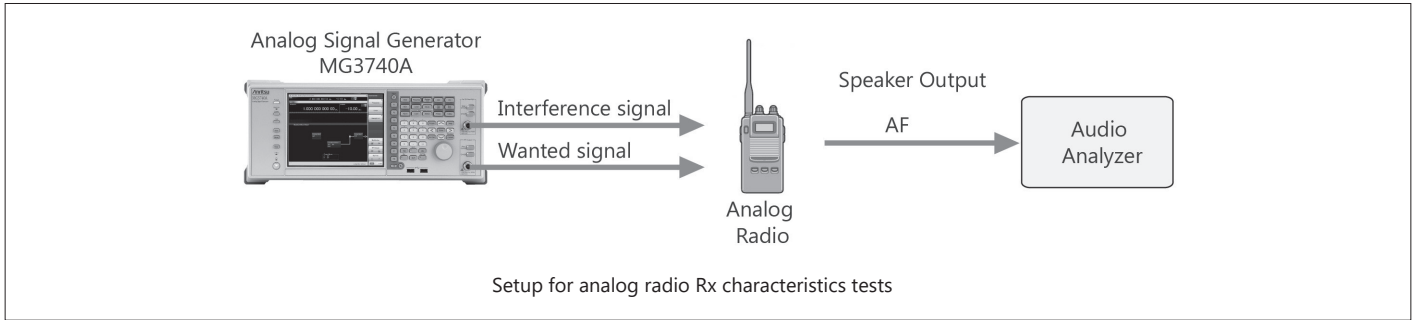


To remotely control the MG3740A, either select the SCPI mode command format defined by the SCPI Consortium, or select backwards compatible modes supporting earlier MG3700A, MS269xA, MS2830A, and MG364xA commands

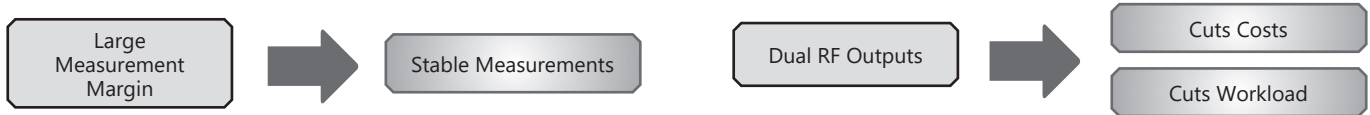


Command Format Setting Example

Analog Radio Rx Characteristics Tests



The MG3740A outputs RF signals for radio operation verification tests and evaluation of Rx characteristics, when the radio AF output can be measured with an external audio analyzer.



High-Purity Signal Source for Testing Analog Radio

Supports SSB Phase Noise Performance -140 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.

The excellent SSB phase noise performance supports narrowband radio Rx sensitivity suppression tests.

- < -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

The excellent level accuracy over a wide output level range supports accurate Rx sensitivity tests.

- Amplitude setting range: -110 to $+17$ dBm (Standard)
- -144 to $+17$ dBm (with Option 042/072)

- Absolute level accuracy: ± 0.5 dB*1
- Linearity 1: ± 0.2 dB (typ)*2

*1: 400 MHz to 3 GHz, -110 to $+10$ dBm

*2: 50 MHz to 3 GHz, -110 to -1 dBm

Supports Maximum Two RF Outputs

The dual RF outputs of the all-in-one MG3740A help cut infrastructure costs by eliminating the need for two signal sources when outputting wanted + interference waves for RX characteristics tests, and evaluating intermodulation characteristics, etc. Additionally, there is no need for troublesome settings at each of two separate signal generators helping cut operation time and costs using the frequency/level synchronization function.

AM/FM/ Φ M/Pulse Function (Standard)

Supports built-in analog modulation (AM/FM/ Φ M) functions and pulse modulation (PM) functions.

Adding additional analog modulation input options (Option 050/080) supports modulation by external signal input. This is used when superimposing tone squelch signals.

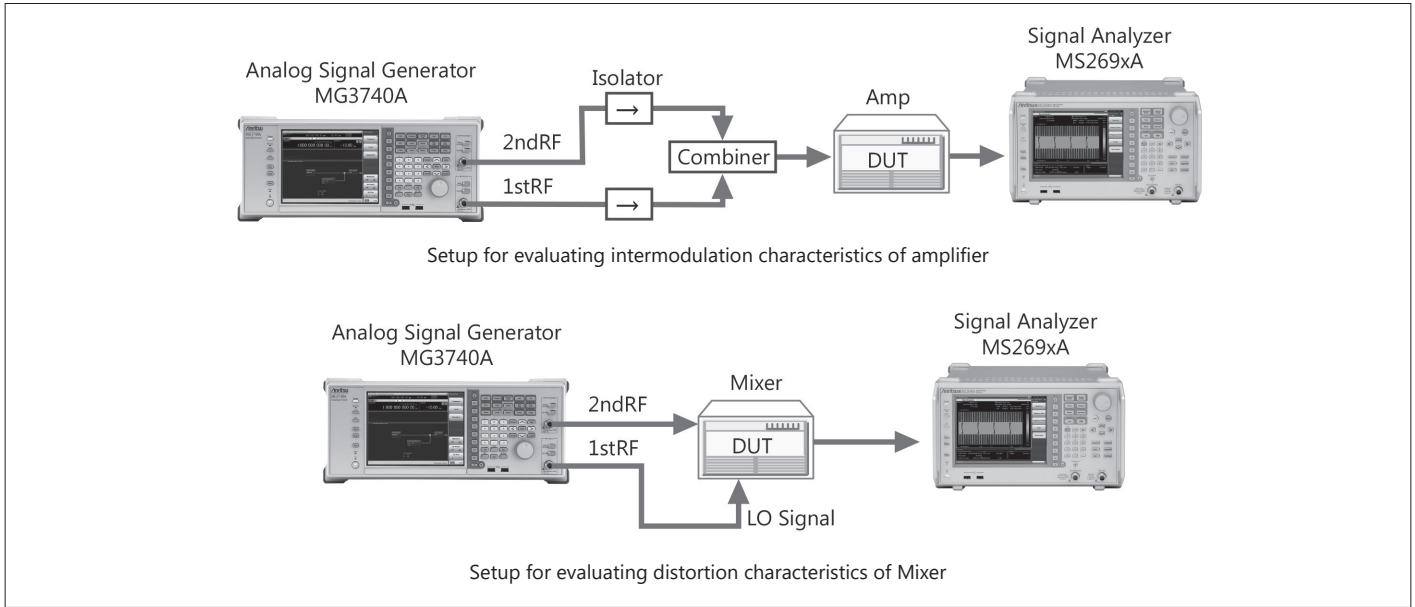
- AM + FM
- AM + Φ M
- Internal 1 + Internal 2
- Internal + External

* FM + Φ M does not support.

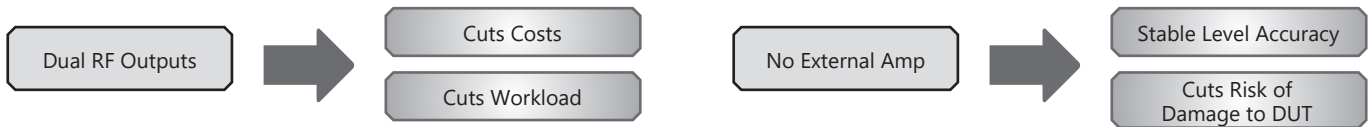
Analog Radio Main Rx Characteristics Evaluation Items

Test Items	MG3740A Key Features	
Sensitivity	✓	Wide level range, High level accuracy, Internal modulation function (standard)
Passing Bandwidth, Attenuation	✓	High level accuracy, Frequency offset setting function
AF Level	✓	Internal modulation function (standard)
Demodulation Frequency Characteristics	✓	Internal modulation function (standard)
Demodulation Distortion	✓	Internal modulation function (standard)
Demodulation S/N	✓	Internal modulation function (standard), External modulation function (Option)
Spurious Response	✓	High level accuracy, Internal modulation function (standard)
Sensitivity Suppression Effect	✓	Dual RF, Low SSB Phase Noise *All-in-one evaluation without requiring two separate signal sources.
Intermodulation Characteristics	✓	Dual RF, Low SSB Phase Noise *Two units of MG3740A support evaluation without requiring three separate signal sources.

Reference Signal Generator for Evaluating Characteristics of Amplifiers, Mixers, etc.



The dual RF outputs of the MG3740A are ideal for evaluating intermodulation (IM3) characteristics of amplifiers, etc., as well as for use as RF/LO signal sources for testing mixers, eliminating the need for two separate signal generators. The high-performance MS269xA Signal Analyzer series is recommended for intermodulation and harmonic wave distortion measurements.



Supports Maximum Two RF Outputs

Usually, two general signal generators are required to output two continuous waveforms when evaluating the intermodulation characteristics of amplifiers, etc., or for use as RF/LO signal sources at mixer tests. A maximum of two RF outputs (1stRF/2ndRF) can be installed in the MG3740A and the product lineup includes models with different 1stRF and 2ndRF frequencies. Different frequencies and levels can be set at the two signal outputs and the frequency/level synchronization function cuts the setting workload too.



USB Power Sensor

Up to two USB power sensors (separately sold) can be connected to the MG3740A. USB connectors to display the measurement results on the MG3740A screen.

Compatible USB power sensors

Model	Frequency Range	Dynamic Range
MA24104A*	600 MHz to 4 GHz	+3 to +51.76 dBm
MA24105A	350 MHz to 4 GHz	+3 to +51.76 dBm
MA24106A	50 MHz to 6 GHz	-40 to +23 dBm
MA24108A	10 MHz to 8 GHz	-40 to +20 dBm
MA24118A	10 MHz to 18 GHz	-40 to +20 dBm
MA24126A	10 MHz to 26 GHz	-40 to +20 dBm

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

High-power Output Option Supports CW Levels of +23 dBm (Option 041/071)

In general, an external amp is required when the output of a signal generator is insufficient, such as covering the measurement system transmission path loss and inputting high-level modulation signals for amp distortion characteristics tests. Since the output of an external amp cannot be assured, it must be checked with a power meter each time the frequency and level are changed. Moreover, when using an external amp, sometimes the DUT may be damaged by mishandling errors. The MG3740A high-power output supports signals required for measuring path loss. In addition, stable measurement is assured when used within the guaranteed setting range. And the risk of mistakenly damaging the DUT is reduced, even at the output limit.

Expansion to Digital Modulation Signal Generator

The MG3740A can be expanded to add digital modulation generation functions, supporting evaluation of digital public safety radio systems. All-in-one support for both analog and digital tests maximizes equipment investment efficiency.

Digital Modulation [Option 020]

Adding the digital modulation option [Option 020] supports generation of digital modulation signals by outputting narrowband digital modulation signals.

- Digital Modulation Performance
- RF Modulation Bandwidth: 2 MHz
- Sampling Rate: 20 kHz to 8 MHz

Dual Waveform Memory: Four Waveform Outputs Max.

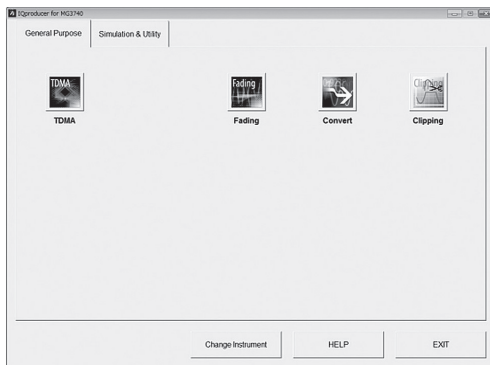
In the standard configuration, one RF (1stRF or 2ndRF) has one waveform memory. However, adding the baseband signal combine option (Option 048/078) upgrades to two memories for one RF. In other words, models with two RFs (1stRF and 2ndRF) installed can have a maximum of four waveform memories. Two waveform patterns can be set easily on-screen for one RF, each with different frequency offset, level offset and delay time settings to output a combined baseband RF signal. With this setup, one MG3740A supports the following test environment — a setup that previously required two signal generators:

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

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 Main Screen

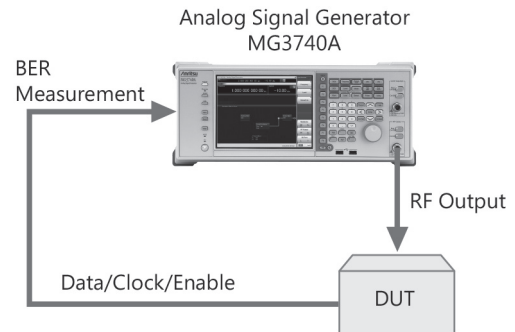
MG3740A Option IQproducer

- TDMA IQproducer MX370102A
Sets required parameters for TDMA waveform patterns and generates various waveform patterns.
- Fading IQproducer MX370107A
Performs IQ channel fading processing, correlation matrix calculation, AWGN combination.

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 MG3740A 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: $\leq 2^{32} - 1$ (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

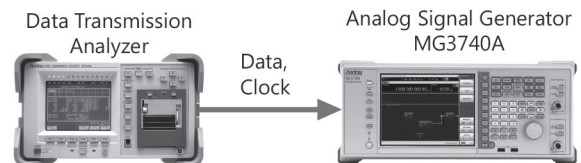


The BER can be measured using the DUT-demodulated Data/Clock/Enable.

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.

Error Rate	PN9	PN11	PN15	PN20	PN23
6.0%	–	–	–	–	–
5.0%	OK	–	–	–	–
4.0%	OK	OK	–	–	–
3.0%	OK	OK	OK	–	–
2.5%	OK	OK	OK	–	–
2.0%	OK	OK	OK	OK	OK
1.0%	OK	OK	OK	OK	OK



Key Differences from MG3710E Vector Signal Generator

Installing the Digital Modulation Option (Option 020) in the MG3740A Analog Signal Generator adds the functions of a digital modulation signal generator. The key differences in the main functions compared to the conventional MG3710E Vector Signal Generator are listed below.

Key Functional Differences between Analog Signal Generator MG3740A and Vector Signal Generator MG3710E

	MG3740A Analog Signal Generator	MG3710E*1 Vector Signal Generator	Remarks
Frequency Range	100 kHz to 2.7 GHz (Option 032/062) 100 kHz to 4.0 GHz (Option 034/064) 100 kHz to 6.0 GHz (Option 036/066)	100 kHz to 2.7 GHz (Option 032/062) 100 kHz to 4.0 GHz (Option 034/064) 100 kHz to 6.0 GHz (Option 036/066)	Supports two signal generators (1stRF/2ndRF output) in one unit
Analog Modulation Internal Source	[Standard]	[Standard]	AM, FM/ΦM Each one internal source
Additional Analog Modulation Input	[Option 050/080]	[Option 050/080]	Extends to one external input, two internal source (AM, FM/ΦM)
Digital Modulation	[Option 020] Digital modulation performance - RF modulation bandwidth: 2 MHz - Sampling rate: 20 kHz to 8 MHz	[Standard] Digital modulation performance - RF modulation bandwidth: 160 MHz*2/120 MHz - Sampling rate: 20 kHz to 200 MHz*2/160 MHz	
Pre-installed Waveform Patterns	No	Yes	LTE FDD/TDD (E-TM1.1 to E-TM3.3) W-CDMA/HSDPA, GSM/EDGE, CDMA2000 1X/1xEV-DO, WLAN (802.11a/11b/11g), etc.
Waveform pattern/IQproducer	TDMA IQproducer Fading IQproducer	Listed below	Listed below
ARB Memory Upgrade (per RF)	[Option 045/075] Max. 256 Msamples	[Option 046/076] Max. 1024 Msamples	Standard: 64 Msamples
Combination of Baseband Signal	[Option 048/078]	[Option 048/078]	
AWGN Generator	No	[Option 049/079]	
Analog IQ Input/Output	No	[Option 018]	
Universal Input/Output	[Option 017] - Sweep Output (1stRF) - AUX-BNC conversion adapter	[Option 017] - Baseband Reference Clock Input/Output - Sweep Output (1stRF) - Local Signal Input/Output - AUX-BNC conversion adapter	
BER Measurement Function	[Option 021]	[Option 021]	

*1: The MG3710E Vector Signal Generator is recommended for many purposes.

For detail, refer to the MG3710E product brochure.

*2: Only when using WLAN IQproducer MX370111A and 802.11ac (160 MHz) option MX370111A-002.

Waveform Pattern Support Systems

Main frame support Waveform Pattern

Waveform pattern Support Systems	MG3740A (with Option 020)	MG3710E
MX370073B DFS Radar Pattern	—	✓
MX370075A DFS (ETSI) Waveform Pattern	—	✓

For detail, refer to the MX3700xxA Waveform pattern product brochure.

IQproducer Support Systems

Main frame support IQproducer

	IQproducer Support Systems	MG3740A (with Option 020)	MG3710E
Standard Accessories	W-CDMA IQproducer	—	✓
	AWGN IQproducer	—	✓
Options	MX370101A HSDPA/HSUPA IQproducer	—	✓
	MX370102A TDMA IQproducer	✓	✓
	MX370103A CDMA2000 1xEV-DO IQproducer	—	✓
	MX370104A Multi-carrier IQproducer	—	✓
	MX370106A DVB-T/H IQproducer	—	✓
	MX370107A Fading IQproducer	✓	✓
	MX370108A LTE IQproducer	—	✓
	MX370108A-001 LTE-Advanced FDD Option	—	✓
	MX370110A LTE TDD IQproducer	—	✓
	MX370110A-001 LTE-Advanced TDD Option	—	✓
	MX370111A WLAN IQproducer	—	✓
	MX370111A-002 802.11ac (160 MHz) Option	—	✓
	MX370112A TD-SCDMA IQproducer	—	✓
	MX370113A 5G NR TDD sub-6 GHz IQproducer	—	✓
MX370114A 5G NR FDD sub-6 GHz IQproducer	—	✓	

For detail, refer to the MX3701xxA IQproducer product brochure.

Specifications

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

Frequency Setting Range

1stRF	
MG3740A-032	9 kHz to 2.7 GHz
MG3740A-034	9 kHz to 4 GHz
MG3740A-036	9 kHz to 6 GHz
2ndRF	
MG3740A-062	9 kHz to 2.7 GHz
MG3740A-064	9 kHz to 4 GHz
MG3740A-066	9 kHz to 6 GHz

Switching Speed (List Mode)

Frequency	≤600 μs
Level	≤600 μs

Amplitude Setting Range

Options	Setting Range [dBm]	
	without Reverse Power Protection	with Reverse Power Protection
Standard	-110 to +17	-110 to +17
with High-power Extension	-110 to +30	-110 to +25
with Low-power Extension	-144 to +17	-144 to +17
with High-power Extension and Low-power Extension	-144 to +30	-144 to +25

Level Accuracy is assured at high levels (CW)

Frequency Range	Standard	Option 041/071
100 kHz ≤ f < 10 MHz	+5 dBm	+5 dBm
10 MHz ≤ f < 50 MHz	+10 dBm	+10 dBm
50 MHz ≤ f < 400 MHz	+13 dBm	+20 dBm
400 MHz ≤ f ≤ 3 GHz		+23 dBm
3 GHz < f ≤ 4 GHz		+20 dBm
4 GHz < f ≤ 5 GHz	+11 dBm	+13 dBm
5 GHz < f ≤ 6 GHz		+11 dBm

Absolute Level Accuracy

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)

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

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

Analog Modulation

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

Digital Modulation Performance [Option 020 installed]

- RF Modulation Bandwidth
2 MHz
- ARB Memory Size
64 Msamples (256 MB) [with 1stRF, 2ndRF]
256 Msamples (1 GB) [Option 045/075]
- Sampling Rate
20 kHz to 8 MHz
- DAC Resolution
14/15/16 bits

EU Standards (CE Marking)

EMC: 2014/30/EU, EN61326-1, EN61000-3-2
 LVD: 2014/35/EU, EN61010-1
 RoHS: 2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018

Dimensions, Mass

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

Power Supply

100 VAC to 120 VAC, 200 VAC to 240 VAC
 50 Hz to 60 Hz

Ordering Information

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

The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name	Remarks
MG3740A	Main Frame Analog Signal Generator	
P0031A	Standard Accessories Power Cord: USB Memory Install CD-ROM	1 pc USB2.0 Flash Driver, ≥256 MB Operation manual (PDF) and application software (IQproducer)
MG3740A-001 MG3740A-002 MG3740A-011 MG3740A-017	Options (Common Parts) Rubidium Reference Oscillator High Stability Reference Oscillator 2ndary HDD Universal Input/Output	Select when ordering main frame, aging rate: $\pm 1 \times 10^{-10}$ /month Select when ordering main frame, aging rate: $\pm 1 \times 10^{-7}$ /year Select when ordering main frame, spare HDD for saving user data without Windows OS Select when ordering main frame, Adds BNC connector for outputting Sweep Output signal (only supports SG1) to rear panel of main frame, includes J1539A AUX Conversion Adapter Select when ordering main frame, Built-in Digital Modulation function.
MG3740A-020	Digital Modulation	Digital modulation Performance: - RF modulation bandwidth: 2 MHz - Sampling rate: 20 kHz to 8 MHz
MG3740A-021	BER Test Function	Select when ordering main frame, Built-in BER measurement, Bit Rate: 100 bps to 40 Mbps J1539A AUX Conversion Adapter required for Data/Clock/Enable signal input
MG3740A-101 MG3740A-102 MG3740A-111 MG3740A-117 MG3740A-120 MG3740A-121 MG3740A-182	Rubidium Reference Oscillator Retrofit High Stability Reference Oscillator Retrofit 2ndary HDD Retrofit Universal Input/Output Retrofit Digital Modulation Retrofit BER Test Function Retrofit CPU/Windows10 Upgrade Retrofit	Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A
MG3740A-282	CPU/Windows10 Upgrade Retrofit	Due to OS license restrictions, this option is not applicable to MG3740A units in which Option 313 Removable HDD (sales discontinued) is installed. Retrofitted to shipped MG3740A Due to OS license restrictions, this option is not applicable to MG3740A units in which Option 313 Removable HDD (sales discontinued) is installed.
MG3740A-032 MG3740A-034 MG3740A-036	(For 1stRF) 1stRF 100 kHz to 2.7 GHz 1stRF 100 kHz to 4 GHz 1stRF 100 kHz to 6 GHz	Select when ordering main frame, select 1stRF frequency range, frequency cannot be changed after installation Select when ordering main frame, select 1stRF frequency range, frequency cannot be changed after installation Select when ordering main frame, select 1stRF frequency range, frequency cannot be changed after installation
MG3740A-041 MG3740A-042 MG3740A-043 MG3740A-045 MG3740A-048 MG3740A-050	High Power Extension for 1stRF Low Power Extension for 1stRF Reverse Power Protection for 1stRF ARB Memory Upgrade 256 Msample for 1stRF Combination of Baseband Signal for 1stRF Additional Analog Modulation Input for 1stRF	Select when ordering main frame, increases upper limit of output signal power setting range Select when ordering main frame, increases lower limit of output signal power setting range Select when ordering main frame, prevents damage caused by reverse input to output connector Select when ordering main frame, expands ARB memory capacity. Requires MG3740A-020. Select when ordering main frame, adds baseband combine function. Requires MG3740A-020. Select when ordering main frame, Adds BNC connector for inputting external signals to rear panel of mainframe.
MG3740A-141 MG3740A-142 MG3740A-143 MG3740A-145 MG3740A-148 MG3740A-150	High Power Extension for 1stRF Retrofit Low Power Extension for 1stRF Retrofit Reverse Power Protection for 1stRF Retrofit ARB Memory Upgrade 256 Msample for 1stRF Retrofit Combination of Baseband Signal for 1stRF Retrofit Additional Analog Modulation Input for 1stRF Retrofit	Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A. Requires MG3740A-020/120. Retrofitted to shipped MG3740A. Requires MG3740A-020/120. Retrofitted to shipped MG3740A
MG3740A-062 MG3740A-064 MG3740A-066	(For 2ndRF) 2ndRF 100 kHz to 2.7 GHz 2ndRF 100 kHz to 4 GHz 2ndRF 100 kHz to 6 GHz	Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation Select when ordering main frame, select 2ndRF frequency range, frequency cannot be changed after installation
MG3740A-071 MG3740A-072 MG3740A-073 MG3740A-075 MG3740A-078 MG3740A-080	High Power Extension for 2ndRF Low Power Extension for 2ndRF Reverse Power Protection for 2ndRF ARB Memory Upgrade 256 Msample for 2ndRF Combination of Baseband Signal for 2ndRF Additional Analog Modulation Input for 2ndRF	Select when ordering main frame, increases upper limit of output signal power setting range Select when ordering main frame, increases lower limit of output signal power setting range Select when ordering main frame, prevents damage caused by reverse input to output connector Select when ordering main frame, expands ARB memory capacity. Requires MG3740A-020. Select when ordering main frame, adds baseband combine function. Requires MG3740A-020. Select when ordering main frame, Adds BNC connector for inputting external signals to rear panel of mainframe.
MG3740A-162 MG3740A-164 MG3740A-166 MG3740A-171 MG3740A-172 MG3740A-173 MG3740A-175 MG3740A-178 MG3740A-180	2ndRF 100 kHz to 2.7 GHz Retrofit 2ndRF 100 kHz to 4 GHz Retrofit 2ndRF 100 kHz to 6 GHz Retrofit High Power Extension for 2ndRF Retrofit Low Power Extension for 2ndRF Retrofit Reverse Power Protection for 2ndRF Retrofit ARB Memory Upgrade 256 Msample for 2ndRF Retrofit Combination of Baseband Signal for 2ndRF Retrofit Additional Analog Modulation Input for 2ndRF Retrofit	Retrofitted to shipped MG3740A when 2ndRF not installed Retrofitted to shipped MG3740A when 2ndRF not installed Retrofitted to shipped MG3740A when 2ndRF not installed Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A Retrofitted to shipped MG3740A. Requires MG3740A-020/120. Retrofitted to shipped MG3740A. Requires MG3740A-020/120. Retrofitted to shipped MG3740A

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Model/Order No.	Name	Remarks
MG3740A-ES210 MG3740A-ES310 MG3740A-ES510	Maintenance Service 2 Years Extended Warranty Service 3 Years Extended Warranty Service 5 Years Extended Warranty Service	
MX370102A MX370107A	Softwares (IQproducer) TDMA IQproducer Fading IQproducer	(License for IQproducer) IQproducer software, license for main frame, manual (PDF) IQproducer software, license for main frame, manual (PDF)
W3580AE W2496AE W2916AE W2995AE	Optional Accessories MG3710A/MG3710E/MG3740A Operation Manual (Main Unit) MG3710A/MG3710E/MG3740A Operation Manual (IQproducer) MX370102A Operation Manual MX370107A Operation Manual	Booklet, for MG3710A/MG3710E/MG3740A Main Frame (Operation, Remote Control) Booklet, for IQproducer (Operation for Common Parts) Booklet, for TDMA IQproducer Booklet, for Fading IQproducer
J1539A Z1572A MA24105A MA24106A MA24108A MA24118A MA24126A K240B	AUX Conversion Adapter Installation Kit Inline Peak Power Sensor USB Power Sensor Microwave USB Power Sensor Microwave USB Power Sensor Microwave USB Power Sensor Power Divider (K connector)	Converts MG3740A rear-panel AUX connector to BNC connector Required when retrofitting hardware options or installing IQproducer (MX3701xxA) 350 MHz to 4 GHz, Inline type, with USB A to micro-B Cable 50 MHz to 6 GHz, with USB A to mini-B Cable 10 MHz to 8 GHz, with USB A to micro-B Cable 10 MHz to 18 GHz, with USB A to micro-B Cable 10 MHz to 26 GHz, with USB A to micro-B Cable DC to 26.5 GHz, K-J, 50Ω, 1 Wmax
MA1612A J0576B J0576D J0127A J0127B J0127C J0322A J0322B J0322C J0322D J0004 J1261B J1261D J0008 B0635A B0657A B0636C B0671A Z0975A Z0541A	Four-Port Junction Pad Coaxial Cord, 1.0 m Coaxial Cord, 2.0 m Coaxial Cord, 1.0 m Coaxial Cord, 2.0 m Coaxial Cord, 0.5 m Coaxial Cord, 0.5 m Coaxial Cord, 1.0 m Coaxial Cord, 1.5 m Coaxial Cord, 2.0 m Coaxial Adapter Ethernet Cable (Shield Type) Ethernet Cable (Shield Type) GPIB Cable, 2.0 m Rack Mount Kit Rack Mount Kit (JIS) Carrying Case Front Cover for 1MW4U Keyboard (USB) USB Mouse	5 MHz to 3 GHz, N-J N-P · 5D-2W · N-P N-P · 5D-2W · N-P BNC-P · RG-58A/U · BNC-P BNC-P · RG-58A/U · BNC-P BNC-P · RG-58A/U · BNC-P SMA-P · SMA-P, DC to 18 GHz, 50Ω SMA-P · SMA-P, DC to 18 GHz, 50Ω SMA-P · SMA-P, DC to 18 GHz, 50Ω SMA-P · SMA-P, DC to 18 GHz, 50Ω N-P · SMA-J Conversion Adapter, DC to 12.4 GHz Straight-through, 3 m Crossover, 3 m EIA JIS Hard Type. With Casters and B0671A Front Cover

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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