

DIGITAL MODULATION SIGNAL GENERATOR

MG3660A

300 kHz to 2.75 GHz

Economy Version of MG3671A with Same Basic Features



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The MG3660A has all the basic functions of the higher-level MG3670B/C, MG3671A/B, and identical GPIB and front-panel operation. In addition, the same expansion units can be used.

- The MG3660A is an economic version of the MG3671A/B with the same basic features.

Specifications

Carrier frequency	Frequency range	300 kHz to 2750 MHz			
	Accuracy	Depends on installed reference oscillator*1			
	Internal reference oscillator	Frequency: 10 MHz Start-up characteristics: $\leq 1 \times 10^{-7}$ /day (after 30-min. warm-up), $\leq 5 \times 10^{-8}$ /day (after 60-min. warm-up) Aging rate: $\leq 2 \times 10^{-8}$ /day (after 24-h warm-up) Temperature characteristics: $\leq \pm 5 \times 10^{-8}$ (0° to 50°C)			
	External reference input	10 MHz or 13 MHz (± 10 ppm), 2 to 5 Vp-p, BNC connector (rear panel)			
	Reference output	10 MHz, 2 to 5 Vp-p, BNC connector (rear panel)			
Output	Level range	-143 to +13 dBm (resolution: 0.1 dB)			
	Frequency response	Within +1 dB (at 0 dBm output)			
	Level accuracy	Output level/frequency	≤ 1000 MHz	> 1000 MHz	
		-33 to +13 dBm	± 1 dB	± 2 dB	
		-123 to -33.1 dBm	± 1.5 dB	± 2 dB	
		-136 to -123.1 dBm	± 3 dB	± 4 dB	
	Impedance	50 Ω , N-type connector			
Continuously-variable level	Continuously-variable output over 20 dB range (+8 to -12 dB) in 0.1 dB steps within upper and lower limits of any output level				
Level unit	dBm, dB μ , μ V, mV, V (dB μ , μ V, mV, V selected terminate/open voltage display)				
Interference radiation	≤ 1 μ V *measured 25 mm from cabinet (except rear panel) with two-turn 25 mm diameter loop antenna, terminated with 50 Ω load, $\leq +5$ dBm output, carrier wave				
Signal purity	Spurious	≤ -65 dBc (≥ 100 kHz offset, ± 100 MHz bandwidth)			
		≤ -50 dBc (≥ 100 kHz offset, full band)			
		≤ -40 dBc [spurious of (5.4 - Fout) GHz at ≥ 2.65 GHz] ≤ -30 dBc (harmonics)			
SSB phase noise	≤ -116 dBc/Hz (100 kHz offset, CW)				

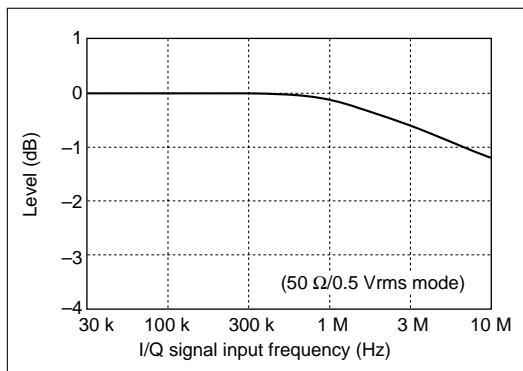
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Digital modulation	Internal modulation	Depends on installed modulation unit (MG0301C, MG0302A, MG0305A, MG0307A, MG0311A)
	External modulation	Any modulation using I/Q input signal Input frequency: DC to 1.2 MHz*2 Input level: $\sqrt{I^2 + Q^2} \leq 0.5$ Vrms, BNC connector *I/Q : ≤ 1.5 Vp-p (50 Ω), I/Q: $\leq 10\%$ to 100% of 1.5 Vp-p (CMOS) Vector error: $\leq 2.5\%$ rms (I/Q input level: 0.5Vrms/50 Ω , at $\leq +5$ dBm output)
	I/Q output	Outputs I/Q signal at internal modulation (MG0301C, MG0302A, MG0305A, MG0307A, or MG0311A installed)
Pulse modulation	Input	TTL level, BNC connector, polarity selectable
	On/off ratio	≥ 40 dB (at ≥ 0 dBm output)
	Transition time	≤ 2 μ s, minimum pulse width: 10 μ s
Memory function	Frequency memory	1000 carrier frequencies (save and recall)
	Parameter memory	100 panel settings (save and recall)
Other functions	Relative display	Carrier frequency, output level
	I/Q signal adjustment	Offset, balance, phase (only output) of I/Q input/output signal
	Backup	Last settings stored at power-off
	Reverse power protection	Maximum reverse input power: 50 W (<1000 MHz), 25 W (≥ 1000 MHz), ± 50 V (DC)
	GPIB	All functions except power switch and panel lock switch controlled Interface function: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2
Operating temperature	0° to 50°C	
Power	85 to 132/170 to 250 Vac (automatically selected), 47.5 to 63 Hz, ≤ 350 VA	
Dimensions and mass	426 ± 5 (W) x 221.5 ± 4 (H) x 451 ± 5 (D) mm, ≤ 23 kg	
EMC*3	EN55011: 1991, Group 1, Class A EN50082-1: 1992	
Safety	EN61010-1: 1993 (Installation Category II, Pollution Degree II)	

*1: Internal reference oscillator accuracy: 2×10^{-8} /day (23° $\pm 5^\circ$ C), calibrated after 24-h operation

*2: Refer to the "frequency response for I/Q external modulation (typical value)" shown below for the input frequency range. Typical value are given for reference only to assist in using this instrument, and are not guaranteed specifications.

*3: Electromagnetic compatibility



• Expansion units

The MG3660A expansion units can be used with the MG3670B/C, MG3671A/B. For the specifications, refer to page 227. However, when an expansion unit is mounted in the MG3660A, the specifications change as shown below.

MG0301C $\pi/4$ DQPSK Modulation Unit

Vector error	RF signal: $\leq 2.5\%$ rms (+5 dBm output)
PHS, PDC_H, NADC, TFTS	Carrier frequency: 300 kHz to 2750 MHz
PHS	Carrier frequency: 1 to 2750 MHz Adjacent channel leakage power ratio: ≤ -69 dB (600/900 kHz offset, ± 96 kHz band, ≥ 10 MHz)

MG0302A GMSK Modulation Unit

GSM, PCN (DCS1800)	Carrier frequency: 1 to 2750 MHz
CT2	Carrier frequency: 300 kHz to 2750 MHz

MG0303B Burst Function Unit

RF output	Burst on/off ratio: ≥ 75 dB (+5 dBm output, PDC, PDC_H, NADC, TFTS, TETRA, CT2)
PHS	Adjacent channel leakage power ratio: ≤ -69 dB (600/900 kHz offset, ± 96 kHz band, ≥ 10 MHz)

MG0305A GFSK Modulation Unit

Vector error	RF signal: ≤ 18 kHz ($\leq +5$ dBm output)
DECT	Carrier frequency: 5 to 2750 MHz

MG0307A $\pi/4$ DQPSK Modulation Unit

Vector error	RF signal: $\leq 2.5\%$ rms ($\leq +5$ dBm output, modulation data FFFF)
PACS, WCPE	Carrier frequency: 1 to 2750 MHz
PHS	Carrier frequency: 1 to 2750 MHz Adjacent channel leakage power ratio: ≤ -69 dB (600/900 kHz offset, ± 96 kHz band, ≥ 10 MHz)

MG0311A $\pi/4$ DQPSK Modulation Unit

Vector error	RF signal: $\leq 2.5\%$ rms ($\leq +5$ dBm output)
TETRA	Carrier frequency: 300 kHz to 2750 MHz Adjacent channel leakage power ratio: ≤ -45 dB (25 kHz offset, ± 9 kHz band) ≤ -62 dB (50 kHz offset, ± 9 kHz band)

Ordering information

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

Model/Order No.	Name
MG3660A	Main frame Digital Modulation Signal Generator
	Expansion units (factory installed)
MG0301C	$\pi/4$ DQPSK Modulation Unit
MG0302A	GMSK Modulation Unit
MG0303B	Burst Function Unit
MG0305A	GFSK Modulation Unit
MG0307A	$\pi/4$ DQPSK Modulation Unit
MG0311A	$\pi/4$ DQPSK Modulation Unit
	Standard accessories (for main frame)
J0576B	Coaxial cord (N-P • 5D-2W • N-P), 1 m: 1 pc
J0127A	Coaxial cord (BNC-P • RG-58A/U • BNC-P), 1 m: 2 pcs
	Power cord, 2.5 m: 1 pc
B0325	Shielded cover for GPIB: 1 pc
F0013	Fuse, 5 A: 2 pcs
W1005AE	MG3660A operation manual: 1 copy
	Standard accessories (for expansion units)
W0872AE	MG0301C/0303B operation manual (supplied with MG0301C): 1 copy
W0691AE	MG0302A/0303B operation manual (supplied with MG0302A): 1 copy
W0851AE	MG0305A/0303B operation manual (supplied with MG0305A): 1 copy
W0949AE	MG0307A/0303B operation manual (supplied with MG0307A): 1 copy
W1042AE	MG0311A/0303B operation manual (supplied with MG0311A): 1 copy
	Options (for main frame)
MG3660A-01	Reference oscillator (aging rate: 5×10^{-9} /day)
MG3660A-02	Reference oscillator (aging rate: 2×10^{-9} /day)
MG3660A-03	Reference oscillator (aging rate: 5×10^{-10} /day)
	Optional accessories
J0127C	Coaxial cord (BNC-P • RG-58A/U • BNC-P), 0.5 m
J0003A	Coaxial cord (SMA-P • 3D-2W • SMA-P), 1 m
J0576D	Coaxial cord (N-P • 5D-2W • N-P), 2 m
J0004	Coaxial adapter (N-P • SMA-J)
J0007	GPIB cable, 1 m
J0008	GPIB cable, 2 m
B0329D	Protective cover
B0331D	Front handle kit (2 pcs/set)
B0332	Joint plate (4 pcs/set)
B0333D	Rack mount kit
B0334D	Carrying case (with casters and protective cover)
	Optional equipment
MS8604A	Digital Mobile Radio Transmitter Tester
MD1620B	Signalling Tester
MD1620C	Signalling Tester
MD6420A	Data Transmission Analyzer
MP1201C	Error Rate Tester
MS2683A	Spectrum Analyzer