

## 1.5 Specifications

The MG3631A/MG3632A specifications are listed below.

### Specifications (1/5)

Carrier frequency	Range	100 kHz to 1040 MHz setting range: 0 to 1040 MHz (MG3631A), 100 kHz to 2080 MHz setting range: 0 to 2080 MHz (MG3632A)			
	Resolution	10 Hz			
	Accuracy	Same as that for the reference oscillator, except in DC-FM mode			
	Internal reference oscillator *1	Frequency	10 MHz		
		Aging rate	$\leq \pm 2 \times 10^{-7}/\text{day}$		
		Temperature characteristics	$\pm 1 \times 10^{-6}$ (0° to 50°C)		
	External reference signal input	10 MHz $\pm 10$ ppm, TTL level, BNC connector on rear panel			
	Reference signal output	10 MHz, TTL level, BNC connector on rear panel			
Switching time	Elapsed time from last command until frequency has stabilized to within $\pm 500$ Hz of set frequency during remote operation: $\leq 150$ ms				
Output level	Range	-143 to +13 dBm			
	Unit	dBm, dB $\mu$ , V, mV, $\mu$ V (Terminated and open voltages are selected in units of dB $\mu$ , V, mV or $\mu$ V)			
	Resolution	0.1 dB			
	Frequency response	$\pm 0.5$ dB at 0 dBm ( $\leq 1040$ MHz) $\pm 1$ dB at 0 dBm ( $> 1040$ MHz, only for MG3632A)			
	Level accuracy	Frequency	100 kHz $\leq$ to $\leq 1040$ MHz	1040 MHz < to $\leq 1700$ MHz, only for MG3632A	1700 MHz <, only for MG3632A
		Output level			
		+13 to -33 dBm	$\pm 1$ dB	$\pm 1.5$ dB	$\pm 1.5$ dB
-33.1 to -108 dBm		$\pm 1.5$ dB	$\pm 2.5$ dB	$\pm 3$ dB	
-108.1 to -123 dBm	$\pm 1.5$ dB	$\pm 2.5$ dB	$\pm 4$ dB		
-123.1 to -133 dBm	$\pm 3$ dB	$\pm 4$ dB	$\pm 4$ dB		
Impedance	50 $\Omega$ , N-type connector VSWR: $\leq 1.5$ ( $\leq 1040$ MHz, $\leq -3$ dBm) $\leq 1.8$ ( $> 1040$ MHz, $\leq -3$ dBm, only for MG3632A)				

\*1 Aging rates up to  $2 \times 10^{-9}/\text{day}$  are available as options 01 to 03.

### Specifications (2/5)

Output level (Cont.)	Switching time	Elapsed time from last command until output level is stabilized within $\pm 0.5$ dB of the last value during remote operation: $\leq 150$ ms																					
	Interference radiation	$\leq 0.3 \mu\text{V}$ (Terminated with $50\Omega$ load, measured 25 mm from front panel with a two-turn 25 mm diameter loop antenna. 10 MHz reference signal excluded with Option 01/02/03)																					
Signal purity	Spurious	In CW mode: <span style="float: right;"><math>f_c</math>: carrier frequency</span>																					
		Harmonics (2nd, 3rd)	$\leq -30$ dBc Band limited by Option 41 $\leq -30$ dBc (2nd, 3rd) (10 MHz $\leq f_c \leq 1040$ MHz) for MG3631A $\leq -30$ dBc (2nd, 3rd) (10 MHz $\leq f_c \leq 2080$ MHz) for MG3632A																				
		Sub-harmonics ( $f_c/2, 3f_c/2, 5f_c/2$ )	None (at $\leq 1040$ MHz) $\leq -30$ dBc (at $> 1040$ MHz for MG3632A)																				
		Non-harmonics	$\leq -60$ dBc ( $f_c < 130$ MHz, $\geq 5$ kHz offset) $\leq -66$ dBc (130 MHz $\leq f_c < 520$ MHz, $\geq 5$ kHz offset) $\leq -60$ dBc (520 MHz $\leq f_c \leq 1040$ MHz, 5 kHz offset) $\leq -54$ dBc ( $f_c > 1040$ MHz, $\geq 5$ kHz offset, only for MG3632A)																				
	SSB phase noise	In CW mode: <table border="1" style="margin: 5px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">Offset frequency</th> <th>10 kHz</th> <th>20 kHz</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Frequency</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">10 MHz <math>\leq f_c &lt; 130</math> MHz</td> <td><math>\leq -124</math> dBc/Hz</td> <td><math>\leq -125</math> dBc/Hz</td> </tr> <tr> <td style="text-align: left;">130 MHz <math>\leq f_c &lt; 260</math> MHz</td> <td><math>\leq -133</math> dBc/Hz</td> <td><math>\leq -134</math> dBc/Hz</td> </tr> <tr> <td style="text-align: left;">260 MHz <math>\leq f_c &lt; 520</math> MHz</td> <td><math>\leq -130</math> dBc/Hz</td> <td><math>\leq -131</math> dBc/Hz</td> </tr> <tr> <td style="text-align: left;">520 MHz <math>\leq f_c \leq 1040</math> MHz</td> <td><math>\leq -124</math> dBc/Hz</td> <td><math>\leq -125</math> dBc/Hz</td> </tr> <tr> <td style="text-align: left;">1040 MHz <math>&lt; f_c</math> (only for MG3632A)</td> <td><math>\leq -118</math> dBc/Hz</td> <td><math>\leq -119</math> dBc/Hz</td> </tr> </tbody> </table>		Offset frequency	10 kHz	20 kHz	Frequency			10 MHz $\leq f_c < 130$ MHz	$\leq -124$ dBc/Hz	$\leq -125$ dBc/Hz	130 MHz $\leq f_c < 260$ MHz	$\leq -133$ dBc/Hz	$\leq -134$ dBc/Hz	260 MHz $\leq f_c < 520$ MHz	$\leq -130$ dBc/Hz	$\leq -131$ dBc/Hz	520 MHz $\leq f_c \leq 1040$ MHz	$\leq -124$ dBc/Hz	$\leq -125$ dBc/Hz	1040 MHz $< f_c$ (only for MG3632A)	$\leq -118$ dBc/Hz
Offset frequency	10 kHz	20 kHz																					
Frequency																							
10 MHz $\leq f_c < 130$ MHz	$\leq -124$ dBc/Hz	$\leq -125$ dBc/Hz																					
130 MHz $\leq f_c < 260$ MHz	$\leq -133$ dBc/Hz	$\leq -134$ dBc/Hz																					
260 MHz $\leq f_c < 520$ MHz	$\leq -130$ dBc/Hz	$\leq -131$ dBc/Hz																					
520 MHz $\leq f_c \leq 1040$ MHz	$\leq -124$ dBc/Hz	$\leq -125$ dBc/Hz																					
1040 MHz $< f_c$ (only for MG3632A)	$\leq -118$ dBc/Hz	$\leq -119$ dBc/Hz																					
Residual AM	$\leq 0.03\%$ rms at $\geq 500$ kHz (demodulation band: 50 Hz to 15 kHz)																						
Residual FM	At demodulation band 0.3 to 3 kHz: $\leq 4$ Hzrms ( $\geq 10$ MHz, $< 130$ MHz) $\leq 1$ Hzrms ( $\geq 130$ MHz, $< 260$ MHz) $\leq 2$ Hzrms ( $\geq 260$ MHz, $< 520$ MHz) $\leq 4$ Hzrms ( $\geq 520$ MHz, $\leq 1040$ MHz) $\leq 8$ Hzrms ( $> 1040$ MHz) (only for MG3632A) At demodulation band 50 Hz to 15 kHz: $\leq 10$ Hzrms ( $\geq 10$ MHz, $< 130$ MHz) $\leq 8$ Hzrms ( $\geq 130$ MHz, $< 260$ MHz) $\leq 5$ Hzrms ( $\geq 260$ MHz, $< 520$ MHz) $\leq 10$ Hzrms ( $\geq 520$ MHz, $\leq 1040$ MHz) $\leq 20$ Hzrms ( $> 1040$ MHz) (only for MG3632A)																						

### Specifications (3/5)

Amplitude modulation	Range	0 to 100%				
	Resolution	1%				
	Internal modulation frequency	Fixed frequency	400 Hz, 1 kHz			
		Variable frequency	0.1 Hz to 100 kHz, 0.1 Hz resolution			
		Frequency accuracy	100 ppm			
	Accuracy	± (5% of indicated value + 2%) [at ≥ 0.4 MHz, ≤ +7 dBm, 0 to 90%, internal 1 kHz, and demodulation band 0.3 to 3 kHz]				
	Frequency response	At ≤ +7 dBm, ±1 dB bandwidth				
		Lower modulation frequency limit	20 Hz (EXT AC mode) DC (EXT DC mode)			
		Upper modulation frequency limit	Carrier Frequency	Modulation factor	0 to 30%	30.1 to 80%
			$0.4 \text{ MHz} \leq f_c < 2 \text{ MHz}$	$2 \text{ MHz} \leq f_c$	10 kHz	5 kHz
External modulation	Input level	Approx. $2V_{p-p}/600\Omega$				
	Input impedance	Nominal 600Ω				
Distortion	$\leq -40 \text{ dB}$ (at ≥ 0.4 MHz, ≤ +7 dBm, internal 1 kHz, 30%) $\leq -30 \text{ dB}$ (at ≥ 0.4 MHz, ≤ +7 dBm, internal 1 kHz, 80%)					
Incidental FM	≤ 200 Hz peak (at ≥ 0.4 MHz, < +7 dBm, internal 1 kHz, 30%, demodulation band 0.3 to 3 kHz)					
Frequency modulation	Range	0 to 200 kHz ( $0.5 \text{ MHz} \leq f_c < 130 \text{ MHz}$ ) 0 to 100 kHz ( $130 \text{ MHz} \leq f_c < 260 \text{ MHz}$ ) 0 to 200 kHz ( $260 \text{ MHz} \leq f_c$ )				
	Resolution	10 Hz (0 to 9.99 kHz deviation) 100 Hz (10 to 99.9 kHz deviation) 1 kHz (100 to 200 kHz deviation)				
	Accuracy	± (5% of indicated value + 20 Hz), (at ≥ 0.5 MHz, internal 1 kHz, demodulation band 0.3 to 3 kHz)				
	Frequency response	At ≥ 0.5 MHz, ± 1 dB bandwidth				
Frequency range		EXT AC mode: 20 Hz to 100 kHz EXT DC mode: DC to 100 kHz				

### Specifications (4/5)

Frequency modulation (Cont.)	External modulation	Input level	Approx. $2V_{p-p}/600\Omega$
		Input impedance	Nominal $600\Omega$
	Distortion	$\leq -45$ dB (at $\geq 0.5$ MHz, AM 30%, internal 1 kHz, 3.5/22.5 kHz deviation)	
	Incidental AM	$\leq 0.4\%$ peak (at $\geq 0.5$ MHz, AM30%, internal 1 kHz, 22.5 kHz deviation, 0.3 to 3 kHz demodulation band)	
	Carrier frequency accuracy in DC-FM mode	$\pm 100$ Hz during 3 minutes at 2. hour power-on and calibration (at 1000 MHz, FM 10 kHz)	
Internal modulation signal	Frequency range	400 Hz, 1 kHz 20 Hz to 100 kHz (Option 04)	
	Frequency accuracy	$\pm 100$ ppm	
Other function	Simultaneous modulation	Simultaneous modulation with each AM and FM setting is possible as shown below. AM: 1 kHz/EXT, 400 Hz/EXT, AF/EXT, 1 kHz/AF, 400 Hz/AF FM: 1 kHz/EXT, 400 Hz/EXT, AF/EXT, 1 kHz/AF, 400 Hz/AF (AF: AF Oscillator of Option 04)	
	Modulation signal output	Modulation signal is output when modulating Output level: $2 V_{p-p} \pm 20\%/600\Omega$	
	Modulation signal polarity	External-modulation-signal polarity can be changed.	
	Relative value display	Carrier frequency Output level	
	Continuously variable output level	Continuously variable within a 26 dB range of the set level with fixed 5 dB-step P-ATT value Linearity: $\pm 1$ dB (at ALC attenuator output level $> -7$ dBm, $\leq +13$ dBm) $\pm 3$ dB (at ALC attenuator output level $\geq -13$ dBm, $\leq -7$ dBm) , where ALC attenuator output level $+7$ dBm as reference	
	Memory	100 panel settings (store/recall)	
	Memory backup	Last settings are stored when power is turned off. The following contents are not backed-up: data during key input and GP-IB transfer, remote status, and Reverse Power Protector (RPP) operation status.	

### Specifications (5/5)

Other function (Cont.)	GP-IB	All functions except POWER switch and LOCAL key can be controlled. Interface: SH0, AH1, T0, L4, TE0, SR0, RL1, PP0, DC1, DT0, C0, E2
	REMOTE	External controller can control some or all functions equal to those by front panel keys (however, except POWER switch and rotary knob). Controllable functions depends on the remote controller.
Reverse power protection	Maximum reverse input power	50 W ( $\leq 1040$ MHz), 25W ( $>1040$ MHz), $\pm 50$ Vdc
General	Ambient temperature, rated range of use	0° to 50°C
	Power	**Vac +10%/-15% (max. 250 Vac), 47.5 to 63 Hz, $\leq 125$ VA
	Dimensions & weight	132.5H $\times$ 426W $\times$ 451D mm, $\leq 22$ kg