

G51

SPECIFICATIONS

(G5100A / G5110A)

Display & Capability	
Display:	(G5100A) Graphic Mode for Visual Verification of Signal Settings (G5110) Text Mode LCD
Standard Waveforms:	Sine, Square, Ramp, Triangle, Pulse, Noise, DC Sine, Square, Ramp, Triangle, Pulse, DC
Built-In Arbitrary Waveforms:	Exponential Rise & Fall, Negative Ramp, Sin(x)/x, Cardiac
Waveform Characteristics	
Frequency:	1 μHz ~ 50 MHz / 1 mHz ~ 15 MHz
Amplitude Flatness: ^{1,2}	0.1 dB (< 100 KHz), 0.15 dB (< 5 MHz), 0.3 dB (Relative to 1 KHz) (< 20 MHz), 0.5 dB (< 50 MHz)
Harmonic: ^{3,3}	DC ~ 20 KHz, -70 (< 1 Vpp) -70 (≥ 1 Vpp) -65 (< 1 Vpp) -65 (> 1 Vpp)
Distortion:	20 KHz ~ 100 KHz, -65 (< 1 Vpp) -60 (≥ 1 Vpp) 100 KHz ~ 1 MHz, -50 (< 1 Vpp) -45 (≥ 1 Vpp)
(Unit: dBc)	1 MHz ~ 20 MHz, -40 (< 1 Vpp) -35 (≥ 1 Vpp) 20 MHz ~ 50 MHz, -35 (< 1 Vpp) -30 (≥ 1 Vpp)
Total Harmonic Distortion:	DC ~ 20 KHz, Out put ≥ 0.5 Vpp (THD + N ≤ 0.06 %)
Spurious: ^{2,4}	DC ~ 1 MHz, -70 dBc 1 MHz ~ 50 MHz, -70 dBc + 6 dB/octave
(Non-Harmonic)	DC ~ 1 MHz, -60 dBc 1 MHz ~ 15 MHz, -60 dBc + 6 dB/octave
Phase Noise:	-115 dBc/Hz (Typical), when f ≥ 1 MHz, V ≥ 0.1 Vpp (10 KHz Offset) -100 dBc/Hz (Typical), when f ≥ 1 MHz, V ≥ 0.1 Vpp
Frequency:	1 μHz ~ 25 MHz / 1 mHz ~ 15 MHz
Rise/Fall Time:	< 10 ns / < 15 ns
Overshoot:	< 2 %
Square:	Variable : 20 % ~ 80 % (to 10 MHz) 20 % ~ 80 % (to 5 MHz) Duty Cycle : 40 % ~ 60 % (to 25 MHz) 40 % ~ 60 % (to 15 MHz)
Asymmetry:	1 % of Period + 5 ns (@ 50 % Duty)
Jitter (RMS):	200 ps, when f ≥ 1 MHz, V ≥ 0.1 Vpp 1 ns + 100 ppm of Period
Ramp, Triangle:	Frequency: 1 μHz ~ 200 KHz / 1 mHz ~ 200 KHz Linearity: < 0.1 % of Peak Output / < 0.2 % of Peak Output Symmetry: 0.0 % ~ 100.0 % / 5.0 % ~ 95.0 %
Frequency:	500 μHz ~ 10 MHz / 1 mHz ~ 5 MHz
Width:	20 ns Minimum / 40 ns Minimum
Variable:	< 10 ns ~ 100 ns / < 15 ns
Pulse: Edge Time:	< 2 %
Overshoot:	< 2 %
Jitter (Rme):	200 ps, when f ≥ 50 kHz, V ≥ 0.1 Vpp 300 ps + 0.1 ppm of Period
Noise: Bandwidth:	20 MHz (Typical) / Not Support
Frequency:	1 μHz ~ 10 MHz / 1 mHz ~ 3 MHz
Length:	2 ~ 256 K / 2 ~ 8 K
Resolution:	14 Bits (Including Sign)
Sample Rate:	125 MSa/s / 50 MSa/s
Arb.: Rise/Fall Time (Min):	30 ns (Typical) / 50 ns (Typical)
Linearity:	< 0.1 % of Peak Output / < 0.5 % of Peak Output
Setting Time:	< 250 ns ~ 0.5 % of Final Value < 250 ns ~ 2 % of Final Value
Jitter (RMS):	6 ns + 30 ppm / 12 ns + 60 ppm
Non-Volatile:	4 Waveforms x 265 K Points
Memory:	8 Waveforms x 8 K Points

Common Characteristics	
Freq.: Resolution:	1 μHz / 1 mHz
Range:	10 mVpp ~ 10 Vpp in 50 Ω 20 mVpp ~ 20 Vpp in Hi-Z
Ampl.: Accuracy: ^{2,3}	± 1 % of Setting ± 1 mVpp / ± 2 % of Setting ± 2 mVpp
(at 1 KHz)	
Units:	Vpp, Vrms, dBm
Resolution:	4 Digits / 3 Digits
Peak Range:	± 5 V in 50 Ω ± 10 V in Hi-Z
DC Offset Accuracy: ^{1,2}	± 2 % of Offset Setting ± 0.5 % of Amplitude Setting ± 2 mV ± 2 % of Offset Setting ± 1 % of Amplitude Setting ± 3 mV
Resolution:	4 Digits / 3 Digits
Impedance:	50 Ω (Typical)
Main Output:	Isolation: 42 Vpk Maximum Protection: Short-Circuit Protected; Overload Automatically Disables Main Output
Internal Frequency: ⁵	± 10 ppm in 90 Days
Reference Accuracy:	± 20 ppm in 1 Year
Ext. Freq. Reference:	Standard / Optional
Lock Range:	10 MHz ± 500 Hz
Ext. Level:	100 mVpp ~ 5 Vpp
Freq.: Impedance:	1 KΩ (Typical), AC Coupled
Input Lock Time:	< 2 Sec
Ext. Lock Range:	10 MHz
Freq.: Level:	632 mVpp (0 dBm), Typical
Output Impedance:	50 Ω (Typical), AC Coupled
Phase Offset:	Range: -360° ~ +360° Resolution: 0.001 Accuracy: 8 ns / 20 ns
External ⁷ Voltage Range:	± 5V Full Scale / NS
Modulation: Input Resistance:	8KΩ Typical / NS
Input Bandwidth:	DC ~ 20 KHz / NS
Level:	TTL Compatible / NS
Slope:	Rising or Falling (Selectable) / NS
Trigger Input:	Pulse Width: > 100 ns / NS Impedance: > 100 KΩ, DC Coupled / NS Latency: < 500 ns / NS
Level:	TTL Compatible into ≥ 1 KΩ / NS
Pulse Width:	> 400 ns / NS
Trigger Output:	Output Impedance: 50 Ω Typical / NS Maximum Rate: 1 MHz / NS Fan-Out: ≤ 4 Picotest G5100As / NS
Pattern Mode Characteristics	
Clock:	Maximum Rate: 50 MHz / NS Level: TTL Compatible into ≥ 2 KΩ / NS
Output:	Impedance: 110 Ω Typical / NS Pattern: Length: 2 ~ 256 / NS

General Specifications			
Item	Description	Item	Description
Power Supply	CAT III 110 ~ 240 V AC ± 10 %	Warm-Up Time	1 Hour
Power Cord Freq.	50 Hz ~ 60 Hz ± 10 %	Language	SCPI-1993, IEEE-488.2
Power	80 VA Max.	Dimension	214.6(W) x 88.6(H) x 346.9(D) mm 214.6(W) x 88.6(H) x 280.7(D) mm
Consumption	35 VA Max.	Weight	3100 g / 2120g
Operating Environment	0 ~ 55°C	Safety	IEC61010-1 EN61010-1
Storage Environment	-30°C ~ 70°C	EMC	EN61326
Operating Altitude	Up to 2000m	Interface	STD. USB & LAN OPT. GPIB or RS-232 STD. USB / OPT. GPIB or RS-232
Operating Humidity	Max. Rel. Humidity 80 % for Temp. up to 31°C Decreasing Linearly to 50 % Rel. Humidity at 40°C	Warranty	1 Year
		Recycle Level	

1. Add 1/10th of output amplitude and offset spec per °C to operation outside the range of 18°C ~ 28°C.
2. The autorange is enabled.
3. DC offset is set to 0V.
4. The spurious output at low amplitude is typical -75 / (-70) dBm.
5. Add 1 ppm / °C average to operation outside the range of 18°C ~ 28°C.
6. The sine and square waveforms above 10 MHz / (3 MHz) are allowed only with an "infinite" burst count.
7. The FSK uses trigger input (1 MHz Max.).
8. The words in gray are for the model G5110A. No gray description represents "the same as G5100A."
9. The words in red and "NS" in gray stand for the functions which are "Not Supported" by G5110A.

For more information, please refer to the user's manuals.

The specifications are subject to change without notice due to design improvements.

G51 Series Function/Arbitrary Generator



Interface:

STD. USB & (LAN: LXI for G5100A)
OPT. GPIB / RS-232
(Conform to USBTMC&IEEE-488.2)

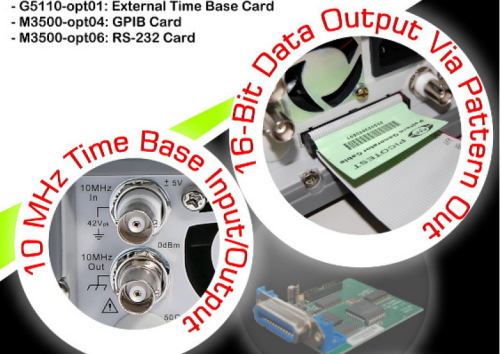
G5110A 15 MHz Function/Arbitrary Waveform Generator

- Features: Sine (15 MHz), Square (15 MHz), Arbitrary (3 MHz)
- Freq. Resolution: 1 mHz
- Arbitrary: 14-Bit, 125 MSa/s, 256 K-Point
- Capability: Sine, Square, Ramp, Triangle, Pulse, DC, Exponential Rise and Fall, Negative Ramp, Sin(x)/x, Cardiac
- Modulation:
 - AM/FM/PM/PWM: 2 mHz ~ 20 KHz
 - FSK: 2 mHz ~ 100 KHz
 - Sweep: Linear/Logarithmic/Arb. Time (1 ms ~ 500 Sec.)
 - Marker (Falling Edge of Sync Signal - Freq.: Programmable)
 - Burst: Counted (1 ~ 50 K Cycles), Infinite, Gated.
 - Phase (-360° to +360°). Internal Period (1µs ~ 500 Sec.)

G5100A 50 MHz Function/Arbitrary Waveform Generator

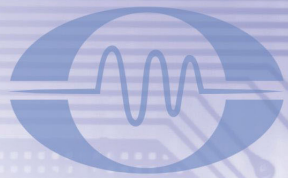
- Features: Sine (50 MHz), Square (25 MHz), Arbitrary (10 MHz)
- Freq. Resolution: 1 μHz
- Arbitrary: 14-Bit, 125 MSa/s, 256 K-Point
- Capability: Sine, Square, Ramp, Triangle, Pulse, Noise, DC, Exponential Rise and Fall, Negative Ramp, Sin(x)/x, Cardiac
- Modulation:
 - AM/FM/PM/PWM: 2 mHz ~ 20 KHz
 - FSK: 2 mHz ~ 100 KHz
 - External Modulation Input: ± 5V full scale, 8.7 KΩ Typical, DC to 20 KHz
 - Sweep: Linear/Logarithmic/Arb. Time (1 ms ~ 500 Sec.)
 - Marker (Falling Edge of Sync Signal - Freq.: Programmable)
 - Burst: Counted (1 ~ 50 K Cycles), Infinite, Gated.
 - Phase (-360° to +360°). Internal Period (1µs ~ 500 Sec.)
 - Trigger Input: TTL Compatible, Rising or Falling, Pulse Width (> 100ns), Impedance (>10 KΩ, DC Coupled), Latency (<500 ns)
 - Trigger Output: TTL Compatible into ≥ 1 KΩ. Output Impedance (50 Ω Typical). Max. Rate (1 MHz).

- Amplitude Range: 20 mVpp to 20 Vpp into Open Circuit
- Display: Graphic Mode (Visual Verification of Signal Settings)
- Pattern Out: 16-Bit Data Output + Clock
- Time Base: 10 MHz Input/Output
- Free Software: WavePat
- Dimension & Weight: (for Rack)
214.6(W) x 88.6(H) x 346.9(D) mm, 3100 g
- Optional Accessories:
 - M3500-opt04: GPIB Card
 - M3500-opt06: RS-232 Card



For more information, link our website.

<http://www.picotest.com.tw>



PICOTEST®

G5100A

Easy-to-use Functions

Users can easily use the following functions.

- Internal modulations of AM, FM, PM, FSK & PWM for waveform adjustment.
- Built-in linear and logarithmic sweeps from 1 ms to 500 s.
- The burst mode has a selectable number of cycles per period of time.
- The remote control via USB, LAN or opt. GPIB interface.
- The programmability by SCPI commands under the remote control connection.
- Precise phase adjustments and calibrations can be done from the front panel or via a PC.



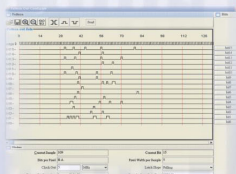
User Friendly Operation

The G5100A's front-panel operation is simple and user friendly. Users can enter all functions with a single key or two, and use the knob or the numeric keypad to adjust frequency, amplitude, offset and other parameters. They can even directly input voltage values in Vpp, Vrms, dBm or high & low levels. Timing parameters can be entered in Hertz (Hz) or second.



Data Transmission via Pattern Out

The WavePatt software adheres to the waveform editor. It allows users to create and store 16-bit data in the G5100A's nonvolatile or volatile memory. Then, according to application purposes, users can transmit data via Pattern Out, located in the rear panel.



Functions and Waveforms

The G5100A can create stable, precise, clean and low distortion sine waves by using DDS (Direct Digital Synthesis) Technology. With fast rise and fall times up to 25 MHz for square waves and 200KHz for linear ramp waves, the G5100A can meet users demand on waveforms.

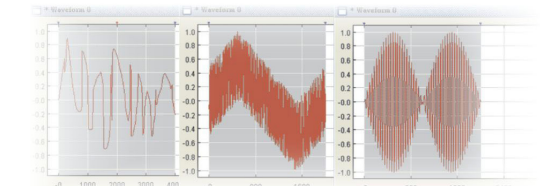
Pulse Generation

The G5100A can generate variable-edge-time pulses up to 10MHz. With variable period, pulse width and amplitude; the G5100A is perfectly suited to applications requiring a flexible pulse signal.

Custom Waveform Generation

The G5100A can generate complex custom waveforms. With 14-bit resolution, and a 125 MSA/s sampling rate, the G5100A gives users the flexibility to create waveforms. It also allows users to store up to 5 waveforms, 4 (4 x 256K Points) in nonvolatile memory and 1 in volatile memory.

The G5100A's Waveform Editor Software allows users to create, edit and download complex waveforms. In addition, by using the software, users can retrieve waveforms from Agilent MSO 8104 Oscilloscope.



Support External Freq. Synchronization

The G5100A's external frequency reference allows users to synchronize an external 10 MHz clock to another G5100A, or to any other unit which can support 10-MHz-frequency-input function.

