

SPECIFICATIONS

G5110A

Display & Capability

Display: Text Mode LCD

Standard Waveforms: Sine, Square, Ramp, Triangle, Pulse, DC

Built-In Arbitrary Waveforms: Exponential Rise & Fall, Negative Ramp, Sin(x)/x, Cardiac

Waveform Characteristics

Frequency: 1 mHz ~ 15 MHz

Amplitude Flatness^{1,2}: 0.10 dB (< 100 KHz), 0.15 dB (< 5 MHz),
(Relative to 1 KHz) 0.2 dB (< 15 MHz)

Harmonic^{2,3}: DC ~ 20 KHz, -65
Distortion: 20 KHz ~ 100 KHz, -65
(Unit: dBc) 100 KHz ~ 1 MHz, -60
1 MHz ~ 15 MHz, -40

Sine:

Total Harmonic Distortion: DC ~ 20 KHz, Out put ≥ 0.32 Vpp (THD + N $\leq 0.2\%$)

Spurious^{2,4}: DC ~ 1 MHz, -60 dBc
(Non-Harmonic) 1 MHz ~ 15 MHz, -60 dBc + 6 dB/octave

Phase Noise: -100/dBc/Hz (Typical), when $f \geq 1$ MHz, V ≥ 0.1 Vpp

Frequency: 1 mHz ~ 15 MHz

Rise/Fall Time: < 15 ns

Overshoot: < 2%

Square:

Variable: 20% ~ 80% (to 5 MHz)
Duty Cycle: 40% ~ 60% (to 15 MHz)

Asymmetry: 1% of Period + 5 ns (@ 50% Duty)

Jitter (RMS): 1 ns + 100 ppm of Period

Ramp, Triangle:

Frequency: 1 mHz ~ 200 KHz

Linearity: < 0.5% of Peak Output

Symmetry: 5.0% ~ 95.0%

Frequency: 1 mHz ~ 5 MHz

Width: 40 ns Minimum

Edge Time: < 15 ns (Untunable)

Overshoot: < 2%

Jitter (Rms): 1 ns + 100 ppm of Period

Frequency: 1 mHz ~ 3 MHz

Length: 2 ~ 8 K

Resolution: 14 Bits (Including Sign)

Sample Rate: 50 MSa/s

Arb.:

Rise/Fall Time (Min): 50 ns (Typical)

Linearity: < 0.5% of Peak Output

Setting Time: < 250 ns ~ 2% of Final Value

Jitter (RMS): 12 ns + 60 ppm

Non-Volatile Memory: 4 Waveforms x 8 K Points

Common Characteristics

Freq.: Resolution: 1 mHz

Range: 10 mVpp ~ 10 Vpp in 50 Ω , 20 mVpp ~ 20 Vpp in Hi-Z

Ampl.: Accuracy^{1,2} (at 1 KHz): $\pm 2\%$ of Setting ± 2 mVpp

Units: Vpp, Vrms, dBm

Resolution: 3 Digits

Peak Range (AC + DC): ± 5 V in 50 Ω , ± 10 V in Hi-Z

DC Offset: Accuracy^{1,2}: $\pm 2\%$ of Offset Setting $\pm 2\%$ of Amplitude Setting ± 2 mV

Resolution: 3 Digits

Impedance: 50 Ω (Typical)

Main Output: Isolation: 42 Vpk Maximum

Protection: Short-Circuit Protected; Overload Automatically Disables Main Output

Internal Frequency⁵: ± 0.5 ppm in 90 Days

Reference Accuracy: ± 1.0 ppm in 1 Year

Ext. Freq. Reference: Optional

Lock Range: 10 MHz ± 500 Hz

Ext. Freq.: Level: 100 mVpp ~ 5 Vpp

Input: Impedance: 1 K Ω (Typical), AC Coupled

Lock Time: < 2 Sec

Ext. Freq.: Level: 632 mVpp (0 dBm), Typical

Output: Impedance: 50 Ω (Typical), AC Coupled

Range: -360° ~ +360°

Phase Offset: Resolution: 0.001

Accuracy: 20 ns

Modulation

Type	Carrier	Source/Trig	Internal Modulation Shape/Type	Freq/Time
AM	Sine, Ramp, Arb		Sine, Square, Ramp, Triangle, Arb	2 mHz ~ 20 KHz
FM, PM	Sine, Square, Ramp, Arb	Source: Internal		
PWM	Pulse		50% Duty Square	2 mHz ~ 100 KHz
FSK	Sine, Square, Ramp, Arb	Trig: Internal/Manual	Linear/Log	1 ms ~ 500 s
Sweep				1 μ s ~ 500 s * = 50 K (Cycles)
Burst	Sine, Square, Ramp, Arb		Counted Infinite	

General Specifications

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

1. Add 1/10th of output amplitude and offset spec per $^{\circ}$ C to operation outside the range of 18 $^{\circ}$ C ~ 28 $^{\circ}$ C.
2. The autorange is enabled.
3. DC offset is set to 0 V.
4. The spurious output at low amplitude is typical -70 dBm.
5. Add 1 ppm / $^{\circ}$ C average to operation outside the range of 18 $^{\circ}$ C ~ 28 $^{\circ}$ C.
6. The sine and square waveforms above 3 MHz are allowed only with an "infinite" burst count.

G5110A - 15MHz

Function/Arbitrary Waveform Generator



Interface:
STD. USB / OPT. GPIB / RS-232
(Conforms to USBTMC & IEEE-488.2)

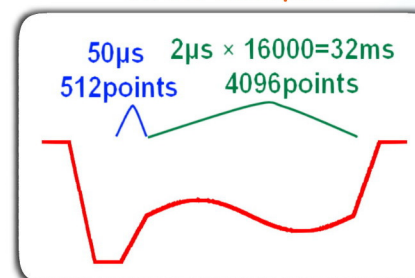
Special Features:

1. 15 MHz Waveform Output (Sine & Square)
2. Arbitrary Waveforms (AW)
3. Sequencing Mode on AW
4. 1 ppm Frequency Accuracy
5. A Long Life Optical Control

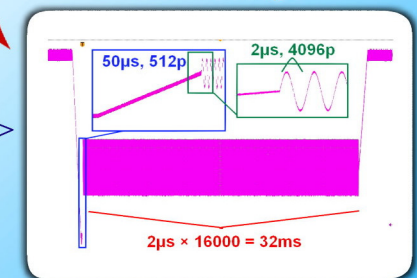
Basic Features:

1. Basic Waveforms (Inc.: Sin, Sqr, Ramp, Puls, and Arb)
2. Internal Modulations (Inc.: AM, FM, PM, PWM, Sweep, and Burst)
3. Low Noise Waveforms (Still Precise at 10 mV)
4. Numerical Entry for All Parameters
5. Universal Power Input (100~240V / 50~60Hz)
6. Supports Optional External Time Base Card

A Waveform Configuration on the Wavepatt



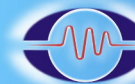
A Screenshot on an Oscilloscope



Sequencing=>

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

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



For more information, please visit our website.
<http://www.picotest.com.tw>



DESCRIPTION

G5110A

Great Performance

The Picotest G5110A function/arbitrary waveform generator is the latest member of the G51XXA family in 2014. This model uses direct digital synthesis technology to create stable and precision low distortion sine & square waves with fast rise and fall times up to 15MHz and linear ramp waves up to 200KHz. The G5110A can also generate 14-bit, 50MSa/s 8K point arbitrary waveform. It's a standard function built in G5110A.



User-Defined Waveform Generation

The G5110A can generate complex user-defined waveforms via the built-in arbitrary function, and working with the free companion software "Wavepatt", it's easy to create specific waves you need. In addition, you can generate waveforms using previously saved files. If user-defined waveforms don't meet your needs, you can set frequency, length, and other parameters with "Sequencing Mode" on each waveform's segment.

Waveform Editor Wavepatt®

The Picotest Waveform Editor Software Wavepatt® allows you to create, edit, and download complex waveforms. This companion software is free of charge.

High Flexible Sequencing Arbitrary Waveform Mode

Using the Sequencing Arbitrary Mode to generate individual segments in different sampling intervals, you can construct any complex waveforms you need. The waveforms can then be transferred distortion free and finally generating the waveform for high-speed output. The process is simple. First of all, break down a complex waveform into individual segments of basic waves using the sequencing mode. Connect the individual segments to form a desired waveform via the Wavepatt software, and transfer it to your G5110A. You can generate any waveforms you want. It's impressive, isn't it?

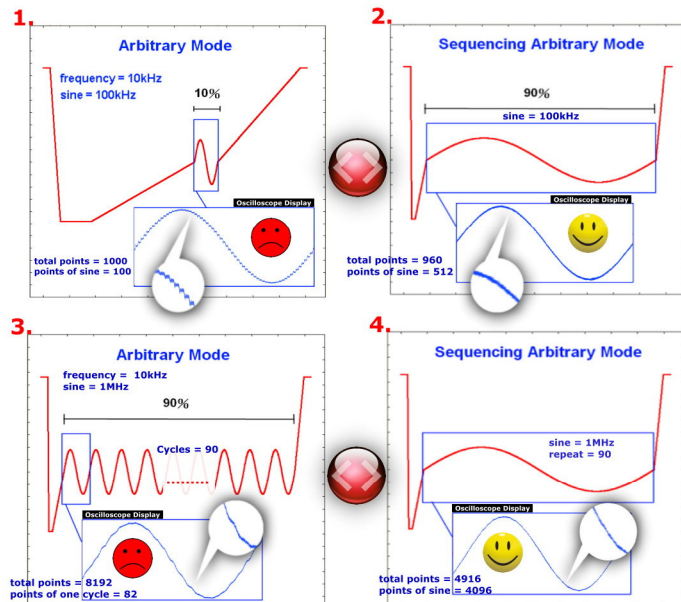


Figure 1. The length and frequency of the arbitrary waveform (AW) is based on 1000 points and 10KHz. To define the freq. of a specific sinewave, you have to calculate and adjust the point proportion in an AW. It's annoying and a waste of time.

Figure 2. By applying the sequencing mode, you do not need the same point proportion to create waveforms. Here is the sinewave created with 512 points. You can just set its output freq. as 100kHz under the same limited 1000 points. After that, the waveforms are generated without distortion. And you don't have to calculate and adjust the point proportion. It streamlines the process while generating complex waveforms in need.

Figure 3. Here is the typical AW with 8192 points. The high freq. parts, 90-cycle sinewaves, occupies 90% (eq. 7372 points) of the AW, and each cycle has 82 points. Therefore, the insufficient points cause the distortion on high freq. presentation when working with an oscilloscope.

Figure 4. Using the sequencing mode each waveform segment can be set separately, so you don't need the same point proportion to create waveforms. Here is the sinewave created with 4096 points, and its repeat time is set as 90. Comparing with any traditional AW, the resolution can be improved 50 times. Due to the sufficient number of points, the sinewave at 1MHz is produced perfectly without distortion.

Pulse Generation

The G5110A can generate pulses up to 5MHz. With variable period, pulse width and amplitude the G5110A is perfectly suited to applications requiring a flexible pulse signal.

Easy-to-Use Functions

- You can easily use the following functions.
- Internal modulations of AM^[1], FM, PM, FSK & PWM for waveform adjustment.
 - Built-in linear and logarithmic sweeps from 1ms to 500s.
 - Burst mode has a selectable number of cycles per period of time.
 - Remote control via USB or Opt. GPIB interface.
 - Programmability by SCPI commands under the remote control connection.
 - Precise phase adjustments and calibrations can be performed from the front panel or via a PC.



High Contrast LCD Display

You can see the relative parameters of waveforms on a distinct LCD Display, via the auxiliary annunciator display, you can clearly see all of the required settings simultaneously, speed up the efficiency creating the desired waveforms.



External Time Base

The G5110A's external time base can synchronize to an external 10MHz clock, to another G5110A or G5100A or any other unit which can support 10-MHz-frequency-input function. You can make phase adjustments from the front panel or via a remote interface, allowing precise phase calibration and adjustment.

User Friendly Operation

The G5110A's front-panel operation is straight-forward and user friendly. With a single key or two, you can access major functions. The long-life optical knob and numeric carbon keypad can be used to precisely adjust frequency, amplitude, offset, and other parameters. Via the remote interface only you can enter voltage values directly in Vpp, Vrms, dBm, or high and low levels, as well as timing parameters in Hertz or seconds.



Standard USB & Optional GPIB

The G5110A is equipped with a standard USB interface. The driver is a free download and can be found by performing an internet search for "NI-VISA RUN-TIME ENGINE". This will direct you to the necessary file. Choose version 4.2 or higher. After downloading and installing the driver, connect this equipment and your PC with the attached USB cable. Your G5110A can be remotely controlled right away. In addition, GPIB connection is also supported. Please contact your local agency for more information.



[1] The carrier waveforms of AM mode includes Sine, Triangle and Arbitrary waveforms.

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

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