



NEW

LXI CE

50 MHz Arbitrary Waveform Generator

The LXI interface makes easier for the test system !

F u n c t i o n G e n e r a t o r

FGA5050

- FGA5050
- FGA5050GC (with GPIB)

The FGA5050 is a function generator that equips with the arbitrary waveform function. In addition to Sine waveform, Square waveform, Ramp waveform of those custom waveform generation function, the FGA5050 offers to realize high precision waveform with 1 μ Hz of resolution and 50MHz of wideband frequency. The FGA5050 can be used in wide application such as "Voltage variation test for Automotive Electronic Components", "ECU false signal source", "Charge-Discharge test for the rechargeable battery", "Ripple super-impose test" and it can be used as the trigger signal for the various type of test system.

Further more, three types of interface, LAN / USB / GPIB* are equipped with the FGA5050 as standard feature, it applies for automated test along with manual operation.

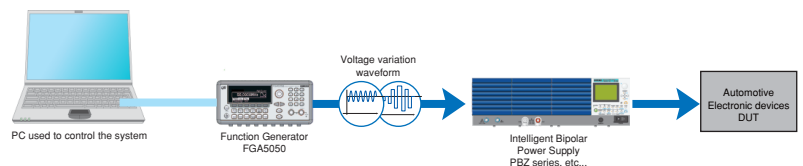
- Wide band frequency
Sine waveform : 1 μ Hz to 50MHz, Square waveform : 1 μ Hz to 25MHz
- Sine waveform, Square waveform, Ramp waveform, Triangle waveform, Pulse waveform, Noise waveform, DC, Arbitrary waveform output
- Waveform Editor Application Software "WAVEPATT" is included as standard
- Various modulation types
AM, FM, PM, FSK, PWM, Frequency sweep, Burst, External Modulation Input
- 16 bits / up to 50MHz pattern out
- 14 bits / 256k-point, 125MSs/s
- 10MHz clock in and out
- Trigger Input and Trigger output (TTL compatible)
- Interface : LAN / USB / GPIB*standard

*Only available in Model FGA5050GC

Application

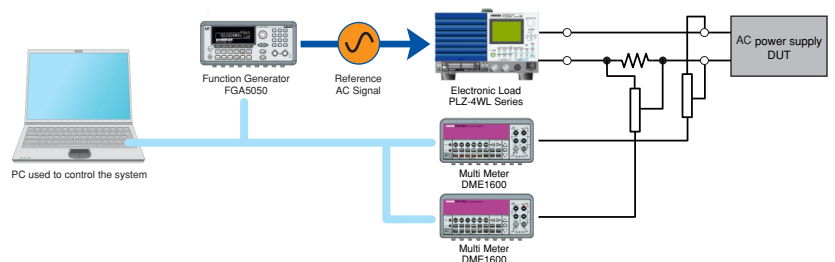
Voltage variation test for Automotive Electronic devices

The system combined with the FGA5050 and the Bipolar power supply, it can be used as the "Signal Source" for the "Voltage variation test of the automotive electronic components" complied to the ISO standard and other manufacturer's standard.



Measurement of the output impedance of the power supply

The system combined with the FGA5050, electronic load, and multi-meter, it can be used as the "Reference AC Signal" for the "Impedance measurement of power supply output".



Specifications

Waveform Characteristic				
Waveform	Standard waveforms	Sine, Square, Ramp, Triangle, Pulse, Noise, DC		
	Built-in arbitrary waveforms	Exponential Rise and Fall, Negative ramp, Sin(x)/x, cardiac		
Sine	Frequency	1 μHz to 50 MHz		
	Amplitude	< 100 kHz	0.1 dB	
	Flatness *1 *2 (Relative to 1 kHz)	< 5 MHz	0.15 dB	
		< 20 MHz	0.3 dB	
		< 50 MHz	0.5 dB	
	Harmonic distortion *2 *3	DC to 20 kHz	< 1 Vpp	-70 dBc
			≥ 1 Vpp	-70 dBc
		20 kHz to 100 kHz	< 1 Vpp	-65 dBc
			≥ 1 Vpp	-60 dBc
100 kHz to 1 MHz		< 1 Vpp	-50 dBc	
		≥ 1 Vpp	-45 dBc	
1 MHz to 20 MHz		< 1 Vpp	-40 dBc	
		≥ 1 Vpp	-35 dBc	
20 MHz to 50 MHz	< 1 Vpp	-35 dBc		
	≥ 1 Vpp	-30 dBc		
Total Harmonic distortion	DC to 20 kHz	< 0.5 Vpp	≤ 0.06 %	
Spurious *2 *4 (non-harmonic)	DC to 1 MHz		-70 dBc	
	1 MHz to 50 MHz		-70 dBc+6 dB/octave	
Phase Noise (10 kHz Offset)	≥ 1 MHz	≥ 0.1 Vpp	-115 dBc/Hz typical	
Square	Frequency	1 μHz to 25 MHz		
	Rise / Fall time	< 10 ns		
	Overshoot	< 2 %		
	Variable Duty Cycle	< 10 MHz	20 % ~ 80 %	
		< 25 MHz	40 % ~ 60 %	
	Asymmetry	1% of period +5 ns (@50 % duty)		
	Jitter (RMS)	≥ 0.1 Vpp	200 ps	
≥ 1 MHz				
Ramp, Triangle	Frequency	1 μHz to 200 kHz		
	Linearity	< 0.1 % of peak output		
	Symmetry	0.0 % to 100.0 %		
Pulse	Frequency	500 μHz to 10 MHz		
	Pulse width	20 ns minimum		
		10 ns res. (period ≤ 10 s)		
	Variable Edge Time	< 10 ns to 100 ns		
	Overshoot	< 2 %		
	Jitter (RMS)	≥ 0.1 Vpp	200 ps	
≥ 50 kHz				
Arbitrary	Bandwidth	20 MHz typical		
	Frequency	1 μHz to 10 MHz		
	Length	2 K to 256 K		
	Resolution	14 bits (including sign)		
	Sample Rate	125 M Sa/s		
	Min Rise / Fall time	30 ns typical		
	Linearity	< 0.1 % of peak output		
	Setting Time	< 250 ns to 0.5 % of final value		
	Jitter (RMS)	6 ns+300 ppm		
	Non-voltage Memory	4 Waveforms * 256 K points		
Common Characteristic				
Frequency	Resolution	1 μHz		
	Range	10 mVpp to 10 Vpp in 50 Ω		
		20 mVpp to 20 Vpp in No Load (open-circuited)		
		Accuracy *2 *5 (at 1 kHz)		
Amplitude	Units	Vpp, Vrms, dBm		
	Resolution	4 digits		
	Range	± 5 V in 50 Ω		
DC Offset	Range	± 10 V in No Load (open-circuited)		
		Accuracy *2 *5 (at 1 kHz)		
	Resolution	4 digits		
Main Output	Impedance	50 Ω typical		
	Isolation	42 Vpeak maximum to earth		
	Protection	Short-circuit protection, Stop the output automatically at the state of over-load		
Internal Frequency	Accuracy *5	± 10 ppm in 90 days		
		± 20 ppm in 1 years		
External Frequency Input	Lock Range	10 MHz ± 500 Hz		
	Level	100 mVpp ~ 5 Vpp		
	Impedance	1 k Ω typical, AC coupled		
External Frequency Output	Lock Range	10 MHz		
	Level	632 mVpp (0 dBm) typical		
	Impedance	50 Ω typical, AC coupled		
Phase Offset	range	-360 ° ~ +360 °		
	Resolution	0.001°		

*1 Add 1/10th of output amplitude and offset spec per °C for operation outside the range of 18 °C to 28 °C
 *2 Autorange enabled
 *3 DC offset set to 0V
 *4 Spurious output at low amplitude is -75 dBm typical
 *5 Add 1 ppm/C average for operation outside the range of 18 °C to 28 °C
 *6 FSK uses trigger input(1MHz maximum)
 *7 Sine and square waveforms above 10 MHz are allowed only with an "infinite" burst count

Modulation				
Modulation Type	AM, FM, PM, FSK, PWM, SWEEP and BURST			
	Carrier	Sine, Square, Ramp, Arb		
AM	Source	Internal / External		
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb		
	Frequency (Internal)	2 mHz to 20 kHz		
	Depth	0.0 % to 120.0 %		
FM	Carrier	Sine, Square, Ramp, Arb		
	Source	Internal / External		
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb		
	Frequency (Internal)	2 mHz to 20 kHz		
PM	Deviation	DC to 25 MHz		
	Source	Internal / External		
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb		
	Frequency (Internal)	2 mHz to 20 kHz		
PWM	Deviation	0.0 ° to 360 °		
	Carrier	Pulse		
	Source	Internal / External		
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb		
FSK	Frequency (Internal)	2 mHz to 100 kHz		
	Deviation	0 % to 100 % of pulse width		
	Carrier	Sine, Square, Ramp, Arb		
	Source	Internal / External		
External Modulation Input *6	Internal Modulation	50 % duty cycle Square		
	Frequency (Internal)	2 mHz to 100 kHz		
	Voltage Range	± 5 V full scale		
	Input Resistance	8.7 k Ω typical		
SWEEP	Bandwidth	DC to 20 kHz		
	Waveforms	Sine, Square, Ramp, Arb		
	Type	Linear, Log		
	Direction	Up or Down		
BURST	Sweep Time	1 ms to 500 s		
	Trigger Source	Internal, External or Manual		
	Marker	falling edge of sync signal (programmable frequency)		
	Waveforms*7	Sine, Square, Ramp, Triangle, Noise, Arb		
	Type	Internal / External		
	Start / Stop Phase	-360 ° to +360 °		
	Internal Period	1 μs to 500 s		
	Gated Source	External trigger		
Trigger Input	Trigger Source	Internal, External or Manual		
	Level	TTL compatible		
	Slope	Rising or Falling (Selectable)		
	Pulse width	≥ 100 ns		
Trigger Output	Impedance	50 Ω typical		
	Maximum rate	1 MHz		
	Fan-out	≤ 4 FGA5050s		
	Level	TTL compatible into ≥ 1 k Ω		
Pattern Mode Characteristic	Clock Maximum Rate	50 MHz		
	Output Level	TTL compatible into ≥ 2 k Ω		
	Output Impedance	110 Ω typical		
	Pattern Length	2 K to 256 K		
General	voltage / frequency range	100 Vac ~ 240 Vac (single phase) / 50 Hz/60 Hz		
	Power consumption	80 Vmax		
	Operating Temperature range	0 °C to 55 °C		
	Operating Humidity range	30 %RH(0 °C, 50 °C), 40 %RH(18 °C, 23 °C, 28 °C), 80 %RH(35 °C), non condensing		
	Storage Temperature range	-40 °C to 70 °C		
	Operating Altitude	Up to 2000 m		
	Dimensions / Weight	224 W X 107 H X 380 D mm / 4.08 kg		
	Interfaces	LAN, USB, GPIB (only GC)		
	Accessories	"Power cable" 1pc. (with 3P plug), "Pattern generator cable" 1pc., "USB cable" 1pc., "CD-R" 1pc., Packing list, "For Safety documents" 2pcs. (1 each for English, Japanese)		
	Electromagnetic compatibility (EMC)	Conforms to the requirements of the following directive and standard.		
		EMC Directive 2004/108/EC		
		EMC: EN61326-1:2006		
		EMI: CISPR 11:2003 Class A, IEC61000-3-2:2000		
	Safety	IEC61000-3-3:1994+A1:2001		
		EMS: IEC61000-4-2:1995+A1:1998+A2:2000, IEC61000-4-3:2002		
IEC61000-4-4:2004, IEC61000-4-5:1995+A1:2000, IEC61000-4-6:1996+A1:2000				
IEC61000-4-8:1993+A1:2000, IEC61000-4-11:2004				
Conforms to the requirements of the following directive and standard.				
IEC61010-1:2001/ EN 6010-1:2001 (2nd Edition)				

*Including the "Operation Manual" and "Communication Interface Manual".



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