



NEW

LXI CE

50MHz 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.

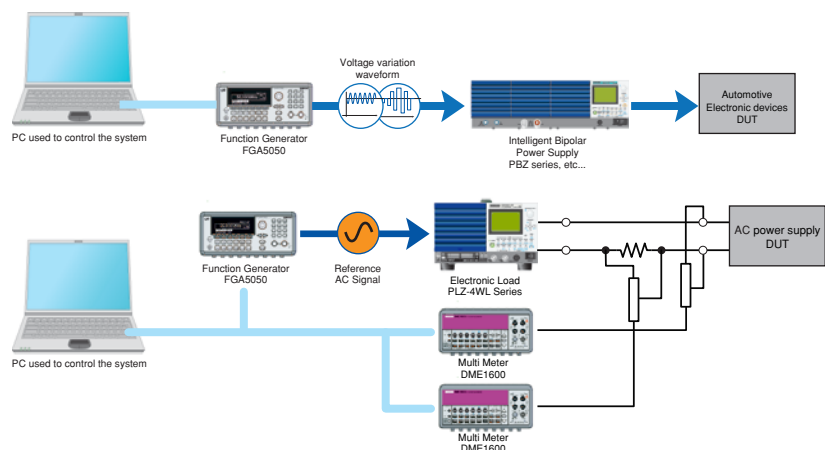
- Wide band frequency
 - Sine waveform : 1 μ Hz to 50MHz, Square waveform : 1 μ Hz to 25MHz
- Sine waveform, Square waveform, Ramp waveform, Triangle waveform, Pulse waveform, Noise waveform, DC, Arbitrary waveform output
- Waveform Editor Application Software "WAVEPATT" is included as standard
- Various 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 μ Hz to 50 MHz		
	Amplitude	< 100 kHz	0.1 dB	
		< 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
			\geq 1 Vpp	-70 dBc
		20 kHz to 100 kHz	< 1 Vpp	-65 dBc
			\geq 1 Vpp	-60 dBc
		100 kHz to 1 MHz	< 1 Vpp	-50 dBc
\geq 1 Vpp			-45 dBc	
1 MHz to 20 MHz	< 1 Vpp	-40 dBc		
	\geq 1 Vpp	-35 dBc		
20 MHz to 50 MHz	< 1 Vpp	-35 dBc		
	\geq 1 Vpp	-30 dBc		
Total Harmonic distortion	DC to 20 kHz	< 0.5 Vpp	\leq 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)	\geq 1 MHz	\geq 0.1 Vpp	-115 dBc/Hz typical	
Square	Frequency	1 μ Hz 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)	\geq 0.1 Vpp	200 ps		
	\geq 1 MHz			
Ramp, Triangle	Frequency	1 μ Hz to 200 kHz		
	Linearity	< 0.1 % of peak output		
	Symmetry	0.0 % to 100.0 %		
Pulse	Frequency	500 μ Hz to 10 MHz		
	Pulse width	20 ns minimum		
		10 ns res. (period \leq 10 s)		
	Variable Edge Time	< 10 ns to 100 ns		
	Overshoot	< 2 %		
Jitter (RMS)	\geq 0.1 Vpp	200 ps		
	\geq 50 kHz			
Noise	Bandwidth	20 MHz typical		
Arbitrary	Frequency	1 μ Hz 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 μ Hz		
Amplitude	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)	\pm 1 % of setting \pm 1 mVpp		
	Units	Vpp, Vrms, dBm		
DC Offset	Resolution	4 digits		
	Range	\pm 5 V in 50 Ω		
		\pm 10 V in No Load (open-circuited)		
Main Output	Accuracy *2 *5 (at 1 kHz)	\pm 2% of offset setting \pm 0.5 % of amplitude setting		
	Resolution	4 digits		
Internal Frequency	Impedance	50 Ω typical		
	Isolation	42 Vpeak maximum to earth		
	Protection	Short-circuit protection, Stop the output automatically at the state of over-load		
External Frequency Input	Accuracy *5	\pm 10 ppm in 90 days		
		\pm 20 ppm in 1 years		
External Frequency Output	Lock Range	10 MHz \pm 500 Hz		
	Level	100 mVpp ~ 5 Vpp		
	Impedance	1 k Ω typical, AC coupled		
Phase Offset	Lock Time	< 2 sec		
	Lock Range	10 MHz		
Level	Level	632 mVpp (0 dBm) typical		
	Impedance	50 Ω typical, AC coupled		
range	range	-360 $^{\circ}$ ~ +360 $^{\circ}$		
	Resolution	0.001 $^{\circ}$		

*1 Add 1/10th of output amplitude and offset spec per μ for operation outside the range of 18 μ to 28 μ

*2 Autorange enabled

*3 DC offset set to 0V

*4 Spurious output at low amplitude is -75 dBm typical

*5 Add 1 ppm/10 average for operation outside the range of 18 μ to 28 μ

*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	Source	Internal / External
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb
	Frequency (Internal)	2 mHz to 20 kHz
	Deviation	0.0 $^{\circ}$ to 360 $^{\circ}$
FSK	Carrier	Pulse
	Source	Internal / External
	Internal Modulation	50 % duty cycle Square
	Frequency (Internal)	2 mHz to 100 kHz
PWM	Source	Internal / External
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb
	Frequency (Internal)	2 mHz to 20 kHz
	Deviation	0 % to 100 % of pulse width
External Modulation Input *6	Carrier	Sine, Square, Ramp, Arb
	Source	Internal / External
	Internal Modulation	50 % duty cycle Square
	Frequency (Internal)	2 mHz to 100 kHz
SWEEP	Carrier	Pulse
	Source	Internal / External
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb
	Frequency (Internal)	2 mHz to 100 kHz
BURST	Carrier	Pulse
	Source	Internal / External
	Internal Modulation	Sine, Square, Ramp, Triangle, Noise, Arb
	Frequency (Internal)	2 mHz to 100 kHz
Trigger Input	Carrier	Pulse
	Source	Internal / External
	Internal Modulation	50 % duty cycle Square
	Frequency (Internal)	2 mHz to 100 kHz
Trigger Output	Carrier	Pulse
	Source	Internal / External
	Internal Modulation	50 % duty cycle Square
	Frequency (Internal)	2 mHz to 100 kHz

Pattern Mode Characteristic		
Output	Clock Maximum Rate	50 MHz
	Output Level	TTL compatible into \geq 2 k Ω
	Output Impedance	110 Ω typical
	Pattern Length	2 K to 256 K

General	
voltage / frequency range	00 Vac ~ 240 Vac (single phase) / 50 Hz/60 Hz
Power consumption	80 VAmx
Operating Temperature range	0 $^{\circ}$ to 55 $^{\circ}$
Operating Humidity range	30 %rh(0 $^{\circ}$, 50 $^{\circ}$), 40 %rh(18 $^{\circ}$, 23 $^{\circ}$, 28 $^{\circ}$), 80 %rh(35 $^{\circ}$), non condensing
Storage Temperature range	-40 $^{\circ}$ to 70 $^{\circ}$
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" 1p c., "USB cable" 1pc, "CD-R" 11pc, 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 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+A IEC61000-4-8:1993+A1:2000, IEC61000-4-11:2004
Safety	Conforms to the requirements of the following directive and standard. IEC61010-1:2001/EN 60101-2:2001 (2nd Edition)

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

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