

# DG1000Z Series Function/Arbitrary Waveform Generator



- SiFi (Signal Fidelity) for 100% waveform replication
- 2Mpts or 8Mpts/CH(std.), 16Mpts/CH (opt.) arbitrary waveform length
- Standard 2 full functional independent channels
- ±1ppm frequency stability, -125dBc/Hz phase noise, 200ps low jitter
- Built-in 8 orders harmonics generator
- Built-in 7 digits/s counter up to 200MHz
- 160 built-in pre-edited waveforms
- Intuitive arbitrary waveform editing software
- Full modulation supported: AM, FM, PM, ASK, FSK, PSK and PWM

DG1000Z series function/arbitrary waveform generator is a multifunctional generator that combines many functions in one, including Function Generator, Arbitrary Waveform Generator, Noise Generator, Pulse Generator, Harmonics Generator, Analog/Digital Modulator and Counter. As a multi-functional, high performance and portable generator, it will be a new selection in education, R&D, production, test and etc.

# DG1000Z Series Function/Arbitrary Waveform Generator





Dimensions: Width × Height × Depth=261.5mm × 112mm × 318.4mm Weight: 3.2kg (without package)

# Feature and Benefits

# Standard 2 full functional channels

Freq Ampl	1.000,000,000 kHz 5.000,0 Vpp	*~	Freq → Period
Offset Phase	0.000,0 ∨₀₀ 0.000 °	$\sim$	Ampl HiLeve
Freq	1,000,000,000 kHz		Offset LoLeve
Ampl Offset Phase	5,000,0 ∨pp 0,000,0 ∨₀c 0,000 °	$\sim$	Start Phase
Sine		HighZ	Align Phase
Sine		HighZ	Sine 4

<u>SiFi</u>

# Arbitrary waveform function with innovative SiFi technology

Freq Ampl	1.000,000,000 kHz 5.000,0 ∨pp		DC
Offset Phase	0,000,0 ∨⊷ 0,000 °	may	BuiltIn
Wform			Stored
Freq	1,000,000,000 kHz		Wforms
Ampl Offset	5,000,0 ∨pp 0,000,0 ∨₀c		
Phase	0.000 °	.l.	
Wform		malhim	

# Multiple analog and digital modulations

# Up to 160 built-in waveforms



# **Burst function**

Type Delay	N_Cycle 0.0 ns	<u>^</u>	Type NCycle
Cycles Period	<b>1</b> 10,000,000,0 ms	/\	Burst Period
Source Sweep	Internal 1.000,0 s	<b>∢</b> →	Polarity
	0,0 ms 100,000,000 Hz 1,000,000,000 kHz		Trigger
Mark	OFF	HUMMANN	Delay

# Standard harmonic generator

Freq Ampl	1.000,000,000 kHz 5.000,0 ∨pp	A	Order
Offset Phase Ampl	0,000,0 ∨₀₀ 0,000 ° 2,264,7 ∨pp		Туре
Freq Ampl Offset Phase	1,000,000,000 kHz 5,000,0 ∨pp 0,000,0 ∨₀c 0,000 °		SN Harmor Ampl

# Channels and system setting

	Utility	Channe
CH1 Sync	:On	Set
CH1 Polarity	y :Normal	Coupling
CH1 Delay	:0,0 ns	Set
CH1 Output	:Normal	Channe
CH1 Resi	:HighZ	Сору
CH1 Mode	:Normal	Set To
CH1 Gated	:Positive	Default
CH1 Range	:Auto	Languag

MFreq Type	100,000,000 Hz AM		AM
Shape	Internal Sine 100,000 %		FM
Sweep	1,000,0 s		PM
	0,0 ms 100,000,000 Hz 1,000,000,000 kHz		ASK
Mark	OFF	MUMUMM	FSK

# Waveform summing function

CH1 Source :Sine CH1 Freq :1.000.00	Sum
CH1 Freq :1,000,00	Course
	JU,UUU kHz
CH1 Ratio :100.0 %	Sum Freq
	Sum

# In line with LXI Core 2011 Device

	Utility	DHCP
LAN Status	:Disconnect	On
IP Configure		AutoIF
DHCP	:ON ////	On
Auto IP	:ON	Manual
Manual IP	:OFF	Off
MAC	:00-14-0E-42-12-CF	Default
VISA	:TCPIP0::0,0	. Config
	.0.0::INSTR	
		Curren
Sine	ON Hi	hZ Config

# Sweep function

Sweep Return	1,000,0 s 0.0 ms		Type Linear,
Start Stop Mark	100,000,000 Hz 1,000,000,000 kHz OFF		Sweep Time
Sweep	1.000,0 s	р	Return
	0,0 ms 100,000,000 Hz 1,000,000,000 kHz		Start Center
Mark	OFF	<b>H</b> UNUNUNU	Stop Span

# Standard 7 digits/s full function frequency counter with 200MHz bandwidth

IGOL	Counter	-
1,310m 25.0 %	s AC OFF	Gate Time
Freque		Select Meas
9 Period	99.996,250,0 Hz	Statist
Duty +Width	52,145 % 521,460,9 us	Display Digital
-Width	478,542,8 us	Clear
Sine Sine	ON High OFF High	

# File Management Function

C:\		File
Disk	State File	Туре
C: D:	S1:0.RSF S2: S3:000.RSF	Brows
	S4:222.RSF S5:012.RSF S6:	
	B S7:0.RSF B S8: B S9:	
	🖹 S10:	

# Specifications

All the specifications can be guaranteed if the following two conditions are met unless where noted.  $\cdot$  The generator is within the calibration period and has performed self-calibration.

• The generator has been working continuously for at least 30 minutes under the specified temperature  $(18^{\circ}C \sim 28^{\circ}C)$ . All the specifications are guaranteed unless those marked with "typical".

Model	DG1022Z	DG1032Z	DG1062Z	
Channel	2	2	2	
Max Frequency	25 MHz	30 MHz	60 MHz	
Sample Rate	200 MSa/s			
Waveform				
Basic Waveform	Sine, Square, Ramp, Pu	lse. Noise		
Built-in Arbitrary Waveform			ential Fall, ECG, Gauss, HaverSine, Lorentz,	
Frequency Characteristics				
Sine	1 µHz to 25 MHz	1 µHz to 30 MHz	1 µHz to 60 MHz	
Square	1 µHz to 25 MHz	1 µHz to 25 MHz	1 µHz to 25 MHz	
Ramp	1 µHz to 500 kHz	1 µHz to 500 kHz	1 μHz to 1 MHz	
Pulse	1 µHz to 15 MHz	1 µHz to 15 MHz	1 µHz to 25 MHz	
Harmonic	1uHz to 10 MHz	1 µHz to 10 MHz	1uHz to 20 MHz	
Noise (-3dB)	25 MHz bandwidth	30 MHz bandwidt		
Arbitrary Waveform	1 µHz to 10 MHz	1 µHz to 10 MHz		
Resolution	1 µHz	I •	· ·	
Accuracy	±1 ppm of the setting va	ue, 18°C to 28°C		
Sine Wave Spectrum Purity				
one wave opcollam raily	Typical (0 dBm)			
Harmonic Distortion	DC-10 MHz (included): <-65 dBc 10 MHz to 30 MHz (included): <-55 dBc 30 MHz to 60 MHz (included): <-50 dBc			
Total Harmonic Distortion	<0.075% (10 Hz to 20 kł	<0.075% (10 Hz to 20 kHz, 0 dBm)		
Spurious (non-harmonic)	Typical (0 dBm) ≤10 MHz: <-70 dBc >10 MHz: <-70 dBc + 6 dB/octave			
Phase Noise	Typical (0 dBm, 10 kHz o 10 MHz: <-125 dBc/Hz	offset)		
Signal Characteristics				
Square				
Rise/Fall Time	Typical (1 Vpp) <10ns			
Overshoot	Typical (100 kHz, 1 Vpp) ≤5%			
Duty Cycle	0.01% to 99.99% (limited	by the current frequency	setting)	
Non-symmetry	1% of the period + 5 ns			
Jitter (rms)	Typical (1 Vpp) ≤5 MHz: 2 ppm + 200 ps > 5 MHz: 200 ps	Typical (1 Vpp) ≤5 MHz: 2 ppm + 200 ps		
Ramp				
Linearity	≤1% of peak output (typi	cal, 1 kHz, 1 VPP, 100% sy	ymmetry)	
Symmetry	0% to 100%			
Pulse				
Pulse Width	16ns to 999.999 982 118	Bks (limited by the current f	requency setting)	
Duty Cycle		ted by the current frequence		
Rising/Falling Edge	,	rrent frequency setting and	· · · · · · · · · · · · · · · · · · ·	
Overshoot	Typical (1 Vpp) ≤5%		· · · · · · · · · · · · · · · · · · ·	
Jitter (rms)	Typical (1 Vpp) ≤5 MHz 2 ppm + 200 p > 5 MHz 200 ps	S		
Arbitrary Waveform				
Waveform Length	2Mpts (std.) 16Mpts (opt.)	8Mpts (std.) 16Mpts (opt.)	8Mpts (std.) 16Mpts (opt.)	
			- F (-F)	

Vertical Resolution	14 bits
Sample Rate	200MSa/s
Min Rise/Fall Time	Typical (1 Vpp) <10 ns
Jitter (rms)	Typical (1 Vpp) ≤5 MHz: 2 ppm + 200 ps > 5 MHz: 200 ps
Editing Mode	Point Edit, Block Edit, Insert Waveform
Harmonic Output	
Harmonic Order	≤8
Harmonic Type	Even Harmonic, Odd harmonic, Order Harmonic, User
Harmonic Amplitude	The amplitude of each order of harmonic can be set
Harmonic Phase	The phase of each order of harmonic can be set
Output Characteristics	
Amplitude (into 50 Ω)	
Range	≤10 MHz: 1.0 mVpp to 10 Vpp≤30 MHz: 1.0 mVpp to 5.0 Vpp≤60 MHz: 1.0 mVpp to 2.5 Vpp
Accuracy	Typical (1 kHz sine, 0 V offset, >10 mVpp, auto) ±(1% of the setting value) ±1 mV
Flatness	Typical (sine, 2.5 Vpp) ≤10 MHz: ±0.1 dB ≤60 MHz: ±0.2 dB
Unit	Vpp, Vrms, dBm
Resolution	0.1mVpp or 4 digits
Offset (into 50 Ω)	
Range (Peak ac+dc)	±5Vpk ac+dc
Accuracy	$\pm$ (1% of the setting value + 5mV + 0.5% of the amplitude)
Waveform Output	
Output Impedance	50 Ω (typical)
Protection	Short-circuit protection, automatically disable the waveform output when overload occurs
Modulation Characteristics	3
Modulation Type	AM, FM, PM, ASK, FSK, PSK, PWM
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Modulation Depth	0% to 120%
Modulating Frequency	2 mHz to 1 MHz
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Modulating Frequency	2 mHz to 1 MHz
PM	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Phase Deviation	0° to 360°
Modulating Frequency	2 mHz to 1 MHz
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency FSK	2 mHz to 1 MHz
r J N	Cine Cruze Dame Arth (suscent DC)
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Carrier Waveform Source	Internal/External
Carrier Waveform Source Modulating Waveform	Internal/External Square with 50% duty cycle
Carrier Waveform Source Modulating Waveform Key Frequency	Internal/External
Carrier Waveform Source Modulating Waveform	Internal/External Square with 50% duty cycle

Madulating Wayoform	Square with 50% duty evelo		
Modulating Waveform	Square with 50% duty cycle 2 mHz to 1 MHz		
Key Frequency PWM			
Carrier Waveform	Pulse		
Source	Internal/External		
Modulating Waveform	Sine, Square, Ramp, Noise, Arb		
Width Deviation	0% to 100% of the pulse width		
Modulating Frequency	2 mHz to 1 MHz		
External Modulation Input			
Input Range	75 mVRMS to ±5 Vac + dc		
Input Bandwidth	50 kHz		
Input Impedance	10ΚΩ		
Burst Characteristics			
Carrier Waveform	Sino Squara Roma Dulao Nai	an Arb (avaant DC)	
	Sine, Square, Ramp, Pulse, Noi 2mHz to 25MHz	2mHz to 30MHz	2 ml la to 60 Ml la
Carrier Frequency		ZMHZ to JUMHZ	2 mHz to 60 MHz
Burst Count	1 to 1,000,000 or Infinite		
Start/Stop Phase	0° to 360°, 0.1° resolution		
Internal Period	1 μs to 500 s		
Gated Source	External Trigger		
Trigger Source	Internal, External or Manual		
Trigger Delay	0 ns to 100 s		
Sweep Characteristics			
Carrier Waveform	Sine, Square, Ramp, Arb (excep	ot DC)	
Туре	Linear, Log or Step		
Direction	Up or Down		
Start/Stop Frequency	The same with the upper/lower limit of the corresponding carrier frequency		
Sweep Time	1 ms to 500 s		
Hold/Return Time	0 ms to 500 s		
	Internal, External or Manual		
Trigger Source	Internal, External or Manual		
Trigger Source Marker	Internal, External or Manual Falling edge of the sync signal (	programmable)	
	,	programmable)	
Marker	,	programmable)	
Marker Frequency Counter	Falling edge of the sync signal (		
Marker Frequency Counter Function	Falling edge of the sync signal ( Frequency, Period, Positive/Neg	ative Pulse Width, Duty Cycle	
Marker Frequency Counter Function Frequency Resolution	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s	ative Pulse Width, Duty Cycle	
Marker Frequency Counter Function Frequency Resolution Frequency Range	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz	ative Pulse Width, Duty Cycle )	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range	ative Pulse Width, Duty Cycle	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal)	ative Pulse Width, Duty Cycle ) 5ns to 16 days	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz easurement	ative Pulse Width, Duty Cycle ) 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz leasurement 1 µHz to 25 MHz	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz leasurement 1 µHz to 25 MHz Min Pulse Width	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns	DC Coupling
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz lasurement 1 µHz to 25 MHz Min Pulse Width Pulse Width Resolution	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns	DC Coupling
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 µHz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1µHz to 100 MHz 100 MHz to 200 MHz 1 µHz to 100 MHz 100 MHz to 200 MHz leasurement 1 µHz to 25 MHz Min Pulse Width	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns	DC Coupling
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle nput Characteristics	Falling edge of the sync signal (Frequency, Period, Positive/Neg7 digits/second (Gate Time = 1s1 μHz to 200 MHzMeasurement Range(non-modulating signal)DC Offset Range1μHz to 100 MHz100 MHz to 200 MHzMin Pulse WidthPulse Width ResolutionMeasurement Range (display)	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics	Falling edge of the sync signal (Frequency, Period, Positive/Neg7 digits/second (Gate Time = 1s1 μHz to 200 MHzMeasurement Range(non-modulating signal)DC Offset Range1μHz to 100 MHz100 MHz to 200 MHz1 μHz to 100 MHz100 MHz to 200 MHz1 μHz to 100 MHz100 MHz to 200 MHz100 MHz to 200 MHz100 MHz to 200 MHzMin Pulse WidthPulse Width ResolutionMeasurement Range (display)Breakdown Voltage	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns 0% to 100% ±7Vac+dc	Input Impedance = 1 MΩ
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range	Falling edge of the sync signal (Frequency, Period, Positive/Neg7 digits/second (Gate Time = 1s1 μHz to 200 MHzMeasurement Range(non-modulating signal)DC Offset Range1μHz to 100 MHz100 MHz to 200 MHz1 μHz to 100 MHz100 MHz to 200 MHzMin Pulse WidthPulse Width ResolutionMeasurement Range (display)	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns 0% to 100%	
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range	Falling edge of the sync signal (Frequency, Period, Positive/Neg7 digits/second (Gate Time = 1s1 μHz to 200 MHzMeasurement Range(non-modulating signal)DC Offset Range1μHz to 100 MHz100 MHz to 200 MHz1 μHz to 100 MHz100 MHz to 200 MHz1 μHz to 100 MHz100 MHz to 200 MHz100 MHz to 200 MHz100 MHz to 200 MHzMin Pulse WidthPulse Width ResolutionMeasurement Range (display)Breakdown Voltage	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns 0% to 100% ±7Vac+dc AC On: Input Bandwidth = 250 kHz;	Input Impedance = 1 MΩ
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range	Falling edge of the sync signal (         Frequency, Period, Positive/Neg         7 digits/second (Gate Time = 1s         1 μHz to 200 MHz         Measurement Range         (non-modulating signal)         DC Offset Range         1 μHz to 100 MHz         100 MHz to 200 MHz         Basurement         1 μHz to 25 MHz         Min Pulse Width         Pulse Width Resolution         Measurement Range (display)         Breakdown Voltage         Coupling Mode         High-frequency Rejection	ative Pulse Width, Duty Cycle 5ns to 16 days ±1.5 Vdc 50 mVRMS to ±2.5 Vac + dc 100 mVRMS to ±2.5 Vac + dc 50 mVRMS to ±2.5 Vpp 100 mVRMS to ±2.5 Vpp 50 mVRMS to ±2.5 Vac + dc ≥20 ns 5 ns 0% to 100% ±7Vac+dc AC	Input Impedance = 1 MΩ
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz easurement 1 $\mu$ Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution	Falling edge of the sync signal (         Frequency, Period, Positive/Neg         7 digits/second (Gate Time = 1s         1 μHz to 200 MHz         Measurement Range         (non-modulating signal)         DC Offset Range         1 μHz to 100 MHz         100 MHz to 200 MHz         easurement         1 μHz to 25 MHz         Min Pulse Width         Pulse Width Resolution         Measurement Range (display)         Breakdown Voltage         Coupling Mode         High-frequency Rejection         Trigger Level Range         Trigger Sensitivity Range	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ $50 \text{ mVRMS to } \pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5  ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5 V to  +2.5 V 0% (about 140 mV hysteresis volt hysteresis voltage)	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz easurement 1 $\mu$ Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range Trigger Sensitivity Range GateTime1	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5V to +2.5V 0% (about 140 mV hysteresis volt hysteresis voltage) 1.310ms	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 200 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz lasurement 1 $\mu$ Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range Trigger Sensitivity Range GateTime1 GateTime2	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5V to $\pm 2.5 \text{V}$ 0% (about 140 mV hysteresis volt hysteresis voltage) 1.310ms 10.48ms	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment Input Trigger	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz easurement 1 $\mu$ Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range Trigger Sensitivity Range GateTime1	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5V to $\pm 2.5 \text{V}$ 0% (about 140 mV hysteresis volt hysteresis voltage) 1.310ms 10.48ms 166.7ms	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment Input Trigger	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 200 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz lasurement 1 $\mu$ Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range Trigger Sensitivity Range GateTime1 GateTime2	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5V to $\pm 2.5 \text{V}$ 0% (about 140 mV hysteresis volt hysteresis voltage) 1.310ms 10.48ms 166.7ms 1.342s	Input Impedance = 1 MΩ DC
Marker Frequency Counter Function Frequency Resolution Frequency Range Period Measurement Voltage Range and Sensitivity DC Coupling AC Coupling Pulse Width and Duty Cycle M Frequency and Amplitude Ranges Pulse Width Duty Cycle Input Characteristics Input Signal Range Input Adjustment	Falling edge of the sync signal ( Frequency, Period, Positive/Neg 7 digits/second (Gate Time = 1s 1 $\mu$ Hz to 200 MHz Measurement Range (non-modulating signal) DC Offset Range 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 1 $\mu$ Hz to 100 MHz 100 MHz to 200 MHz 100 MHz to 200 MHz Hz to 25 MHz Min Pulse Width Pulse Width Resolution Measurement Range (display) Breakdown Voltage Coupling Mode High-frequency Rejection Trigger Level Range Trigger Sensitivity Range GateTime1 GateTime2 GateTime3	ative Pulse Width, Duty Cycle 5ns to 16 days $\pm 1.5 \text{ Vdc}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 100 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 100 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vpp}$ 50 mVRMS to $\pm 2.5 \text{ Vac} + \text{dc}$ $\geq 20 \text{ ns}$ 5 ns 0% to 100% $\pm 7 \text{Vac+dc}$ AC On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz -2.5V to $\pm 2.5 \text{V}$ 0% (about 140 mV hysteresis volt hysteresis voltage) 1.310ms 10.48ms 166.7ms	Input Impedance = 1 MΩ DC

Trigger Characteristics	
Trigger Input	
Level	TTL-compatible
Slope	Rising or falling (selectable)
Pulse Width	>100ns
Latency	Sweep: <100 ns (typical) Burst: <300 ns (typical)
Trigger Output	
Level	TTL-compatible
Pulse Width	> 60 ns (typical)
Maximum Frequency	1 MHz

Two-channel Characteristics - Phase Offset		
Range	0° to 360°	
Waveform Phase Resolution	0.03°	

Reference Clock	
External Reference Input	
Lock Range	10 MHz ± 50 Hz
Level	250 mVpp to 5 Vpp
Lock Time	<2s
Input Impedance (Typical)	1 kΩ, AC coupling
Internal Reference Output	
Frequency	10 MHz ± 50 Hz
Level	3.3 Vpp
Input Impedance (Typical)	50 Ω, AC coupling

Sync Output	
Level	TTL-compatible
Impedance	50 Ω, nominal value

# **Overvoltage Protection**

Occurred when:

- The instrument amplitude setting is greater than 2Vpp or the output offset is greater than |2Vpc| and the input voltage is greater than ±11.5 × (1 ± 5%)V (<10kHz).</li>
- The instrument amplitude setting is lower than or equal to 2Vpp or the output offset is lower than or equal to  $|2V_{DC}|$  and the input voltage is greater than  $\pm 3.5 \times (1 \pm 5\%)V$  (<10kHz).

General Specifications	
Power Supply	
Power Voltage	100 V to 240 V (45 Hz to 440 Hz)
Power Consumption	Lower than 40 W
Fuse	250 V, T3.15 A
Display	
Туре	3.5-inch TFT LCD
Resolution	320 horizontal × RGB × 240 vertical resolution
Color	16 M color
Environment	
Temperature Range	Operating: 0°C to 50°C Non-operating: -40°C to 70°C
Cooling Method	Fan cooling
Humidity Range	Lower than 30°C : ≤95% relative humidity 30°C to 40°C : ≤75% relative humidity 40°C to 50°C : ≤45% relative humidity
Altitude	Operating: below 3000 meters Non-operating: below 15,000 meters
Mechanical	
Dimensions (W×H×D)	261.5 mm × 112 mm × 318.4 mm
Weight	Without Package: 3.2 kg With Package: 4.5 kg
Interfaces	USB Host, USB Device, LAN
IP Protection	IP2X
Calibration Interval	1 year recommended calibration interval

Certification Information		
	in line with EN61326-1:2006	
	IEC 61000-3-2:2000	±4.0kV (contact discharge) ±4.0kV (air discharge)
	IEC 61000-4-3:2002	3 V/m (80 MHz to 1 GHz) 3 V/m (1.4 GHz to 2 GHz) 1 V/m (2.0 GHz to 2.7 GHz)
	IEC 61000-4-4:2004	1 kV power lines
EMC	IEC 61000-4-5:2001	0.5kV (Phase to Neutral) 0.5kV (Phase to PE) 1 kV (Neutral to PE)
	IEC 61000-4-6:2003	3V,0.15MHz-80MHz
	IEC 61000-4-11:2004	Voltage dip: 0 % UT during half cycle 0 % UT during 1 cycle 70 % UT during 25 cycles Short interruption: 0 % UT during 1 cycle
Electrical Safety	Electrical Safety in line with USA:UL 61010-1:2012, Canada: CAN/CSA-C22.2 No. 61010-1-2012 EN 61010-1:2010	

# Ordering Information

	Description	Order Number
	DG1022Z (25MHz, Dual-channel)	DG1022Z
Model	DG1032Z (30MHz, Dual-channel)	DG1032Z
	DG1062Z (60MHz, Dual-channel)	DG1062Z
Standard Accessories	Power Cord	-
	USB Cable	CB-USBA-USBB-FF-150
	BNC Cable	CB-BNC-BNC-MM-100
	Quick Guide	-
	Resource CD (including User's Guide and etc.)	-
Options	16Mpts Memory for Arb	Arb16M-DG1000Z
	Rack Mount Kit (for single instrument)	RM-1-DG1000Z
	Rack Mount Kit (for dual instruments)	RM-2-DG1000Z
	40dB Attenuator	RA5040K
	10W Power Amplifier	PA1011
	USB-GPIB Converter	USB-GPIB



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