Specifications

Unless otherwise specified, all specifications can be guaranteed if the following two conditions are met.
● 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℃~28℃).

All the specifications are guaranteed unless those marked with "typical".

Model	DG1022Z	DG1032Z	DG1062Z
Channel	2	2	2
Maximum Frequency	25MHz	30MHz	60MHz
Sample Rate	200MSa/s		
Waveforms			
Basic waveforms	Sine, Square, Ramp, Pulse, Noise		
Built-in Arbitrary Waveforms	160 kinds, including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-Tone, etc.		
Frequency Characteristics			
Sine	1µHz to 25MHz	1µHz to 30MHz	1µHz to 60MHz
Square	1µHz to 25MHz	1µHz to 25MHz	1µHz to 25MHz
Ramp	1µHz to 500kHz	1µHz to 500kHz	1µHz to 1MHz
Pulse	1µHz to 15MHz	1µHz to 15MHz	1µHz to 25MHz
Harmonic	1µHz to 10MHz	1µHz to 10MHz	1µHz to 20MHz
Noise (-3dB)	25MHz bandwidth	30MHz bandwidth	60MHz bandwidth
Arbitrary Waveform	1µHz to 10MHz	1µHz to 10MHz	1µHz to 20MHz
Resolution	1µHz		
Accuracy	±1ppm of the settings, 18℃ to 28℃		
Sine Wave Spectrum Purity			
Harmonic Distortion	Typical (0dBm) DC-10MHz (included): <-65dBc 10MHz-30MHz (included): <-55dBc 30MHz-60MHz (included): <-50dBc		
Total Harmonic Distortion	<0.075% (10Hz-20kHz, 0dBm)		
Spurious (non-harmonic)	Typical (0dBm) ≤10MHz: <-70dBc >10MHz: <-70dBc+6dB/octave		
Phase Noise	Typical (0dBm, 10kHz deviation) 10MHz: <-125dBc/Hz		

Signal Characteristics	
Square	
Rise/Fall Time	Typical (1Vpp) <10ns
Overshoot	Typical (100KHz, 1Vpp) ≤5%
Duty Cycle	0.01% to 99.99% (limited by the current frequency setting)
Non-symmetry	1% of period+5ns
Jitter (rms)	Typical (1MHz, 1Vpp, 50Ω) ≤5MHz: 2ppm+200 ps >5MHz: 200ps
Ramp	
Linearity	≤1% of peak output (typical, 1kHz, 1Vpp, 100% Symmetry)
Symmetry	0% to 100%
Pulse	
Pulse Width	16ns to 999.999 982 118ks (limited by the current frequency setting)
Duty Cycle	0.001% to 99.999% (limited by the current frequency setting)
Leading/Trailing Edge Time	≥10ns (limited by the current frequency and pulse width settings)
Overshoot	Typical (1Vpp) ≤5%
Jitter (rms)	Typical (1Vpp) ≤5MHz: 2ppm+200ps >5MHz: 200ps
Arb	
Waveform Length	8pts to 2Mpts (16Mpts optional) 8pts to 8Mpts (16Mpts optional)
Vertical Resolution	14bits
Sample Rate	200MSa/s
Minimum Rise/Fall Time	Typical (1Vpp) <10ns
Jitter (rms)	Typical (1Vpp) ≤5MHz: 2ppm+200ps >5MHz: 200ps
Edit Method	Edit Points, Edit Block, Insert Waveform
Harmonic	
Harmonic Order	≤8
Harmonic Type	Even, Odd, All, User
Harmonic Amplitude	can be set for all harmonics
Harmonic Phase	can be set for all harmonics

Output Characteristics	
Amplitude (into 50 Ω)	
Range	≤10MHz: 1.0mVpp to 10Vpp ≤30MHz: 1.0mVpp to 5.0Vpp ≤60MHz: 1.0mVpp to 2.5Vpp
Accuracy	Typical (1kHz Sine, 0V Offset, >10mVpp, Auto) ±1% of setting ± 1mV
Flatness	Typical (Sine 2.5Vpp) ≤10MHz: ±0.1dB ≤60MHz: ±0.2dB
Units	Vpp, Vrms, dBm
Resolution	0.1mVpp or 4digits
Offset (into 50 Ω)	
Range (Peak ac+dc)	±5Vpk ac+dc
Accuracy	±(1% of setting+5mV+0.5% of amplitude)
Waveform Output	
Impedance	50Ω (typical)
Protection	Short-circuit protection, automatically disable waveform output when overload occurs

Modulation Characteristics	
Modulation Type	AM, FM, PM, ASK, FSK, PSK, PWM
AM	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Depth	0% to 120%
Modulating Frequency	2mHz to 1MHz
FM	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Modulating Frequency	2mHz to 1MHz
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	2mHz to 1MHz
ASK	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2mHz to 1MHz

FSK	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2mHz to 1MHz
PSK	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2mHz to 1MHz
PWM	
Carrier Waveform	Pulse
Source	Internal/External
Modulating Waveforms	Sine, Square, Ramp, Noise, Arb
Width Deviation	0% to 100% of Pulse Width
Modulating Frequency	2mHz to 1MHz
[Mod/Trig/FSK/Sync] Input	
Input Range	75mVRMS to ±5Vac+dc
Input Bandwidth	50kHz
Input Impedance	10kΩ

Burst Characteristics			
Carrier Waveform	Sine, Square, Ramp, Pulse, Noise, Arb (except DC)		
Carrier Frequency	2mHz to 25MHz	2mHz to 30MHz	2mHz to 60MHz
Burst Count	1 to 1,000,000 or Infinite		
Start/Stop Phase	0° to 360°, 0.1° resolution		
Internal Period	1µs to 500s		
Gated Source	External Trigger		
Trigger Source	Internal, External or Manual		
Trigger Delay	0ns to 100s		

Sweep Characteristics	
Carrier Waveform	Sine, Square, Ramp, Arb (except DC)
Type	Linear, Log or Step
Direction	Up/Down
Start/Stop Frequency	Consistent with the upper/lower limit of the frequency of the carrier waveform
Sweep Time	1ms to 500s
Hold/Return Time	0ms to 500s
Trigger Source	Internal, External or Manual
Mark	Falling edge of the Sync signal (programmable)

Counter			
Function	Frequency, Period, Positive/Negative Pulse Width, Duty Cycle		
Frequency Resolution	7 digits/second (Gate Time =1s)		
Frequency Range	1µHz to 200MHz		
Period Measurement	Measurement Range	5ns to 16 days	
Voltage Range and Sensitivity (Not modulation signal)			
DC Coupling	DC Offset Range	±1.5Vdc	
	1µHz to 100MHz	50mVRMS to ±2.5Vac+dc	
	100MHz to 200MHz	100mVRMS to ±2.5Vac+dc	
AC Coupling	1µHz to 100MHz	50mVRMS to ±2.5Vpp	
	100MHz to 200MHz	100mVRMS to ±2.5Vpp	
Pulse Width and Duty Cycle Measurement			
Frequency/Amplitude Range	1µHz to 25MHz	50mVRMS to ±2.5Vac+dc	DC Coupling
Pulse Width	Minimum	≥20ns	
	Resolution	5ns	
Duty Cycle	Range (Display)	0% to 100%	
Input Characteristics			
Input Signal Range	Breakdown Voltage	±7Vac+dc	Impedance= 1MΩ
Input Adjustment	Coupling	AC	DC
	HF Suppression	ON: input bandwidth=250kHz; OFF: input bandwidth=200MHz	
Input Trigger	Trigger Level Range	-2.5V to +2.5V	
	Trigger Sensitivity Range	0% (about 140mV hysteresis voltage) to 100% (about 2mV hysteresis voltage)	
Gate Time	GateTime1	1.310ms	
	GateTime2	10.48ms	
	GateTime3	166.7ms	
	GateTime4	1.342s	
	GateTime5	10.73s	
	GateTime6	>10s	

Trigger Characteristics	
Trigger Input	
Level	TTL-compatible
Slope	Rising or falling (optional)
Pulse Width	>100ns
Latency	Sweep: <100ns (typical) Burst: <300ns (typical)
Trigger Output	
Level	TTL-compatible

Pulse Width	>60ns (typical)
Maximum Frequency	1MHz

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

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

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

Overvoltage Protection
Overvoltage protection will take effect once any of the following two conditions is met: - The amplitude setting in the generator is greater than 2Vpp or the output offset is greater than $|2V_{DC}|$, the input voltage is greater than $\pm 11.5\times(1\pm5\%)$V (<10kHz).   - The amplitude setting in the generator is lower than or equal to 2Vpp or the output offset is lower than or equal to $|2V_{DC}|$, the input voltage is greater than $\pm 3.5\times(1\pm5\%)$V (<10kHz).

General Specifications	
Power	
Power Voltage	100V to 240V (45Hz to 440Hz)
Power Consumption	Less than 40W
Fuse	250V, T3.15A
Display	
Type	3-inch TFT LCD
Resolution	320 Horizontal×RGB×240 Vertical Resolution
Color	16M color

Environment	
Temperature Range	Operating: 0℃ to 50℃ Non-Operating: -40℃ to 70℃
Cooling Method	Cooling by fans compulsively
Humidity Range	Less than 30℃: ≤95% Relative Humidity (RH) 30℃ to 40℃: ≤75% Relative Humidity (RH) 40℃ to 50℃: ≤45％ Relative Humidity (RH)
Altitude	Operating: Less than 3000 meters Non-Operating: Less than 15,000 meters
Mechanical	
Dimensions (W×H×D)	261.5mm×112mm×318.4mm
Weight	without package: 3.2kg with package: 4.5kg
Interfaces	USB Host, USB Device, LAN
IP Protection	IP2X
Calibration Interval	Recommend calibration interval is one year

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