

DGE1000 Series Single Channel

Arbitrary Waveform Generator Specification

All technical specifications are guaranteed when the following conditions are met, unless otherwise stated.

- The signal generator must be operated continuously for more than 30 minutes at the specified operating temperature (20°C to 30°C) to meet these specifications;
- The signal generator is in the calibration interval and has performed a self-calibration.

In addition to the specifications marked with the word "Typical", the specifications used are guaranteed.

Waveforms

Waveforms		
Bandwidth	DGE1030	30 MHz
	DGE1060	60 MHz
Sample Rate	DGE1030	125MSa/s
	DGE1060	300MSa/s
Vertical Resolution	14 bits	
Channel	1	
Standard Waveforms	Sine wave, square wave, ramp wave, pulse wave, noise	
Arbitrary Waveforms	Sinc, exponential rise, exponential decline, electrocardiogram, Gaussian, semi-positive, Lorentz, dual audio, DC voltage totaling more than 160 kinds	

Frequency Characteristics

Frequency Characteristics (Frequency resolution to 1 μ Hz)		
Sine wave	DGE1030	1 μ Hz ~ 30MHz
	DGE1060	1 μ Hz ~ 60MHz
Square wave	DGE1030	1 μ Hz ~ 15MHz
	DGE1060	1 μ Hz ~ 20MHz
Pulse wave	DGE1030	1 μ Hz ~ 15MHz
	DGE1060	1 μ Hz ~ 20MHz
Ramp wave	DGE1030	1 μ Hz - 1 MHz
	DGE1060	1 μ Hz - 2 MHz
Noise wave (-3 dB)	20 MHz BW (AWGN)	
Arbitrary wave	1 μ Hz - 10 MHz	
Frequency resolution	1 μ Hz or 7 significant figures	
Frequency stability	± 30 ppm at 0 $\pm 40^\circ$ C	
Frequency aging	± 30 ppm per year	

rate	
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Amplitude Characteristics

Amplitude Characteristics (not specifically labeled, the load defaults to 50Ω)		
Output amplitude	DGE1030	2mVpp ~ 20Vpp ($\leq 10\text{MHz}$) High Z 2mVpp ~ 8Vpp ($\leq 30\text{MHz}$) High Z 1mVpp ~ 10Vpp ($\leq 10\text{MHz}$) 50 Ω 1mVpp ~ 4Vpp ($\leq 30\text{MHz}$) 50 Ω
	DGE1060	2mVpp ~ 20Vpp ($\leq 10\text{MHz}$) High Z 2mVpp ~ 8Vpp ($\leq 60\text{MHz}$) High Z 1mVpp ~ 10Vpp ($\leq 10\text{MHz}$) 50 Ω 1mVpp ~ 4Vpp ($\leq 60\text{MHz}$) 50 Ω
Amplitude accuracy	$\pm (1\% \text{ of setting} + 1 \text{ mVpp})$ (Typical 1kHz sine, 0V offset)	
Amplitude resolution	1mVpp or 4 digits	
DC offset range (AC +DC)	DGE1030	$\pm(10 \text{ Vpk} - \text{Amplitude Vpp}/2)$ High Z ($\leq 10\text{MHz}$) $\pm(4\text{Vpk} - \text{Amplitude Vpp}/2)$ High Z ($\leq 30\text{MHz}$) $\pm(5 \text{ Vpk} - \text{Amplitude Vpp}/2)$ 50 Ω ($\leq 10\text{MHz}$) $\pm(2 \text{ Vpk} - \text{Amplitude Vpp}/2)$ 50 Ω ($\leq 30\text{MHz}$)
	DGE1060	$\pm(10\text{Vpk} - \text{Amplitude Vpp}/2)$ High Z ($\leq 10\text{MHz}$) $\pm(4\text{Vpk} - \text{Amplitude Vpp}/2)$ High Z ($\leq 60\text{MHz}$) $\pm(5 \text{ Vpk} - \text{Amplitude Vpp}/2)$ 50 Ω ($\leq 10\text{MHz}$) $\pm(2 \text{ Vpk} - \text{Amplitude Vpp}/2)$ 50 Ω ($\leq 60\text{MHz}$)
DC offset accuracy	$\pm (1 \% \text{ of } \text{setting} + 1 \text{ mV} + \text{amplitude Vpp} * 0.5\%)$	
Offset resolution	1 mVpp or 4 digits	
Output Impedance	50 Ω (Typical)	

Signal Characteristics

Signal Characteristics	
Sine	
Bandwidth flatness (relative to 1 kHz Sine wave, 1 Vpp)	$\leq 10\text{MHz}$: $\pm 0.3\text{dB}$ $\leq 35\text{MHz}$: $\pm 0.5\text{dB}$ $\leq 60\text{MHz}$: $\pm 1\text{dB}$
Harmonic distortion	Typical (0dBm) DC to 1MHz: $< -65\text{dBc}$ 1MHz to 35MHz: $< -60\text{dBc}$ 35MHz to 60MHz: $< -50\text{dBc}$
Total harmonic distortion	$< 0.2 \%$, 10 Hz to 20 kHz, 1 Vpp
Non-harmonic distortion	Typical (0dBm) $\leq 10\text{MHz}$: $< -70\text{dBc}$ $> 10\text{MHz}$: $< -70\text{dBc} + 6\text{dB/ sound interval}$
Phase noise	Typical (0dBm, 10kHz offset) 10MHz: $\leq -110\text{dBc/Hz}$
Square	
Rise/fall time	$< 20\text{ns}$

Jitter (rms), typical (1Vpp, 50Ω)	200ps + 30ppm	
Overshoot	< 5%	
Ramp		
Linearity	< 1% of peak output (typical 1 kHz, 1 Vpp, symmetry 50%)	
Symmetry	0% to 100%	
Pulse		
Period	DGE1030	67 ns to 1 Ms
	DGE1060	50 ns to 1 Ms
Pulse Width	≥ 24ns	
Rise and fall time	≥ 15ns	
Overshoot	< 5%	
Jitter (rms), typical (1Vpp, 50Ω)	200ps + 30ppm	
Noise		
Types	Gaussian white noise	
Bandwidth (-3dB)	20 M	
Arbitrary wave		
Bandwidth	10M	
Waveform length	2 to 8K points	
Sampling rate	DGE1030	125Ma/s
	DGE1060	300Ma/s
Amplitude accuracy	14 bits	

Modulation Characteristics

Modulation Characteristics	
Modulation Type	AM, FM, PM, FSK
AM	
Carrier	Sine wave, square wave, ramp wave, arbitrary wave (except DC)
Modulated signal source	Internal
Internal modulation waveform	Sine wave, square wave, ramp wave, white noise
Internal amplitude modulation frequency	2 mHz to 100 kHz
Depth	0.0% to 100.0%
FM	
Carrier	Sine wave, square wave, ramp wave, arbitrary wave (except DC)
Modulated signal source	Internal
Internal modulation waveform	Sine wave, square wave, ramp wave, white noise

Internal modulation frequency	2 mHz to 100 kHz
Frequency offset	$1 \mu\text{Hz} \leq \text{offset} < \text{carrier frequency}$
PM	
Carrier	Sine wave, square wave, ramp wave, arbitrary wave (except DC)
Modulated signal source	Internal
Internal modulation waveform	Sine, square, ramp, white noise
Internal phase modulation frequency	2 mHz to 100 kHz
Phase deviation range	0° to 180°
FSK	
Carrier	Sine wave, square wave, ramp wave, arbitrary wave (Except DC)
Modulated signal source	Internal
Internal modulation waveform	50% square wave
FSK rate	2 mHz to 1MHz
FSK hopfreq	$2 \text{ mHz} \leq \text{offset} < \text{maximum frequency of corresponding carrier}$

Sweep Characteristics

Sweep Characteristics	
Carrier	Sine, square wave, ramp wave, arbitrary wave (Except DC)
Minimum/maximum starting frequency	$1 \mu\text{Hz}$ (minimum) / maximum frequency of corresponding carrier
Minimum/maximum termination frequency	$1 \mu\text{Hz}$ (minimum) / maximum frequency of corresponding carrier
Types	Linear, logarithmic
Sweep time	1 ms to 500 s $\pm$ 0.1%
Trigger source	Internal, manual

Burst Characteristics

Burst Characteristics		
Waveform	Sine wave, square wave, ramp wave, pulse wave and arbitrary wave (Except DC)	
Types	N-cycle	
N-cycle trigger source	Internal, manual	
Carrier frequency	$1 \mu\text{Hz} \leq \text{Offset} \leq \text{Maximum frequency of corresponding carrier} / 2$	
N-cycle trigger cycle	DGE1030	58 ns $\sim$ 1 Ms (Min = Cycles * Period)
	DGE1060	29 ns $\sim$ 1 Ms (Min = Cycles * Period)

periodicity	1 ~ 60000 (Max =Burst Period / Period) /infinite
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Input/Output Characteristics

Input/Output Characteristics	
Communication Interface	USB Device

General Specifications

Display	
Display type	3.6-inch color LCD display
Display resolution	480 Horizontal ×272 Vertical pixels
Display color	65536 colors, 16 bits, TFT
Power	
Voltage	DC 5V /2A
Power consumption	Less than 10W
Environment	
Temperature	Working temperature: 0 °C to 40 °C
	Storage temperature: -20 °C to 60 °C
Relative humidity	Less than 35°C: ≤ 90% relative humidity 35°C to 40°C: ≤ 60% relative humidity
Height	Operating 3,000 meters Non-operation 12,000 meters
Mechanical Specification	
Dimension	200mm (Length) × 68.5 mm (Height) × 73.6mm (Width)
Weight	Approx. 0.5 kg
Others	
Adjustment interval	The recommended calibration interval is one year

