

# 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 μHz)		
Sine wave	DGE1030	1 μHz ~ 30MHz
	DGE1060	1 μHz ~ 60MHz
Square wave	DGE1030	1 μHz ~ 15MHz
	DGE1060	1 μHz ~ 20MHz
Pulse wave	DGE1030	1 μHz ~ 15MHz
	DGE1060	1 μHz ~ 20MHz
Ramp wave	DGE1030	1 μHz - 1 MHz
	DGE1060	1 μHz - 2 MHz
Noise wave (-3 dB)	20 MHz BW(AWGN)	
Arbitrary wave	1 μHz - 10 MHz	
Frequency resolution	1 μHz or 7 significant figures	
Frequency stability	±30 ppm at 0±40°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(≤ 10MHz)High Z 2mVpp ~ 8Vpp(≤ 30MHz)High Z 1mVpp ~ 10Vpp(≤ 10MHz)50 Ω 1mVpp ~ 4Vpp(≤ 30MHz)50 Ω
	DGE1060 2mVpp ~ 20Vpp(≤ 10MHz)High Z 2mVpp ~ 8Vpp(≤ 60MHz)High Z 1mVpp ~ 10Vpp(≤ 10MHz)50 Ω 1mVpp ~ 4Vpp(≤ 60MHz)50 Ω
Amplitude accuracy	± (1% of setting + 1 mVpp) (Typical 1kHz sine, 0V offset)
Amplitude resolution	1mVpp or 4 digits
DC offset range (AC +DC)	DGE1030 ±(10 Vpk–Amplitude Vpp/2) High Z(≤ 10MHz) ±(4Vpk - Amplitude Vpp/2) High Z(≤ 30MHz) ±(5 Vpk – Amplitude Vpp/2) 50Ω(≤ 10MHz) ±(2 Vpk – Amplitude Vpp/2) 50Ω(≤ 30MHz)
	DGE1060 ±(10Vpk – Amplitude Vpp/2) High Z(≤ 10MHz) ±(4Vpk–Amplitude Vpp/2) High Z(≤ 60MHz) ±(5 Vpk - Amplitude Vpp/2) 50Ω(≤ 10MHz) ±(2 Vpk– Amplitude Vpp/2) 50Ω(≤ 60MHz)
DC offset accuracy	± (1 % of  setting  + 1 mV + amplitude Vpp * 0.5%)
Offset resolution	1 mVpp or 4 digits
Output Impedance	50Ω (Typical)

## Signal Characteristics

Signal Characteristics	
<b>Sine</b>	
Bandwidth flatness (relative to 1 kHz Sine wave, 1 Vpp)	≤10MHz: ±0.3dB ≤35MHz: ±0.5dB ≤60MHz: ±1dB
Harmonic distortion	Typical (0dBm) DC to 1MHz: <-65dBc 1MHz to 35MHz: <-60dBc 35MHz to 60MHz: <-50dBc
Total harmonic distortion	< 0.2 %, 10 Hz to 20 kHz, 1 Vpp
Non-harmonic distortion	Typical (0dBm) ≤10MHz: <-70dBc >10MHz: <-70dBc + 6dB/ sound interval
Phase noise	Typical (0dBm, 10kHz offset) 10MHz: ≤-110dBc/Hz
<b>Square</b>	
Rise/fall time	< 20ns
Jitter(rms),typical(1Vpp,50Ω)	200ps + 30ppm

Overshoot	< 5%	
<b>Ramp</b>		
Linearity	< 1% of peak output (typical 1 kHz, 1 Vpp, symmetry 50%)	
Symmetry	0% to 100%	
<b>Pulse</b>		
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	
<b>Noise</b>		
Types	Gaussian white noise	
Bandwidth (-3dB)	20 M	
<b>Arbitrary wave</b>		
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
<b>AM</b>	
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%
<b>FM</b>	
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 μHz ≤ offset < carrier frequency

<b>PM</b>	
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°
<b>FSK</b>	
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

<b>Sweep Characteristics</b>	
Carrier	Sine, square wave, ramp wave, arbitrary wave (Except DC)
Minimum/maximum starting frequency	1 $\mu$ Hz(minimum)/ maximum frequency of corresponding carrier
Minimum/maximum termination frequency	1 $\mu$ 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

<b>Burst Characteristics</b>		
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	$1 \sim 60000$ (Max = Burst Period / Period)/infinite	

## Input/Output Characteristics

<b>Input/Output Characteristics</b>	
Communication Interface	USB Device

## General Specifications

<b>Display</b>	
Display type	3.6-inch color LCD display
Display resolution	480 Horizontal ×272 Vertical pixels
Display color	65536 colors, 16 bits, TFT
<b>Power</b>	
Voltage	DC 5V /2A
Power consumption	Less than 10W
<b>Environment</b>	
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
<b>Mechanical Specification</b>	
Dimension	200mm (Length) × 68.5 mm (Height) × 73.6mm (Width)
Weight	Approx. 0.5 kg
<b>Others</b>	
Adjustment interval	The recommended calibration interval is one year



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V1.0.0