



DG1000Z Series Function/Arbitrary Waveform Generator



- SiFi (Signal Fidelity) for 100% waveform replication
- 8Mpts (standard) or 16Mpts (optional) arbitrary waveform memory length for each channel
- Standard 2 full functional independent channels
- ± 1 ppm 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 multi-functional 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

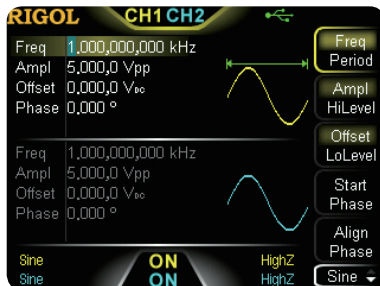


Dimensions: Width × Height × Depth=261.5mm × 112mm × 318.4mm
Weight: 3.2kg (without package)

► Feature and Benefits



Standard 2 full functional channels



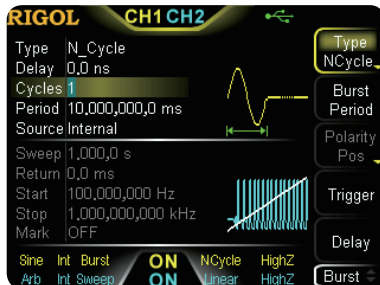
Arbitrary waveform function with innovative SiFi technology



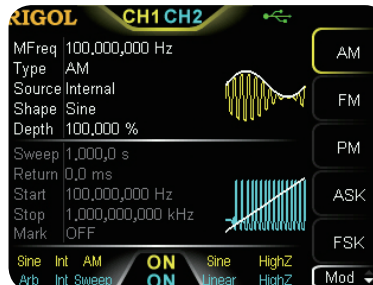
Up to 160 built-in waveforms



Burst function



Multiple analog and digital modulations



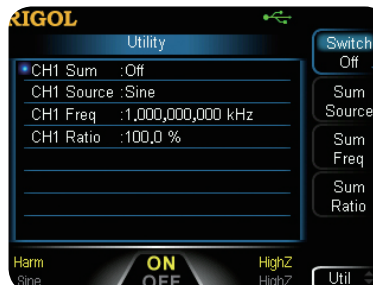
Sweep function



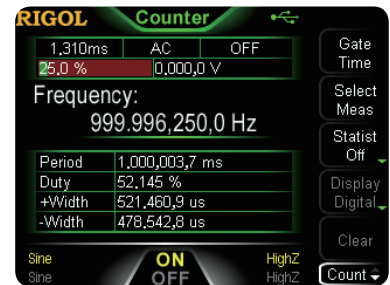
Standard harmonic generator



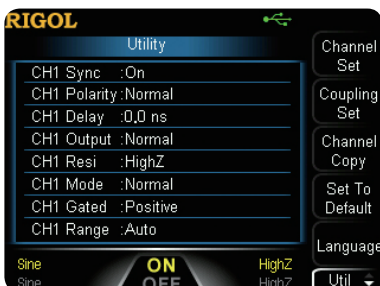
Waveform summing function



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



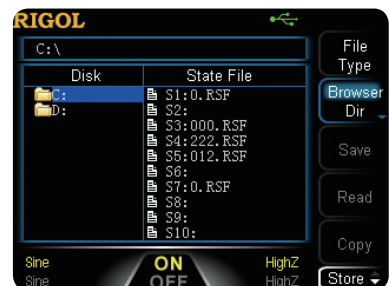
Channels and system setting



In line with LXI Core Device 2011



File Management Function



► Specifications

All the specifications can be guaranteed if the following two conditions are met unless where noted.

- 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°C ~ 28°C).
- All the specifications are guaranteed unless those marked with "typical".

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|---------------|-----------|---------|
| Model | DG1032Z | DG1062Z |
| Channel | 2 | 2 |
| Max Frequency | 30 MHz | 60 MHz |
| Sample Rate | 200 MSa/s | |

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| Waveform | |
| Basic Waveform | Sine, Square, Ramp, Pulse, Noise |
| Built-in Arbitrary Waveform | 160 kinds, including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-Tone, etc. |

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| Frequency Characteristics | | |
| Sine | 1 µHz to 30 MHz | 1 µHz to 60MHz |
| Square | 1 µHz to 15 MHz | 1 µHz to 25 MHz |
| Ramp | 1 µHz to 500kHz | 1 µHz to 1MHz |
| Pulse | 1 µHz to 15 MHz | 1 µHz to 25 MHz |
| Harmonic | 1uHz to 10MHz | 1uHz to 20MHz |
| Noise (-3dB) | 30 MHz bandwidth | 60 MHz bandwidth |
| Arbitrary Waveform | 1 µHz to 10 MHz | 1 µHz to 20 MHz |
| Resolution | 1 µHz | |
| Accuracy | ±1 ppm of the setting value, 18°C to 28°C | |

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| Sine Wave Spectrum Purity | |
| Harmonic Distortion | Typical (0 dBm) 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 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 offset) 10 MHz: <-125 dBc/Hz |

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| 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 |
| Ramp | |
| Linearity | ≤1% of peak output (typical, 1 kHz, 1 VPP, 100% symmetry) |
| Symmetry | 0% to 100% |
| Pulse | |
| Pulse Width | ≥16 ns (limited by the current frequency setting) |
| Duty Cycle | 0.001% to 99.999% (limited by the current frequency setting) |
| Rising/Falling Edge | ≥10 ns (limited by the current frequency setting and pulse width setting) |
| Overshoot | Typical (1 Vpp) ≤5% |
| Jitter (rms) | Typical (1 Vpp) ≤5 MHz 2 ppm + 200 ps > 5 MHz 200 ps |
| Arbitrary Waveform | |
| Waveform Length | 8pts to 8Mpts (16Mpts optional) |
| Vertical Resolution | 14 bits |

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| 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 Built-in 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 |

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| 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) | ±5 V |
| Accuracy | ±(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 |

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

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| Key Frequency | 2 mHz to 1 MHz |
| 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 | 10K Ω |

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

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| Sweep Characteristics | | |
| Carrier Waveform | Sine, Square, Ramp, Arb (except DC) | |
| Type | 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 | |
| Trigger Source | Internal, External or Manual | |
| Marker | Falling edge of the sync signal (programmable) | |

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| Frequency Counter | | | |
| Function | Frequency, Period, Positive/Negative Pulse Width, Duty Cycle | | |
| Frequency Resolution | 7 digits/second (Gate Time = 1 s) | | |
| Frequency Range | 1 μ Hz to 200 MHz | | |
| Period Measurement | Measurement Range | 5ns to 16 days | |
| Voltage Range and Sensitivity (non-modulating signal) | | | |
| DC Coupling | DC Offset Range | \pm 1.5 Vdc | |
| | 1 μ Hz to 100 MHz | 50 mVRMS to \pm 2.5 Vac + dc | |
| | 100 MHz to 200 MHz | 100 mVRMS to \pm 2.5 Vac + dc | |
| AC Coupling | 1 μ Hz to 100 MHz | 50 mVRMS to \pm 2.5 Vpp | |
| | 100 MHz to 200 MHz | 100 mVRMS to \pm 2.5 Vpp | |
| Pulse Width and Duty Cycle Measurement | | | |
| Frequency and Amplitude Ranges | 1 μ Hz to 25 MHz | 50 mVRMS to \pm 2.5 Vac + dc | DC Coupling |
| Pulse Width | Min Pulse Width | \geq 20 ns | |
| | Pulse Width Resolution | 5 ns | |
| Duty Cycle | Measurement Range (display) | 0% to 100% | |
| Input Characteristics | | | |
| Input Signal Range | Breakdown Voltage | \pm 7Vac+dc | Input Impedance = 1 M Ω |
| Input Adjustment | Coupling Mode | AC | DC |
| | High-frequency Rejection | On: Input Bandwidth = 250 kHz; Off: Input Bandwidth = 200 MHz | |
| Input Trigger | Trigger Level Range | -2.5V to +2.5V | |
| | Trigger Sensitivity Range | 0% (about 140 mV hysteresis voltage) to 100% (about 2 mV hysteresis voltage) | |
| Gate Time | GateTime1 | 1.310ms | |
| | GateTime2 | 10.48ms | |
| | GateTime3 | 166.7ms | |
| | GateTime4 | 1.342s | |
| | GateTime5 | 10.73s | |
| | GateTime6 | >10s | |

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| 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 |
| Reference Clock | |
| Phase Offset | |
| Range | 0° to 360° |
| Resolution | 0.03° |
| External Reference Input | |
| Lock Range | 10 MHz ± 50 Hz |
| Level | 250 mVpp to 5 Vpp |
| Lock Time | < 2 s |
| 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: | |
| <ul style="list-style-type: none"> The instrument amplitude setting is greater than 2Vpp or the output offset is greater than 2V_{DC} and the input voltage is greater than $\pm 11.5 \times (1 \pm 5\%)V$ (<10kHz). 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 | |
| Type | 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 | | |
|---------------------------|---|--|
| 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 | 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 |
| | 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 250 cycles |
| 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 |
|----------------------|---|---------------------|
| 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 |

RIGOL

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