RIGOL

Electronic Testing & Measuring Instruments

Product Catalog

About RIGOL

Founded in 1998, RIGOL TECHNOLOGIES CO., LTD. (STAR: 688337.SH), is a global leader in electronic measurement instruments. Our focus lies in spreading the development and breakthroughs of cutting-edge technology in the realm of general electronic measurement instruments. With the mission of "Enabling Technology Exploration, Empowering Possibilities and More", we bring together talented individuals with great potential and visionary aspirations to deliver testing and measuring products and solutions that accelerate technological innovation.

RIGOL steadfastly upholds a commitment to original technology innovation, prioritizing independent research and development of key core technologies. Our brand footprint extends across more than 90 countries and regions worldwide, ensuring customers in the testing and measurement industries have access to RIGOL's versatile electronic measurement products. Our offerings include digital oscilloscopes, RF signal generators, waveform generators, power supplies, electronic loads, multimeters, and data acquisition tools. Continuously innovating our product lines, we provide multi-level solutions at the chip, module, and system levels. These solutions cater to the diverse needs of customers in sectors such as communications, renewable energy, automotive, semiconductors, educational research, and system integration. By empowering our customers with these innovative solutions, we enable them to unlock a realm of possibilities and achieve more in their endeavors.

Headquartered in Suzhou, China, RIGOL has established its research and development centers in Beijing, Shanghai, and Xi'an. Additionally, RIGOL has set up its overseas subsidiaries in Portland (U.S.A), Munich (Germany), Tokyo (Japan), Seoul (Korea), Penang (Malaysia), and Singapore. In alignment with our commitment to meeting the evolving technology challenges faced by our customers, RIGOL has established international marketing representative offices in key cities such as Bangalore, Sao Paulo, and Hanoi, to support our customers better. Through our dedicated local technology experts and partners, RIGOL has demonstrated its commitment to creating value for over 100,000 customers around the globe.

RIGOL holds self-developed core intellectual property rights, continually fortifying our technical prowess in the high-end testing and measuring domain. As of December 31, 2023, we've secured 461 authorized patents, among which 397 are invention patents. Notably, RIGOL's core technology was honored with the 24th China Patent Gold Award. Recognized as one of the fifth batch of "little giant" firms, we've also achieved notable mentions, including appearances on the Top 500 Chinese Enterprise Patent list for 2019, 2020, and 2022. In 2023, we were bestowed the prestigious title of "National Intellectual Property Demonstration Enterprise." Our accolades extend to over 70 prizes, encompassing esteemed recognitions such as the "Second Prize of Science and Technology of China Machinery Industry," "Excellent Prize of Suzhou Patent Award," "R&D100 Awards," "Suzhou Quality Award," and "World Electronics Achievement Awards."

RIGOL also holds various qualifications, including membership in the International Bus LXI Alliance and CNAS certification for our laboratory. Engaging actively in standardization efforts, RIGOL serves as a member of the 5th National Technical Committee for Standardization of Electronic Measuring Instruments. In this capacity, RIGOL has participated in the drafting and formulation of ONE National standard, contributed significantly to leading the drafting and formulation of three industry general specifications

RIGOL Product Line

- Digital Oscilloscope
- Waveform Generator
- Spectrum Analyzer
- RF Signal Generator
- Power Supply and Electronic Load
- Digital Multimeter
- Data Acquisition

Founded in 1998

Dual Driving Strategy Market
Technology Core Strength

5 R&D Centers
Beijing/Suzhou/Shanghai /Xi'an/Shenzhen

Fields with RMB100 billion Market Scale
Communications/ New Energy/ Semiconductors

Technology Self-owned and Controllable
Adhere to Self-reliance and Originality Master Key and Core Technologies

Multi-level Solutions
System/Module /Chip Levels

Contents

High-Performance Instruments

Enabling Technology Exploration and Empowering Possibilities and More. With this mission in mind, RIGOL has been leading the innovation tide in the domestic High-Performance testing and measuring instruments, with High-Performance digital oscilloscope, arbitrary waveform generator, and RF signal generator as its cornerstone to create excellence in their performance at an unprecedented price point. Whatever its cutting-edge technology or its pursuit of high precision, RIGOL can always be counted on for its reliable products. From design to performance, RIGOL has been committed to bringing you extraordinary user experience, helping you improve your working efficiency and test accuracy. RIGOL, a High-Performance brand choice for you, escorts you to embark on the technology journey and open a new chapter for you.

DS70000 Series Digital Oscilloscope

It's RIGOL's 7th generation of High-Performance digital oscilloscope. With the unique brand new UltraVision III platform, DS70000 series has excelled in its key specifications which have reached the high level in the industry. It caters to meet the demand of making an analysis of various serial buses, power integrity, and others, playing an important role in the industry and technology fields.

- Max. bandwidth: 5 GHz
- Max. real-time sample rate: 20 GSa/s
- Max. memory depth: 2 Gpts
- Max. waveform capture rate: 1,000,000 wfms/s

DG70000 Series Arbitrary Waveform Generator

It's RIGOL's High-Performance Arbitrary Waveform Generator which is built on its unique SiFi III technical platform and Android-based operating system. It can make accurate sampling, self-define the complex waveforms, support sync output and remote control, applicable to various industries, bringing more possibilities to the users.

- Max. sample rate: 5 GSa/s (12 Gsa/s interpolated)
- 4-CH (for 4-CH model) synchronization for a single instrument
- 70 dBc SFDR
- 16-bit vertical resolution
- 1.5 Gpts memory depth per channel

DSG5000 Series Microwave Signal Generator

It is a multi-channel phase-coded miscrowave signal generator with the Android-based operating system. It can be controlled by the touch screen, the externally connected mouse, Web Control, and SCPI commands. With its superb long-term phase stability and low phase noise, the DSG5000 series can generate high quality signals, accurate signal level and wide output power range, capable of meeting the complex test scenarios such as superconducting quantum computation, radar signal generation, MIMO, and EMS.

- Frequency range: 9 kHz to 20 GHz
- Channel-to-channel phase stability: <1°@10GHz
  phase deviation resolution: 0.01°
- Switchover time < 3 ms (typ.)
- Max. output level 25 dBm
- Phase noise: <-133 dBc/Hz@10 kHz, carrier waveform 1 GHz (typ.)

DS70000 Series Digital Oscilloscope

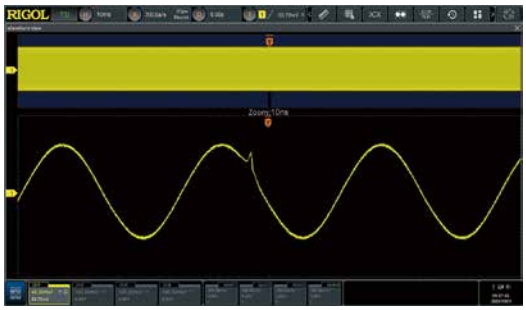
With the brand new unique UltraVision III platform, the DS70000 series, as the 7th generation of digital oscilloscope, delivers industry-leading performance for its key specifications such as memory depth, waveform capture rate, and vertical resolution. It delivers up to 20 GSa/s real-time sample rate and 5 GHz real-time bandwidth. It supports analysis of serial data on computer, embedded, automotive, audio and additional bus types. UltraVision III also enables power integrity analysis as well as multi-domain debugging with simultaneous analysis of time-domain and frequency-domain signals. In addition to the improvement of hardware specification, DS70000 series also has many user-friendly designs to ensure high-quality user experience.

- Analog channel bandwidth: 5 GHz for DS70504; 3 GHz for DS70304
- 4 analog channels, 1 EXT input channel
- Up to 20 GSa/s real-time sample rate
- Max. 2 Gpts memory depth
- 1,000,000 wfms/s waveform capture rate capable of capturing rare signal anomalies that you might otherwise miss
- Recording and playback functions for a maximum of 2,000,000 frames of hardware real-time and ceaseless waveforms
- A variety of triggers and bus decodes; support 4 decode channels
- High-precision frequency counter and totalizer
- Protocol analyzer
- Vertical sensitivity range: 1 mV/div to 10 V/div (1 MΩ), 1 mV/div to 1 V/div (50 Ω)
- 8 to 16 bits adjustable vertical resolution capable of accurately measuring low level signals
- Real-time spectrum analysis (RTSA, opt.) capable of capturing up to 10,000 FFTs per second so you don't miss small signal artifacts even in the RF domain
- 3-digit DC/AC_{RMS}, AC+DC_{RMS} voltage measurement

16-bit vertical resolution

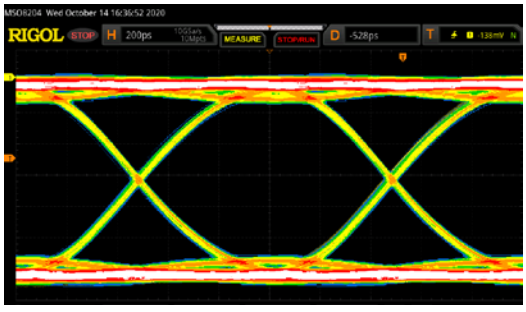
10,000 hardware accelerated FFTs/s with the RTSA option

2 Gpts memory depth



Multiple external interfaces

Eye analysis



Brand new UI design

Models and Specifications

Model		DS70504	DS70304
Analog bandwidth (50 Ω, -3 dB)		5 GHz	3 GHz
Analog Bandwidth (1 MΩ, -3 dB)		500 MHz	
No. of Input/Output Channels		4 analog channel inputs 1 EXT channel input	
Rise Time (50Ω, 10% to 90%, typ.)		⩽ 108 ps	⩽ 130 ps
Sampling Mode		Real-time Sampling	
Max. Sample Rate of Analog Channel		Half-channel[1]: 20 GSa/s Full-channel[2]: 10 GSa/s	
Max. Memory Depth		Standard: 500 Mpts Option: 2 Gpts (half-channel[1]), 1 Gpts (full-channel[2])	
Max. Waveform Capture Rate[3]		⩾ 1,000,000 wfms/s	
Hardware Real-time Waveform Recording and Playing		Max. 2,000,000 frames (half-channel[1])	
Range of Time Base		50 ps/div to 1 ks/div	100 ps/div to 1 ks/div
		Fine	
Vertical Sensitivity Range[4]	1 MΩ	1 mV/div to 10 V/div	
	50 Ω	1 mV/div to 1 V/div	
DC Gain Accuracy[4]		±2% of full scale	
Trigger Type		Standard: Edge trigger, Pulse trigger, Slope trigger, Video trigger, Pattern trigger, Duration trigger, Timeout trigger, Runt trigger, Window trigger, Delay trigger, Setup/Hold trigger, Nth Edge trigger Option: RS232/UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553	
Bus Decoding		Standard: Parallel Option: RS232/UART, I2C, SPI, LIN, CAN, CAN-FD, FlexRay, I2S, MIL-STD-1553, MIPI-RFFE, USB2.0, and SENT	
Waveform Measurement	Number of Measurements	41 auto measurements; and up to 14 measurements can be displayed at a time.	
	Waveform Analysis	Waveform recording, Pass/fail test, histogram, color grade, real-time eye diagram (option), and jitter analysis (option)	
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop	
Enhanced FFT	Record Length	Max. 1 Mpts	
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.	
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold	
I/O		USB3.0 Host, USB3.0 Device, LAN, web control, AUX Output, 10 MHz reference clock In/Out, HDMI, and Probe Compensation Output	
LCD Size and Type	Main display	15.6'' capacitive multi-touch screen with one-button electronic tilt	
		1920x1080	
	Secondary display	3.5'' capacitive multi-touch screen with user-defined shortcut key menu, supporting quick-responsive touch operation with vibration	
		480x320	
Weight[5]		Package excluded: <22.5 kg Package included: <29.5 kg	

Note:

[1]: 5 GHz bandwidth is only applicable to half-channel mode; 4 GHz for full-channel mode. CH1 and CH2 are considered as a group; CH3 and CH4 are considered as another group. If one of the two channels in each group is enabled, it is called half-channel mode.

[2]: CH1 and CH2 are considered as a group; CH3 and CH4 are considered as another group. If two channels in either one group or four channels are all enabled, it is called full-channel mode.

[3]: Maximum value. single-channel, 5 ns horizontal time base, set a sine wave signal with 1 kpts memory depth, 4 div input amplitude, 10 MHz frequency. Others are default settings.

[4]: 1 mV/div and 2 mV/div are a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 1 mV/div and 2 mV/div sensitivity setting.

[5]: DS70000 model, standard configuration.

Order Information

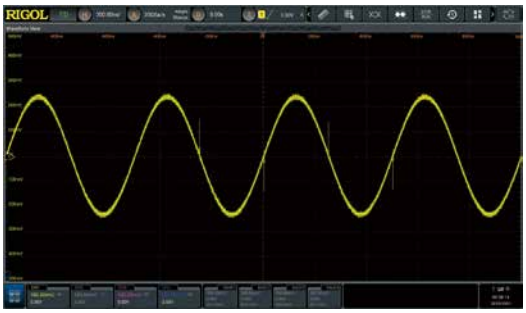
Order Information	Order No.
Model	
DS70304 (3 GHz, 20 GSa/s, 500 Mpts, 4-CH digital oscilloscope)	DS70304
DS70504 (5 GHz, 20 GSa/s, 500 Mpts, 4-CH digital oscilloscope)	DS70504
Standard Accessories	
Power Cord Conforming to the Standard of the Destination Country	-
USB Cable	-
Passive HighZ Probes (500 MHz) x4	RP3500A
Recommended Accessories	
Active Differential Probe (3.5 GHz BW)	PVA8350
Active Differential Probe (7 GHz BW)	PVA8700
Current Probe (50 MHz, 30A)	PCA1030
Current Probe (100 MHz, 30A)	PCA2030
Current Probe (10 MHz, 150A)	PCA1150
High-Voltage Differential Probe (70 MHz, 1500 V)	PHA0150
High-Voltage Differential Probe (100 MHz, 1500 V)	PHA1150
USB-GPIB Adaptor	USB-GPIB
Bandwidth Upgrade Option	
2 Gpts Memory Depth Upgrade Option	DS70000-RL-20
Serial Protocol Analysis Option	
Embedded Serial Bus Trigger and Analysis (RS232/UART, I2C, and SPI)	DS70000-EMBDA
Auto Serial Bus Trigger and Analysis (CAN, CAN-FD, LIN, FlexRay)	DS70000-AUTOA
Audio Serial Bus Trigger and Analysis (I2S)	DS70000-AUDIOA
MIL-STD-1553 Serial Bus Trigger and Analysis	DS70000-AEROA
Measurement Application Option	
Advanced Eye Diagram and Jitter Analysis (Option)	DS70000-JITTA
Compliance Test Software	
USB2.0 Compliance Test	DS70000-USBC
1000 Base-T/100Base-T Ethernet Compliance Test	DS70000-ENETC
100M/1000M Automotive Ethernet Compliance Test	DS70000-AENETC
Real-Time Spectrum Analysis (RTSA)	
Real-Time Spectrum Analysis Function	DS70000-RTSA

DG70000 Series Arbitrary Waveform Generator

Built on its unique SiFi III technical platform and Android-based operating system, the DG70000 series Arbitrary Waveform Generator (AWG) features accurate and adjustable sample rate; generating arbitrary waveforms point by point; recovering the signal without distortion; and etc. This series is customer-oriented with a variety of functions suitable for practical applications. For example, the creation of advanced sequences enables you to self-define complex waveforms. The multi-channel high-precision synchronization, high-bandwidth and low-jitter waveform output make it applicable in a variety of industrial and communications fields. Equipped with a 15.6-inch angle-adjustable touch screen supporting multi-pane windowing, the DG70000 series brings you brand new UI interaction and extraordinary user experience. It has multiple standard configuration interfaces, enabling users to realize remote control over the instruments, offering users more solutions.

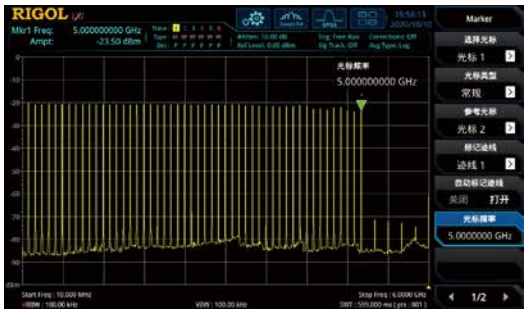
- SiFi III technical platform and Android-based operating system
- Sample rate up to 12 GSa/s
- 4-CH synchronization for a single instrument
- -70 dBc SFDR
- 16-bit vertical resolution
- 1.5 Gpts memory depth per channel
- Generate the carrier waveform signal up to 5 GHz directly
- Generate the arbitrary waveforms point by point; recover the signal without distortion
- Total jitter low as 10 ps_{p-p}, random jitter low as 350 fs_{rms}
- Sample rate adjustable, ranging from 100 Sa/s to 12 GSa/s
- High-precision synchronization, with the channel-to-channel skew repeatability ±10 ps
- Support creating advanced sequence to define outputs of various types of complex waveforms
- Multiple interfaces available: LAN, USB3.0, and HDMI
- Support import of waveform files from the external
- 15.6-inch angle-adjustable display

Variable sample rate from 100 Sa/s to 12 GSa/s for realistic recovering of signal details



With the new technology platform, the adjustable sampling rate from 100 Sa/s to 12 GSa/s can reproduce narrow pulses as low as 400 ps to truly restore the signal.

DC ~ 5 GHz output frequency range to cater to various application scenarios



Provide a wider frequency output range for more application scenarios.

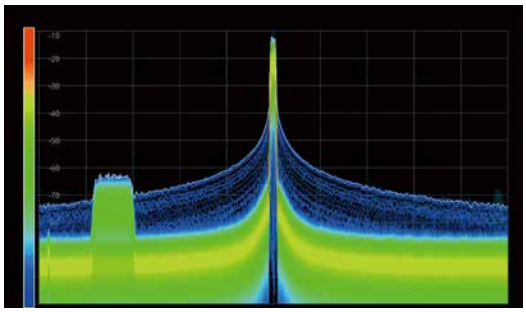
16-bit vertical resolution for more refined level quantization

Compared with 12-bit or 14-bit vertical resolution, the 16-bit vertical resolution and high sample rate make it to produce finer quantization level to ensure the quality of output signal.

Support 1.5 GHz modulation bandwidth to meet a variety of new broadband wireless standards

With up to 1.5 GHz modulation bandwidth and Digital Up Converter (DUC) function, it can, through IQ modulator, output various modulation methods such as 1024 QAM/256 QAM, combined with built-in frequency hopping mode (frequency hopping interval as low as 128 ns), to meet a variety of new broadband wireless standards.

4 Gpts memory depth per channel ensures long duration of signal output at a high sample rate



Provide 1.5 Gpts memory depth per channel. The sequence editor supports up to 16 kpts waveform segments and flexible adjustment to allow long-time signal playback, sequence jumping, etc.

Pure signal with -70 dBc SFDR and 10 ps total jitter

Provide high-purity signal with -70 dBc SFDR, 10 ps total jitter, 350 fs random jitter, to ensure the true effect of the test.

Models and Specifications

Model		DG70002	DG70004
Number of Channels		2	4
Max. Output Frequency		2 GHz (real mode, 5 GSa/s) 4 GHz (complex mode, 10 GSa/s, opt.)	
Sample Rate		100 Sa/s to 12 GSa/s[1]	
Vertical Resolution		16-bit (0 Marker/CH) 15-bit (1 Marker/CH) 14-bit (2 Marker/CH)	
Memory Depth		1.5 Gpts/CH	
Multi-channel Synchronization		Skew Repeatability: ±10 ps	
		Delay Correction Resolution: 3 ps	
Jump		Wait, sync jump, async jump, Go To, and pattern jump	
Sequence Generator		Supported waveform length: 2.4 kpts to 500 Mpts (1.5 Gpts opt.) Min. waveform acquisition: 1 sample points	
Analog Output Amplitude Range	DC High Bandwidth Output (DC HBW)	single-ended, 50 Ω terminated[2]: 350 mVpp to 700 mVpp	
		differential, 100 Ω terminated: 700 mVpp to 1,400 mVpp	
	DC Amplifier Output (DC AMP)	single-ended, 50 Ω terminated: 25 mVpp to 1,000 mVpp	
		differential, 100 Ω terminated: 50 mVpp to 2,000 mVpp	
	AC-Coupled Output (AC)		-20 dBm to +10 dBm
Rise/Fall Time		<120 ps @ 700 mVpp single-ended voltage swing (DC HBW); <160 ps @ 1.0 Vpp single-ended voltage swing (DC AMP)	
Bit Rate (Sample Rate/4 points per cycle)		Max. 1.25 Gb/s	
Jitter		Random Jitter: 350 fs_{rms}; Total Jitter: 10 ps_{p-p}	
Standard Interface		LAN, HDMI, USB3.0 Host (2 on the front panel, 2 on the rear panel), USB Device (on the rear panel), Sync Control interface (on the rear panel, MDR-26)	

Note:
[1]: 5 GSa/s (interpolated: 10 GSa/s for real output; 12 GSa/s for complex output).
[2]: The output terminal that is not in use is recommended to use a 50 Ω load to connect to GND.

Order Information

	Description	Order No.
Standard Accessories	Power Cord Conforming to the Standard of the Destination Country	-
	USB Cable x1	-
	Three 50 Ω, 18 GHz SMA terminators per channel (12 in total)	-
Function Upgrade Options	Digital Up Converter (DUC) and IQ Modulation	DG70000-DIGUP
	Complex Sequence Function	DG70000-SEQ
	High-Speed Serial Waveform Function	DG70000-PJ
	DC Amplifier Output	DG70000-DC
	Multitone & Chirp Mode	DG70000-MTONENL

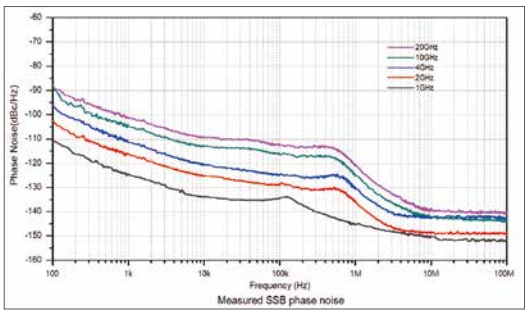
DSG5000 Series Microwave Signal Generator

The DSG5000 series microwave signal generator is a multi-channel phase-coded microwave signal generator with the frequency up to 20 GHz, the output level range from -30 dBm to +25 dBm. The DSG5000 series includes models with 2, 4, 6, or 8 channels. With its high channel-to-channel phase stability, it can meet customers' demand for the application of the multi-channel coherent signals. The DSG5000 series has low phase noise and excellent spurious specifications. Besides the high stability clock (OCXO) option, it is equipped with AM, FM, PM, and Pulse modulation functions, which can be widely used in R&D, production, maintenance, education and training scenarios.

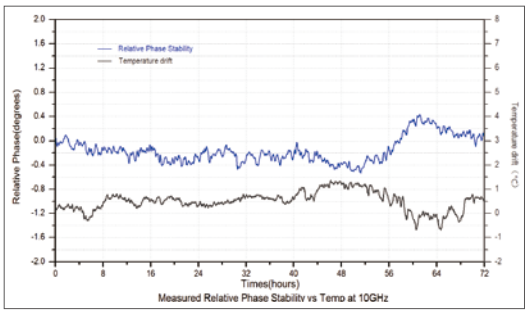
The DSG5000 series is equipped with the Android-based operating system. There are no physical keys except the power key button. The instrument can be controlled by the touch screen, the externally connected mouse, Web Control, and SCPI commands. The user-friendly operation modes has greatly improved the user experience. Besides the touch screen, the DSG5000 series also allows you to connect an external display via the HDMI interface.

- Frequency range: 9 kHz to 20 GHz
- Frequency resolution: 0.01 Hz
- Output level setting range: -30 dBm to +25 dBm
- Amplitude resolution: 0.01 dB
- Phase noise: -133 dBc/Hz@10 kHz, carrier waveform 1 GHz (typ.)
- Full-scale accuracy: <0.7 dB (typ.)
- Switchover time < 3 ms (typ.)
- Channel-to-channel phase stability: <1°@10 GHz
- Channel-to-channel isolation: > 80 dB (typ.)
- Harmonics spurious: <-50 dBc@10 GHz
- Modulation type: AM, FM, PM, and Pulse
- Communication interface: USB and LAN
- Number of channels: 2, 4, 6, and 8
- Structure dimensions: 2U height, full-rack width

Low phase noise



Superb long-term phase stability



High Density, More Compact

DSG5000 series microwave signal generator supports up to 8 channels, with each channel independent of each other and independently controlled. Multiple devices can be integrated in rack mount installation, which improves the integration density and helps simplify the test system setup. With a single instrument, you can achieve stable phase coherence and ultra-low phase noise in the multi-channel signal application, greatly saving your test space and cost.

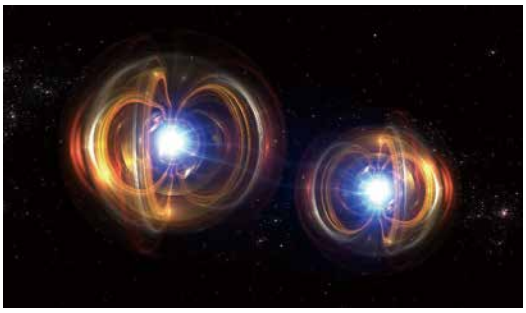
High Scalability, Easier Control

With a standard 2U rack size and rack mount kit, you can extend the channels of the DSG5000 series microwave signal generator for easy integration and application. The front and rear-panel ventilation design provides adequate ventilation to ensure the signal accuracy and stability even if multiple devices are stacked in the cabinet. These considerable designs guarantee your test effects.

High Usability, More Easy

The DSG5000 series microwave signal generator comes with a touch screen and standard USB and LAN interfaces, which can be used to set SCPI commands to realize remote control. Support external PAD, display, projector, etc. through the HDMI port on the rear panel, and realize single-unit remote control through Web Control.

Quantum



Single or multiple quantum bit manipulation is the basis of complex quantum algorithms. The DSG5000 series multi-channel microwave signal generator generates multiple phase-related and ultra-low phase noise microwave signals to provide stable local oscillator signal to achieve multiple quantum bits control. Multiple instruments can be stacked in a rack, with multi-channel phase-coherent output, supporting larger-scale quantum gate operation.

Multiple Modulations

Simultaneous Modulation				
	AM	FM	ΦM	Pulse mod.
AM	—	○	○	△
FM	○	—	×	○
ΦM	○	×	—	○
Pulse Modulation	△	○	○	—

Note: ○ : compatible; ×: incompatible; △ : compatible, but the AM performance will be undermined when pulse modulation is enabled.
Note: Unless otherwise specified, the specifications are applicable to the situation when the modulation source is Sine. The temperature range is from 20°C to 30°C , and the carrier frequency ⩾ 1 MHz.

Models and Specifications

Model		DSG5122/DSG5124/DSG5126/DSG5128	DSG5202/DSG5204/DSG5206/DSG5208
Frequency Range		9 kHz to 12 GHz	9 kHz to 20 GHz
Amplitude Setting Range		-30 dBm to +25 dBm	
Amplitude Accuracy		<0.7 dB (typ.)	
Clock Reference Stability		<0.5 ppm, <5 ppb (with option OCXO-D08)	
Spectral Purity	SSB Phase Noise	CW mode, level > -10 dBm, carrier offset = 10 kHz, 1 Hz measurement bandwidth • f = 1 GHz: <-130 dBc/Hz, <-133 dBc/Hz (typ.) • f= 2 GHz: <-120 dBc/Hz, <-123 dBc/Hz (typ.) • f= 4 GHz: <-114 dBc/Hz, <-117 dBc/Hz (typ.) • f= 10 GHz: <-108 dBc/Hz, <-111 dBc/Hz (typ.) • f= 20 GHz: <-102 dBc/Hz, <-105 dBc/Hz (typ.)	
	Harmonic Distortion	CW mode •<-30 dBc (10 MHz ⩽ f ⩽ 4 GHz, output level ⩽ +10 dBm) •<-50 dBc (4 GHz ⩽ f ⩽ 10 GHz, output level ⩽ +10 dBm) •<-30 dBc (10 GHz ⩽ f ⩽ 20 GHz, output level ⩽ +7 dBm)	
	Non-harmonic Distortion	CW mode, output level > -10 dBm, carrier offset >10 kHz • 1 MHz ⩽ f ⩽ 1.5 GHz: <-60 dBc, <-70 dBc (typ.) • 1.5 GHz < f ⩽ 2.825 GHz: <-70 dBc, <-75 dBc (typ.) • 2.825 GHz < f ⩽ 5.65 GHz: <-64 dBc, <-69 dBc (typ.) • 5.65 GHz < f ⩽ 11.3 GHz: <-58 dBc, <-63 dBc (typ.) • 11.3 GHz < f ⩽ 20 GHz: <-52 dBc, <-57 dBc (typ.)	
Sweep	Sweep Mode	Step/List sweep; Single/Continuous sweep	
	Sweep Points	2 to 1,001	
Modulation Type		AM,FM, PM, and pulse modulation	

AM	Modulation Depth	0% to 100%
	Setting Uncertainty	< 4% of setting value + 1%
	Modulation Frequency Response	<3 dB (m < 80%, DC/10 Hz to 100 kHz)
FM	Max. Deviation	N[1] x 1 MHz
	Setting Uncertainty	<2% of setting value + 20 Hz
	Modulation Frequency Response	<3 dB (10 Hz – 100 kHz)
ØM	Max. Deviation	N[1] x 5 rad
	Setting Uncertainty	<1% of setting value + 0.1 rad
	Modulation Frequency Response	<3 dB (DC/10 Hz to 100 kHz)
Pulse Modulation	On/Off Ratio	>80 dB (typ.) (f ⩽ 6 GHz) >70 dB (typ.) (6 GHz < f ⩽ 11 GHz) >60 dB (typ.) (f > 11 GHz)
	Rise/Fall Time	<50 ns, 20 ns (typ.)
	Pulse Mode	Single pulse, pulse train (option DSG5000-PUG)
General Specifications	Interface	Standard: USB, LAN, and HDMI
		Front panel: RF output, external trigger input [TRIGGER], signal valid output [VALID], pulse input/output [PULSE], and sweep output [SWEEP]
		Rear panel: external modulation input [EXT MOD IN], external reference clock [10MHz IN/OUT], Sync reference clock output [4.8GHz OUT/IN]

Note:
[1]: 9 kHz ⩽ f ⩽ 1.5 GHz, N = 1; 1.5 GHz ⩽ f < 2.825 GHz, N = 0.25; 2.825 GHz< f ⩽ 5.65 GHz, N = 0.5; 5.65 GHz ⩽ f < 11.3 GHz, N = 1; 11.3 GHz < f ⩽ 20 GHz, N=2.

Order Information

	Description	Order No.
Models	DSG5122 (2-CH microwave signal generator, 9 kHz to 12 GHz)	DSG5122
	DSG5124 (4-CH Microwave Signal Generator, 9 kHz to 12 GHz)	DSG5124
	DSG5126 (6-CH Microwave Signal Generator, 9 kHz to 12 GHz)	DSG5126
	DSG5128 (8-CH Microwave Signal Generator, 9 kHz to 12 GHz)	DSG5128
	DSG5202 (2-CH microwave signal generator, 9 kHz to 20 GHz)	DSG5202
	DSG5204 (4-CH Microwave Signal Generator, 9 kHz to 20 GHz)	DSG5204
	DSG5206 (6-CH Microwave Signal Generator, 9 kHz to 20 GHz)	DSG5206
	DSG5208 (8-CH Microwave Signal Generator, 9 kHz to 20 GHz)	DSG5208
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	-
Options	Pulse Modulation	DSG5000-PUL
	Pulse Train Generator	DSG5000-PUG
	Analog Modulation	DSG5000-AMD
	High Stability Clock (OCXO)	OCXO-D08
	Rack Mount Kit	RM2031

Portable Instruments

Big display with compact size, portable to be carried anywhere just with the standard configured Type-C charger to charge for it anytime. In addition to the High-Performance instruments, RIGOL also launches the portable and compact oscilloscopes, function/arbitrary waveform generators, and high-precision digital multimeters, integrating both the functionality and portability. Wherever they are used in the field test or mobile lab, our products can always be counted on, making your work more efficient and convenient. With their accurate measurements and reliable performance, everything is under control with their capabilities. Choose the portable family products to let technology escort you in your journey to success.

7-inch color HD touch screen

Support Type-C power interface

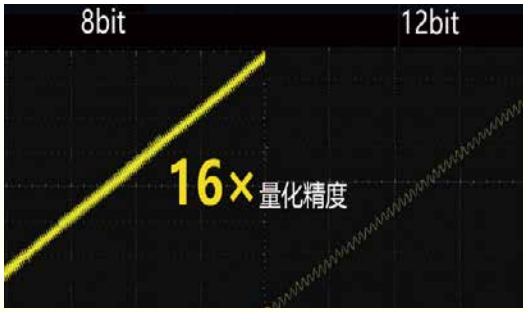
Compact and portable design

Various interfaces for remote connectivity

Portable Digital Oscilloscope

RIGOL launches the brand new portable DHO800/900 series high-resolution digital oscilloscopes. Based on the"Centaurus" technical platform, the DHO800/900 series features a capture rate up to 1,000,000 wfms/s (in UltraAcquire Mode), 50 Mpts memory depth, 12-bit resolution, and low noise. Compared with the traditional 8-bit resolution, the 12-bit vertical resolution provides 16 times the vertical digitizing level of the 8-bit resolution, easy for users to capture the small signals and observe the tiny changes.

12-bit high resolution display



The 12-bit vertical resolution provides 4096 vertical digitizing levels, improving the measurement accuracy to an unprecedented level. Compared with the traditional 8-bit resolution, the 12-bit vertical resolution provides 16 times the vertical digitizing level of the 8-bit resolution, easy for users to capture the small signals and observe the tiny changes. This upgrade significantly enhances waveform measurement accuracy, particularly in critical applications like power ripple testing and medical equipment detection.

Various types of interfaces enable versatile connectivity

Configured with USB, LAN, and HDMI interfaces, the DHO800/900 series caters to diversified application scenarios such as remote control, conference presentations, and teaching, enhancing collaborative efficiency during collaborative work or teaching. Whatever the data sharing in office or interactive teaching in classroom, the DHO800/900 series enables you to transfer information smoothly and realize highly efficient team collaboration, making communication more vivid and direct.

A variety of triggers and decodes

DHO800/900 series has a variety of triggers, such as Edge trigger, Slope trigger, Pulse trigger, etc, and serial protocol decodings like I2C, SPI, RS232, and CAN. The trigger and decoding functions of the DHO800/900 series can accurately capture and interpret the decode information, display the decoding information on the waveforms or present it in the form of event table, making your debugging more convenient and direct.

Floating ground test

The DHO800/900 series supports using the power tank to charge independently, making the floating ground test easy to be carried out.

Note: It is not allowed to be used in the application scenarios where the floating ground voltage is greater than the human safety voltage.

Automobile inspection test

The DHO800/900 series is equipped with various protocol decodings such as CAN, Parallel, RS232/UART, I2C, SPI, and LIN, to meet different test needs of automobile inspection. The portable family products DG900 Pro/800 Pro series function/arbitrary waveform generator works together with the DM858 series digital multimeter to provide inspection and maintenance for the automobiles. The portable and compact instrument provide great convenience for engineers to carry it anytime and anywhere, with the Type-C charger at hand and RIGOL's portable multifunctional instrument bag, to make diversified measurements without the limitation of time and places.

Bode plot analysis

The DHO900S series is equipped with the bode plot analysis function, providing power technical support in the switching power supply loop analysis or component amplitude frequency response test. This standard configuration helps users to accurately evaluate and adjust the circuit performance, providing detailed data analysis in optimizing the complex switching power supply design and electronic component characteristics, conducive to improving technical innovation and performance.

DHO800 Series Digital Oscilloscope

The DHO800 series is a brand new economical digital oscilloscope designed for the vast mainstream digital oscilloscope market to meet their design, debugging, and test demands.
Though compact in design, it has superior performance. Based on the"Centaurus" technical platform, the DHO800 series features a capture rate up to 1,000,000 wfms/s (in UltraAcquire Mode), 25 Mpts memory depth, 12-bit resolution, and low noise, capable of meeting the testing demand in the R&D, education, science and technology fields. The HD touch screen, smart appearance, various interfaces, and other user-friendly designs ensure the high-quality user experience.

- Analog channel bandwidth: 70 MHz for DHO802 and DHO804; 100 MHz for DHO812 and DHO814
- Designed on RIGOL's "Centaurus" technical platform
- Ultra-low noise floor, purer signal, never miss the low-level signals
- Up to 12-bit resolution for all the models of this series
- Max. analog bandwidth of 100 MHz, 4 analog channels, external trigger output (std.) available for the dual-channel model
- Up to 1.25 GSa/s real-time sample rate
- Max. memory depth of 25 Mpts
- Vertical sensitivity range: 500 μV/div to 10 V/div
- Max. capture rate of 1,000,000 wfms/s (in UltraAcquire mode)
- Digital phosphor display with real-time 256-level intensity grading
- Waveform search and navigation function allows you to debug the signal anomalies faster
- 7" (1024x600) capacitive multi-touch screen
- User-friendly Flex Knobs design brings extraordinary user experience
- USB Device & Host, LAN, and HDMI interfaces (std.) for all the models of this series
- Novel and delicate industrial design, easy to operate
- Support online version upgrade

Models and Specifications

Model		DHO802	DHO804	DHO812	DHO814
Analog Bandwidth (-3 dB)		70 MHz		100 MHz	
Rise Time (10% to 90%, typ.)		⩽ 5 ns		⩽ 3.5 ns	
No. of Analog Channels		2 + EXT	4	2 + EXT	4
Sampling Mode		Real-time Sampling			
Max. Sample Rate of Analog Channel		Two-channel model: 1.25 GSa/s (single-channel[1]), 625 MSa/s (full-channel[3]) four-channel model: 1.25 GSa/s (single-channel[1]), 625 MSa/s (dual-channel[2]), 312.5 Msa/s (full-channel[3])			
Max. Memory Depth		Two-channel model: 25 Mpts (single-channel[1]), 10 Mpts (full-channel[3]) four-channel model: 25 Mpts (single-channel[1]), 10 Mpts (dual-channel[2]), 1 Mpts (full-channel[3])			
Max. Waveform Capture Rate		30,000 wfms/s (Vector Mode); 1,000,000 wfms/s (UltraAcquire Mode)			
Vertical Sensitivity Range[4]		500 μV/div to 10 V/div			
Trigger Type		Standard: Edge trigger, Pulse trigger, Slope trigger, Video trigger, Pattern trigger, Duration trigger, Timeout trigger, Runt trigger, Window trigger, Delay trigger, Setup/Hold trigger, Nth Edge trigger, RS232/UART, I2C, SPI, and CAN			
Bus Decoding		Standard: Parallel, RS232/UART, I2C, SPI, and CAN			
DC Gain Accuracy[4]		±1% (>5 mV/div, full scale) ±2% (⩽ 5 mV/div, full scale, typ.)			
Vertical Resolution		12 bits			
Hardware Real-time Waveform Recording and Playing		Max. 500,000 frames			
Waveform Measurement	Number of Measurements	41 auto measurements; and up to 10 measurements can be displayed at a time.			
	Waveform Analysis	Waveform recording, Pass/fail test, histogram, and color grade			
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop			
FFT	Record Length	Max. 1 Mpts (The max. number of the points to be analyzed for the FFT operation is 1 Mpts.)			
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.			
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold			
LCD Size and Type		7'' capacitive multi-touch screen			
Display Resolution		1024X600 (Screen Region) 16:9			
Weight[5]		Package excluded: 1.78 kg Package included: 2.78 kg			

Note:
[1]: Single-channel mode: If any one of the channels is enabled, it is called single-channel mode.
[2]: Dual-channel mode: For four-channel models, if any two of the channels are enabled, it is called dual-channel mode.
[3]: Full-channel mode: For two-channel models, if all of the two channels are enabled, it is called full-channel mode. For four-channel models, if any three channels or all of the four channels are enabled, it is called full-channel mode.
[4]: 500 μV/div is a magnification of 1 mV/div setting. For vertical accuracy calculations, use full scale of 8 mV.
[5]: Standard configuration.

Order Information

Order Information	Order No.
Standard Accessories	
Power Adaptor Conforming to the Standard of the Destination Country	— —
DHO814/DHO804: Passive Probe (150 MHz) x4	PVP3150

DHO900 Series Digital Oscilloscope

DHO900 series is RIGOL's new launched high-performance economical digital oscilloscope. Based on the"Centaurus" technical platform, though compact in design, the DHO900 series has superior performance. It features a capture rate up to 1,000,000 wfms/s (in UltraAcquire Mode), 50 Mpts memory depth, 12 bits resolution, and low noise.
The DHO900 series supports 16 digital channels. One instrument can make an analysis on both the analog and digital signals to meet the embedded design and test scenarios. With an affordable price equivalent to purchasing an entry-level instrument, you can access the auto serial and parallel bus analysis, bode plot analysis, and other functions to meet the test demands in the R&D, education, and scientific research fields.

- Analog channel bandwidth: 125 MHz for DHO914 and DHO914S; 250 MHz for DHO924 and DHO924S
- Ultra-low noise floor, purer signal, never miss the low-level signals
- Up to 12-bit resolution for all the models of this series
- Max. analog bandwidth of 250 MHz, 4 analog channels, 16 digital channels (std.), logic analyzer probe required to be purchased if needed
- Up to 1.25 GSa/s real-time sample rate
- Max. memory depth of 50 Mpts
- Vertical sensitivity range: 200 μV/div to 10 V/div
- Max. capture rate of 1,000,000 wfms/s (in UltraAcquire mode)
- Digital phosphor display with real-time 256-level intensity grading
- Integrates the AFG function, bode plot analysis, histogram, digital signal analysis, and etc.
- Waveform search and navigation function allows you to debug the signal anomalies faster
- 7'' (1024x600) capacitive multi-touch screen
- User-friendly Flex Knobs design brings extraordinary user experience
- USB Device & Host, LAN, and HDMI interfaces (std.) for all the models of this series
- Support online version upgrade

Models and Specifications

Model		DHO914	DHO914S	DHO924	DHO924S
Analog Bandwidth (-3 dB)		125 MHz		250 MHz	
Rise Time (10% to 90%, typ.)		⩽ 2.8 ns		⩽ 1.4 ns	
Range of Time Base		2 ns/div to 500 s/div			
		Fine			
No. of Input/Output Channels		4 input analog channels 16 input digital channels (required to purchase the PLA2216 logic analyzer probe) single-channel arbitrary function generator (AFG) output (only available for the S model)			
Sampling Mode		Real-time Sampling			
Vertical Resolution		12 bits			
Hardware Real-time Waveform Recording and Playing		Max. 500,000 frames			
Max. Sample Rate of Analog Channel		1.25 GSa/s (single-channel[1]), 625 GSa/s (dual-channel[2]), 312.5 GSa/s (full-channel[3])			
Max. Memory Depth		50 Mpts (single-channel[1]), 25 Mpts (dual-channel[2], 10 Mpts (full-channel[3])			
Max. Waveform Capture Rate		30,000 wfms/s (Vector Mode); 1,000,000 wfms/s (UltraAcquire Mode)			
Vertical Sensitivity Range[4]		200 μV/div to 10 V/div			
DC Gain Accuracy[4]		±1% (>5 mV/div, full scale) ±2% (⩽ 5 mV/div, full scale, typ.)			
Trigger Type		Standard: Edge trigger, Pulse trigger, Slope trigger, Video trigger, Pattern trigger, Duration trigger, Timeout trigger, Runt trigger, Window trigger, Delay trigger, Setup/Hold trigger, Nth Edge trigger, RS232/UART, I2C, SPI, CAN, and LIN			
Bus Decoding		Standard: Parallel, RS232/UART, I2C, SPI, LIN, and CAN			
Waveform Measurement	Number of Measurements	41 auto measurements; and up to 10 measurements can be displayed at a time.			
	Waveform Analysis	Waveform recording, Pass/fail test, histogram, and color grade			
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop			
FFT	Record Length	Max. 1 Mpts			
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.			
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold			
LCD Size and Type		7'' capacitive multi-touch screen			
Display Resolution		1024X600 (Screen Region) 16:9			
Weight[5]		Package excluded: 1.78 kg Package included: 2.78 kg			

Note:
[1]: Single-channel mode: If any one of the channels is enabled, it is called single-channel mode.
[2]: Dual-channel mode: If any two of the channels are enabled, it is called dual-channel mode.
[3]: Full-channel mode: If any three channels or all of the four channels are enabled, it is called full-channel mode.
[4]: 200 μV/div and 500 μV/div is a magnification of 1 mV/div setting. For vertical accuracy calculations, use full scale of 8 mV.
[5]: Standard configuration.

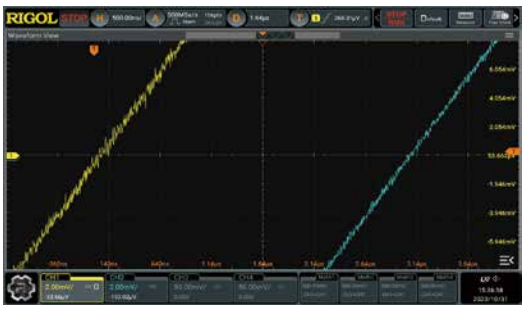
Order Information

Order Information	Order No.
Standard Accessories	
Power Adaptor Conforming to the Standard of the Destination Country	— —
DHO924/DHO924S: Passive Probe (350 MHz) x4	PVP2350
DHO914/DHO914S: Passive Probe (150 MHz) x4	PVP3150
Recommended Accessories	
16-channel Logic Analyzer Probe	PLA2216

Portable Function/Arbitrary Waveform Generator

Based on the dedicated SiFi® II high-fidelity signal synthesis techniques, the brand new DG800 Pro/900 Pro series portable function/arbitrary waveform generator launched by RIGOL can generate signals characterized with low noise, low distortion, and low jitter. The DG900 Pro series can provide a max. output frequency of 200 MHz, max. sample rate of 1.25 GSa/s, 16-bit vertical resolution, memory depth of 32 Mpts. The 60 MHz square output frequency and 3 ns rise/fall time provide accurate and reliable test support in the testing and measuring work for engineers.

Excellent accuracy



1.25 GSa/s sample rate, 16-bit vertical resolution, easy to create high-fidelity signals

Ultra-low jitter

RIGOL's unique SiFi II technology enables the DG800Pro/900Pro series to generate the arbitrary waveforms point by point; recover the signal without distortion; sample rate accurate and adjustable; jitter of the generated signals is lower than that of signal generated by the traditional DDS signal generator, jitter as low as 200 ps (RMS).

Various modulation types

Supports rich modulation functions (AM, FM, PM, ASK, FSK, PSK, PWM, and SUM modulation functions) to meet the requirements of communication principles, motor control, switching power supply and other application scenarios.

Sequence function

Supports up to 64 waveform events, 256 loops, and able to load multiple test cases in a sequence that require sequential execution at a time to switch over the test cases seamlessly, thus greatly improving testing efficiency.

Fast rising time

60 MHz square wave and 50 MHz adjustable edge pulse wave output, with waveform rise time as low as 3 ns, meeting the waveform requirements of different application scenarios.

1 GHz frequency counter

The portable Function/Arbitrary Waveform Generator series supports up to 1 GHz measurement frequency, capable of measuring the frequency of common high-frequency signals such as VHF and UHF for relevant debugging.

DG800 Pro Series Function/Arbitrary Waveform Generator

DG800 Pro series function/arbitrary waveform generator provides up to 625 MSa/s sample rate and 2 Mpts/CH memory depth (std.). It is a cost-effective function/arbitrary waveform generator that combines multiple functions including Function Generator, Arbitrary Waveform Generator, Noise Generator, Pulse Generator, Harmonic Generator, Analog/Digital Modulator and Counter.

- Up to 625 MSa/s sample rate
- Max. output frequency: 50 MHz
- 16-bit vertical resolution
- Arbitrary waveform editing function with a max. Arb waveform length of 2 Mpts/CH (8 Mpts/CH optional)
- Built-in max. 20th order harmonics generator
- Independent signal frequency measurement channel with a max. frequency of 500 MHz
- USB and LAN interfaces for remote connection
- Type-C power interface for charging the instrument with mobile power source, satisfying the requirements of the field testing.
- Standard Web Control function for easier remote operation

Models and Specifications

Model		DG821 Pro	DG822 Pro	DG852 Pro
Max. Output Frequency		25 MHz	25 MHz	50 MHz
No. of Channels		1	2	2
Sample Rate		625 MSa/s		
Waveform Type		Waveform: Sine, Square, Ramp, Pulse, Noise, Arb, Harmonic. 148 types of Arb waveforms, including Sinc, Exponential Rise, Exponential Fall, ECG, Gaussian, HaverSine, Lorentz, and etc.		
Waveform Memory Depth		2 Mpts/CH (std.), 8 Mpts/CH (opt.)		
Vertical Resolution		16-bit		
Sine		1 μHz to 25 MHz	1 μHz to 25 MHz	1 μHz to 50 MHz
Square		1 μHz to 20 MHz	1 μHz to 20 MHz	1 μHz to 40 MHz
Ramp		1 μHz to 1 MHz		
Pulse		1 μHz to 10 MHz	1 μHz to 10 MHz	1 μHz to 25 MHz
Arb		1 μHz to 10 MHz	1 μHz to 10 MHz	1 μHz to 15 MHz
Harmonic		1 μHz to 10 MHz	1 μHz to 10 MHz	1 μHz to 15 MHz
Noise (-3 dB)		0 dBm (typ.), >250 MHz bandwidth		
Sine Wave Spectrum Purity		Total Harmonic Distortion (THD): 1 Vpp (typ.) 10 Hz to 20 kHz: <0.1% Phase Noise: 1 Vpp, 10 kHz (typ.) 20 MHz: <-110 dBc/Hz		
Square Rise/Fall Time		⩽ 2 Vpp amplitude, 50 Ω load (typ.), ⩽ 3 ns		
Jitter (rms)		0 dBm amplitude, >1 kHz frequency (typ.), 200 ps		
Output Amplitude	Into 50 Ω	1 mVpp to 10 Vpp		
	Into HighZ	2 mVpp to 20 Vpp		
Modulation Type		AM, FM, PM, ASK, FSK, PSK, PWM, SUM		
Output Mode		Continuous, Modulation, Sweep, Burst, Sequence		
Sequence Characteristics		Sequence Length: 32 pts/CH to 2 Mpts (opt. 8 Mpts/CH) No. of Waveform Entries: 64 Loop: 0 to 256		
Standard Interface		USB Device (on the rear panel), USB Host (on the front panel), LAN (on the rear panel)		

Order Information

	Description	Order No.
Standard Accessories	Power Adaptor Conforming to the Standard of the Destination Country	-
	USB Cable	-
	BNC Cable x1	CB-BNC-BNC-MM-100
Options	8 Mpts Memory Depth Upgrade Option	DG800Pro-3RL
	Two-channel Upgrade Option (for DG821 Pro only)	DG800Pro-DCH
Accessories	40 dB Attenuator (50 Ω, 1 W)	RA5040K

DG900 Pro Series Function/Arbitrary Waveform Generator

DG900 Pro series function/arbitrary waveform generator provides up to 1.25 GSa/s sample rate and 16 Mpts/CH memory depth (std.). It is a cost-effective dual-channel function/arbitrary waveform generator that combines multiple functions including Function Generator, Arbitrary Waveform Generator, Noise Generator, Pulse Generator, Harmonic Generator, Analog/Digital Modulator and Counter.

- Up to 1.25 GSa/s sample rate
- Max. output frequency: 200 MHz
- 16-bit vertical resolution
- Arbitrary waveform editing function with a max. Arb waveform length of 16 Mpts/CH (32 Mpts/CH optional)
- Built-in max. 20th order harmonics generator
- Independent signal frequency measurement channel with a max. frequency of 1 GHz
- USB and LAN interfaces for remote connection
- Type-C power interface for charging the instrument with mobile power source, satisfying the requirements of the field testing.
- Standard Web Control function for easier remote operation

Models and Specifications

Model		DG902 Pro	DG912 Pro	DG922 Pro
Max. Output Frequency		70 MHz	150 MHz	200 MHz
No. of Channels		2		
Sample Rate		1.25 GSa/s		
Waveform Type		Standard Waveform: Sine, Square, Ramp, Pulse, Noise, Arb, Harmonic Arbitrary Waveform: 148 types of waveforms, including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, etc.		
Waveform Memory Depth		16 Mpts/CH (std.), 32 Mpts/CH (opt.)		
Vertical Resolution		16-bit		
Sine		1 μHz to 70 MHz	1 μHz to 150 MHz	1 μHz to 200 MHz
Square		1 μHz to 60 MHz		
Ramp		1 μHz to 3 MHz	1 μHz to 5 MHz	1 μHz to 5 MHz
Pulse		1 μHz to 50 MHz		
Arb		1 μHz to 30 MHz	1 μHz to 50 MHz	1 μHz to 50 MHz
Harmonic		1 mHz to 35 MHz	1 mHz to 75 MHz	1 mHz to 100 MHz
Noise (-3 dB)		0 dBm (typ.), >250 MHz bandwidth		
Sine Wave Spectrum Purity		Total Harmonic Distortion (THD): 1 Vpp (typ.) 10 Hz to 20 kHz: <0.1% Phase Noise: 1 Vpp, 10 kHz (typ.) 20 MHz: <-110 dBc/Hz		
Square Rise/Fall Time		⩽ 2 Vpp amplitude, 50 Ω load (typ.), ⩽ 3 ns		
Jitter (rms)		0 dBm amplitude, >1 kHz frequency (typ.), 200 ps		
Output Amplitude	Into 50 Ω	⩽ 50 MHz: 1 mVpp to 10 Vpp ⩽ 100 MHz: 1 mVpp to 5 Vpp ⩽ 200 MHz: 1 mVpp to 2 Vpp		
	Into HighZ	⩽ 50 MHz: 2 mVpp to 20 Vpp ⩽ 100 MHz: 2 mVpp to 10 Vpp ⩽ 200 MHz: 2 mVpp to 4 Vpp		
Modulation Type		AM, FM, PM, ASK, FSK, PSK, PWM, SUM		
Output Mode		Continuous, Modulation, Sweep, Burst, Sequence		
Sequence Characteristics		Sequence length: 32 pts/CH to 16 Mpts/CH (opt. 32 Mpts/CH) No. of Waveform Entries: 64 Loop: 0 to 256		
Standard Interface		USB Device (on the rear panel), USB Host (on the front panel), LAN (on the rear panel)		

Order Information

	Description	Order No.
Standard Accessories	Power Adaptor Conforming to the Standard of the Destination Country	-
	USB Cable x1	-
	BNC Cable x1	CB-BNC-BNC-MM-100
Options	32 Mpts Memory Depth Upgrade Option	DG900Pro-3RL
Accessories	40 dB Attenuator (50 Ω, 1 W)	RA5040K

Portable Digital Multimeter

RIGOL's newly launched DM858 series is an economical 5.5-digit benchtop digital multimeter. It features high precision, multifunction, easy operation, large screen, and compact size. It provides USB and LAN interfaces and supports remote control. It is compact and supported by a desktop stand. The Type-C interface allows you to charge the instrument with an mobile power supply, making on-site testing more convenient. Its high precision and flexible operation experience make it the best choice for engineers.

Slim and light body with comprehensive functionality

Compared with the previous generation product DM3058, DM858 series has a slim and light body but with a wider screen for clear view. The depth of the instrument is only 80 mm, making it a desktop digital multimeter that saves a lot of desktop space.

Wider screen, clearer view

The DM858 series is equipped with a 7-inch color touch screen display with a resolution of 1024x600.
The main and secondary display areas allow you to simultaneously view readings, instrument status, statistical information, and other contents without the need to switch back and forth between interfaces. The spacious screen and touch screen design makes it easy to set measurement settings and view results.

5.5-digit reading

The 5.5-digit reading resolution and 125 readings/s measurement rate make it applicable for fast measurement. The 500,000 points logging memory allows it to record more test data for analysis.

11 input signal measurements

Supports 11 types of measurements, including DCV, DCI, ACV, ACI, 2WR, 4WR, Frequency/Period, Capacitance, Continuity, Diode, and Sensor, providing various choices for measurements.

Graphical display and mathematical operation functions

Supports three graphical displays: trend, histogram, and bar chart. It also provides various mathematical functions such as statistical operations, limit operation, dB/dBm, and relative operations, allowing for a more intuitive observation and analysis of changes in test values.

"Any sensor" measurement

10 sets of standard sensor configurations are preset, with built-in thermocouple cold junction temperature. Users can easily configure various types of sensors such as Pressure Sensor, Flux Sensor, and Temperature Sensor.

DM858 Series Digital Multimeters

The DM858 series desktop digital multimeter is an economical electronic measuring instrument. With 5.5-bit resolution, 125 readings/s, 500,000 points logging memory, 0.03% DCV annual accuracy, 11 measurement functions for input signals, 5 Math operations, and 3 graphical display types, the DM858 series can meet most of your test requirements and applicable in the lab scenario. The 7-inch color touch screen enables you to view the test results clearly. The standard configuration of the USB and LAN interfaces allows you to control the instrument with the mouse. Web control mode is also supported. The diversified operation modes provide users with friendly user experience. The Type-C interface allows you to charge the instrument with an mobile power supply. Its compact and slim size makes it portable and supports to be attached to the desktop stand, saving bench space for engineers and making on-site testing more convenient.

- Max. reading rate: 125 readings/s
- Up to 500,000 points logging memory to record and analyze more data
- 5.5-digit resolution
- True RMS AC voltage and AC current measurement
- Built-in 10 groups of data storage and 10 groups of setup storage
- Powerful math operation, support various application protocols
- 7" color touch screen, available to display the results of basic measurement and secondary measurements
- Type-C interface for power charge, compact and thin size, saving workbench space
- Standard USB and LAN interfaces, supporting Web Control

Models and Specifications

Function	Range		Optimal Annual Accuracy ±(% of reading + % of range) (Tcal23°C ±5°C)	
	DM858	DM858E	DM858	DM858E
DC Voltage (DCV)	100.000 mV to 1000.00 V	100.000 mV to 1000.00 V	0.03 + 0.003	0.06 + 0.003
DC Current	100.000 µA to 10.0000 A	100.000 µA to 3.00000 A	0.055 + 0.005	0.055 + 0.005
AC Voltage (RMS)	100.000 mV to 750.000 V	100.000 mV to 750.000 V	0.2 + 0.1	0.2 + 0.1
AC Current (RMS)	100.0000 µA to 10.00000 A	100.0000 µA to 3.00000 A	0.50 + 0.10	0.50 + 0.10
Resistance	100.000 Ω to 50.0 MΩ	100.000 Ω to 100.000 MΩ	0.050 + 0.020	0.050 + 0.020
Diode Test	2.000 V/350 µA	2.000 V/350 µA	0.050 + 0.15	0.050 + 0.15
Continuity Test	1000 Ω/100 µA	1000 Ω/100 µA	0.3 + 0.15	0.3 + 0.15
Period/Frequency	20 Hz to 100 kHz (100 mV to 750 V)	20 Hz to 100 kHz (100 mV to 750 V)	0.01 + 0.003	0.01 + 0.003
Capacitance	1.000 nF to 10.0 mF	1.000 nF to 1.000 mF	1 + 0.5	1 + 0.5
Max. Reading Speed	-	-	125 rdgs/s	80 rdgs/s
Volatile Memory	-	-	500,000 readings of history records	2,000 readings of history records

Order Information

	Description	Order No.
Models	DM858 (5.5-digit Digital Multimeter)	DM858
	DM858E (5.5-digit Digital Multimeter)	DM858E
Standard Accessories	Test Lead x2 (black and red)	LD-DM
	Alligator Clip x2 (black and red)	ALLIGATORCLIP-DMM
	2 Backup Fuses: DM858: AC, 250 V, F10 A DM858E: AC, 250 V, F3.15 A	-
	Power Cord Conforming to the Standard of the Destination Country	-
Optional Accessories	Kelvin Test Clip	KELVINTESTCLIP-DMM
	USB Cable x1, 150 cm	CB-USBA-USBB-FF-150

Digital Oscilloscope

Digital oscilloscope, an essential instrument for the design, manufacturing, and maintenance of electronic equipment, is used by electronic engineers to observe various analog and digital signals to locate and resolve the problem in their designing and debugging work. DS70000 is the digital oscilloscope with the bandwidth up to 5 GHz. It adopts RIGOL's self-developed core technical platform, greatly enhancing the compliance and reliability of the digital oscilloscope. The full memory hardware measurement technology ensures high measurement accuracy.

The histogram analysis and waveform search functions offer users a more efficient way to accurately locate and analyze the waveforms. The innovative UltraVision and UltraVision II platform enables RIGOL to deliver products with high waveform capture rate, deep memory depth, full memory hardware measurement, multi-level intensity grading display, and hardware waveform recording and playback. Now RIGOL has developed a series of digital oscilloscopes (including MSO/DS1000Z, DS1000Z-E, MSO5000, MSO5000-E, MSO/DS7000, MSO8000/A, DS8000-R, DHO1000/DHO4000, DHO900/DHO800, and DS70000 to meet different customer needs and help engineers to improve the testing efficiency.

Model	No. of Analog Channels	Digital Channels (MSO)	Max. Sample Rate	Max. Memory Depth	Signal Generator	Bandwidth (MHz)																	
						13000	8000	5000	3000	2000	1000	800	600	500	400	350	250	200	150	125	100	70	50
DS70000	4	--	20 GSa/s	2 Gpts (Optional)	--			●	●														
DS8000-R	4	--	10 GSa/s	500 Mpts	●					●	●					●							
MSO8000	4	16	10 GSa/s	500 Mpts	●					●	●		●										
MSO/DS7000	4	16	10 GSa/s	500 Mpts	●①									●		●		●			●		
MSO5000	2/4	16	8 Gsa/s	200 Mpts	●											●		●	●		●	●	
DHO4000	4	--	4 GSa/s	500 Mpts (Optional)	--							●			●			●					
DHO1000	2/4	--	2 GSa/s	100 Mpts (Optional)	--													●			●	●	
DHO900	4	16	1.25 GSa/s	50 Mpts (Optional)	●												●			●			
DHO800	2/4	--	1.25 GSa/s	25 Mpts (Optional)	--																●	●	
DS1000Z-E	2	--	1 GSa/s	24 Mpts	--													●			●		
DS1000Z	2/4	16②	1 GSa/s	24 Mpts	●													●			●	●	●

● Standard or Option, could be supported.
① Option available for MSO models
② Only Plus Models support

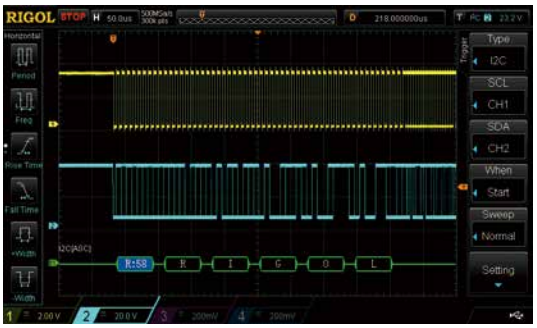
DS1000Z Series Digital Oscilloscope

The DS1000Z series digital oscilloscope is a high-performance and economical oscilloscope designed to meet the designing, debugging, and teaching requirements of the mainstream oscilloscope market. Among them, the mixed signal oscilloscope designed for embedded design and testing has 16 digital channels, allowing users to measure the analog and digital signals simultaneously.

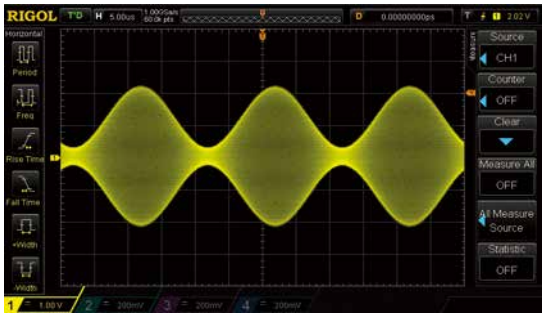
- Analog channel bandwidth: 100 MHz, 70 MHz, 50 MHz
- 4 analog channels, 16 digital channels (only for DS1000Z Plus)
- Real-time sample rate up to 1 GSa/s
- Memory depth up to 24 Mpts
- Up to 30,000 wfms/s waveform capture rate
- Up to 60,000 frames of hardware real-time and ceaseless waveforms recording and playback functions
- Innovative UltraVision technology
- Various trigger and bus decoding functions
- Low noise floor, vertical scale range: 1 mV/div to 10 V/div
- Built in 25 MHz dual-channel Function/Arbitrary Waveform Generator (only for digital oscilloscope with signal source channels)
- Various interfaces: USB Host & Device, LAN (LXI), AUX
- Novel and delicate industrial design, easy to use
- 7-inch WVGA (800×480), multi-level intensity grading display

4 Standard Analog Channels

Standard Serial Bus Trigger and Decoding Functions

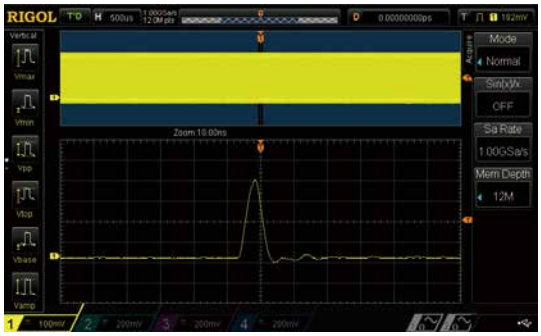


Intensity Graded Color Display

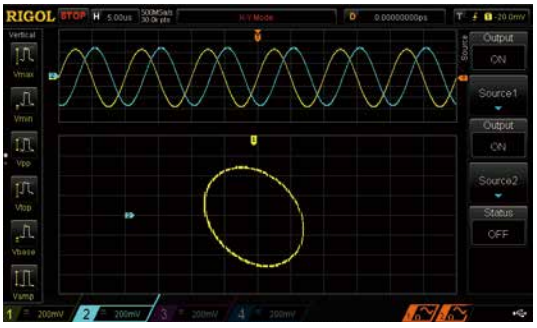


Mixed Signal Analysis with Analog and Digital Channels

Deeper Memory (Std.24 Mpts)



Built-in Dual-Channel 25 MHz Source (-S Model)



Models and Key Specifications

Model	DS1104Z Plus DS1104Z-S Plus	DS1074Z Plus DS1074Z-S Plus	DS1054Z
Analog Bandwidth	100 MHz	70 MHz	50 MHz
Analog Channels	4		
Digital Channels	16 digital channels for DS1000Z Plus model		--
Max. Sample Rate	Analog Channel: 1 GSa/s (Single-channel), 500 MSa/s (Dual-channel), 250 MSa/s (4-CH); Digital Channel (only available for Plus model): 1 GSa/s (8-CH), 500 Msa/s (16-CH)		
Memory Depth	Analog Channel: 24 Mpts(Single-channel), 12 Mpts(Dual-channel), 6 Mpts(4-CH); Digital Channel (only available for Plus model): 24 Mpts (8-CH)/12 Mpts(16-CH)		
Max. Waveform Capture Rate	30,000 wfms/s		
Timebase Scale	5 ns/div to 50 s/div		
Input Impedance	Analog Channel: (1 MΩ±2%)||(13 pF±3 pF); Digital Channel (only available for PLUS model): (100 kΩ±1%)||(8 pF±3 pF)		
Vertical Sensitivity Range	Analog Channel: 1 mV/div to 10 V/div Digital Channel (only available for Plus model): Threshold adjustable for each group of 8 channels, threshold range ±15 V, in 10 mV step		
DC Gain Accuracy	<10 mV: ±4% of full scale; ⩾ 10 mV: ±3% of full scale		
Waveform Record and Analysis	Up to 60,000 Frames		
Standard Trigger Function	Edge, Pulse, Slope, Video, Pattern, Duration, Setup/Hold, RS232/UART, I2C, SPI, Runt, Window, Nth Edge, Delay trigger, and Timeout		
Bus Decoding	Parallel decoding, serial bus decoding: RS232/UART, I2C, and SPI		
Waveform Calculation	A+B, A-B, A×B, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, and Filter		
Auto Measurements	37 types		
Interface	USB Host (support USB-GPIB), USB Device, LAN (LXI), AUX (TrigOut/PassFail)		
Display	7.0-inch WVGA (800×480) TFT LCD display, 64-level intensity grading display		

DS1XX4Z-S Plus, built-in dual-channel 25 MHz Function/Arbitrary Waveform Generator

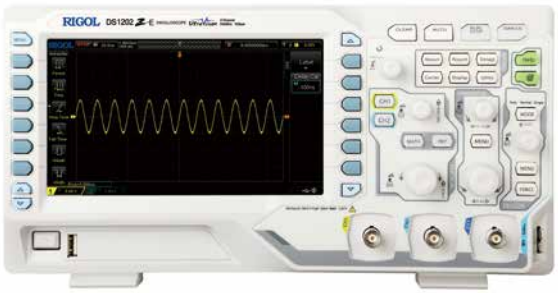
No. of Channels	Max. Sample Rate	Vertical Resolution	Max. Frequency	Amplitude Range	Waveform Length	Output Waveforms
2	200 MSa/s	14 bits	25 MHz	20 mVpp-5 Vpp (HighZ)	16K	Sine, Square, Ramp, Pulse, Noise, DC, Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, Haversine, User-defined

Order Information

	Description	Order No.
Models	DS1054Z (50 MHz, 4-CH)	DS1054Z
	DS1074Z Plus (70 MHz, 4-CH, MSO ready)	DS1074Z Plus
	DS1074Z-S Plus (70 MHz, 4-CH, 2-CH source, upgradeable to 16-CH)	DS1074Z-S Plus
	DS1104Z Plus (100 MHz, 4-CH, MSO ready)	DS1104Z Plus
	DS1104Z-S Plus (100 MHz, 4-CH, 2-CH source, upgradeable to 16-CH)	DS1104Z-S Plus
Standard Accessories	4 passive probes (1X: 20 MHz/10X: 150 MHz BW, available for 4-CH model)	PVP3150
	USB cable	CB-USBA-USBB-FF-150
	Power cord conforming to the standard of the destination country	--
Standard Options	Memory depth option	MEM-DS1000Z
	Waveform recording option	REC-DS1000Z
	Serial protocol analysis option	SA-DS1000Z
	Advanced trigger option	AT-DS1000Z
RPL1116	MSO upgrade for DS1000Z Plus only	RPL1116

For probes and optional accessories, please refer to the“Probes and Accessories Selection Guide”section

DS1000Z-E Series Digital Oscilloscope



The DS1000Z-E series digital oscilloscopes are high-performance and economical digital oscilloscopes for e-commerce designed by RIGOL to meet mainstream needs.

- Analog channel bandwidth: 200 MHz (DS1202Z-E); 100 MHz (DS1102Z-E)
- 2 analog channels
- 1 GSa/s real-time sample rate
- Memory depth up to 24 Mpts
- Up to 30,000 wfms/s waveform capture rate
- Up to 60,000 frames of hardware real-time and ceaseless waveforms recording and playback functions
- Innovative UltraVision technology
- Various trigger and bus decoding functions
- Low noise floor, vertical scale range: 500 uV/div to 10 V/div
- Various interfaces: USB Host & Device, LAN (LXI), AUX
- Novel and delicate industrial design, easy to use
- 7-inch WVGA (800×480) TFT LCD, intensity graded color display

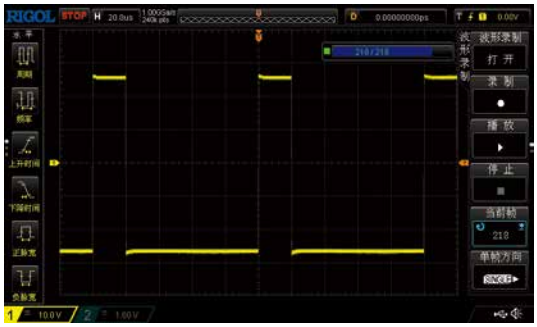
30,000 wfms/s Waveform Capture Rate

30,000 wfms/s waveform capture rate makes it easier to catch occasional abnormal signals.

24 Mpts Memory Depth

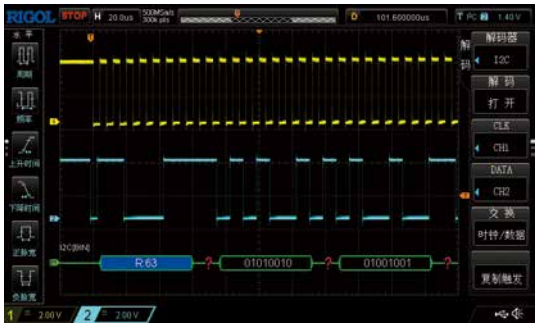
Standard 24 Mpts memory depth enables users to observe the overall and detailed waveforms, without missing any variations of the waveforms at a high sample rate for a long duration.

Hardware Waveform Recording and Playback Functions



Provide waveform recording option, record waveform changes, play back the waveforms easily, and locate the faults accurately.

Serial Bus Trigger and Decoding Functions



Provide bus trigger and decoding options, supporting RS232/UART, I2C, and SPI.

Digital Fluorescent Display

The intensity graded color display provides the fluorescent display effect, making the waveform changes obviously to be seen.

Various Trigger Functions

Models and Key Specifications

Model	DS1202Z-E	DS1102Z-E
Analog Bandwidth	200 MHz	100 MHz
No. of Analog Channels	2	
Max. Sample Rate	1 GSa/s (Single-channel), 500 Msa/s (Dual-channel)	
Max. Memory Depth	Standard 24 Mpts (Single-channel), 12 Mpts (Dual-channel) .	
Max. Waveform Capture Rate	30,000 wfms/s	
Hardware real-time waveform recording and playback functions	Up to 60,000 Frames	
Timebase Scale	2 ns/div to 50 s/div	
Input Impedance	(1 MΩ±1%) || (15 pF±3 pF)	
DC Gain Accuracy	<10 mV: ±4% of full scale ⩾ 10 mV: ±3% of full scale	
Vertical Scale (Probe ratio is 1X)	1 mV/div to 10 V/div	
Standard Trigger Function	Edge, Pulse, Slope, Video, Pattern, Duration, Setup/Hold, RS232/UART, I2C, SPI, Runt, Window, Nth Edge, Delay trigger, and Timeout	
Bus Decoding	Parallel decoding, serial bus decoding: RS232, I2C, and SPI	
Waveform Calculation	A+B, A-B, A×B, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, and Filter	
Auto Measurements	Period, Frequency, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, tVmax, tVmin, Positive Rate, Negative Rate, Delay 1 → 2 , Delay 1 → 2 , Phase 1 → 2 , Phase 1 → 2 , Maximum, Minimum, Peak-Peak Value, Top Value, Bottom Value, Amplitude, Upper Value, Middle Value, Lower Value, Average, Vrms, Overshoot, Pre-shoot, Area, Period Area, Period Vrms, and Variance	
Interface	USB Host, USB Device, LAN, Aux Output (TrigOut/PassFail)	
Display	7-inch WVGA (800×480), multi-level intensity grading display	

Order Information

Description		Order No.
Models	DS1202Z-E (200 MHz, 2 analog channels)	DS1202Z-E
	DS1102Z-E (100 MHz, 2 analog channels)	DS1102Z-E
Standard Accessories	Power cord conforming to the standard of the destination country	-
	USB cable	CB-USBA-USBB-FF-150
	2 passive probes (350 MHz PVP2350, only available for DS1202Z-E)	PVP2350
	2 passive probes (150 MHz PVP3150, only available for DS1102Z-E)	PVP3150
Optional Accessories	Rack mount kit	RM-DS1000Z

Note: For all the mainframes, accessories and options, please contact the local office of RIGOL.

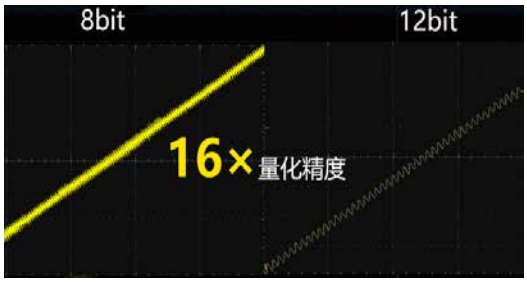
DHO1000 Series Digital Oscilloscope

The DHO1000 series oscilloscope is designed for the vast mainstream digital oscilloscope market to meet their design, debugging, and test demands. Built on RIGOL's Centaurus technical platform, the DHO1000 series delivers the waveform capture rate up to 1,500,000 wfms/s in UltraAcquire mode, 100 Mpts memory depth, 12-bit vertical resolution, excellent noise floor performance, and vertical measurement accuracy to meet the high-precision measurement requirements, bringing extraordinary test and measurement experience for you.

- Analog channel bandwidth: 70 MHz (DHO1072 and DHO1074); 100 MHz (DHO1104 and DHO1102); 200 MHz (DHO1204)
- Built on RIGOL's Centaurus technical platform
- Ultra-low noise floor delivers purer signal and never miss the low-level signals
- 12-bit vertical resolution for all the DHO1000 series[1]
- 70/100/200 MHz analog bandwidth models, 2/4 analog channels, and 1 EXT channel
- Up to 2 GSa/s real-time sample rate
- Max. memory depth: 100 Mpts (optional)
- Vertical sensitivity range: 500 μV/div to 10 V/div
- Up to 1,500,000 wfms/s waveform capture rate in UltraAcquire mode
- 10.1-inch 1280x800 HD touch display
- User-friendly Flex knob, bringing smoother interaction
- Standard photoelectric encoder operating knobs, effectively prolonging its service life
- Standard USB Device & Host, LAN, and HDMI interfaces

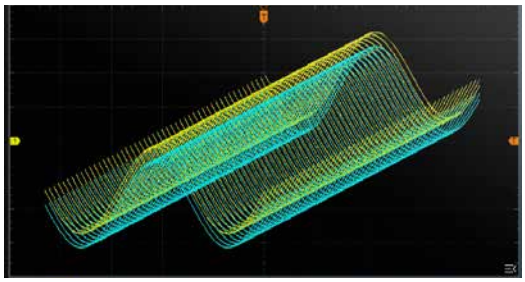
Notes:
[1]: 16 bits in high resolution mode.

12-bit Vertical Resolution



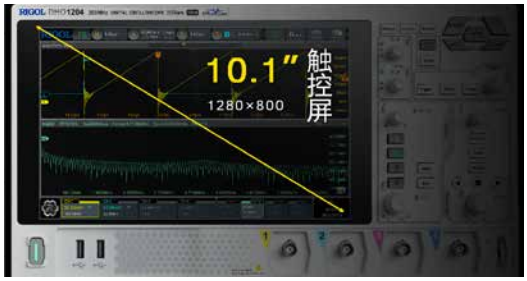
The 12-bit vertical resolution provides 4096 vertical digitizing levels, 16 times the vertical digitizing level of the 8-bit resolution, easy for users to capture the small signals and observe the tiny changes.

UltraAcquire Mode



Up to 1,500,000 wfms/s waveform capture rate in UltraAcquire mode, capable of capturing any abnormal waveform.

10.1-inch HD Touch Screen



10.1-inch HD touch screen designed for better touch interactions.

Flex Knob

Flex Knobs bring more effective interaction and easier measurements.

Photoelectric Encoder

Standard photoelectric encoder with 34 years service life to guarantee your fixed assets.

Ultra-Low Noise Floor

Ultra-low noise floor for the DHO series oscilloscopes as low as 18 μVrms, easy to capture smaller signals.

Models and Key Specifications

Model		DHO1072	DHO1074	DHO1102	DHO1104	DHO1202	DHO1204
Analog Bandwidth (-3 dB)		70 MHz	70 MHz	100 MHz	100 MHz	200 MHz	200 MHz
No. of Input Channels		2 + EXT	4 + EXT	2 + EXT	4 + EXT	2 + EXT	4 + EXT
Rise Time (50 Ω, 10% to 90%, typical)		⩽ 5 ns	⩽ 5 ns	⩽ 3.5 ns	⩽ 3.5 ns	⩽ 1.75 ns	⩽ 1.75 ns
Timebase Scale		2 ns/div to 1 ks/div					
		Fine					
Max. Sample Rate of Analog Channel		Two-channel model: 2 GSa/s (single-channel[1]), 1 GSa/s (full-channel[3]) Four-channel model: 2 GSa/s (single-channel[1]), 1 GSa/s (half-channel[2]), 500 MSa/s (full-channel[3])					
Standard Memory Depth		Two-channel model: 50 Mpts (single-channel[1]), 25 Mpts (full-channel[3]) Four-channel model: 50 Mpts (single-channel[1]), 25 Mpts (half-channel[2]), 12.5 Mpts (full-channel[3])					
Optional Memory Depth		Two-channel model: 100 Mpts (single-channel[1]), 50 Mpts (full-channel[3]) Four-channel model: 100 Mpts (single-channel[1]), 50 Mpts (half-channel[2]), 25 Mpts (full-channel[3])					
Max. Waveform Capture Rate		50,000 wfms/s (Vector Mode); 1,500,000 wfms/s (UltraAcquire Mode)					
Vertical Sensitivity Range[4]		500 uV/div to 10 V/div					
DC Gain Accuracy[4]		± 2% of full scale					
Vertical Resolution		12-bit					
Hardware Real-time Waveform Recording and Playback		Max. 500,000 frames					
Trigger Type		Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, Nth Edge, I2C, SPI, RS232/UART, CAN, and LIN					
Bus Decoding		Standard: Parallel, RS232/UART, I2C, SPI, LIN, and CAN					
Waveform Measurement		41 auto measurements; and up to 14 measurements can be displayed at a time.					
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop					
Enhanced FFT	Record Length	Max. 1 Mpts					
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.					
	Peak Search	A maximum of 15 peaks, confirmed by the settable threshold and offset threshold set by users					
Interface		USB3.0 Host, USB3.0 Device, LAN, Web Control, AUX Out, 10 MHz In/Out, HDMI, and Probe Compensation Output					
LCD Size and Type		10.1-inch capacitive multi-touch screen, gesture enabled operation					
Display Resolution		1280×800					
Dimensions		358.14 mm (W) x 214.72 mm (H) x 120.62 mm (D)					
Weight[5]		Package excluded: 3.8 kg					
		Package included: 5.37 kg					

Notes:
[1]: Single-channel mode: If any one of the channels is enabled, it is called single-channel mode.
[2]: Half-channel mode: For four-channel models, if any two of the channels are enabled, it is called half-channel mode.
[3]: Full-channel mode: For two-channel models, if all of the two channels are enabled, it is called full-channel mode. For four-channel models, if any three channels or all of the four channels are enabled, it is called full-channel mode.
[4]: 500 uV/div is a magnification of 1 mV/div. For vertical accuracy calculations, use full scale of 8 mV.
[5]: Standard configuration.

Order Information

Order Information		Order No.
Standard Accessories	Power Cord Conforming to the Standard of the Destination Country	— —
	USB cable	— —
	DHO1204: Passive HighZ Probe (350 MHz, Std.) x4 DHO1202: Passive HighZ Probe (350 MHz, Std.) x2	PVP2350
	DHO1104: Passive HighZ Probe (150 MHz, Std.) x4 DHO1074: Passive HighZ Probe (150 MHz, Std.) x4	PVP3150
	DHO1102: Passive HighZ Probe (150 MHz, Std.) x2 DHO1072: Passive HighZ Probe (150 MHz, Std.) x2	PVP3150
Bandwidth Upgrade Option	70 MHz to 100 MHz Upgrade Option	DHO1000-BWU7T10
	70 MHz to 200 MHz Upgrade Option	DHO1000-BWU7T20
	100 MHz to 200 MHz Upgrade Option	DHO1000-BWU10T20
Memory Depth Upgrade Option	100 Mpts Memory Depth Upgrade Option	DHO1000-RLU-01

DHO4000 Series Digital Oscilloscope

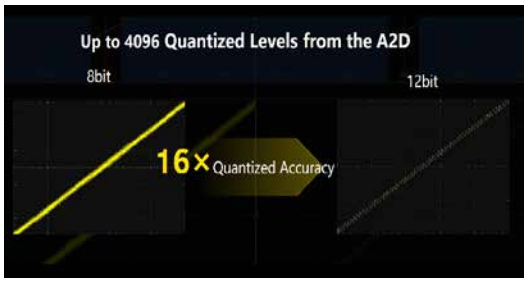
The DHO4000 series oscilloscope is designed for the vast mainstream digital oscilloscope market to meet their design, debugging, and test demands. Built on RIGOL's Centaurus technical platform, the DHO4000 series delivers the waveform capture rate up to 1,500,000 wfms/s in UltraAcquire mode, 500 Mpts memory depth, 12-bit vertical resolution, excellent noise floor performance, and vertical measurement accuracy to meet the high-precision measurement requirements, bringing extraordinary test and measurement experience for you.

- Analog channel bandwidth: 800 MHz for DHO4804(50Ω); 500 MHz for DHO4804(1MΩ); 400 MHz for DHO4404, and 200 MHz for DHO4204
- Built on RIGOL's Centaurus technical platform
- Ultra-low noise floor: 18 μVrms
- 12-bit vertical resolution for all the DHO4000 series
- Up to 4 GSa/s real-time sample rate
- Max. memory depth: 500 Mpts
- Up to 100 μV/div vertical sensitivity
- Up to 1,500,000 wfms/s waveform capture rate in UltraAcquire mode
- 10.1-inch 1280x800 HD touch display
- User-friendly Flex knob, bringing smoother interaction
- Standard photoelectric encoder operating knobs, effectively prolonging its service life
- Standard USB Device & Host, LAN, and HDMI interfaces
- Optional battery pack in a highly portable package for unlimited freedom from an AC power source
- Support online upgrade

Ultra-Low Noise Floor

Ultra-low noise floor of 18 μVrms, with purer signal.

12-Bit Vertical Resolution



The 12-bit vertical resolution provides 4096 vertical digitizing levels, 16 times the vertical digitizing level of the 8-bit resolution, easy for users to capture the small signals and observe the tiny changes.

100 μV Ultra-Low Vertical Sensitivity

100 μV/div vertical sensitivity, capable of measuring the signal at μV/div level.

UltraAcquire Mode

UltraAcquire mode provides the high waveform capture rate up to 1,500,000 wfms/s, capable of capturing any abnormal waveform.

Dual Flex knob Design

Flex Knobs bring more effective interaction and easier measurements.

Battery Powered

Optional battery pack in a highly portable package for unlimited freedom from an AC power source.

Models and Key Specifications

Model		DHO4204	DHO4404	DHO4804
Analog bandwidth (50 Ω, -3 dB)		200 MHz	400 MHz	800 MHz
Analog bandwidth (1 MΩ, -3 dB)		200 MHz	400 MHz	500 MHz
Timebase Scale		500 ps/div to 1 ks/div		
		Fine		
No. of Input Channels		4 analog channel inputs, 1 EXT channel input		
Max. Sample Rate of Analog Channel		4 GSa/s (single-channel[1]), 2 GSa/s (half-channel[2]), 1 GSa/s (full-channel[3]) Note: When all the channels are enabled, the sample rate is 1 GSa/s, and the analog bandwidth of the DHO4804 can only reach up to 400 MHz.		
Max. Memory Depth		Standard: 250 Mpts (single-channel[1]), 125 Mpts (half-channel[2]), 62.5 Mpts (full-channel[3]) Optional: 500 Mpts (single-channel[1]), 250 Mpts (half-channel[2]), 125 Mpts (full-channel[3])		
Max. Waveform Capture Rate		50,000 wfms/s (Vector Mode); 1,500,000 wfms/s (UltraAcquire Mode)		
Vertical Sensitivity Range[4]	1 MΩ	100 uV/div to 10 V/div		
	50 Ω	100 uV/div to 1 V/div		
DC Gain Accuracy[4]		± 2% of full scale		
Vertical Resolution		12-bit		
Hardware Real-time Waveform Recording and Playback		Max. 500,000 frames		
Trigger Type		Standard: Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, Nth Edge, I2C, SPI, RS232/UART, CAN, and LIN Optional: CAN-FD, LIN, FlexRay, I2S, MIL-STD-1553		
Bus Decoding		Standard: Parallel, RS232/UART, I2C, SPI, and CAN Option: LIN, CAN-FD, FlexRay, I2S, and MIL-STD-1553		
Waveform Measurement		41 auto measurements; and up to 14 measurements can be displayed at a time.		
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop		
Enhanced FFT	Record Length	Max. 1 Mpts		
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.		
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold		
Interface		USB3.0 Host, USB3.0 Device, LAN, Web Control, AUX Out, 10 MHz In/Out, HDMI, and Probe Compensation Output		
LCD Size and Type		10.1-inch capacitive multi-touch screen, gesture enabled operation		
Display Resolution		1280×800		
Dimensions		358.14 mm (W)x214.72 mm (H)x120.62 mm (D)		
Weight[5]		Package excluded: 3.8 kg Package included: 5.37 kg		

Notes:
[1]: Single-channel mode: If any one of the channels is enabled, it is called single-channel mode.
[2]: Half-channel mode: For four-channel models, if any two of the channels are enabled, it is called half-channel mode.
[3]: Full-channel mode: For two-channel models, if all of the two channels are enabled, it is called full-channel mode. For four-channel models, if any three channels or all of the four channels are enabled, it is called full-channel mode.
[4]: 100 μV/div, 200 μV/div, and 500 μV/div are a magnification of 1 mV/div setting. For vertical accuracy calculations, use full scale of 8 mV.
[5]: Standard configuration.

Order Information

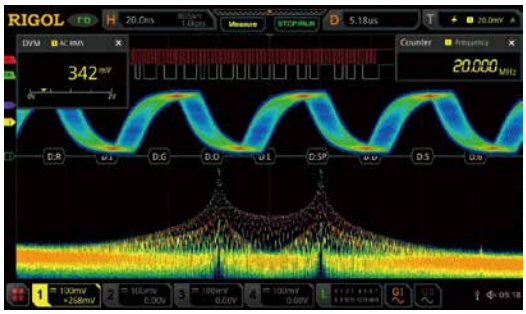
Order Information	Order No.
Standard Accessories	
Power Cord Conforming to the Standard of the Destination Country	— —
USB cable	— —
DHO4204: Passive HighZ Probe (350 MHz, Std.) x4 DHO4404/DHO4804: Passive HighZ Probe (500 MHz, Std.) x4	PVP2350 RP3500A
Bandwidth Upgrade Option	
200 MHz to 400 MHz Upgrade Option	DHO4000-BWU2T4
200 MHz to 800 MHz Upgrade Option	DHO4000-BWU2T8
400 MHz to 800 MHz Upgrade Option	DHO4000-BWU4T8
Memory Depth Upgrade Option	
500 Mpts Memory Depth Upgrade Option	DHO4000-RLU-05
Protocol Decoding Option	
CAN-FD/LIN Bus Trigger and Analysis Option	DHO4000-AUTOA
MIL-STD-1553 Bus Trigger and Analysis Option	DHO4000-AEROA
FlexRay Serial Bus Trigger and Analysis Option	DHO4000-FLEXA
I2S Bus Trigger and Analysis Option	DHO4000-AUDIOA
Optional Accessories	
Power Analysis Option	DHO4000-PWRA
Function and Application Bundle Option including DHO4000-AUTOA/AEROA/FLEXA/AUDIOA/PWRA	DHO4000-BND

MSO5000 Series Digital Oscilloscope

MSO5000 series digital oscilloscope is a high-performance oscilloscope model designed based on RIGOL UltraVision II technology. With a 9-inch capacitive multi-touch screen, the MSO5000 series integrates 7 independent instruments into one, delivering super sample bandwidth ratio, extremely high memory depth, and other excellent specifications. Highly integrated ASIC chipset and innovative non relay front-end have prolonged the service life of the oscilloscope to a large extent, indirectly reducing the usage cost for users. The MSO5000 series products support the upgrade of the channels, bandwidths, and the analysis software. As it integrates many functions of multiple instruments, different user groups can have more choices in selecting their desired product based on their needs, helping them save budget to a large extent while enjoying the superior test support and user experience.

- Analog bandwidth: 350 MHz, 200 MHz,100 MHz, and 70 MHz; bandwidth upgrade supported
- 2 or 4 analog channels (upgradeable for all the MSO5000 series), standard 16 digital channels (required to purchase the logic analyzer probe)
- Up to 8 GSa/s real-time sample rate
- Up to 200 Mpts memory depth (option)
- Up to 500,000 wfm/s capture rate
- Up to 41 waveform parameters; full-memory hardware measurement function
- Up to 450,000 frames of hardware real-time and ceaseless waveforms recording and playback
- 9-inch capacitive multi-touch screen, 256-level intensity grading display, with color persistence

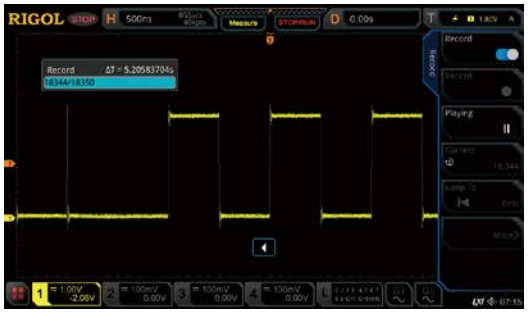
7-in-1 Integrated Digital Oscilloscope



Max. 500,000 wfms/s Waveform Capture Rate

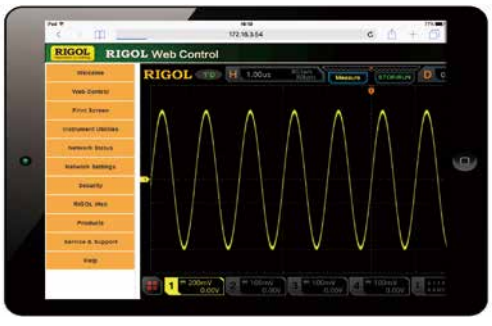
Full Memory Hardware Measurement

Up to 450,000 Frames of Real-time and Ceaseless Waveforms



A Variety of Protocol Decodings

Convenient Web Control Remote Operation



Models and Key Specifications

Model		MSO5072	MSO5074	MSO5102	MSO5104	MSO5204	MSO5354
Analog Bandwidth		70 MHz		100 MHz		200 MHz	350 MHz
Rise Time		⩽ 5 ns		⩽ 3.5 ns		⩽ 1.75 ns	
No. of Input/Output Channels		2	4	2	4	4	4
		16 input digital channels (required to purchase the PLA2216 logic analyzer probe)					
		Dual-channel arbitrary waveform generator (required to install the MSO5000-AWG option to activate)					
Max. Sample Rate of Analog Channel		MSO5354/MSO5204/MSO5104/MSO5074: 8 GSa/s (single-channel), 4 GSa/s (half-channel[1]), 2 GSa/s (full-channel) MSO5102/MSO5072: 8 GSa/s (single-channel), 2 GSa/s (full-channel)					
Max. Memory Depth	Optional 2RL	Analog channel: 200 Mpts (single-channel), 100 Mpts (half-channel[1]), 50 Mpts (full-channel)					
		Digital channel: 25 Mpts (full-channel)					
Max. Waveform Capture Rate[2]		⩾500,000 wfms/s					
Timebase Scale		5 ns/div to 1 ks/div		5 ns/div to 1 ks/div		2 ns/div to 1 ks/div	1 ns/div to 1 ks/div
Vertical Sensitivity Range		500 uV/div to 10 V/div					
DC Gain Accuracy[3]		± 3% of full scale					
Hardware Real-time Waveform Recording and Playback		⩾450,000 wfms (single-channel)					
Trigger Type		Standard: Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, and Nth Edge Option: RS232, UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553					
Bus Decoding		Standard: Parallel Option: RS232, UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553					
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop					
Auto Measurements		41 auto measurements; and up to 10 measurements can be displayed at a time.					
Enhanced FFT	Record Length	Max. 1 Mpts					
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.					
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold					
Analysis Function		Frequency counter, DVM, power analysis, histogram					
Arbitrary Waveform Generator		25 MHz, two-channel (required to purchase the AWG option)					
Interface		USB2.0 Host, USB2.0 Device, LAN (10/100/1000 Base-T), HDMI 1.4b, TRIG OUT					
LCD Size and Type		9-inch capacitive multi-touch screen, gesture enabled operation					

Notes:

[1]: Half-channel mode: CH1 and CH2 are considered as a group; CH3 and CH4 are considered as another group. Each group share the sample rate of 4 GSa/s, and either one of the channels in each group is enabled.

[2]: Maximum value. Single-channel, 10 ns horizontal time base, input amplitude 4 div, sine wave signal with 10 MHz frequency. Others are default settings.

[3]: 1 mV/div and 2 mV/div are a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 1 mV/div and 2 mV/div sensitivity setting.

Order Information

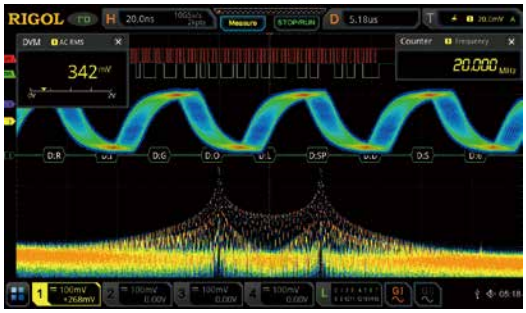
Order Information	Order No.
Models	
MSO5354 (350 MHz, 8 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO5354
MSO5204 (200 MHz, 8 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO5204
MSO5104 (100 MHz, 8 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO5104
MSO5102 (100 MHz, 8 GSa/s, 100 Mpts, 2+16 CH MSO)	MSO5102
MSO5074 (70 MHz, 8 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO5074
MSO5072 (70 MHz, 8 GSa/s, 100 Mpts, 2+16 CH MSO)	MSO5072
Standard Accessories	
Power cord conforming to the standard of the destination country	-
USB cable	CB-USBA-USBB-FF-150
2 or 4 passive probes (350 MHz)	PVP2350
Optional Accessories	
16-channel logic analyzer probe (dedicated probe for the MSO5000 series)	PLA2216
Front panel cover	MSO5000-FPC
Rack mount kit	MSO5000-RM
USB to GPIB interface converter	USB-GPIB
Near-field probe	NFP-3
Power analysis phase deviation correction jig	RPA246
Digital oscilloscope demonstration plate	DK-DS6000
Bandwidth Upgrade Option	
Bandwidth upgrades from 70 MHz to 100 MHz	MSO5000-BW0T1
Bandwidth upgrades from 70 MHz to 200 MHz	MSO5000-BW0T2
Bandwidth upgrades from 70 MHz to 350 MHz	MSO5000-BW0T3
Bandwidth upgrades from 100 MHz to 200 MHz	MSO5000-BW1T2
Bandwidth upgrades from 100 MHz to 350 MHz	MSO5000-BW1T3
Bandwidth upgrades from 200 MHz to 350 MHz	MSO5000-BW2T3
Memory Depth Option	
Maximum memory depth upgradable to 200 Mpts	MSO5000-2RL
Channel Number Upgrade Option	
Upgrade the number of analog channels to 4 (only available for the MSO5XX2 modelexcluding MSO5152-E)	MSO5000-4CH
Bundle Option	
Function and application bundle option, including MSO5000-COMP, MSO5000-EMBD, MSO5000-AUTO, MSO5000-FLEX, MSO5000-AUDIO, MSO5000-AERO, MSO5000-AWG, MSO5000-PWR	MSO5000-BND
Serial protocol analysis option	
PC Serial Bus Trigger and Analysis (RS232/UART)	MSO5000-COMP
Embedded Serial Bus Trigger and Analysis (I2C and SPI)	MSO5000-EMBD
Auto Serial Bus Trigger and Analysis (CAN and LIN)	MSO5000-AUTO
FlexRay Serial Bus Trigger and Analysis (FlexRay)	MSO5000-FLEX
Audio serial bus trigger and analysis (I2S, only available for the MSO5XX4 model or the model installed with the MSO5000-4CH option)	MSO5000-AUDIO
MIL-STD-1553 Serial Bus Trigger and Analysis (MIL-STD-1553)	MSO5000-AERO
Measurement Application Option	
Dual-channel 25 MHz arbitrary waveform generator	MSO5000-AWG
Built-in power analysis	MSO5000-PWR

MSO/DS7000 Series Digital Oscilloscope

MSO/DS7000 Series Digital Oscilloscope adopts RIGOL's self-developed technical platform, which can deliver up to 10 GSa/s sample rate, realizing the high integration of all the function modules required for the analog front-end (AFE), and greatly improving the consistency and reliability of the digital oscilloscope. MSO/DS7000 Series Digital Oscilloscope is a versatile and high-performance oscilloscope built on RIGOL innovative UltraVision II technology. It integrates 7 independent instruments into one, delivering super high sample bandwidth ratio and memory depth, excellent display and waveform capture rate, and powerful data analysis functions, all making it outstanding in the market. It provides complete solutions from the host, accessories to application software, particularly attractive for industrial customers such as industrial control, power supply, and automotive electronics.

- Analog bandwidth: 500 MHz, 350MHz, 200 MHz, and 100 MHz; bandwidth upgrade option supported
- 4 analog channels, 1 EXT channel, 16 digital channels (option)
- Up to 10 GSa/s real-time sample rate
- Up to 500 Mpts memory depth (option)
- Up to 600,000 wfm/s high waveform capture rate
- Up to 450,000 frames of hardware real-time and ceaseless waveforms recording and playback functions
- Integrates 7 independent instruments into 1, including one digital oscilloscope, one 16-channel logic analyzer, one spectrum analyzer, one arbitrary waveform generator, one digital voltmeter, one 6-digit frequency counter and totalizer, and one protocol analyzer
- Various serial protocol triggers and decoding functions
- 10.1-inch capacitive multi-touch screen, 256-level intensity grading display, with color persistence

7-in-1 Integrated Digital Oscilloscope



Integrate the digital oscilloscope, logic analyzer, spectrum analyzer, arbitrary waveform generator, digital voltmeter, high-precision frequency counter and totalizer, and protocol analyzer. Optional for integration test.

600,000 wfms/s Waveform Capture Rate

Capture occasional abnormal signals, greatly improving debugging efficiency.

Full Memory Hardware Measurement

Full-memory hardware measurement enables you to observe and accurately measure two signals with great frequency deviations.

Up to 450,000 Frames of Hardware Waveform Recording and Playback

With the segmented storage, you can set the trigger conditions to make a selective choice in capturing and saving the signals that you are interested in, and then mark the time on the signal.

A Variety of Protocol Decodings

Support 4 serial buses simultaneously. The full memory data analysis and the decoding event table display can help engineers quickly find out the system failure and locate the symbol error waveforms.

Histogram Analysis

Measurement histogram is applicable for observing the distribution of the measurement signal over a long period of time to help users quickly find out the potential abnormalities of the signal.

Models and Key Specifications

Model		MSO7014 / DS7014	MSO7024 / DS7024	MSO7034 / DS7034	MSO7054 / DS7054
Analog Bandwidth		100 MHz	200 MHz	350 MHz	500 MHz
Rise Time		⩽ 3.5 ns	⩽ 1.75 ns	⩽ 1 ns	⩽ 700 ps
Analog Channels		4 input analog channels			
Digital Channels		16 input digital channels (only for the MSO model)			
Max. Sample Rate		10 GSa/s (single-channel), 5 GSa/s (dual-channel), 2.5 Gsa/s (four-channel)			
Max. Memory Depth		Analog Channel, 500 Mpts (single-channel), 250 Mpts (dual-channel), 125 Mpts (four-channel)			
		Digital channel: 62.5 Mpts (full-channel)			
Max. Waveform Capture Rate		⩾600,000 wfms/s			
Timebase Scale		5 ns/div to 1 ks/div	2 ns/div to 1 ks/div	1 ns/div to 1 ks/div	500 ps/div to 1 ks/div
Vertical Sensitivity Range		50Ω：500 μV/div ~ 1 V/div 1 MΩ：500 μV/div ~ 10 V/div			
DC Gain Accuracy		± 2% of full scale			
Vertical Resolution		8-bit			
Hardware Real-time Waveform Recording and Playback		⩾450,000 wfms (single-channel)			
Trigger Type		Standard: Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, and Nth Edge Option: RS232, UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553			
Bus Decoding		Standard: Parallel Option: RS232, UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553			
Waveform Calculation		A+B, A-B, A×B, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, and AX+B			
Auto Measurements		Vmax, Vmin, Vpp, Vtop, Vbase, Vamp, Vupper, Vmid, Vlower, Vavg, VRMS, Per. VRMS, Overshoot, Preshoot, Area, Period Area, and Std Dev, Period, Frequency, Rise Time, Fall Time, +Width, -Width, +Duty, -Duty, Positive Pulse Count, Negative Pulse Count, Rising Edge Count, Falling Edge Count, Tvmax, Tvmin, +Slew Rate, -Slew Rate, Delay(1↑-2↑), Delay(1↑-2↓), Delay(1↓-2↑), Delay(1↓-2↓), Phase(1↑-2↑), Phase(1↑-2↓), Phase(1↓-2↑), Phase(1↓-2↓)			
Enhanced FFT	Record Length	Max. 1 Mpts			
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.			
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold			
Analysis Function		Frequency counter, DVM, power analysis, histogram			
Arbitrary Waveform Generator		25 MHz, 2-CH (option, only for the MSO model)			
Interface		USB2.0 Host X 4, USB2.0 Device, LAN, HDMI 1.4b, TRIG OUT			
LCD Size and Type		10.1-inch capacitive multi-touch screen, gesture enabled operation			
Display Resolution		1024x600			

Order Information

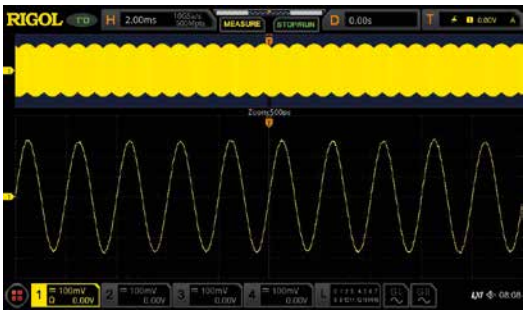
Order Information	Order No.
Models	
MSO7054 (500 MHz, 10 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO7054
MSO7034 (350 MHz, 10 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO7034
MSO7024 (200 MHz, 10 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO7024
MSO7014 (100 MHz, 10 GSa/s, 100 Mpts, 4+16 CH MSO)	MSO7014
DS7054 (500 MHz, 10 GSa/s, 100 Mpts, 4 CH DS)	DS7054
DS7034 (350 MHz, 10 GSa/s, 100 Mpts, 4 CH DS)	DS7034
DS7024 (200 MHz, 10 GSa/s, 100 Mpts, 4 CH DS)	DS7024
DS7014 (100 MHz, 10 GSa/s, 100 Mpts, 4 CH DS)	DS7014
Standard Accessories	
Power cord conforming to the standard of the destination country	-
USB cable	CB-USBA-USBB-FF-150
4 passive probes (500 MHz)	RP3500A
1 logic analyzer probe (only for MSO model)	RPL2316
Front panel cover	DS7000-FPC
Recommended Accessories	
Active differential probe (1.5 GHz BW)	RP7150
Active differential probe (800 MHz BW)	RP7080
Rack mount kit	DS7000-RM
USB to GPIB interface converter	USB-GPIB
Near-field probe	NFP-3
Power analysis phase deviation correction jig	RPA246
Digital oscilloscope demonstration plate	DK-DS6000
Bandwidth Upgrade Option	
Bandwidth upgrades from 100 MHz to 200 MHz	DS7000-BW1T2
Bandwidth upgrades from 100 MHz to 350 MHz	DS7000-BW1T3
Bandwidth upgrades from 100 MHz to 500 MHz	DS7000-BW1T5
Bandwidth upgrades from 200 MHz to 350 MHz	DS7000-BW2T3
Bandwidth upgrades from 200 MHz to 500 MHz	DS7000-BW2T5
Bandwidth upgrades from 350 MHz to 500 MHz	DS7000-BW3T5
Memory Depth Option	
Maximum memory depth upgradable to 250 Mpts	DS7000-2RL
Maximum memory depth upgradable to 500 Mpts	DS7000-5RL
Bundle Option	
Function and application bundle option, including DS7000-COMP, DS7000-EMBD, DS7000-AUTO, DS7000-FLEX, DS7000-AUDIO, DS7000-AERO, MSO7000-AWG, and DS7000-PWR	DS7000-BND
Serial protocol analysis option	
PC serial bus trigger and analysis (RS232/UART)	DS7000-COMP
Embedded serial bus trigger and analysis (I2C, SPI)	DS7000-EMBD
Auto serial bus trigger and analysis (CAN, LIN)	DS7000-AUTO
FlexRay serial bus trigger and analysis (FlexRay)	DS7000-FLEX
Audio serial bus trigger and analysis (I2S)	DS7000-AUDIO
MIL-STD-1553 serial bus trigger and analysis (MIL-STD-1553)	DS7000-AERO
Measurement Application Option	
Dual-channel 25 MHz arbitrary waveform generator (only for MSO model)	MSO7000-AWG
Built-in power analysis	DS7000-PWR

MSO8000/A Series Digital Oscilloscope

The MSO8000/A series oscilloscope is a medium and High-Performance digital oscilloscope designed on the basis of RIGOL's Phoenix and UltraVision II technical platform, which can deliver up to 10 GSa/s sample rate, realizing the high integration of all the function modules required for the analog front-end (AFE), and greatly improving the consistency and reliability of the digital oscilloscope. The innovative UltraVision II platform makes the digital oscilloscope deliver a high waveform capture rate, full digital trigger technology, and full memory hardware measurement technology. The MSO8000/A series digital oscilloscope also integrates other instrument modules, such as MSO, AWG, digital voltmeter, 6-digit counter and totalizer, and protocol analyzer, offering extraordinary user experience at an unprecedented price point.

- Up to 10 GSa/s real-time sample rate
- Up to 500 Mpts memory depth
- High waveform capture rate (over 600,000 wfm/s)
- Up to 450,000 frames of hardware real-time and ceaseless waveforms recording and playback functions
- 7-in-1 instrument
- Analog channel bandwidth: 600 MHz, 750 MHz, 1 GHz, 1.5 GHz, 2 GHz, 3 GHz
- 10.1-inch capacitive multi-touch screen, 256-level intensity grading display, with color persistence
- Web Control and VNC remote command supported
- Waveform histogram analysis (std.)
- Auto measurement of 41 waveform parameters; full-memory hardware measurement function

Excellent Bandwidth and Sample Rate



Provides max. 2 GHz analog bandwidth and 10 GSa/s sample rate. Low bandwidth models can upgrade to 2 GHz (single-channel and half-channel modes) by software at any time, ensuring to achieve higher signal fidelity and resolution (as short as 100 ps, capable of reaching 2 ps for the minimum time base) at an affordable price.

Economical and Practical Eye Diagram Pretest

Better observe the transmission quality of the digital signal and understand the inter-symbol interference in the system, so that you can make improvement in the system design. It is a smart choice when you need to verify the quality of digital signals.

Supports Jitter Analysis for Diverse Displays

Measure several consecutive bits at a time, make statistics, and efficiently complete the jitter analysis of large data volumes.

Up to 600,000 wfms/s Waveform Capture Rate

Minimize the dead time between trigger, easy to observe the glitches and occurrence frequencies of the infrequent events, greatly improving the debugging efficiency.

Full Memory Hardware Measurement

No longer limited to the waveform effects visible on the screen. The results can still be accurately obtained for multi-period high-frequency signal testing.

500 Mpts Deep Memory, up to 450,000 Frames of Hardware Waveform Recording

With the segmented storage, you can set the trigger conditions to make a selective choice in capturing and saving the signals that you are interested in, and then mark the time on the signal, ensuring efficient capture and further expanding the total time for waveform observations.

Models and Key Specifications

Model		MSO8064	MSO8104	MSO8204	MSO8074A	MSO8154A	MSO8204A
Analog Bandwidth (50 Ω, -3 dB)[1]		600 MHz	1 GHz	2 GHz	750 MHz	1.5 GHz	2 GHz
Analog bandwidth (1 MΩ, -3 dB)			500 MHz			500 MHz	
Rise Time (10% to 90%, typical)		⩽ 583 ps	⩽ 350 ps	⩽ 175 ps	⩽ 556 ps	⩽ 269 ps	⩽ 206 ps
No. of Analog Channels		4 input analog channels+1 input EXT channel+16 input digital channels(opt.) + dual-channel arbitrary waveform generator output (opt.)					
Sampling Mode		Real-time sample					
Max. Sample Rate of Analog Channel		10 GSa/s (single-channel), 5 GSa/s (half-channel[2]), 2.5 GSa/s (full-channel) Notes: When all the channels are enabled, the sample rate is 2.5 GSa/s, and the analog bandwidth can reach up to 1 GHz.					
Max. Memory Depth		Analog channel: 500 Mpts (single-channel), 250 Mpts (half-channel[2]), 125 Mpts (full-channel) Digital channel: 62.5 Mpts (full-channel)					
Max. Waveform Capture Rate[3]		⩾ 600,000 wfms/s					
Vertical Sensitivity Range[4]	1 MΩ	1 mV/div to 10 V/div					
	50 Ω	1 mV/div to 1 V/div					
Trigger Type		Standard: Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, and Nth Edge Option: RS232, UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553					
Bus Decoding		Standard: Parallel Option: RS232, UART, I2C, SPI, LIN, CAN, FlexRay, I2S, and MIL-STD-1553					
DC Gain Accuracy[4]		± 2% of full scale					
Vertical Resolution		8-bit					
Hardware Real-time Waveform Recording and Playback		⩾ 450,000 wfms (single-channel)					
Waveform Measurement	Quantity	41 auto measurements; and up to 10 measurements can be displayed at a time.					
	Analysis	Frequency counter, DVM, power analysis (option), histogram, zone trigger, eye analysis (option), and jitter analysis (option)					
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop, and Trend					
FFT	Record Length	Max. 1Mpts					
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.					
	Peak Search	A maximum of 15 peaks, determined by the user-defined threshold and offset threshold					
LCD Size and Type[5]		10.1-inch capacitive multi-touch screen, gesture enabled operation					
Display Resolution		1024×600					
Weight[6]		Package excluded: <4.0 kg Package included: <9.2 kg					

Notes:
[1]: 3 GHz bandwidth is only applicable to single-channel; 2 GHz bandwidth is only applicable to single-channel and half-channel modes.
[2]: Half-channel mode: CH1 and CH2 are considered as a group; CH3 and CH4 are considered as another group. Each group shares the sample rate of 5 GSa/s, and either one of the channels in each group is enabled.
[3]: Maximum value. Single-channel, 10 ns horizontal time base, input amplitude 4 div, sine wave signal with 10 MHz frequency. Others are default settings.
[4]: 1 mV/div and 2 mV/div are a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 1 mV/div and 2 mV/div sensitivity setting.
[5]: Supporting legs and handle folded, knob height included, front panel cover excluded.
[6]: MSO8000/A model, standard configuration.

Order Information

Order Information	Order No.
Models	
MSO8204 (2 GHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8204
MSO8104 (1 GHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8104
MSO8064 (600 MHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8064
MSO8204A (2 GHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8304A
MSO8154A (1.5 GHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8154A
MSO8074A (750 MHz, 10 GSa/s, 500 Mpts, 4+16 CH MSO)	MSO8074A
Standard Accessories	
USB cable	CB-USBA-USBB-FF-150
4 passive high-impedance probes (500 MHz)	RP3500A
2 passive low-impedance probes (1.5 GHz, only for MSO8104, MSO8204, MSO8154A and MSO8204A)	RP6150A
Front protective cover	MSO8000-FPC
Power cord conforming to the standard of the destination country	-
Recommended Accessories	
16-channel logic analyzer probe	RPL2316
Active single-ended/differential probe (2.5 GHz BW)	PVA7250
Active differential probe (1.5 GHz BW)	RP7150
Active differential probe (800 MHz BW)	RP7080
Active single-ended probe (1.5 GHz BW)	RP7150S
Active single-ended probe (800 MHz BW)	RP7080S
Rack mount kit	RM6041
USB-GPIB adapter	USB-GPIB
Near-field probe	NFP-3
Power analysis phase deviation correction jig	RPA246
Digital oscilloscope demonstration plate	DK-DS6000
Bandwidth Upgrade Option	
Bandwidth upgrades from 600 MHz to 1 GHz	MSO8000-BW6T10
Bandwidth upgrades from 600 MHz to 2 GHz	MSO8000-BW6T20
Bandwidth upgrades from 1 GHz to 2 GHz	MSO8000-BW10T20
Bandwidth upgrades from 750 MHz to 1.5 GHz	MSO8000A-BW7T15
Bandwidth upgrades from 750 MHz to 2 GHz	MSO8000A-BW7T20
Bandwidth upgrades from 1.5 GHz to 2 GHz	MSO8000A-BW15T20
Single-channel 3 GHz bandwidth upgrade option	MSO8000A-BW20T30
Bundle Option	
Function and application bundle option, including MSO8000-COMP, MSO8000-EMBD, MSO8000- AUTO, MSO8000-FLEX, MSO8000-AUDIO, MSO8000-AERO, MSO8000-AWG, MSO8000-PWR, and MSO8000-JITTER	MSO8000-BND
Serial protocol analysis option	
PC serial bus trigger and analysis (RS232/UART)	MSO8000-COMP
Embedded serial bus trigger and analysis (I2C and SPI)	MSO8000-EMBD
Auto serial bus trigger and analysis (CAN and LIN)	MSO8000-AUTO
FlexRay serial bus trigger and analysis (FlexRay)	MSO8000-FLEX
Audio serial bus trigger and analysis (I2S)	MSO8000-AUDIO
MIL-STD-1553 serial bus trigger and analysis (MIL-STD-1553)	MSO8000-AERO
Measurement Application Option	
Dual-channel 25 MHz arbitrary waveform generator	MSO8000-AWG
Built-in power analysis (Required to purchase the RPA246 phase deviation correction jig)	MSO8000-PWR
Real-time eye diagram and jitter analysis	MSO8000-JITTER

DS8000-R Series Digital Oscilloscope

DS8000-R series is a medium and High-Performance mixed signal digital oscilloscope with a compact size designed on the basis of the UltraVision II, the RIGOL' s technical platform with self-own intellectual property right. It supports system integration of multiple devices, rack mount installation, and remote system operation to meet the system requirements for industrial automation test system. DS8000-R series oscilloscope has an analog bandwidth of up to 2 GHz, supporting multi-device synchronous triggering, available to be extended to 512 channels. It provides an excellent solution for users to meet their high-speed requirement for the system integration test and synchronization requirement for multi-channel data acquisition.

- Analog channel bandwidth: 2 GHz, 1 GHz and 350 MHz
- Up to 10 GSa/s real-time sample rate for DS8104-R and DS8204-R; 5 GSa/s real-time sample rate for DS8034-R
- 4 analog channels, 1 EXT Input channel
- Standard memory depth: 500 Mpts
- Up to 600,000 wfm/s waveform capture rate
- Low jitter, multiple-device synchronization (<200 ps_{RMS}, typical)
- High-speed data communication interface (10 GE SFP+), ensuring the reliable transmission of large data
- Integrates 6 independent instruments into 1, including one digital oscilloscope, one spectrum analyzer, one arbitrary waveform generator (option), one digital voltmeter, one 6-digit frequency counter and totalizer, and one protocol analyzer (option)
- Extend up to 512 channels, supporting synchronous acquisition (with the synchronization module)
- Real-time eye diagram and jitter analysis software (option for DS8104-R/DS8204-R)
- Built-in advanced power analysis software (option)
- Operating temperature -40°C or above, available to be used for signal monitoring in some special conditions
- Multiple interfaces available: USB Host & Device, LAN(LXI), 10 GE SFP+, HDMI, TRIG OUT, 10 MHz In/Out
- Web control remote command supported
- Compact and thin design, save rack space, 1U rack mount kit (standard)
- Software development kit available for users to meet their customized development according to their specific scenarios
- Easy-to-use on-site multi-channel synchronization calibration kit, enabling you to view multiple channels synchronously

Compact Design

Thin and compact in body design: 214 mm (W)×43 mm (H)×478 mm (D), available to be placed in narrow space.

Convenient Stand-alone Working Mode

Working with external devices, a single DS8000-R oscilloscope can meet users' demand for a traditional oscilloscope. For example, you can connect the display device via the HDMI interface to view the user interface; use the externally connected mouse (via the USB Host interface) to realize clicking or dragging operation; use the externally connected keypad board to input numbers or strings.

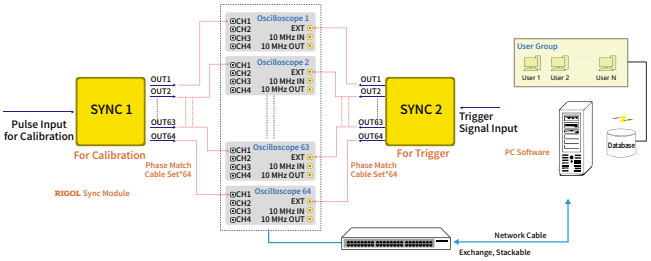
Suitable for Low Temperature Working Environment

No LCD, with the operating temperature as low as -40°C, available to be used for signal monitoring in some special conditions.

Highly Efficient Use of Rack Space

1U rack allows two sets of oscilloscopes (with a total of 8 channels) to be installed in parallel, greatly saving the rack space.

Synchronous Triggering Capability with Extended 512 Channels



The synchronization module provides multi-device synchronization schemes and on-site multi-channel synchronization calibration kit, enabling you to view multiple channels synchronously.

Multi-channel High-speed Data Acquisition

The multi-channel high-speed data acquisition software (option) can be used to configure multiple devices and channels, provide user-friendly interface to display the acquired waveforms of each channel.

Models and Key Specifications

Model		DS8104-R	DS8204-R	DS8034-R
Analog bandwidth (50 Ω, -3 dB)[1]		1 GHz	2 GHz	350 MHz
Analog bandwidth (1 MΩ, -3 dB)		500 MHz		350 MHz
Calculated Rising Time under 50 Ω (single-channel mode, 10%-90%, typical)		⩽ 350 ps	⩽ 225 ps	⩽ 1 ns
No. of Input/Output Channels		4 input analog channels		
		1 input EXT channel		
		Single-channel arbitrary waveform generator output (required to purchase the DS8000-R-AWG option)		
Sampling Mode		Real-time sample		
Max. Sample Rate of Analog Channel		10 GSa/s (single-channel), 5 GSa/s (half-channel[2]), 2.5 GSa/s (full-channel) Note: When all the channels are enabled, the sample rate is 2.5 GSa/s, and the analog bandwidth can reach up to 1 GHz.		5 GSa/s (single-channel), 5 GSa/s (half-channel), 2.5 GSa/s (full-channel)
Max. Memory Depth		Analog channel: 500 Mpts (single-channel), 250 Mpts (half-channel[2]), 125 Mpts (full-channel)		
Max. Waveform Capture Rate[3]		⩾ 600,000 wfms/s		
Hardware Real-time Waveform Recording and Playback		⩾ 450,000 wfms (single-channel)		
Peak Detection		capture 400 ps glitches		capture 800 ps glitches
Timebase Scale		200 ps/div to 1 ks/div		
		Fine		
Vertical Sensitivity Range[4]	1 MΩ	1 mV/div to 10 V/div		
	50 Ω	1 mV/div to 1 V/div		
DC Gain Accuracy[4]		± 2% of full scale		
Vertical Resolution		8-bit		
Decoding Type		Standard: Parallel		
		Option: RS232/UART, I2C, SPI, LIN, CAN, FlexRay, I2S, and MIL-STD-1553		
Trigger Type		Standard: Edge, Pulse, Slope, Video, Pattern, Duration, Timeout, Runt, Window, Delay, Setup/Hold, and Nth Edge		
		Option: RS232/UART, I2C, SPI, CAN, FlexRay, LIN, I2S, and MIL-STD-1553		
Waveform Calculation		A+B, A-B, AxB, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Lg, Ln, Exp, Sqrt, Abs, AX+B, LowPass, HighPass, BandPass, BandStop, and Trend		
Waveform Measurement	Quantity	41 auto measurements; and up to 10 measurements can be displayed at a time.		
	Analysis	Frequency counter, DVM, power analysis (option), histogram, zone trigger, eye analysis (option), and jitter analysis (option)		
Enhanced FFT	Record Length	Max. 1 Mpts		
	Window Type	Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.		
	Peak Search	A maximum of 15 peaks, confirmed by the settable threshold and offset threshold set by users		
Arbitrary Waveform Generator		25 MHz, single-channel (required to purchase the AWG option)		
Interface		USB2.0 Host, USB2.0 Device, LAN, GPIB (option), WEB, AUX Out, 10 MHz In/Out, HDMI, Probe Compensation Output, SFP+ interface		
Dimensions		Without handles and hanging ears: 214 mm (W)×43 mm (H)×478 mm (D) With handles and hanging ears: 268 mm (W)×43 mm (H)×499 mm (D)		
Weight[5]		Package excluded: <3.6 kg Package included: <7.1 kg		

Notes:

[1]: 2 GHz bandwidth is only applicable to single-channel or half-channel mode.

[2]: Half-channel mode: CH1 and CH2 are considered as a group; CH3 and CH4 are considered as another group. Each group shares the sample rate of 5 GSa/s, and either one of the channels in each group is enabled.

[3]: Maximum value. DS8104-R/DS8204-R: single-channel, 10 ns/div horizontal time base, input amplitude 4 div, sine wave signal with 10 MHz frequency, memory depth Auto. Others are default settings. For DS8034-R: single-channel, 20 ns/div horizontal time base, input amplitude 4 div, sine wave signal with 10 MHz frequency, memory depth Auto. Others are default settings.

[4]: 1 mV/div and 2 mV/div are a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 1 mV/div and 2 mV/div sensitivity setting.

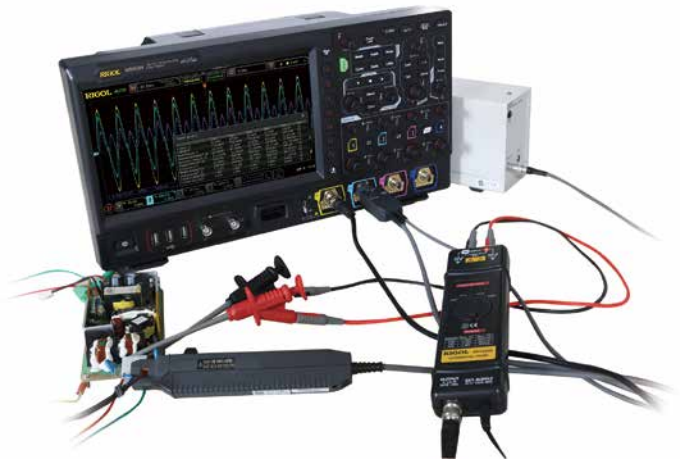
[5]: DS8000-R model, standard configuration.

Order Information

Order Information	Order No.
Models	
DS8204-R (2 GHz, 10 GSa/s, 500 Mpts, 4 CH compact digital oscilloscope)	DS8204-R
DS8104-R (1 GHz, 10 GSa/s, 500 Mpts, 4 CH compact digital oscilloscope)	DS8104-R
DS8034-R (350 MHz, 5 GSa/s, 500 Mpts, 4 CH compact digital oscilloscope)	DS8034-R
Standard Accessories	
USB Cable	CB-USBA-USBB-FF-150
Power Cord Conforming to the Standard of the Destination Country	——
Rack Mount Kit	RM1011 & RM1012
Recommended Accessories	
Passive High-impedance Probe (500 MHz BW)	RP3500A
Passive Low-impedance Probe (1.5 GHz BW)	RP6150A
Active Differential Probe (2.5 GHz BW)	PVA7250
Active Differential Probe (1.5 GHz BW)	RP7150
Active Differential Probe (800 MHz BW)	RP7080
Active Single-ended Probe (1.5 GHz BW)	RP7150S
Active Single-ended Probe (800 MHz BW)	RP7080S
Power Analysis Phase Deviation Correction Jig	RPA246
64 CH Synchronization Module	DS SYNC64
2-way Power Splitter (DC to 4 GHz)	PRSC42
10 GE Communication Option	
High-Speed Data Communication Option	DS8000-R-HSDC
Software Tool	
Software Development Kit (open source, available to download from RIGOL official website)	——
Bundle Option	
Function and application bundle option, including DS8000-R-COMP, DS8000-R-EMBD, DS8000-R-AUTO, DS8000-R-FLEX, DS8000-R-AUDIO, DS8000-R-AERO, DS8000-R-AWG, DS8000-R-PWR, and DS8000-R-JITTER	DS8000-R-BND
Serial protocol analysis option	
PC Serial Bus Trigger and Analysis (RS232/UART)	DS8000-R-COMP
Embedded Serial Bus Trigger and Analysis (I2C, SPI)	DS8000-R-EMBD
Auto Serial Bus Trigger and Analysis (CAN, LIN)	DS8000-R-AUTO
FlexRay Serial Bus Trigger and Analysis (FlexRay)	DS8000-R-FLEX
Audio Serial Bus Trigger and Analysis (I2S)	DS8000-R-AUDIO
MIL-STD-1553 Serial Bus Trigger and Analysis (MIL-STD-1553)	DS8000-R-AERO
Measurement Application Option	
Single-channel 25 MHz Arbitrary Waveform Generator	DS8000-R-AWG
Built-in Power Analysis (Required to Purchase the RPA246 Phase Deviation Correction Jig)	DS8000-R-PWR
Real-time Eye Diagram and Jitter Analysis	DS8000-R-JITTER

Note: For all the mainframes, accessories and options, please contact the local office of RIGOL.

Power Test and Analysis



Power supply is an important component of electronic devices. The development, design, and debugging of the power supply circuit are important parts for the product development and production. In the power testing, various test devices may be used, in particular, the oscilloscope and the probe are most commonly used. Users can select a proper high-voltage probe or the current probe to make measurements based on the different signals under test. With the software, users can obtain the power-related measurement results.

Ultra Power Analyzer launched by RIGOL is a PC software with full-function power measurement and analysis. The software along with RIGOL's digital oscilloscope, high voltage differential probe, current probe, probe deskew fixture, and passive probe, forms a complete power measurement system for power supply design and testing. After testing, the test results will be delivered in the form of a test report.

Power Test and Analysis includes

- Power quality analysis
- Current harmonic analysis
- Inrush current analysis
- Power device switching loss analysis
- Safe operating area analysis
- Modulation analysis
- Output ripple analysis

Power quality analysis

Safe operating area analysis

Power device switching loss analysis

Power quality analysis

DHO4000, DS70000, DS8000-R, MSO8000/A, MSO/DS7000, and MSO5000 series oscilloscopes support the optional built-in power analysis software, which can complete the power quality analysis and ripple analysis. The power analysis software can help engineers analyze the commonly used power parameters rapidly and accurately, without needing to make tedious configurations manually or do complicated calculation.

Recommended Configuration

	Description	Order No.
Digital Oscilloscope Models	DHO4000, DS70000, DS8000-R, MSO8000/A, MSO/DS7000, MSO5000, DS1000Z, and DS1000Z-E Series	
Accessories	High-Voltage Differential Probe (Depend on the Selected Bandwidth and Voltage Range)	RP1000D Series
	Current Probe (Depend on the Selected Bandwidth and Current Range)	RP1000C Series
	1:1 Passive HighZ Probe (Depend on the Selected Bandwidth)	PVP3150/PVP2350
Power Analysis Software	Ultra Power Analyzer	UPA-DS
	Built-in Power Analysis (Only Available for MSO8000/A)	MSO8000-PWR
	Built-in Power Analysis (Only Available for MSO/DS7000)	DS7000-PWR
	Built-in Power Analysis (Only Available for MSO5000)	MSO5000-PWR
	Built-in Power Analysis (Only Available for DS8000-R; Required to Purchase the RPA246 Phase Deviation Correction Jig)	DS8000-R-PWR

Compliance Analysis

USB2.0 Compliance Test Solution

To ensure the USB interface product compliance, it is ruled that "products that achieve certification may be authorized to display the USB logo, but this requires that a company have a valid USB-IF Trademark License Agreement (TLA) on file". To help engineers quickly identify the requirement for the USB device in the design, inspection, and validation of the products, RIGOL provides a comprehensive USB2.0 signal quality test solution, with which design engineers can use the RIGOL's device to work with the software and test fixture to complete the USB2.0 signal quality compliance test.

Signal Quality Test

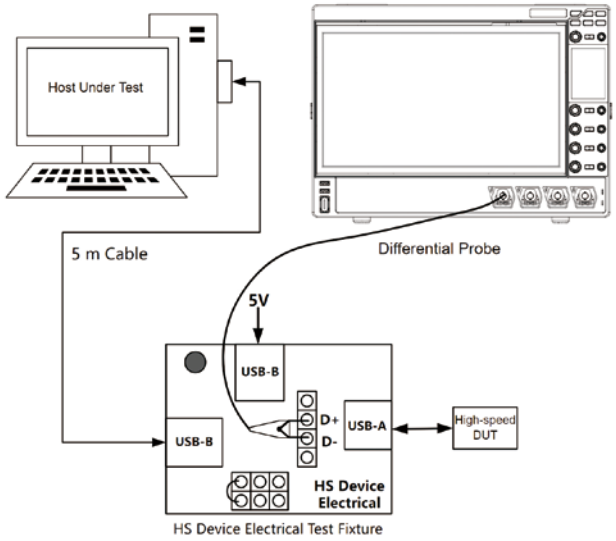
Signal quality testing is a set of basic electrical function testing. It is the key to verifying that the equipment meets the standard and qualified to obtain the USB certification mark. The main tool used in the USB2.0 signal quality test is the digital oscilloscope. During the test process, the digital oscilloscope works with the probe, cable and test fixture to perform the test. The specific requirements of the test devices are described in detail in the later section. USB-IF has clearly defined the test item and compliance range in the USB2.0 standard, and also lists the manual test method. However, it seems inefficient to configure the test setup, validate the test, and summarize the results manually. The RIGOL USB2.0 compliance test software automates the test process, allowing engineers to efficiently and accurately perform the compliance test.

Signal quality test items include:

- SYNC
- EOP Width
- Signal Rate
- Edge Monotonicity
- Rise Edge Time/Edge Rate
- Fall Edge Time/Edge Rate
- Paired JK Jitter
- Paired KJ Jitter
- Signal Eye Violation Points

Recommended USB2.0 High-Speed Test Devices

According to the rules specified by USB-IF on USB2.0 high-speed signal quality test, it is required that the bandwidth of the oscilloscope should be at least 2.5 GHz. RIGOL recommends to use DS70000 series digital oscilloscope to complete the test as its max. bandwidth is 5 GHz, sample rate 20 GSa/s, and it has a high accuracy. The recommended probes are also provided, including high-speed active differential probe (PVA7000 and PVA8000 series), high-speed active single-ended probe (RP7000S series), and etc. In addition, in the USB2.0 test, the test fixtures recognized by USB-IF for the USB compliance test are required. The test fixtures include two types: TF-USBD-STP (used for device test) and TF-USBH-STP (used for host test).



Connection Diagram of the High-speed Device Signal Quality Compliance Test (Differential)

Tool Set Containing Active Differential Probe

Qty.	Item	Description/Model
1	Digital Oscilloscope	DS70304/DS70504
1	USB2.0 Compliance Analysis Software	DS70000-USBC
1	Differential Probe	PVA7250/PVA8000 Series Active Differential Probe
1	Test Fixture	Standard test fixture specified by USB-IF or RIGOL test fixture in accordance with the USB 2.0 Specification
1	Software tool from USB-IF to generate test packets	USBHSETT (available at usb.org)
1	5 V Power Cable	USB-A (M)-USB-B (M) cable (Cable_USB)

Tool Set Containing Coaxial Cables

Qty.	Item	Description/Model
1	Digital Oscilloscope	DS70304/DS70504
1	USB2.0 Compliance Analysis Software	DS70000-USBC
1	Test Fixture	Standard test fixture specified by USB-IF or RIGOL test fixture in accordance with the USB 2.0 Specification
1	SMA-BNC Cable	SMA-BNC testing cable
1	5 V Power Cable	USB-A (M)-USB-B (M) cable (Cable_USB)

Ethernet Physical Layer Compliance Analysis Test Solution

Ethernet is by far the most widely used local area networking (LAN) technology in the world today. It can be traced back as early as 1973 and was introduced to interconnect servers, workstations and etc. After evolution, IEEE 802.3 standard defines the Ethernet technical specification. Its rate evolved over the years from the initial 10 M rate to 100 Mbps, 1000 Mbps, and even 10 Gbps. Transmission medium is also changing with times, from the original coaxial cable to using twisted pair (shielded/unshielded), optical fiber (single-mode/multi-mode) and other transmission carriers.

This test solution introduces 100Base-Tx and 1000Base-T Ethernet signal quality compliance test, providing engineers with an efficient and fast test method to improve their product development and test efficiency.

100Base-Tx Ethernet Test

The main tool used in the 100Base-Tx signal quality test is the digital oscilloscope. During the test process, the digital oscilloscope works with the probe, cable and test fixture to perform the test. The specific requirements of the test devices are described in detail in the later section.

Test items for 100Base-Tx Ethernet test include:

- Eye
- Amplitude Symmetry
- Rise/Fall Time
- Jitter
- Rise/Fall Time Symmetry
- Overshoot
- Distortion Based on Duty Cycle
- Out Voltage

Other test items (not covered in this test solution): MDI return loss test (including transmitter and receiver), receiver test (bit error rate test), advanced test (common mode rejection, transformer attenuation, input impedance).

1000Base-T Ethernet Test

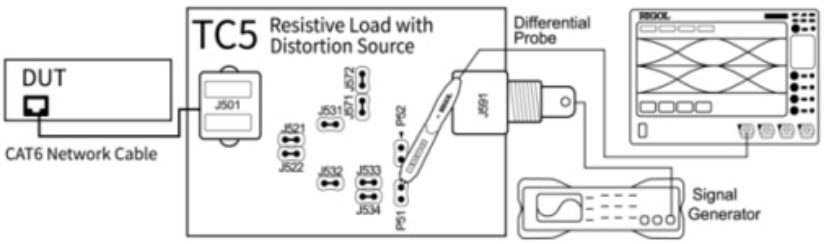
1000Base-T speeds up to 10 times the data transfer rate over 100Base-Tx, expanding network bandwidth, enabling real-time bandwidth-intensive applications, and more widely for financial applications, business, education and government agencies. Due to the complexity of 1000Base-T signals, four test modes are defined in the IEEE802.3ab specification to test the physical layer compliance of Gigabit Ethernet.

According to the IEEE 802.3 standard for the 1000BASE-T physical layer compliance test, the DUT is required to perform a series of compliance tests in the four test modes specified in the standard:

- Test Mode 1: Template, Peak, Droop
- Test Mode 2: Master Jitter
- Test Mode 3: Slave Jitter
- Test Mode 4: Distortion, Common Mode Voltage

Test Device Requirement for the Signal Quality Test

According to IEEE 802.3 and ANSI X3.263-1995, an oscilloscope with a bandwidth ⩾ 1 GHz is recommended. RIGOL recommends to use DS70000 series digital oscilloscope in the test as its max. bandwidth is 5 GHz, sample rate 20 GSa/s, and it has a high accuracy. In the 1000Base-T test mode 1, a sine wave of ±2.8V amplitude and 31.25 MHz frequency is required to be input as the interference signal. RIGOL's DG5000 series function/arbitrary waveform generator can make it. In terms of the probe requirement, the bandwidth required for a differential probe shall be greater than 1.5 GHz. The recommended probes from RIGOL can include high-speed active differential probe (PVA7000 and PVA8000 series), high-speed active single-ended probe (RP7000S series), and etc. In addition, Ethernet signal quality test is high-speed signal test, which requires to work with the fixture TF-ENET-STP. It includes TC2, TC3, TC4, and TC5 modules which can be used separately for different test items.



Connection Diagram of 1000Base-T Compliance Test with the Disturbing Signals

Recommended Test Devices for 100Base-Tx Signal Quality Test

Qty.	Item	Description/Model
1	Digital Oscilloscope	DS70304/DS70504
1	100Base-T Ethernet Signal Quality Compliance Analysis Software	DS70000-ENETC
1	Differential Probe	PVA7000/PVA8000 Series Active Differential
1	Test Fixture	Ethernet Test Fixture
1	CAT6 Network Cable	Compliant transmission network cable

Recommended Test Devices for 1000Base-Tx Signal Quality Test

Qty.	Item	Description/Model
1	Digital Oscilloscope	DS70304/DS70504
1	Function/Arbitrary Waveform Generator	DG5000
1	1000Base-T Ethernet Signal Quality Compliance Analysis Software	DS70000-ENETC
1	Single-Ended/Differential Probe	PVA7000/PVA8000 Series Probe
1	Test Fixture	Ethernet Test Fixture
1	CAT6 Network Cable	Compliant transmission network cable
1	Jumper Cap	Used to short-circuit the golden pin

Probes and Accessories Selection Guide

PIA1000 Series Optical-fiber Isolated Probe

The PIA1000 Series Optical-fiber Isolated Probe offers extraordinary performance and safety tests with its excellent common mode rejection capability and high insulation voltage. It achieves full-scale output in the differential mode voltage ranging from ±0.01 V to ±2500 V with various attenuating tips. The PIA1000 series adopts laser-powered technology and offers a perfect solution for isolated power supply. Besides, it is compatible with the auto-recognized interface of RIGOL oscilloscopes (e.g. MSO8000, DHO4000). It supports hot plugging, simplifying the operation and improving the user experience.

- High bandwidth: PIA1020: 200 MHz; PIA1050: 500 MHz; PIA1100: 1 GHz
- Common mode voltage up to 85 kVpk
- Full-scale output in the differential mode voltage ranging from ±0.01 V to ±2500 V with various attenuating tips
- High CMRR, up to 108 dB at 1 GHz
- Fast response, immediate test after power-on with no warm-up time, 1% DC gain accuracy

Models and Specifications

Characteristics	PIA1020	PIA1050	PIA1100
Bandwidth	200 MHz	500 MHz	1 GHz
Rise Time	⩽ 1.75 ns	⩽ 700 ps	⩽ 450 ps
CMRR (Common Mode Rejection Ratio)	DC: 180 dB 200 MHz: 122 dB	DC: 180 dB 500 MHz: 114 dB	DC: 180 dB 1 GHz: 108 dB
Differential Mode Voltage	±6250 V	±5000 V	±5000 V
Transmission Delay	18.5 ns (2 m fiber length)	17.2 ns (2 m fiber length)	17.2 ns (2 m fiber length)
Output Voltage Range	±1.25 V	±500 mV	±500 mV
Noise Floor	⩽ 2 mVrms@0 dB ⩽ 400 μVrms@20 dB	⩽ 2.4 mVrms@0 dB ⩽ 420 μVrms@20 dB	⩽ 2.4 mVrms@0 dB ⩽ 420 μVrms@20 dB
Power Supply	Powered from the oscilloscope's probe interface or the Type-C interface		
DC Gain Accuracy[1](Typ.)	1%		
Common Mode Voltage	85 kVpk		

Note[1]: When the signal is much greater than the oscilloscope's noise floor, it is recommended to use the oscilloscope's ±3 div DC signal.

Order Information

Order Information	Description
Probe Model	
PIA1020	200 MHz optical-fiber isolated probe, 2-meter cable
PIA1050	500 MHz optical-fiber isolated probe, 2-meter cable
PIA1100	1 GHz optical-fiber isolated probe, 2-meter cable
Standard Accessories	
Applicable Attenuating Tips	PIA1020: TIP-MMCX-20X-02 (std.) PIA1050: TIP-MMCX-50X-05 and TIP-MCX-2000X-05 (std.) PIA1100: TIP-MMCX-50X-1 and TIP-MCX-2000X-1 (std.)
MCX Adapter (2.54mm spacing)x5	Used to connect the optical-fiber isolated probe and the circuit under test
MCX Adapter (5.08mm spacing)x5	Used to connect the optical-fiber isolated probe and the circuit under test
MMCX Coaxial Cable x1	Used to connect the optical-fiber isolated probe and the circuit under test
MCX Coaxial Cable x1	Used to connect the optical-fiber isolated probe and the circuit under test
Carrying Case x1	Customized suitcase for 2-meter cable, with foam inserted to protect the optical-fiber isolated probe and the fiber
Probe Mount x1	Tripod mount to support the probe
Packing List x1	A list of all accessories for the optical-fiber isolated probe
Optional Attenuating Tips	
TIP-MMCX-10X-02	10× attenuating tip with 200 MHz bandwidth
TIP-MCX-500X-02	500× attenuating tip with 200 MHz bandwidth
TIP-MCX-1000X-02	1000× attenuating tip with 200 MHz bandwidth
TIP-MMCX-20X-05	20× attenuating tip with 500 MHz bandwidth
TIP-MCX-1000X-05	1000× attenuating tip with 500 MHz bandwidth
TIP-MCX-5000X-05	5000× attenuating tip with 500 MHz bandwidth
TIP-MMCX-20X-1	20× attenuating tip with 1 GHz bandwidth
TIP-MCX-1000X-1	1000× attenuating tip with 1 GHz bandwidth
TIP-MCX-5000X-1	5000× attenuating tip with 1 GHz bandwidth

High-Speed Active Differential Probe

PVA8000

PVA7250

RP7150/RP7080

Optical-fiber Isolated Probe

PIA1000

High-voltage Probe

RP1018H

High-Speed Active Single-ended Probe

RP7150S/RP7080S

Current Probe

RP1003C/RP1004C

RP1001C/RP1002C

PCA1030

PCA2030

PCA1150

PCA1500

High-voltage Differential Probe

PHA0150/PHA1150

RP1000D

PHA2150

Selection Guide

Model	Description	DHO900	DHO800	DHO4000	DHO1000	DS70000	DS8000-R	MSO8000/A	MSO/DS7000	MSO5000	DS1000Z/-E
PIA1000	200 MHz/500 MHz/1 GHz Optical-fiber Isolated Probe			●		●		●			
PVA8700	7 GHz Active Differential Probe					●	●				
PVA8350	3.5 GHz Active Differential Probe					●					
PVA7250	2.5 GHz Active Differential Probe, 30 Vp-p, CATI						●	●	●		
RP7150	1.5 GHz Differential/Single-ended Probe, 30 Vp-p, CATI						●	●	●		
RP7150S	1.5 GHz Single-ended Probe, 30 Vp-p, CATI						●	●	●		
RP7080	800 MHz Differential/Single-ended Probe, 30 Vp-p, CATI						●	●	●		
RP7080S	800 MHz Single-ended Probe, 30 Vp-p, CATI						●	●	●		
RP6150A	1.5 GHz Passive Low-impedance Probe							●	●		
RP5600A	600 MHz Passive HighZ Probe, 10 X						●	●	●		
RP3500A	500 MHz Passive HighZ Probe, 10 X							●	●	●	●
PVP2150	150 MHz, 10:1/1:1, Passive HighZ Probe (Single)	●	●	●	●	●	●	●	●	●	●
PVP2350	1X: 35 MHz BW/10 X: 350 MHz BW, Passive HighZ Probe						●	●	●	●	●
PVP3150	1X: 20 MHz BW/10X: 150 MHz BW, Passive HighZ Probe						●	●	●	●	●
RP1300H	High-voltage Probe, DC-300 MHz, 2000 V CATI, 1500 V CATII (DC+AC)						●	●	●	●	●
RP1010H	High-voltage Probe, DC-50 MHz, DC: 10 kV, AC: pulse ⩽ 20 kVpp, sine ⩽ 7 kVrms						●	●	●	●	●
RP1018H	High Voltage Probe, DC-150 MHz, DC+AC:18 kVpp CATII, AC: 12 kVrms CATII						●	●	●	●	●
RP1025D	High-voltage Differential Probe, DC-25 MHz, Vmax ⩽ 1400 Vpp						●	●	●	●	●
RP1050D	High-voltage Differential Probe, DC-50 MHz, Vmax ⩽ 7000 Vpp						●	●	●	●	●
RP1100D	High-voltage Differential Probe, DC-100 MHz, Vmax ⩽ 7000 Vpp						●	●	●	●	●
PHA0150	High-voltage Differential Probe, DC-70 MHz, Vmax ⩽ 1500 Vpp						●	●	●	●	●
PHA1150	High-voltage Differential Probe, DC-100 MHz, Vmax ⩽ 1500 Vpp						●	●	●	●	●
PHA2150	High-voltage Differential Probe, DC-200 MHz, 1500 V	●	●	●	●	●	●	●	●	●	●
RP1001C	Current Probe, DC-300 kHz, DC: ±100 A, AC: 200 App, 70 Arms						●	●	●	●	●
RP1002C	Current Probe, DC-1 MHz, DC: ±70 A, AC: 140 App, 50 Arms						●	●	●	●	●
RP1003C	Current Probe, DC-50 MHz, Max. Current: 50 A (Non-continuous), 30 Arms, Required to Order RP1000P Power Supply						●	●	●	●	●
RP1004C	Current Probe, DC-100 MHz, Max. Current: 50 A (Non-continuous), 30 Arms, Required to Order RP1000P Power Supply						●	●	●	●	●
RP1005C	Current Probe, DC-10 MHz, Max. Current: 150 Arms, 300 A (Non-continuous),500 Apeak, Required to Order RP1000P Power Supply						●	●	●	●	●
PCA1030	Current Probe, DC-50 MHz, Max. Current: 50 A (Non-continuous), 30 Arms, Power Supplied by the Digital Oscilloscope			●			●	●	●		
PCA2030	Current Probe, DC-100 MHz, Max. Current: 50 A (Non-continuous), 30 Arms, Power Supplied by the Digital Oscilloscope						●	●	●		
PCA1150	Current Probe, DC-10 MHz, Max. Current: 150 Arms, 300 A (Non-continuous),500 Apeak, Power Supplied by the Digital Oscilloscope						●	●	●		
PCA1500	Current Probe: 2 MHz, 500 A			●							
RPL2316	16-channel Logic Analyzer Probe							●	●		
PLA2216	16-Channel Logic Analyzer Probe for MSO5000 Series									●	
RPL1116	16-Channel Logic Analyzer Probe for MSO1000Z Series										●
T2R1000	Tek Probe to RIGOL Oscilloscope Adaptor						●	●	●		
USB-GPIB	USB-GPIB Adaptor						●	●	●	●	●
ADP0150BNC	50 ohm Adaptor (2 W, 1 GHz)									●	●

● Supported as standard or optional configuration.

Spectrum Analyzer

RIGOL's RSA series (including RSA5000 series, RSA3000 series, and RSA3000(E) series) are the full-function real-time spectrum analyzers. Being equipped with the patented technology Ultra Real, it optimizes performance and price. The superb specifications and outstanding performance can be delivered both in the RTSA, GPSA, VSA, and EMI pre-compliance working modes. With a 10.1-inch capacitive multi-touch screen with high resolution, it supports various touch gestures. You can also operate it with the externally connected keyboard and mouse. It has the built-in Linux system, and the HDMI interface is available for you to make the communication interface more stable and reliable. It can be widely applied to corporate R&D, factory production, education teaching, and other fields. With excellent performance at an unprecedented price point, the RSA series real-time spectrum analyzer allows you to further improve measurement quality at low costs.

DSA800 series, DSA800E series, and DSA700 series spectrum analyzers adopt the high-level digital IF technology. These spectrum analyzer products cover different frequency ranges, and its frequency can reach up to 7.5 GHz, the Displayed Average Noise Level (DANL) as low as -161 dBm, phase noise below -98 dBc/Hz, RBW up to 10 Hz. These specifications reach the international advanced level of the same product category. To meet the demands of different users, these spectrum analyzers are also equipped with standard and optional accessories, such as preamplifier (PA), tracking generator (TG), vector signal analysis measurement application, EMI measurement application, advanced measurement kit (AMK), VSWR measurement kit, teaching kit, VSWR bridge, cables, and converters.

	Frequency Band								Max. RTBW	Min. RBW	Phase Noise (at 10 kHz offset)	Software Option						Hardware Option	
	0.5 GHz	1 GHz	1.5 GHz	3 GHz	3.2 GHz	4.5 GHz	6.5 GHz	7.5 GHz				Vector Signal Analysis Measurement Application	EMI Measurement Application	VNA	AMK	EMC Filter and Quasi-peak Detector	VSWR	TG	Preamp
RSA5065/-TG/N							●		40 MHz	1 Hz	-108 dBc/Hz	●	●	only N Model	●	●	●	-TG/N Model	●
RSA5032/-TG/N					●				40 MHz	1 Hz	-108 dBc/Hz	●	●	only N Model	●	●	●	-TG/N Model	●
RSA3045/-TG/N						●			40 MHz	1 Hz	-102 dBc/Hz		●	only N Model	●	●	●	-TG/N Model	●
RSA3030/-TG/N				●					40 MHz	1 Hz	-102 dBc/Hz		●	only N Model	●	●	●	-TG/N Model	●
RSA3030E/-TG				●					10 MHz	1 Hz	-102 dBc/Hz		●		●	●	●	-TG Model	●
RSA3015E/-TG			●						10 MHz	1 Hz	-102 dBc/Hz		●		●	●	●	-TG Model	●
RSA3015N			●						40 MHz	1 Hz	-102 dBc/Hz		●	●	●	●	●	N Model	●
DSA875/-TG								●		10 Hz	-98 dBc/Hz				●	●	●	-TG Model	●
DSA832/-TG					●					10 Hz	-98 dBc/Hz				●	●	●	-TG Model	●
DSA832E/-TG					●					10 Hz	-90 dBc/Hz				●	●	●	-TG Model	●
DSA815/-TG			●							10 Hz	-80 dBc/Hz				●	●	●	-TG Model	●
DSA710		●								100 Hz	-80 dBc/Hz				●	●		N/A	●
DSA705	●									100 Hz	-80 dBc/Hz				●	●		N/A	●

● Standard or Option, could be supported.

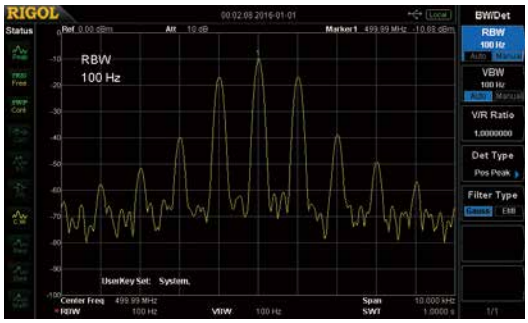
DSA700 Series Spectrum Analyzer

With a compact size and light weight, the DSA700 series spectrum analyzer has excellent technical specifications. Its measurement frequency range is from 100 kHz to 1 GHz. The high cost-effective spectrum analyzer with a high performance makes it popular with the users.

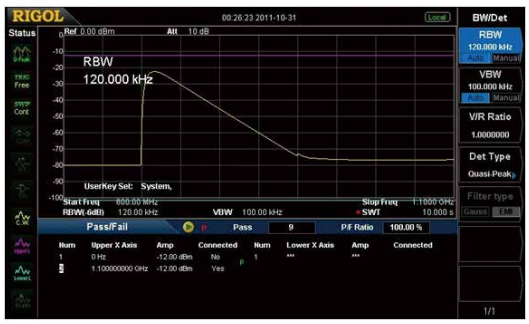
After being installed with the EMI filter and quasi-peak detector, the DSA700 series can complete the EMI pre-compliance test together with the near-field probe and LISN. With the SSC-DSA option, the DSA700 series is capable of capturing signals seamlessly. With a unique wide screen, novel appearance design, and easy operation experience, the DSA700 series is an ideal instrument for application scenarios such as the RF R&D, design and verification, production and manufacturing, as well as education training.

- Frequency range: 100 kHz to 1 GHz
- Min. RBW 100 Hz
- Min. DANL -130 dBm
- Min. phase noise -80 dBc/Hz @10 kHz offset
- EMI pre-compliance test
- Signal seamless capture mode
- Powerful DSA PC software

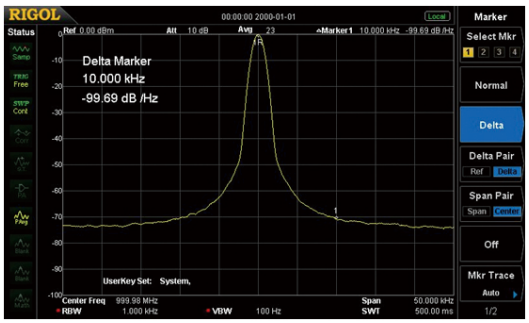
Distinguish the Two Nearby Signals Clearly with the 100 Hz RBW



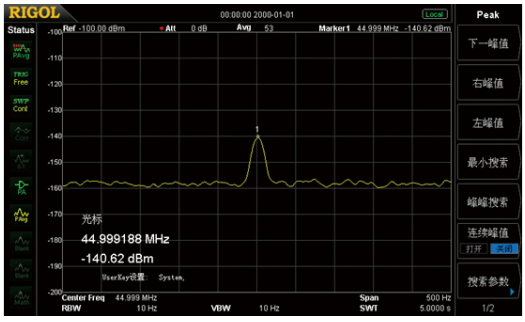
EMI Kit (EMI Filter & Quasi-peak & Pass/Fail)



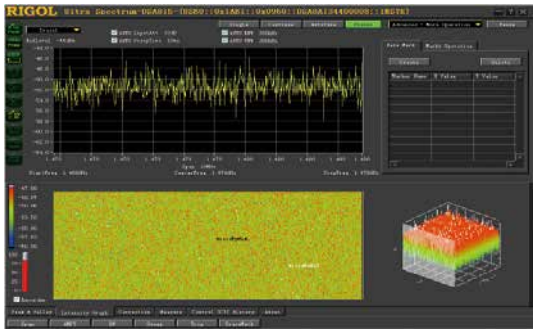
Phase Noise < -80 dBc/Hz @ 10 kHz Offset



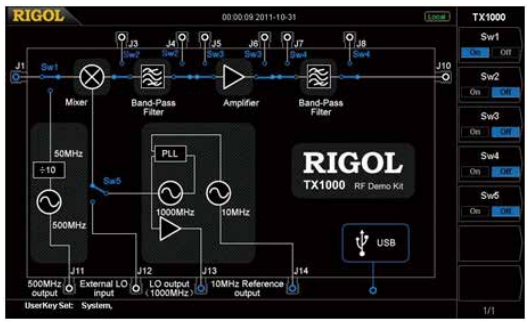
Measure the Low Level Signals with the PA On



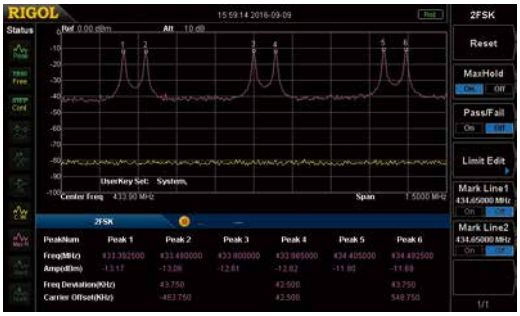
Powerful DSA PC Software



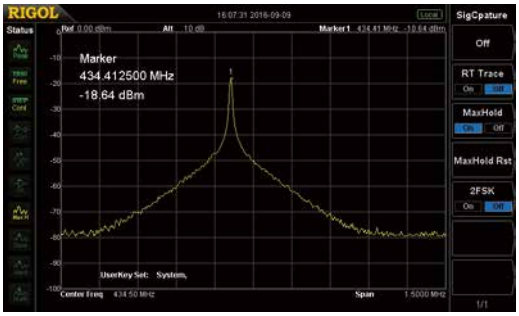
Built-in TX1000 Panel Control



Capture the FSK Signal with the SSC Kit



Capture the ASK Signal with the SSC Kit



Models and Key Specifications

	DSA705	DSA710
Frequency Range	100 kHz to 500 MHz	100 kHz to 1 GHz
Frequency Resolution	1 Hz	
Aging Rate	<2 ppm / year	
Phase Noise (fc = 1 GHz)	<-80 dBc/Hz @ 10kHz offset	
Resolution Bandwidth (-3 dB)	100 Hz to 1 MHz; in 1-3-10 step	
Resolution Bandwidth (-6 dB)	200 Hz, 9 kHz, and 120 kHz (EMI-DSA800 Option)	
Video Bandwidth (-3 dB)	1 Hz to 3 MHz; in 1-3-10 step	
Maximum Input DC Voltage	50 V	
Maximum Input CW RF Power	Attenuation = 30 dB, +20 dBm (100 mW)	
Maximum Damage Level	+30 dBm (1 W)	
Displayed Average Noise Level (DANL)	PA on, RBW = VBW = 100 Hz, sample detector, trace average ⩾ 50	
100 kHz to 1 MHz	<-110 dBm, <-130 dBm (typ.)	
1 MHz to 500 MHz	<-120 dBm, <-130 dBm (typ.)	
500 MHz to 1 GHz	<-120 dBm, <-130 dBm (typ.)	
Detector Type	Normal, positive-peak, negative-peak, sample, RMS, voltage average, quasi-peak (with EMI-DSA800 option)	
Trace Function	Clear write, max hold, min hold, average, view, blank	
Scale Unit	dBm, dBmV, dBμV, nV, μV, mV, V, nW, μW, mW, W	
Level Measurement Uncertainty	<1.5 dB (nom.)	
SSC Measurement Bandwidth	1.5 MHz	
I/O	LAN (LXI), USB, USB-GPIB (option)	

Order Information

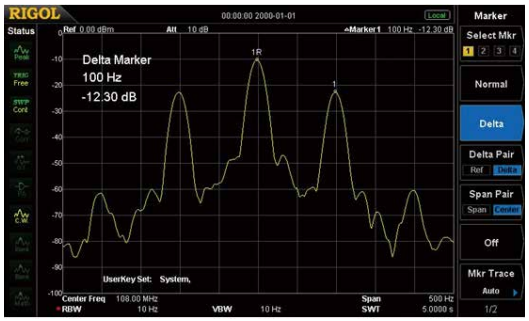
	Description	Order No.
Models	DSA705 (Spectrum Analyzer, 100 kHz to 500 MHz, with the PA)	DSA705
	DSA710 (Spectrum Analyzer, 100 kHz to 1 GHz, with the PA)	DSA710
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	--
Options	EMI Filter and Quasi-Peak Detector Kit	EMI-DSA800
	Advanced Measurement Kit	AMK-DSA800
	DSA PC Software	Ultra Spectrum
	Signal Seamless Capture	SSC-DSA

DSA800/E Series Spectrum Analyzer

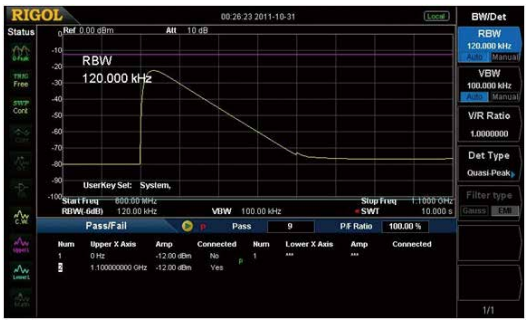
With light weight and compact size, the DSA875, DSA832/E, and DSA815 series spectrum analyzer has excellent technical specifications. Their frequency bands can reach 7.5 GHz, 3.2 GHz, and 1.5 GHz. DSA815 is an entry-level spectrum analyzer, with its frequency ranging from 9 kHz to 1.5 GHz. It is an economical instrument with an affordable price.
The models of the DSA800/E series are all equipped with the TG option, capable of completing the specification analysis for the RF components. After being installed with the EMI filter and quasi-peak detector options, the instrument can complete the EMI pre-compliance test together with the near-field probe and LISN. With a unique wide screen, novel appearance design, and easy operation experience, the DSA800/E series is an ideal instrument for application scenarios such as the RF R&D, design and verification, production and manufacturing, as well as education training.

- Frequency range: 9 kHz to 7.5 GHz
- Min. RBW 10 Hz
- Min. DANL -161 dBm
- Min. phase noise -98 dBc/Hz @10 kHz offset
- EMI pre-compliance test
- VSWR measurement
- Signal seamless capture (available for DSA815)
- Powerful DSA PC software

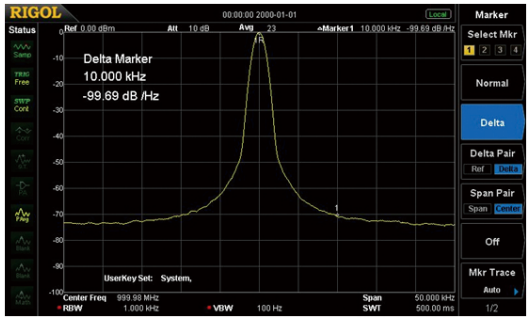
Distinguish the Two Nearby Signals Clearly with the 10 Hz RBW



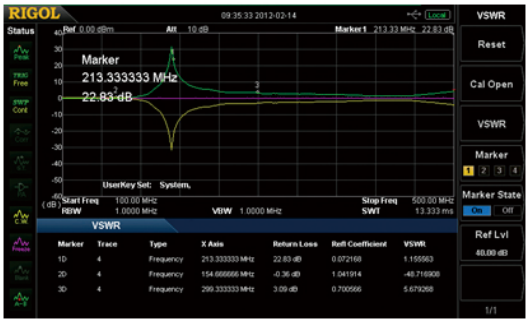
EMI Kit (EMI Filter & Quasi-peak & Pass/Fail)



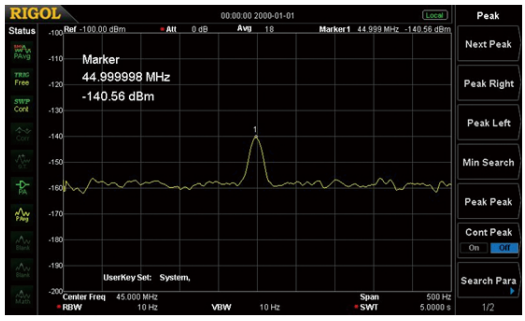
Phase Noise < -98 dBc/Hz @ 10 kHz Offset (DSA832/875)



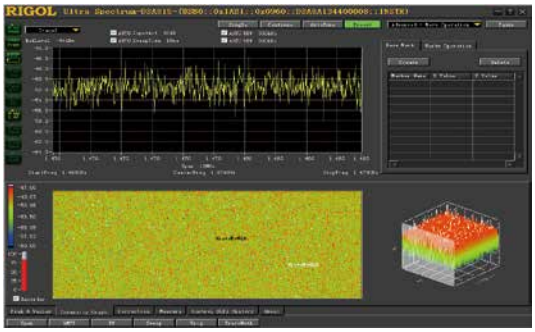
VSWR Measurement



Measure the Low Level Signals with the PA on



Powerful DSA PC Software



Models and Key Specifications

		DSA815/DSA815-TG	DSA832E/DSA832E-TG	DSA832/DSA832-TG	DSA875/DSA875-TG
Frequency Range		9 kHz to 1.5 GHz	9 kHz to 3.2 GHz	9 kHz to 3.2 GHz	9 kHz to 7.5 GHz
Frequency Resolution		1 Hz			
Frequency Reference Aging Rate		<2 ppm / year		<1 ppm / year	
Phase Noise (fc = 1 GHz)		<-80 dBc/Hz @ 10kHz offset	<-90 dBc/Hz @ 10kHz offset <-98 dBc/Hz @ 10kHz offset (typ.)	<-98 dBc/Hz @ 10kHz offset	
		<-100 dBc/Hz @ 100 kHz offset (typ.)			
Resolution Bandwidth (-3 dB)		10 Hz to 1 MHz; in 1-3-10 step			
Resolution Bandwidth (-6 dB)		200 Hz, 9 kHz, and 120 kHz (EMI-DSA800 Option)			
Video Bandwidth (-3 dB)		1 Hz to 3 MHz; in 1-3-10 step			
Displayed Average Noise Level (DANL)		Attenuator = 0 dB, RBW = VBW = 100 Hz, sample detector, trace averages ⩾ 50, 20°C to 30°C , input impedance = 50 Ω	Attenuator = 0 dB, RBW = VBW = 10 Hz, sample detector, trace averages ⩾ 50, 20°C to 30°C , input impedance = 50 Ω		
Preamplifier Off	9 kHz to 100 kHz		<-110 dBm, (typ.)	<-110 dBm, (typ.)	<-110 dBm, (typ.)
	100 kHz to 1 MHz	<-90 dBm, <-110 dBm (typ.)	<-122 dBm, <-128 dBm (typ.)	<-125 dBm, <-128 dBm (typ.)	<-125 dBm, <-128 dBm (typ.)
	1 MHz to 5 MHz	<-110 dBm + 6 x (f/1 GHz) dB, <-115 dBm (typ.)			
	5 MHz to 1.5 GHz		<-127 dBm, <-134 dBm (typ.)	<-130 dBm, <-134 dBm (typ.)	<-130 dBm, <-134 dBm (typ.)
	1.5 GHz to 3.2 GHz				
	3.2 GHz to 6 GHz				<-126 dBm, <-130 dBm (typ.)
	6 GHz to 7.5 GHz				<-121 dBm, <-125 dBm (typ.)
Preamplifier On	9 kHz to 100 kHz				
	100 kHz to 1 MHz	<-110 dBm, <-130 dBm (typ.)	<-142 dBm, (typ.)	<-142 dBm, (typ.)	<-142 dBm, (typ.)
	1 MHz to 5 MHz	<-130 dBm + 6 x (f/1 GHz) dB, <-135 dBm (typ.)	<-140 dBm, <-145 dBm (typ.)	<-142 dBm, <-145 dBm (typ.)	<-142 dBm, <-145 dBm (typ.)
	5 MHz to 1.5 GHz		<-145 dBm, <-151 dBm (typ.)	<-147 dBm, <-151 dBm (typ.)	<-147 dBm, <-151 dBm (typ.)
	1.5 GHz to 3.2 GHz				
	3.2 GHz to 6 GHz				<-143 dBm, <-147 dBm (typ.)
	6 GHz to 7.5 GHz				<-138 dBm, <-142 dBm (typ.)
Detector Type		Normal, positive-peak, negative-peak, sample, RMS, voltage average, quasi-peak (with EMI-DSA800 option)			
Trace Function		Clear write, max hold, min hold, average, view, blank			
Scale Unit		dBm, dBmV, dBμV, nV, μV, mV, V, nW, μW, mW, W			
Level Measurement Uncertainty		<1.5 dB (nom.)	<1.0 dB (nom.)	<0.8 dB (nom.)	
TG Frequency Range (-TG Model)		100 kHz to 1.5 GHz	100 kHz to 3.2 GHz	100 kHz to 3.2 GHz	100 kHz to 7.5 GHz
TG Output Level Range (-TG Model)		-20 dBm to 0 dBm	-40 dBm to 0 dBm	-40 dBm to 0 dBm	
TG Output Level Resolution (-TG Model)		1 dB			
SSC Measurement Bandwidth		1.5 MHz	N/A		
ASK/FSK Demodulation Analysis (PC Software Option)			S1220 ASK-FSK Demodulation Analysis Supported	S1220 ASK-FSK Demodulation Analysis Supported	
I/O		LAN (LXI), USB, USB-GPIB (option)			

Order Information

	Description	Order No.
Models	DSA815 (Spectrum Analyzer, 9 kHz to 1.5 GHz)	DSA815
	DSA832 (Spectrum Analyzer, 9 kHz to 3.2 GHz)	DSA832
	DSA875 (Spectrum Analyzer, 9 kHz to 7.5 GHz)	DSA875
	DSA832E (Spectrum Analyzer, 9 kHz to 3.2 GHz)	DSA832E
	DSA815-TG (Spectrum Analyzer, 9 kHz to 1.5 GHz, with TG installed when leaving the factory)	DSA815-TG
	DSA832-TG (Spectrum Analyzer, 9 kHz to 3.2 GHz, with TG installed when leaving the factory)	DSA832-TG
	DSA875-TG (Spectrum Analyzer, 9 kHz to 7.5 GHz, with TG installed when leaving the factory)	DSA875-TG
	DSA832E-TG (Spectrum Analyzer, 9 kHz to 3.2 GHz, with TG installed when leaving the factory)	DSA832E-TG
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	--
Options	EMI Filter and Quasi-Peak Detector Kit	EMI-DSA800
	Advanced Measurement	AMK-DSA800
	VSWR Measurement Kit	VSWR-DSA800
	DSA PC Software	Ultra Spectrum
	Signal Seamless Capture(Only Available for DSA815 and DSA700)	SSC-DSA
	EMI Pre-compliance Test Software	S1210 EMI Pre-compliance Software
	ASK-FSK Demodulation Analysis Software (Only Available for DSA832/DSA875/DSA832E)	S1220 ASK-FSK Demodulation Analysis RSA3030/-TG/N

RSA3000 Series Spectrum Analyzer

The RSA3000 series real-time spectrum analyzer includes seven models: RSA3015N, RSA3030, RSA3030-TG, RSA3030N, RSA3045, RSA3045-TG, RSA3045N. The -TG model is equipped with the tracking generator. The frequency band range: 9 kHz to 1.5 GHz; 9 kHz to 3 GHz; 9 kHz to 4.5 GHz. The RSA3000 series has a standard configuration of GPSA and RTSA modes, capable of delivering excellent performance at low costs. The RSA3000 series is a real-time spectrum analyzer built on the Ultra Real technical platform. Both in the RTSA and GPSA working modes, it can deliver excellent specifications. The general-purpose spectrum analyzer may not fully capture the signal due to the deadtime and slow sweep, which may even result in signal loss. Compared with the general-purpose spectrum analyzer, the real-time spectrum analyzer can perfectly address this issue. EMI measurement application software allows users to perform pre-compliance test and diagnosis evaluation before formal EMI certification for the product. Through the pre-compliance test, users can discover existing electromagnetic compatibility problems in advance, thereby ensuring that new designs can pass the final certification at one time test.

- Ultra Real technology
- Frequency range: up to 4.5 GHz
- Displayed average noise level: <-161 dBm (typ.)
- Phase noise < -102 dBc/Hz (typ.)
- Level measurement uncertainty: <1.0 dB
- Tracking generator up to 4.5 GHz
- Min. RBW 1 Hz
- Up to 40 MHz real-time analysis bandwidth
- Various measurement functions
- EMI measurement application (option)
- Vector network analysis software
- Multiple trigger modes and trigger masks
- Density, spectrogram, and other display modes
- PC software options
- 10.1-inch capacitive multi-touch screen, gesture enabled operation
- USB, LAN, HDMI, and other communication and display interfaces

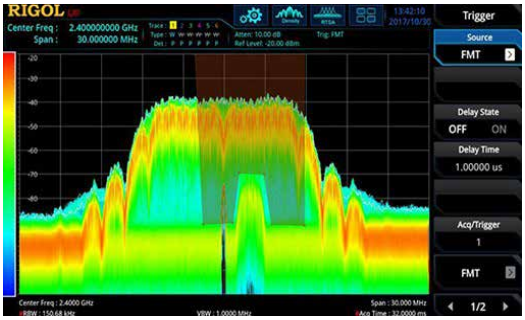
Built-in VNA Mode (N model)

In VNA mode, you can make S11, S21, and DTF measurements for the components and circuit networks. The network characteristics of the components under test can be accurately demonstrated in Smith chart, Polar chart, and other formats.

Conduction/Radiation Pre-testing with Built-in EMI Test Software

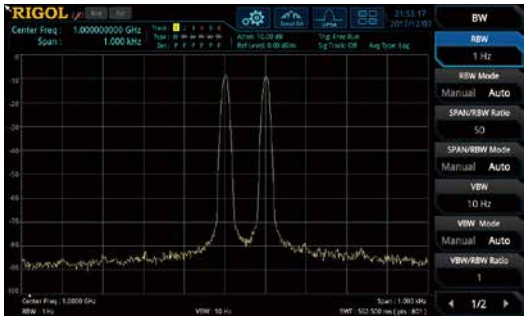
The RSA3000's built-in EMI pre-test application software, combined with CISPR-compliant filters, makes a pre-compliance test on the product for conduction and radiation to identify and improve its conduction/radiation disturbance source and accelerate time-to-market.

Signal Triggering and Monitoring Via FMT Template



The FMT frequency mask trigger is a unique trigger mode for real-time spectrum analyzers. You can quickly build a template and accurately locate and trigger signals that match the template rules to detect sporadic anomalies within the monitored range.

Resolution Bandwidth as Low as 1 Hz



Resolving signals with similar frequencies is critical to verify many RF devices and systems. With the RSA3000, the 1 Hz RBW allows you to view more details of adjacent signals.

Excellent Phase Noise Reduces the Impact on the Weak Signal Testing

Testing for the weak signals is liable to be influenced by the noise floor of the spectrum analyzer itself. DANL as low as -161 dBm can effectively ensure the testing for the weak signals.

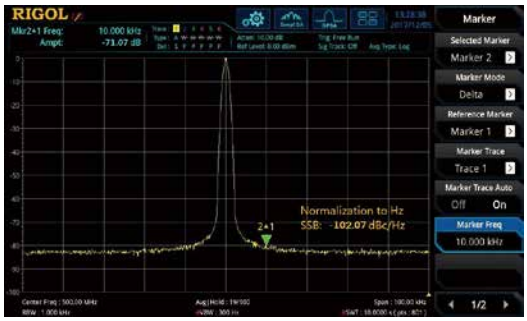
Multiple Interfaces to Improve the Connectivity of the Instruments

The instrument can be connected to a larger display/monitor via the HDMI interface for better display effects. The Web Control function allows you to directly control the device by accessing the device IP address, improving the experience of remote control.

Quickly Complete Operations with a Multi-touch Screen

The RSA3000 provides a 10.1-inch capacitive multi-touch screen for quick setup, and supports a variety of gestures such as dragging, expanding, and zooming waveforms to provide a personalized interactive experience.

Excellent Phase Noise Metric



Excellent sweep performance, phase noise as low as -102 dBc/Hz

Models and Key Specifications

Model		RSA3015N	RSA3030/-TG/N	RSA3045/-TG/N
Frequency Range		9 kHz to 1.5 GHz	9 kHz to 3.0 GHz	9 kHz to 4.5 GHz
Frequency Stability	0°C to 50°C , with the reference 25°C			
	Standard	<0.5 ppm		
	Option OCXO-C08	<0.005 ppm		
Phase Noise	10 kHz, fc = 500 MHz	<-100 dBc/Hz, <-102 dBc/Hz (typ.)		
Resolution Bandwidth (-3 dB)		1 Hz to 3 MHz (option 1 Hz to 10 MHz), in 1-3-10 step		
Resolution Bandwidth (-6 dB, option)		200 Hz, 9 kHz, 120 kHz, 1 MHz		
Displayed Average Noise Level (DANL)		PA on, attenuation = 0 dB, sample detector, trace averages ⩾ 50, tracking generator off, normalized to 1 Hz, 20°C to 30°C , input impedance = 50 Ω.		
		<-158 dBm, <-161 dBm (typ.)		
Level Measurement Uncertainty		<1.0 dB (nom.)		
TG Frequency Range (only available for -TG and N models)		100 kHz to 1.5 GHz	100 kHz to 3 GHz	100 kHz to 4.5 GHz
TG Output Level Range (only available for -TG and N models)		-40 dBm to 0 dBm	-40 dBm to 0 dBm	-40 dBm to 0 dBm
Real-time Analysis Bandwidth		Support upgrading: 10 MHz (std.), 25 MHz (option RSA3000-B25), 40 MHz (option RSA3000-B40)		
Full-scale Accuracy Min. Signal Duration for 100% POI at the Full-Scale Accuracy		Maximum span; default Kaiser Window		
		9.3 µs		
		7.82 µs (option RSA3000-B25)		
		7.45 µs (option RSA3000-B40)		
Window Type		Hanning, Blackman-Harris, Rectangular, Flattop, Kaiser, Gaussian		
FFT Rate		146,484/s (nom.)		
SFDR		Mixer level = -30 dBm		
		<-50 dBc (typ.)		
Trigger Source		Free Run, External, Power, FMT		

VNA Mode (only available for N models)	Measurement Setup	
	Measurement Type	S11, S21, and DTF
	Measurement Bandwidth	1 kHz to 10 MHz (in 1-3-10 step)
	Data Points	101 to 10,001; default 201
	Transmission Measurement S21	
	Trace Format	Lin Mag, Log Mag, Phase, Group Delay
	Dynamic Range	S21, RBW = 10 kHz, Port1 level = 0 dBm, Log Mag, Average = 50
		80 dB (nom.)
	Transmission Measurement S11	
	Trace Format	Lin Mag, Log Mag, Phase, Group Delay, SWR Smith Chart (Lin/Phase, Log/Phase, Real/Imag, R+j*X, G+j*B) Polar Chart (Lin/Phase, Log/Phase, Real/Imag)
	Corrected Directivity (With CK106A)	S11, Log Mag, Average = 50
		>40 dB (nom.)

Order Information

	Description	Order No.
Models	RSA3030 (Real-time Spectrum Analyzer, 9 kHz to 3.0 GHz)	RSA3030
	RSA3045 (Real-time Spectrum Analyzer, 9 kHz to 4.5 GHz)	RSA3045
	RSA3030-TG (Real-time Spectrum Analyzer, 9 kHz to 3.0 GHz, with tracking generator installed before leaving factory)	RSA3030-TG
	RSA3045-TG (Real-time Spectrum Analyzer, 9 kHz to 4.5 GHz, with tracking generator installed before leaving factory)	RSA3045-TG
	RSA3015N (Real-time Spectrum Analyzer, 9 kHz to 1.5 GHz, with tracking generator, VNA supported)	RSA3015N
	RSA3030N (Real-time Spectrum Analyzer, 9 kHz to 3.0 GHz, with tracking generator, VNA supported)	RSA3030N
	RSA3045N (Real-time Spectrum Analyzer, 9 kHz to 4.5 GHz, with tracking generator, VNA supported)	RSA3045N
Standard Accessory	Power Cord	-
Options	EMI Measurement Application (including RSA3000-EMC)	RSA3000-EMI
	Preamplifier (PA)	RSA3000-PA
	High Stable Clock (Required to be installed and calibrated before leaving factory)	OCXO-C08
	RBW 1 Hz to 10 MHz	RSA3000-BW1
	Real-time/Analysis Bandwidth 25 MHz	RSA3000-B25
	Real-time/Analysis Bandwidth 40 MHz	RSA3000-B40
	Advanced Measurement Kit	RSA3000-AMK
	EMC Filter and Quasi-Peak Detector Kit	RSA3000-EMC
	Spectrum Analyzer PC Software	Ultra Spectrum
	EMI Pre-compliance Software	S1210 EMI Pre-compliance Software

RSA3000E Series Spectrum Analyzer

The RSA3000E series real-time spectrum analyzer includes four models: RSA3015E, RSA3015E-TG, RSA3030E, and RSA3030E-TG. The -TG model is equipped with the tracking generator. The frequency band range: 9 kHz to 1.5 GHz; 9 kHz to 3 GHz. The RSA3000E series has a standard configuration of GPSA and RTSA modes, capable of delivering excellent performance at low costs. The RSA3000E series is a real-time spectrum analyzer built on the Ultra Real technical platform. Both in the RTSA and GPSA working modes, it can deliver excellent specifications. The general-purpose spectrum analyzer may not fully capture the signal due to the deadtime and slow sweep, which may even result in signal loss. Compared with the general-purpose spectrum analyzer, the real-time spectrum analyzer can perfectly address this issue. EMI measurement application software allows users to perform pre-compliance test and diagnosis evaluation before formal EMI certification for the product. Through the pre-compliance test, users can discover existing electromagnetic compatibility problems in advance, thereby ensuring that new designs can pass the final certification at one time test.

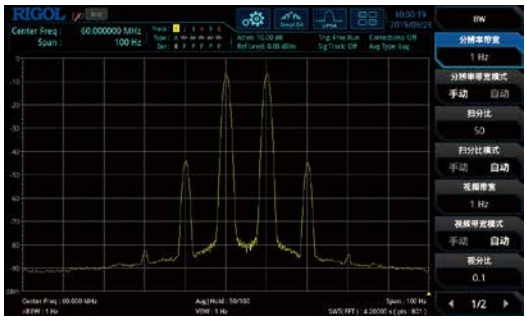
GPSA is a swept working mode, which realizes the function of the general-purpose spectrum analyzer. Compared with DSA800/E and DSA700 series, its key specifications such as phase noise, DANL, RBW, and sweep speed have been greatly enhanced. RTSA is a real-time working mode, which can seamlessly capture the transient signal, and display the measurement results completely through the Density view, Spectrum view, etc. Users can set the FMT trigger mode to accurately capture the desired signal of interest.

- Ultra Real technology
- Frequency range: up to 3 GHz
- Displayed average noise level: <-161 dBm (typ.)
- Phase noise: <-102 dBc/Hz (typ.)
- Level measurement uncertainty: <1.0 dB
- Tracking generator up to 3 GHz
- Min. RBW 1 Hz
- Up to 10 MHz real-time analysis bandwidth
- Multiple measurement modes
- Various measurement functions
- EMI measurement application (option)
- Multiple trigger modes and trigger masks
- Density, spectrogram, and other display modes
- PC software options
- 10.1-inch capacitive multi-touch screen, gesture enabled operation
- USB, LAN, HDMI, and other communication and display interfaces

Conduction/Radiation Pre-testing with Built-in EMI Test Software

The RSA3000E's built-in EMI pre-test application software, combined with CISPR-compliant filters, makes a pre-compliance test on the product for conduction and radiation to identify and improve its conduction/radiation disturbance source and accelerate time-to-market.

Resolution Bandwidth as Low as 1 Hz



Resolving signals with similar frequencies is critical to verify many RF devices and systems. With the RSA3000E, the 1 Hz RBW allows you to view more details of adjacent signals.

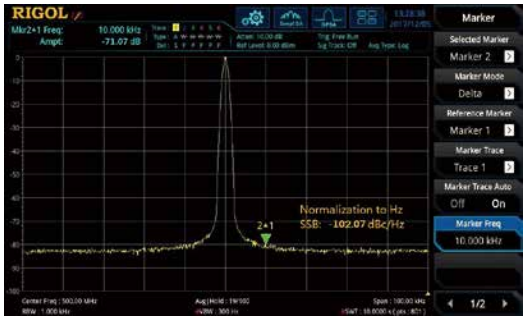
Excellent Phase Noise Reduces the Impact on the Weak Signal Testing

Testing for the weak signals is liable to be influenced by the noise floor of the spectrum analyzer itself. DANL as low as -161 dBm can effectively ensure the testing for the weak signals.

ASK/FSK Demodulation Analysis

ASK/FSK demodulation analysis software can help engineers demodulate and analyze signals such as TPMS, PKE/RKE, and obtain parameters of signal modulation quality to accelerate time-to-market for the products.

Excellent Phase Noise Metric



Excellent sweep performance, phase noise as low as -102 dBc/Hz

Quickly Complete Operations with a Multi-touch Screen

The RSA3000E provides a 10.1-inch capacitive multi-touch screen for quick setup, and supports a variety of gestures such as dragging, expanding, and zooming waveforms to provide a personalized interactive experience

Models and Key Specifications

Model		RSA3015E/RSA3015E-TG	RSA3030E/RSA3030E-TG
Frequency Range		9 kHz to 1.5 GHz	9 kHz to 3 GHz
Frequency Stability	0°C to 50°C , with the reference 25°C		
	Standard	<0.5 ppm	
	Option OCXO-C08	<0.005 ppm	
Phase Noise	10 kHz, fc = 500 MHz	<-100 dBc/Hz, <-102 dBc/Hz (typ.)	
Resolution Bandwidth (-3 dB)		1 Hz to 3 MHz; in 1-3-10 step	
Resolution Bandwidth (-6 dB, option)		200 Hz, 9 kHz, 120 kHz, 1 MHz	
Displayed Average Noise Level (DANL)		PA on, attenuation = 0 dB, sample detector, trace averages ⩾ 50, tracking generator off, normalized to 1 Hz, 20°C to 30°C , input impedance = 50 Ω.	
		<-158 dBm, <-161 dBm (typ.)	
Level Measurement Uncertainty		<1.0 dB (nom.)	
TG Frequency Range (only available for -TG model)		100 kHz to 1.5 GHz	100 kHz to 3 GHz
TG Output Level Range (only available for -TG model)		-40 dBm to 0 dBm	-40 dBm to 0 dBm
Real-time Analysis Bandwidth		10 MHz (real-time analysis bandwidth upgrade is not supported)	
Full-scale Accuracy		Maximum span; default Kaiser Window	
Min. Signal Duration for 100% POI at the Full-scale Accuracy		9.3 µs	
Window Type		Hanning, Blackman-Harris, Rectangular, Flattop, Kaiser, Gaussian	
FFT Rate		146,484/s (nom.)	
SFDR		Mixer level = -30 dBm	
		<-50 dBc (typ.)	
Trigger Source		Free Run, External, Power, FMT	

Order Information

	Description	Order No.
Models	RSA3015E (Real-time Spectrum Analyzer, 9 kHz to 1.5 GHz)	RSA3015E
	RSA3030E (Real-time Spectrum Analyzer, 9 kHz to 3 GHz)	RSA3030E
	RSA3015E-TG (Real-time Spectrum Analyzer, 9 kHz to 1.5 GHz, with tracking generator installed before leaving factory)	RSA3015E-TG
	RSA3030E-TG (Real-time Spectrum Analyzer, 9 kHz to 3 GHz, with tracking generator installed before leaving factory)	RSA3030E-TG
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	-
Options	EMI Measurement Application (including RSA3000E-EMC)	RSA3000E-EMI
	Preamplifier (PA)	RSA3000E-PA
	High Stable Clock (Required to be installed and calibrated before leaving factory)	OCXO-C08
	Advanced Measurement Kit	RSA3000E-AMK
	EMC Filter and Quasi-Peak Detector Kit	RSA3000E-EMC
	Spectrum Analyzer PC Software	Ultra Spectrum
	VSWR Measurement Kit	RSA3000E-VSWR
	ASK/FSK Demodulation Software	RSA3000E-ASK/FSK

RSA5000 Series Spectrum Analyzer

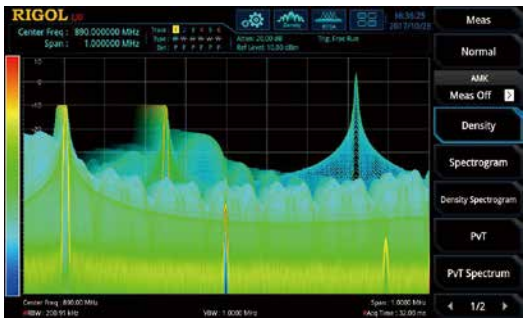
The RSA5000 series real-time spectrum analyzer includes six models: RSA5065, RSA5065-TG, RSA5032, RSA5032-TG, RSA5065N, and RSA5032N. The -TG model is equipped with the tracking generator. The frequency band range: 9 kHz to 6.5 GHz; 9 kHz to 3.2 GHz. The RSA5000 series has a standard configuration of GPSA and RTSA modes, capable of delivering excellent performance at low costs. The RSA5000 series is a real-time spectrum analyzer built on the Ultra Real technical platform. Both in the RTSA and GPSA working modes, it can deliver excellent specifications. The general-purpose spectrum analyzer may not fully capture the signal due to the deadtime and slow sweep, which may even result in signal loss. Compared with the general-purpose spectrum analyzer, the real-time spectrum analyzer can perfectly address this issue. In addition, the RSA5000 series real-time spectrum analyzer also has vector signal analysis application software and EMI measurement application software. The former provides vector signal analysis function which enables the RSA5000 series real-time spectrum analyzer to make comprehensive and detailed analysis and measurement of vector signals in multiple dimensions in the time domain, frequency domain, and modulation domain. EMI measurement application software allows users to perform pre-compliance test and diagnosis evaluation before formal EMI certification for the product. Through the pre-compliance test, users can discover existing electromagnetic compatibility problems in advance, thereby ensuring that new designs can pass the final certification at one time test.

GPSA is a swept working mode, which realizes the function of the general-purpose spectrum analyzer. Compared with DSA800/E and DSA700 series, its key specifications such as phase noise, DANL, RBW, and sweep speed have been greatly enhanced. RTSA is a real-time working mode, which can seamlessly capture the transient signal, and display the measurement results completely through the Density view, Spectrum view, etc. Users can set the FMT trigger mode to accurately capture the desired signal of interest.

The VNA mode enables users to make S11, S21, and DTF measurements for the components and circuit networks. The network characteristics of the components under test can be accurately demonstrated in Smith chart, Polar chart, and other formats.

- Ultra Real technology
- Frequency range: up to 6.5 GHz
- Displayed average noise level: <-165 dBm (typ.)
- Phase noise <-108 dBc/Hz (typ.)
- Level measurement uncertainty: <0.8 dB
- Tracking generator up to 6.5 GHz
- Min. RBW 1 Hz
- Up to 40 MHz real-time analysis bandwidth
- Multiple measurement modes
- Various measurement functions
- Vector signal analysis application software (opt.)
- EMI measurement application (opt.)
- Vector network analysis software
- Multiple trigger modes and trigger masks
- Density, spectrogram, and other display modes
- PC software options
- 10.1-inch capacitive multi-touch screen, gesture enabled operation
- USB, LAN, HDMI and other communication and display interfaces

Discover Transient Anomalies Through Ultra Real Technology



The RSA5000 series delivers up to 40 MHz of real-time bandwidth using the original Ultra Real technology. In the real-time bandwidth range, transient signals exceeding 7.45 µs duration can be guaranteed to be 100% captured and accurately measured.

Conduction/Radiation Pre-testing with Built-in EMI Test Software

The RSA5000's built-in EMI pre-test application software, combined with CISPR-compliant filters, makes a pre-compliance test on the product for conduction and radiation to identify and improve its conduction/radiation disturbance source and accelerate time-to-market.

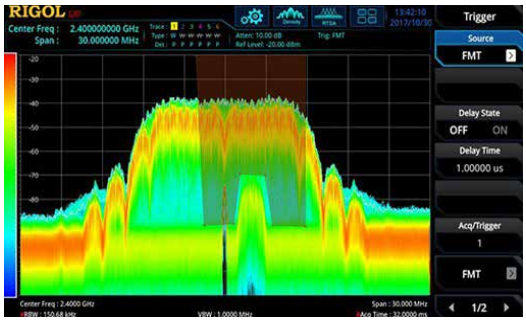
Discover Problems in Design with Vector Analysis

The VSA supports a variety of digital modulation formats such as QAM, PSK, MSK, ASK, FSK, etc. This function is used to quickly demodulate and display multi-dimensional data such as its constellation, eye diagram (baseband signal), spectrogram, demodulation data, etc., to discover problems in the design.

Built-in VNA Mode (N model)

In VNA mode, you can make S11, S21, and DTF measurements for the components and circuit networks. The network characteristics of the components under test can be accurately demonstrated in Smith chart, Polar chart, and other formats.

Signal Triggering and Monitoring Via FMT Template



The FMT frequency mask trigger is a unique trigger mode for real-time spectrum analyzers. You can quickly build a template and accurately locate and trigger signals that match the template rules to detect sporadic anomalies within the monitored range.

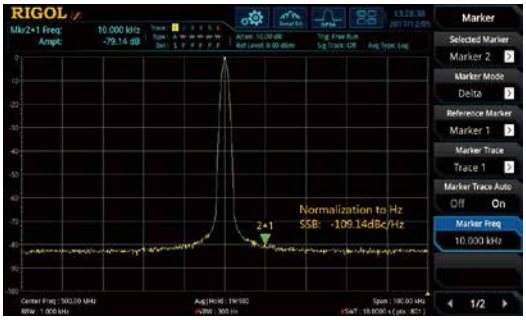
Multiple Interfaces for Connectivity

The instrument can be connected to a larger display/monitor via the HDMI interface for better display effects. The Web Control function allows you to directly control the device by accessing the device IP address, improving the experience of remote control.

Quickly Complete Operations with a Multi-touch Screen

The RSA5000 series provides a 10.1-inch capacitive multi-touch screen for quick setup, and supports a variety of gestures such as dragging, expanding, and zooming waveforms to maximize your time.

Excellent Phase Noise Metric



Excellent sweep performance; phase noise as low as -108 dBc/Hz

Models and Key Specifications

Model		RSA5032/-TG/N	RSA5065/-TG/N
Frequency Range		9 kHz to 3.2 GHz	9 kHz to 6.5 GHz
Frequency Stability	0°C to 50°C , with the reference 25°C		
	Standard	<0.5 ppm	
	Option OCXO-C08	<0.005 ppm	
Phase Noise	10 kHz, fc = 500 MHz	<-106 dBc/Hz (typ.), <-108 dBc/Hz (typ.)	
Resolution Bandwidth (-3 dB) [1]		1 Hz to 10 MHz; in 1-3-10 step	
Resolution Bandwidth (-6 dB)		200 Hz, 9 kHz, 120 kHz, 1 MHz	
Displayed Average Noise Level (DANL)		PA on, attenuation = 0 dB, sample detector, trace averages ⩾ 50, tracking generator off, normalized to 1 Hz, 20°C to 30°C , input impedance = 50 Ω.	
		<-162 dBm, <-165 dBm (typ.)	
Level Measurement Uncertainty		<0.8 dB (nom.)	
TG Frequency Range (only available for -TG and N models)		100 kHz to 3.2 GHz	100 kHz to 6.5 GHz
TG Output Level Range (only available for -TG and N models)		-40 dBm to 0 dBm	-40 dBm to 0 dBm
Real-time Analysis Bandwidth or I/Q Demodulation Bandwidth		25 MHz, 40 MHz (option RSA5000-B40)	
Full-scale Accuracy		Maximum span; default Kaiser Window	
Min. Signal Duration for 100% POI at the Full-scale Accuracy		7.45 µs	
Window Type		Hanning, Blackman-Harris, Rectangular, Flattop, Kaiser, Gaussian	
Max. Sample Rate		51.2 MSa/s	
FFT Rate146,484/s (nom.)		146,484/s (nom.)	
SFDR		Mixer level = -30 dBm	
		<-60 dBc (typ.)	
Trigger Source		Free Run, External, Power, FMT	

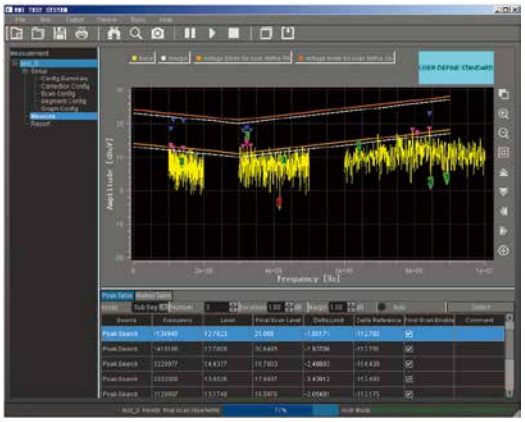
VNA Mode (only available for N models)	Measurement Setup	
	Measurement Type	S11, S21, and DTF
	Measurement Bandwidth	1 kHz to 10 MHz (in 1-3-10 step)
	Data Points	101 to 10,001; default 201
	Transmission Measurement S21	
	Trace Format	Lin Mag, Log Mag, Phase, Group Delay
	Dynamic Range	S21, RBW = 10 kHz, Port1 level = 0 dBm, Log Mag, Average = 50
		80 dB (nom.)
	Transmission Measurement S11	
	Trace Format	Lin Mag, Log Mag, Phase, Group Delay, SWR Smith Chart (Lin/Phase, Log/Phase, Real/Imag, R+j*X, G+j*B) Polar Chart (Lin/Phase, Log/Phase, Real/Imag)
	Corrected Directivity (With CK106A)	S11, Log Mag, Average = 50
		>40 dB (nom.)

Note: [1] When the tracking generator on or the sweep span is zero, the resolution bandwidth can be set among 1 kHz to 10 MHz.

Order Information

	Description	Order No.
Models	RSA5032 (Real-time Spectrum Analyzer, 9 kHz to 3.2 GHz)	RSA5032
	RSA5065 (Real-time Spectrum Analyzer, 9 kHz to 6.5 GHz)	RSA5065
	RSA5032-TG (Real-time Spectrum Analyzer, 9 kHz to 3.2 GHz, with tracking generator installed before leaving factory)	RSA5032-TG
	RSA5065-TG (Real-time Spectrum Analyzer, 9 kHz to 6.5 GHz, with tracking generator installed before leaving factory)	RSA5065-TG
	RSA5032N (Real-time Spectrum Analyzer, 9 kHz to 3.2 GHz, with tracking generator, VNA supported)	RSA5032N
	RSA5065N (Real-time Spectrum Analyzer, 9 kHz to 6.5 GHz, with tracking generator, VNA supported)	RSA5065N
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	-
Options	Vector Signal Analysis Measurement Application	RSA5000-VSA
	EMI Measurement Application	RSA5000-EMI
	Preamplifier (PA)	RSA5000-PA
	High Stable Clock (Required to be installed and calibrated before leaving factory)	OCXO-C08
	Real-time/Analysis Bandwidth 40 MHz	RSA5000-B40
	Advanced Measurement Kit	RSA5000-AMK
	Spectrum Analyzer PC Software	Ultra Spectrum
	EMI Pre-compliance Software	S1210 EMI Pre-compliance Software

EMI Test System[1](S1210)



EMI test system is a PC application software developed by RIGOL for RSA5000, RSA3000/E, DSA800, DSA800E and DSA700 series with the EMI-DSA800 option to do the EMI pre-compliance tests. You can perform conduction and radiation tests using S1210 EMI Test System software and RIGOL' s RSA/DSA series spectrum analyzers. You can measure the interference voltage on the power cable by using the Line Impedance Stabilization Network (LISN) and perform amplitude correction on the results by loading the correction factor (antenna, cable, or other correction arrays) automatically to the radiation test.

This software also provides various functions to facilitate your measurements. You can set various parameters (such as the frequency range, resolution bandwidth, and scan time) via the scan table. After performing a scan, the software system displays the results in log or linear format. You can search for signal peak value and view the results displayed in the peak table. Besides, you can mark and delete the undesired signal, as well as easily recognize signals that do not pass the standard limit line.

- Provide amplitude correction function
- Segment scanning and editing for the table to accelerate the measurement
- Limit Line function enables to quickly judge the measurement results
- Provide fast pre-scan and final scan modes
- Peak search function, define and save the peak table
- Frequency axis supports the scale display in linear or log format
- Amplitude axis displayed in multiple amplitude units
- Generate test report automatically

Recommended Configuration

	Description	Order No.
Models	RSA5000/3000/3000E, DSA800/800E/700 Series Spectrum Analyzer	Refer to Specific Models of Each Series
	EMI Filter and Quasi-Peak Detector Kit of the RSA3000 Series Spectrum Analyzer	RSA3000-EMC
	EMI Filter and Quasi-Peak Detector Kit of the RSA3000E Series Spectrum Analyzer	RSA3000E-EMC
	EMI Filter and Quasi-Peak Detector Kit of the DSA800/800E/700 Series Spectrum Analyzer	EMI-DSA800
EMI Pre-compliance Test Analysis Software	EMI Test System	S1210
Test Accessories	Near-Field Probe (For Detecting the Near-field Radiated EMI Emissions Testing)	NFP-3
	Line Impedance Stabilization Network (LISN) (For Conducted EMI Testing)	Self-provided
	Antenna (For Far-field Radiated EMI Emissions Testing)	Self-provided

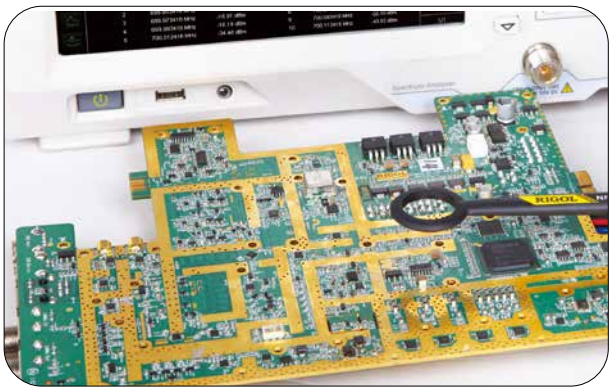
[1] Built-in EMI function of the RSA series can be used.

NFP-3 Near-field Probe

NFP-3 is used with RIGOL RSA/DSA series spectrum analyzer for the EMI tests of electronic products. It can be used to test the magnetic field strength and magnetic field coupling channels on the surface of the electronic components as well as the magnetic field environment near the electronic module so as to quickly locate the interference source. NFP-3 includes four models (NFP-3-P1, NFP-3-P2, NFP-3-P3 and NFP-3-P4).

Test Connection

The test connection between the NFP-3 and the spectrum analyzer is shown in the following figure.



Connect the spectrum analyzer

Connect the SMB (M) terminal of NFP-3 and the BNC (F) terminal of the N-BNC adaptor respectively by using the BNC-SMB RF cable. Then connect the N (M) terminal of the N-BNC adaptor to the RF input terminal of the spectrum analyzer.

Connect the DUT

NFP-3 is used to perform short-distance contact-free measurement on the device under test. Pay attention to the direction where the probe is positioned during measurement.

Typical applications

Locate the EMI radiation interference source.

Determine the frequency and relative strength of the spectral component of the interference source.

Specifications

Frequency	
Frequency Range	30 MHz to 3 GHz
Terminal Type	
Terminal Type	SMB (M)
Adaptor	N(M)-BNC(F)
RF Cable	BNC(M)-SMB(F), 1,000 mm
Terminal and Adaptor Impedance	50 Ω

Common RF Accessories

DSA Utility Kit

- 6 dB Attenuator (1 pcs)
- 10 dB Attenuator (2 pcs)

RF CATV Kit

- 50 Ω-75 Ω Adaptor (2 pcs)

30 dB High Power Attenuator

- Max. Power is 100 W

RF Adaptor Kit

- N(F)-N(F) Adaptor (1 pcs)
- N(M)-N(F) Adaptor (1 pcs)
- N(M)-SMA(F) Adaptor (2 pcs)
- N(M)-BNC(F) Adaptor (2 pcs)
- SMA(F)-SMA(F) Adaptor (1 pcs)
- SMA(M)-SMA(M) Adaptor (1 pcs)
- BNC T-type Adaptor (1 pcs)
- 50 Ω SMA Load (1 pcs)
- 50 Ω BNC Impedance Adaptor (1 pcs)

RF Attenuator Kit

- N-SMA Cable
- BNC-BNC Cable
- N-BNC Adaptor
- N-SMA Adaptor
- 75 Ω-50 Ω Adapter
- 2 Antennas (900 MHz/1.8 GHz)
- 2 Antennas (2.4 GHz)

VSWR Bridge

- VB1032[1], 1 MHz to 3.2 GHz
- VB1040[1], 800 MHz to 4 GHz
- VB1080[1], 2 GHz to 8 GHz

[1] VSWR-DSA800 provided for free

CK106A Accessory Kit

- High-performance network analysis calibration kit
- Frequency range, DC to 6.5 GHz
- Only available for N model
- Wide test frequency, small volume, and stable electrical performance

CK106E Accessory Kit

- Economical network analysis calibration kit
- Frequency range, DC to 1.5 GHz
- Only available for N model

RF Cable

- Various RF cable kits
- Easy to install, operate stably

RF Signal Generator

RIGOL RF signal generators adopt an innovative design, breaking through the cost bottleneck of traditional products, providing users with unprecedented cost-effective products. DSG series signal generators can provide highly pure RF signals, and the typical value of phase noise can be as low as -116 dBc/Hz. The application of digital ALC circuit enables accurate control of the amplitude of output RF signals, with power accuracy up to 0.5 dB. In addition to the conventional AM/FM/ΦM modulation, the RF signal generator can also provide pulse modulation and pulse train functions to meet the communication and research requirements. DSG800A model also offers a variety of I/Q modulations, supporting internal or external modulation and providing IF signal output. The convenient operation and abundant functions make DSG series RF signal generators become the ideal instruments for the development and design of wireless communication, Internet of things (IoT) and consumer electronic products. They provide cost-effective test solutions for the production and testing of RF components. The economical DSG800 series sets a new benchmark for RF testing instruments, making it affordable for engineers engaged in college teaching experiments and basic RF development. The DSG3000B series is a high-performance RF signal generator. It is an ideal tool in various fields such as communication, computers, instrumentation, R&D, education, production and maintenance.

Model	Frequency Band									Amplitude Range	Amplitude Accuracy	Clock Stability	Phase Noise	Standard Modulation	Pulse Train Generator	I/Q Modulation
	1.5 GHz	2.1 GHz	3 GHz	3.6 GHz	6 GHz	6.5 GHz	13.6 GHz	12 GHz	20 GHz							
DSG5122								●		-30 dBm to +25 dBm	<0.7 dB (typ.)	<0.5 ppm <5 ppb (OCXO-D08 option)	-133 dBc/Hz@10 kHz, carrier waveform 1 GHz (typ.)	AM/FM/ØM/ Pulse	DSG5000-PUG	-
DSG5124								●								
DSG5126								●								
DSG5128								●								
DSG5202									●							
DSG5204									●							
DSG5206									●							
DSG5208									●							
DSG815	●									-110 dBm to +13 dBm	⩽ 0.5 dB (typ.)	<2 ppm <5 ppb (OCXO-B08 option)	-112 dBc/Hz (typ.)	AM/FM/ØM	DSG800-PUM DSG800-PUG (including DSG800-PUM)	-
DSG830			●													-
DSG821		●														Std.
DSG821A		●														-
DSG836				●												Std.
DSG836A				●												
DSG3065B						●				-110 dBm to +27 dBm	⩽ 0.5 dB (typ.)	<1 ppm <5 ppb (OCXO-B08 option)	<-116 dBc/Hz (typ.)	AM/FM/ΦM	DSG3000B-PUG	-
DSG3065B-IQ						●										Std.
DSG3136B							●									-
DSG3136B-IQ							●									Std.

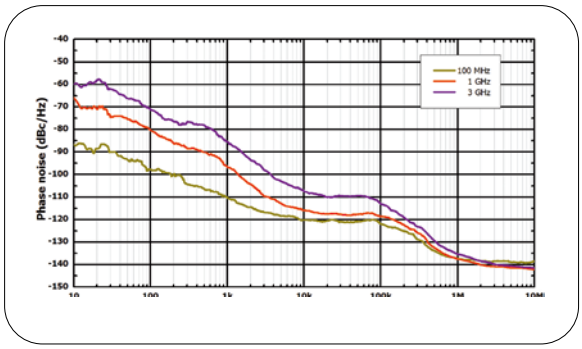
DSG800 Series RF Signal Generator

The DSG800 series delivers outstanding performance in the same class of economical RF signal generators to address the demands of RF components manufacturing, IoT, wireless communication, education and training, as well as RF operation and maintenance. With full frequency and power scanning capabilities, as well as AM/FM/ØM analog modulation, powerful pulse modulation and newly added IQ modulation, compared with similar products, the DSG800 series has the smallest footprint, light weight and superior portability, making it an excellent choice for educational laboratories, industrial production lines, development and research applications. It breaks through the cost bottle neck of the RF signal generator, making it become an affordable instrument for every engineer with high quality pure RF signals at an unprecedented price point.

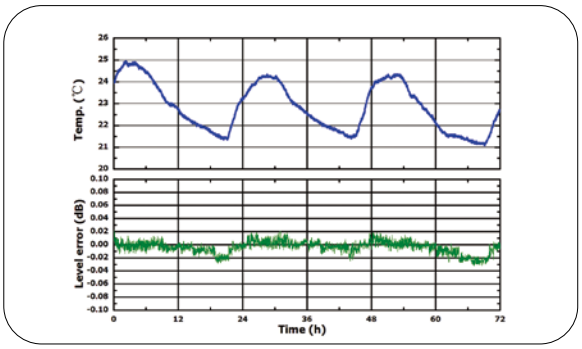
The DSG800 series has 6 models: DSG815/DSG830/DSG821/DSG836/DSG821A/DSG836A, with the frequencies ranging from 9 kHz, 1.5 GHz, 2.1 GHz, 3 GHz, and 3.6 GHz. The typical phase noise can reach up to -112 dBc/Hz, amplitude accuracy up to 0.5 dB. It has a standard configuration of AM, FM, ØM modulation types. Pulse modulation and pulse train generator are also supported as options. Its compact size and portable design make it suitable for on-site application.

- High signal purity, with the typical phase noise up to -112 dBc/Hz
- Max. output power 20 dBm
- Digital ALC circuit ensures stability and accuracy, with amplitude accuracy up to 0.5 dB
- Flexible frequency and amplitude sweep functions
- Complete AM/FM/ØM analog modulation functions
- Open vector modulation function (for A model)
- Powerful pulse modulation and pulse train generator function
- Light weight and compact size, easy to carry and operate

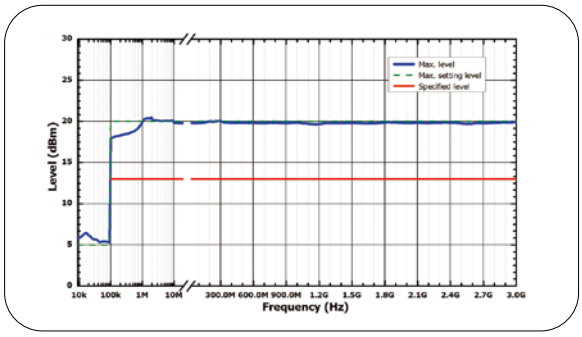
Excellent phase noise



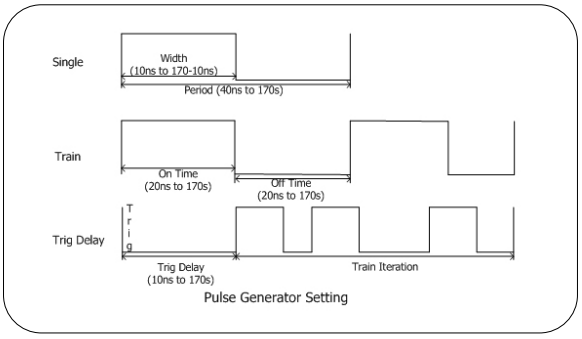
Superb output stability



Max. output power 20 dBm



Powerful pulse modulation and pulse train generator function



Simultaneous Modulation

	AM	FM	ΦM	Pulse Modulation (Opt.)	I/Q Modulation (Opt.)
AM	—	○	○	△	×
FM	○	—	×	○	○
ΦM	○	×	—	○	○
Pulse Modulation (Opt.)	△	○	○	—	○
I/Q Modulation (Opt.)	×	○	○	○	—

Note: ○ : compatible; ×: incompatible; △ : compatible, but the AM performance will be undermined when pulse modulation is enabled.

Models and Specifications

Model		DSG815	DSG830	DSG821	DSG821A	DSG836	DSG836A
Frequency Range		9 kHz to 1.5 GHz	9 kHz to 3 GHz	9 kHz to 2.1 GHz	9 kHz to 2.1 GHz	9 kHz to 3.6 GHz	9 kHz to 3.6 GHz
Amplitude Range		-110 dBm to +13 dBm					
Amplitude Setting Range		-110 dBm to +20 dBm					
Amplitude Accuracy		<0.9 dB (<0.5 dB, typ.)					
Clock Reference Stability		<2 ppm; <5 ppb (with option OCXO-B08)					
Spectral Purity	SSB Phase Noise	100 kHz ⩽ f ⩽ 1.5 GHz: <-105 dBc/Hz (-112 dBc/Hz (typ.)) 1.5 GHz < f ⩽ 3.6 GHz: <-99 dBc/Hz, <-106 dBc/Hz (typ.), CW mode, carrier offset = 20 kHz					
	Harmonic Distortion	<-30 dBc, CW mode, 1 MHz ⩽ f ⩽ 3 GHz, output level ⩽ +13 dBm					
	Non-harmonic Distortion	100 kHz ⩽ f ⩽ 1.5 GHz: <-60 dBc, <-70 dBc (typ.); 1.5 GHz ⩽ f ⩽ 3 GHz: <-54 dBc/Hz (-64 dBc/Hz (typ.))					
Sweep	Sweep Mode	Linear sweep, Step/List sweep, Single/Continuous sweep					
	Sweep Points	2 to 65,535 (Step sweep); 1 to 6,001 (List sweep)					
Modulation Type		AM, FM, PM, and pulse modulation					
AM	Modulation Depth	0% to 100%					
	Setting Uncertainty	< 4% of setting value + 1%					
	Modulation Frequency Response	<3 dB (10 Hz to 100kHz, m<80%)					
FM	Max. Deviation	N[1] x 1 MHz					
	Setting Uncertainty	<2% of setting value + 20 Hz					
	Modulation Frequency Response	<3 dB (10 Hz – 100 kHz)					
ØM	Max. Deviation	N[1] x 5 rad					
	Setting Uncertainty	<1% of setting value + 0.1 rad					
	Modulation Frequency Response	<3 dB (10 Hz – 100 kHz)					
Pulse Modulation	On/Off Ratio	>70 dB (100 kHz ⩽ f <3.6 GHz)					
	Rise/Fall Time	<50 ns, 10 ns (typ.)					
	Pulse Mode	Single pulse, pulse train (option DSG800-PUG)					
IQ Modulation (Only Available for A Model)	Bandwidth	External modulation: baseband (I or Q): ⩽ 60 MHz (nom.); RF (I + Q): ⩽ 120 MHz Internal modulation: baseband (I or Q): ⩽ 30 sMHz (nom.); RF (I + Q): ⩽ 60MHz					
	EVM	⩽ 2% rms (typ.)					
General Specifications	Interface	Standard: USB and LAN					
		Front panel: RF output, internal modulation generator (LF) output					
		Rear panel: external trigger input, signal valid output, pulse input/output					
		External modulation input (EXT MOD INPUT), 10 MHz In/Out					

Note: [1] f < 227.5 MHz, N = 0.25; 227.5 MHz ⩽ f < 455 MHz, N = 0.125; 455 MHz ⩽ f < 910 MHz, N = 0.25; 910 MHz ⩽ f < 1820 MHz, N=0.5; 1820 MHz ⩽ f ⩽ 3600 MHz, N = 1

Order Information

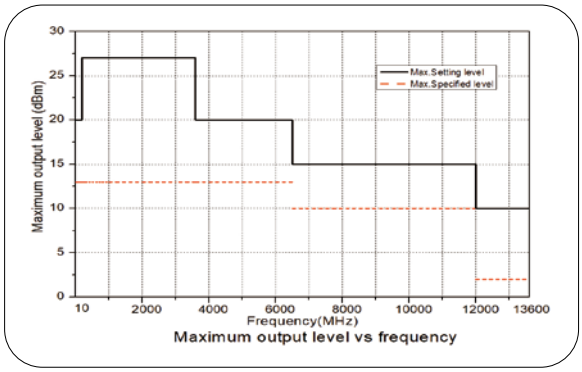
	Description	Order No.
Models	DSG830 (RF Signal Generator, 9 kHz to 3 GHz)	DSG830
	DSG815 (RF Signal Generator, 9 kHz to 1.5 GHz)	DSG815
	DSG821 (RF Signal Generator, 9 kHz to 2.1 GHz)	DSG821
	DSG821A (RF Signal Generator, 9 kHz to 2.1 GHz, with the IQ Modulation)	DSG821A
	DSG836 (RF Signal Generator, 9 kHz to 3.6 GHz)	DSG836
	DSG836A (RF Signal Generator, 9 kHz to 3.6 GHz, with the IQ Modulation)	DSG836A
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	-
Options	Pulse Modulation, Pulse Train Generator	DSG800-PUM
	Pulse Train Generator (include DSG800-PUM)	DSG800-PUG
	Highly Stable Clock Reference (Required to be installed and calibrated before leaving factory)	OCXO-B08
	Rack Mount Kit (for a single instrument)	RM-1-DG1000Z
	Rack Mount Kit (for two instruments)	RM-2-DG1000Z

DSG3000B Series RF Signal Generator

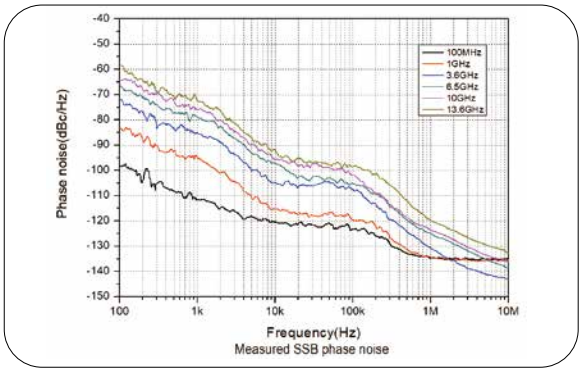
The DSG3000B series is a high-performance RF signal generator. It provides comprehensive modulation solutions: AM/FM/ΦM analog modulation; pulse modulation with user-defined pulse train; and I/Q modulation. All the modulations support internal and external modulation sources. In addition, to meet the demands of production environments, the DSG3000B series has undergone a strict verification through the experiments in its design and production stages to ensure its high stability and reliability. The DSG3000B series also features a clear user interface, compact size and light weight. It is easy to operate and can output stable, precise and pure signals. It is an ideal tool in various fields such as communication, computers, instrumentation, R&D, education, production and maintenance.

- Frequency up to 6.5 GHz/13.6 GHz
- Amplitude accuracy < 0.5 dB
- Output level setting range: -130 dBm to +27 dBm
- High signal purity, with the phase noise <-116 dBc/Hz@20 kHz
- Standard 1 ppm internal clock; optional 5 ppb high stable clock
- Standard AM/FM/ΦM analog modulation
- Pulse modulation; on/off ratio up to 70 dB; user-defined pulse train
- I/Q modulation and I/Q baseband output
- All modulations support internal and external modulation sources
- Standard 2U height design to save rack space; rack mount kit available
- USB/LAN/GPIB remote control interfaces for connectivity; SCPI command set for remote control
- Wear-free electronic attenuator design

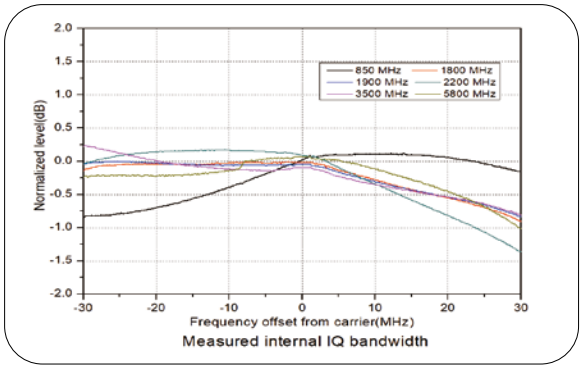
High-power signal generation capability



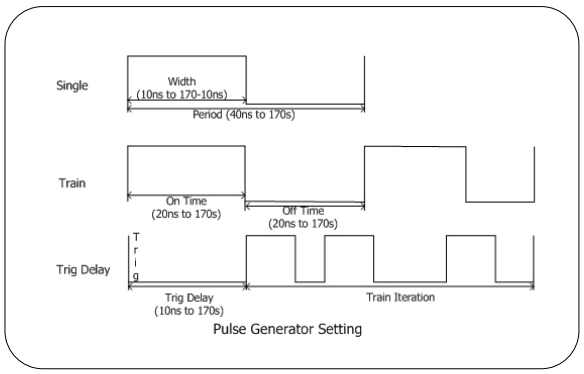
Excellent phase noise



Support internal and external IQ modulation



Pulse modulation; on/off ratio up to 70 dB



Multiple Modulations

Simultaneous Modulation

	AM	FM	ΦM	Pulse Modulation (Opt.)	I/Q Modulation (Opt.)
AM	—	○	○	△	×
FM	○	—	×	○	○
ΦM	○	×	—	○	○
Pulse Modulation	△	○	○	—	○
I/Q mod.	×	○	○	○	—

Note: ○ : compatible; ×: incompatible; △ : compatible, but the AM performance will be undermined when pulse modulation is enabled.

Models and Specifications

Model		DSG3065B	DSG3065B-IQ	DSG3136B	DSG3136B-IQ
Frequency Range		9 kHz to 6.5 GHz	9 kHz to 6.5 GHz (IQ: 50 MHz to 6.5 GHz)	9 kHz to 13.6 GHz	9 kHz to 13.6 GHz (IQ: 50 MHz to 6.5 GHz)
Amplitude Range		-110 dBm to +13 dBm			
Amplitude Setting Range		-130 dBm to +27 dBm			
Amplitude Accuracy		<0.9 dB (<0.5 dB, typ.)			
Clock Reference Stability		<1 ppm; <5 ppb (with option OCXO-B08)			
Spectral Purity	SSB Phase Noise	CW mode, carrier offset = 20 kHz, 1 Hz measurement bandwidth f = 1 GHz: <-110 dBc/Hz, <-116 dBc/Hz (typ.) f = 6.5 GHz: <-98 dBc/Hz, <-102 dBc/Hz (typ.) f = 13.6 GHz: <-92 dBc/Hz, <-96 dBc/Hz (typ.)			
	Harmonic Distortion	CW mode <-30 dBc (2 MHz ⩽ f ⩽ 6.5 GHz, level ⩽ +13 dBm) <-30 dBc (6.5 GHz ⩽ f ⩽ 12 GHz, level ⩽ +10 dBm) <-30 dBc (12 GHz < f ⩽ 13.6 GHz, level ⩽ 2 dBm)			
	Non-harmonic Distortion	CW mode, level > -10 dBm, carrier offset > 10 kHz 100 kHz ⩽ f ⩽ 1.5 GHz: <-60 dBc/H, -70 dBc/Hz (typ.) 1.5 GHz < f ⩽ 3.6 GHz: <-54 dBc, <-64 dBc (typ.) 3.6 GHz < f ⩽ 6.5 GHz: <-48 dBc, <-58 dBc (typ.) 6.5 GHz ⩽ f ⩽ 13.6 GHz: <-42 dBc/H, -52 dBc/Hz (typ.)			
Sweep	Sweep Mode	Step/List sweep; Single/Continuous sweep			
	Sweep Points	2 to 65,535 (Step sweep); 1 to 6,001 (List sweep)			
Modulation Type		AM, FM, PM, pulse modulation, and I/Q modulation (frequency range of AM, PM, PM, and pulse modulation ⩽ 3.6 GHz)			
AM	Modulation Depth	0% to 100%			
	Setting Uncertainty	< 4% of setting value + 1%			
	Modulation Frequency Response	m < 80%, DC/10 Hz to 100 kHz			
FM	Max. Deviation	N[1] x 1 MHz			
	Setting Uncertainty	<2% of setting value + 20 Hz			
	Modulation Frequency Response	<3 dB (10 Hz – 100 kHz)			
ØM	Max. Deviation	N[1] x 5 rad			
	Setting Uncertainty	<1% of setting value + 0.1 rad			
	Modulation Frequency Response	<3 dB (DC/10 Hz to 100 kHz)			
Pulse Modulation	On/Off Ratio	>70 dB (100 kHz ⩽ f < 3 GHz)			
	Rise/Fall Time	<50 ns (typ.)			
	Pulse Mode	Single pulse, pulse train (option DSG3000B-PUG)			
I/Q Modulation (Only Available for DSG3065B-IQ and DSG3136B-IQ)	Bandwidth	External modulation: baseband (I or Q): ⩽ 60 MHz (nom.); RF (I + Q): ⩽ 120 MHz Internal modulation: baseband (I or Q): ⩽ 30 MHz (nom.); RF (I + Q): ⩽ 60 MHz			
	EVM	⩽ 2% rms (typ.)			
General Specifications	Interface	Standard: USB and LAN			
		Front panel: RF output, internal modulation generator (LF) output, and external modulation input (EXT MOD)			
		Rear panel: external trigger input (Trigger In), signal valid output (Signal Valid Out), pulse input/output (Pulse In/Out), and reference clock (10 MHz In/Out)			

Note: [1] f < 227.5 MHz, N = 0.25; 227.5 MHz ⩽ f < 455 MHz, N = 0.125; 455 MHz ⩽ f < 910 MHz, N = 0.25; 910 MHz ⩽ f < 1820 MHz, N=0.5; 1820 MHz ⩽ f ⩽ 3600 MHz, N=1; 3600 MHz < f ⩽ 6500 MHz, N=2; 6500 MHz < f ⩽ 13600 MHz, N=4.

Order Information

	Description	Order No.
Models	DSG3065B (RF Signal Generator, 9 kHz to 6.5 GHz)	DSG3065B
	DSG3065B-IQ (RF Signal Generator, 9 kHz to 6.5 GHz, I/Q Modulation (Std.))	DSG3065B-IQ
	DSG3136B (RF Signal Generator, 9 kHz to 13.6 GHz)	DSG3136B
	DSG3136B-IQ (RF Signal Generator, 9 kHz to 13.6 GHz, IQ Modulation (Std.))	DSG3136B-IQ
Standard Accessory	Power Cord Conforming to the Standard of the Destination Country	-
Options	Pulse Modulation, Pulse Generator, and Pulse Train Generator	DSG3000B-PUG
	Highly Stable Clock Reference (Required to be installed and calibrated before leaving factory)	OCXO-B08
	Rack Mount Kit	RM-DSG3000
Optional Accessories	Include: N(F)-N(F) adaptor (1pcs), N(M)-N(M) adaptor (1pcs), N(M)-SMA(F) adaptor (2pcs), N(M)-BNC(F) adaptor (2pcs), SMA(F)-SMA(F) adaptor (1pcs), SMA(M)-SMA(M) adaptor (1pcs), BNC T type adaptor (1pcs), 50 Ω SMA load (1pcs), 50 Ω BNC impedance adaptor (1pcs)	RF Adaptor Kit
	Include: 50 Ω to 75 Ω adaptor (2pcs)	RF CATV Kit
	Include: 6 dB attenuator (1pcs), 10 dB attenuator (2pcs)	RF Attenuator Kit
	N(M)-N(M) RF Cable	CB-NM-NM-75-L-12G
	N(M)-SMA(M) RF Cable	CB-NM-SMAM-75-L-12G
	USB-GPIB Adaptor	USB-GPIB

Function/Arbitrary Waveform Generator

RIGOL's function/arbitrary waveform generator adopts the latest Direct Digital Frequency Synthesis technology (DDS) to generate accurate and stable standard function waveforms such as Sine, Square, Triangle, and Pulse, as well as the analog/digital modulated signals. What' s more, the generator also provides arbitrary waveform function which allows engineers to generate any desired waveforms using the UltraStation editing software to work with the instrument to capture the actual signal and generate the arbitrary waveforms.

RIGOL has launched a series of function/arbitrary waveform generators over the past years, including DG70000, DG5000, DG4000, DG2000, DG1000Z, DG900 Pro, and DG800 Pro series, with up to 5 GHz output frequency, 12 GSa/s sample rate, 1.5 Gpts memory depth, and 16-bit vertical resolution. The LCD display, user-friendly UI design, and panel layout have brought users with extraordinary experience. The multiple interfaces realize flexible connectivity, allowing users to remotely control the instrument and enabling generators to be the excellent circuit debug tools for engineers.

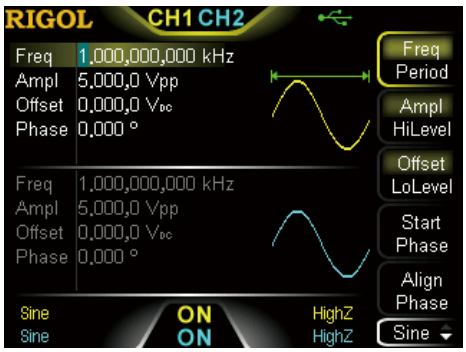
Model	Frequency (MHz)	No. of Channels	Max. Sample Rate	Memory Depth	Waveform Generation Technology	Modulation Types
DG70000	5000	2/4	10 GSa/s (real) 12 GSa/s (complex)	1.5 Gpts	SiFi III	IQ Modulation (Opt.)
DG5000	70/100/250/350	1/2	1 GSa/s	128 Mpts	DDS	AM, FM, PM, ASK, FSK, PSK, PWM, and IQ
DG4000	60/100/160/200	2	500 MSa/s	16 kpts	DDS	AM, FM, PM, ASK, FSK, PSK, BPSK, QPSK, 3FSK, 4FSK, OSK, and PWM
DG2000	50/70/100	2	250 MSa/s	16 Mpts	SiFi II	AM, FM, PM, ASK, FSK, PSK, and PWM
DG1000Z	25/30/60	2	200 MSa/s	8 Mpts/2 Mpts (DG1022Z) (16 Mpts, opt.)	SiFi	AM, FM, PM, ASK, FSK, PSK, and PWM
DG900 Pro	70/150/200	2	1.25 GSa/s	16 Mpts (32 Mpts opt.)	SiFi II	AM, FM, PM, ASK, FSK, PSK, PWM, SUM
DG800 Pro	25/50	1/2	625 MSa/s	2 Mpts (8 Mpts opt.)	SiFi II	AM, FM, PM, ASK, FSK, PSK, PWM, SUM

DG1000Z Series Function/Arbitrary Waveform Generators

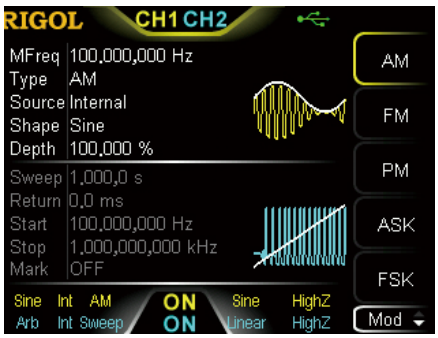
DG1000Z series function/arbitrary waveform generator is a multi-functional generator that integrates many functions into one, including Function Generator, Arbitrary Waveform Generator, Noise Generator, Pulse Generator, Harmonics Generator, Analog/Digital Modulator and Frequency Counter. As a multi-functional, high performance and portable generator, it will be a new selection in education, R&D, production, and test, providing more solutions for users at an affordable price. Its maximum output frequency is 25MHz/30MHz/60MHz. The standard USB and LAN interfaces enable you to control the instrument remotely. All models of this series have two channels with identical functions and phase adjustable between channels.

- Innovative SiFi technology
- 160 built-in arbitrary waveforms
- Various analog and digital modulation functions
- Standard harmonic generator function
- Waveform combine function
- Built-in 7-digit frequency counter

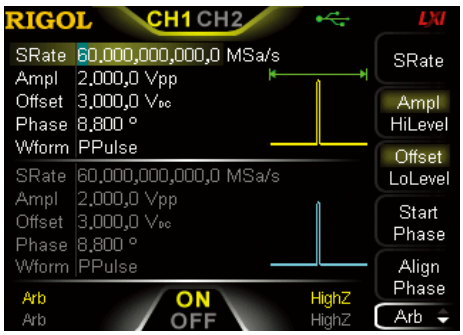
Standard dual channels with the same performance



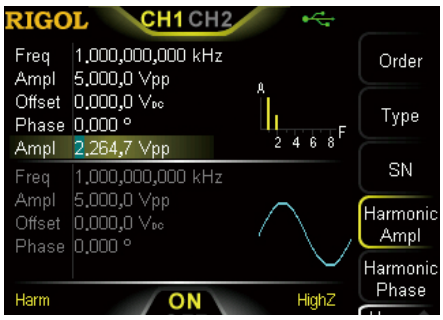
Various analog and digital modulation functions



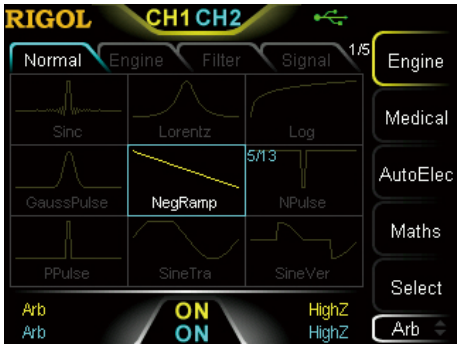
Arbitrary waveform function with the unique SiFi technology



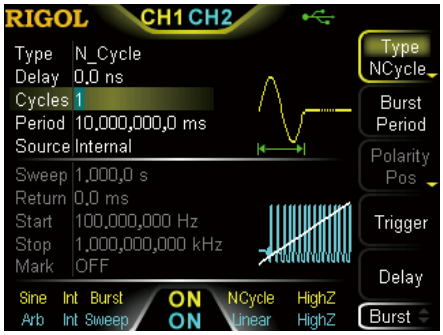
Standard harmonic generator function



160 built-in arbitrary waveforms



Burst function



Models and Specifications

Model		DG1062Z	DG1032Z	DG1022Z
No. of Channels		2		
Max. Output Frequency		60 MHz	30 MHz	25 MHz
Sample Rate		200 MSa/s		
Waveform Type		Standard waveforms: Sine, Square, Ramp, Pulse, Noise, Harmonics (up to 8 orders) Arbitrary waveforms: 160 waveforms including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-tone, DC, and etc.		
Waveform Memory Depth	Standard	8 Mpts	8 Mpts	2 Mpts
	Option	16 Mpts	16 Mpts	16 Mpts
Vertical Resolution		14-bit		
Sine		1 μHz to 60 MHz	1 μHz to 30 MHz	1 μHz to 25 MHz
Square		1 μHz to 25 MHz	1 μHz to 25 MHz	1 μHz to 25 MHz
Ramp		1 μHz to 1 MHz	1 μHz to 500 MHz	1 μHz to 500 MHz
Pulse		1 μHz to 25 MHz	1 μHz to 15 MHz	1 μHz to 15 MHz
Arb/Harmonics		1 μHz to 20 MHz	1 μHz to 10 MHz	1 μHz to 10 MHz
Noise (-3 dB)		60 MHz BW	30 MHz BW	25 MHz BW
Sine Wave Spectrum Purity		Total Harmonic Distortion <0.075% (10 Hz-20 KHz, 0 dBm); Typ. (0 dBm, 10 kHz offset) 10 MHz: <-125 dBc/Hz		
Square Rise/Fall Time		Typ. (1 Vpp) < 10 ns		
Jitter (rms)		Typ. (1 Vpp) ⩽ 5 MHz: 2 ppm + 200 ps > 5 MHz: 200 ps		
Amplitude (into 50 Ω)		⩽ 10 MHz: 1 mVpp to 10 Vpp ⩽ 30 MHz: 1 mVpp to 5 Vpp ⩽ 60 MHz: 1 mV to 2.5 Vpp		
Modulation Type		AM, FM, PM, ASK, FSK, PSK, and PWM		
Working Mode		Continuous, Burst, Sweep, and Modulation		
Burst Characteristics		Carrier frequency: 2 MHz to 25 MHz/30 MHz/60 MHz Burst count: 1 to 1 million, or Infinite; Trigger source: internal, external, manual		
Standard Interface		USB Device (on the front panel), USB Host, LAN (LXI-C), USB-GPIB (opt.)		

Order Information

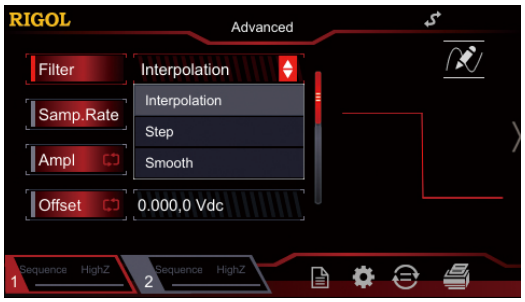
	Description	Order No.
Models	DG1022Z (25MHz, Dual-channel)	DG1022Z
	DG1032Z (30 MHz, Dual-channel)	DG1032Z
	DG1062Z (60 MHz, Dual-channel)	DG1062Z
Standard Accessories	USB Cable x1	CB-USBA-USBB-FF-150
	BNC Cable x1	CB-BNC-BNC-MM-100
	Power Cord Conforming to the Standard of the Destination Country	
Options	16 M Internal Memory	Arb16M-DG1000Z
	Arbitrary Waveform Editing PC Software (advanced function)	Ultra Station-adv
	40 dB Attenuator	RA5040K
	10W Power Amplifier	PA1011
	Rack Mount Kit (for a single instrument)	RM-1-DG1000Z
	Rack Mount Kit (for two instruments)	RM-2-DG1000Z
	USB-GPIB Adaptor	USB-GPIB

DG2000 Series Function/Arbitrary Waveform Generators

DG2000 series function/arbitrary waveform generator is a multi-functional generator that integrates many functions into one, including Function Generator, Arbitrary Waveform Generator, Noise Generator, Pulse Generator, Pattern Generator, Harmonics Generator, Analog/Digital Modulator and Frequency Counter. The brand new appearance and user-friendly interface design bring you excellent user experience. DG2000 series function/arbitrary waveform generator is the upgrade of DG900. With the newly added standard waveform key, users can switch the standard waveforms freely and conveniently. Besides, with 1UH in width and 2U in height, the DG2000 series function/arbitrary waveform generator is more suitable for the integration test.

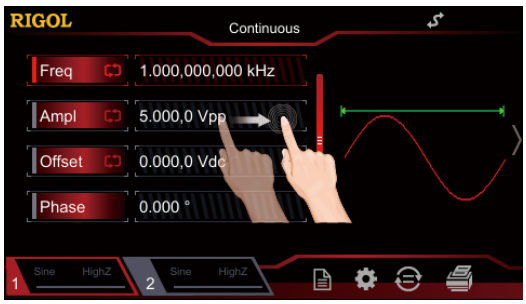
- SiFi II technology, generating the arbitrary waveforms points by points, outputting high quality waveforms accurately
- Built-in 8 orders harmonics generator
- Up to 250 MSa/s sample rate and 16 Mpts memory depth
- 4.3'' TFT color touch screen and brand new UI design
- PRBS, RS232, and Sequence
- Fan-free mute design

Innovative SiFi II technology

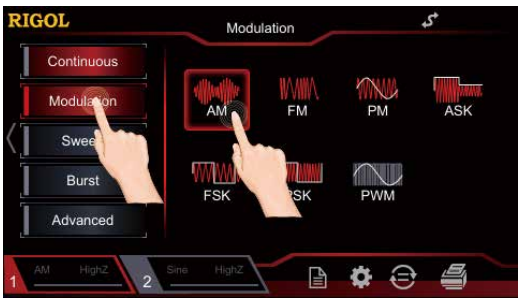


PRBS, RS232 pattern, and sequence

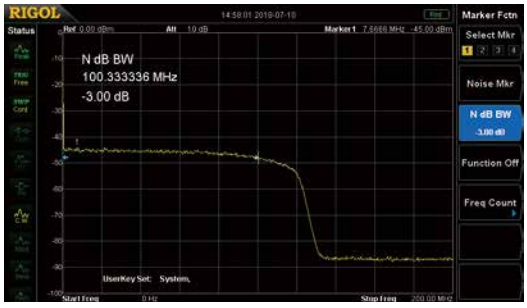
Touch-enabled UI design (drag)



Touch-enabled UI design (tap)



100 MHz bandwidth white Gaussian noise



16-bit vertical resolution

Models and Specifications

Model	DG2052	DG2072	DG2102
No. of Channels	2		
Max. Output Frequency	50 MHz	70 MHz	100 MHz
Sample Rate	250 MSa/s		
Waveform Type	Standard waveforms: Sine, Square, Ramp, Pulse, Noise, Dual-tone, Harmonics (up to 8 orders) Arbitrary waveforms: 160 waveforms including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-tone, DC, and etc. Advanced waveforms: PRBS, RS232, and Sequence		
Waveform Memory Depth	16 Mpts		
Vertical Resolution	16-bit		
Sine	1 μHz to 50 MHz	1 μHz to 70 MHz	1 μHz to 100 MHz
Square	1 μHz to 15 MHz	1 μHz to 20 MHz	1 μHz to 25 MHz
Ramp	1 μHz to 1.5 MHz	1 μHz to 1.5 MHz	1 μHz to 2 MHz
Pulse	1 μHz to 15 MHz	1 μHz to 20 MHz	1 μHz to 25 MHz
Arbitrary Waveform	1 μHz to 15 MHz	1 μHz to 20 MHz	1 μHz to 20 MHz
Harmonic	1 μHz to 20 MHz	1 μHz to 20 MHz	1 μHz to 25 MHz
Dual-tone	1 μHz to 20 MHz	1 μHz to 20 MHz	1 μHz to 20 MHz
RS232	Baud rate: 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400		
PRBS	2 kbps to 40 Mbps	2 kbps to 50 Mbps	2 kbps to 60 Mbps
Sequence	2 kSa/s to 60 MSa/s		
Noise (-3 dB)	100 MHz Bandwidth		
Sine Wave Spectrum Purity	Total Harmonic Distortion <0.075% (10 Hz to 20 kHz, 0 dBm); Typ. (0 dBm, 10 kHz offset) 10 MHz: <-105 dBc/Hz		
Square Rise/Fall Time	Typ. (1 Vpp) ⩽ 9 ns		
Jitter (rms)	Typ. (1 Vpp) ⩽ 5 MHz: 2 ppm + 200 ps > 5 MHz: 200 ps		
Amplitude (into 50 Ω)	⩽ 10 MHz: 1 mVpp to 10 Vpp ⩽ 30 MHz: 1 mVpp to 5 Vpp ⩽ 60 MHz: 1 mVpp to 2.5 Vpp >60 MHz: 1 mVpp to 1 Vpp		
Modulation Type	AM, FM, PM, ASK, FSK, PSK, and PWM		
Working Mode	Continuous, Burst, Sweep, and Modulation		
Burst Characteristics	Carrier frequency: 2 mHz-10 MHz/25 MHz/35 MHz/50 MHz/70 MHz/100 MHz; Burst count: 1 to 1 million, or Infinite; Trigger source: internal, external, manual		
Standard Interface	USB Device (on the rear panel) and USB Host		

Order Information

	Description	Order No.
Models	DG2052 (50 MHz, Dual-channel)	DG2052
	DG2072 (70 MHz, Dual-channel)	DG2072
	DG2102 (100 MHz, Dual-channel)	DG2102
Standard Accessories	Power Cord Conforming to the Standard of the Destination Country	-
	USB Cable x1	CB-USBA-USBB-FF-150
	BNC Cable x1	CB-BNC-BNC-MM-100
	Product Warranty Card	-
Options	40 dB Attenuator	RA5040K
	Arbitrary Waveform Editing PC Software (advanced function)	Ultra Station-adv
	Rack Mount Kit (for a single instrument)	RM-1-DG1000Z
	Rack Mount Kit (for two instruments)	RM-2-DG1000Z
	USB-GPIB Adaptor	USB-GPIB-L

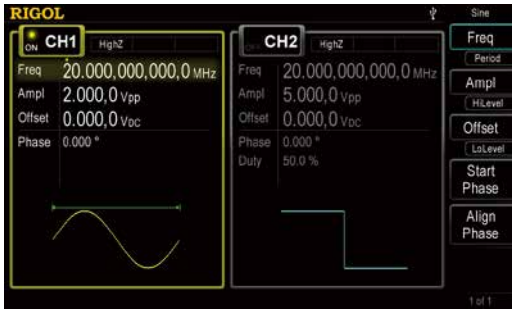
DG4000 Series Function/Arbitrary Waveform Generators

DG4000 series provides stable, precise, pure and low distortion signals. The max. frequency can reach up to 200 MHz. The high-definition wide screen display, friendly interface design and key operation layout bring users with extraordinary experience. The standard LAN and USB interfaces allow users to remotely control the instrument, providing more solutions for users. All models of this series have two channels with identical functions and phase adjustable between channels.

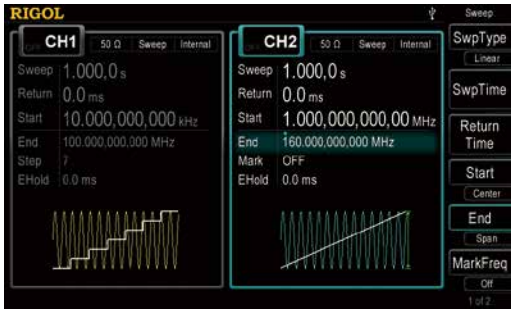
DG4000 series is a multi-functional generator that integrates many functions into one, including Function Generator, Arbitrary Waveform Generator, Pulse Generator, Harmonic Generator, Analog/Digital Modulator and Frequency Counter. With the Direct Digital Synthesizer (DDS) technology, the

- 7" LCD display and novel appearance
- 150 built-in arbitrary waveforms
- Various analog and digital modulation functions
- Various sweep modes
- Noise generation and burst modes
- Generate up to 16th order of harmonics

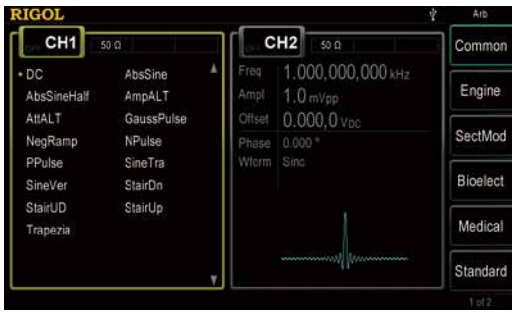
Dual channels with identical functions and phase adjustable between channels



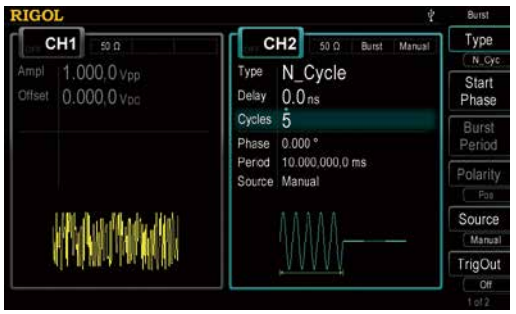
Various sweep modes



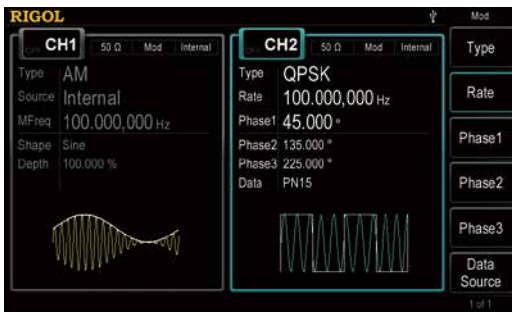
Arbitrary waveform editing (std.) and 150 built-in arbitrary waveforms



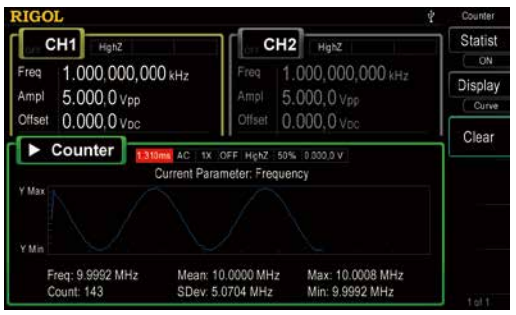
Noise and burst modes



Abundant analog and digital modulation functions



7-digit frequency counter with statistical analysis



Models and Specifications

Model	DG4202	DG4162	DG4102	DG4062
No. of Channels	2			
Max. Output Frequency	200 MHz	160 MHz	100 MHz	60 MHz
Sample Rate	500 MSa/s			
Waveform Type	Standard waveforms: Sine, Square, Ramp, Pulse, Noise, Harmonics (up to 16 orders) Arbitrary waveforms: 150 waveforms including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-tone, DC, and etc.			
Waveform Memory Depth	16K			
Vertical Resolution	14-bit			
Sine	1 μHz to 200 MHz	1 μHz to 160 MHz	1 μHz to 100 MHz	1 μHz to 60 MHz
Square	1 μHz to 60 MHz	1 μHz to 50 MHz	1 μHz to 40 MHz	1 μHz to 25 MHz
Ramp	1 μHz to 5 MHz	1 μHz to 4 MHz	1 μHz to 3 MHz	1 μHz to 1 MHz
Pulse	1 μHz to 50 MHz	1 μHz to 40 MHz	1 μHz to 25 MHz	1 μHz to 15 MHz
Noise (-3 dB)	120 MHz	120 MHz	80 MHz	60 MHz
Sine Wave Spectrum Purity	Total Harmonic ≤ 0.1% (10 Hz-20 kHz, 0 dBm); Typ. (0 dBm, 10 kHz offset) 10 MHz: ≤ -115 dBc/Hz			
Square Rise/Fall Time	<8 ns	<8 ns	<10 ns	<12 ns
Jitter (rms)	≤ 5 MHz: 2 ppm + 500 ps; >5 MHz: 500 ps			
Amplitude (into 50 Ω)	≤ 20 MHz: 1 mVpp to 10 Vpp ≤ 70 MHz: 1 mVpp to 5 Vpp ≤ 120 MHz: 1 mVpp to 2.5 Vpp ≤ 200 MHz: 1 mVpp to 1 Vpp			
Modulation Type	AM, FM, PM, ASK, FSK, PSK, BPSK, QPSK, 3FSK, 4FSK, OSK, and PWM			
Working Mode	Continuous, Burst, Sweep, and Modulation			
Burst Characteristics	Carrier frequency: 2 mHz to 100 MHz (or max. frequency of the instrument) Burst count: 1 to 1 million, or Infinite; Trigger source: internal, external, manual			

Order Information

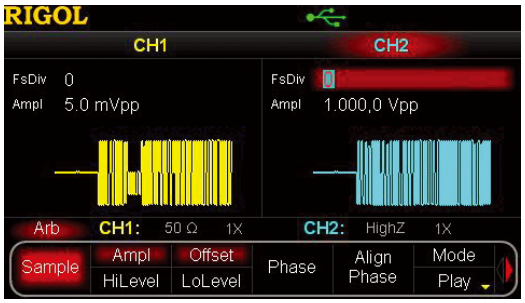
	Description	Order No.
Models	DG4202 (200 MHz, dual-channel function/arbitrary waveform generator)	DG4202
	DG4162 (160 MHz, dual-channel function/arbitrary waveform generator)	DG4162
	DG4102 (100 MHz, dual-channel function/arbitrary waveform generator)	DG4102
	DG4062 (60 MHz, dual-channel function/arbitrary waveform generator)	DG4062
Standard Accessories	USB Cable x1	CB-USBA-USBB-FF-150
	BNC Cable x1 (1 meter)	CB-BNC-BNC-MM-100
	Power Cord Conforming to the Standard of the Destination Country	
Options	Arbitrary Waveform Editing PC Software (advanced function)	Ultra Station-adv
	40 dB Attenuator	RA5040K
	Rack Mount Kit	RM-DG4000
	USB-GPIB Adaptor	USB-GPIB

DG5000 Series Function/Arbitrary Waveform Generator

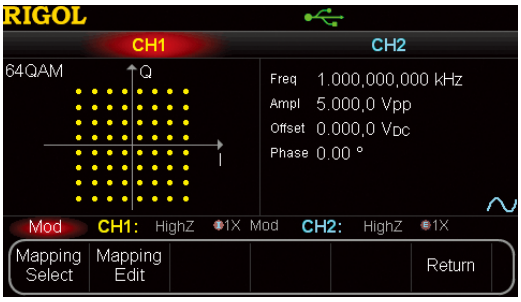
DG5000 series is a multi-functional generator that integrates many functions into one, including Arbitrary Waveform Generator, Pulse Generator, IQ Baseband Source/IQ IF Source, Frequency Hopping Source Pattern Generator, and Function Generator. The DG5000 series, adopting the Direct Digital Synthesizer (DDS) technology, can provide stable, precise, pure and low distortion signals. The user-friendly interface design and panel layout bring users extraordinary experience. Besides, the standard configuration of interfaces allows users to remotely control the instrument, providing more solutions for users. It provides single and dual-channel models. The two channels have identical functions and phase adjustable between the two channels.

- 1 GSa/s sample rate, 128 Mpts memory depth
- Support internal and external IQ modulation
- Various analog/digital modulation functions
- Various sweep types (std.)
- Intuitive constellation setup and display
- Support frequency hopping function (opt.)
- Various interfaces for connectivity, support digital and logic outputs

1 GSa/s sample rate, 14-bit resolution

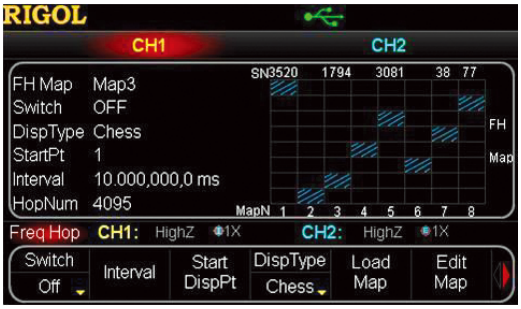


Intuitive constellation setup and display

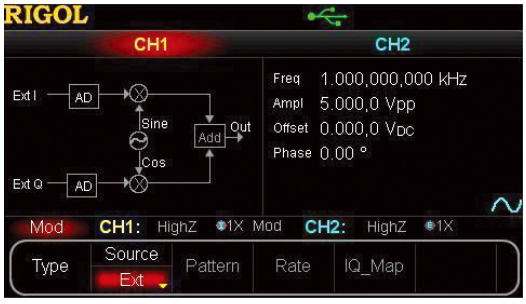


Various sweep types (std.)

Support frequency hopping function (opt.)



Support internal and external IQ modulation (std.)



Various interfaces for connectivity, support parallel bus output

Models and Specifications

Model	DG5351/DG5352	DG5251/DG5252	DG5101/DG5102	DG5071/DG5072
No. of Channels	1/2	1/2	1/2	1/2
Max. Output Frequency	350 MHz	250 MHz	100 MHz	70 MHz
Sample Rate	1 GSa/s			
Waveform Type	Standard waveforms: Sine, Square, Ramp, Pulse, and Noise Arbitrary waveforms: Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, Dual-Tone, DC, and user-defined			
Sine	1 μHz to 350 MHz	1 μHz to 250 MHz	1 μHz to 100 MHz	1 μHz to 70 MHz
Square	1 μHz to 120 MHz	1 μHz to 120 MHz	1 μHz to 100 MHz	1 μHz to 70 MHz
Ramp	1 μHz to 5 MHz	1 μHz to 5 MHz	1 μHz to 3 MHz	1 μHz to 3 MHz
Pulse	1 μHz to 50 MHz			
Noise	250 MHz			
Arbitrary Waveform	1 μHz to 50 MHz			
Waveform Length	128 Mpts (std.)			
Sine Wave Spectrum Purity	Total Harmonic Distortion <0.5% (10 Hz-20 KHz, 0 dBm); Typ. (0 dBm, 10 kHz offset) 10 MHz: ⩽ -110 dBc/Hz			
Square Rise/Fall Time	<2.5 ns	<2.5 ns	<3 ns	<4 ns
Jitter (rms)	⩽ 30 MHz: 10 ppm + 500 ps; >30 MHz: 500 ps			
Output Amplitude (into 50 Ω)	⩽ 100 MHz: 5 mVpp to 10 Vpp ⩽ 300 MHz: 5 mVpp to 5 Vpp ⩽ 350 MHz: 5 mV to 2 Vpp			
IQ Modulation	4QAM, 8QAM, 16QAM, 32QAM, 64QAM, BPSK, QPSK, OQPSK, 8PSK, 16PSK, and user-defined; Symbol Rate: 1 bps to 1 Mbps; Carrier Waveform: Sine; Frequency ⩽ 200 MHz			
Frequency Hopping	FH Bandwidth 1.5 MHz to 250 MHz (or max. frequency of the instrument); FH Rate: 1 Hop/s to 12.5M Hop/s; Number of Frequency Points: 4,096			
Burst Characteristics	Carrier frequency: 1 μHz to 120 MHz (or max. frequency of the instrument) Burst count: 1 to 1 million, or Infinite			

Order Information

	Description	Order No.
Models	DG5352 (AWG, 350 MHz, dual-channel, 128 Mpts)	DG5352
	DG5351 (AWG, 350 MHz, single-channel, 128 Mpts)	DG5351
	DG5252 (AWG, 250 MHz, dual-channel, 128 Mpts)	DG5252
	DG5251 (AWG, 250 MHz, single-channel, 128 Mpts)	DG5251
	DG5102 (AWG, 100 MHz, dual-channel, 128 Mpts)	DG5102
	DG5101 (AWG, 100 MHz, single-channel, 128 Mpts)	DG5101
	DG5072 (AWG, 70 MHz, dual-channel, 128 Mpts)	DG5072
	DG5071 (AWG, 70 MHz, single-channel, 128 Mpts)	DG5071
Standard Accessories	USB Cable x1	CB-USBA-USBB-FF-150
	BNC Cable x1 (1 meter)	CB-BNC-BNC-MM-100
	SMB(F)-to-BNC(M) Cable x1 (1 meter)	CB-SMB-BNC-FM-100
	Power Cord Conforming to the Standard of the Destination Country	-
Options	Frequency Hopping Module	FH-DG5000
	Arbitrary Waveform Editing PC Software (advanced function)	Ultra Station-adv
	Power Amplifier	PA1011
	40 dB Attenuator	RA5040K
	Rack Mount Kit	RM-DG5000

Digital Multimeter

The multimeter is a multi-purpose electronic measuring instrument. In choosing a proper multimeter, we need to consider its precision, annual accuracy, measurement speed, etc. The requirement for the specified technical parameter is related to the actual test demands and applications.

RIGOL has launched DM3000 series and DM858/E series digital multimeters. DM3000 series includes the high-precision 6.5-digit DM3068 series and 5.5-digit DM3058/DM3058E series economical digital multimeters. DM3000 series is designed for high-precision, multi-functional, automatic measurement testing needs, integrating the automatic measurement, multiple mathematical transformations and any sensor measurement. The commands of the DM3000 series are compatible with those of the mainstream multimeters, capable of meeting the requirements in research, quality validation, automatic production, education and training, etc.

RIGOL's newly launched DM858 series is an economical 5.5-digit benchtop digital multimeter. It features high precision, multifunction, easy operation, large screen, and compact size. It provides USB and LAN interfaces and supports remote control. It is compact and supported by a desktop stand, designed for automatic measurement, making it the best choice for engineers.

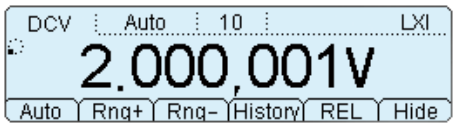
Model	Accuracy	Annual DCV Accuracy	Fastest Measurement Rate	Connectivity
DM3068	6.5 digits	0.0035%	10k rdgs/s	USB, LAN (LXI-C), RS232, GPIB
DM3058	5.5 digits	0.015%	123 rdgs/s	USB, LAN, RS-232, GPIB
DM3058E	5.5 digits	0.015%	123 rdgs/s	USB, RS232
DM858	5.5 digits	0.030%	125 rdgs/s	USB, LAN
DM858E	5.5 digits	0.060%	80 rdgs/s	USB, LAN

DM3000 Series Digital Multimeters

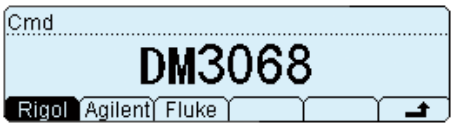
DM3000 series digital multimeters (DM3068, DM3058, DM3058E) are the products designed with multi-functions, high-precision, high performance and automation test. While providing stable and accurate measurements, the DM3000 series is equipped with high-speed data acquisition, automation tests, and any sensor test functions. A variety of interfaces such as GPIB, USB, LAN (LXI-C), and RS232 are available for connectivity. USB storage is supported. To cater to the automation test requirements, the DM3000 series, featuring its fast measurement speed and anti-interference capability, can be used for the production line automation test with the PASS/FAIL control, unified power management, pre-programmed configurations, and configuration setup cloning functions to improve the productivity. DM3000 series digital multimeters are widely used in the fields such as production line tests, scientific research, education, quality assurance, inspection and maintenance.

- 6.5-digit (DM3068) or 5.5-digit (DM3058/E) readings resolution
- Max. 10A current range
- Dual display of measurement, capable of displaying parameters of two types of signals
- Support temperature sensors (TC, RTD, and THERM) and user-defined any sensor measurement
- Statistical analysis, real-time trend and histogram display (DM3068)
- A variety of interfaces for connectivity, compatible with commands of main stream DMMs

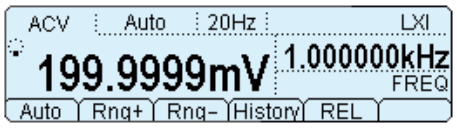
True 6.5-digit resolution(DM3068)



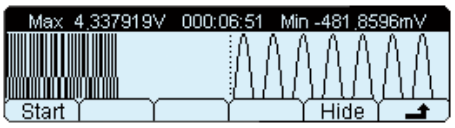
Support command sets of mainstream manufacturers



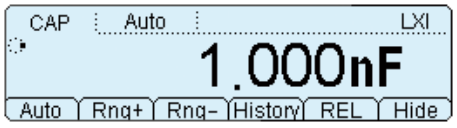
Dual display easy for you to measure two different parameters of the same signal from one test connection



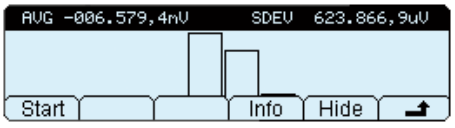
Trend display



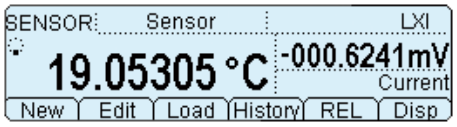
Capacitor measurement function



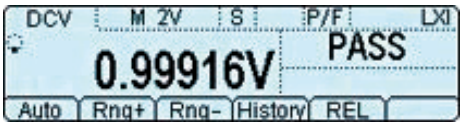
Histogram display



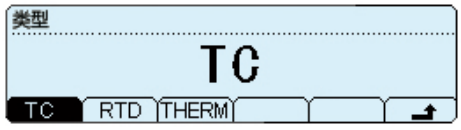
"Any sensor" measurement



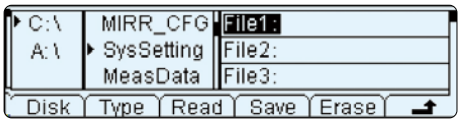
Pass/Fail test



Built-in thermocouple cold junction temperature; support multiple temperature sensors (TC, RTD, and THERM)



Convenient mirror configuration



Models and Specifications

Function	Range	Optimal Annual Accuracy ±(readout%+range%)(Tcal 23°C ±5°C)	
		DM3068	DM3058/E
DC Voltage (DCV)	200.000 mV to 1000.00 V	0.0035 + 0.0006	0.015 + 0.003
DC Current (DCI)	200.000 µA to 10.0000 A	0.030 + 0.003	0.055 + 0.005
AC Voltage (RMS)	200.000 mV to 750.000 V	0.06 + 0.04	0.2 + 0.05
AC Current (RMS)	200.0000 µA to 10.00000 A[1]	0.10 + 0.04	0.30 + 0.10
Resistance	200.000 Ω to 100.000 MΩ	0.010 + 0.001	0.020 + 0.003
Diode Test	2.000 V/1 mA	0.010 + 0.020	0.05 + 0.01
Connectivity Test	2000.0 Ω/1 mA	0.010 + 0.020	0.05 + 0.01
Period/Frequency	3 Hz to 1 MHz (200 mV to 750 V)	0.007	0.01 + 0.003
Capacitance	2.000 nF to 100.0 mF[2]	1 + 0.3	1 + 0.5
Max. Reading Speed		10,000 rdgs/s	123 rdgs/s
Volatile Memory		512 k readings of history records	2,000 readings of history data

[1]: DM3058/E ACI range: 20 mA to 10 A
[2]: DM3058/E Cap range: 2 nF to 10 µF

Order Information

	Description	Order No.
Models	DM3068 (6.5-digit; dual display bench DMM; standard GPIB, LAN, USB, and RS232 interfaces for connectivity)	DM3068
	DM3058 (5.5-digit; dual display bench DMM; standard GPIB, LAN, USB, and RS232 interfaces for connectivity)	DM3058
	DM3058E (5.5-digit; dual display bench DMM; standard USB and RS232 interfaces for connectivity)	DM3058E
Standard Accessories	Test Lead x2 (black and red)	LD-DM
	Alligator Clip x2 (black and red)	ALLIGATORCLIP-DMM
	USB Cable x1	CB-USBA-USBB-FF-150
	Spare Fuses (4 for DM3068; 2 for DM3058/E)	-
	Power Cord Conforming to the Standard of the Destination Country	-
Optional Accessories	Kelvin Test Clip	KELVINTESTCLIP-DMM
	RS232 Cable	CB-DB9-DB9-F-F-150
	Rack Mount Kit	RM-DM3000

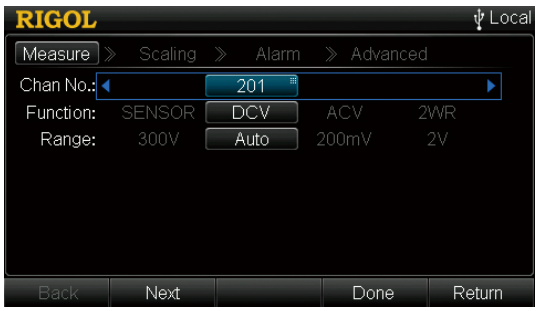
Data Acquisition/Switch System

M300 Series Data Acquisition/Switch System

The M300 series data acquisition/switch system with modular structure combines precision measurement capability with flexible signal connections, which can provide various solutions for the applications with multiple test points or signals to be tested in product performance test during R&D phase as well as automation test during production process.

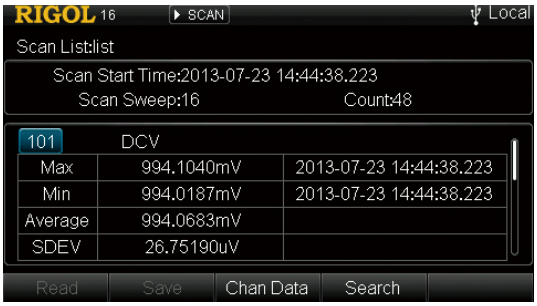
- 4.3" TFT LCD, easy for operation
- 6.5-digit measurement accuracy, supporting DCV, DCI, ACV, ACI, Period, Frequency, TEMP (thermocouple, thermister, and RTD) and any sensor measurement
- Up to 320 switch channels for a single instrument
- 8 modules supported
- Standard configuration of a variety of communication interfaces: USB Device, USB Host, GPIB, LAN (LXI Core 2011), RS232
- Powerful PC control and analysis software

Channel configuration guide

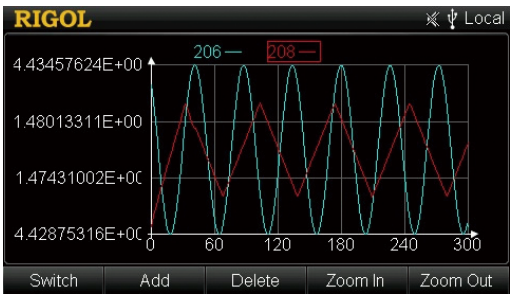


Channel monitor

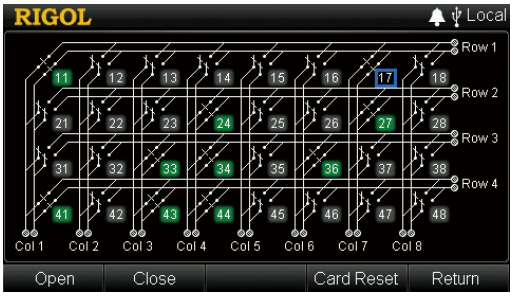
Display real-time scan information and all the measurement data of the channel selected



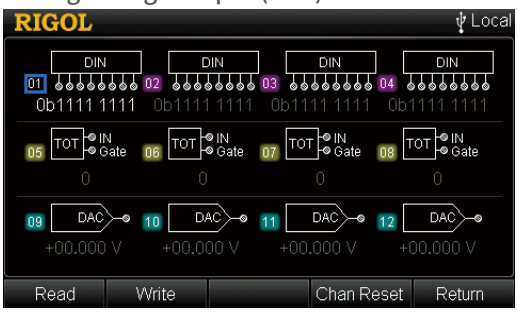
Draw real-time scan data curves



MC3648 matrix switch module



MC3534 multifunction module, providing digital input/output (DIO), totalizer input (TOT), and analog voltage output (DAC)



Models and Specifications

Module	Terminal Block	No. of Test Channels				Description
		20	24	32	64	
MC3065	-					DMM module, 6.5-digit, support DCV, ACV, DCI, ACI, FREQ, PERIOD, TEMP and any sensor
MC3120	M3TB20	●				20-channel HI/LO (differential) input
MC3132	M3TB32			●		32-channel HI/LO (differential) input
MC3164	M3TB64				●	64-channel (single-ended), switch HI input only
MC3324	M3TB24		●			Mixed multiplexer with 20 voltage channels and 4 current channels
MC3416	M3TB16					16-channel actuator that can connect signal to the device under test or enable the external device
MC3534	M3TB34					Multifunction module. DIO: four 8-bit digital input/output ports TOT: four totalizer input terminals DAC: four analog output terminals
MC3648	M3TB48					4x8 two-wire matrix switch

Order Information

	Description	Order No.
Model	M300 (Data Acquisition/Switch System)	M300
	M301 (Data Acquisition/Switch System + DMM Module)	M301
	M302 (Data Acquisition/Switch System + DMM Module + MC3120 20-Channel Multiplexer + M3TB20 Terminal Block	M302
Module	DMM Module (6.5-digit)	MC3065
	20-channel Multiplexer	MC3120 (Required to work with M3TB20)
	32-channel Multiplexer	MC3132 (Required to work with M3TB32)
	64-channel Single-ended Multiplexer	MC3164 (Required to work with M3TB64)
	20-voltage-channel + 4-current-channel Mixed Multiplexer	MC3324 (Required to work with M3TB24)
	16-channel Actuator	MC3416 (Required to work with M3TB16)
	Multifunction Module	MC3534 (Required to work with M3TB34)
	4x8 Matrix Switch	MC3648 (Required to work with M3TB48)
Terminal Block	MC3120	M3TB20
	MC3324	M3TB24
	MC3648	M3TB48
	MC3534	M3TB34
	MC3416	M3TB16
	MC3132	M3TB32
	MC3164	M3TB64
Standard Accessories	USB Cable x1	CB-USBA-USBB-FF-150
	Mixed-interface Separator Line	MIX-SEPARATOR
	Power Cord Conforming to the Standard of the Destination Country	-
	Spare Fuses	-
Optional Accessories	RS232 Cable	CB-DB9-DB9-FF-150
	GPIB Reverse Entry Extender	M3GPIB
	External Bus Interface	M3A2B
	Rack Mount Kit	RM-1-M300
	Rack Mount Kit (for two instruments)	RM-2-M300
	PC Control and Advanced Data Analysis Software for M300 Series	UltraAquire Pro

Programmable Linear DC Power Supplies




DP2000, DP900, DP800, and DP700 series are programmable linear DC power supplies with high performance. They feature powerful timing outputs, extremely low ripple and noise, comprehensive overvoltage, over current, over-temperature protection, fast transient response, large and clear user interface, excellent specifications, multiple interfaces for connectivity, capable of meeting both benchtop and integrated testing requirements.

Models and Specifications

Model	No. of Channels	Max. Range for Each Channel	Maximum Power	Ripple and Noise	Programming Resolution (Std.)
DP2031	3	32 V/3 A || 32 V/3 A || 6 V/5 A (10 A)	222 W	<350 μVrms	CH1, CH2:1 mV/0.1 mA; CH3:1 mV/1 mA
DP932A	3	32 V/3 A || 32 V/3 A || 6 V/3 A	210 W	<350 μVrms	1 mV/1 mA
DP932U	3	32 V/3 A || 32 V/3 A || 6 V/3 A	210 W		10 mV/1 mA
DP932E	3	30 V/3 A || 30 V/3 A || 6 V/3 A	198 W		10 mV/10 mA
DP811	1	20 V/10 A or 40 V/5 A	200 W	<350 μVrms	10 mV/10 mA
DP813	1	8 V/20 A or 20 V/10 A	200 W		10 mV/10 mA
DP821	2	8 V/10 A || 60 V/1 A	140 W		CH1: 10 mV/1 mA; CH2: 10 mV/10 mA
DP822	2	20 V/5 A || 5 V/16 A	180 W		10 mV/10 mA
DP831	3	8 V/5 A || 30 V/2 A, -30 V/2 A	160 W		CH1: 1 mV/1 mA; CH2, CH3: 10 mV/1 mA
DP832	3	30 V/3 A || 30 V/3 A, 5 V/3 A	195 W		10 mV/1 mA
DP811A	1	20 V/10 A or 40 V/5 A	200 W		1 mV/0.5 mA
DP813A	1	8 V/20 A or 20 V/10 A	200 W		1 mV/1 mA
DP821A	2	8 V/10 A || 60 V/1 A	140 W		1 mV/0.1 mA
DP822A	2	20 V/5 A || 5 V/16 A	180 W		1 mV/1 mA
DP831A	3	8 V/5 A || 30 V/2 A, -30 V/2 A	160 W		CH1: 1 mV/0.3 mA; CH2, CH3: 1 mV/0.1 mA
DP832A	3	30 V/3 A || 30 V/3 A, 5 V/3 A	195 W		1 mV/1 mA
DP711	1	30 V/5 A	150 W	<500 μVrms	10 mV/10 mA

	DP2031	DP932A	DP932U	DP932E	DP811	DP813	DP821	DP822	DP831	DP832	DP811A	DP813A	DP821A	DP822A	DP831A	DP832A	DP711	DP712
High Resolution	●	●	●	●	●		●		●	●	●		●		●	●	●	●
Monitor	-	-	-	-	●		●		●	●	●		●		●	●	-	-
Analyzer	●	●	●	●	●		●		●	●	●		●		●	●	-	-
Timer	●	●	●	-	●		●		●	●	●		●		●	●	●	●
Digital I/O	●	●	●	-	●		●		●	●	●		●		●	●	-	-
Multi-Device Synchronization	-	-	-	-	-		-		-	-	-		-		-	-	●	●
RS232	●	-	-	-	●		●		●	●	●		●		●	●	●	●
LAN	●	●	●	●	●		●		●	●	●		●		●	●	-	-

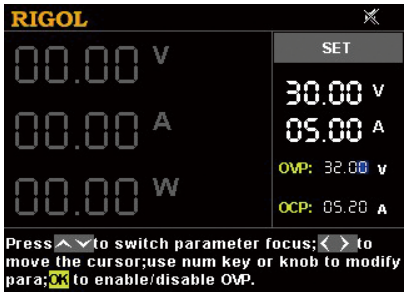
Note: ● Supported as standard or optional configuration.

DP700 Series Programmable Linear DC Power Supply

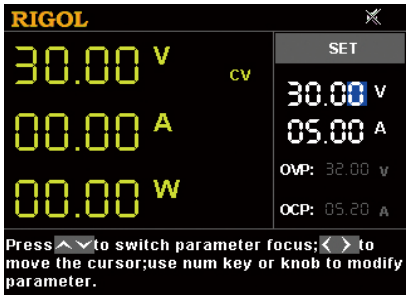
DP700 series power supply is a type of affordable programmable linear DC power supply with high performance. With superb performance specifications, pure and reliable output, and clear user interface, the DP700 series supports timing output and trigger function, enabling you to meet your diversified test requirements.

- Two models, single output, total power up to 150 W
- Low ripple and noise: <500 μVrms/3 mVpp or 4 mVpp
- 0.01% line regulation and load regulation
- 1 mV/1 mA resolution (opt.)
- Sound overvoltage/overcurrent/overtemperature protection, with the response time for the overvoltage protection less than 10 ms
- External trigger function supported, enabling synchronous output for multiple devices
- Timing output supported for up to 2,048 groups
- 3.5-inch TFT-LCD; compact and elegant; easy to use

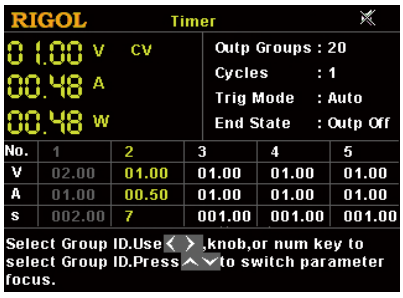
Sound overvoltage/overcurrent protection (OVP/OCP)



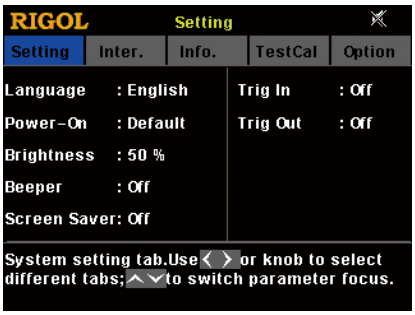
Clear and intuitive user interface, easy to operate



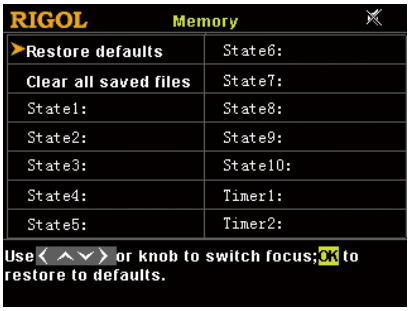
Powerful timing output function



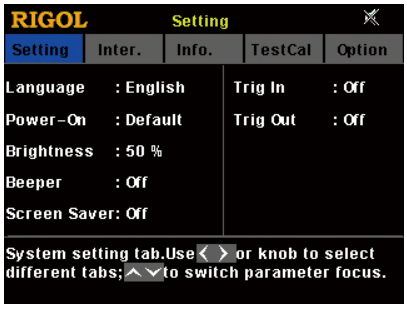
Convenient trigger function



Easy-to-use function of file storage and recalling



Abundant system setting function



Models and Specifications

Model	Rated Voltage/Current	OVP/OCP
DP711	0 V to 30 V/0 A to 5 A	0.01 V to 33 V/0.01 A to 5.5 A
DP712	0 V to 50 V/0 A to 3 A	0.01 V to 55 V/0.01 A to 3.3 A
Load Regulation, ±(% of Output + Offset)		
Voltage	<0.01% + 2 mV	
Current	<0.01% + 2 mA	
Line Regulation, ±(% of Output + Offset)		
Voltage	<0.01% + 2 mV	
Current	<0.01% + 2 mA	
Ripple and Noise (20 Hz to 20 MHz)		
Model	Normal Mode Voltage	Normal Mode Current
DP711	<500 μVrms/3 mVpp	<2 mArms
DP712	<500 μVrms/4 mVpp	

Annual Accuracy[1] (25°C ± 5°C), ±(% of Output + Offset)		
Programming	Voltage	0.05% + 20 mV
	Current	0.2% + 10 mA
Readback	Voltage	0.05% + 20 mV
	Current	0.2% + 20 mA

Resolution			
Programming	Voltage	10 mV (std.)	1 mV (with high resolution option installed)
	Current	10 mA (std.)	1 mA (with high resolution option installed)
Readback	Voltage	10 mV (std.)	1 mV (with high resolution option installed)
	Current	10 mA (std.)	1 mA (with high resolution option installed)
Display	Voltage	10 mV (std.)	1 mV (with high resolution option installed)
	Current	10 mA (std.)	1 mA (with high resolution option installed)

Transient Response Time
Less than 50 μs for output voltage to recover to within 15 mV following a change in output current from full load to half load or from half load to full load.

Mechanical	
Size	140 mm (W) x 202 mm (H) x 332 mm (D)
Weight	Net weight: 6.9 kg
I/O	
RS232	1

Order Information

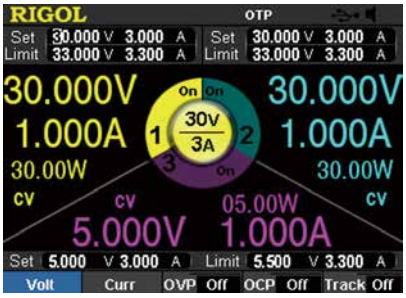
	Description	Order No.
Model	DP711 (Programmable Linear DC Power Supply, 1-CH, 30 V/5A)	DP711
	DP712 (Programmable Linear DC Power Supply, 1-CH, 50 V/3A)	DP712
Standard Accessories	Power Cord Conforming to the Standard of the Destination Country	-
	Either one of the following fuses: ● Fuse 50T-050H 250 V 5 A (voltage selector: 100 Vac/120 Vac) ● Fuse 50T-025H 250 V 2.5 A (voltage selector: 220 Vac/240 Vac)	-
Optional Accessories	High Resolution	HIRES-DP700
	Trigger (external synchronous trigger input and output)	TRIGGER-DP700
	Timer	TIMER-DP700
	9-Pin RS232 Cable (female-to-female, straight)	CB-DB9-DB9-F-F-150
	DP700 Series Rack Mount Kit (for a single instrument)	RM-1-DP700
	DP700 Series Rack Mount Kit (for two instruments)	RM-2-DP700
	DP700 Series Rack Mount Kit (for three instruments)	RM-3-DP700

DP800 Series Programmable Linear DC Power Supply

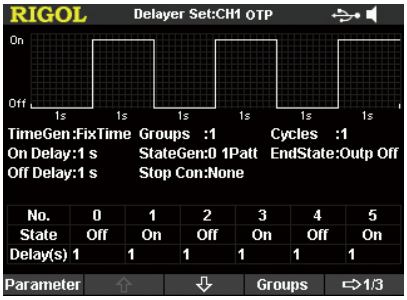
DP800 series power supply is a type of programmable linear DC power supply with high performance. It has powerful timing outputs, extremely low ripple and noise, comprehensive overvoltage, over current, over-temperature protection, fast transient response, large and clear user interface, excellent specifications, multiple interfaces for connectivity, capable of meeting both workbench testing and integrated testing requirements. DP800 A-models provide standard high resolution mode (1 mV/1 mA), with multiple interfaces available.

- 1, 2, or 3 outputs, with the max. power up to 195 W
- Low ripple and noise: <350 μVrms/2 mVpp
- Quick transient response time: <50 μs
- 0.01% line regulation and load regulation
- Standard timing output, built-in V/A/W measurements and waveform display
- 3.5" TFT display, easy for operation

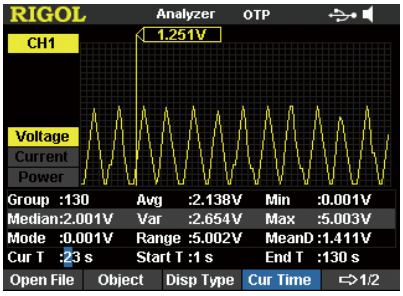
Intuitive and clear display



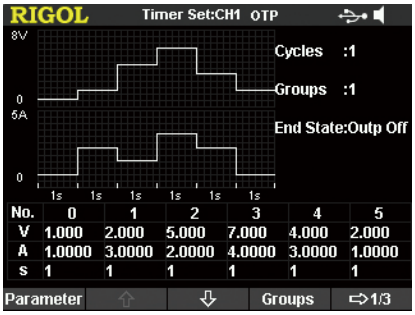
Output On/Off delay



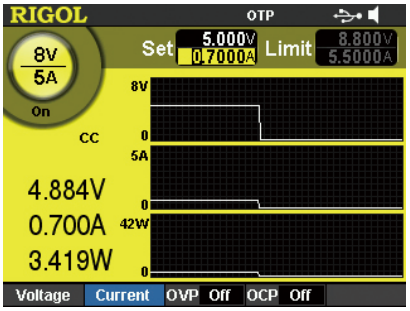
Output analysis



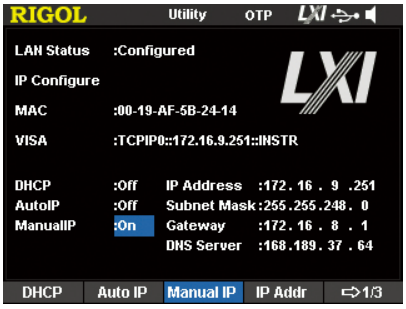
Standard timing output



V/W/A waveform display



LAN setting



Models and Specifications

Model	DP832A	DP832	DP831A	DP831	DP822A	DP822	DP821A	DP821	DP813A	DP813	DP811A	DP811
Number of Channels	3				2				1 (two output ranges)			
DC Output	30 V/3 A || 30 V/3 A, 5 V/3 A		8 V/5 A || 30 V/2 A, -30 V/2 A		20 V/5 A || 5 V/16 A		8 V/10 A || 60 V/1 A		8 V/20 A or 20 V/10 A		20 V/10 A or 40 V/5 A	
Load Regulation	Voltage: <0.01% + 2 mV; current: <0.01% + 250 μA											
Line Regulation	Voltage: <0.01% + 2 mV; current: <0.01% + 250 μA											
Ripple and Noise (20 Hz to 20 MHz)	Normal Mode Voltage: <350 μVrms/2mVpp; Normal Mode Current: <2 mArms								Normal Mode Voltage: <350μVrms/3mVpp; Normal Mode Current: <2 mArms			

Model			DP832A	DP832	DP831A	DP831	DP822A	DP822	DP821A	DP821	DP813A	DP813	DP811A	DP811
Annual Programming Accuracy	Voltage	CH1	0.05% + 20 mV		0.1% + +5 mV		0.1% + 25 mV		0.1% + +25 mV		0.05% + 10 mV		0.05% + +10 mV	
		CH2	0.05% + 20 mV		0.05% + 20 mV		0.05% + 10 mV		0.05% + +10 mV		-		-	
		CH3	0.1% + 5 mV		0.05% + 20 mV		-		-		-		-	
	Current	CH1	0.2% + 5 mA		0.2% + +10 mA		0.2% + 10 mA		0.2% + +10 mA		0.1% + 10 mA		0.1% + +10 mA	
		CH2	0.2% + 5 mA		0.2% + +5 mA		0.2% + 10 mA		0.2% + +10 mA		-		-	
		CH3	0.2% + 5 mA		0.2% + +5 mA		-		-		-		-	
Annual Readback Accuracy	Voltage	CH1	0.05% + 20 mV		0.1% + +5 mV		0.1% + 25 mV		0.1% + +25 mV		0.05% + 10 mV		0.05% + +10 mV	
		CH2	0.05% + 20 mV		0.05% + 20 mV		0.05% + 5 mV		0.05% + +10 mV		-		-	
		CH3	0.1% + 5 mV		0.05% + 20 mV		-		-		-		-	
	Current	CH1	0.15% + 5 mA		0.2% + +10 mA		0.15% + 10 mA		0.15% + +10 mA		0.1% + 10 mA		0.1% + +10 mA	
		CH2	0.15% + 5 mA		0.1% + +5 mA		0.15% + 10 mA		0.15% + +10 mA		-		-	
		CH3	0.15% + 5 mA		0.1% + +5 mA		-		-		-		-	
Programming Resolution	Voltage		1 mV	10 mV	1 mV 1 mV 1 mV	1 mV 10 mV 10 mV	1 mV	10 mV	10 mV 1 mV	10 mV 10 mV	1 mV	10 mV	1 mV	10 mV
	Current		1 mA	1 mA	0.3 mA 0.1 mA 0.1 mA	1 mA 1 mA 1 mA	1 mA	10 mA	0.1 mA 1 mA	1 mA 10 mA	1 mA	10 mA	0.5 mA	10 mA
Readback Resolution	Voltage		0.1 mV	10 mV	0.1 mV	1 mV	1 mV	10 mV	1 mV 1 mV	10 mV 10 mV	1 mV	10 mV	0.1 mV	1 mV
	Current		0.1 mA	1 mA	0.1 mA	1 mA	0.1 mA 1 mA	1 mA 10 mA	0.1 mA 1 mA	1 mA 10 mA	1 mA	10 mA	0.1 mA	1 mA
Display Resolution	Voltage		1 mV	10 mV	1 mV	10 mV	1 mV	10 mV	1 mV 1 mV	10 mV 10 mV	1 mV	10 mV	1 mV	10 mV
	Current		1 mA	10 mA	1 mA	10 mA	0.1mA 1 mA	10 mA	0.1 mA 1 mA	1 mA 10 mA	1 mA	10 mA	1 mA	10 mA
I/O	USB Device		●	●	●	●	●	●	●	●	●	●	●	●
	USB Host		●	●	●	●	●	●	●	●	●	●	●	●
	LAN		●	○	●	○	●	○	●	○	●	○	●	○
	RS232		●	○	●	○	●	○	●	○	●	○	●	○
	Digital IO		●	○	●	○	●	○	●	○	●	○	●	○
	USB-GPIB		○	○	○	○	○	○	○	○	○	○	○	○

Note: The empty circle (●) indicates standard configuration; the empty circle (○) indicates optional configuration.

Order Information

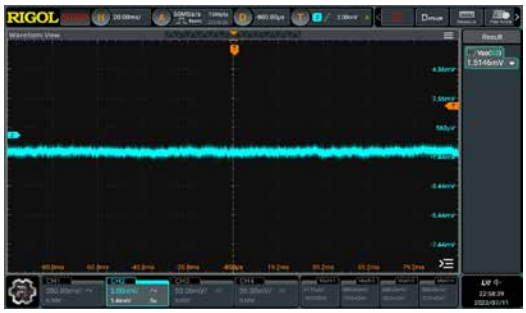
	Description	Order No.
Models	DP832A (3-CH High-Resolution Programmable Linear DC Power Supply)	DP832A
	DP832 (3-CH Programmable Linear DC Power Supply)	DP832
	DP831A (3-CH Dual-Polarity Output High-Resolution Programmable Linear DC Power Supply)	DP831A
	DP831 (3-CH Dual-Polarity Output Programmable Linear DC Power Supply)	DP831
	DP822A (Programmable Linear DC Power Supply, Dual-channel)	DP822A
	DP822 (Programmable Linear DC Power Supply, Dual-channel)	DP822
	DP821A (2-CH High-Resolution Programmable Linear DC Power Supply)	DP821A
	DP821 (2-CH Programmable Linear DC Power Supply)	DP821
	DP813A (Programmable Linear DC Power Supply, Single-Channel)	DP813A
	DP813 (Programmable Linear DC Power Supply, Single-Channel)	DP813
	DP811A (Single-channel Dual-range High Resolution Programmable Linear DC Power Supply)	DP811A
	DP811 (Single-channel Dual-range Programmable Linear DC Power Supply)	DP811
Standard Accessories	USB Cable	CB-USBA-USBB-FF-150
	Fuse 50T-032H 250V 3.15A (DP832A/DP832/DP822A/DP822/DP813A/DP813/DP811A/DP811) Fuse 50T-025H 250V 2.5A (DP831A/DP831/DP821A/DP821)	-
	Short-circuiting Equipment x1	-
	Power Cord Conforming to the Standard of the Destination Country	-
Optional Accessories	High Resolution (Option for DP832/DP831/DP822/DP821/DP813/DP811; Standard for Other Models)	HIRES-DP800
	4 Trigger Input/Output Channels (Option for DP832/DP831/DP822/DP821/DP813/DP811; Standard for Other Models)	DIGITALIO-DP800
	Online Monitoring and Analysis (Option for DP832/DP831/DP822/DP821/DP813/DP811; Standard for Other Models)	AFK-DP800
	RS232 and LAN (Option for DP832/DP831/DP822/DP821/DP813/DP811; Standard for Other Models)	INTERFACE-DP800
	USB-GPIB Adaptor	USB-GPIB
	DP800 Rack Mount Kit (For a Single Instrument)	RM-1-DP800
	DP800 Rack Mount Kit (For Two Instruments)	RM-2-DP800
	DP800 Series Red Safety Plug	SPR-DP800
	DP800 Series Black Safety Plug	SPB-DP800
	DP800 Series Green Safety Plug	SPG-DP800

DP900 Series Programmable Linear DC Power Supply

The latest DP900 series, in addition to the low ripple and high accuracy, also adds a variety of new functions such as one-key series/parallel connection, full-channel isolation, etc. to meet the new needs of various application fields. A new model dedicated for education field is newly launched for university teachers and students, providing great safety guarantee for users. With its classical 3-CH output, the DP900 series embarks on a new journey to make a brand new start.

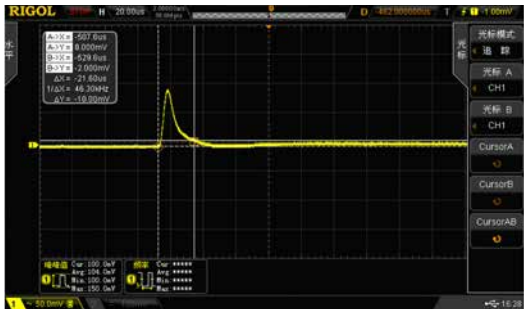
- Three models:
- DP932A (Standard): 32 V/3 A || 32 V/3 A || 6 V/3 A
- DP932U (Education Edition-with safety sockets): 32 V/3 A || 32 V/3 A || 6 V/3 A
- DP932E (E-commerce): 30 V/3 A || 30 V/3 A || 6 V/3 A
- 3 electrically isolated independent channels with up to 210 W total power
- 4.3" LCD color touch screen
- Front-panel safety sockets available on some models
- Internal series/parallel connections for CH1 and CH2
- Excellent programming/readback accuracy
- Fast transient response time: <50 µs
- Low output ripple and noise: <350 µVrms/ 2 mVpp
- Command processing time < 10 ms
- Standard 3U height, half rack width
- PC software control
- Timing output, data logging and analysis
- A maximum of 512 arbitrary points with dwell time down to 100 ms; various built-in basic waveforms
- OVP/OCP/OTP protection
- Multiple interfaces for connectivity: USB, LAN, and Digital IO

Low ripple and noise: <350 µVrms/2 mVpp



One of the advantages of linear DC power supply is the pure output. Within the 20 Hz-20 MHz bandwidth, the DP900's ripple and noise is as low as 350µVrms/2 mVpp. The ultra-low noise design and purer output minimizes any interference to the load, offering high-purity signals to your device.

Fast transient response time: <50 µs



A high-quality power supply must be able to cope with changing loads well. The DP900 series has a transient response capability of less than 50 µs, which meets the user's needs for rapidly changing voltage waveforms and ensures the smooth progress of the test work.

Precise arbitrary wave function: 100 ms

The Arb minimum dwell time of DP900 is increased to 100 ms, and a variety of basic waveforms are built in, which supports free editing and generation of waveforms, and simulates different application scenarios for testing.

One-Key series/parallel connection, flexible testing

CH1 and CH2 of the DP900 series can be internally connected in series or in parallel to realize serial 64 V or parallel 6 A output, without making any external wiring connection and software switching, greatly improving your test efficiency.

Models and Specifications

All the technical specifications[1] are guaranteed when the instrument has been working for more than 30 minutes under the specified operating temperature.

Model			DP932A	DP932U	DP932E
No. of Channels			3		
DC Output	Voltage/Current	CH1, CH2	0 to 32V/0 to 3A		0 to 30V/0 to 3A
		CH3	0 to 6V/0 to 3A		0 to 6V/0 to 3A
	OVP/OCP	CH1, CH2	1 mV to 35.2 V/1 mA to 3.3 A		1 mV to 33 V/1 mA to 3.3 A
		CH3	1 mV to 6.6 V/1 mA to 3.3 A		1 mV to 6.6 V/1 mA to 3.3 A
Load Regulation		Voltage[2]	<0.01% + 2 mV		
		Current	<0.01% + 250 μA		
Line Regulation		Voltage	<0.01% + 2 mV		
		Current	<0.01% + 250 μA		
Ripple Noise (20 Hz to 20 MHz)		Normal Mode Voltage	<350 μVrms/2 mVpp		
		Normal Mode Current	<2 mArms		
Annual Programming Accuracy[3]	Voltage	CH1, CH2	0.05% + 10 mV	0.05% + 20 mV	0.05% + 10 mV
		CH3	0.1% + 5 mV	0.1% + 5 mV	0.1% + 5 mV
	Current	CH1, CH2, CH3	0.2% + 5 mA		
Annual Readback Accuracy	Voltage	CH1, CH2	0.05% + 10 mV	0.05% + 20 mV	0.05% + 10 mV
		CH3	0.1% + 5 mV	0.1% + 5 mV	0.1% + 5 mV
	Current	CH1, CH2, CH3	0.15% + 5 mA		
Programming Resolution	Standard (CH1, CH2, CH3)	Voltage	1 mV	10 mV	10 mV
		Current	1 mA	1 mA	10 mA
	High Resolution (CH1, CH2, CH3)	Voltage	N/A	1 mV	1 mV
		Current	N/A	1 mA	1 mA
Readback Resolution	Standard (CH1, CH2, CH3)	Voltage	0.1 mV	10 mV	10 mV
		Current	0.1 mA	1 mA	10 mA
	High Resolution (CH1, CH2, CH3)	Voltage	N/A	0.1 mV	0.1 mV
		Current	N/A	0.1 mA	0.1 mA
Display Resolution	Standard (CH1, CH2, CH3)	Voltage	1 mV	10 mV	10 mV
		Current	1 mA	1 mA	10 mA
	High Resolution (CH1, CH2, CH3)	Voltage	N/A	1 mV	1 mV
		Current	N/A	1 mA	1 mA
I/O			USB DEVICE x1, USB HOST x2 (1 on the front panel and 1 on the rear panel), LAN x1, Digital IO x1 (option for DP932U, unavailable for DP932E)		

Note: [1]: Unless otherwise stated, the specifications are applicable to all the channels of the specified model. Not applicable in series/parallel connection mode.
[2]: Due to the structure design of the terminal of DP932U, the voltage load regulation cannot be guaranteed.
[3]: The accuracy parameters are acquired via calibration under 25°C after 1-hour warm-up.

Order Information

Order Information	Order No.
Standard Accessories	
USB Cable	CB-USBA-USBB-FF-150
Fuse x1	-
Power Cord Conforming to the Standard of the Destination Country	-
10 A Test Output Lead x3	10A-Testing-Cable
Optional Accessories	
1 mA & 1 mV High-resolution Setting	DP900-HIRES
Min. Arb Dwell Time 100 ms (Only Available for DP932U)	DP900-ARB
4 Trigger Input/Output Channels (Only Available for DP932U)	DP900-DIGITALIO
DP900 Rack Mount Kit (For a Single Instrument)	RM-1-DP800

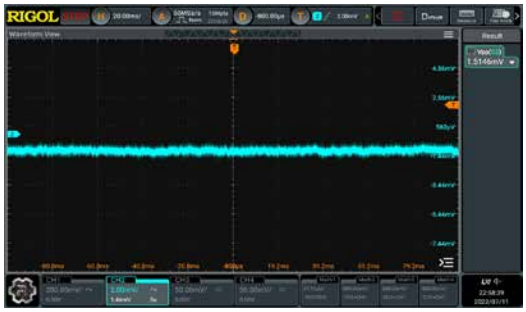
DP2000 Series Programmable Linear DC Power Supply

DP2000 series is a high-precision programmable linear DC power supply. In addition to the low ripple and noise and fast transient response time, it features 3 fully isolated channels, high precision, and high sample rate. The low current measurement resolution can be up to 1 µA, and its annual accuracy is 28 µA. With color touch screen and multiple standard interfaces, it can be used on the bench or stacked in the rack to meet various test scenarios.

- DP2031: 32 V/3 A || 32 V/3 A || 6 V/5 A (10 A)[1]
- 3 electrically isolated independent channels with up to 222 W total power
- 4.3'' LCD color touch screen
- Internal series/parallel connections for CH1 and CH2
- High resolution for measurement of 1 µA low current
- Dynamic current waveform measurement and display
- Excellent programming/readback accuracy
- Fast transient response time: <50 µs
- Front-panel and rear-panel output terminals
- 2-wire or 4-wire remote sense
- A maximum of 512 arbitrary points with dwell time down to 1 ms; various built-in basic waveforms
- Low output ripple and noise: <350 µVrms/2 mVpp
- Command processing time < 10 ms
- Automatic switchover between low and high range measurement
- Timing output, energy consumption analysis (IoT), data logging and analysis
- Support 1 ms pulse current waveform measurement
- Standard 3U height, half rack width
- PC software control
- OVP/OCP/OTP protection
- Various interfaces available: standard USB, LAN, Digital I/O, and RS232; GPIB (optional)[2]

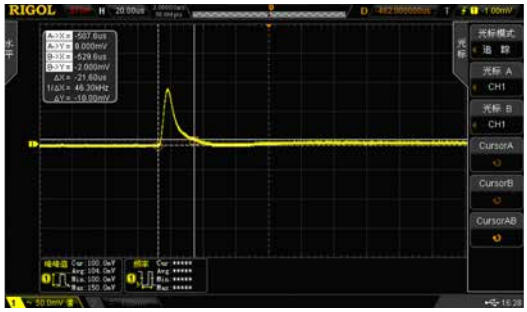
Note[1]: The CH3 of DP2031 has two ranges: 6 V/5 A and 6 V/10 A (opt.). When CH3 switches to 6 V/10 A, the range of CH1 and CH2 switches from 32 V/3 A to 32 V/2 A.
[2]: GPIB and RS232 share the same physical interface. Only one of them can be enabled. Therefore, when GPIB is enabled, the RS232 interface will be occupied by GPIB and RS232 is unavailable.

Low ripple and noise: <350 µVrms/2 mVpp



One of the advantages of linear DC power supply is the pure output. Within the 20 Hz-20 MHz bandwidth, the DP2000's ripple and noise is as low as 350µVrms/2 mVpp. The ultra-low noise design and purer output minimizes any interference to the load, offering high-purity signals to your device.

Fast transient response time: <50 µs

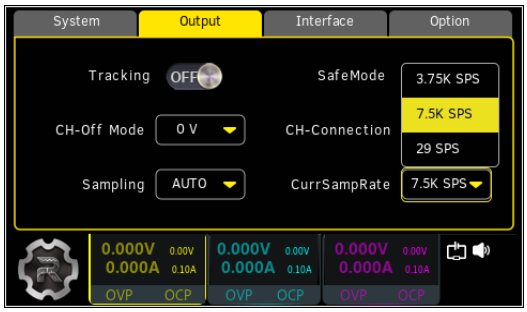


With a transient response capability of less than 50 µs, the DP2000 series is able to cope with changing loads and guarantee your tests.

High-speed Arb mode

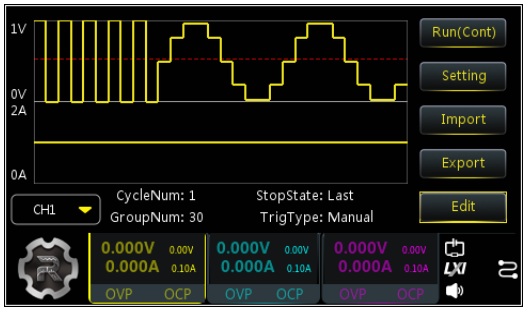
In the low range, its current readback resolution is 1 µA. When measured with the 6.5-digit DMM, its accuracy can reach up to 28 µA. Featuring low current and high precision, it is applicable to low-consumption application scenarios. Auto switchover between low and high range current makes it easy to deal with the constant changing of the current from "µA" level to "A" level.

Automatic series & parallel connections



DP2000 series has a current sample rate up to 7.5 kSa/s, high range current measurement bandwidth, and its readback results are nearly the same as what the 6.5-digit DMM measures. Under the high sample rate, you can monitor the rapid changes of the current and capable of capturing the tiny changes of the current easily.

ms-level editing, exporting more detailed waveforms



The standard waveform function has enhanced significantly, with the dwell time as low as 1 ms. The built-in output templates cover different ranges of voltage, current, dwell time, repetition times, and data points. You can edit the output sequence freely and output more detailed waveforms.

Color touch screen, smooth UI experience

The simple and intuitive 4.3" color touch screen brings users smooth experience.

Models and Specifications

Model			DP2031
Number of Channels			3
DC Output	Voltage/Current	Range1	CH1, CH2: 0 to 32 V/0 to 3 A CH3: 0 to 6 V/0 to 5 A
		Range2 (Option)	CH1, CH2: 0 to 32 V/0 to 2 A CH3: 0 to 6 V/0 to 10 A
	OVP/OCP	Range1	CH1, CH2: 1 mV to 35.2 V/1 mA to 3.3 A CH3: 1 mV to 6.6 V/1 mA to 5.5 A
		Range2 (Option)	CH1, CH2: 1 mV to 35.2 V/1 mA to 2.2 A CH3: 1 mV to 6.6 V/1 mA to 11 A
Load Regulation		Voltage	<0.01% + 2 mV
		Current	<0.01% + 250 μA
Line Regulation		Voltage	<0.01% + 2 mV
		Current	<0.01% + 250 μA
Ripple Noise (20 Hz to 20 MHz)		Normal Mode Voltage	<350 μVrms/2 mVpp
		Normal Mode Current	<2 mArms
Annual Programming Accuracy	Voltage/Current	CH1, CH2	0.03% + 8 mV/0.15% + 5 mA
		CH3	0.04% + 4 mV/0.15% + 10 mA
Annual Readback Accuracy	Voltage/Current	CH1, CH2	0.05% + 8 mV/0.15% + 5 mA
		CH3	0.08% + 3 mV/0.15% + 10 mA
Programming Resolution	Voltage/Current	CH1, CH2	1 mV/0.1 mA
		CH3	1 mV/1 mA
Readback Resolution	Voltage		1mV
	Current		0.1 mA
Display Resolution	Voltage		1mV
	Current		0.1 mA
I/O			USB/LAN/ RS232/Digital IO

Order Information

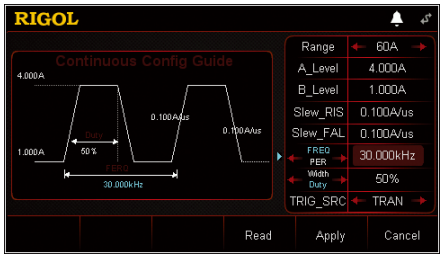
Order Information	Order No.
Standard Accessories	
USB Cable	CB-USBA-USBB-FF-150
Fuse x1	-
Power Cord Conforming to the Standard of the Destination Country	-
10 A Test Output Lead x3	10A-Testing-Cable
Optional Accessories	
CH3 10 A High Current Range	DP2000-10A
7.5 kSa/s High-Speed Current Sampling Option	DP2000-HADC
GPIB Interface Module	DP2000-GPIB
DP2000 Rack Mount Kit (For a Single Instrument)	RM-1-DP800
DP2000 Rack Mount Kit (For Two Instruments)	RM-2-DP800

Programmable DC Electronic Load

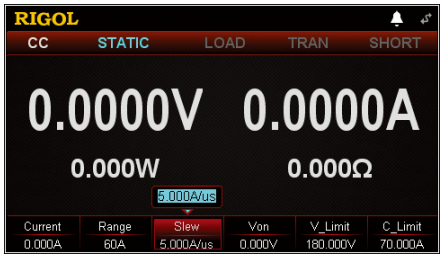
DL3000 is a cost-effective programmable DC electronic load with high performance. With a user-friendly interface and superb performance specifications, DL3000 provides various interfaces for remote communication to meet your diversified test requirements.

- 150 V/40 A, 200 W; 150 V/60 A, 350 W
- Dynamic mode: up to 30 kHz
- Adjustable current slew rate: 0.001 A/μs to 5 A/μs
- Min. readback resolution: 0.1 mV, 0.1 mA
- RS232, USB, and LAN interface
- USB-GPIB module (opt.)

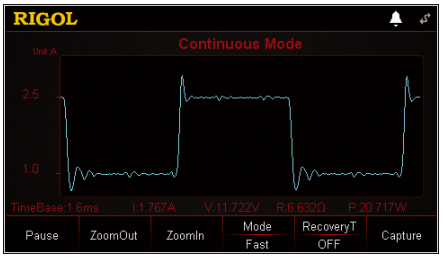
30 kHz dynamic mode



5 A/μs current slew rate



Powerful waveform display function



Models and Specifications

Model	DL3021		DL3021A		DL3031		DL3031A	
	Low Range	High Range	Low Range	High Range	Low Range	High Range	Low Range	High Range
Power	200 W				350 W			
Voltage	0 V to 150 V							
Current	0 A to 40 A				0 A to 60 A			
Minimum Operating Voltage (DC)	1 V@ 40 A				1.3 V@60 A			
CC Mode								
Range	0 A to 4 A	0 A to 40 A	0 A to 4 A	0 A to 40 A	0 A to 6 A	0 A to 60 A	0 A to 6 A	0 A to 60 A
Programming Resolution	1mA							
Programming Accuracy	±(0.05% + 0.05% FS)							
Programming Temperature Coefficient	100 ppm/° C							
CV Mode								
Range	0 V to 15 V	0 V to 150 V	0 V to 15 V	0 V to 150 V	0 V to 15 V	0 V to 150 V	0 V to 15 V	0 V to 150 V
Programming Resolution	1mV	5mV	1mV	5mV	1mV	5mV	1mV	5mV
Programming Accuracy	±(0.05% +0.02% FS)	±(0.05% +0.025% FS)	±(0.05% +0.02% FS)	±(0.05% +0.025% FS)	±(0.05% +0.02% FS)	±(0.05% +0.025% FS)	±(0.05% +0.02% FS)	±(0.05% +0.025% FS)
Programming Temperature Coefficient	50 ppm/°C							
CR Mode								
Range	0.08 Ω to 15 Ω	2 Ω to 15 kΩ	0.08 Ω to 15 Ω	2 Ω to 15 kΩ	0.08 Ω to 15 Ω	2 Ω to 15 kΩ	0.08 Ω to 15 Ω	2 Ω to 15 kΩ
Programming Resolution	2 mA/Vsense							
Programming Accuracy	Vin/Rset*(0.2%) + 0.2%IFS							
CP Mode								
Range	0 ~ 200 W				0 ~ 350 W			
Resolution	100 mW							

Con Mode								
Frequency Range	0.001 Hz to 15 kHz		0.001 Hz to 30 kHz		0.001 Hz to 15 kHz		0.001 Hz to 30 kHz	
Frequency Resolution	0.8%							
Frequency Accuracy	±0.5%							
Duty Cycle Range	5%~95%, 1%							
Current Slew Rate								
Range	0.001 A/μs to 0.25 A/μs	0.001 A/μs to 2.5 A/μs (>5 V)	0.001 A/μs to 0.3 A/μs	0.001 A/μs to 3 A/μs (>5 V)	0.001 A/μs to 0.25 A/μs	0.001 A/μs to 2.5 A/μs (>5 V)	0.001 A/μs to 0.5 A/μs	0.001 A/μs to 5 A/μs (>5 V)
Resolution	0.001 A/μs							
Accuracy	5% + 10 μs							
Current Readback								
Range	0 A to 40 A				0 A to 60 A			
Resolution	1 mA		0.1 mA		1 mA		0.1 mA	
Accuracy	±(0.05% + 0.05% FS)							
Temperature Coefficient	50 ppm/° C							
Voltage Readback								
Range	0 V to 150 V							
Resolution	0.1 mV							
Accuracy	±(0.05% + 0.02% FS)							
Temperature Coefficient	20 ppm/° C							
Protection Function	Overcurrent protection (OCP), overvoltage protection (OVP), overpower protection (OPP), overtemperature protection (OTP), and local/remote reverse voltage (LRV/RRV) protection							
Current	±(0.01% ± 10 mA)							
Voltage	±(0.01% ± 10 mV)							
Input Impedance	350 kΩ							
I/O								
USB DEVICE	●		●		●		●	
USB HOST	●		●		●		●	
RS232	●		●		●		●	
LAN	○		●		○		●	
Digital I/O	○		●		○		●	
GPIB	○		○		○		○	

Order Information

	Description	Order No.
Models	DL3021 (Programmable DC Electronic Load, single-channel, DC 150 V/40 A 200 W 15 kHz 2.5 A/μs)	DL3021
	DL3021A (Programmable DC Electronic Load, single-channel, DC 150 V/40 A 200 W 30 kHz 3.0 A/μs)	DL3021A
	DL3031 (Programmable DC Electronic Load, single-channel, DC 150 V/60 A 350 W 15 kHz 2.5 A/μs)	DL3031
	DL3031A (Programmable DC Electronic Load, single-channel, DC 150 V/60 A 350 W 30 kHz 5.0 A/μs)	DL3031A
Optional Accessories	LAN Interface	LAN-DL3
	Digital I/O Option	DIGITALIO-DL3
	Readback Resolution	HIRES-DL3
	High Frequency Option	FREQ-DL3
	High Slew Rate Option	SLEWRATE-DL3
	Terminal Shield	DL-02
	9-Pin RS232 Cable (female-to-female, cross-over)	CB-RS232-A
	USB-GPIB interface converter	USB-GPIB
	Sense Cable	CB-SENSE
	20 A Red and Black Test Leads	CB-20A-780MM
	40 A Red and Black Test Leads	CB-40A-780MM
	60 A Red and Black Test Leads	CB-60A-780MM
	DL3000 Series Rack Mount Kit (for a single instrument)	RM-1-DP800
	DL3000 Series Rack Mount Kit (for two instruments)	RM-2-DP800

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HEADQUARTER

RIGOL TECHNOLOGIES CO., LTD.
No.8 Keling Road, New District,Suzhou,
JiangSu,P.R.China
Tel:+86-400620002
Email:info@rigol.com

EUROPE

RIGOL TECHNOLOGIES EU GmbH
Carl-Benz-Str. 11
82205 Gilching
Germany
Tel: +49 (0)8105-27292-0
Email: info-europe@rigol.com

NORTH AMERICA

RIGOL TECHNOLOGIES, USA INC.
10220 SW Nimbus Ave.
Suite K-7
Portland, OR 97223
Tel:1-877-4-**RIGOL**-1
Fax: 1-877-4-**RIGOL**-1
Email: info@rigol.com

JAPAN

RIGOL JAPAN CO., LTD.
5F,3-45-6,Minamiotsuka,
Toshima-Ku,
Tokyo,170-0005,Japan
Tel: +81-3-6262-8932
Fax: +81-3-6262-8933
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