RIGOL

DG70000 Series

Arbitrary Waveform Generator

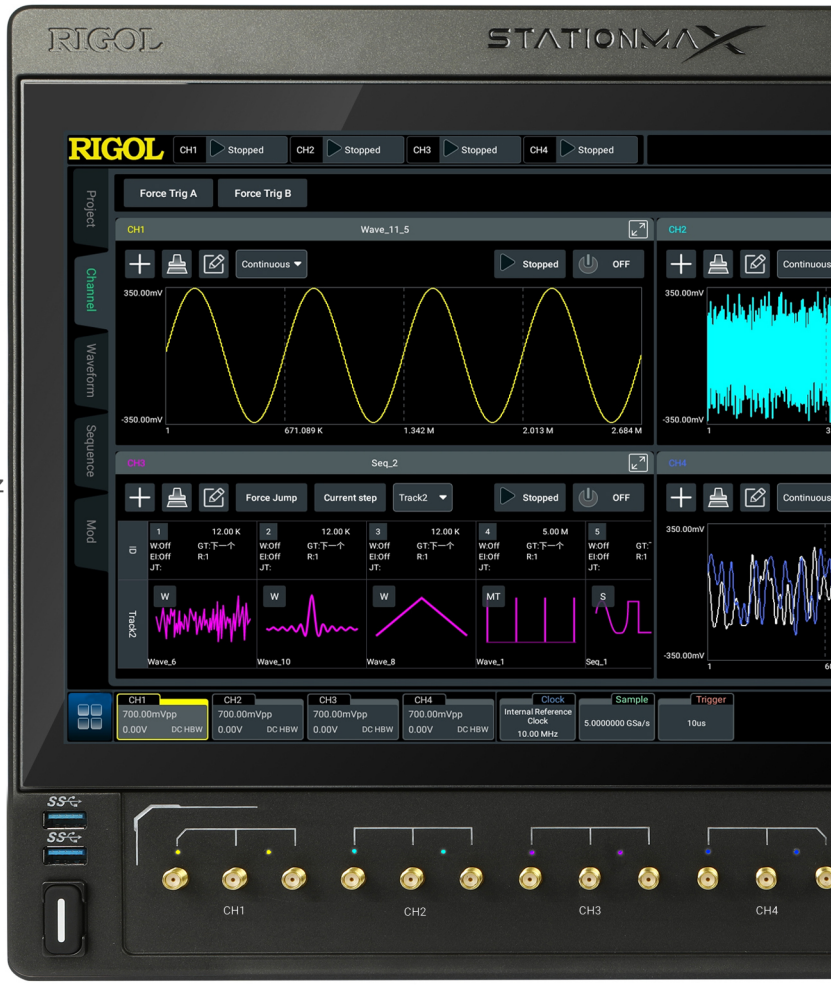
DataSheet

DSB13100-1110

July.2022

DG70000 Series

Arbitrary Waveform Generator

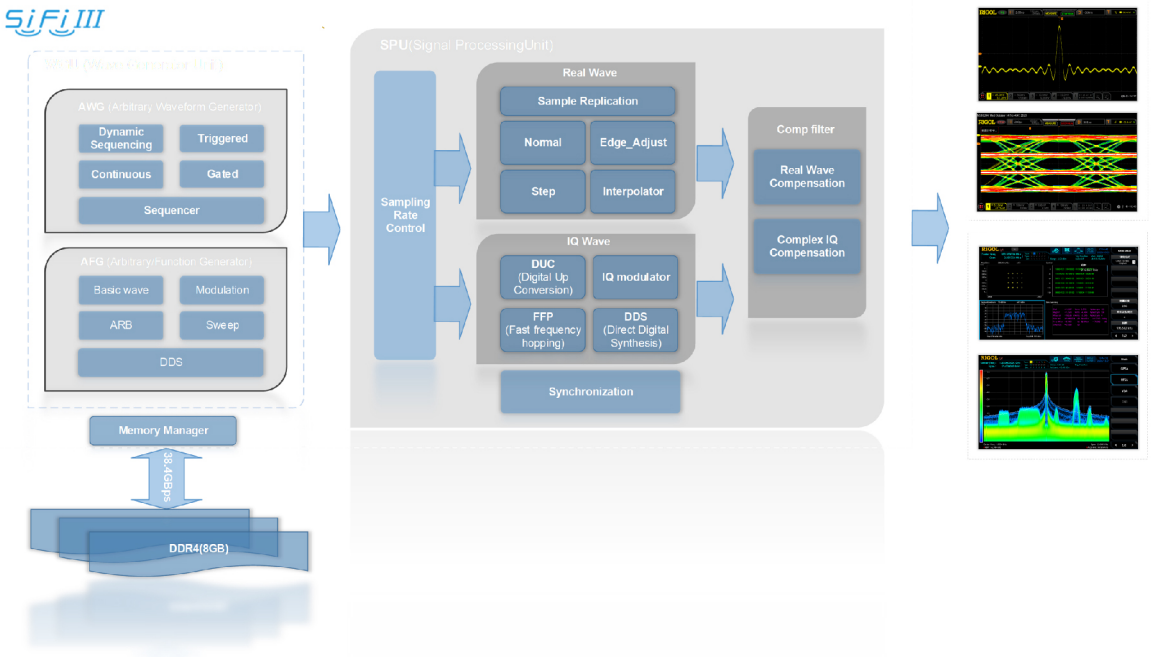


Key Specifications

- Sample rates up to 5 GSa/s (12 GSa/s interpolated)
- 4-channel synchronization for a single instrument
- -70 dBc SFDR
- 16-bit vertical resolution
- 1.5 GSample waveform memory depth per channel
- Direct generation of signals with carriers up to 5 GHz
- Total jitter low as 10 ps_{p-p}, random jitter low as 350 fs_{rms}
- Sample rates adjustable from 100 Sa/s to 12 GSa/s
- High-precision synchronization with channel-to-channel skew repeatability low as ±10 ps

Brand New SiFi III Technical Platform

Built on RIGOL's brand new **SiFi III** platform, the DG70000 series supports multiple signal output modes such as sequence output, precise trigger output, continuous output, and pattern jump output. With industry-leading waveform memory depth, it achieves a maximum data throughput of 38.4 **Gbps**. The advanced sequence function allows for segmentation of its waveform memory, which maximizes flexibility. In terms of signal processing, this series has various functions including adjustable sample rates, IQ modulation, DUP, fast frequency hopping, and direct digital synthesis (DDS).



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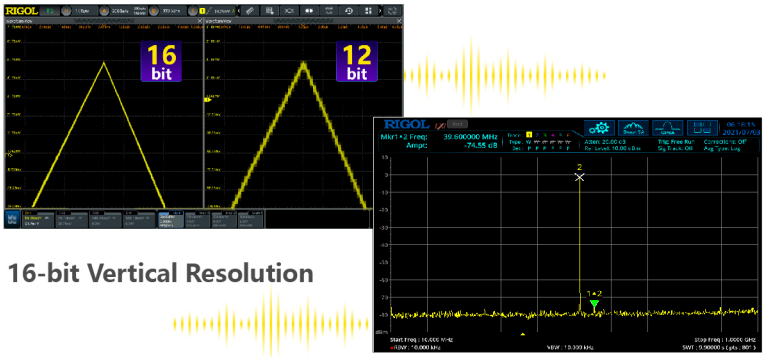
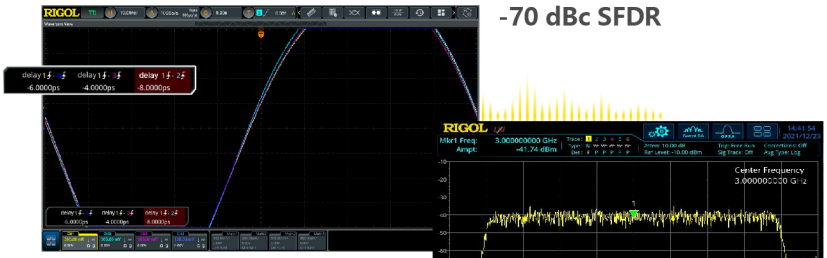
Arbitrary Waveform Generator



16-bit Vertical Resolution



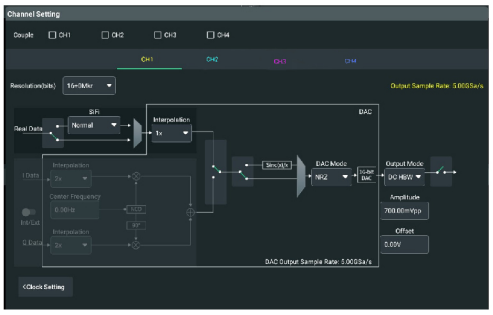
-70 dBc SFDR

Multi-channel Synchronization

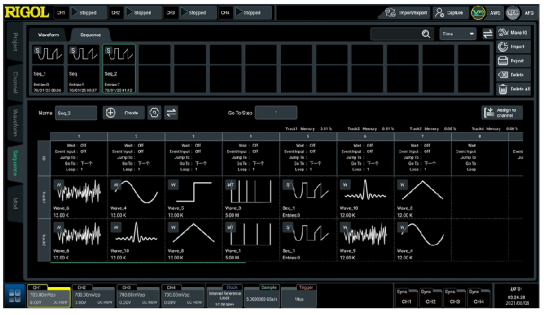
1.5 GHz Modulation Bandwidth

Meeting Requirements for Various Applications

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 long complex waveforms. It can realize high-precision multi-channel synchronization and the output of high-bandwidth and low-jitter waveforms, making it ready for applications in areas like communications, scientific research, and industry. Multiple standard interfaces provides you with more solutions in connectivity, realizing remote instrument control and synchronization.



Channel Setting Interface



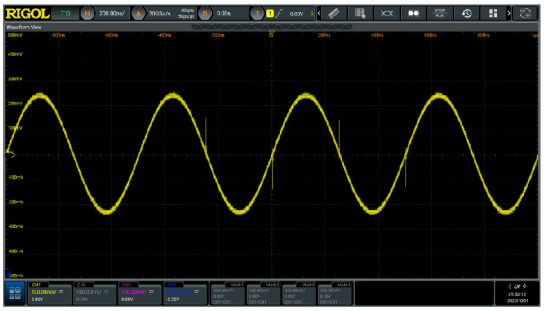
Advanced Sequence Editing Interface

Brand New Appearance and UI Design Bring Extraordinary User Experience

This series features a 7U full-rack structure and delicate industrial design. Equipped with two touch screens, it brings brand new UI design and extraordinary user experience. The main display is a 15.6-inch touch screen with one button electronic tilt. It supports simultaneous waveform display in multi-pane windowing, making it easier to view signals, measurements, and results.

DG70000 Series

Arbitrary Waveform Generator



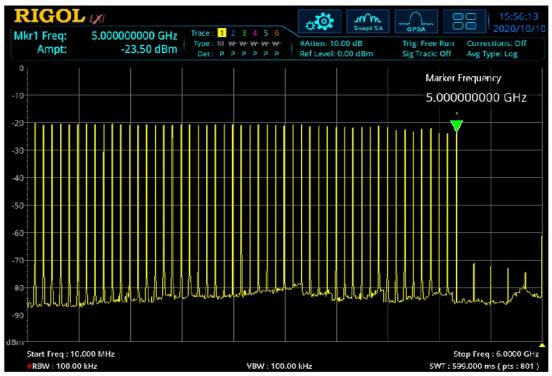
High Sample Rate and High Resolution, Restore Signals with High Quality

The DG70000 series provides sample rate up to **12 GSa/s** and an adjustable range from **100 Sa/s** to **12 GSa/s**. The 16-bit high resolution ensures its high fidelity.

To restore the signal with high quality is the basis for reliable and repeatable testing. The DG70000 series features excellent sample rate and resolution, capable of restoring the signal without distortion, presenting you with more real test results.

- **12 GSa/s Sample Rate**
  (5 GSa/s data rate, interpolated: 10 GSa/s for real waveform output and 12 GSa/s for IQ waveform output)
- **16-bit Vertical Resolution**

Wider Output Frequency Range and Modulation Bandwidth Ensures Wireless Signal Simulation Test



With the renewal and iteration of wireless standards, the carrier frequency and modulation bandwidth of wireless signals are constantly improving, bringing more severe test challenges.

The DG70000 series provides up to **5 GHz** output frequency and up to **1.5 GHz** modulation bandwidth. It can directly output IQ baseband signal or use the Digital Up Converter (DUC) option to generate RF modulated signal, meeting your demands for testing various types of wireless signals.

- **Max. 5 GHz Output Frequency**
- **Max. 1.5 GHz Modulation Bandwidth**

DG70000 Series

Arbitrary Waveform Generator

Lower Channel-to-Channel Delay and Channel Extension Ability, Reproduce Complex Test Scenarios

In cutting-edge fields such as quantum technology, it is necessary to build a multi-channel high-speed signal system. Such complex test scenarios require that the arbitrary waveform generator should support multi-channel signal output and low channel-to-channel delay.

The DG70000 series can realize multi-channel synchronization, and **10 ps** channel-to-channel delay of a single device, enabling you to rebuild multi-channel and low-latency complex test scenarios.

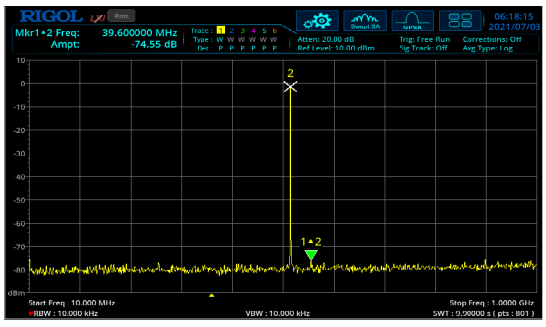
- **Min. 10 ps Channel-to-Channel Delay**
- **Multi-channel Synchronization across Multiple Devices**

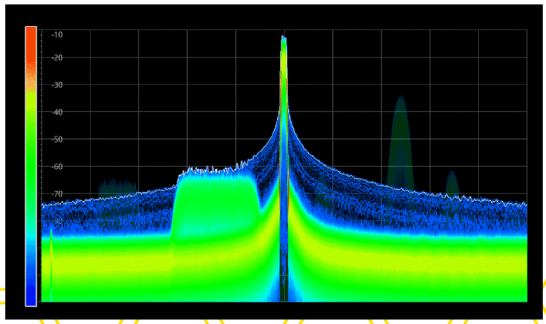
More Sample Points Help Generate Purer Signals

Simulation testing through building real-world environment can effectively reduce the cost of system testing. Improved signal purity and the creation of long complex signals are key requirements for such simulation.

The DG70000 series can provide **-70 dBc** spurious-free dynamic range (SFDR) and up to **1.5G** sample points per channel, creating long complex waveforms without compromising bandwidth. At the same time, it provides the advanced sequence function, which can divide the waveform memory to store several waveform segments, making good use of the waveform memory depth. It also makes it flexible to construct your desired waveforms through internal and external trigger events.

- **1.5 GSample Waveform Memory Depth**
- **-70 dBc SFDR**





Product Features

Product Features

- Up to 5 GSa/s sample rates (12 GSa/s interpolated)
- 4-channel synchronization for a single instrument
- -70 dBc SFDR
- 16-bit vertical resolution
- 1.5 GSample waveform memory depth per channel
- Direct generation of signals with carriers up to 5 GHz
- Generate 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 rates adjustable from 100 Sa/s to 12 GSa/s
- High-precision synchronization with channel-to-channel skew time low as ± 10 ps
- Support advanced sequence to define outputs of various complex waveforms
- Multiple interfaces available: LAN, USB3.0, HDMI
- Support the import of external waveform files
- 15.6-inch angle-adjustable display

Built on its unique SiFi III technical platform and Android operating system, the DG70000 series Arbitrary Waveform Generator (AWG) has the following advantages: accurate and adjustable sample rates; generate arbitrary waveforms point by point; recover the signal without distortion; 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 long complex waveforms. The multi-channel high-precision synchronization, high-bandwidth and low-jitter waveform output make it ready for applications in a variety of industrial and communications fields. Equipped with a 15.6-inch angle-adjustable touch screen supporting multi-pane windowing, it brings a brand new UI design and extraordinary user experience. Multiple standard interfaces provide you with more solutions in connectivity, making it simple to control the instrument remotely.

Specifications

Specifications are valid under the following conditions:

the instrument is within the calibration period; stored for at least two hours at 0℃ to 50℃ temperature; 40-minute warm-up.

Unless otherwise noted, the specifications in the manual include the measurement uncertainty.

- **Typical (typ.):** typical performance, which 80 percent of the measurement results will meet at room temperature (approximately 25℃). The data are not warranted and do not include the measurement uncertainty.
- **Nominal (nom.):** the expected mean or average performance or a designed attribute (such as the 50Ω connector). The data are not warranted and are measured at room temperature (approximately 25℃).
- **Measured (meas.):** an attribute measured during the design phase which can be compared to the expected performance, i.e. the amplitude drift varies with time. The data are not warranted and are measured at room temperature (approximately 25℃).

NOTE:

All charts in this manual are the measurement results of multiple instruments at room temperature unless otherwise noted.

Overview of the DG70000 Series Technical Specifications

Overview of the DG70000 Series Technical Specifications		
Sample Rate	100 Sa/s to 12 GSa/s[1]	
Number of Channels	4	
Vertical Resolution	16 bit (0 Marker/channel) 15 bit (1 Marker/channel) 14 bit (2 Markers/channel)	
Waveform Memory Depth	1.5 Gpts/channel	
Multi-channel Synchronization	Skew Repeatability	±10 ps
	Delay Correction Resolution	3 ps
Effective Frequency Output	The maximum frequency is determined as “sample rate/2.5”. 2 GHz (Real Data mode) 4 GHz (IQ Data mode, 10 GSa/s interpolated)	

Analog Output

Analog Output		
DC High Bandwidth Output (DC HBW)	Amplitude Range	350 mVpp~700 mVpp (single-ended, 50 Ω terminated) [2] 700 mVpp~1400 mVpp (differential, 100 Ω terminated)
	Amplitude Accuracy[3]	±2% of the setting value
	Analog Bandwidth	2 GHz (-3 dB), 4 GHz (-6 dB)
	Offset	±20 mV (50 Ω into GND), ±40 mV into DC voltage terminated
	Offset Resolution	50 μV (nom.)
	Offset Accuracy[4]	±2 mV
	Rise/Fall Time Measured at 20% to 80% Levels	< 110 ps at 700 mVpp single-ended termination
DC Amplifier Output (DC AMP)	Amplitude Range	25 mVpp~1000 mVpp (single-ended, 50 Ω terminated) 50 mVpp~2000 mVpp (differential, 100 Ω terminated)
	Amplitude Accuracy[3]	±2% of the setting value ≥ 100 mVpp ±5% of the setting value < 100 mVpp
	Offset	±1 V (50 Ω into GND), ±2 V into DC voltage terminated
	Offset Accuracy[4]	Common mode: ±(2% of the offset + 10 mV); ((OutP +OutN)/2) Differential mode: ±20 mV; (OutP - OutN)
	Analog Bandwidth	1.3 GHz (-3 dB), 2.6 GHz (-6 dB)
	Rise/Fall Time Measured at 20% to 80% Levels	< 180 ps at 1.0 Vpp single-ended
AC Output (AC)	Amplitude Range	-20 dBm~+10 dBm
	Amplitude Accuracy	±0.5 dB (typ.)
	Offset	±2 V/70 mA
	Offset Accuracy[4]	±(2% of the offset + 20 mV); into an open circuit (zero-load current)
	Analog Bandwidth	10 MHz~2 GHz (-3 dB), 10 MHz~3.8 GHz (-6 dB), 10 MHz~5 GHz (-18 dB)
Number of Channels		4 channels, 3 SMA connectors per channel at front panel

Time Domain

Time Domain		
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}

Frequency Domain

Frequency Domain		
Output Match VSWR	DC HBW	DC~4 GHz < 1.8:1
	DC AMP	DC~2.6 GHz < 1.8:1
	AC	DC~5 GHz < 2.0:1
Intermodulation Distortion	100 MHz ± 1 MHz	-70 dBc
	1 GHz ± 1 MHz	-60 dBc

Spurious Free Dynamic Range (SFDR)

SFDR Characteristics: SFDR is determined as a function of the directly generated carrier frequency. Harmonics not included. Measured with a balun and with output amplitude set to 500 mVpp.

SFDR DC HBW Output (Typ.)					
		In Band Performance		Adjacent Band Performance	
	DC HBW Output	Measured Across	Specifications	Measured Across	Specifications
2.5 GSa/s	100 MHz	DC~500 MHz	-80 dBc	DC~1.25 GHz	-72 dBc
	DC~625 MHz	DC~625 MHz	-70 dBc	DC~1.25 GHz	-62 dBc
	DC~1 GHz	DC~1 GHz	-60 dBc	DC~1.25 GHz	-58 dBc
5 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~2.5 GHz	-72 dBc
	DC~1.25 GHz	DC~1.25 GHz	-70 dBc	DC~2.5 GHz	-62 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~2.5 GHz	-58 dBc
10 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~5 GHz	-48 dBc
	2 GHz~3.5 GHz	2 GHz~3.5 GHz	-42 dBc	DC~5 GHz	-42 dBc
	3.5 GHz~4 GHz	3.5 GHz~4 GHz	-55 dBc	DC~5 GHz	-40 dBc
12 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~5 GHz	-48 dBc
	2 GHz~3.5 GHz	2 GHz~3.5 GHz	-42 dBc	DC~5 GHz	-42 dBc
	3.5 GHz~4 GHz	3.5 GHz~4 GHz	-55 dBc	DC~5 GHz	-40 dBc
SFDR DC AMP Output (Typ.)					
		In Band Performance		Adjacent Band Performance	
	DC AMP Output	Measured Across	Specifications	Measured Across	Specifications
2.5 GSa/s	100 MHz	DC~500 MHz	-80 dBc	DC~1.25 GHz	-72 dBc
	DC~625 MHz	DC~625 MHz	-70 dBc	DC~1.25 GHz	-62 dBc
	DC~1 GHz	DC~1 GHz	-60 dBc	DC~1.25 GHz	-58 dBc
5 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~2.5 GHz	-72 dBc
	DC~1.25 GHz	DC~1.25 GHz	-70 dBc	DC~2.5 GHz	-62 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~2.5 GHz	-58 dBc

SFDR DC AMP Output (Typ.)					
10 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~5 GHz	-48 dBc
	2 GHz~2.6 GHz	2 GHz~2.6 GHz	-44 dBc	DC~5 GHz	-44 dBc
12 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-60 dBc	DC~5 GHz	-48 dBc
	2 GHz~2.6 GHz	2 GHz~2.6 GHz	-44 dBc	DC~5 GHz	-44 dBc

SFDR AC Output (Typ.)					
		In Band Performance		Adjacent Band Performance	
	AC Output	Measured Across	Specifications	Measured Across	Specifications
2.5 GSa/s	100 MHz	DC~500 MHz	-80 dBc	DC~1.25 GHz	-72 dBc
	DC~625 MHz	DC~625 MHz	-70 dBc	DC~1.25 GHz	-62 dBc
	DC~1 GHz	DC~1 GHz	-60 dBc	DC~1.25 GHz	-58 dBc
5 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~2.5 GHz	-72 dBc
	DC~1.25 GHz	DC~1.25 GHz	-70 dBc	DC~2.5 GHz	-62 dBc
	DC~2 GHz	DC~2 GHz	-58 dBc	DC~2.5 GHz	-58 dBc
10 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-58 dBc	DC~5 GHz	-46 dBc
	2 GHz~3.5 GHz	2 GHz~3.5 GHz	-46 dBc	DC~5 GHz	-42 dBc
	3.5 GHz~4 GHz	3.5 GHz~4 GHz	-46 dBc	DC~5 GHz	-40 dBc
12 GSa/s	100 MHz	DC~1 GHz	-80 dBc	DC~5 GHz	-60 dBc
	DC~1.25 GHz	DC~1.25 GHz	-68 dBc	DC~5 GHz	-50 dBc
	DC~2 GHz	DC~2 GHz	-58 dBc	DC~5 GHz	-46 dBc
	2 GHz~3.5 GHz	2 GHz~3.5 GHz	-46 dBc	DC~5 GHz	-42 dBc
	3.5 GHz~4 GHz	3.5 GHz~4 GHz	-46 dBc	DC~5 GHz	-40 dBc

Harmonics and Phase Noise

Harmonics		
Harmonic Distortion (@ 500 mVpp)		
SHG (Differential or with a balun)	10 MHz~500 MHz	< –62 dBc
	500 MHz~1 GHz	< –50 dBc
	1 GHz~4 GHz	< –30 dBc
SHG (Single-ended)	10 MHz~500 MHz	< –42 dBc
	500 MHz~1 GHz	< –40 dBc
	1 GHz~4 GHz	< –25 dBc

Harmonics		
THG	10 MHz~750 MHz	< –55 dBc
	750 MHz~1 GHz	< –50 dBc
	1 GHz~2 GHz	< –35 dBc
Harmonic Distortion (@ 1000 mVpp)		
SHG (Differential or with a balun)	10 MHz~500 MHz	< –55 dBc
	500 MHz~1 GHz	< –45 dBc
	1 GHz~2.6 GHz	< –35 dBc
SHG (Single-ended)	10 MHz~500 MHz	< –38 dBc
	500 MHz~1 GHz	< –30 dBc
	1 GHz~2.6 GHz	< –25 dBc
THG	10 MHz~500 MHz	< –33 dBc
	500 MHz~1 GHz	< –30 dBc
	1 GHz~2.6 GHz	< –25 dBc

Phase Noise	
Output Phase Noise [5]	fc=100 MHz: -126 dBc/Hz @ offset 10 kHz
	fc=1 GHz: -112 dBc/Hz @ offset 10 kHz
	fc=2 GHz: -106 dBc/Hz @ offset 10 kHz
	fc=4 GHz: -100 dBc/Hz @ offset 10 kHz

Input

Input		
Trigger In	Inputs	2
	Polarity	Positive or Negative
	Impedance	1 MΩ (nom.)
	Range	1 MΩ: ±8 V_{rms}
	Threshold Level	Range: -5.0 V to 5.0 V Resolution: 0.1 V (nom.)
	Trigger Pulse Width[6]	20 ns
	Minimum Trigger Interval	10 µs
	Trigger Sensitivity	500 mVpp
	Connector	SMA (rear panel)
Modulating Signal Input	Inputs	4
	Multiplexing	Analog modulation input or baseband IQ input
	Frequency Range	DC~100 MHz
	Input Level	1 Vpp (full-range)
	Impedance	50 kΩ (nom.)
	Connector	SMA (rear panel)

Input		
Pattern Jump Input	Input Impedance	1 kΩ to GND
	Input Level	3.3 V LVCMOS
	Number of Destinations	256
	Strobe Polarity	Negative and positive edge (selectable)
	Strobe Setup Time	5 ns
	Strobe Hold Time	5 ns
	Min. Pulse Width	64 ns
	Analog Output Channel Delay	<12,500/sample rate
	Connector	DB15 female (rear panel)

Pattern Jump Pin Assignments					
Pin	**Description**	**Pin**	**Description**	**Pin**	**Description**
1	GND	6	GND	11	Data bit 5, input
2	Data bit 0, input	7	Strobe, input	12	Data bit 6, input
3	Data bit 1, input	8	GND	13	Data bit 7, input
4	Data bit 2, input	9	GND	14	GND
5	Data bit 3, input	10	Data bit 4, input	15	GND

Waveform Capability

Waveform Capability	
Waveform File Import Capability	*.txt file format, supporting voltage code and normalized value *.wfm file format created by RIGOL AWG *.seq file format created by RIGOL AWG
Waveform File Export Capability	*.txt file format, supporting voltage code and normalized value *.wfm file format created by RIGOL AWG *.seq file format created by RIGOL AWG

Marker Output

Marker Output	
Number	0 (default), 1, or 2
Minimum Pulse Width	3.2 ns
Max. Data Rate	2.5 GSa/s
Type	Single-ended
Impedance	50 Ω (nom.)

Marker Output	
Output into 50 Ω	Window: -0.5 V to 1.75 V Amplitude: 400 mV to 1.75 V (typ.) Resolution: 100 μV (nom.)
Rise Time	(20%~80%): 750 ps
Delay Control	±2 ns
Connector	SMA (rear panel)

Sequencer

Sequencer	
Sequence	Number of steps for each sequence: 1 to 16,384
Subsequence	Number of steps for each subsequence: 2 to 16,384
Waveform Segment	Waveform length: 2.4k to 500M sample points (1.5G optional) Minimum waveform granularity: 1 sample
Output Sequence	Execute the steps of the sequence/subsequence in specific order.
Loop	Execute 1 to 2^{32}-1 times or infinite times in loop.
Jump	Wait: wait for a trigger event to play the step in the sequence Synchronous Jump: support synchronous event jump to a specified step in the sequence Asynchronous Jump: support asynchronous event jump to a specified step in the sequence Go To: define the next step in the sequence or subsequence to go to and play Pattern Jump: support 256 jump destinations

Clock Characteristics

Clock Characteristics		
10 MHz Reference Clock Output	Output Amplitude	+4 dBm ±2 dB
	Output Frequency	10 MHz ± (1 ppm + aging)
	Temperature Stability	＜ 0.5 ppm (0℃ to 50℃, with the reference 25℃)
	Aging Rate	＜ 1 ppm/year
	Output Impedance	50 Ω (nom.)
Sample Clock Output	Output Amplitude	+2 dBm to +10 dBm
	Output Frequency	2.5 GHz~6 GHz
	Output Impedance	50 Ω (nom.)
Sync Clock Output	Output Amplitude	1.0 V ±150 mVpp to 50 Ω
	Output Frequency	Sample clock frequency/32
	Output Impedance	50 Ω (nom.)

Clock Characteristics		
Reference Clock Input	Input Amplitude	-5 dBm to +5 dBm
	Fixed Frequency	10 MHz, ±40 Hz
	Variable Frequency Range	35 MHz~150 MHz
	Input Impedance	50 Ω (nom.)
External Sample Clock Input	Input Amplitude	0 dBm to +10 dBm
	Input Frequency	2.5 GHz~6.0 GHz
	Input Impedance	50 Ω (nom.)
Connector	SMA (rear panel)	

NOTE:

[1] 5 GSa/s data rate, interpolated: 10 GSa/s for real waveform output; 12 GSa/s for IQ waveform output.

[2] It is recommend to connect the output terminal that is not in use to GND with a 50 Ω load.

[3] 100 MHz sine waveform

[4] It is under the condition that the self-calibration temperature is within 25℃±5℃ indoor temperature.

[5] 5 GHz sample clock with 10 GSa/s sample rate

[6] Nominal value with 5 GHz sample clock. Reference formula: 48/Sample Clock+10 ns.

General Specifications

Characteristics

Characteristics	
Operating System	Android
Touch Screen	15.6'' main screen, 3.5'' auxiliary screen

Interface

Interface	
LAN Interface	1 at rear panel, RJ-45 Ethernet connector, 10/100/1000BASE-T port, supporting LXI-C
Web Control	Support Web Control (input the IP address of the generator into the Web browser to display the operation interface)
HDMI Interface	1 at rear panel, HDMI 1.4b, A plug; used to connect to an external monitor or projector
USB 3.0 Host High-Speed Interface	4 (2 at front panel and 2 at rear panel)
USB 3.0 Device High-Speed Interface	1 at rear panel, supporting TMC
Sync Control Interface	1 at rear panel, MDR-26 interface, used to control the synchronization of multiple instruments

Power Supply

Power Supply	
AC Input	100 V to 240 V (nom.)
AC Frequency	45 Hz to 440 Hz
Consumption	300 W (typ.), 500 W (max.)

Environment

Environment		
Temperature Range	Operating	0℃~+50℃
	Non-operating	-30℃~+70℃

Environment		
Humidity Range	Operating	below +30℃: ≤90% RH (without condensation)
		+30℃ to +40℃, ≤75% RH (without condensation)
		+40℃ to +50℃, ≤45% RH (without condensation)
	Non-operating	below 65℃: ≤90% RH (without condensation)
Altitude	Operating	below 3,000 meters
	Non-operating	below 15,000 meters

Regulation Standards

Regulation Standards		
Electromagnetic Compatibility	Compliant with EMC Directive (2014/30/EU), compliant with or higher than the standards specified in EN 61326-1: 2013, EN 61326-2-1:2013, EN IEC 61000-3-2:2019+A1, EN 61000-3-3:2013+A1:2019	
	CISPR 11:2009+A1 Class A	
	EN IEC 61000-3-2:2019+A1	Harmonics, Class A
	EN 61000-3-3:2013+A1:2019	Voltage flicker
	EN 61000-4-2:2009	±4.0 kV (contact discharge), ±8.0 kV (air discharge)
	EN 61000-4-3:2006+A1+A2	10 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 6 GHz)
	EN 61000-4-4:2004+A1	2 kV power cord
	EN 61000-4-5:2006	1 kV (phase-to-neutral voltage); 2 kV (phase-to-earth voltage); 2 kV (neutral-to-earth voltage)
	EN 61000-4-6:2009	10V, 0.15 MHz to 80 MHz
	EN 61000-4-11:2004	Voltage dip: 0% UT during half cycle; 0% UT during 1 cycle; 70% UT during 25 cycles Short interruption: 0% UT during 250 cycles
Safety	EN 61010-1:2010+A1:2019 IEC 61010-1:2010+A1:2016 UL 61010-1: 2012 R7.19 CAN/CSA-C22.2 NO. 61010-1-12 + GI1 + GI2 (R2017) + A1	
Vibration	Meets GB/T 6587; class 2 random Meets MIL-PRF-28800F and IEC60068-2-6; class 3 random	

Regulation Standards	
Shock	Meets GB/T 6587-2012; class 2 random Meets MIL-PRF-28800F and IEC 60068- 2- 27; class 3 random (in non-operating conditions: 30 g, half sine, 11 ms duration, 3 shocks along the main axis, a total of 18 vibrations)

Mechanical Characteristics

Mechanical Characteristics	
Dimension	439 mm (W)×310 mm (H)×491 mm (D)
Weight	Net weight <22.5 kg
	Gross weight <29.5 kg

Warranty and Calibration Interval

Warranty and Calibration Interval	
Warranty	Three years for the base unit, excluding the accessories.
Recommended Calibration Interval	12 months

Order Information and Warranty Period

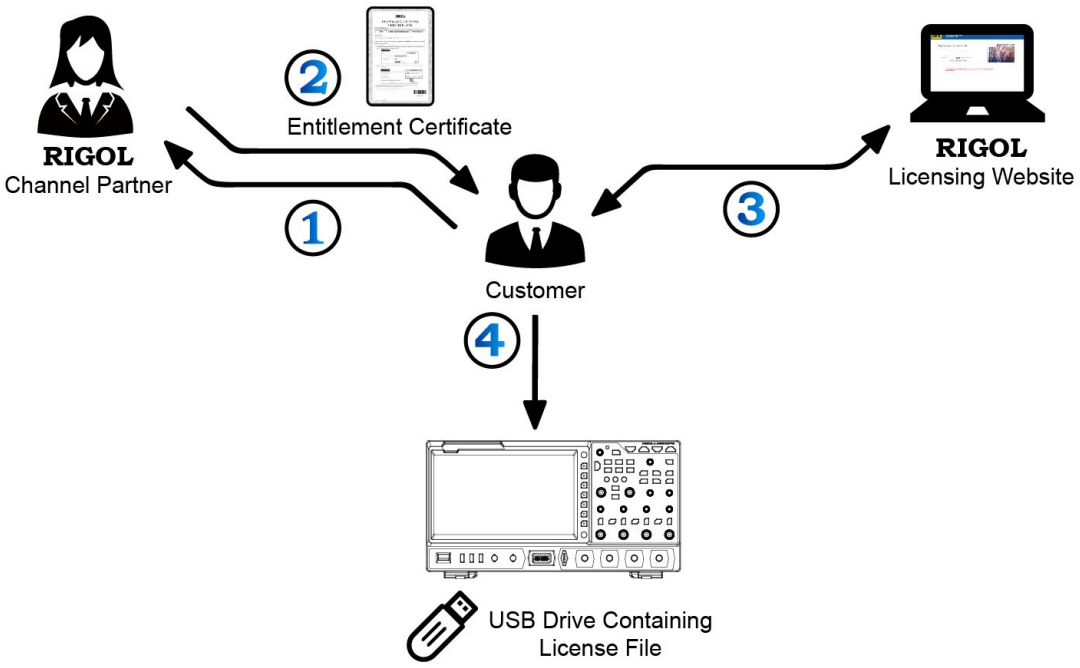
Order Information

Order Information	Order No.
Model	
2 GHz bandwidth, 5 GSa/s data rate, 1.5G sample points	DG70004
Standard Shipped Accessory	
Power cord (based on destination country)	— —
USB cable	— —
Three 50 Ω, 18 GHz SMA terminators per channel	— —
Performance Upgrade Option	
Digital Up Converter (DUC) and IQ Modulation	DG70000-DIGUP
Complex Sequence function	DG70000-SEQ
High-speed Serial Function	DG70000-PJ
DC Amplifier Output	DG70000-DC
Multitone & Chirp Mode	DG70000-MTONENL

Warranty Period

Three years for the mainframe, excluding the accessories.

Option Ordering and Installation Process



1. According to the usage requirements, please purchase the specified function options from **RIGOL Sales Personnel**, and provide the serial number of the instrument that needs to install the option.
2. After receiving the option order, the **RIGOL** factory will mail the paper software product entitlement certificate to the address provided in the order.
3. Log in to **RIGOL** official website for registration. Use the software key and instruments serial number provided in the entitlement certificate to obtain the option license code and the option license file.
4. Download the option license file to the root directory of the USB storage device, and connect the USB storage device to the instrument properly. After the USB storage device is successfully recognized, the **Option install** menu is activated. Press this menu key to start installing the option.

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