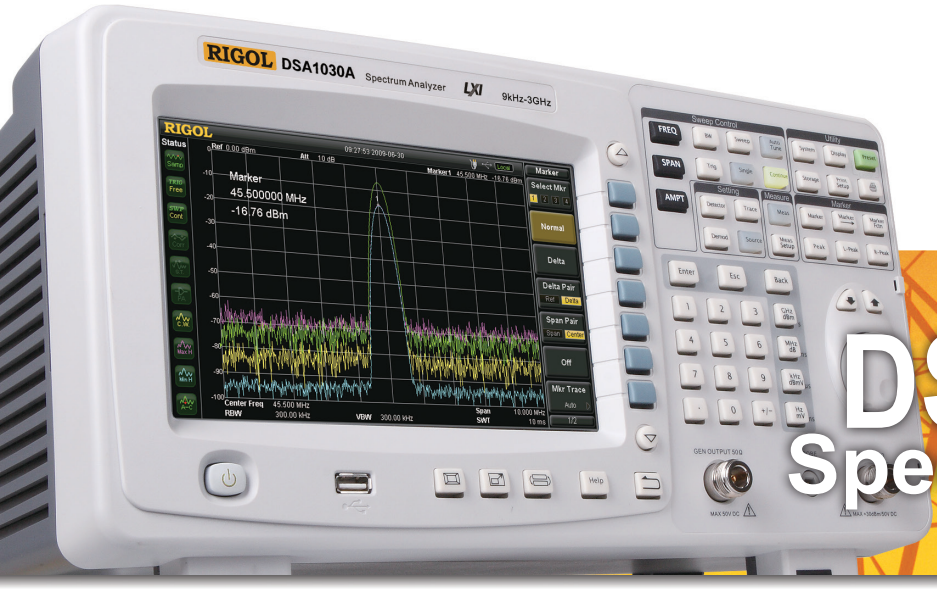
RIGOL

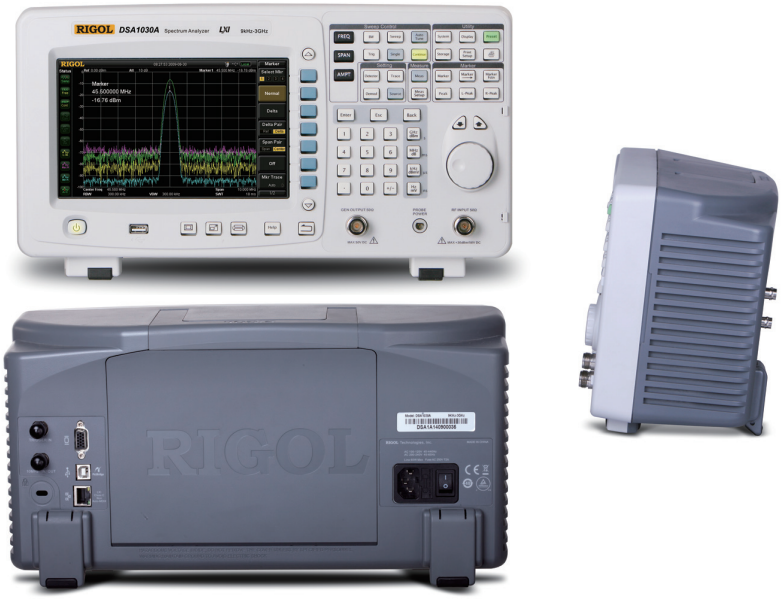


DSA1000 series Spectrum Analyzer

- All Digital IF Technology
- Frequency Range: 9 kHz to 3 GHz
- Displayed Average Noise Level Up to -148 dBm (DSA1030A)
- Phase Noise up to -88 dBc/Hz @10 kHz offset (DSA1030A)
- Total Amplitude Uncertainty <1.0 dB(DSA1030A)
- Minimum Resolution Bandwidth (RBW) : 10 Hz (DSA1030A)
- Quasi-Peak Detector & EMI Filter (Standard)
- 3 GHz Tracking Generator (for DSA1030-TG and DSA1030A-TG)
- Advanced measurement functions (option for DSA1030 and DSA1030-TG, standard for DSA1030A and DSA1030A-TG)
- 8.5 inch widescreen display (800X480)
- Complete Connectivity: LAN, USB Host&Device, VGA, USB-GPIB (optional)
- Compact size, light weight

DSA1000 series is a 3GHz general purpose spectrum analyzer. With its stable performance as well as overall and easy-to-use test functions, it can fulfill most of the spectrum-related test and application requirements, such as maintenance, production and education. In addition, it is a highly cost effective instrument that is worth having.

Unique widescreen display, friendly interface and easy-to-use operations



Product Dimensions: Width X Height X Depth = 399 mm × 223 mm × 159 mm Weight: 6.2 kg (Without Battery and Package)

Advanced Performance and stability

Stability and precision is the primary design goal of the DSA1000 Series. We started with an all digital IF core. With the minimum 10Hz resolution bandwidth, -88 dBc/Hz phase noise (typical) at 10 kHz offset, up to -148 dBm displayed average noise level (10 Hz RBW, standard preamplifier on) and less than 1.0 dB total amplitude error, the DSA1000 Series makes high precision measurements easier than ever whether the application calls for low noise or narrow resolution.

Incomparable Value

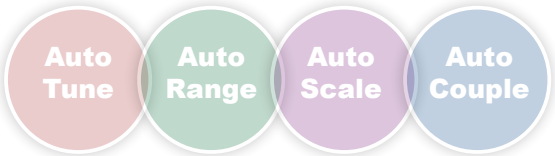
With the DSA1000 Series get a high quality spectrum analyzer without the price tag. This lowers the investment whether you are in stages related to research and development or manufacturing and maintenance. Don't let instrumentation costs dictate resource allocation. With our available calibration and maintenance training as well as firmware updates never regret a purchase because of total cost of ownership.

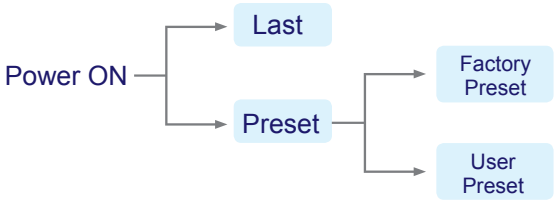
Benefits of Rigol's all digital IF design

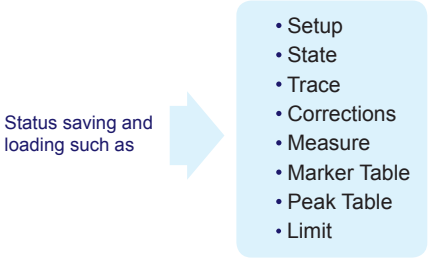
1. The ability to measure smaller signals: on the basis of this technology, the IF filter enables smaller bandwidth settings, which greatly reduce the displayed average noise level.
2. The ability to distinguish between small signals by frequency: using the IF filter with the smallest bandwidth setting it is possible to make out signals with a frequency difference of only 10 Hz.
3. High precision amplitude readings: this technology almost eliminates the errors generated by filter switching, reference level uncertainty, scale distortion, as well as errors produced in the process of switching between logarithmic and linear display of amplitude when using a traditional analog IF design.
4. Higher reliability: compared with traditional analog designs, the digital IF greatly reduces the complexity of the hardware, the system instability caused by channel aging, and the temperature sensitivity that can contribute to parts failure.
5. High measurement speed: the use of digital IF technology improves the bandwidth precision and selectivity of the filter, minimizing the scanning time and improving the speed of the measurement.

Breadth of measurement functions and automatic settings provide ultimate flexibility

DSA1000 Series provides a series of automatic setting functions such as Auto Tune, Auto Range, Auto Scale and Auto Couple that enable the analyzer to acquire signals and match parameters automatically, instead of the manual process used by a traditional analyzer. In addition, the User and Factory settings under the Preset function enable users to quickly and easily recall previous measurement settings.

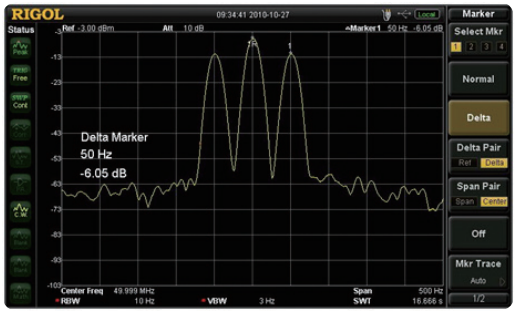




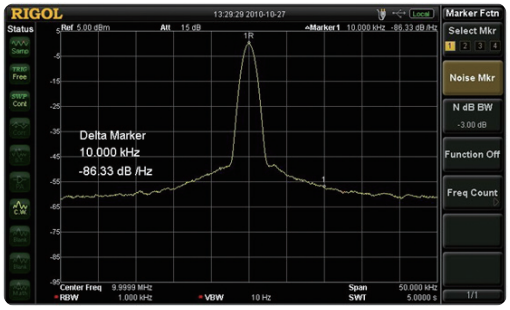


Features and Benefits

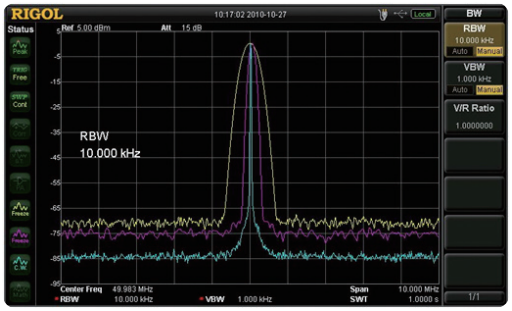
Distinguish the two nearby signals clearly with the 10Hz RBW



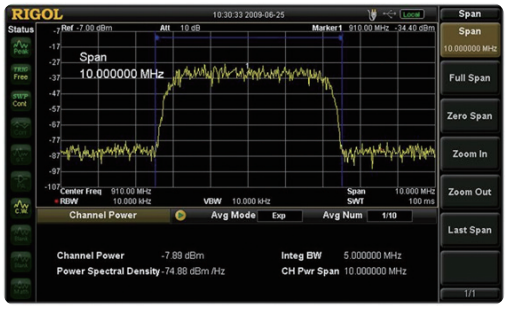
Readout the signal's Phase Noise directly by using the standard Noise Marker function



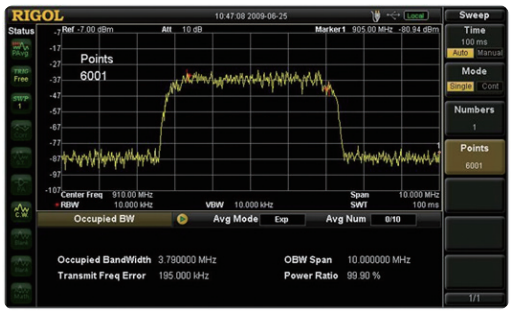
Compare the spectrums with different color trace



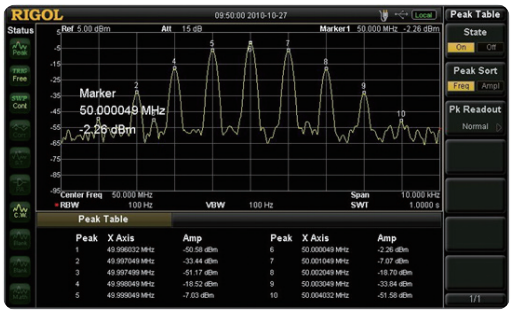
The advanced Channel Power measurement function



The advanced Occupied Bandwidth measurement function

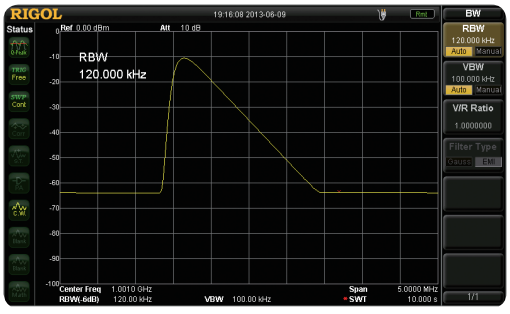


Readout the Spectrum Peak values with the Peak table function

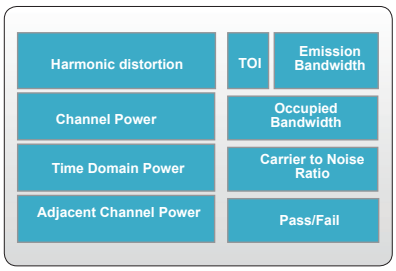


The advanced Harmonic distortion measurement function

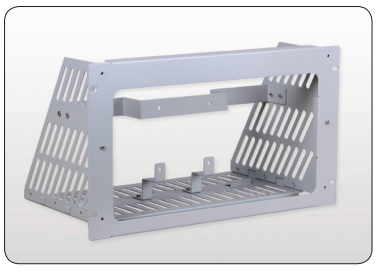
Quasi-Peak Detector & EMI Filter (Standard)



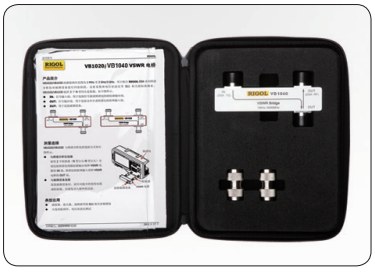
➤ RIGOL Spectrum Analyzer Option and Accessory



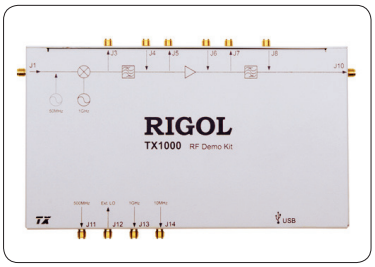
Advanced Measurement Kit
(AMK–DSA1000)



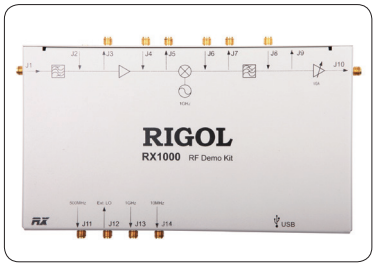
Rack Mount Kit
(RM–DSA1000)



VSWR Bridge
(VB1020/VB1040)



RF Demo Kit
(TX1000)



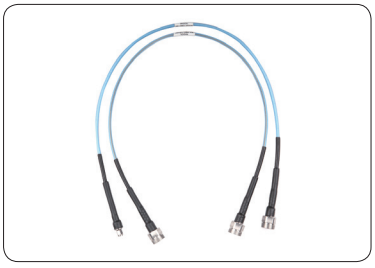
RF Demo Kit
(RX1000)

RF CATV Kit

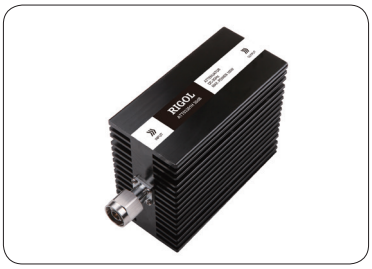
DSA Utility Kit

RF Adaptor Kit

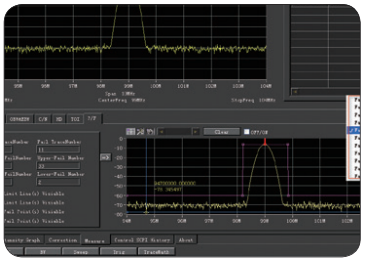
RF Attenuator Kit



RF Cable Kit
(CB-NM-NM-75-L-12G)
(CB-NM-SMAM-75-L-12G)



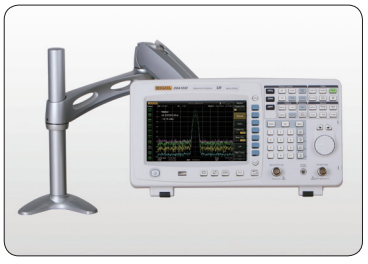
High Power Attenuator
(ATT03301H)



DSA PC Software
(Ultra Spectrum)

Soft Carrying Bag
(BAG-DSA1000)

USB to GPIB Converter
(USB-GPIB)



Desk Mount Instrument Arm
(ARM)

Specifications

Specifications are valid under the following conditions: the instrument is within the calibration period, is stored for at least two hours at 5℃ to 40℃ temperature, and is warmed up for 30 minutes. Unless otherwise noted, the specifications in this manual include the measurement uncertainty.

Typical (typ.): characteristic performance, which 80 percent of the measurement results will meet at room temperature (approximately 25℃). This data is not warranted and does not include the measurement uncertainty.

Nominal (nom.): the expected mean or average performance or a designed attribute (such as the 50 Ω connector). This data is not warranted and is measured at room temperature (approximately 25℃).

Measured (meas.): an attribute measured during the design phase which can be compared to the expected performance, such as the amplitude drift variation with time. This data is not warranted and is measured at room temperature (approximately 25℃).

NOTE: All data in this manual are the measurement results of multiple instruments at room temperature unless otherwise noted. The specifications (except the TG specifications) listed in this manual are those when the tracking generator is off.

Model	DSA1030A/DSA1030A-TG	DSA1030/DSA1030-TG
Frequency		
Frequency		
Frequency Range	9 kHz to 3 GHz	
Frequency Resolution	1 Hz	
Internal Frequency Reference		
Reference Frequency	10 MHz	
Aging Rate	<3 ppm/year	
Temperature Drift	<3 ppm, 20 ℃ to 30 ℃	
Frequency Readout Accuracy		
Marker Resolution	span/(sweep points-1)	
Marker Uncertainty	± (frequency indication × frequency reference uncertainty +1% × span + 10% × resolution bandwidth + marker resolution)	
Marker Frequency Counter		
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz	
Uncertainty	±(frequency indication × frequency reference uncertainty + counter resolution) Note: Frequency Reference Uncertainty= (aging rate × period since adjustment + temperature drift).	
Frequency Span		
Range	0 Hz, 100 Hz to 3 GHz	
Uncertainty	±span/(sweep points-1)	
SSB Phase Noise		
SSB Phase Noise Note: Typical fc = 500MHz, RBW≤1kHz, sample detector, and trace average≥50.	Carrier Offset 10 kHz: <-88 dBc/Hz, typical Carrier Offset 100 kHz：<-100 dBc/Hz, typical Carrier Offset 1 MHz：<-110 dBc/Hz, typical	Carrier Offset 10 kHz: <-80 dBc/Hz
Bandwidths		
Set “Auto SWT” to “Accy”		
Resolution Bandwidth (-3dB)	10 Hz to 1 MHz, in 1-3-10 sequence	100 Hz to 1 MHz, in 1-3-10 sequence
Bandwidth (-6dB)	200Hz, 9kHz, 120kHz, 1 MHz	200Hz, 9kHz, 120kHz, 1 MHz
RBW Uncertainty	<5%, nominal	
Resolution Filter Shape Factor (60 dB : 3 dB)	<5, nominal	
Video Bandwidth (-3dB)	1 Hz to 3 MHz, in 1-3-10 sequence	
Amplitude		
Measurement Range		
Range	10 MHz to 3 GHz: DANL to +30 dBm 1 MHz to 10 MHz: DANL to +21 dBm 9 kHz to 1 MHz: DANL to +17 dBm	
Maximum rated input level Note: When input level >33 dBm, the protection switch will be on.		
DC Voltage	50 V	
CW RF Power	30 dBm (1 W) (RF attenuation≥20 dB)	
Max. Damage Level	40 dBm (10 W)	
1dB Gain Compression		
fc ≥ 50MHz, preamplifier off		

Total Power at Input Mixer	>0 dBm Note: Mixer power level (dBm) = input power (dBm) – input attenuation (dB).	
Displayed Average Noise Level (DANL)		
	0 dB RF Attenuation, RBW=10 Hz, VBW=1Hz, RMS Average Detector, Trace Average ≥ 50, Input Impedance=50 Ω, Tracking Generator Off.	0 dB RF Attenuation, RBW=100 Hz, VBW=1Hz, RMS Average Detector, Trace Average ≥ 50, Input Impedance=50 Ω, Tracking Generator Off.
DANL (Preamplifier Off)	100 kHz to 10 MHz: <-85 dBm-3 x (f/1 MHz) dB, typical -125 dBm 10 MHz to 2.5 GHz: <-127 dBm+3 x (f/1GHz) dB, typical -130 dBm 2.5 GHz to 3 GHz:<-115 dBm	100 kHz to 10 MHz: <-75 dBm-3 x (f/1 MHz) dB, typical -115 dBm 10 MHz to 2.5 GHz: <-117 dBm+3 x (f/1 GHz) dB, typical -120 dBm 2.5 GHz to 3 GHz:<-105 dBm
DANL (Preamplifier On)	100 kHz to 1 MHz:<-103 dBm 1 MHz to 10 MHz:<-103 dBm-3 x (f/1 MHz) dB, typical -143 dBm 10 MHz to 2.5 GHz:<-145 dBm+3 x (f/1 GHz) dB, typical -148 dBm 2.5 GHz to 3 GHz:<-133 dBm	100 kHz to 1 MHz:<-93 dBm 1 MHz to 10 MHz:<-93 dBm-3 x (f/1 MHz) dB, typical -133 dBm 10 MHz to 2.5 GHz:<-135 dBm+3 x (f/1 GHz) dB, typical -138 dBm 2.5 GHz to 3 GHz:<-123 dBm
Level Display Range		
Log Scale	1 dB to 200 dB	
Linear Scale	0 to Reference Level	
Number of Display Points	Normal: 601; Full Screen: 751	
Number of Traces	3 + Math Trace	
Trace Detectors	Normal, Positive-peak, Negative-peak, Sample, RMS, Voltage Average, Quasi-Peak	
Trace Functions	Clear Write, Max Hold, Min Hold, Average, Freeze, Blank	
Scale Units	dBm, dBmV, dBμV, V, W	
Frequency Response		
10 dB RF Attenuation, Relative to 50 MHz, 20℃ to 30℃		
Frequency Response	Preamplifier Off , 100 kHz to 3 GHz: <0.7 dB Preamplifier On , 1 MHz to 3 GHz: <1.0 dB	Preamplifier Off , 100 kHz to 3 GHz: <1.0 dB Preamplifier On , 1 MHz to 3 GHz: <1.4 dB
Input Attenuation Switching Uncertainty		
Setting Range	0 to 50 dB, in 1 dB step	
Switching Uncertainty (fc=50 MHz, relative to 10 dB, 20 ºC to 30 ºC)	< (0.3 + 0.01 x attenuator setting) dB	<0.8 dB
Absolute Amplitude Uncertainty		
Uncertainty (fc=50 MHz, peak detector, preamplifier off, 10 dB RF attenuation, input signal=-10 dBm, 20 ºC to 30 ºC)	±0.4 dB	
RBW Switching Uncertainty		
	10 Hz to 1 MHz, relative to 1 kHz RBW	100 Hz to 1 MHz, relative to 1 kHz RBW
Uncertainty	<0.1 dB	
Reference Level		
Range	-100 dBm to +30 dBm, in 1 dB step	
Resolution	Log Scale: 0.01 dB; Linear Scale: 5 digits	
Level Measurement Uncertainty		
95% confidence level, S/N>20 dB, RBW=VBW=1 kHz, preamplifier off, 10 dB RF attenuation, -50 dBm<reference level<0,10 MHz<fc<3 GHz, 20 ºC to 30 ºC		
Level Measurement Uncertainty	<1.0 dB, nominal	<1.5 dB, nominal
RF Input VSWR		
10 dB RF Attenuation		
VSWR	100 kHz to 10 MHz: <1.8, nominal 10 MHz to 2.5 GHz: <1.5, nominal 2.5 GHz to 3 GHz: <1.8, nominal	

Intermodulation		
Second Harmonic Intercept (SHI)	+35 dBm	
Third-order Intermodulation (TOI)	fc >30 MHz: +7 dBm	
Spurious Responses		
Image Frequency	<-60 dBc	
Intermediate Frequency	<-60 dBc	
Spurious Response	<-88 dBm, typical	<-85 dBm, typical
System-related Sideband (Referenced to local oscillators, referenced to A/D conversion, referenced to subharmonic of first LO, referenced to harmonic of first LO)	<-60 dBc	
Input Related Spurious (Mixer level: -30 dBm)	<-60 dBc, typical	
Sweep		
Sweep		
Sweep Time Range	100 Hz ≤ Span ≤ 3 GHz: 10 ms to 3000 s Span=0 Hz: 20 μs to 3000 s	
Sweep Time Uncertainty	Non-zero Span (100 Hz ≤ Span ≤ 3 GHz): 5%, nominal Zero Span (1 ms to 3000 s): 5%, nominal	
Sweep Mode	Continuous, single	
Trigger Functions		
Trigger		
Trigger Source	Free Run, Video, External	
External Trigger Level	5 V TTL level, nominal	
Tracking (for DSA1030A-TG and DSA1030-TG)		
TG Output		
Frequency Range	10 MHz to 3 GHz , 9 kHz settable	
Output Level	-20 dBm to 0 dBm, in 1 dB steps	
Output Flatness (10 MHz to 3 GHz, referenced to 50 MHz)	±3 dB	
Inputs/Outputs		
RF Input		
Impedance	50 Ω, nominal	
Connector	N female	
TG Out		
Impedance	50 Ω, nominal	
Connector	N female	
Probe Power		
Voltage/Current	+15 V, <10% at 150 mA -12.6 V, <10% at 150 mA	
10 MHz REF In / 10 MHz REF Out / External Trigger In		
Connector	BNC female	
10 MHz REF Amplitude	0 dBm to 10 dBm	
Trigger Voltage	5 V TTL level, nominal	
Remote Control		
USB		
USB Host		
Connector	A Plug	
Protocol	Version 2.0	
USB Device		
Connector	B Plug	
Protocol	Version 2.0	
LAN		
LXI Core 2011 Device	10/100 Base, RJ-45	
GPIB		
IEC/IEEE Bus (GPIB)	With the USB-GPIB option IEEE 488.2	

VGA	
Connector	VGA compatible, 15-pin mini D-SUB
Resolution	800 * 600 @ 60Hz
General Specifications	
Display	
Type	TFT LCD
Resolution	800 * 480
Size	8.5”
Colors	65536
Printer Supported	
Protocol	PictBridge
Mass Memory	
Mass Memory	Flash Disk (internal), USB Disk (not supplied)
Data Storage Space	1G Bytes
Power Supply	
Input Voltage Range, AC	100 V to 240 V, nominal
AC Supply Frequency	45 Hz to 440 Hz
Power Consumption	Typical 35 W, Max 60 W with all options.
Operation Time at DC Power Supply	About 3 hours, nominal
Temperature	
Operating temperature range	5 ℃ to 40 ℃
Storage temperature range	–20 ℃ to 70 ℃
Dimensions	
Dimensions (W x H x D)	399 mm x 223 mm x 159 mm (15.7 inches x 8.78 inches x 6.26 inches), approximate
Weight	
Weight	Without battery pack: 6.2 kg (13.7 lbs), approximate; With battery pack: 7.4 kg (16.3 lbs) , approximate

➤ Ordering Information

	Description	Order Number
Model	Spectrum Analyzer, 9 kHz to 3 GHz, with preamplifier	DSA1030A
	Spectrum Analyzer, 9 kHz to 3 GHz, with preamplifier, with track generator	DSA1030A-TG
	Spectrum Analyzer, 9 kHz to 3 GHz	DSA1030
	Spectrum Analyzer, 9 kHz to 3 GHz, with track generator	DSA1030-TG
Standard Accessories	Front Panel Cover	FPCS-DSA1000
	Quick Guide (Hard Copy)	-
	CDROM (User Guide, Programming Guide)	-
	USB Data Cable	-
	Power Cable Conforming to the Standard of the Country	-
Options	Preamplifier (for DSA1030 and DSA1030-TG)	PA-DSA1030
	Advanced Measurement Kit (for DSA1030 and DSA1030-TG)	AMK-DSA1000
	DSA PC Software	Ultra Spectrum
Optional Accessories	Include: N-SMA Cable, BNC-BNC Cable, N-BNC Adaptor, N-SMA Adaptor, 75 Ω – 50 Ω Adaptor, 900 MHz/1.8 GHz Antennas, 2.4 GHz Antennas	DSA Utility Kit
	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), 50Ω SMA Load (1pcs), 50Ω Impedance Adaptor (1pcs)	RF Adaptor Kit
	Include: 50Ω to 75Ω Adaptor (2pcs)	RF CATV Kit
	Include: 6dB Attenuator (1pcs), 10dB Attenuator (2pcs)	RF Attenuator Kit
	30dB High Power Attenuator, Max Power 100W	ATT03301H
	N(M)-N(M) RF Cable	CB-NM-NM-75-L-12G
	N(M)-SMA(M) RF Cable	CB-NM-SMAM-75-L-12G
	RF Demo Kit (Transmitter)	TX1000
	RF Demo Kit (Receiver)	RX1000
	VSWR Bridge (1 MHz to 2 GHz)	VB1020
	VSWR Bridge (800 MHz to 4 GHz)	VB1040
	Rack Mount Kit	RM-DSA1000
	Soft Carrying Bag	BAG-DSA1000
	USB to GPIB Interface Converter for Instrument	USB-GPIB
	11.1 V, 147 Wh Li-ion Battery Pack	BAT(China Only)
	Desk Mount Instrument Arm	ARM

Warranty

Three –year warranty, excluding accessories.

HEADQUARTER

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Fax:+86-10-80705070
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November 2015