



Datenblatt



Vertriebs-Hotline: +49 (0) 89 894 222 74

E-Mail: sales@alldaq.com

Wir beraten Sie gerne!





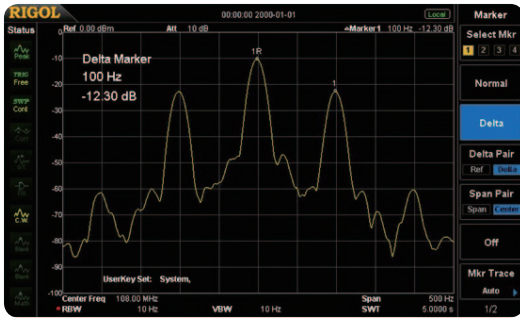
DSA800 Series Spectrum Analyzer

- All-Digital IF Technology
- Frequency Range from 9 kHz up to 7.5 GHz
- Min. -161dBm Displayed Average Noise Level (Typ.)
- Min. < -98dBc/Hz @ 10kHz Offset Phase Noise
- Level Measurement Uncertainty < 0.8dB
- 10Hz Minimum Resolution Bandwidth (DSA832/875)
- Up to 7.5GHz Tracking Generator (DSA8XX-TG)
- Optional Preamplifier(DSA832/875)
- Advanced Measurement Functions (Opt.)
- EMI Filter & Quasi-Peak Detector Kit(Opt.)
- VSWR Measurement Kit(Opt.)
- PC Software(Opt.)
- Optional RF TX/RX Training Kit
- Optional RF Accessories(Cable, Adaptor,Attenuator,Bridge ...)
- Complete Connectivity: LAN(LXI),USB Host & Device, GPIB (Opt.)
- 8 Inch WVGA (800x480) Display
- Compact Size, Light Weight Design

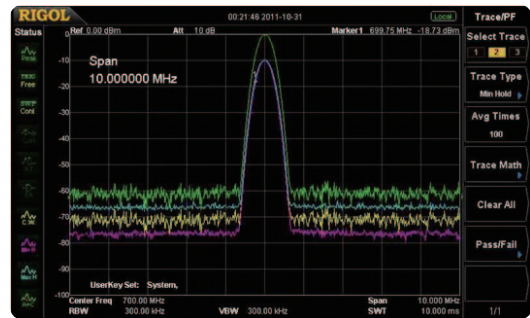


► Features and Benefits

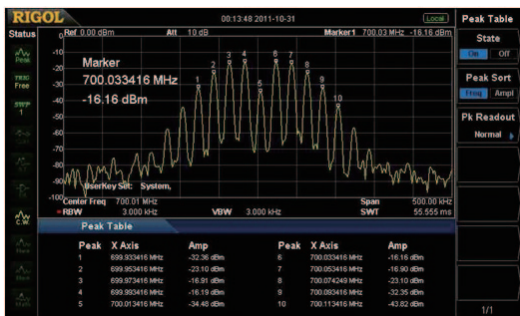
Distinguish the two nearby signals clearly with the 10Hz RBW (DSA832/875)



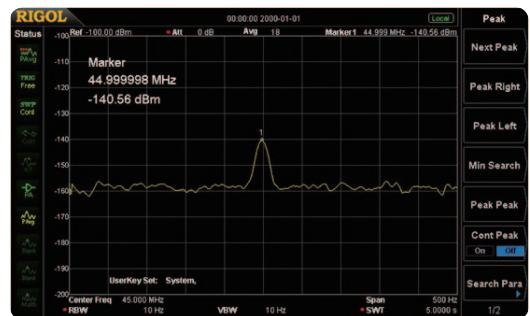
Compare the spectrums with different color trace



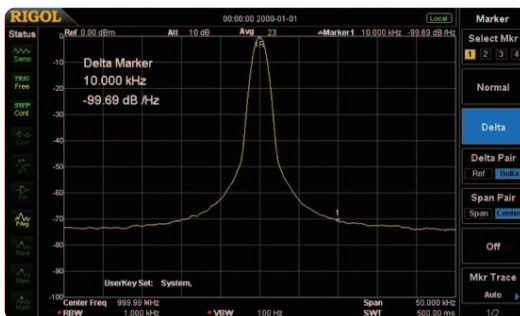
Readout the spectrum peak values with the peak table function



Measure lower level signal with the preamplifier turn on



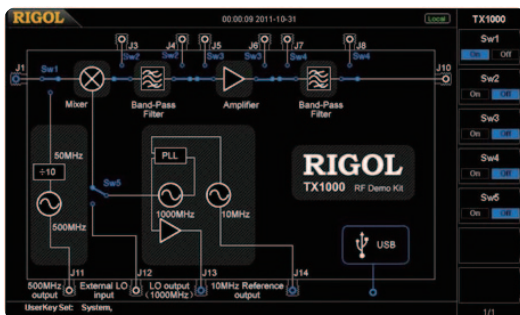
Phase noise <-98dBc/Hz @10 kHz offset (DSA832/875)



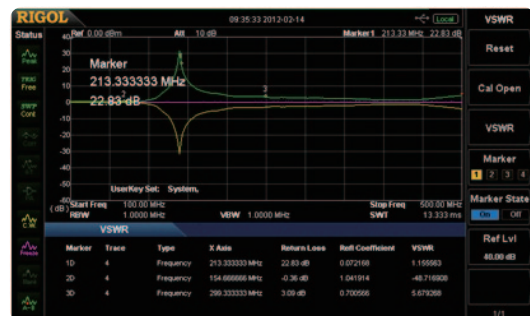
EMI kit(EMI filter & Quasi-peak & Pass/Fail)



The GUI to control the RF demo kit (Transmitter) directly



VSWR measurement



► RIGOL Spectrum Analyzer Option and Accessory

Harmonic Distortion	TOI	Emission Bandwidth
Channel Power	Occupied Bandwidth	
Time Domain Power	Carrier to Noise Ratio	
Adjacent Channel Power	Pass/Fail	

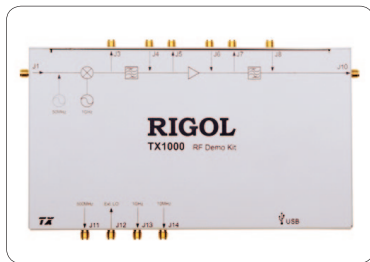
Advanced Measurement Kit
(AMK-DSA800)



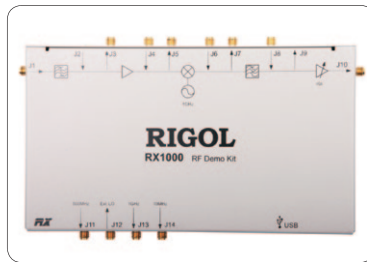
Rack Mount Kit
(RM-DSA800)



VSWR Bridge
(VB1020/VB1040/VB1080)



RF Demo Kit
(TX1000)



RF Demo Kit
(RX1000)



RF CATV Kit



DSA Utility Kit



RF Adaptor Kit



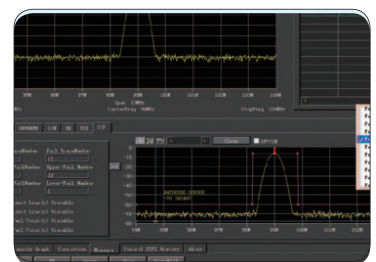
RF Attenuator Kit



RF Cable Kit



High Power Attenuator



DSA PC Software
(Ultra Spectrum)



Soft Carrying Bag
(BAG-G1)



USB to GPIB Converter
(USB-GPIB)

► Specifications

Specifications are valid under the following conditions: the instrument is within the calibration period, is stored for at least two hours at 0 °C to 50 °C temperature, and is warmed up for 40 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°C). 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°C).

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°C).

NOTE: All charts 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.

Frequency

Frequency	DSA815	DSA832	DSA875
Frequency range	9 kHz to 1.5 GHz	9 kHz to 3.2 GHz	9 kHz to 7.5 GHz
Frequency resolution	1 Hz		

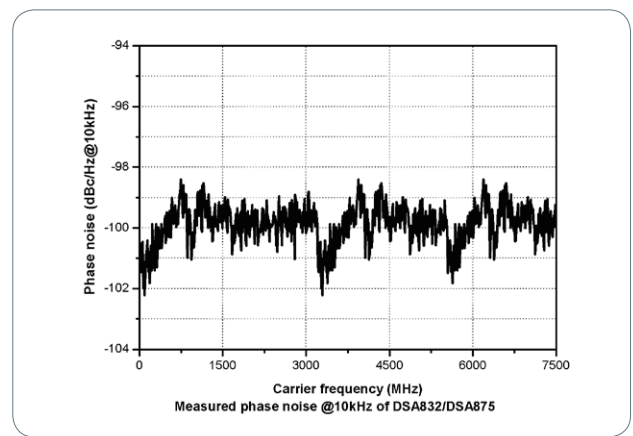
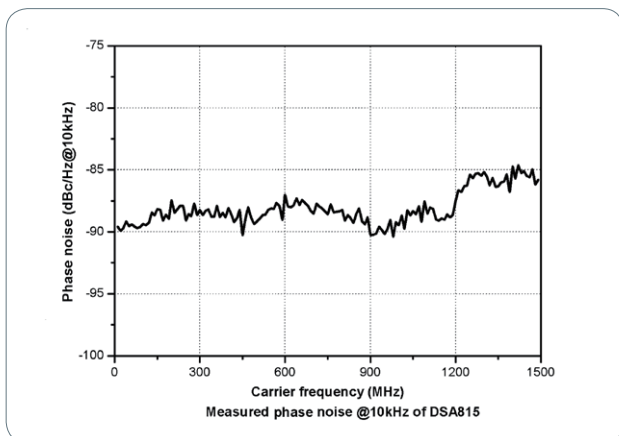
Internal Reference Frequency	DSA815	DSA832	DSA875
Reference frequency	10MHz		
Accuracy	±[(time since last adjustment × aging rate)+temperature stability + calibration accuracy]		
Initial calibration accuracy	<1ppm		
Temperature stability	0°C to 50°C , reference to 25°C		
	< 2ppm	< 0.5ppm	
Aging rate	< 2ppm/year	< 1ppm/year	

Frequency Readout Accuracy	
Marker resolution	span/ (number of sweep points - 1)
Marker uncertainty	±(frequency indication × frequency reference uncertainty + 1% × span + 10% × resolution bandwidth + marker resolution)

Frequency Counter	
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz, 10kHz, 100kHz
Uncertainty	±(frequency indication × reference frequency accuracy + counter resolution)

Frequency Span	
Range	0Hz, 100Hz to maximum frequency of instrument
Uncertainty	±span/ (number of sweep points - 1)

SSB Phase Noise	20°C to 30°C , f _c =1 GHz		
Carrier offset	DSA815	DSA832	DSA875
10 kHz	<-80 dBc/Hz	<-98 dBc/Hz	
100 kHz	<-100 dBc/Hz (typ.)	<-100 dBc/Hz (typ.)	



Residual FM			
	20°C to 30°C , RBW = VBW = 1 kHz		
	DSA815	DSA832	DSA875
Residual FM	< 50 Hz (nom.)	< 20Hz (nom.)	

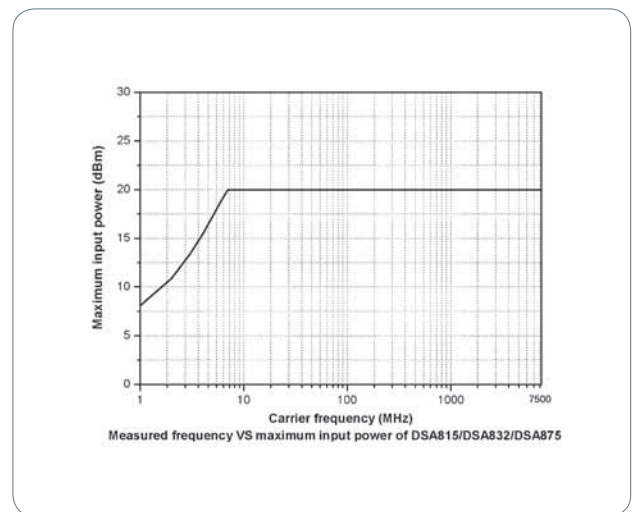
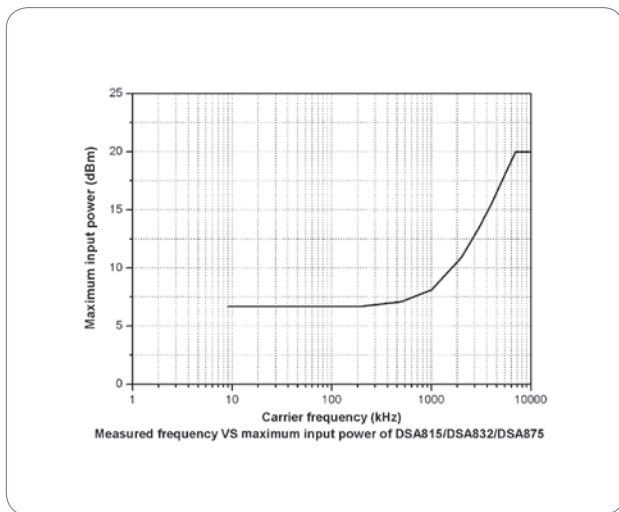
Bandwidths			
	DSA815	DSA832	DSA875
Resolution bandwidth (-3dB)	100 Hz to 1 MHz, in 1-3-10 sequence		10 Hz to 1 MHz, in 1-3-10 sequence
RBW uncertainty	<5% (nom.)		
Resolution filter shape factor (60dB: 3dB)	<5 (nom.)		
Video bandwidth (-3dB)	1 Hz to 3 MHz, in 1-3-10 sequence		
Resolution bandwidth (-6dB) (EMI-DSA800 option)	200 Hz, 9 kHz, 120 kHz		

Amplitude

Measurement Range	
Range	$f_c \geq 10\text{MHz}$ DANL to +20 dBm

Maximum Input Level	
DC voltage	50 V
CW RF power	attenuation = 30 dB +20 dBm (100 mW)
Max. damage level ^[1]	+30 dBm (1 W)

NOTE: [1] When $f_c \geq 10\text{ MHz}$, input level > +25 dBm and PA is Off, the protection switch will be on.



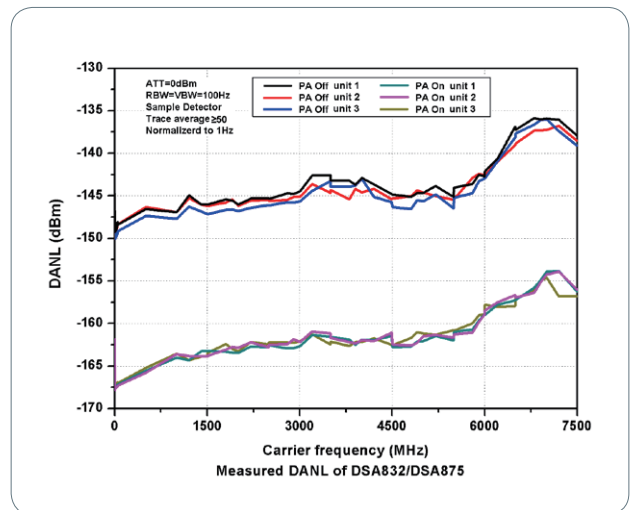
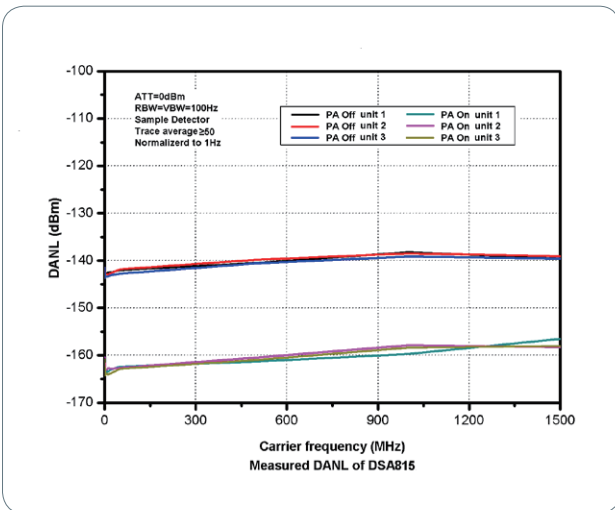
Displayed Average Noise Level (DANL)		
	DSA815	
Frequency	attenuation = 0 dB, RBW = VBW = 100 Hz, sample detector, trace average ≥ 50 , tracking generator off, 20°C to 30°C , input impedance = 50 Ω	
PA off	100 kHz to 1 MHz	<-90 dBm, <-110 dBm (typ.)
	1MHz to 1.5 GHz	<-110 dBm+6*(f/1GHz)dB, <-115 dBm (typ.)
PA on	100 kHz to 1 MHz	<-110 dBm, <-130 dBm (typ.)
	1MHz to 1.5 GHz	<-130 dBm+6*(f/1GHz)dB, <-135 dBm (typ.)

Displayed Average Noise Level (DANL)

		DSA832	DSA875
Frequency		attenuation = 0 dB, RBW = VBW = 10 Hz, sample detector, trace average ≥ 50, tracking generator off, 20°C to 30°C , input impedance = 50 Ω	
PA off	9 kHz to 100 kHz	<-110 dBm (typ.)	<-110 dBm (typ.)
	100 kHz to 5 MHz	<-125 dBm, <-128 dBm (typ.)	<-125 dBm, <-128 dBm (typ.)
	5 MHz to 3.2 GHz	<-130 dBm, <-134 dBm (typ.)	<-130 dBm, <-134 dBm (typ.)
	3.2 GHz to 6 GHz		<-126 dBm, <-130 dBm (typ.)
	6 GHz to 7.5 GHz		<-121 dBm, <-125 dBm (typ.)
PA on	100 kHz to 5 MHz	<-142 dBm, <-145 dBm (typ.)	<-142 dBm, <-145 dBm (typ.)
	5 MHz to 3.2 GHz	<-147 dBm, <-151 dBm (typ.)	<-147 dBm, <-151 dBm (typ.)
	3.2 GHz to 6 GHz		<-143 dBm, <-147 dBm (typ.)
	6 GHz to 7.5 GHz		<-138 dBm, <-142 dBm (typ.)

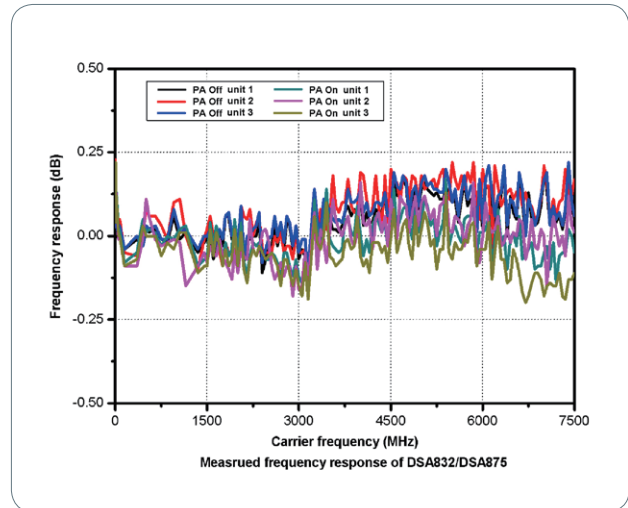
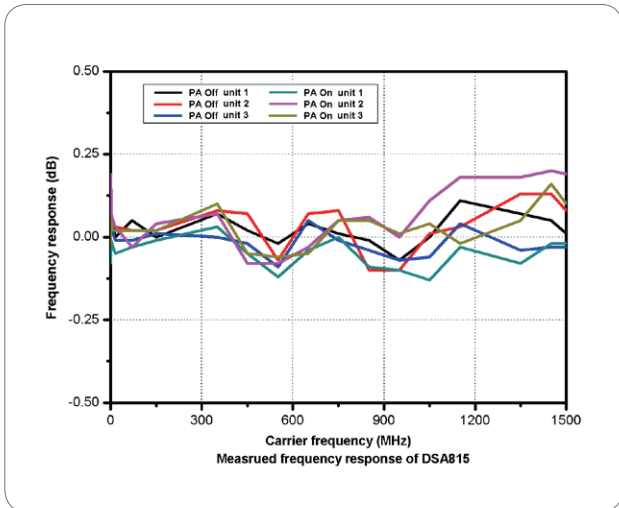
Displayed Average Noise Level (DANL) (Normalized to 1Hz)

		DSA815	DSA832	DSA875
Frequency		attenuation = 0 dB, RBW = VBW = 100 Hz, sample detector, trace average ≥ 50, tracking generator off, normalized to 1Hz, 20°C to 30°C , input impedance = 50 Ω		
PA off	9 kHz to 100 kHz		<-120 dBm (typ.)	<-120 dBm (typ.)
	100 kHz to 1 MHz	<-110 dBm, <-130 dBm (typ.)	<-135 dBm, <-138 dBm (typ.)	<-135 dBm, <-138 dBm (typ.)
	1MHz to 5MHz	<-130 dBm+6×(f/1GHz) dB, <-135 dBm (typ.)		
	5 MHz to 1.5 GHz		<-140 dBm, <-144 dBm (typ.)	<-140 dBm, <-144 dBm (typ.)
	1.5 GHz to 3.2 GHz			
	3.2 GHz to 6 GHz			<-136 dBm, <-140 dBm (typ.)
PA on	6 GHz to 7.5 GHz			<-131 dBm, <-135 dBm (typ.)
	100 kHz to 1 MHz	<-130 dBm, <-150 dBm (typ.)	<-152 dBm, <-155 dBm (typ.)	<-152 dBm, <-155 dBm (typ.)
	1MHz to 5MHz	<-150dBm + 6×(f/1GHz)dB, <-155 dBm (typ.)		
	5 MHz to 1.5 GHz		<-157 dBm, <-161 dBm (typ.)	<-157 dBm, <-161 dBm (typ.)
	1.5 GHz to 3.2 GHz			
	3.2 GHz to 6 GHz			<-153 dBm, <-157 dBm (typ.)
6 GHz to 7.5 GHz			<-148 dBm, <-152 dBm (typ.)	

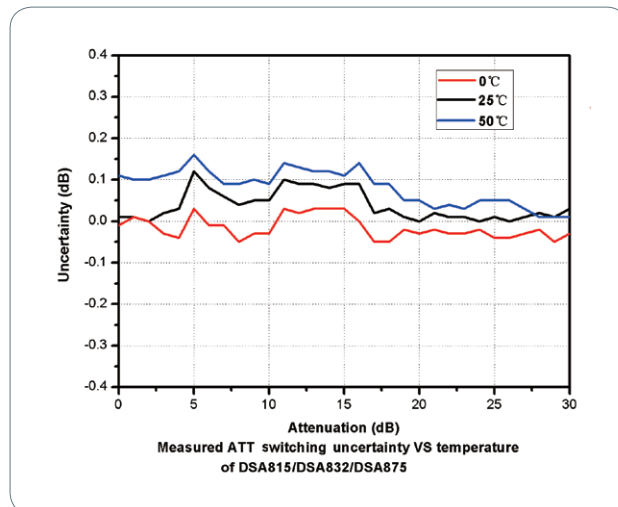


Level Display	
Logarithmic level axis	1 dB to 200 dB
Linear level axis	0 to Reference Level
Number of display points	601
Number of traces	3 + Math Trace
Trace detectors	normal, positive-peak, negative-peak, sample, RMS, voltage average quasi-peak (with EMI-DSA800 option)
Trace functions	clear write, max hold, min hold, average, view, blank
Units of level axis	dBm, dBmV, dBμV, nV, μV, mV, V, nW, μW, mW, W

Frequency Response		DSA815	DSA832	DSA875
Frequency response		$f_c \geq 100\text{kHz}$, attenuation = 10 dB, relative to 50 MHz, 20°C to 30 °C		
PA off	100kHz to 1.5GHz	<0.7 dB	<0.5 dB, <0.3 dB(typ.)	
	1.5GHz to 3.2GHz		<0.7 dB, <0.3 dB(typ.)	
	3.2GHz to 7.5GHz		<0.7 dB, <0.3 dB(typ.)	
		$f_c \geq 1\text{MHz}$, attenuation = 10 dB, relative to 50 MHz, 20°C to 30 °C		
PA on	100kHz to 1.5GHz	<1.0 dB	<0.7 dB, <0.3 dB(typ.)	
	1.5GHz to 3.2GHz		<0.7 dB, <0.3 dB(typ.)	
	3.2GHz to 7.5GHz		<0.9 dB, <0.3 dB(typ.)	



Input Attenuation Switching Uncertainty		DSA815	DSA832	DSA875
Setting range		0 to 30 dB, in 1 dB step		
Switching uncertainty		$f_c = 50\text{ MHz}$, relative to 10 dB, 20 °C to 30 °C		
		< 0.5 dB	< 0.3 dB	



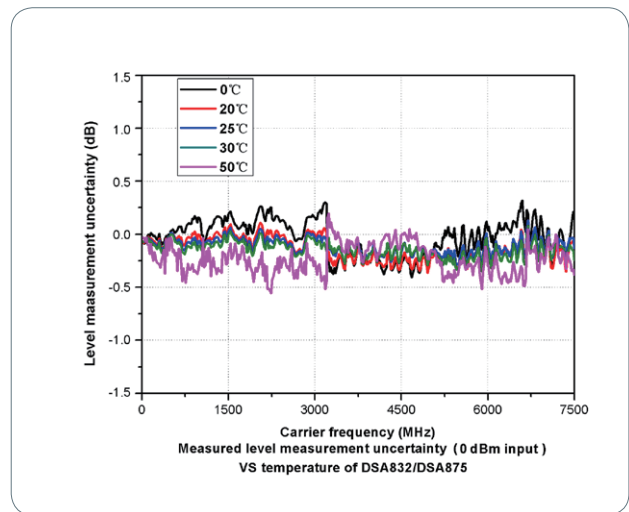
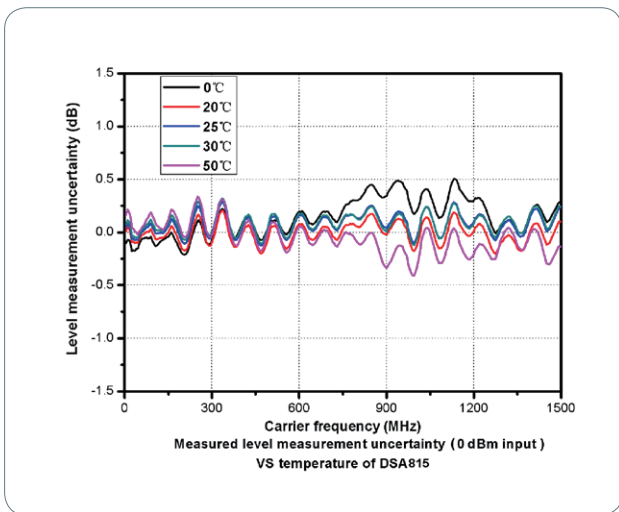
Absolute Amplitude Uncertainty			
	DSA815	DSA832	DSA875
Uncertainty	f _c = 50 MHz, peak detector, preamplifier off, attenuation = 10 dB, input signal level = -10 dBm, 20 °C to 30 °C		
	<0.4dB	<0.3 dB	

RBW Switching Uncertainty	
Uncertainty	relative to 1 kHz RBW <0.1 dB

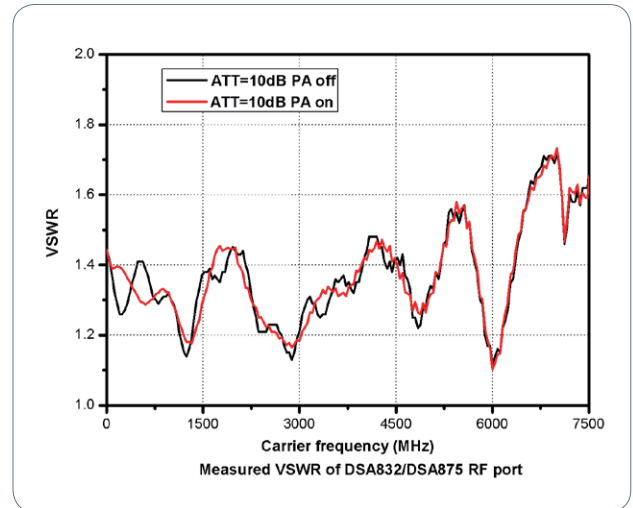
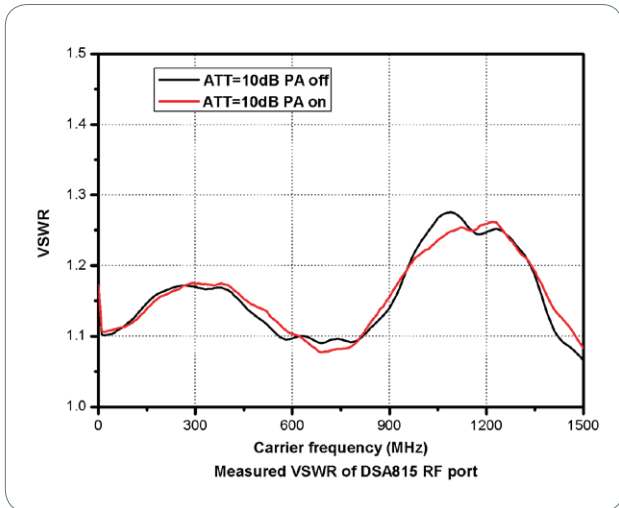
Reference Level		
Range	-100 dBm to +20 dBm, in 1 dB step	
Resolution	log Scale	0.01 dB
	linear Scale	4 digits

Preamplifier				
		DSA815 (standard)	PA-DSA832 (option)	PA-DSA875 (option)
Gain	100kHz to 1.5 GHz	20 dB(nom.)	17 dB(nom.)	17 dB(nom.)
	1.5GHz to 3.2 GHz			
	3.2GHz to 7.5 GHz			

Level Measurement Uncertainty			
	DSA815	DSA832	DSA875
	95% confidence level, S/N > 20 dB, RBW = VBW = 1 kHz, preamplifier off, attenuation = 10 dB, -50 dBm < input level ≤ 0 dBm, f _c > 10 MHz, 20 °C to 30 °C		
Level measurement uncertainty	<1.5 dB(nom.)	<0.8 dB (nom.)	



RF Input VSWR		DSA815	DSA832	DSA875
		attenuation ≥ 10 dB		
VSWR	300kHz to 1.5GHz	<1.5(nom.)	<1.5(nom.)	<1.5(nom.)
	1.5GHz to 3.2GHz			
	3.2GHz to 7.5GHz			<1.8(nom.)

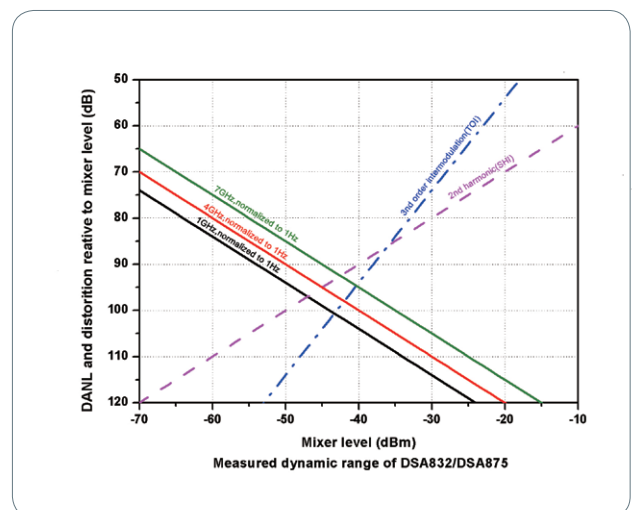
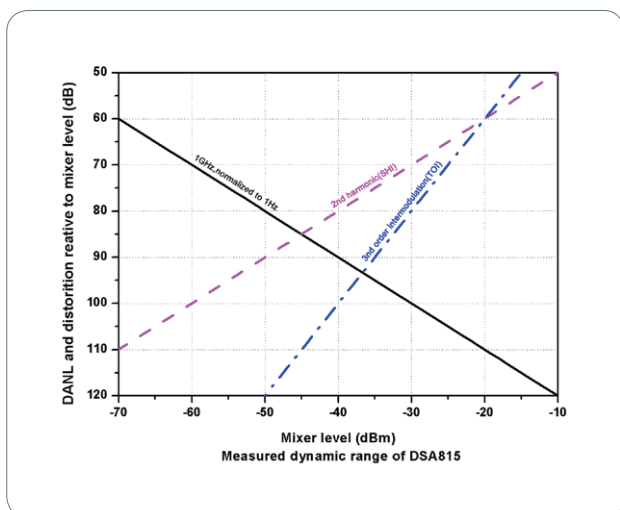


Distortion

Second Harmonic Intercept		DSA815	DSA832	DSA875
Second harmonic Intercept (SHI)		$f_c \geq 50$ MHz, input signal level = -20 dBm, attenuation = 10 dB		
		+40dBm	+45dBm	

Third-order Intercept		DSA815	DSA832	DSA875
Third-order intercept (TOI)		$f_c \geq 50$ MHz, two -20dBm tones at input mixer spaced by 200kHz, attenuation = 10 dB		
		+10dBm	+11 dBm, +15 dBm (typ.)	

1dB Gain Compression		DSA815	DSA832	DSA875
1dB compression of input mixer (P_{1dB})		$f_c \geq 50$ MHz, attenuation = 0 dB		
		>0dBm		



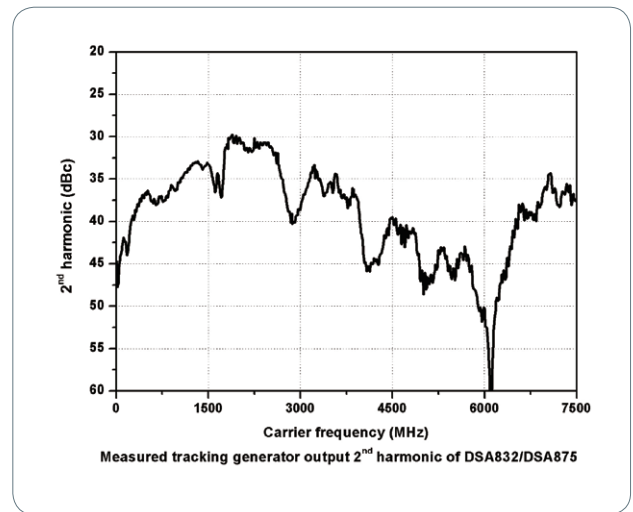
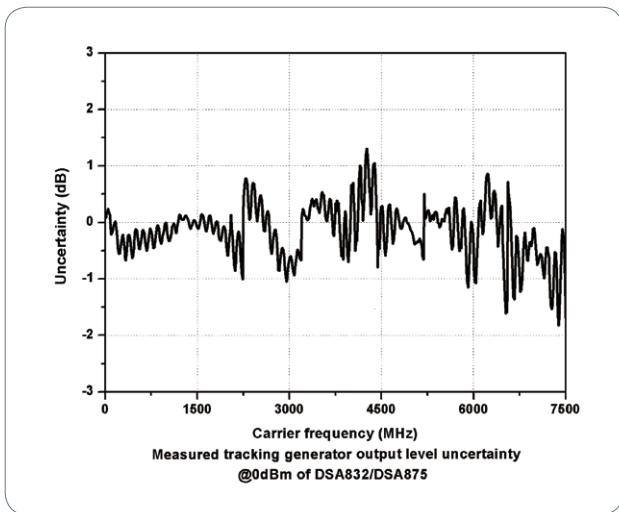
Spurious Responses			
Spurious response	DSA815	DSA832	DSA875
	input terminated 50 Ω , attenuation = 0 dB, 20°C to 30°C		
	< -88dBm (typ.)	< -90dBm, < -100dBm (typ.)	
Intermediate frequency	< -60 dBc		
System related sidebands	referenced to local oscillators, referenced to A/D conversion, referenced to subharmonic of first LO, referenced to harmonic of first LO		
	< -60 dBc		
Input Related Spurious	mixer level = -30 dBm		
	<-60 dBc		

Sweep

Sweep			
Sweep time	Span \geq 100 Hz	10ms to 1500s	1ms to 1500s
	zero span	20 μ s to 1500 s	20 μ s to 3200 s
Sweep time uncertainty	Span \geq 100 Hz	5%(nom.)	20 μ s to 7500 s
	zero span (sweep time setting value > 1 ms)	5%(nom.)	
Sweep mode	continuous, single		

Tracking Generator (Option)

TG Output			
	DSA815	DSA832	DSA875
Frequency range	100 kHz to 1.5 GHz	100 kHz to 3.2 GHz	100 kHz to 7.5 GHz
Output level range	-20 dBm to 0 dBm	-40 dBm to 0 dBm	
Output level resolution	1 dB		
Output flatness	relative to 50 MHz		
	\pm 3 dB (nom.)		



Trigger Functions

Trigger		
Trigger source		Free run, video, external
External trigger level		5 V TTL level

Input /Output

Front Panel Connectors		
RF input	impedance	50 Ω (nom.)
	connector	N female
Tracking generator output	impedance	50 Ω (nom.)
	connector	N female

Internal/ External Reference		
Internal reference	frequency	10 MHz
	output level	+3 dBm to +10 dBm, +8 dBm (typ.)
	impedance	50 Ω (nom.)
	connector	BNC female
External reference	frequency	10 MHz \pm 5 ppm
	input level	0 dBm to +10 dBm
	impedance	50 Ω (nom.)
	connector	BNC female

External Trigger Input		
External trigger input	impedance	1 k Ω (nom.)
	connector	BNC female

Communication Interface		
USB host	connector	A plug
	protocol	Version2.0
USB device	connector	B plug
	protocol	Version2.0
LAN	LXI core 2011 device	10/100Base, RJ-45
IEC/IEEE(GPIB) bus(USB-GPIB option)		IEEE488.2

General Specifications

Display			
Type	TFT LCD		
Resolution	800 x 480 pixels		
Size	8 inch		
Colors	64 k		
Printer Supported			
Protocol	PictBridge		
Mass Memory			
Mass Memory	Flash Disk (internal), USB Disk (not supplied)		
Power Supply			
Input Voltage Range, AC	100 V to 240 V (nom.)		
AC Supply Frequency	45 Hz to 440 Hz		
Power Consumption	35 W (typ.), max. 50 W with all options		
Environmental			
Temperature	Operating temperature range	0°C to 50°C	
	Storage temperature range	-20°C to 70°C	
Humidity	0°C to 30°C	≤95% rel. humidity	
	30°C to 40°C	≤75% rel. humidity	
Altitude	operating height	up to 3,000m	
Electromagnetic Compatibility and Safety			
EMC	In line with EN61326-1:2006		
	IEC 61000-4-2:2001	±4.0kV (contact discharge), ±4.0kV (air discharge)	
	IEC 61000-4-3:2002	3V/m (80MHz to 1GHz) 3V/m (1.4GHz to 2GHz) 1V/m (2.0GHz to 2.7GHz)	
	IEC 61000-4-4:2004	1kV power lines	
	IEC 61000-4-5:2001	0.5kV (Phase to Neutral) 0.5kV (Phase to PE) 1kV (Neutral to PE)	
	IEC 61000-4-6:2003	3V,0.15-80MHz	
	IEC 61000-4-11:2004	Voltage dip: 0% UT during half cycle 0% UT during 1 cycle 70% UT during 25 cycles Short interruption:0% UT during 250 cycles	
Electrical Safety	In line with UL 61010-1:2012, CAN/CSA-C22.2 No. 61010-1-12, EN 61010-1:2010		
Dimensions			
(W x H x D)	361.6 mm × 178.8 mm × 128 mm (14.2 in × 7.0 in × 5.0 in)		
Weight			
	DSA815	DSA832	DSA875
Standard		4.55 kg (10.0 lb)	
With tracking generator	4.25 kg (9.4 lb)	5.15 kg (11.4 lb)	

► Ordering Information

	Description	Order Number
Model	Spectrum Analyzer, 9 kHz to 1.5 GHz (with preamplifier)	DSA815
	Spectrum Analyzer, 9 kHz to 3.2 GHz	DSA832
	Spectrum Analyzer, 9 kHz to 7.5 GHz	DSA875
	Spectrum Analyzer, 9 kHz to 1.5 GHz (with preamplifier, with tracking generator, factory installed)	DSA815-TG
	Spectrum Analyzer, 9 kHz to 3.2 GHz (with tracking generator, factory installed)	DSA832-TG
	Spectrum Analyzer, 9 kHz to 7.5 GHz (with tracking generator, factory installed)	DSA875-TG
Standard accessories	quick guide (hard copy)	QGD07X00
	CDROM (user's guide, programming guide)	-
	power cable	-
Options	preamplifier, 100 kHz to 3.2 GHz (only for DSA832)	PA-DSA832
	preamplifier, 100 kHz to 7.5 GHz (only for DSA875)	PA-DSA875
	EMI filter & quasi-peak detector	EMI-DSA800
	advanced measurement kit	AMK-DSA800
	VSWR measurement kit	VSWR-DSA800
	DSA PC software	Ultra Spectrum
Optional accessories	include: N-SMA cable, BNC-BNC cable, N-BNC adaptor, N-SMA adaptor, 75 Ω to 50 Ω adaptor, 900 MHz/1.8 GHz antenna (2pcs), 2.4 GHz antenna (2pcs)	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), 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: 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 with VSWR-DSA800, 1 MHz to 2 GHz	VB1020
	VSWR bridge with VSWR-DSA800, 800 MHz to 4 GHz	VB1040
	VSWR bridge with VSWR-DSA800, 2 GHz to 8 GHz	VB1080
	rack mount kit	RM-DSA800
	soft carrying bag	BAG-G1
	USB to GPIB interface converter for instrument	USB-GPIB

Warranty

Three –year warranty, excluding probes and accessories.

RIGOL



Headquarter

RIGOL TECHNOLOGIES, INC.
No.156,Cai He Village,
Sha He Town,
Chang Ping District, Beijing,
102206 P.R.China
Tel:+86-10-80706688
Fax:+86-10-80705070
Email: support@rigol.com

USA

RIGOL TECHNOLOGIES
USA,INC.
7401 First Place,Suite N
Oakwood Village
OH 44146,USA
Tel: 440-232-4488x111
Fax: 440-232-4499
Toll free: 877-4-RIGOL-1x111
Email: info@rigol.com

Europe

RIGOL TECHNOLOGIES EU,
GmbH
Lindbergh str. 4
82178 Puchheim, Germany
Tel: +49(0)89-8941895-0
Email: info-europe@rigol.com

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Ultra Spectrum Software DSA1000 and DSA800 series

- Supports RIGOL DSA1000 series and DSA800 series
- Control parameter configuration of the Spectrum Analyzer
- Operation and processing of the data acquired from the Spectrum Analyzer
- Supports *.csv, *.jpg, *.png, *.bmp files
- Various marker setting functions
- Powerful trace display and operation functions
- Peak and valley detection
- Various advanced measurement functions
- View history spectrum data
- Amplitude correction data editing
- SCPI Command List and Command Log

RIGOL Ultra Spectrum is PC software for RIGOL DSA1000 series and DSA800 series, to control the parameter configuration of the Spectrum Analyzer. It can be used for operation and processing of the data acquired from the Spectrum Analyzer.



Product Overview

Ultra Spectrum is a software tool, that supports RIGOL DSA1000 and DSA800 series Spectrum Analyzer

This software tool is compatible with Windows XP, Windows Vista and Windows 7 operating systems.

There are 2 working modes, the Basic Mode and the Advanced Mode

Ultra Spectrum supports *.csv, *.jpg, *.png, *.bmp files.

Main Features

Basic Mode

In the Basic Mode it is possible to control the Spectrum Analyzer remotely.

In addition various marker setting functions are available, like creating up to 20 markers and displaying the values of the markers in the marker table.

The following trace display functions stand by:

- Line (no bar)
- Vertical Bar
- Horizontal Bar



Advanced Mode

In this mode, the Peak and Valley Detect function is available, so the software will search for peaks and valleys automatically.

The History Spectrum Data can be shown, and a 3D waterfall graph or intensity graph can be created.

Various advanced measurement functions stand by:

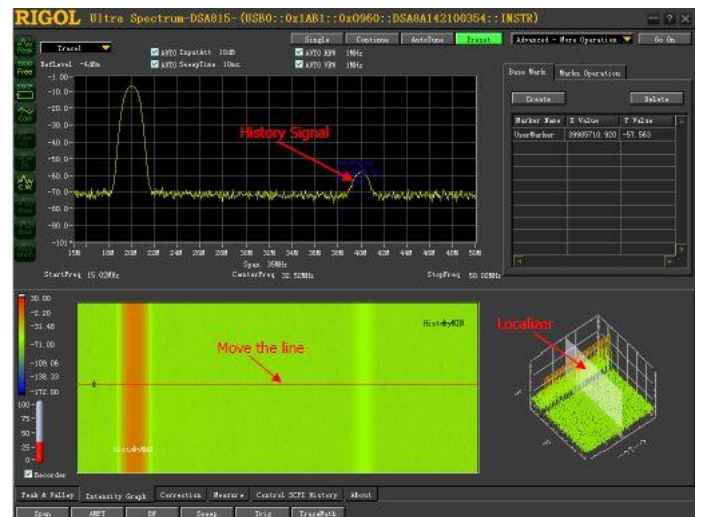
- Time Power
- Channel Power
- Adjacent Channel
- Occupied and Emission BW
- C/N Ration
- Harmonic Distortion
- 3rd Order Intermodulation Distortion
- Pass/Fail Test

The 'Trace Setting' dialog box is shown. It contains a table with columns for 'Trace Name', 'Color', and 'Operand'. The table lists various trace types and their settings.

Trace Name	Color	Operand
<input checked="" type="checkbox"/> Peak	Color	Original
<input checked="" type="checkbox"/> Original	Color	Original
<input checked="" type="checkbox"/> Valley	Color	Original
<input type="checkbox"/> MaxHold	Color	Original
<input type="checkbox"/> MinHold	Color	Original
<input type="checkbox"/> Freeze	Color	Original
<input type="checkbox"/> VideoAvg	Color	Original
<input checked="" type="checkbox"/> PowerAvg	Color	Original
<input type="checkbox"/> UTrace1	Color	Original
<input type="checkbox"/> UTrace2	Color	Original

There are also seven basic and twelve user defined trace operation functions:

- Peak
- Valley
- Max Hold
- Min Hold
- Freeze
- Video Average
- Power Average



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Fax:+86-10-80705070
Email: info@rigol.com

www.rigol.com

USA

RIGOL TECHNOLOGIES
USA,INC.
7401 First Place,Suite N
Oakwood Village
OH 44146,USA
Tel/Fax: 440-232-4488
Toll free: 877-4-RIGOL-1
Email: info@rigol.com

Europe

RIGOL TECHNOLOGIES EU,
GmbH
Lindberghstr. 4
82178 Puchheim, Germany
Tel: +49(0)89-8941895-0
Email: info-europe@rigol.com