RIGOL

User's Guide

DSA800 Options and Accessories

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RIGOL Technologies, Inc.

Guaranty and Declaration

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DSA800 Options and Accessories

Options and accessories provided by DSA800 series spectrum analyzer are as shown in the table below. If needed, please contact **RIGOL** or the local distributors. This manual only introduces the functions of the main options. For the option with remark in the table below, refer to the dedicated manual.

	Description	**Order No.**
Model	Spectrum Analyzer, 9 kHz to 1.5 GHz (with preamplifier)	DSA815
Standard Accessories	Quick Guide (Hard Copy)	QGD03X00
	CDROM (User's Guide, Programming Guide)	-
	Power Cord	-
Options	EMI Filter & Quasi-Peak Detector Kit (for DSA815 only)	DSA800-EMI
	VSWR Measurement Kit (for DSA815 only)	DSA800-VSWR
	VSWR Bridge[1]	VB1020
	Advanced Measurement Kit (for DSA815 only)	DSA800-AMK
	1.5 GHz Tracking Generator (for DSA815 only)	DSA800-TG
	RF Demo Kit (Transmitter)[1]	TX1000
	USB-GPIB Interface Converter	USB-GPIB
	Rack Mount Kit[1]	DSA800-RMSA
Optional Accessories	DSA Accessories Package[1] includes: N-SMA Cable, BNC-BNC Cable, N-BNC Adapter, N-SMA Adapter, 75 Ω-50 Ω Adapter 2 Antennas (900 MHz/1.8 GHz), 2 Antennas (2.4 GHz)	DSA Utility Kit
Optional Manuals (Hard Copy)	Quick Guide, Chinese & English	QGD03X00
	User's Guide, Chinese	UGD03000
	User's Guide, English	UGD03100
	Programming Guide, Chinese	PGD03000
	Programming Guide, English	PGD03100

Remark: [1] for more details, refer to the corresponding manual (included in the option package in CD or hard copy form, or download the manual from www.rigol.com).

Standard Accessories

The following are the standard accessories.

Power Cord

Quick Guide

Resource CD[1]

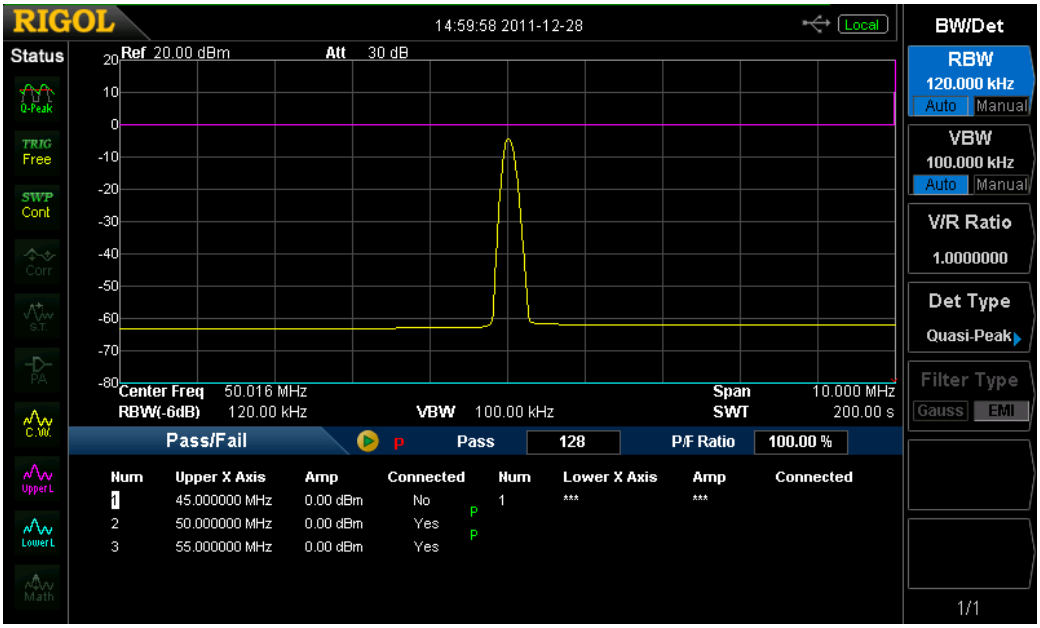
Remark: [1] the User's Guide and Programming Guide are included in the resource CD. You can also order the hard copies.

Note: images in this section are indicative only. The actual products you receive may differ.

EMI Filter and Quasi-Peak Detector

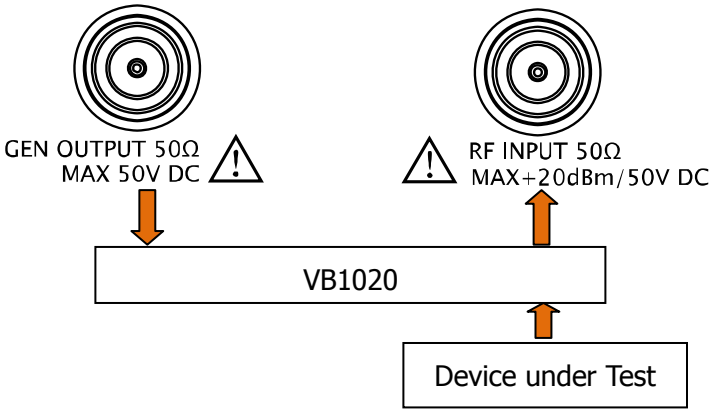
DSA800-EMI option provides Quasi-Peak detector and EMI filter (200 Hz, 9 kHz, 120 kHz, -6 dB bandwidth). Quasi-Peak detection is a weighted form of peak detection. For each data point, the detector detects the peaks within the specified time interval, weights the peaks detected using circuit with specified charge and discharge structures as well as the display time constant specified in the CISPR Publication 16 standards and display the result. By default, the instrument uses Gauss filter and will switch to EMI filter automatically if Quasi-Peak detector is selected.

Press **BW/Det** at the front panel. Then, press **Det Type** to select Quasi-Peak detector. At this point, the instrument automatically changes the filter type to EMI and the **Filter Type** menu is grayed out and disabled. DSA800-EMI option is used in electromagnetic interference test.

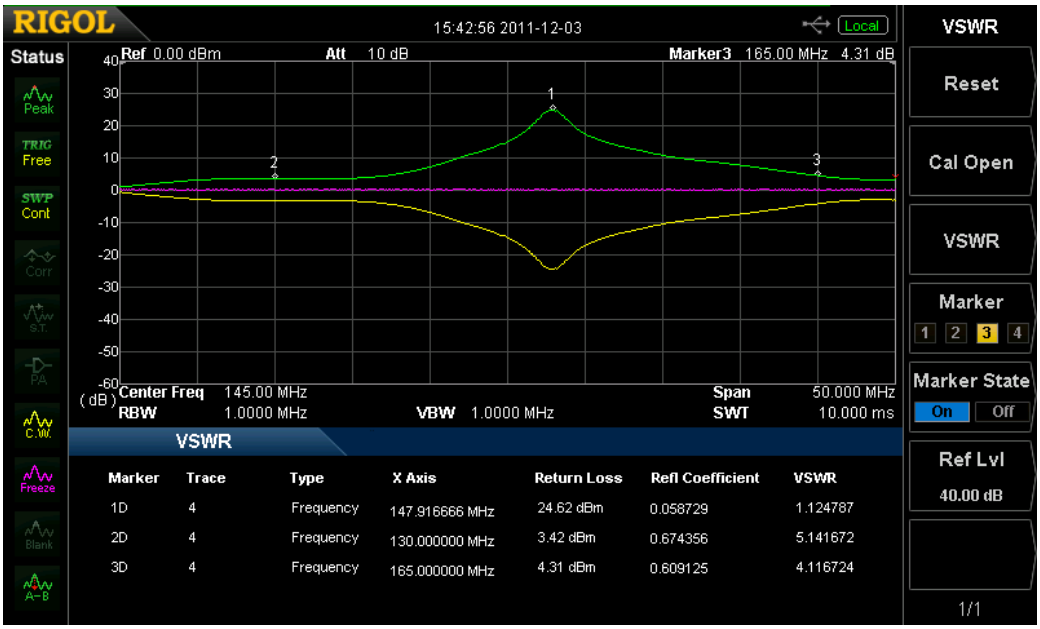


VSWR Measurement Kit

DSA800-VSWR option (used together with the VB1020 and DSA800-TG options) provides measurement functions of S11-related specifications (such as the return loss, reflection coefficient and VSWR).



Press **Meas** at the front panel and then press **VSWR** to enable the VSWR measurement function. The screen is divided into two windows with the upper window (the basic measurement window) displaying the sweep trace and the lower window displaying the measurement wizard and measurement results. Perform two measurements respectively according to the measurement wizard in the lower window: measurement with the device under test disconnected (**Meas Setup** → **Cal Open**, represented by trace 2) and measurement with the device under test connected (**Meas Setup** → **VSWR**, represented by trace 1). The return loss is determined by the difference (represented by the math trace) of the results of the two measurements and the reflection coefficient and VSWR are determined by the return loss.


RIGOL
15:42:56 2011-12-03
Local
Status
Peak
TRIG Free
SWP Cont
Corr
S.T.
PA
C.W.
Freeze
Blank
A-B
Ref 0.00 dBm
Att 10 dB
Marker3 165.00 MHz 4.31 dB
40
30
20
10
0
-10
-20
-30
-40
-50
-60
(dB)
Center Freq 145.00 MHz
RBW 1.0000 MHz
VBW 1.0000 MHz
Span 50.000 MHz
SWT 10.000 ms
VSWR
Marker Trace Type X Axis Return Loss Refl Coefficient VSWR
1D 4 Frequency 147.916666 MHz 24.62 dBm 0.058729 1.124787
2D 4 Frequency 130.000000 MHz 3.42 dBm 0.674356 5.141672
3D 4 Frequency 165.000000 MHz 4.31 dBm 0.609125 4.116724
VSWR
Reset
Cal Open
VSWR
Marker
1 2 3 4
Marker State
On Off
Ref Lvl
40.00 dB
1/1

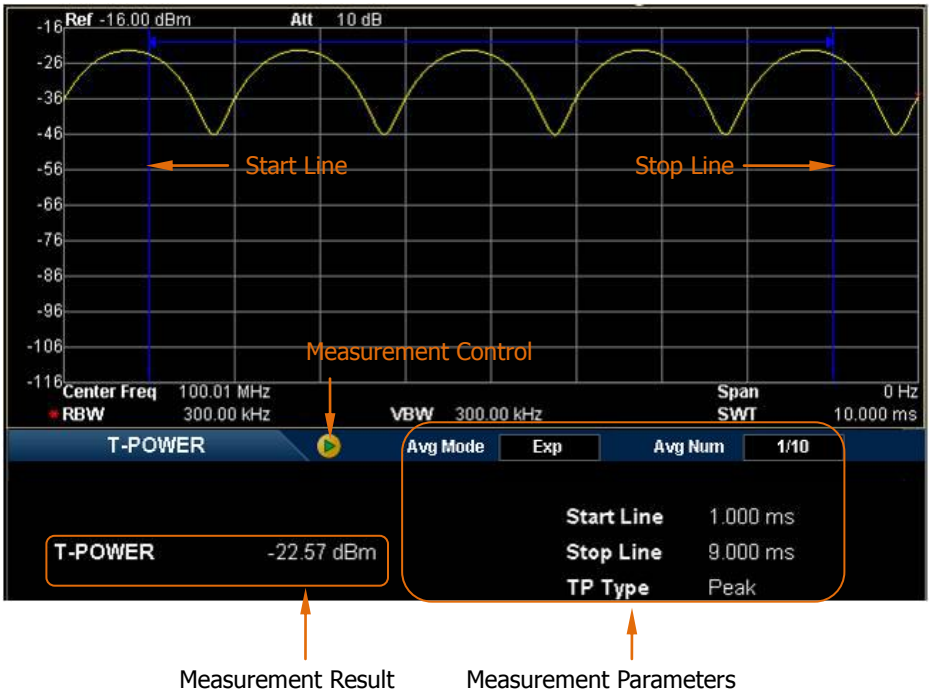
Advanced Measurement Kit

DSA800-AMK option provides various measurement functions, including T-Power, ACP (Adjacent Channel Power), Chan Pwr (Channel Power), OBW (Occupied Bandwidth), EBW (Emission Bandwidth), C/N Ratio, Harmo Dist (Harmonic Distortion) and TOI (Third Order Intermodulation). For advanced measurement functions, the measurement mode can be single or continuous and you can control the measurement including Restart, Pause and Resume.

Press **Meas** at the front panel and then press **Meas Fctn** to select a measurement function. The screen is divided into two windows with the upper window (the basic measurement window) displaying the sweep trace and the lower window displaying the measurement results.

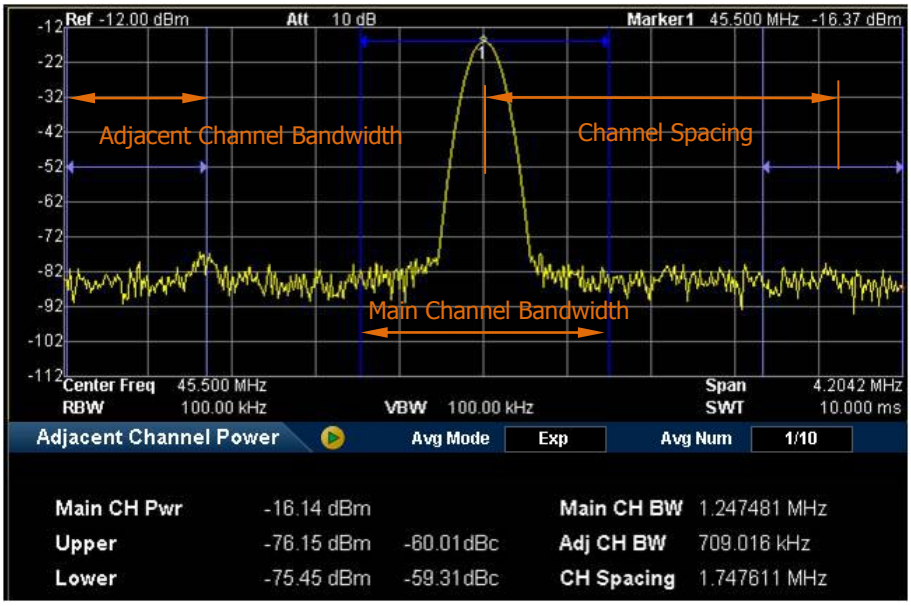
1. T-power

The system enters zero span mode and calculates the power within the time domain. The types of powers available include Peak, Average and RMS.



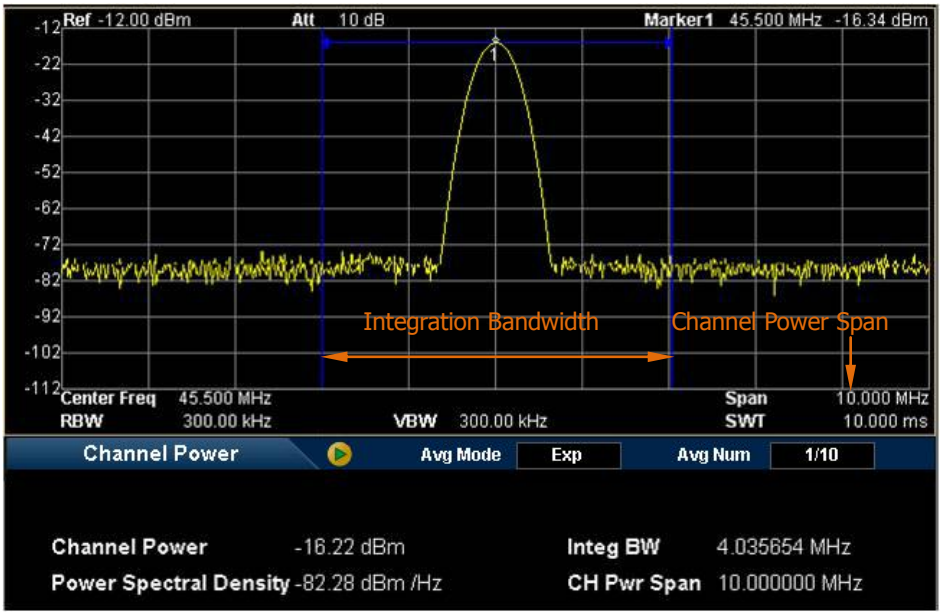
2. ACP

Measure the powers of the main channel and adjacent channels as well as the power difference between the main channel and each of the adjacent channels. When this function is enabled, the span and resolution bandwidth of the analyzer are adjusted to smaller values automatically.



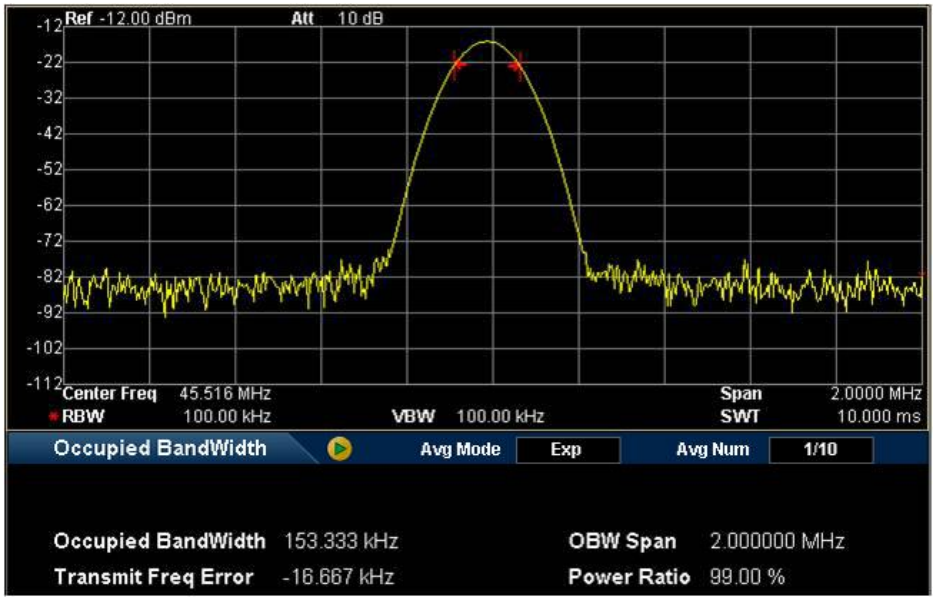
3. Chan Pwr

Measure the power and power spectral density within the specified channel bandwidth. When this function is enabled, the span and resolution bandwidth are automatically adjusted to smaller values.



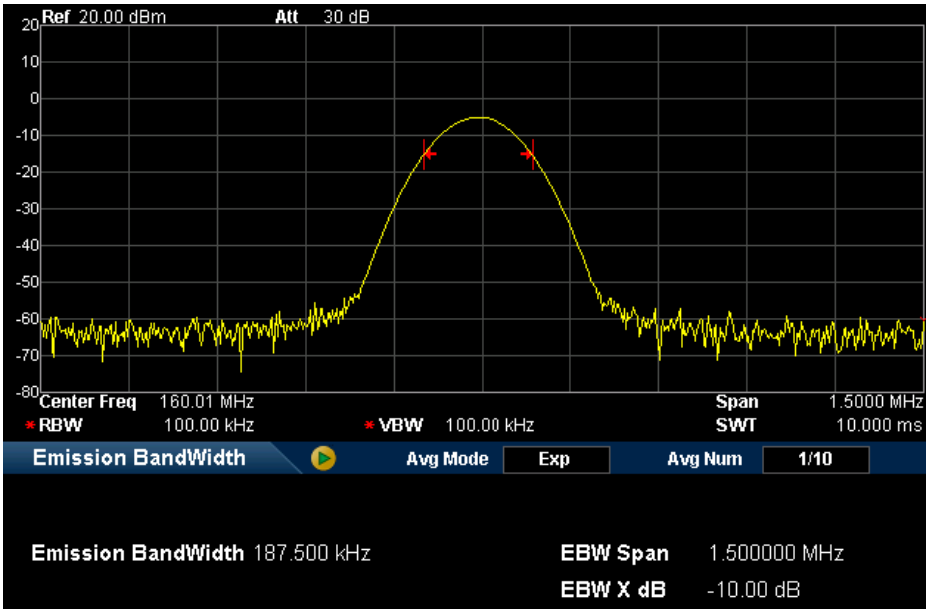
4. OBW

Integrate the power within the whole span and calculate the bandwidth occupied by this power according to the specified power ratio. The OBW function also indicates the difference between the center frequency of the channel under measurement and the center frequency of the analyzer.



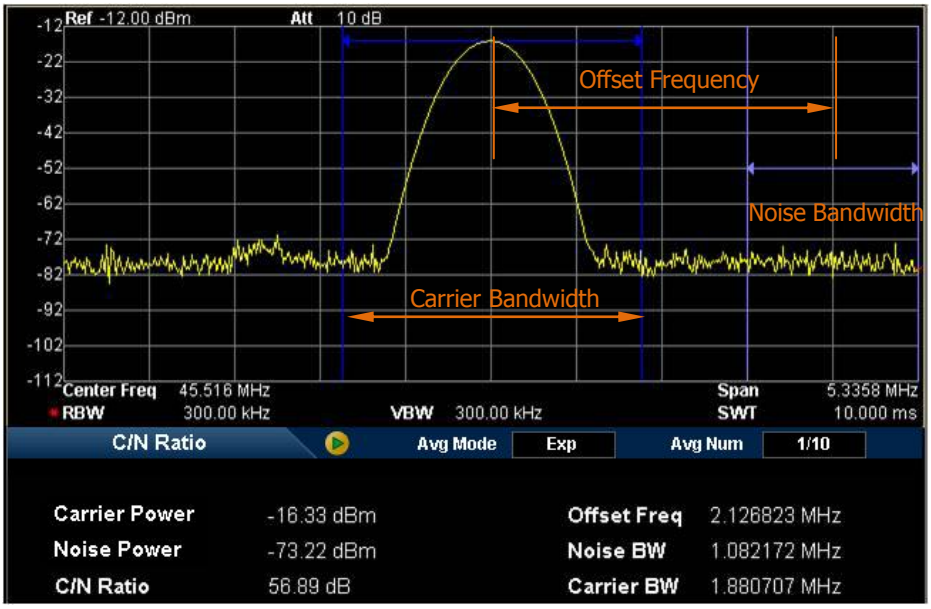
5. EBW

Measure the bandwidth between two points on the signal which are X dB below the highest point within the span.



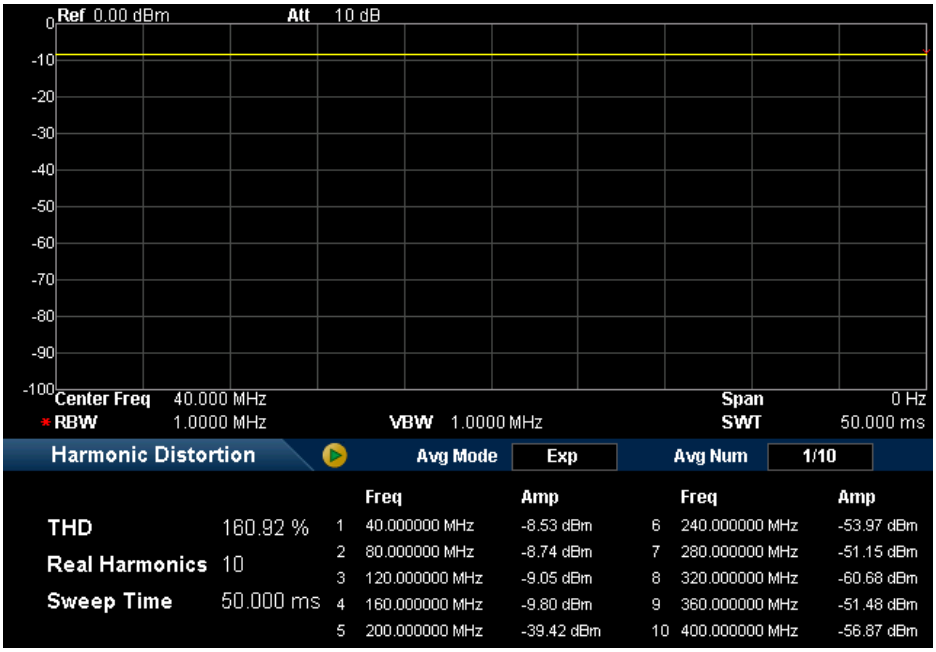
6. C/N Ratio

Measure the powers of the carrier and noise with the specified bandwidths as well as their power ratio.



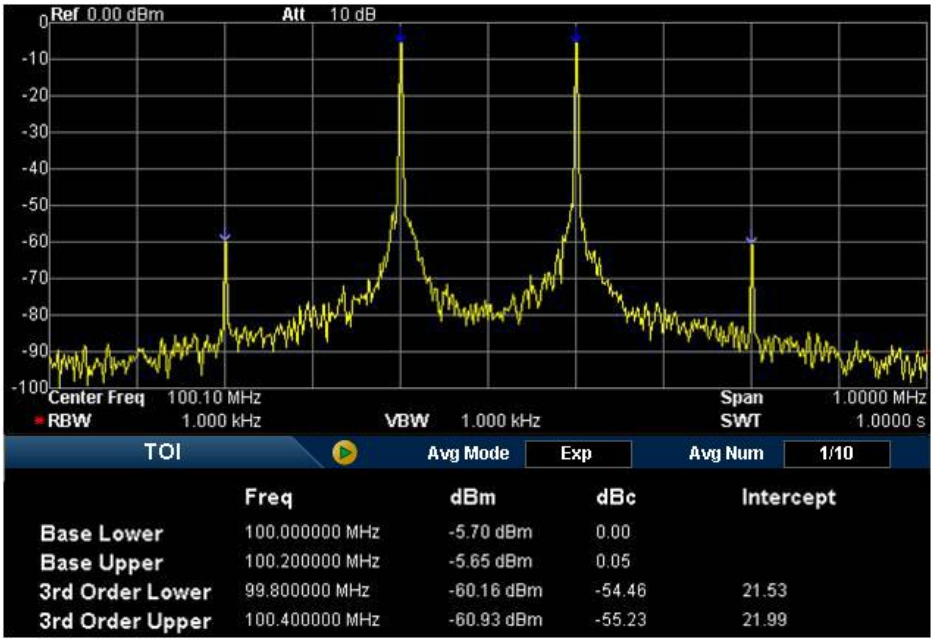
7. Harmo Dist

Measure the power of each order of harmonic and THD (total harmonic distortion) of the carrier. The highest order of harmonic available is 10 and the fundamental wave amplitude must be greater than -50 dBm, or else the measurement will be invalid.



8. TOI

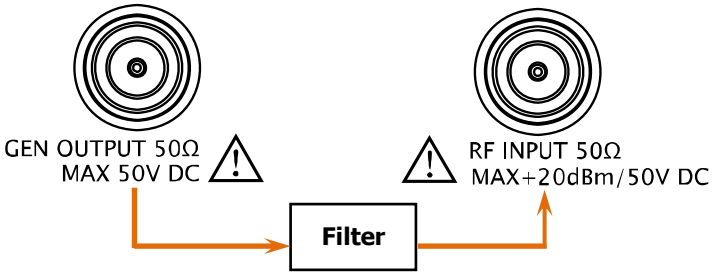
Measure the parameters of the TOI production of two signals with the same amplitude and similar frequency. Those parameters include the frequencies and amplitudes of the Base Lower, Base Upper, 3rd Order Lower and 3rd Order Upper signal, as well as the Intercepts of both the Base Lower and Base Upper.



1.5 GHz Tracking Generator

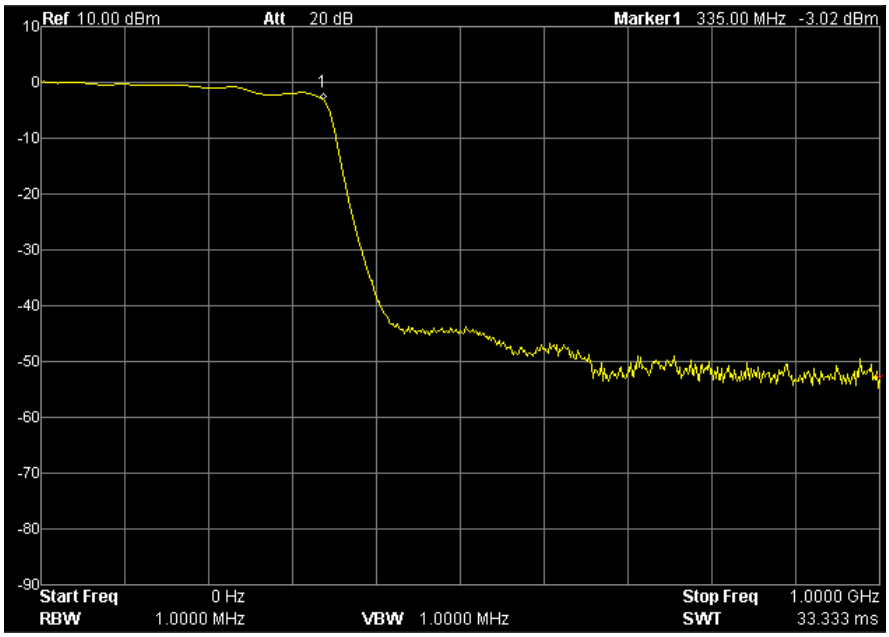
DSA800-TG option provides tracking output function. When the tracking generator is enabled, a signal with the same frequency of the current sweep signal is output from the **[GEN OUTPUT 50 Ω]** connector at the front panel and the power of the signal can be set through the menu. The tracking generator provides two working modes: Power Sweep output and Fixed Power output.

When the tracking generator is used as an excitation, the DUT (device under test) characteristics can be obtained by measuring the output from the DUT. For example, use the tracking generator to verify the frequency response of the filter. Connect the filter to be tested to the **[RF INPUT 50Ω]** and **[GEN OUTPUT 50Ω]** connectors at the front panel of the spectrum analyzer.



Measurement Example

The figure below shows the frequency response of a 300 MHz low-pass filter.

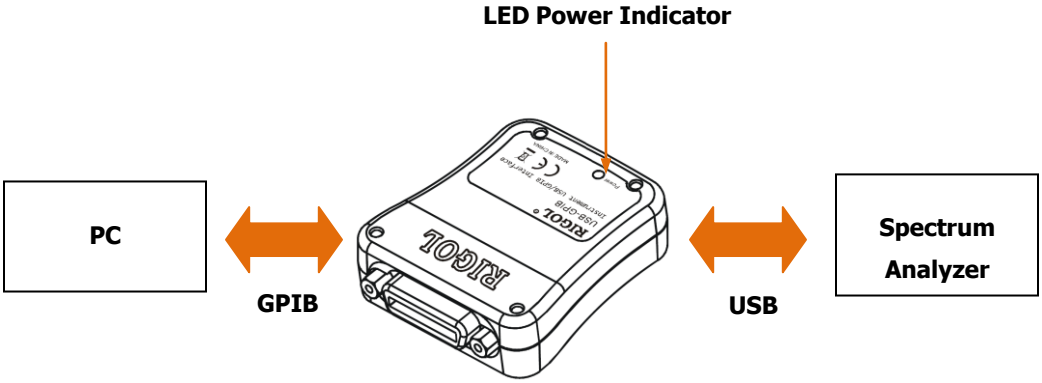


Tracking Generator Specifications

Main Specifications	Condition	Value
Frequency Range		9 kHz to 1.5 GHz
Output Power		-20 dBm to 0 dBm, the step is 1 dB
Output Flatness	1 MHz to 1.5 GHz, referenced to 50 MHz	±3 dB

USB-GPIB Interface Converter

Through the **RIGOL** USB-GPIB interface converter, the spectrum analyzer can be connected to the GPIB bus controller of the PC, namely to expand a GPIB interface through which the spectrum analyzer can finish various tasks using the GPIB instructions more easily for the spectrum analyzer. The performance characteristics of the USB-GPIB interface converter are listed below.

- Achieve GPIB control via the USB Host interface of the spectrum analyzer.
- Distribute a GPIB address for the spectrum analyzer via the GPIB host device (PC).
- USB powered instead of external power supply.
- Indicate the power status via a LED.

Connect the USB interface and the GPIB interface of the USB-GPIB interface converter to the USB Host interface of the spectrum analyzer and the GPIB bus controller of the PC respectively.