

Ultra Power Analyzer Software

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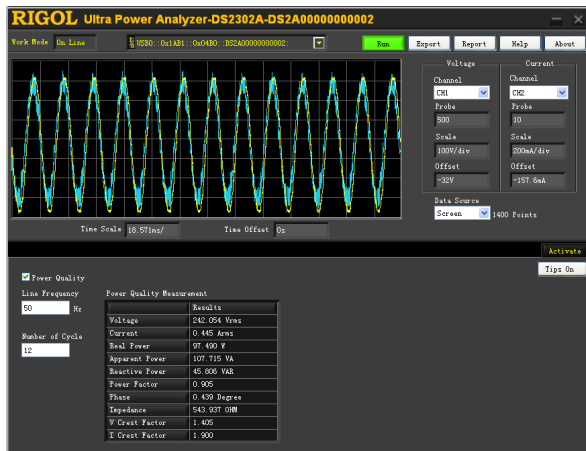
Tel +44 (0) 161 871 7450
www.instruments4engineers.com

S6000, MSO/DS4000 and
MSO/DS2000A series oscilloscopes

- Auto calibration of channel delay
- Power quality analysis
- Current harmonics analysis
- Inrush current analysis
- Power device analysis
- Safe operating area analysis
- Modulation analysis
- Output analysis
- Offline and online working modes

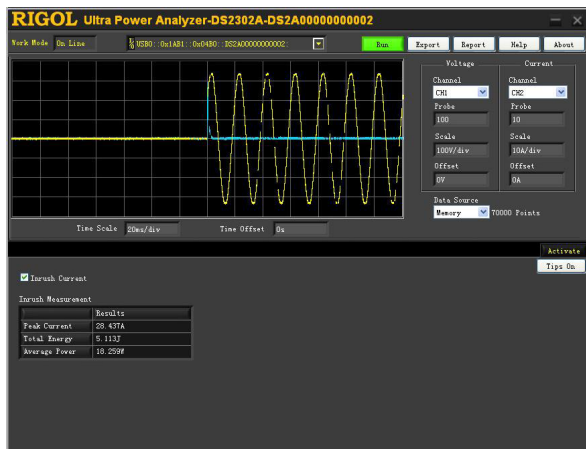
RIGOL Ultra Power Analyzer is a software of the **RIGOL** DS6000 series, MSO/DS4000 series, and MSO/DS2000A series digital oscilloscopes. It can be used to analyze the Switch-Mode Power Supply (SMPS). This software can be run on Windows XP, Windows 7, Windows 8 and Windows 10 operating systems.

► Main Features



Current harmonics analysis

The input current waveform contains harmonics. Nowadays, most of the AC-DC power supply design should conform to the IEC61000-3-2 current harmonic standard which specifies the limit of each order of harmonic for different classes of devices. Ultra Power Analyzer supports the pre-testing for all four classes of devices and the measurement of up to 40 orders of harmonics.

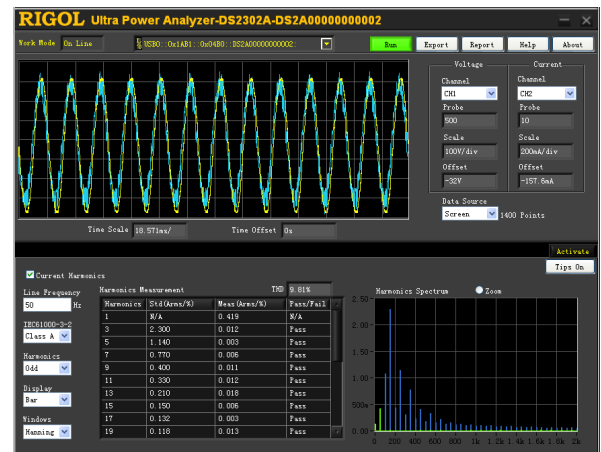


Output analysis

The measurement results provide the peak-peak value, maximum, minimum as well as the frequency corresponding to the maximum amplitude in the spectrum analysis of the AC component of the output signal.

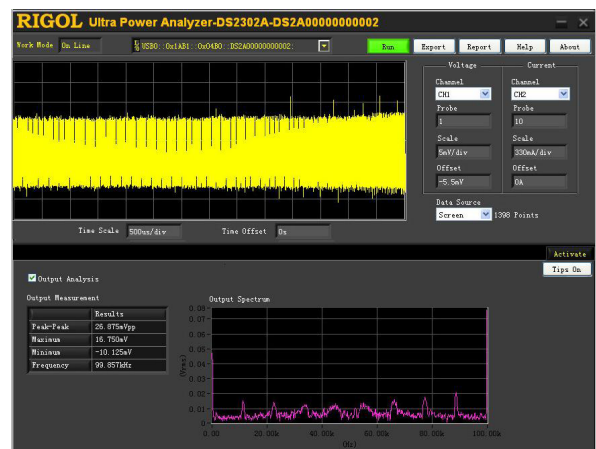
Power quality analysis

The power quality characteristics of the power supply reflect the operating condition of the power supply. As the switch-mode power supply adds a non-linear load to the mains supply, the voltage and current waveforms are different and the input current waveform would contain harmonics. This power quality measurement is required to test the power consumption and distortion on the mains supply. **RIGOL** Ultra Power Analyzer provides common power quality measurement.



Inrush current analysis

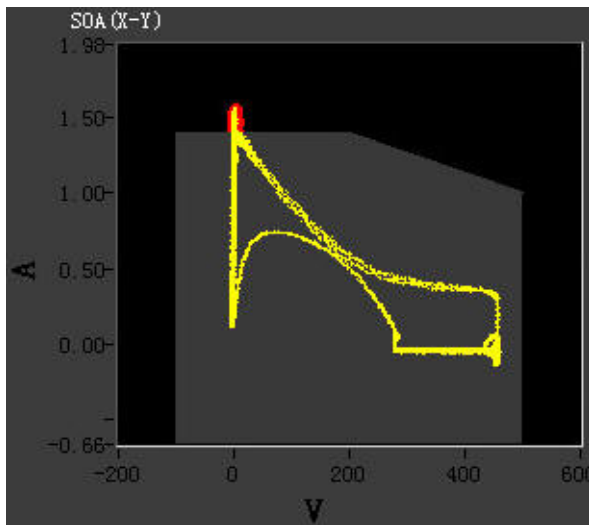
When the switch-mode power supply is turned on, the filter capacitance at the input terminal is equivalent to a transient short circuit and will generate a current with a short rise time. The inrush current function is used to analyze the power-on waveform of the switch-mode power supply.



Modulation analysis

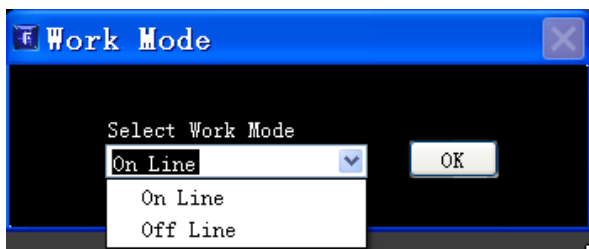
The switch power supply usually uses feedback control loop to stabilize the output voltage.

The modulation analysis is mainly used to analyze the characteristics of the control loop of the switch power supply.



Power device analysis

Switch loss is the most important and difficult test item in the switch-mode power supply test, because the accuracy of the measurement result can only be ensured when the real switch point is recognized. Ultra Power Analyzer allows users to set the switch level and conduction. The loss can be calculated accurately based on the settings.



Modulation Measurement			
	Maximum	Minimum	Average
Frequency	88.570kHz	87.497kHz	88.032kHz
Period	11.429us	11.291us	11.360us
+Duty Cycle	79.289%	78.610%	79.012%
-Duty Cycle	21.390%	20.711%	20.988%
+Pulse Width	9.041us	8.875us	8.976us
-Pulse Width	2.415us	2.361us	2.384us

Safe operating area analysis

When designing the switch power supply, make sure that the switch device works in SOA (Safe Operating Area).

With the SOA function, the voltage and current of the switch device are displayed in X-Y mode. You can make a pass/fail test with the specification (in X-Y mode) of the switch device as a reference.


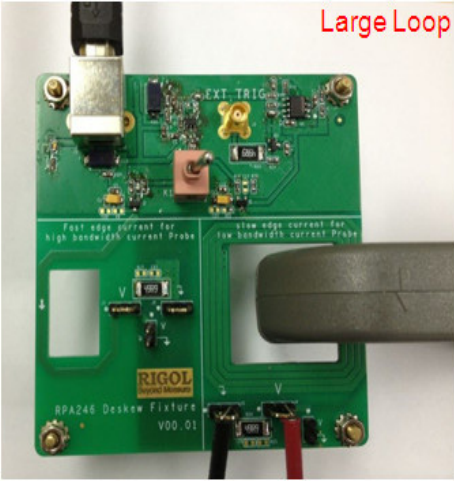


Online/Offline Mode

In the online mode, it is possible to store the data in a *.csv file and to create a test report in html format.

In the offline mode, waveform data can be imported and a test report in html format can also be created.

► Specifications

Oscilloscope Compatibility	
Ultra Power Analyzer	All models of DS6000 series, MSO/DS4000 series and MSO/DS2000A series
Measurement and Analysis	
Power Quality Analysis	Vrms, Irms, Real Power, Apparent Power, Reactive Power, Power Factor, Phase, Impedance, V Crest Factor, I Crest Factor
Current Harmonics Analysis	Supports the pre-testing for all the four classes of devices (IEC61000-3-2 Class A, Class B, Class C and Class D) Supports THD and RMS measurements of up to 40 harmonics Displays the harmonics values in graph and table
Inrush Current Analysis	Peak Current, Total Energy, Average Power
Power Device Analysis	Measures the following 8 items: Power Loss (Ton, Toff, Conduction, Total) Energy Loss (Ton, Toff, Conduction, Total)
Safe Operation Area Analysis	Displays the voltage and current waveforms of the switch device in Y-T mode and X-Y mode Pass/fail test with the specification (in X-Y mode) of the switch device as a reference
Modulation Analysis	Frequency, period, positive duty cycle, negative duty cycle, positive pulse width and negative pulse width
Output Analysis	Peak-peak value, maximum, minimum as well as the frequency corresponding to the maximum amplitude for the output voltage ripple and noise
Deskew	
	<p>Calculates the deskew values automatically based on the settings.</p> <p>The deskew values can be adjusted manually.</p> <p>The deskew values can be stored and you can use it when you run the software next time.</p> <div><div><p>Small Loop</p>A photograph of the RIGOL RPA246 Deskew Fixture, a green printed circuit board (PCB) with various electronic components. A small loop of wire is connected to the top of the board. A black cable is plugged into the left side. The board has labels for 'EXT TRIG', 'Test edge current for high bandwidth current Probe', 'slow edge current for low bandwidth current Probe', and 'RIGOL RPA246 Deskew Fixture V00.01'.</div><div><p>Large Loop</p>A photograph of the RIGOL RPA246 Deskew Fixture, similar to the one on the left, but with a larger loop of wire connected to the top. The same black cable is plugged into the left side. The board has the same labels as the first image.</div></div> <p>RIGOL RPA246 Deskew Fixture</p>

► Ordering Information

	Description	Order Number
Software	Ultra Power Analyzer Software	UPA-DS
Standard Accessories	RPA246 Deskew Fixture	-
	USB Data Cable	CB-USBA-USBB-FF-150
Oscilloscopes	DS6000 Series	-
	MSO/DS4000 Series	-
	MSO/DS2000A Series	-
Probes	RP2200 150 MHz Passive High Impedance Probe	RP2200
	RP3300A 350 MHz Passive High Impedance Probe	RP3300A
	RP1300H 300 MHz Passive High Voltage Probe	RP1300H
	RP1010H 40 MHz Passive High Voltage Probe	RP1010H
	RP1018H 150 MHz Passive High Voltage Probe	RP1018H
	RP1025D 25 MHz High Voltage Differential Probe	RP1025D
	RP1050D 50 MHz High Voltage Differential Probe	RP1050D
	RP1100D 100 MHz High Voltage Differential Probe	RP1100D
	RP1001C 300 kHz Current Probe	RP1001C
	RP1002C 1 MHz Current Probe	RP1002C
	RP1003C 50 MHz Current Probe	RP1003C
	RP1004C 100 MHz Current Probe	RP1004C
Other Optional Accessory	T2R1000 Active Probe Adaptor (used to connect Tek probes to RIGOL oscilloscopes)	T2R1000

