



## Ultra Power Analyzer Software DS4000, MSO4000 and DS2000 series

- Supports RIGOL DS4000, MSO4000 and DS2000 series
- Auto calibration if channel delay
- Power quality analysis
- Current harmonics analysis
- Inrush current analysis
- Safe operating area analysis
- Modulation analysis
- Output analysis
- Working modes Off Line and On Line

RIGOL Ultra Power Analyzer is a software application of the RIGOL DS4000 series, MSO4000 series and DS2000 series Digital/Mixed Signal Oscilloscopes. It can be used to analyze the Switch-Mode Power Supply (SMPS). This application can be run on Windows XP, Windows Vista and Windows 7 operating systems.

## Main Features

### Power quality analysis

The power quality characteristics of the power supply reflect the "health" 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.



### Current harmonics analysis

The input current waveform contains harmonics. Nowadays, most of the AC-DC power supply design should conform to the EN61000-3-2 current harmonic standard which specifies the limit of each order of harmonic for different class of device.

Ultra Power Analyzer supports the pre-testing for all four classes of devices and supports the measurements of up to 40 orders of harmonics.

### 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.

### Inrush current analysis

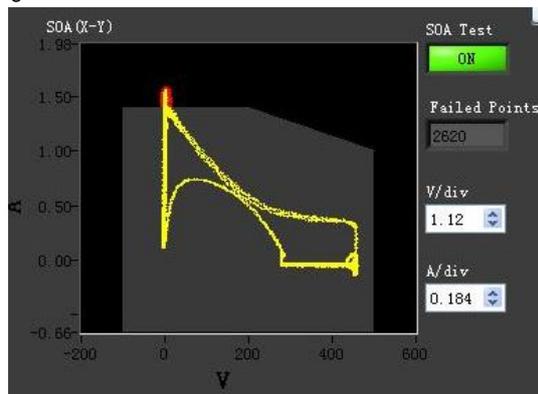
When the switch-mode power supply is turned on, the filter capacitance at the input terminal is equivalent to a transient short circuit and will generate a current with short rise time.

The inrush current function is used to analyze the power-on waveform of the switch-mode power supply.

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

### 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.



### 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 of 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 calculate the loss according to this level.

Power Device Measurement				
Measure Items	Result	Start Time	Stop Time	
Switch Off Power Loss, #1	133.115W	-34.884us	-34.852us	
Switch Off Power Loss, #2	108.557W	-22.899us	-22.864us	
Switch Off Power Loss, #3	119.458W	-11.597us	-11.563us	
Switch Off Power Loss, #4	110.059W	-5.002us	30.002us	
Switch Off Power Loss, #5	108.309W	11.250us	11.284us	
Switch Off Power Loss, #6	107.408W	22.410us	22.446us	
Maximum Switch Off Power Loss	133.115W	N/A	N/A	
Minimum Switch Off Power Loss	107.408W	N/A	N/A	
Average Switch Off Power Loss	114.484W	N/A	N/A	
Switch Off Energy Loss, #1	4.260uJ	-34.884us	-34.852us	

# 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: info@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

[www.rigol.com](http://www.rigol.com)