

Power Analysis

Now available on Siglent SDS5000X Oscilloscopes

Power converter design has become an important part of electronic product development. Modern design needs have increased the importance of power supplies that have greater efficiency, more reliability, with lower electromagnetic emissions (EMI) than past designs. This is especially true for designs implementing Switch Mode Power Supplies (SMPS) that can be especially noisy. Highly specialized Power Design Engineers can measure many of the parameters of SMPS manually, but this is extremely time consuming and inconvenient. To help minimize time-to-market and maximize Engineering efficiency, the SIGLENT SDS5000X oscilloscope now offers a Power Analysis option to standardize, automate and speed measurements and simplify power supply testing.

SIGLENT Power Analysis Requirements:

- **SDS5000X Series Oscilloscope (FW version \geq 0.8.7R1B1)**
- **SDS-5000X-PA Power Analysis option for SDS5000X oscilloscopes**
- **DF2001A Deskew fixture**
- **CP series Current Probes**
- **DPB series Differential Voltage Probes**

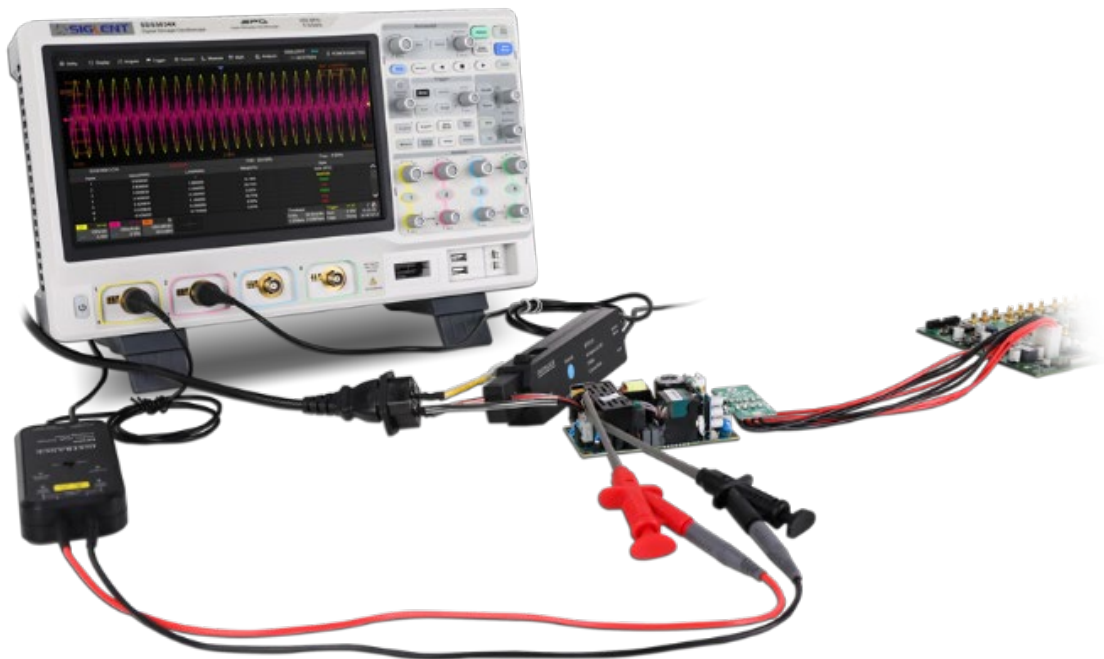


Figure 1: typical test setup for PA

SDS-5000X-PA provides the following measurements:

The measurements are grouped into Input / Switching / Output sections.

Power Supply Rejection Ratio (PSRR) is also part of the PA option.

Bode Plot is included for free with SDS5000X firmware revisions > 0.8.7R1B1 and is available without the PA option.

Input Parameters

Power Quality

Power Factor, Real Power, Apparent Power, Reactive Power, Phase Angle, I&V Crest

Current Harmonics

Based on IEC61000-3-2 A/B/C/D, up to 40th harmonics

Inrush Current

Switching Parameters

Switching Loss

Power Loss, Energy Loss. Conduction: Waveform, Rds(on), Vce(sat)

Slew Rate

Top/Base of Voltage/Current,

Modulation

Ave, AC-RMS, Period, Width, Duty, Rise/Fall time etc.

Output Parameters

Output Ripple

Turn On/ Turn Off

Transient Response

Efficiency

Frequency Response Measurements

Power Supply Rejection Ratio (PSRR)

Control Loop Response (Standard function also available without PA option)

Recommended Accessories:

Siglent Current Probes	
CPL5100	Bandwidth: DC-600 kHz; Maximum continuous current 70.7 Arms
CP4020	Bandwidth: 100 kHz; Maximum continuous current 20 Arms
CP4050	Bandwidth: 1 MHz; Maximum continuous current 50 Arms
CP4070	Bandwidth: 150kHz; Maximum continuous current 70 Arms
CP4070A	Bandwidth: 300 kHz; Maximum continuous current 70 Arms
CP5030	Bandwidth: 50 MHz; Maximum continuous current 30 Arms
CP5030A	Bandwidth: 100 MHz; Maximum continuous current 30 Arms
CP5150	Bandwidth: 12 MHz; Maximum continuous current 150 Arms
CP5500	Bandwidth: 5 MHz; Maximum continuous current 500 Arms

Siglent Voltage Probes	
DPB1300	Bandwidth: 50 MHz; Max Input: 600 V CATIII, 1000 V CATII
DPB4080	Bandwidth: 50 MHz; Maximum input differential voltage 800 V(DC + Peak AC)
DPB5150	Bandwidth: 70 MHz; Maximum input differential voltage 1500 V(DC + Peak AC)
DPB5150A	Bandwidth: 100 MHz; Maximum input differential voltage 1500 V(DC + Peak AC)
DPB5700	Bandwidth: 70 MHz; Maximum input differential voltage 7000 V(DC + Peak AC)
DPB5700A	Bandwidth: 100 MHz; Maximum input differential voltage 7000V(DC + Peak AC)

For more information about probes, please visit Siglent websites--SDS5000X--Accessories--Probes.

Deskew the current and differential voltage probes for accurate Measurements

It is important to perform probe deskew calibration to eliminate the difference in propagation between probes. After initial setup, it is also recommended to perform another calibration if any physical changes to the setup have occurred. To make this process as simple-as-possible, we offer the DF2001A deskew fixture (shown below)

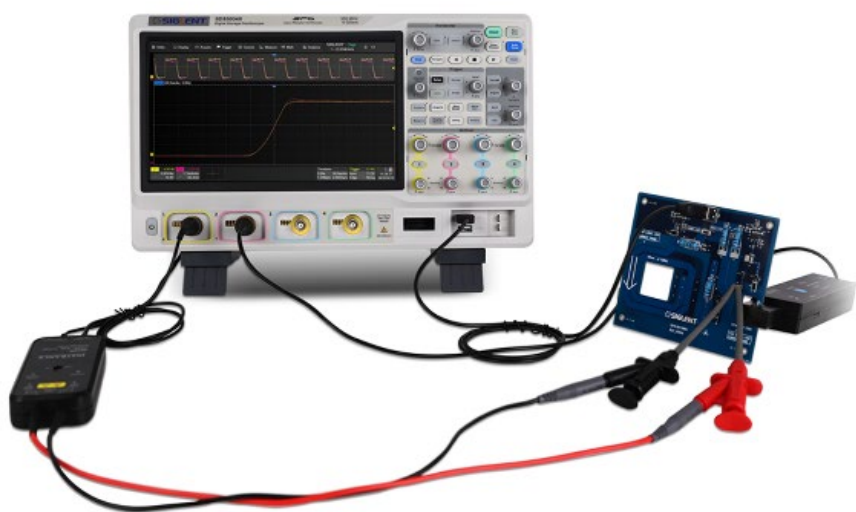


Figure 2: Probe deskew with Siglent DF2001A deskew fixture.

The Power Analysis option includes a graphical connection setup guide that provides key connection information for common design types, making measurement setup easy. The tests process is also simple: Perform the physical connections, enter the required parameters, and start the measurements. The instrument will perform the testing and report the results automatically.

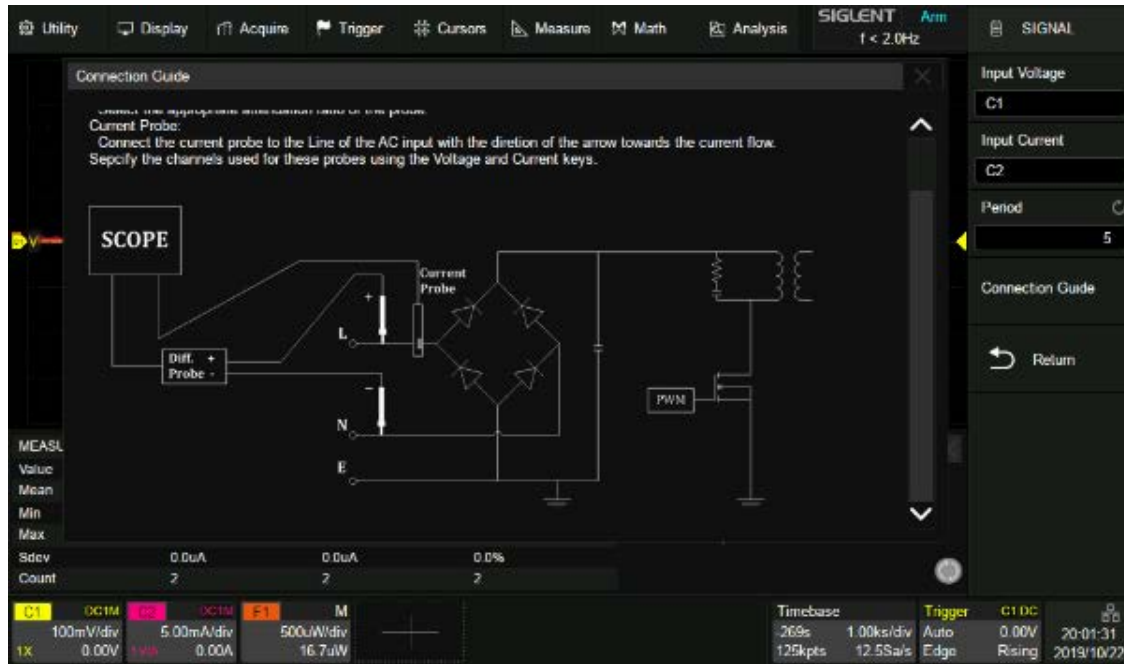


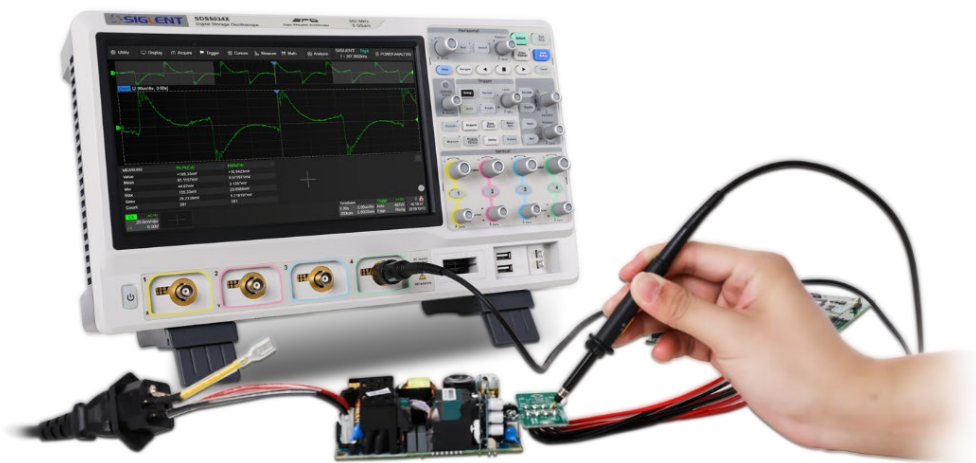
Figure 3: Example of the Connection setup diagram

All the data can be stored to USB. Just press the **Print** menu button. The onboard web control interface can also be used to retrieve pictures and data remotely over LAN connections.



Siglent SDS5000X Power Analysis and Bode Plot function are very convenient and a great time saving option for power circuit engineers.

SIGLENT Technologies Test and Measurement portfolio also includes Electronic DC loads, Bench top power supplies and EMC-Pre Compliance solutions.



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