

Application Note

Switched mode power supply output monitoring

Industry: Electronic Manufacturing

ScopeCorder DL950



ScopeCorder DL950

Background

The global Switched Mode Power Supply (SMPS*) market has been increasing over the years and is expected to grow at a Compound Annual Growth Rate (CAGR) of 2% from 2020 to 2027.

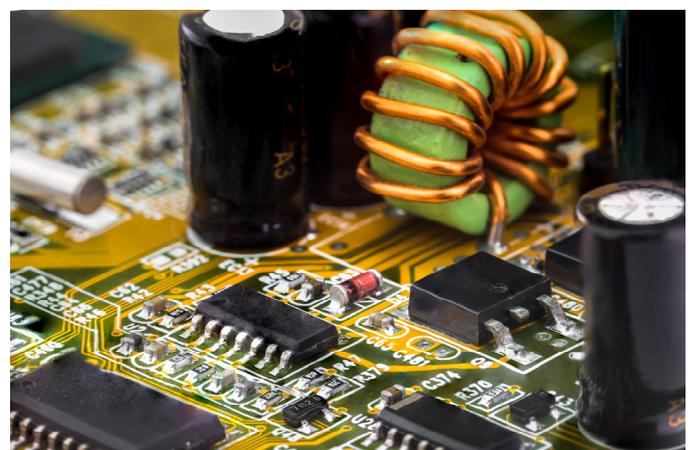
SMPS manufacturers are differentiating themselves from their competitors by offering new models that are more efficient in power usage and power conversion, more lightweight and compact size to meet rising demand. Engineers need to perform complex measurement test to ensure the reliability, stability, compliance, and safety of the new SMPS design.

* A power supply that stabilizes the output by controlling the on / off time ratio of semiconductor switch elements.

Challenge

There are many tests needed for SMPS design, such as power quality, inrush current, and MOSFET switching testing. One of the key tests is to monitor and record the SMPS output current characteristics when connected to different loads at a high sampling rate for a long period of time. Any change in output current due to the dynamic load conditions is monitored and saved for further analysis. To perform this test, engineers need an instrument that can meet the following requirements:

- SMPS output voltage and current measurement
- Isolated input channels
- High A/D convertor resolution
- High speed data sampling rate
- Long period of recording time (a few minutes to an hour)
- Data can be saved easily to the instrument internal storage



Solution and benefit

Yokogawa DL950 ScopeCorder is a standalone instrument with the following capabilities that meet user's requirements.

- **Isolated input modules**

Each channel is isolated from others. The 4ch 10MS/s 16bit resolution module (720256) can be used with the DL950.

- **High sampling rate**

The DL950 supports the new high speed module, 2ch 200MS/s 14bit (720212).

- **Various Math and Analysis functions**

The DL950 can calculate various parameters, such as frequency, period, and RMS in real time. In addition, it has power and harmonic analysis function (/G05 option).

The DL950 captures SMPS output current data over a long period of time with high sampling rate. The long time data is easily saved to the instrument's internal SSD memory. The DL950 can be used with a high resolution and high voltage module whose channels are isolated from each other.

The DL950 can be used as a normal oscilloscope to conduct other tests such as power quality, inrush current, and MOSFET switching testing (amplitude, duty cycle, frequency). Also, it can be used as a recorder by switching oscilloscope/recorder mode. Users can use the DL950 in a measuring instrument mode they are familiar with.

New Modules

High-speed 200MS/s 14bit Isolated Module 720212

Number of channels: 2
 Sample rate: 200MS/s
 Bandwidth: DC to 40 MHz
 Max. input voltage:
 1000 V(DC+ACpeak)*
 Resolution: 14 bit

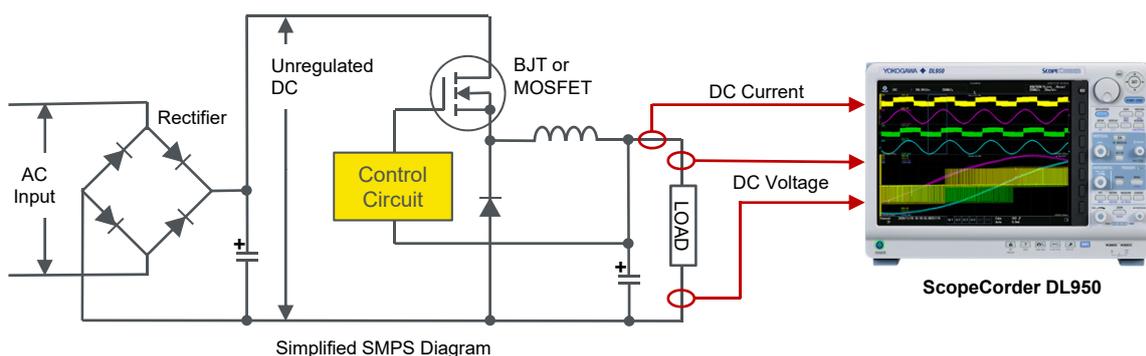


4CH 10MS/s 16bit Isolated Module 720256

Number of channels: 4
 Sample rate: 10MS/s
 Bandwidth: DC to 3 MHz
 Max. input voltage:
 600 V(DC+ACpeak)*
 Resolution: 16 bit



*When set 10:1 or use 100:1 probe



<https://tmi.yokogawa.com/>

YMI-KS-MI-SE08

YOKOGAWA TEST & MEASUREMENT CORPORATION

Global Sales Dept. /Phone: +81-42-690-8810 E-mail: tm@cs.jp.yokogawa.com
 Facsimile: +81-42-690-8826

The contents are as of February 2021. Subject to change without notice.
 Copyright © 2021, Yokogawa Test & Measurement Corporation

[Ed:01/d]

Printed in Japan, 102(YMI)

YOKOGAWA CORPORATION OF AMERICA

YOKOGAWA EUROPE B.V.

YOKOGAWA TEST & MEASUREMENT (SHANGHAI) CO., LTD.

YOKOGAWA ELECTRIC KOREA CO., LTD.

YOKOGAWA ENGINEERING ASIA PTE. LTD.

YOKOGAWA INDIA LTD.

YOKOGAWA ELECTRIC CIS LTD.

YOKOGAWA AMERICA DO SUL LTDA.

YOKOGAWA MIDDLE EAST & AFRICA B.S.C(c)

Phone: +1-800-888-6400

Phone: +31-88-4641429

Phone: +86-21-6239-6363

Phone: +82-2-2628-3810

Phone: +65-6241-9933

Phone: +91-80-4158-6396

Phone: +7-495-737-7868

Phone: +55-11-3513-1300

Phone: +973-17-358100

E-mail: tmi@us.yokogawa.com

E-mail: tmi@nl.yokogawa.com

E-mail: tmi@cs.cn.yokogawa.com

E-mail: TMI@kr.yokogawa.com

E-mail: TMI@sg.yokogawa.com

E-mail: tmi@in.yokogawa.com

E-mail: info@ru.yokogawa.com

E-mail: eproc@br.yokogawa.com

E-mail: help.yematmi@bh.yokogawa.com

Facsimile: +86-21-6880-4987

Facsimile: +82-2-2628-3899

Facsimile: +65-6241-9919

Facsimile: +91-80-2852-1442

Facsimile: +7-495-737-7869

Facsimile: +973-17-336100