

Debugging Fast-Switching Power Electronics Circuits

The advantage of isolated inputs

Challenge

New semiconductors such as GaN transistors enable higher efficiencies and higher power density than traditional, silicon-based alternatives. Switching times well below 10 ns require a measurement bandwidth greater than 200 MHz. Typically, several floating voltages have to be viewed and analyzed at the same time in order to minimize losses and optimize the design.

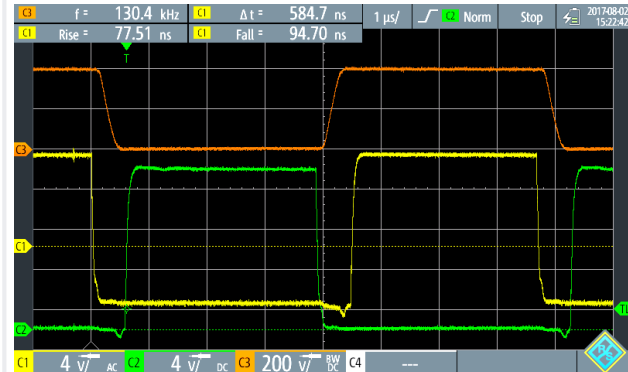
Solution

The R&S®Scope Rider (R&S®RTH1004) provides 500 MHz bandwidth and four isolated inputs rated for 1000 V (RMS) isolation voltage and is therefore ideal for advanced power electronics applications. Dedicated 10:1 or 100:1 passive probes allow high-quality, cost-effective measurements. Advanced measurement and analysis functions make day-to-day work easy.

Your benefit	Features
High bandwidth and superior performance	<ul style="list-style-type: none">■ 60 MHz to 500 MHz bandwidth with channel isolation for up to 1000 V (RMS)■ High-resolution signal acquisition with 10-bit A/D converter■ Excellent sensitivity: 2 mV/div to 100 V/div■ Advanced triggering capabilities■ 33 automatic measurement functions
Outstanding protection	<ul style="list-style-type: none">■ Isolated input channels: CAT IV 600 V/CAT III 1000 V■ IP51 housing that meets military requirements
Dedicated power electronics functions	<ul style="list-style-type: none">■ Automatic harmonics analyzer■ 33 automatic measurement functions, including active, apparent and reactive power as well as power factor■ User-selectable digital lowpass filter
Ideal for digital power; easily extendable for future needs	<ul style="list-style-type: none">■ Serial trigger & decode options: I²C/SPI, UART, CAN/LIN, CAN-FD, SENT■ Advanced analysis options: spectrum analyzer, frequency analyzer, logic analyzer

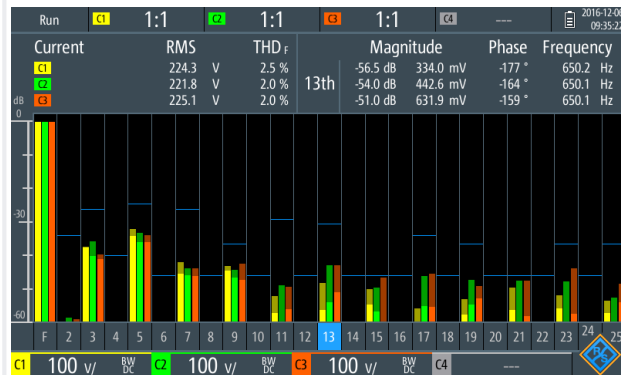


500 MHz bandwidth with 1000 V (RMS) channel isolation



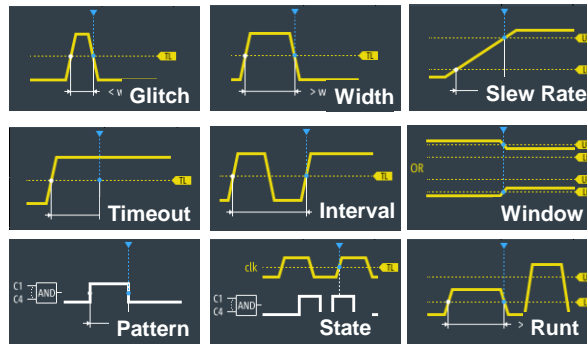
Isolated inputs for up to 1000 V (RMS) floating voltage measurements eliminates the need for differential high-voltage probes.

Harmonics analysis function on up to four channels



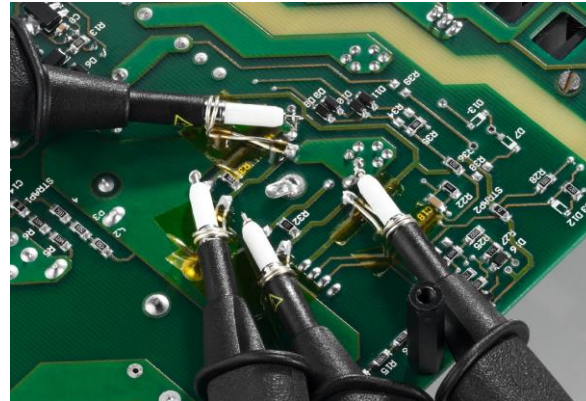
Harmonics analysis with magnitude, phase and frequency measurements for up to 64 harmonics and automatic limit testing.

Advanced trigger capabilities



Advanced trigger functions to isolate the event of interest. Combined with the history function, long-term monitoring of signals is an easy task.

Dedicated passive probes for high-quality measurements



Dedicated 10:1 and 100:1 passive probes allow high-quality floating measurements when connections to the device under test are kept short.

Popular options/accessories

Software options

I ² C/SPI serial trigger & decode	R&S®RTH-K1
UART/RS-232/422/485 serial trigger & decode	R&S®RTH-K2
History/segmented memory	R&S®RTH-K15
Advanced triggering	R&S®RTH-K19
Frequency counter	R&S®RTH-K33
Harmonics analysis	R&S®RTH-K34
Wireless LAN	R&S®RTH-K200 R&S®RTH-K200US
Web interface remote control	R&S®RTH-K201

Passive probes

500 MHz, 10:1, isolated, 300 V CAT III, compact lab probe	R&S®RT-ZI10C R&S®RT-ZI10C-2 R&S®RT-ZI10C-4
500 MHz, 100:1, isolated, 600 V CAT IV, 1000 V CAT III (3540 V CAT 0)	R&S®RT-ZI11

Current probes

20 kHz, 2000 A, AC/DC	R&S®RT-ZC02
100 kHz, 30 A, AC/DC	R&S®RT-ZC03

Accessories

Accessory extension set for R&S®RT-ZI10/ R&S®RT-ZI11 passive probe	R&S®RT-ZA21
Soft carrying bag	R&S®HA-Z220
Hard shell protective carrying case	R&S®RTH-Z4
Car adapter	R&S®HA-Z302
Battery charger for lithium-ion battery	R&S®HA-Z303
Replacement lithium-ion battery pack	R&S®HA-Z306

Languages supported: English, German, French, Spanish, Russian, simplified and traditional Chinese, Korean and Japanese.