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.

<table>
<thead>
<tr>
<th>Your benefit</th>
<th>Features</th>
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<tr>
<td>High bandwidth and superior performance</td>
<td>60 MHz to 500 MHz bandwidth with channel isolation for up to 1000 V (RMS)</td>
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<td>High-resolution signal acquisition with 10-bit A/D converter</td>
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<td>Excellent sensitivity: 2 mV/div to 100 V/div</td>
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<td>Advanced triggering capabilities</td>
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<td>33 automatic measurement functions</td>
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<td>Outstanding protection</td>
<td>Isolated input channels: CAT IV 600 V/CAT III 1000 V</td>
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<td>IP51 housing that meets military requirements</td>
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<td>Dedicated power electronics functions</td>
<td>Automatic harmonics analyzer</td>
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<td>33 automatic measurement functions, including active, apparent and reactive power as well as power factor</td>
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<td>User-selectable digital lowpass filter</td>
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<td>Ideal for digital power; easily extendable for future needs</td>
<td>Serial trigger &amp; decode options: I²C/SPI, UART, CAN/LIN, CAN-FD, SENT</td>
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<td>Advanced analysis options: spectrum analyzer, frequency analyzer, logic analyzer</td>
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Dedicated passive probes for high-quality measurements

Advanced trigger capabilities

Harmonics analysis function on up to four channels

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.

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

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

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

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

Rohde & Schwarz GmbH & Co. KG | Europe, Africa, Middle East +49 89 4129 12345 | North America 1 888 TEST RSA (1 888 837 87 72)
Latin America +1 410 910 79 88 | Asia Pacific +65 65 13 04 88 | China +86 800 810 82 28 / +86 400 650 58 96
www.rohde-schwarz.com | customersupport@rohde-schwarz.com
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Popular options/accessories

Software options

- PC/SPI serial trigger & decode
- UART/RS-232/422/485 serial trigger & decode
- History/segmented memory
- Advanced triggering
- Frequency counter
- Harmonics analysis
- Wireless LAN
- Web interface remote control

Passive probes

- 500 MHz, 10:1, isolated, 300 V CAT III, compact lab probe
- 500 MHz, 100:1, isolated, 600 V CAT IV, 1000 V CAT III (3540 V CAT 0)

Current probes

- 20 kHz, 2000 A, AC/DC
- 100 kHz, 30 A, AC/DC

Accessories

- Accessory extension set for R&S®RT-Z110/R&S®RT-Z111 passive probe
- Soft carrying bag
- Hard shell protective carrying case
- Car adapter
- Battery charger for lithium-ion battery
- Replacement lithium-ion battery pack

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