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Measurement confidence.

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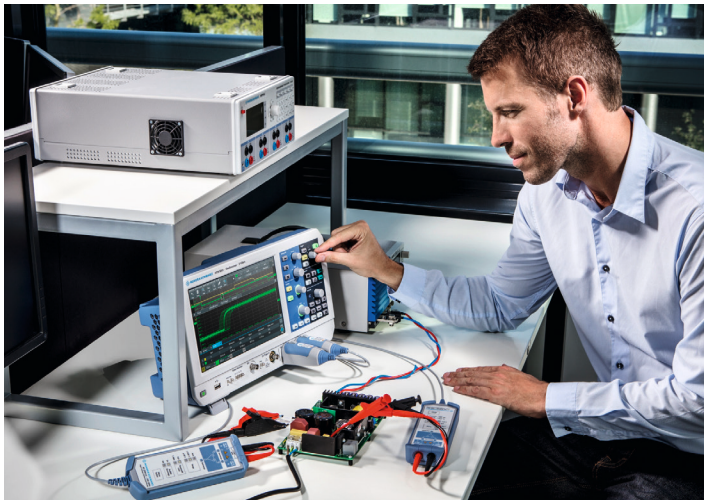
ROHDE&SCHWARZ

Applications

Power Analysis

Analysis tools support verification and debugging during the development of current and voltage supply circuits. The R&S®RTx-K31 power analysis option facilitates the analysis of the turn on/off behavior, the internal transfer function of the overall circuit, the safe operating area (SOA), the output signal quality and any loss. For measuring of high dynamic voltage and current signals a complete set of voltage probes from µV to kV and current probes form mA to A are available from Rohde&Schwarz.



Measurement functions of the R&S®RTx-K31 option

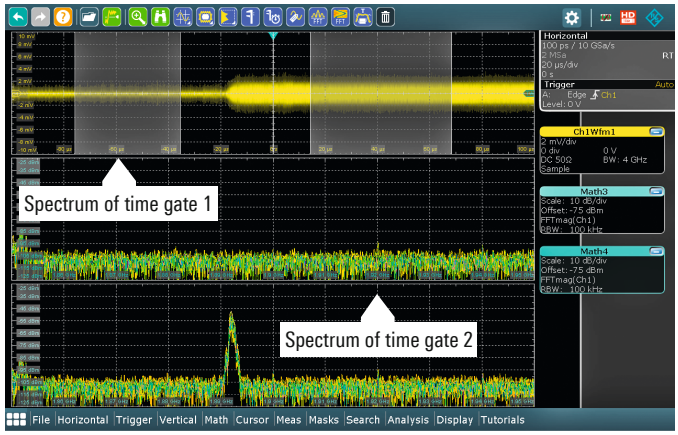
Measurement	Measurement functions
Current harmonics	▪ EN 61000-3-2 class A, B, C, D ▪ MIL-STD-1399 ▪ RTCA DO-160
Input	▪ inrush current ▪ power quality ▪ power consumption
Power converter control	▪ modulation analysis ▪ slew rate ▪ dynamic on-resistance
Power path	▪ safe operating area (SOA mask editor) ▪ turn on/off ▪ switching loss ▪ power efficiency
Output	▪ output ripple ▪ transient response ▪ output spectrum

R&S®RTM3000
Digital Oscilloscope
Power of ten

Starting at
€ 3,190

Spectrum Analysis

Electronic circuits are driven with ever faster signals with very short rise times. This is the root cause for the growing importance to measure electromagnetic emissions and their possible influence on the circuit or other systems. Based on decades of experience in advanced spectrum analysis, Rohde&Schwarz implemented corresponding technologies like digital down conversion or overlapping FFT in their Oscilloscopes as an industry first. The R&S®RTx-K18 Options offer unbeatable speed, easy to use, spectrogram and marker for EMI Analysis in the development phase.



Fast analysis in frequency domain using automatic peak marker and spectrogram

Power of ten

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Starting at
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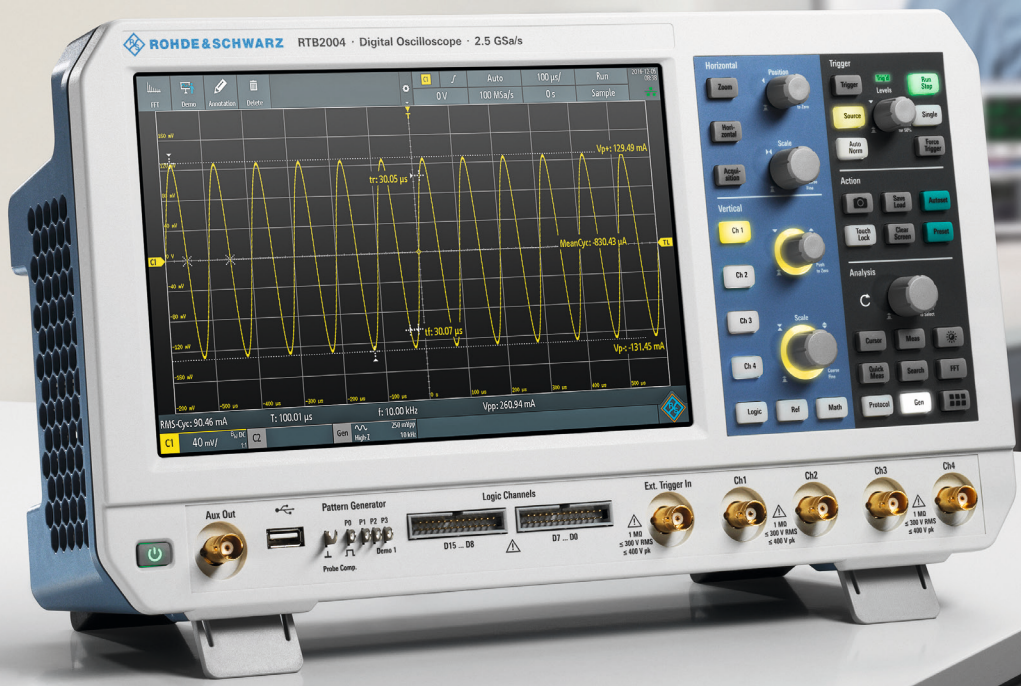

Analysis

We continually enhance our oscilloscope portfolio with new models, applications and accessories to ensure high quality analysis.

R&S® family	Measure	Math	Mask test	Serial protocol triggering and decoding[1]	Display functions	Applications[1]	Generator[1]	Compliance tests[1]
RTH1000	cursor, parameter	elementary	elementary (tolerance mask around the signal)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, CAN-FD, SENT (7)	data logger	high resolution frequency counter, advanced spectrum analysis, harmonics analysis		–
RTC1000	cursor, parameter	elementary	elementary (tolerance mask around the signal)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN (5)	–	–	1Ch Function, 4 Bit Pattern [1) 2)]	–
RTB2000	cursor, parameter incl. Statistic	elementary	elementary (tolerance mask around the signal)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN (5)	–	digital voltmeter (DVM)	1Ch Function & Arbitrary, 4 Bit Pattern [1) 2)]	–
RTM3000	cursor, parameter incl. Statistic	basic (math on math)	elementary (tolerance mask around the signal)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429 (8)	–	power, digital voltmeter (DVM), spectrum analysis and spectrogram	1Ch Function & Arbitrary, 4 Bit Pattern [1) 2)]	–
RTA4000	cursor, parameter incl. Statistic	basic (math on math)	elementary (tolerance mask around the signal)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429 (8)	–	power, digital voltmeter (DVM), spectrum analysis and spectrogram	1Ch Function & Arbitrary, 4 Bit Pattern [1) 2)]	–
RTE1000	cursor, parameter incl. Statistic, parameter math	advanced (formula editor)	advanced (freely configurable, hardware-based)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429, FlexRay™, CAN-FD, USB 2.0/HSIC, Ethernet, Manchester, NRZ, SENT, SpaceWire, CXPI, USB Power Delivery, automotive Ethernet 100BASE-T1 (19)	histogram, trend, track[2]	power, 16-bit high definition mode (standard), advanced spectrum analysis and spectrogram	2 Ch Function & Arbitrary, 8 Bit Pattern [1) 2)]	–
RTO2000	cursor, parameter incl. Statistic, parameter math	advanced (formula editor)	advanced (freely configurable, hardware-based)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429, FlexRay™, CAN-FD, MIPI RFFE, USB 2.0/HSIC, MDIO, 8b 10b, Ethernet, Manchester, NRZ, SENT, MIPI D-PHY, SpaceWire, MIPI M-PHY/UniPro, CXPI, USB 3.1 Gen1, USB-SSIC, PCIe 1.1/2.0, USB Power Delivery, automotive Ethernet 100BASE-T1 (27)	histogram, trend, track[2]	power, 16-bit high definition mode, advanced spectrum analysis and spectrogram, jitter, clock data recovery, I/Q data, RF analysis	2 Ch Function & Arbitrary, 8 Bit Pattern [1) 2)]	various options available, for details see data sheet (PD 3607.2684.22)

[1] Upgradeable. [2] Requires an option

Oscilloscope portfolio

Excellent signal fidelity, high acquisition rate, innovative trigger system and a clever user interface are what you get with a Rohde&Schwarz oscilloscope.

Choose from a wide range of oscilloscopes, from value class for service, maintenance and education to our top instruments for R&D or EMI debugging in the 600 MHz to 6 GHz class. Benefit from the high quality and in-depth development and production expertise at Rohde&Schwarz.

R&S® family	RTH1000	RTC1000	RTB2000	RTM3000
Vertical				
Bandwidth	60/100/200/350/500 MHz [1]	50/70/100/200/300 MHz [1]	70/100//200/300 MHz [1]	100/200/350/500 MHz/1 GHz [1]
Number of channels	2 plus DMM/4	2	2/4	2/4
V/div 1 MΩ	2 mV to 100 V	1 mV to 10 V	1 mV to 5 V	500 µV to 10 V
V/div 50 Ω	–			500 µV to 1 V
Horizontal				
Sampling rate	1.25 Gsample/s per channel (4-channel model); 2.5 Gsample/s per channel (2-channel model); 5 Gsample/s (all channels interleaved)	1 Gsample/s per channel 2 Gsample/s (2 channels interleaved)	1.25 Gsample/s per channel; 2.5 Gsample/s (2 channels interleaved)	2.5 Gsample/s per channel; 5 Gsample/s (2 channels interleaved)
Max. memory (per channel/1 channel active)	125 ksample (4-channel model); 250 ksample (2-channel model); 500 ksample (50 Msample in segmented memory mode [2])	1 Msample; 2 Msample	10 Msample; 20 Msample (160 Msample in segmented memory mode [2])	40 Msample; 80 Msample (400 Msample in segmented memory mode [2])
Segmented memory	option	–	option	option
Acquisition rate	50 000 waveforms/s	10 000 waveforms/s	50 000 waveforms/s (300 000 waveforms/s in fast segmented memory mode [2])	64 000 waveforms/s (700 000 waveforms/s in fast segmented memory mode [2])
Trigger				
Options	advanced, digital trigger (14 trigger types) [2]	elementary (5 trigger types)	basic (6 trigger types)	basic (7 trigger types)
Mixed signal option				
No. of digital channels [1]	8	8	16	16
Sampling rate of digital channels	1.25 Gsample/s	1 Gsample/s	1.25 Gsample/s	two logic probes: 2.5 Gsample/s on each channel; one logic probe: 5 Gsample/s on each channel
Memory of digital channels	125 ksample	1 Msample	10 Msample	40 Msample
Display and operation				
Size and resolution	7", color, 800 × 480 pixel	6.5", color, 640 × 480 pixel	10.1", color, 1280 × 800 pixel	10.1", color, 1280 × 800 pixel
Operation	optimized for touchscreen operation, parallel button operation	optimized for fast button operation	optimized for touchscreen operation, parallel button operation	
General data				
Size in mm (W × H × D)	201 × 293 × 74	285 × 175 × 140	390 × 220 × 152	390 × 220 × 152
Weight in kg	2.4	1.7	2.5	3.3
Battery	lithium-ion, > 4 h	–	–	–

[1] Upgradeable. [2] Requires an option.

	RTA4000	RTE1000	RTO2000
	200/350/500 MHz/1 GHz [1]	200/350/500 MHz/1/1.5/2 GHz [1]	600 MHz/1/2/3/4/6 GHz [1]
	4	2/4	2/4 (only 4 channels in 4 GHz and 6 GHz model)
	500 µV to 10 V	500 µV to 10 V	1 mV to 10 V (500 µV to 10 V) [2]
	500 µV to 1 V	500 µV to 5 V	1 mV to 1 V (500 µV to 1 V) [2]
	2.5 Gsample/s per channel; 5 Gsample/s (2 channels interleaved)	5 Gsample/s per channel	10 Gsample/s per channel; 20 Gsample/s (2 channels interleaved in 4 GHz and 6 GHz model)
	100 Msample; 200 Msample (1 Gsample in segmented memory mode)	50 Msample/200 Msample	standard: 50 Msample/200 Msample; max. upgrade: 1 Gsample/2 Gsample
	standard	standard	standard
	64 000 waveforms/s (700 000 waveforms/s in fast segmented memory mode)	1 000 000 waveforms/s (2 000 000 waveforms/s in ultra-segmented memory mode)	1 000 000 waveforms/s (3 000 000 waveforms/s in ultra-segmented memory mode)
	basic (7 trigger types)	advanced, digital trigger (13 trigger types)	advanced (includes zone trigger), digital trigger (14 trigger types) [2]
	16	16	16
	two logic probes: 2.5 Gsample/s on each channel; one logic probe: 5 Gsample/s on each channel	5 Gsample/s	5 Gsample/s
	100 Msample	100 Msample	200 Msample
	10.1", color, 1280 × 800 pixel	10.4", color, 1024 × 768 pixel	12.1", color, 1280 × 800 pixel
	optimized for touchscreen operation, parallel button operation		
	390 × 220 × 152	427 × 249 × 204	427 × 249 × 204
	3.3	8.6	9.6
	–	–	–

Probe portfolio

Type	Sort	Bandwidth	Dynamic range
R&S®RT-ZP10	passive, single ended, 10:1	500 MHz	400 V (RMS)
R&S®RT-ZH10	passive, single ended, 100:1	400 MHz	1 kV (RMS)
R&S®RT-ZH11	passive, single ended, 1000:1	400 MHz	1 kV (RMS)
R&S®RT-ZI10	passive, single ended, 10:1, isolated	500 MHz	600 V CAT IV / 1000 V CAT III
R&S®RZ-ZI10C	passive, single ended 10:1, isolated, compact	500MHz	300 V CAT III
R&S®RT-ZI11	passive, single ended, 100:1, isolated	500 MHz	600 V CAT IV / 1000 V CAT III / 3540 V CAT I
R&S®RT-ZZ80	passive, single ended, 10:1, broadband	8 GHz	20 V (RMS)
R&S®RT-ZP1X	passive, single ended, 1:1	38 MHz	55 V (RMS)
R&S® RT-ZPR20/40	active, single ended, 1:1 [2]	2/4 GHz	±850 mV
R&S®RT-ZS10L	active, single ended, 10:1	1 GHz	±8 V
R&S®RT-ZS10E	active, single ended, 10:1 [2]	1 GHz	±8 V
R&S®RT-ZS10/20/30/60	active, single ended, 10:1 [1] [2]	1/1,5/3/6 GHz	±8 V
R&S®RT-ZD01	active, differential, 100:1/1000:1	100 MHz	±140 V (100:1) / ±1400 V (1000:1)
R&S®RT-ZD002	active, differential, 10:1/100:1	25 MHz	±700 V
R&S®RT-ZD003	active, differential, 20:1/200:1	25 MHz	±1400 V
R&S®RT-ZD02	active, differential, 10:1	200 MHz	±20 V
R&S®RT-ZD08	active, differential, 10:1	800 MHz	±15 V
R&S®RT-ZD10/20/30	active, differential, 10:1 [1] [2]	1/1,5/3 GHz	±5 V, with R&S®RT-ZA15: ±70 V DC / ±46 V AC (peak)
R&S®RT-ZD40	active, differential, 10:1 [1] [2]	4,5 GHz	±5 V
R&S®RT-ZM15/30/60/90	active, multimode amplifier module, 10:1 / 1:1 [1] [2]	1,5/3/6/9 GHz	depends on tip module used
R&S®RT-ZMA10	Solder-In [3]	[4]	±2.5 V in 10:1 mode, ±0.5 V in 1:1 mode
R&S®RT-ZMA12	Square Pin [3]	[4], max. 6 GHz	±2.5 V in 10:1 mode, ±0.5 V in 1:1 Mode
R&S®RT-ZMA15	Quick Connect [3]	[4]	±2.5 V in 10:1 mode, ±0.5 V in 1:1 mode
R&S®RT-ZMA30	Browser [3]	[4]	±2.5 V in 10:1 mode, ±0.5 V in 1:1 mode
R&S®RT-ZMA40	SMA [3]	[4], max. 6 GHz	±2.5 V in 10:1 mode, ±0.5 V im 1:1 mode
R&S®RT-ZMA50	extreme temperature Solder-In [3]	[4], max. 2,5 GHz	±2.5 V in 10:1 mode, ±0.5 V im 1:1 mode
R&S®RT-ZHD07	active, differential, 25:1/250:1 [1] [2]	200 MHz	±750 V (peak)
R&S®RT-ZHD15/16	active, differential, 50:1/500:1 [1] [2]	100/200 MHz	±1500 V (peak)
R&S®RT-ZHD60	active, differential, 100:1/1000:1 [1] [2]	100 MHz	±6000 V (peak)
R&S®RT-ZC02	AC/DC, current probe	20 kHz	100 A (RMS) / 1000 A (RMS), 0.01 V/A/0.001 V/A switchable
R&S®RT-ZC03	AC/DC, current probe	100 kHz	20 A (RMS) / ±30 A (peak), 0.1 V/A
R&S®RT-ZC05B	AC/DC, current probe [2]	2 MHz	500 A (RMS) / ±700 A (peak), 0.01 V/A
R&S®RT-ZC10/B	AC/DC, current probe [2]	10 MHz	150 A (RMS) / ±300 A (peak), 0.01 V/A
R&S®RT-ZC15B	AC/DC, current probe [2]	50 MHz	30 A (RMS) / ±50 A (peak), 0.1 V/A
R&S®RT-ZC20/B	AC/DC, current probe [2]	100 MHz	30 A (RMS) / ±50 A (peak), 0.1 V/A
R&S®RT-ZC30	AC/DC, high sensitive current probe	120 MHz	5 A (RMS) / ±7.5 A (peak), 1 V/A
R&S®HZ-14	active, E and H near-field probe set [5]	9 kHz to 1 GHz	N/A
R&S®HZ-15	passive, E and H near-field probes	30 MHz to 3 GHz	
R&S®HZ-17	compact H near-field probe set	30 MHz to 3 GHz	N/A

[1] R&S®ProbeMeter and micro button for instrument control

[2] With Rohde&Schwarz interface

[3] Tip module for R&S®RT-ZMxx

[4] Depend on amplifier module

[5] Requires R&S®HZ-9 external power supply

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Rohde&Schwarz GmbH&Co. KG
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Regional contact

- Europe, Africa, Middle East | +49 89 4129 12345
  customersupport@rohde-schwarz.com
- North America | 1 888 TEST RSA (1 888 837 87 72)
  customer.support@rsa.rohde-schwarz.com
- Latin America | +1 410 910 79 88
  customersupport.la@rohde-schwarz.com
- Asia Pacific | +65 65 13 04 88
  customersupport.asia@rohde-schwarz.com
- China | +86 800 810 82 28 | +86 400 650 58 96
  customersupport.china@rohde-schwarz.com

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