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ROHDE&SCHWARZ

Make ideas real

OSCILLOSCOPE INNOVATION. MEASUREMENT CONFIDENCE.

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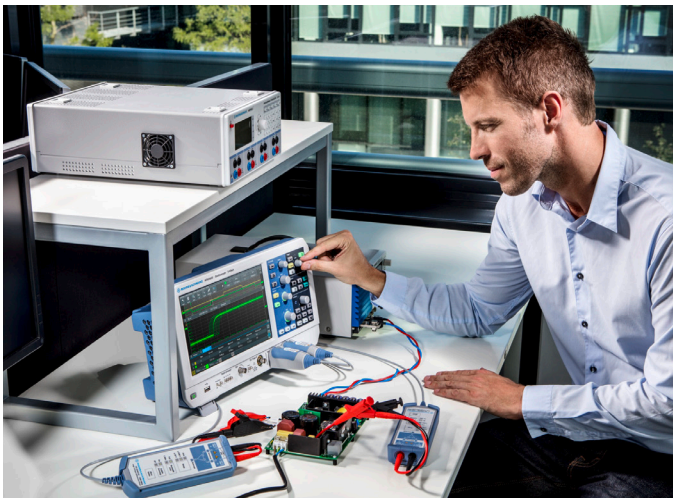
APPLICATIONS

Power analysis

Analysis tools help developers verify and debug current and voltage supply circuits. The R&S®RTx-K31 power analysis option facilitates analysis of the turn on/off behavior, the circuit's internal transfer function, the safe operating area (SOA), the output signal quality and any loss. To measure voltage and current signals, users can choose from a wide selection of Rohde&Schwarz voltage probes ranging from µV to kV and current probes from mA to A.



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

GET IN TOUCH WITH THE POWER OF TEN.

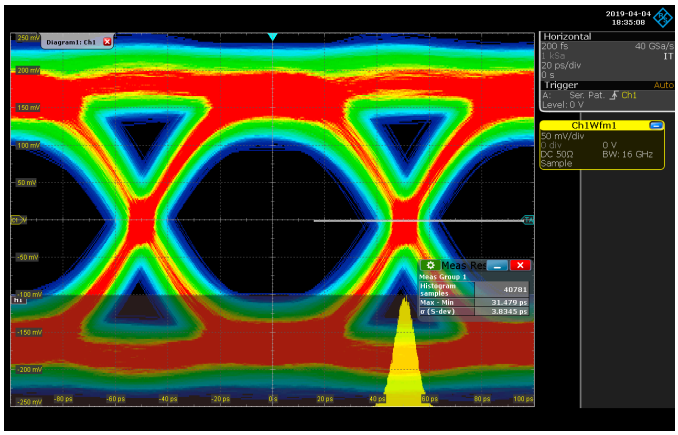
Signal integrity debugging

The R&S®RTP oscilloscopes offer various analysis and measurement tools for analyzing the signal integrity of high-speed interfaces and designs:

- ► High-speed serial pattern trigger with 8/16 Gbps clock data recovery (CDR)
- ► Real-time deembedding for signal path correction
- ► Compliance test solutions for USB, Ethernet, PCIe, MIPI, DDR
- ► Trigger and decode solutions for various standards
- ► First TDR/TDT solution in a real-time oscilloscope

Wideband and multichannel RF signal analysis

The R&S®RTP oscilloscopes enable users to perform precise wideband and multichannel RF measurements. To analyze pulsed radar and digitally modulated signals, the oscilloscope converts the input signal to I/Q data for further analysis with the R&S®VSE vector signal explorer software. External analysis tools such as MATLAB® can be used to analyze proprietary signals with maximum flexibility applying customized algorithms.



The high-speed serial pattern trigger and the hardware-based CDR enable fastest eye diagram measurements

5G NR signal analysis with the R&S®VSE vector signal explorer software

HIGH PERFORMANCE, BENCHTOP VERSATILITY.

Now up to 16 GHz

ANALYSIS

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

R&S®	RTH1000	RTC1000	RTB2000	RTM3000	RTA4000	RTE1000	RTO2000	RTP
Measure	cursor, parameter	cursor, parameter	cursor, parameter incl. statistics	cursor, parameter incl. statistics	cursor, parameter incl. statistics	cursor, parameter incl. statistics	cursor, parameter incl. statistics	cursor, parameter incl. statistics
Mathematics	elementary	elementary	basic (math on math)	basic (math on math)	basic (math on math)	advanced (formula editor)	advanced (formula editor)	advanced (formula editor)
Mask test	elementary (tolerance mask around signal)	elementary (tolerance mask around signal)	elementary (tolerance mask around signal)	elementary (tolerance mask around signal)	elementary (tolerance mask around signal)	advanced (user-configurable, hardware based)	advanced (user-configurable, hardware based)	advanced (user-configurable, hardware based)
Serial protocols triggering and decoding [1]	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN, CAN-FD, SENT	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429	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	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, 8b10b, 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	I²C, SPI, UART/ RS-232/RS-422/ RS-485, CAN, LIN, MIL-STD-1553, ARINC 429, CAN-FD, MIPI RFFE, USB 2.0/ HSIC, MDIO, 8b10b, Ethernet, Manchester, NRZ, MIPI D-PHY, SpaceWire, MIPI M-PHY/UniPro, USB 3.1 Gen1/ Gen2, USB-SSIC, PCIe 1.1/2.0, USB Power Delivery, automotive Ethernet 100BASE-T1
Display functions	data logger	–	–	–	–	histogram, trend, track [2]	histogram, trend, track [2]	histogram, trend, track [2]
Applications [1]	high-resolution frequency counter, advanced spectrum analysis, harmonics analysis	digital voltmeter (DVM), component tester, fast Fourier transform (FFT)	digital voltmeter (DVM), fast Fourier transform (FFT), frequency response analysis [3]	power, digital voltmeter (DVM), spectrum analysis and spectrogram, frequency response analysis [3]	power, digital voltmeter (DVM), spectrum analysis and spectrogram, frequency response analysis [3]	power, 16-bit high definition mode (standard), advanced spectrum analysis and spectrogram	power, 16-bit high definition mode (standard), advanced spectrum analysis and spectrogram, jitter, clock data recovery, I/Q data, RF analysis, deembedding, TDR/TDT analysis	16-bit high definition mode, advanced spectrum analysis and spectrogram, jitter, RF analysis, real-time deembedding, TDR/TDT analysis, I/Q data, HS serial pattern trigger with 8/16 Gbps CDR, TDR/TDT analysis
Generator [1]	–	1-channel function, 4-bit pattern [1, 2]	1-channel function, 1-channel arbitrary, 4-bit pattern [1, 2]	1-channel function, 1-channel arbitrary, 4-bit pattern [1, 2]	1-channel function, 1-channel arbitrary, 4-bit pattern [1, 2]	2-channel function, 2-channel arbitrary, 8-bit pattern [1, 2]	2-channel function, 2-channel arbitrary, 8-bit pattern [1, 2], 16 GHz differential pulse source	2-channel function, 2-channel arbitrary, 8-bit pattern [1, 2], 16 GHz differential pulse source
Compliance testing [1]	–	–	–	–	–	–	various options available (see PD 3607.2684.22)	various options available (see PD 5215.4152.22)

[1] Upgradeable. [2] Requires an option. [3] Available Q1 2019.

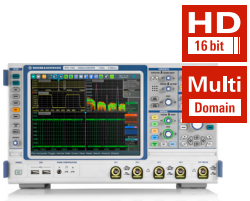
OSCILLOSCOPE PORTFOLIO

R&S®	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
Resolution	10 bit	8 bit	10 bit	10 bit
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 per channel (in Gsample/s)	1.25 (4-channel model); 2.5 (2-channel model); 5 (all channels interleaved)	1; 2 (2 channels interleaved)	1.25; 2.5 (2 channels interleaved)	2.5; 5 (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 (in waveforms/s)	50 000	10 000	50 000 (300 000 in fast segmented memory mode [2])	64 000 (2 000 000 in fast segmented memory mode [2])
Trigger				
Options	advanced, digital trigger (14 trigger types) [2]	elementary (5 trigger types)	basic (7 trigger types)	basic (10 trigger types)
Mixed signal option				
No. of digital channels [1]	8	8	16	16
Sampling rate of digital channels (in Gsample/s)	1.25	1	1.25	two logic probes: 2.5 on each channel; one logic probe: 5 on each channel
Memory of digital channels	125 ksample	1 Msample	10 Msample	two logic probes: 40 Msample per channel; one logic probe: 80 Msample per channel
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				
Dimenstions 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. [3] Available Q1 2019.

Excellent signal fidelity, high acquisition rates, an innovative trigger system and a smart user interface – that is what you get with a Rohde&Schwarz oscilloscope.

Choose from a wide range of oscilloscopes, from high-volume oscilloscopes for service, maintenance and education to top-class instruments for R&D and EMI debugging in the 600 MHz to 16 GHz range. Benefit from the high product quality and in-depth development and production expertise offered by Rohde&Schwarz.



RTA4000	RTE1000	RTO2000	RTP
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]	4/6/8/13/16 GHz [1]
4	2/4	2/4 (only 4 channels in 4 GHz and 6 GHz models)	4
10 bit	8 bit (up to 16 bit with HD mode)	8 bit (up to 16 bit with HD mode)	8 bit (up to 16 bit with HD mode)
500 µV to 10 V	500 µV to 10 V	1 mV to 10 V (500 µV to 10 V) [2]	2 mV to 10 V (with R&S®RT-Z1M adapter)
500 µV to 1 V	500 µV to 1 V	1 mV to 1 V (500 µV to 1 V) [2]	2 mV to 1 V [2]
2.5; 5 (2 channels interleaved)	5	10; 20 (2 channels interleaved in 4 GHz and 6 GHz model)	20; 40 (2 channels interleaved)
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: 50 Msample/200 Msample; max. upgrade: 1 Gsample/2 Gsample
standard	standard	standard	standard
64 000 (2 000 000 in fast segmented memory mode)	1 000 000 (1 600 000 in ultra-segmented memory mode)	1 000 000 (2 500 000 in ultra-segmented memory mode)	> 750 000 (3 200 000 in ultra-segmented memory mode)
basic (10 trigger types)	advanced, digital trigger (13 trigger types)	advanced (includes zone trigger), digital trigger (14 trigger types) [2]	advanced, digital trigger (14 trigger types) with real-time deembedding [2], high-speed serial pattern trigger with 8/16 Gbps CDR [2], zone trigger [2]
16	16	16	16
two logic probes: 2.5 on each channel; one logic probe: 5 on each channel	5	5	5
two logic probes: 100 Msample per channel; one logic probe: 200 Msample per channel	100 Msample	200 Msample	200 Msample
10.1", color, 1280 × 800 pixel	10.4", color, 1024 × 768 pixel	12.1", color, 1280 × 800 pixel	12.1", color, 1280 × 800 pixel
optimized for touchscreen operation, parallel button operation			
390 × 220 × 152	427 × 249 × 204	427 × 249 × 204	441 × 285 × 316
3.3	8.6	9.6	18
–	–	–	–

PROBE PORTFOLIO

Probe type

- Passive
- Active single-ended
- Active differential
- Modular
- Power rail
- Multi-channel
- High voltage
- Current
- Near-field

Type	Description	Bandwidth	Dynamic range
R&S®RT-ZP10	passive, single-ended, 10:1	500 MHz	400 V (RMS)
R&S®RT-ZI10	passive, single-ended, 10:1, isolated	500 MHz	600 V CAT IV, 1000 V CAT III
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-ZS10L	active, single-ended, 10:1	1 GHz	±8 V
R&S®RT-ZS10E	active, single-ended, 10:1 [1]	1 GHz	±8 V
R&S®RT-ZS10/20/30/60	active, single-ended, 10:1 [1, 2]	1/1.5/3/6/13/16 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-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-ZM15/30/60/90/130/160	active, multimode amplifier module, 10:1/2:1 [1, 2]	1.5/3/6/9/13/16 GHz	depends on tip module used
R&S®RT-ZMA10	solder-in [3]	[4]	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA12	square-pin [3]	[4], max. 6 GHz	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA14	flex solder-in [3]	[4]	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA15	quick-connect [3]	[4]	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA30	browser [3]	[4]	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA40	SMA [3]	[4], max. 6 GHz	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZMA50	extreme temperature solder-in [3]	[4], max. 2.5 GHz	±2.5 V (10:1), ±0.5 V (1:1)
R&S®RT-ZPR20/40	active, single-ended, 1:1 [1]	2 GHz/4 GHz	±850 mV
R&S®RT-ZVC02/04	multi-channel power probe	1 MHz	±1.8 V to ±15 V, ±4.5 µA to ±10 A
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®RZ-ZI10C	passive, single-ended, 10:1, isolated, compact	500 MHz	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 0
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-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 MHz/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 [1]	2 MHz	500 A (RMS), ±700 A (peak), 0.01 V/A
R&S®RT-ZC10/B	AC/DC current probe [1]	10 MHz	150 A (RMS), ±300 A (peak), 0.01 V/A
R&S®RT-ZC15B	AC/DC current probe [1]	50 MHz	30 A (RMS), ±50 A (peak), 0.1 V/A
R&S®RT-ZC20/B	AC/DC current probe [1]	100 MHz	30 A (RMS), ±50 A (peak), 0.1 V/A
R&S®RT-ZC30	AC/DC high-sensitivity 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 probe set	30 MHz to 3 GHz	N/A
R&S®HZ-17	compact H near-field probe set	30 MHz to 3 GHz	N/A

[1] Includes Rohde&Schwarz probe interface.
[2] Includes R&S®ProbeMeter and micro button for instrument control.
[3] Tip module for R&S®RT-ZMxx probes.
[4] Depends on amplifier module.
[5] Requires R&S®HZ-9 external power supply.

Service that adds value

- Worldwide
- Local und personalized
- Customized and flexibel
- Uncompromising quality
- Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

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