

# R&S® RT-ZXX HIGH BANDWIDTH PROBES

Specifications

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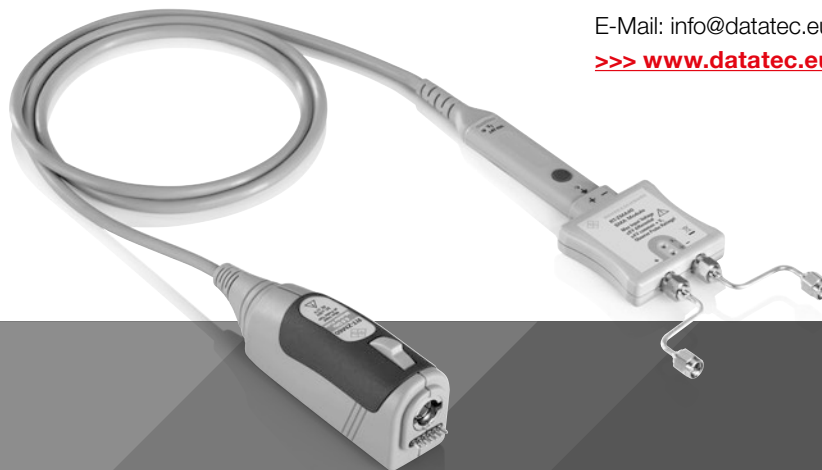
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Data Sheet | Version 26.00

**ROHDE & SCHWARZ**

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## Definitions

### General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to

### Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as  $<$ ,  $\leq$ ,  $>$ ,  $\geq$ ,  $\pm$ , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.

### Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

### Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with  $<$ ,  $>$  or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

### Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

Typical data as well as measured values are not warranted by Rohde & Schwarz.

## Probe/oscilloscope chart

| Base unit:<br>R&S®         | RTM3000<br>RTA4000<br>MXO 4 | RTE<br>RTO6 |           |       |       |       |       | RTP   |       |       |        |        | Page |
|----------------------------|-----------------------------|-------------|-----------|-------|-------|-------|-------|-------|-------|-------|--------|--------|------|
| Probe:<br>R&S®             | ≤ 500 MHz                   | 1 GHz       | ≤ 600 MHz | 1 GHz | 2 GHz | 4 GHz | 6 GHz | 4 GHz | 6 GHz | 8 GHz | 13 GHz | 16 GHz |      |
| <b>Passive probes</b>      |                             |             |           |       |       |       |       |       |       |       |        |        |      |
| RT-ZZ80                    | ○                           | ●           | ●         | ●     | ●     | ●     | ●     | ●     | ●     | ●     | ●      | ●      | 6    |
| <b>Active probes</b>       |                             |             |           |       |       |       |       |       |       |       |        |        |      |
| RT-ZS10L <sup>1</sup>      | ○                           | ○           | ○         | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 8    |
| RT-ZS10E                   | ●                           | ○           | ●         | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 11   |
| RT-ZS10                    | ●                           | ○           | ●         | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 11   |
| RT-ZS20                    | ○                           | ●           | ○         | ●     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 11   |
| RT-ZS30                    | ○                           | ○           | ○         | ○     | ●     | ●     | ●     | ●     | ●     | ●     | ●      | ●      | 11   |
| RT-ZS60                    | ○                           | ○           | ○         | ○     | ○     | ●     | ●     | ●     | ●     | ●     | ●      | ●      | 16   |
| <b>Differential probes</b> |                             |             |           |       |       |       |       |       |       |       |        |        |      |
| RT-ZD10                    | ●                           | ○           | ●         | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 19   |
| RT-ZD20                    | ○                           | ●           | ○         | ●     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 19   |
| RT-ZD30                    | ○                           | ○           | ○         | ○     | ●     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 19   |
| RT-ZD40                    | ○                           | ○           | ○         | ○     | ○     | ●     | ●     | ●     | ●     | ●     | ●      | ●      | 24   |

<sup>1</sup> The R&S®RT-ZS10L has a BNC interface and requires 50 Ω input coupling. It can be attached to oscilloscopes with 1 MΩ input coupling using a BNC feedthrough termination adapter.

| Base unit:<br>R&S® | RTM3000<br>RTA4000<br>MXO 4 |       | RTE<br>RTO6 |       |       |       |       | RTP   |       |       |        |        | Page |
|--------------------|-----------------------------|-------|-------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|------|
|                    | ≤ 500 MHz                   | 1 GHz | ≤ 600 MHz   | 1 GHz | 2 GHz | 4 GHz | 6 GHz | 4 GHz | 6 GHz | 8 GHz | 13 GHz | 16 GHz |      |
| Probe:<br>R&S®     | ≤ 500 MHz                   | 1 GHz | ≤ 600 MHz   | 1 GHz | 2 GHz | 4 GHz | 6 GHz | 4 GHz | 6 GHz | 8 GHz | 13 GHz | 16 GHz |      |
| Modular probes     |                             |       |             |       |       |       |       |       |       |       |        |        |      |
| RT-ZM15            | ○                           | ○     | ●           | ●     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 27   |
| RT-ZM30            | ○                           | ○     | ○           | ○     | ●     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 27   |
| RT-ZM60            | ○                           | ○     | ○           | ○     | ○     | ●     | ●     | ●     | ●     | ○     | ○      | ○      | 27   |
| RT-ZM90            | ○                           | ○     | ○           | ○     | ○     | ○     | ●     | ○     | ●     | ●     | ○      | ○      | 27   |
| RT-ZM130           | ○                           | ○     | ○           | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ●      | ○      | 27   |
| RT-ZM160           | ○                           | ○     | ○           | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○      | ●      | 27   |
| Power rail probes  |                             |       |             |       |       |       |       |       |       |       |        |        |      |
| RT-ZPR20           | ●                           | ●     | ●           | ●     | ●     | ○     | ○     | ○     | ○     | ○     | ○      | ○      | 34   |
| RT-ZPR40           | ○                           | ○     | ○           | ○     | ○     | ●     | ●     | ●     | ●     | ●     | ●      | ●      | 34   |

- recommended extra
- possible accessory, with limited functionality of probe or base unit

## R&S®RT-ZZ80 transmission line probe

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50  $\Omega$ .  
See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

|                                             |                                                   | R&S®RT-ZZ80           |
|---------------------------------------------|---------------------------------------------------|-----------------------|
| <b>Step response</b>                        |                                                   |                       |
| Rise time                                   | 10 % to 90 %                                      | < 60 ps               |
| <b>Frequency response</b>                   |                                                   |                       |
| Bandwidth                                   | starting at DC                                    | 8.0 GHz (meas.)       |
| <b>Input impedance</b>                      |                                                   |                       |
| DC input resistance                         | system                                            | 500 $\Omega \pm 1 \%$ |
| Input capacitance                           |                                                   | 0.3 pF (meas.)        |
| <b>DC characteristics</b>                   |                                                   |                       |
| Attenuation                                 | system                                            | 10:1                  |
| Attenuation error                           | probe only, with ideal 50 $\Omega$ load impedance | $\pm 1 \%$            |
| <b>Maximum nondestructive input voltage</b> |                                                   |                       |
| Continuous voltage                          |                                                   | 20 V (RMS)            |
| ESD tolerance                               | human body model                                  | 2 kV (meas.)          |

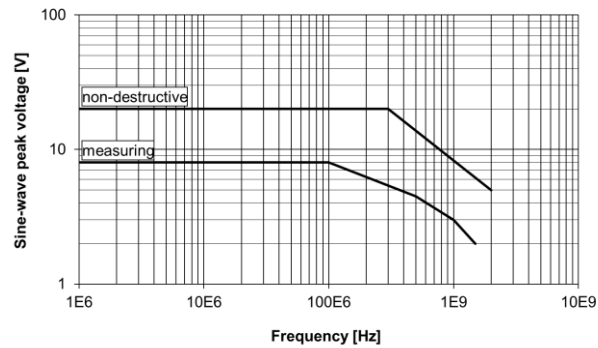
**General data**

|                             |                             |                                                                                                  |
|-----------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|
| <b>Temperature</b>          |                             |                                                                                                  |
| Temperature loading         | operating temperature range | 0 °C to +50 °C                                                                                   |
|                             | storage temperature range   | –40 °C to +70 °C                                                                                 |
| Climatic loading            |                             | +25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30 |
| Altitude                    | operation                   | up to 3000 m                                                                                     |
|                             | transport                   | up to 4600 m                                                                                     |
| <b>Calibration interval</b> |                             | 2 years                                                                                          |
| <b>Safety</b>               |                             | in line with IEC/EN 61010-1                                                                      |
| <b>RoHS</b>                 |                             | in line with EN 50581                                                                            |
| <b>Mechanical data</b>      |                             |                                                                                                  |
| Dimensions                  | probe head (L × W × H)      | approx. 68 mm × 12 mm × 7.5 mm<br>(2.68 in × 0.47 in × 0.3 in)                                   |
|                             | cable length                | approx. 1.1 m (43 in)                                                                            |
|                             | overall length              | approx. 1.2 m (48 in)                                                                            |
| Weight                      | probe only                  | approx. 40 g (0.1 lb)                                                                            |
| <b>Probe interface</b>      |                             |                                                                                                  |
| Connector                   |                             | SMA                                                                                              |

## R&S®RT-ZS10L active probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 50  $\Omega$ . See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

|                                    |                                                   | R&S®RT-ZS10L         |
|------------------------------------|---------------------------------------------------|----------------------|
| <b>Step response</b>               |                                                   |                      |
| Rise time                          | 10 % to 90 %, calculated from 0.35/bandwidth      | 350 ps               |
| <b>Frequency response</b>          |                                                   |                      |
| Bandwidth                          | starting at DC                                    | > 1 GHz (meas.)      |
| <b>Input impedance</b>             |                                                   |                      |
| DC input resistance                |                                                   | 1 M $\Omega$ (meas.) |
| Input capacitance                  |                                                   | 0.9 pF (meas.)       |
| <b>DC characteristics</b>          |                                                   |                      |
| Dynamic range                      | derated, see figure on page 9                     | $\pm 8$ V            |
| Attenuation                        |                                                   | 10:1                 |
| Attenuation error                  | probe only, with ideal 50 $\Omega$ load impedance | $\pm 0.5$ % (meas.)  |
| <b>Maximum rated input voltage</b> |                                                   |                      |
| DC                                 |                                                   | $\pm 20$ V           |
| AC                                 | derated, see figure on page 9                     | 20 V ( $V_p$ )       |
| <b>Base unit</b>                   |                                                   |                      |
| Input coupling                     |                                                   | 50 $\Omega$          |



*R&S®RT-ZS10L maximum rated sine-wave peak voltage versus frequency*

**General data**

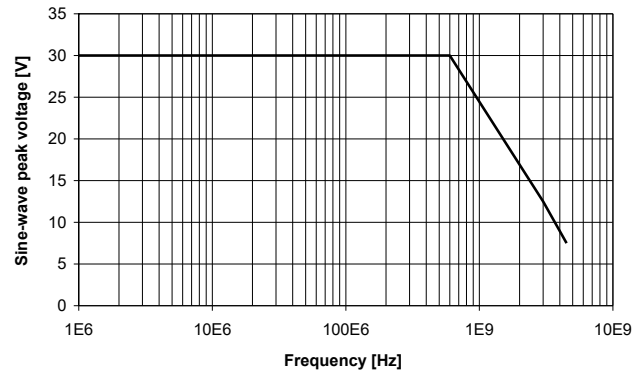
|                             |                             | <b>R&amp;S®RT-ZS10L</b>                                                                     |
|-----------------------------|-----------------------------|---------------------------------------------------------------------------------------------|
| <b>Temperature</b>          |                             |                                                                                             |
| Temperature loading         | operating temperature range | 0 °C to +50 °C                                                                              |
|                             | storage temperature range   | –40 °C to +70 °C                                                                            |
| Climatic loading            |                             | 80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +50 °C |
| Altitude                    | operation                   | up to 2000 m                                                                                |
|                             | transport                   | up to 15 000 m                                                                              |
| <b>Safety</b>               |                             | in line with EN 61010-1                                                                     |
| <b>RoHS</b>                 |                             | in line with EN 50581                                                                       |
| <b>EMC</b>                  |                             | in line with EN 61326-1                                                                     |
| <b>Calibration interval</b> |                             | 2 years                                                                                     |
| <b>Mechanical data</b>      |                             |                                                                                             |
| Dimensions                  | probe head (L × W × H)      | approx. 111 mm × 22 mm × 14 mm<br>(4.3 in × 0.9 in × 0.6 in)                                |
|                             | length of probe cable       | approx. 1.3 m (51 in)                                                                       |
| Weight                      | probe only                  | approx. 96 g (0.21 lb)                                                                      |
| <b>Probe interface</b>      |                             |                                                                                             |
| Connector                   |                             | BNC                                                                                         |
| Supply type                 |                             | use the provided power adaptor only                                                         |

## R&S®RT-ZS10/-ZS10E/-ZS20/-ZS30 active probes

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50 Ω.  
See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

|                                |                                                                      | R&S®RT-ZS10/<br>R&S®RT-ZS10E | R&S®RT-ZS20    | R&S®RT-ZS30    |
|--------------------------------|----------------------------------------------------------------------|------------------------------|----------------|----------------|
| <b>Step response</b>           |                                                                      |                              |                |                |
| Rise time                      | 10 % to 90 %                                                         | < 350 ps                     | < 250 ps       | < 135 ps       |
| Flatness                       | starting 2 ns after edge                                             | 2 % (meas.)                  |                |                |
| Propagation delay              |                                                                      | 5.5 ns (meas.)               |                |                |
| <b>Frequency response</b>      |                                                                      |                              |                |                |
| Bandwidth                      | starting at DC, calculated from rise time                            | 1.0 GHz                      | 1.5 GHz        | 3.0 GHz        |
| Flatness                       | 100 kHz to 100 MHz                                                   | 0.2 dB (meas.)               | 0.2 dB (meas.) | 0.2 dB (meas.) |
|                                | 100 MHz to 500 MHz                                                   | –                            | 0.5 dB (meas.) | 0.5 dB (meas.) |
|                                | 500 MHz to 1 GHz                                                     | –                            | –              | 0.5 dB (meas.) |
| <b>Input impedance</b>         |                                                                      |                              |                |                |
| DC input resistance            |                                                                      | 1 MΩ                         |                |                |
| Input capacitance              |                                                                      | 0.8 pF (meas.)               |                |                |
| <b>DC characteristics</b>      |                                                                      |                              |                |                |
| Attenuation                    |                                                                      | 10:1                         |                |                |
| Attenuation error              | after applying digital correction factors                            | ±0.5 %                       |                |                |
| Temperature drift, attenuation |                                                                      | ±60 ppm/°C                   |                |                |
| Zero error                     | after applying digital correction factors, referenced to probe input |                              |                |                |
|                                | +15 °C to +35 °C                                                     | ±2 mV                        |                |                |
|                                | 0 °C to +50 °C                                                       | ±4 mV                        |                |                |
| Temperature drift, zero error  | referenced to probe input                                            | ±90 µV/°C                    |                |                |

| <b>Dynamic range</b>                        |                                                                                                                                                                             |                                                  |                         |                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------|
| DC                                          |                                                                                                                                                                             | $\pm 8\text{ V}$ (+ offset compensation setting) |                         |                         |
| Offset compensation range                   | not available with R&S®RT-ZS10E                                                                                                                                             | $\pm 12\text{ V}$                                |                         |                         |
| Offset compensation error                   | offset compensation setting = 0 V                                                                                                                                           | no additional error                              |                         |                         |
|                                             | offset compensation setting $\neq 0\text{ V}$                                                                                                                               | $\pm 0.2\%$ of setting $\pm 2\text{ mV}$ (meas.) |                         |                         |
| AC                                          | with zero or compensated DC component                                                                                                                                       | $16\text{ V}$ ( $V_{pp}$ )                       |                         |                         |
| Total harmonic distortion                   | $16\text{ V}$ ( $V_{pp}$ ) sine-wave input at <ul style="list-style-type: none"> <li>300 MHz for R&amp;S®RT-ZS10/-ZS10E</li> <li>1 GHz for R&amp;S®RT-ZS20/-ZS30</li> </ul> | $-35\text{ dB}$ (meas.)                          |                         |                         |
| Noise voltage                               | referenced to probe input                                                                                                                                                   | 1.2 mV (RMS)<br>(meas.)                          | 1.6 mV (RMS)<br>(meas.) | 2.0 mV (RMS)<br>(meas.) |
| <b>Maximum nondestructive input voltage</b> |                                                                                                                                                                             |                                                  |                         |                         |
| DC peak voltage                             |                                                                                                                                                                             | $\pm 30\text{ V}$                                |                         |                         |
| AC peak voltage                             | derated, see figure                                                                                                                                                         | 30 V                                             |                         |                         |
| ESD tolerance                               | human body model                                                                                                                                                            | 8 kV (meas.)                                     |                         |                         |



*Maximum nondestructive sine-wave peak voltage versus frequency*

## R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®RT-ZS10E probe is not equipped with an R&S®ProbeMeter.

|                    |                  |                                  |
|--------------------|------------------|----------------------------------|
| Measurement error  | +15 °C to +35 °C | ±0.1 % of reading ± 750 µV       |
|                    | 0 °C to +50 °C   | ±0.2 % of reading ± 1.5 mV       |
| Temperature drift  |                  | ±50 ppm/°C of reading ± 40 µV/°C |
| 50/60 Hz rejection |                  | > 87 dB                          |
| Integration time   |                  | 147 ms                           |

## General data

|                              |                             |                                                                                                  |
|------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|
| <b>Temperature</b>           |                             |                                                                                                  |
| Temperature loading          | operating temperature range | 0 °C to +50 °C                                                                                   |
|                              | storage temperature range   | −40 °C to +70 °C                                                                                 |
| Climatic loading             |                             | +25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30 |
| Altitude                     | operation                   | up to 3000 m                                                                                     |
|                              | transport                   | up to 4600 m                                                                                     |
| <b>Mechanical resistance</b> |                             |                                                                                                  |
| Vibration                    | sinusoidal                  | 5 Hz to 150 Hz, max. 2 g at 55 Hz, 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6         |
|                              | random                      | 10 Hz to 500 Hz, acceleration 1.9 g (RMS), in line with EN 60068-2-64                            |
| Shock                        |                             | 40 g shock spectrum, in line with MIL-STD-810E                                                   |

|                             |                        |                                                                                                               |
|-----------------------------|------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>EMC</b>                  |                        | in line with EMC Directive 2014/30/EC, IEC/EN 61326-1 (table 2), IEC/EN 61326-2-1, CISPR 11/EN 55011(class B) |
| <b>Calibration interval</b> |                        | 2 years                                                                                                       |
| <b>Safety</b>               |                        | in line with IEC/EN 61010-1                                                                                   |
| <b>RoHS</b>                 |                        | in line with EN 50581                                                                                         |
| <b>Mechanical data</b>      |                        |                                                                                                               |
| Dimensions                  | probe head (W × H × L) | approx. 12 mm × 7.5 mm × 68 mm<br>(0.47 in × 0.3 in × 2.68 in)                                                |
|                             | cable length           | approx. 1.1 m (43 in)                                                                                         |
|                             | overall length         | approx. 1.3 m (51 in)                                                                                         |
| Weight                      | probe only             | approx. 90 g (0.2 lb)                                                                                         |
| <b>Probe interface</b>      |                        |                                                                                                               |
| Connector                   |                        | Rohde & Schwarz probe interface                                                                               |

## R&S®RT-ZS60 active probe

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50 Ω.

See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

|                                |                                                                      | R&S®RT-ZS60    |
|--------------------------------|----------------------------------------------------------------------|----------------|
| <b>Step response</b>           |                                                                      |                |
| Rise time                      | 10 % to 90 %                                                         | < 67 ps        |
| Flatness                       | starting 2 ns after edge                                             | 2 % (meas.)    |
| Propagation delay              |                                                                      | 5.5 ns (meas.) |
| <b>Frequency response</b>      |                                                                      |                |
| Bandwidth                      | starting at DC, calculated from rise time                            | 6.0 GHz        |
| Flatness                       | 100 kHz to 100 MHz                                                   | 0.3 dB (meas.) |
|                                | 100 MHz to 1 GHz                                                     | 0.3 dB (meas.) |
| <b>Input impedance</b>         |                                                                      |                |
| DC input resistance            |                                                                      | 1 MΩ           |
| Input capacitance              | see figure on page 18 for input impedance                            | 0.3 pF (meas.) |
| <b>DC characteristics</b>      |                                                                      |                |
| Attenuation                    |                                                                      | 10:1           |
| Attenuation error              | after applying digital correction factors                            |                |
|                                | 0 °C to +50 °C                                                       | ±0.5 %         |
| Temperature drift, attenuation |                                                                      | ±100 ppm/°C    |
| Zero error                     | after applying digital correction factors, referenced to probe input |                |
|                                | +15 °C to +35 °C                                                     | ±2 mV          |
|                                | 0 °C to +50 °C                                                       | ±4 mV          |
| Temperature drift, zero error  | referenced to probe input                                            | ±100 µV/°C     |

|                                             |                                                     |                                                  |
|---------------------------------------------|-----------------------------------------------------|--------------------------------------------------|
| <b>Dynamic range</b>                        |                                                     |                                                  |
| DC                                          |                                                     | $\pm 8\text{ V}$ (+ offset compensation setting) |
| Offset compensation range                   |                                                     | $\pm 10\text{ V}$                                |
| Offset compensation error                   | not when offset compensation setting = $0\text{ V}$ | $\pm 0.2\%$ of setting $\pm 2\text{ mV}$ (meas.) |
| AC                                          | with zero or compensated DC component               | $16\text{ V}$ ( $V_{pp}$ )                       |
| Total harmonic distortion                   | $16\text{ V}$ ( $V_{pp}$ ) sine-wave input          | $-70\text{ dB}$ (meas.)                          |
| Noise voltage                               | referenced to probe input                           | $2\text{ mV}$ (RMS) (meas.)                      |
| <b>Maximum nondestructive input voltage</b> |                                                     |                                                  |
| DC peak voltage                             |                                                     | $\pm 30\text{ V}$                                |
| AC peak voltage                             | derated, see figure on page 18                      | $30\text{ V}$                                    |
| ESD tolerance                               | human body model                                    | $2\text{ kV}$ (meas.)                            |

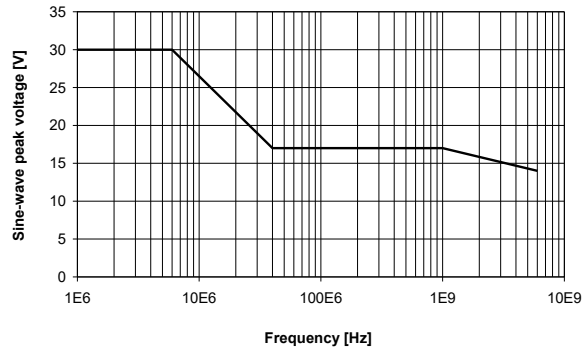
## R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is  $0\text{ V}$ .

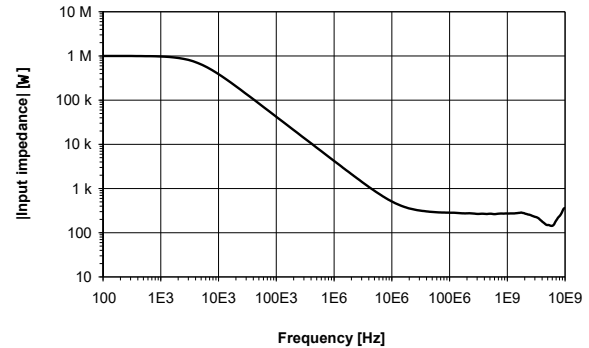
|                    |                                                                |                                                                                               |
|--------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Measurement error  | $+15\text{ }^{\circ}\text{C}$ to $+35\text{ }^{\circ}\text{C}$ | $\pm 0.1\%$ of reading $\pm 2\text{ mV}$                                                      |
|                    | $0\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$   | $\pm 0.2\%$ of reading $\pm 4\text{ mV}$                                                      |
| Temperature drift  |                                                                | $\pm 50\text{ ppm}/^{\circ}\text{C}$ of reading $\pm 100\text{ }\mu\text{V}/^{\circ}\text{C}$ |
| 50/60 Hz rejection |                                                                | $> 87\text{ dB}$                                                                              |
| Integration time   |                                                                | $147\text{ ms}$                                                                               |

## General data

See page 14.



*Maximum nondestructive sine-wave peak voltage versus frequency*



*Input impedance versus frequency*

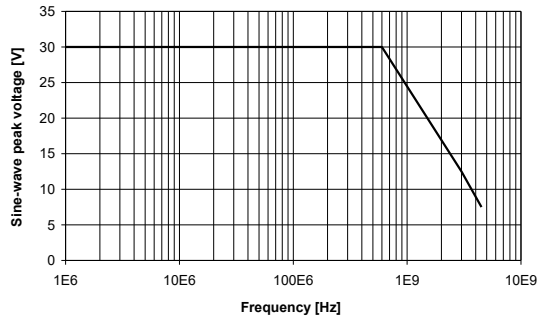
## R&S®RT-ZD10/-ZD20/-ZD30 differential probes

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50 Ω.  
See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

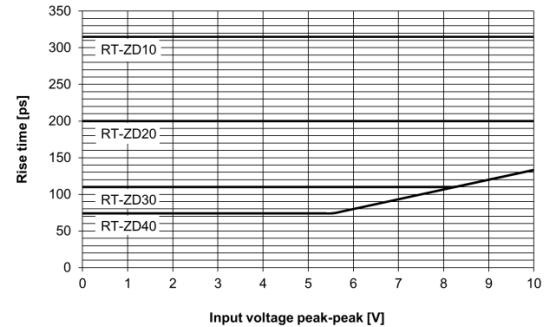
|                       |                                                     | R&S®RT-ZD10     | R&S®RT-ZD20    | R&S®RT-ZD30    |
|-----------------------|-----------------------------------------------------|-----------------|----------------|----------------|
| Step response         |                                                     |                 |                |                |
| Rise time             | 10 % to 90 %                                        | < 350 ps        | < 250 ps       | < 135 ps       |
| Flatness              | starting 2 ns after edge                            | 2 % (meas.)     |                |                |
| Slew rate             | referenced to probe input,<br>see figure on page 21 | 60 V/ns (meas.) |                |                |
| Propagation delay     |                                                     | 5.5 ns (meas.)  |                |                |
| Frequency response    |                                                     |                 |                |                |
| Bandwidth             | starting at DC,<br>calculated from rise time        | 1.0 GHz         | 1.5 GHz        | 3.0 GHz        |
| Flatness              | 100 kHz to 100 MHz                                  | 0.2 dB (meas.)  | 0.2 dB (meas.) | 0.2 dB (meas.) |
|                       | 100 MHz to 500 MHz                                  | –               | 0.5 dB (meas.) | 0.5 dB (meas.) |
|                       | 500 MHz to 1 GHz                                    | –               | –              | 0.5 dB (meas.) |
| Common mode rejection | DC to 10 kHz                                        | > 50 dB         |                |                |
|                       | 10 kHz to 1 MHz                                     | 40 dB (meas.)   |                |                |
|                       | 1 MHz to 1 GHz                                      | 30 dB (meas.)   |                |                |
|                       | > 1 GHz                                             | 20 dB (meas.)   |                |                |
| Input impedance       |                                                     |                 |                |                |
| DC input resistance   | between signal sockets                              | 1 MΩ            |                |                |
|                       | each signal socket to ground                        | 500 kΩ          |                |                |
| Input capacitance     | between signal sockets                              | 0.6 pF (meas.)  |                |                |
|                       | each signal socket to ground                        | 0.8 pF (meas.)  |                |                |

| DC characteristics                   |                                                                      |                                                      |                         |                         |
|--------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|-------------------------|-------------------------|
| Attenuation                          |                                                                      | 10:1                                                 |                         |                         |
| Attenuation error                    | after applying digital correction factors                            | ±0.5 %                                               |                         |                         |
| Temperature drift, attenuation       |                                                                      | ±50 ppm/°C                                           |                         |                         |
| Zero error                           | after applying digital correction factors, referenced to probe input |                                                      |                         |                         |
|                                      | +15 °C to +35 °C                                                     | ±3 mV                                                |                         |                         |
|                                      | 0 °C to +50 °C                                                       | ±6 mV                                                |                         |                         |
| Temperature drift, zero error        | referenced to probe input                                            | ±150 µV/°C                                           |                         |                         |
| Dynamic range                        |                                                                      |                                                      |                         |                         |
| Differential input                   | between signal sockets                                               | ±5 V (+ offset compensation setting) <sup>2</sup>    |                         |                         |
| Offset compensation range            |                                                                      | ±5 V                                                 |                         |                         |
| Offset compensation error            | offset compensation setting = 0 V                                    | no additional error                                  |                         |                         |
|                                      | offset compensation setting ≠ 0 V                                    | ±0.2 % of setting ± 2 mV (meas.)                     |                         |                         |
| Operating voltage window             | each signal socket to ground                                         | ±8 V (+ cm offset compensation setting) <sup>2</sup> |                         |                         |
| CM offset compensation range         |                                                                      | ±22 V                                                |                         |                         |
| CM offset compensation error         | cm offset compensation setting = 0 V                                 | no additional error                                  |                         |                         |
|                                      | cm offset compensation setting ≠ 0 V                                 | ±0.2 % of setting ± 2 mV (meas.)                     |                         |                         |
| Total harmonic distortion            | 10 V (V <sub>pp</sub> ) sine-wave input at 1 GHz                     | −35 dB (meas.)                                       |                         |                         |
| Noise voltage                        | referenced to probe input                                            | 1.7 mV (RMS)<br>(meas.)                              | 2.4 mV (RMS)<br>(meas.) | 3.0 mV (RMS)<br>(meas.) |
| Maximum nondestructive input voltage |                                                                      |                                                      |                         |                         |
| DC peak voltage                      | each signal socket to ground                                         | ±30 V                                                |                         |                         |
| AC peak voltage                      | each signal socket to ground,<br>derated, see figure on page 21      | 30 V                                                 |                         |                         |
| ESD tolerance                        | human body model,<br>each signal socket to ground                    | 8 kV (meas.)                                         |                         |                         |

<sup>2</sup> Can be extended with the R&S®RT-ZA15 external attenuator (see page 22). For the R&S®RT-ZD10, the R&S®RT-ZA15 is part of delivery.



Maximum nondestructive sine-wave peak voltage versus frequency



Rise time versus input voltage (meas.)

## R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter can be used to measure differential and common mode voltages.

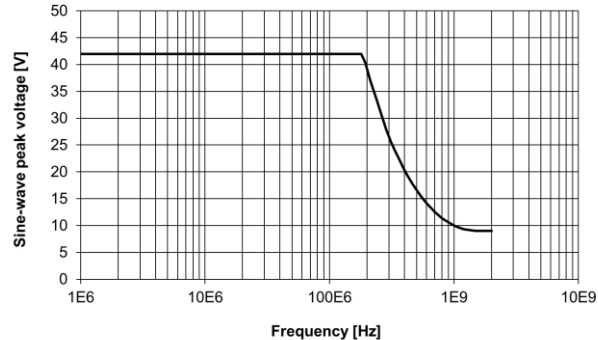
|                                                      |                                              |                                   |
|------------------------------------------------------|----------------------------------------------|-----------------------------------|
| Measurement error, differential mode and common mode | +15 °C to +35 °C                             | ±0.1 % of reading ± 2 mV          |
|                                                      | 0 °C to +50 °C                               | ±0.2 % of reading ± 4 mV          |
| Temperature drift                                    |                                              | ±40 ppm/°C of reading ± 100 µV/°C |
| Common mode rejection                                | for differential measurement, 0 °C to +50 °C | > 50 dB                           |
| 50/60 Hz rejection                                   |                                              | > 87 dB                           |
| Integration time                                     |                                              | 147 ms                            |

**R&S®RT-ZA15 external attenuator**

All parameters are valid for the R&S®RT-ZA15 external attenuator when connected to an R&S®RT-ZD10/-ZD20/-ZD30 differential probe.

|                            |                                           | <b>R&amp;S®RT-ZA15</b>                     |
|----------------------------|-------------------------------------------|--------------------------------------------|
| <b>Dynamic response</b>    |                                           |                                            |
| Rise time                  | 10 % to 90 %                              |                                            |
|                            | with R&S®RT-ZD10                          | < 350 ps (meas.)                           |
|                            | with R&S®RT-ZD20                          | < 250 ps (meas.)                           |
|                            | with R&S®RT-ZD30                          | < 200 ps (meas.)                           |
| Bandwidth                  | starting at DC, calculated from rise time |                                            |
|                            | with R&S®RT-ZD10                          | 1.0 GHz                                    |
|                            | with R&S®RT-ZD20                          | 1.5 GHz                                    |
|                            | with R&S®RT-ZD30                          | 2.0 GHz                                    |
| Common mode rejection      | DC to 10 kHz, after adjustment            | 80 dB (meas.)                              |
|                            | 10 kHz to 1 MHz                           | 40 dB (meas.)                              |
|                            | 1 MHz to 100 MHz                          | 30 dB (meas.)                              |
|                            | 100 MHz to 1 GHz                          | 20 dB (meas.)                              |
| <b>Input impedance</b>     |                                           |                                            |
| DC input resistance        | between signal sockets                    | 1 M $\Omega$                               |
|                            | each signal socket to ground              | 500 k $\Omega$                             |
| Input capacitance          | between signal sockets                    | 1.3 pF (meas.)                             |
|                            | each signal socket to ground              | 2.1 pF (meas.)                             |
| <b>DC characteristics</b>  |                                           |                                            |
| System attenuation         | probe and attenuator                      | 100:1                                      |
| External attenuation       |                                           | 10:1                                       |
| External attenuation error |                                           | $\pm 0.3$ % (nom.)                         |
| <b>Dynamic range</b>       |                                           |                                            |
| Differential input         | between signal sockets                    | $\pm 50$ V (+ offset compensation setting) |
| Offset compensation range  |                                           | $\pm 50$ V                                 |
| Operating voltage window   | each signal socket to ground              | $\pm 60$ V                                 |

| Maximum rated input voltage |                                                      |              |
|-----------------------------|------------------------------------------------------|--------------|
| DC voltage                  | each signal socket to ground                         | $\pm 60$ V   |
| AC voltage                  | each signal socket to ground,<br>derated, see figure | 30 V (RMS)   |
| Transient peak voltage      | each signal socket to ground                         | $\pm 42$ V   |
| ESD tolerance               | human body model,<br>each signal socket to ground    | 8 kV (meas.) |



*Maximum rated sine-wave peak voltage versus frequency*

## General data

See page 14.

## R&S®RT-ZD40 differential probe

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50  $\Omega$ .

See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

|                           |                                                  | R&S®RT-ZD40              |
|---------------------------|--------------------------------------------------|--------------------------|
| <b>Step response</b>      |                                                  |                          |
| Rise time                 | 10 % to 90 %                                     | < 90 ps, < 73 ps (meas.) |
| Flatness                  | starting 2 ns after edge                         | 2 % (meas.)              |
| Slew rate                 | referenced to probe input, see figure on page 21 | 60 V/ns (meas.)          |
| Propagation delay         |                                                  | 5.5 ns (meas.)           |
| <b>Frequency response</b> |                                                  |                          |
| Bandwidth                 | starting at DC, calculated from rise time        | 4.5 GHz, 5.5 GHz (meas.) |
| Flatness                  | 100 kHz to 100 MHz                               | 0.2 dB (meas.)           |
|                           | 100 MHz to 500 MHz                               | 0.5 dB (meas.)           |
|                           | 500 MHz to 1 GHz                                 | 0.5 dB (meas.)           |
| Common mode rejection     | DC to 10 kHz                                     | > 50 dB                  |
|                           | 10 kHz to 1 MHz                                  | 40 dB (meas.)            |
|                           | 1 MHz to 1 GHz                                   | 30 dB (meas.)            |
|                           | > 1 GHz                                          | 20 dB (meas.)            |
| <b>Input impedance</b>    |                                                  |                          |
| DC input resistance       | between signal sockets                           | 1 M $\Omega$             |
|                           | each signal socket to ground                     | 500 k $\Omega$           |
| Input capacitance         | between signal sockets                           | 0.4 pF (meas.)           |
|                           | each signal socket to ground                     | 0.65 pF (meas.)          |

|                                             |                                                                      |                                                      |
|---------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|
| <b>DC characteristics</b>                   |                                                                      |                                                      |
| Attenuation                                 |                                                                      | 10:1                                                 |
| Attenuation error                           | after applying digital correction factors                            |                                                      |
|                                             | 0 °C to +50 °C                                                       | ±0.5 %                                               |
| Temperature drift, attenuation              |                                                                      | ±50 ppm/°C                                           |
| Zero error                                  | after applying digital correction factors, referenced to probe input |                                                      |
|                                             | +15 °C to +35 °C                                                     | ±3 mV                                                |
|                                             | 0 °C to +50 °C                                                       | ±6 mV                                                |
| Temperature drift, zero error               | referenced to probe input                                            | ±150 µV/°C                                           |
| <b>Dynamic range</b>                        |                                                                      |                                                      |
| Differential input                          | between signal sockets                                               | ±5 V (+ offset compensation setting)                 |
| Offset compensation range                   |                                                                      | ±5 V                                                 |
| Offset compensation error                   | offset compensation setting = 0 V                                    | no additional error                                  |
|                                             | offset compensation setting ≠ 0 V                                    | ±0.2 % of setting ± 2 mV (meas.)                     |
| Operating voltage window                    | each signal socket to ground                                         | ±8 V (+ cm offset compensation setting) <sup>3</sup> |
| CM offset compensation range <sup>3</sup>   |                                                                      | ±22 V                                                |
| CM offset compensation error                | cm offset compensation setting = 0 V                                 | no additional error                                  |
|                                             | cm offset compensation setting ≠ 0 V                                 | ±0.2 % of setting ± 2 mV (meas.)                     |
| Total harmonic distortion                   | 10 V (V <sub>pp</sub> ) sine-wave input at 1 GHz                     | –35 dB (meas.)                                       |
| Noise voltage                               | referenced to probe input                                            | 3 mV (RMS) (meas.)                                   |
| <b>Maximum nondestructive input voltage</b> |                                                                      |                                                      |
| DC peak voltage                             | each signal socket to ground                                         | ±30 V                                                |
| AC peak voltage                             | each signal socket to ground,<br>see figure on page 21               | 30 V                                                 |
| ESD tolerance                               | human body model,<br>each signal socket to ground                    | 8 kV (meas.)                                         |

<sup>3</sup> Available starting from serial number 200 000. Older probes have ±5 V operating voltage window and no cm offset compensation.

## **R&S®ProbeMeter**

See page 21.

## **General data**

See page 14.

## R&S®RT-ZM15/-ZM30/-ZM60/-ZM90/-ZM130/-ZM160 modular probes

All parameters are valid for the probe only when connected to a host instrument with an input impedance of 50 Ω. See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

### R&S®RT-ZM15/-ZM30/-ZM60/-ZM90/-ZM130/-ZM160 modular probe amplifier

The R&S®RT-ZMxx modular probe amplifiers support four different measurement modes for differential mode (DM), common mode (CM) and single-ended measurements on the positive (P) and negative (N) signal terminal. The R&S®RT-ZMxx modular probe amplifiers support two different attenuation settings (10:1 and 2:1).

| <b>Step response</b>      |                                             |                 |
|---------------------------|---------------------------------------------|-----------------|
| Rise time                 | 10 % to 90 %, calculated from bandwidth     |                 |
|                           | R&S®RT-ZM15                                 | < 230 ps        |
|                           | R&S®RT-ZM30                                 | < 100 ps        |
|                           | R&S®RT-ZM60                                 | < 75 ps         |
|                           | R&S®RT-ZM90                                 | < 50 ps         |
|                           | R&S®RT-ZM130                                | < 35 ps         |
|                           | R&S®RT-ZM160                                | < 28 ps         |
| Slew rate                 | referenced to probe input, 10:1 attenuation | 80 V/ns (meas.) |
| Propagation delay         |                                             | 5.5 ns (meas.)  |
| <b>Frequency response</b> | DM mode, 10:1 and 2:1 attenuation           |                 |
|                           | R&S®RT-ZM15                                 | > 1.5 GHz       |
|                           | R&S®RT-ZM30                                 | > 3.0 GHz       |
|                           | R&S®RT-ZM60                                 | > 6.0 GHz       |
|                           | R&S®RT-ZM90                                 | > 9.0 GHz       |
|                           | R&S®RT-ZM130                                | > 13.0 GHz      |
|                           | R&S®RT-ZM160                                | > 16.0 GHz      |

|                                |                                                                                                        |                             |
|--------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------|
| Common mode rejection          | DM mode, 10:1 and 2:1 attenuation                                                                      |                             |
|                                | DC to 1 kHz                                                                                            | > 50 dB                     |
|                                | 1 kHz to 1 MHz                                                                                         | 40 dB (meas.)               |
|                                | 1 MHz to 3 GHz                                                                                         | 35 dB (meas.)               |
|                                | 3 GHz to 6 GHz                                                                                         | 25 dB (meas.)               |
|                                | > 6 GHz                                                                                                | 20 dB (meas.)               |
| <b>Input impedance</b>         |                                                                                                        |                             |
| DC input resistance            | between signal terminals                                                                               | 400 k $\Omega$              |
|                                | each signal terminal to ground                                                                         | 200 k $\Omega$              |
| <b>DC characteristics</b>      |                                                                                                        |                             |
| Attenuation                    | automatically set by oscilloscope vertical setting                                                     | 10:1                        |
|                                |                                                                                                        | 2:1                         |
| Attenuation error              | DM, CM, P, N mode, 10:1 and 2:1 attenuation, after applying digital correction factors, 0 °C to +40 °C | $\pm 0.5$ %                 |
| Temperature drift, attenuation |                                                                                                        | $\pm 40$ ppm/°C (meas.)     |
| Zero error                     | after applying digital correction factors, referenced to probe input                                   | < 0.5 mV (meas.)            |
| Temperature drift, zero error  | referenced to probe input                                                                              | $\pm 20$ $\mu$ V/°C (meas.) |

|                                             |                                                                                                |                                                     |
|---------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Dynamic range</b>                        |                                                                                                |                                                     |
| Input voltage range                         | DM, CM, P, N mode, 2:1 attenuation                                                             | $\pm 0.5 \text{ V}$ or $1.0 \text{ V}$ ( $V_{pp}$ ) |
|                                             | DM, CM, P, N mode, 10:1 attenuation                                                            | $\pm 2.5 \text{ V}$ or $5.0 \text{ V}$ ( $V_{pp}$ ) |
| Operating voltage window                    | each signal terminal to ground                                                                 |                                                     |
|                                             | DM mode, 2:1 and 10:1 attenuation, DC to 100 kHz                                               | $\pm 7.0 \text{ V}$                                 |
|                                             | DM mode, 2:1 attenuation, > 100 kHz                                                            | $\pm 1.0 \text{ V}$                                 |
|                                             | DM mode, 10:1 attenuation, > 100 kHz                                                           | $\pm 5.0 \text{ V}$                                 |
| Offset compensation range                   | compensation of differential, common mode and single-ended offsets for each measurement mode   | $\pm 16 \text{ V}$                                  |
| Offset compensation error                   | offset compensation setting = 0 V                                                              | no additional error                                 |
|                                             | offset compensation setting $\neq 0 \text{ V}$                                                 | $\pm 0.2 \%$ of setting $\pm 2 \text{ mV}$ (meas.)  |
| Total harmonic distortion                   | DM mode, 5 V ( $V_{pp}$ ) sine-wave input at 2 GHz                                             | -31 dB (meas.)                                      |
| Noise voltage                               | DM mode, 2:1 attenuation, for R&S®RT-ZM160 probe amplifier (16 GHz), referenced to probe input | 5.4 mV (RMS) (meas.)                                |
| Noise spectral density                      | referenced to probe input                                                                      |                                                     |
|                                             | DM, CM, P, N mode, 2:1 attenuation                                                             | 42 nV/rt(Hz) (meas.)                                |
|                                             | DM, CM, P, N mode, 10:1 attenuation                                                            | 83 nV/rt(Hz) (meas.)                                |
| <b>Maximum nondestructive input voltage</b> |                                                                                                |                                                     |
| DC peak voltage                             | at probe tip module, each signal socket to ground                                              | $\pm 30 \text{ V}$                                  |
| AC peak voltage                             | at probe tip module, each signal socket to ground                                              | $\pm 7 \text{ V}$                                   |
| <b>Termination voltage source</b>           |                                                                                                |                                                     |
| Compensation range                          | using VT socket at R&S®RT-ZMxx modular probe amplifier                                         | $\pm 4 \text{ V}$ (meas.)                           |
| Output current                              | overcurrent turns termination voltage source off                                               | $\pm 40 \text{ mA}$ (meas.)                         |

## R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter simultaneously measures differential, common mode, and single-ended DC components independent of the probe amplifier measurement mode setting.

|                       |                                              |                                     |
|-----------------------|----------------------------------------------|-------------------------------------|
| Measurement error     | 0 °C to +40 °C                               | ±0.2 % of reading ± 5 mV            |
|                       |                                              | ±0.05 % of reading ± 0.5 mV (meas.) |
| Common mode rejection | for differential measurement, 0 °C to +40 °C | > 50 dB                             |

## General data

|                              |                             |                                                                                                               |
|------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Temperature</b>           |                             |                                                                                                               |
| Temperature loading          | operating temperature range | 0 °C to +40 °C                                                                                                |
|                              | storage temperature range   | –40 °C to +70 °C                                                                                              |
| Climatic loading             |                             | +25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30              |
| Altitude                     | operation                   | up to 3000 m                                                                                                  |
|                              | transport                   | up to 4600 m                                                                                                  |
| <b>Mechanical resistance</b> |                             |                                                                                                               |
| Vibration                    | sinusoidal                  | 5 Hz to 150 Hz, max. 2 g at 55 Hz, 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6                      |
|                              | random                      | 10 Hz to 500 Hz, acceleration 1.9 g (RMS), in line with EN 60068-2-64                                         |
| Shock                        |                             | 40 g shock spectrum, in line with MIL-STD-810E                                                                |
| <b>EMC</b>                   |                             | in line with EMC Directive 2014/30/EC, IEC/EN 61326-1 (table 2), IEC/EN 61326-2-1, CISPR 11/EN 55011(class B) |
| <b>Calibration interval</b>  |                             | 2 years                                                                                                       |
| <b>Safety</b>                |                             | in line with IEC/EN 61010-1                                                                                   |
| <b>RoHS</b>                  |                             | in line with EN 50581                                                                                         |
| <b>Mechanical data</b>       |                             |                                                                                                               |
| Dimensions                   | probe amplifier (W × H × L) | approx. 18 mm × 10 mm × 105 mm (0.7 in × 0.4 in × 4.1 in)                                                     |
|                              | cable length                | approx. 1.1 m (43 in)                                                                                         |
|                              | overall length              | approx. 1.3 m (51 in)                                                                                         |
| Weight                       | probe only                  | approx. 160 g (0.35 lb)                                                                                       |
| <b>Probe interface</b>       |                             | Rohde & Schwarz probe interface                                                                               |

## R&S®RT-ZMA probe tip modules

| Frequency response |                                                                          |                |                |                |
|--------------------|--------------------------------------------------------------------------|----------------|----------------|----------------|
| Bandwidth          | with R&S®RT-ZM160 probe amplifier (16 GHz)                               |                |                |                |
|                    | R&S®RT-ZMA10 tip cable solder-in                                         | 16 GHz (meas.) |                |                |
|                    | R&S®RT-ZMA14 tip cable flex connect                                      |                |                |                |
|                    | R&S®RT-ZMA30 browser module                                              |                |                |                |
|                    | R&S®RT-ZMA40 SMA module                                                  |                |                |                |
|                    | R&S®RT-ZMA50 extreme temperature kit                                     | 12 GHz (meas.) |                |                |
|                    | R&S®RT-ZMA12 tip cable square pin                                        | 6 GHz (meas.)  |                |                |
|                    | R&S®RT-ZMA15 tip cable quick connect                                     | 12 GHz (meas.) |                |                |
| Step response      |                                                                          |                |                |                |
| Rise time          | with R&S®RT-ZM160 probe amplifier (16 GHz),<br>calculated from bandwidth |                | 10 % to 90 %   |                |
|                    | R&S®RT-ZMA10 tip cable solder-in                                         | 28 ps          |                |                |
|                    | R&S®RT-ZMA14 tip cable flex connect                                      |                |                |                |
|                    | R&S®RT-ZMA30 browser module                                              |                |                |                |
|                    | R&S®RT-ZMA40 SMA module                                                  |                |                |                |
|                    | R&S®RT-ZMA50 extreme temperature kit                                     | 37 ps          |                |                |
|                    | R&S®RT-ZMA12 tip cable square pin                                        | 75 ps          |                |                |
|                    | R&S®RT-ZMA15 tip cable quick connect                                     | 37 ps          |                |                |
| Input impedance    |                                                                          |                |                |                |
| Input capacitance  | with R&S®RT-ZMxx probe amplifier                                         |                | differential   | single-ended   |
|                    | R&S®RT-ZMA10 tip cable solder-in                                         |                | 77 fF (meas.)  | 96 fF (meas.)  |
|                    | R&S®RT-ZMA12 tip cable square pin                                        |                | 279 fF (meas.) | 521 fF (meas.) |
|                    | R&S®RT-ZMA14 tip cable flex connect                                      |                | 90 fF (meas.)  | 144 fF (meas.) |
|                    | R&S®RT-ZMA15 tip cable quick connect                                     |                | 109 fF (meas.) | 150 fF (meas.) |
|                    | R&S®RT-ZMA30 browser module                                              |                | 32 fF (meas.)  | 52 fF (meas.)  |
|                    | R&S®RT-ZMA50 extreme temperature kit                                     |                | 77 fF (meas.)  | 96 fF (meas.)  |

|                          |                                      |                       |                     |
|--------------------------|--------------------------------------|-----------------------|---------------------|
| DC input resistance      | with R&S®RT-ZMxx probe amplifier     | <b>differential</b>   | <b>single-ended</b> |
|                          | R&S®RT-ZMA10 tip cable solder-in     | 400 kΩ                | 200 kΩ              |
|                          | R&S®RT-ZMA12 tip cable square pin    |                       |                     |
|                          | R&S®RT-ZMA14 tip cable flex connect  |                       |                     |
|                          | R&S®RT-ZMA15 tip cable quick connect |                       |                     |
|                          | R&S®RT-ZMA50 extreme temperature kit |                       |                     |
|                          | R&S®RT-ZMA30 browser module          |                       |                     |
| Input resistance > 3 MHz | R&S®RT-ZMA40 SMA module              | 100 Ω                 | 60 Ω to VT          |
|                          | with R&S®RT-ZMxx probe amplifier     | <b>differential</b>   | <b>single-ended</b> |
|                          | R&S®RT-ZMA10 tip cable solder-in     | 764 Ω                 | 382 Ω               |
|                          | R&S®RT-ZMA12 tip cable square pin    |                       |                     |
|                          | R&S®RT-ZMA14 tip cable flex connect  |                       |                     |
|                          | R&S®RT-ZMA15 tip cable quick connect |                       |                     |
|                          | R&S®RT-ZMA50 extreme temperature kit |                       |                     |
|                          | R&S®RT-ZMA30 browser module          |                       |                     |
| Input return loss        | R&S®RT-ZMA40 SMA module              | 100 Ω                 | 50 Ω (> 3 kHz)      |
|                          | 3 kHz to 9 GHz                       | > 12 dB (meas.)       | > 12 dB (meas.)     |
|                          | 9 kHz to 16 GHz                      | > 9 dB (meas.)        | > 9 dB (meas.)      |
| <b>Temperature</b>       |                                      |                       |                     |
| Temperature loading      | operating temperature range          |                       |                     |
|                          | R&S®RT-ZMA10 tip cable solder-in     | –30 °C to +80 °C      |                     |
|                          | R&S®RT-ZMA12 tip cable square pin    | –30 °C to +80 °C      |                     |
|                          | R&S®RT-ZMA14 tip cable flex connect  | –30 °C to +80 °C      |                     |
|                          | R&S®RT-ZMA15 tip cable quick connect | –30 °C to +80 °C      |                     |
|                          | R&S®RT-ZMA30 browser module          | 0 °C to +40 °C        |                     |
|                          | R&S®RT-ZMA40 SMA module              | 0 °C to +40 °C        |                     |
| <b>RoHS</b>              | R&S®RT-ZMA50 extreme temperature kit | –55 °C to +125 °C     |                     |
|                          |                                      | in line with EN 50581 |                     |

## R&S®RT-ZPR20/-ZPR40 power rail probes

All parameters are valid for the probe only with the supplied SMA extension cable when connected to a host instrument with an input impedance of 50  $\Omega$ . See table on page 4 and Rohde & Schwarz oscilloscope operating manual for more details.

| <b>Step response</b>           |                                                                      |                                           |
|--------------------------------|----------------------------------------------------------------------|-------------------------------------------|
| Rise time                      | 10 % to 90 %, calculated from bandwidth                              |                                           |
|                                | R&S®RT-ZPR20                                                         | < 175 ps                                  |
|                                | R&S®RT-ZPR40                                                         | < 120 ps, < 105 ps (meas.)                |
| Propagation delay              | R&S®RT-ZPR20                                                         | 5.5 ns (meas.)                            |
|                                | R&S®RT-ZPR40                                                         | 5.0 ns (meas.)                            |
| <b>Frequency response</b>      |                                                                      |                                           |
| Bandwidth                      | starting at DC                                                       |                                           |
|                                | R&S®RT-ZPR20                                                         | 2.0 GHz                                   |
|                                | R&S®RT-ZPR40                                                         | 3.5 GHz, 4.0 GHz (meas.)                  |
| <b>Input impedance</b>         |                                                                      |                                           |
| Input resistance               | DC                                                                   | 50 k $\Omega$                             |
|                                | AC                                                                   | 50 $\Omega$                               |
| Coupling capacitance           | in series with 50 $\Omega$                                           | 2 nF                                      |
| <b>DC characteristics</b>      |                                                                      |                                           |
| Attenuation                    |                                                                      | 1:1                                       |
| Attenuation error              | after applying digital correction factors                            | $\pm 0.5$ %                               |
| Temperature drift, attenuation |                                                                      | $\pm 100$ ppm/ $^{\circ}\text{C}$ (meas.) |
| Zero error                     | after applying digital correction factors, referenced to probe input | $\pm 3$ mV                                |
| Temperature drift, zero error  | referenced to probe input                                            | $\pm 75$ $\mu\text{V}/^{\circ}\text{C}$   |

|                                             |                                       |                                         |
|---------------------------------------------|---------------------------------------|-----------------------------------------|
| <b>Dynamic range</b>                        |                                       |                                         |
| DC                                          |                                       | ±850 mV (+ offset compensation setting) |
| Offset compensation range                   |                                       | ±60 V                                   |
| Offset compensation error                   | offset compensation setting = 0 V     | no additional error                     |
|                                             | offset compensation setting ≠ 0 V     | ±0.2 % of setting ± 1 mV (meas.)        |
| AC                                          | with zero or compensated DC component | 1.7 V ( $V_{pp}$ )                      |
| System noise voltage                        | referenced to probe input             | 10 % in addition to oscilloscope noise  |
| <b>Maximum nondestructive input voltage</b> |                                       |                                         |
| DC peak voltage                             |                                       | ±60 V                                   |
| AC peak voltage                             |                                       | ±5 V                                    |
| ESD tolerance                               | human body model                      | 8 kV (meas.)                            |

## R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V.

|                   |                |                                     |
|-------------------|----------------|-------------------------------------|
| Measurement error | 0 °C to +40 °C | ±0.2 % of reading ± 5 mV            |
|                   |                | ±0.05 % of reading ± 0.1 mV (meas.) |

## General data

|                              |                             |                                                                                                               |
|------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Temperature</b>           |                             |                                                                                                               |
| Temperature loading          | operating temperature range | 0 °C to +40 °C                                                                                                |
|                              | storage temperature range   | -40 °C to +70 °C                                                                                              |
| Climatic loading             |                             | +25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30              |
| Altitude                     | operation                   | up to 3000 m                                                                                                  |
|                              | transport                   | up to 4600 m                                                                                                  |
| <b>Mechanical resistance</b> |                             |                                                                                                               |
| Vibration                    | sinusoidal                  | 5 Hz to 150 Hz, max. 2 g at 55 Hz, 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6                      |
|                              | random                      | 10 Hz to 500 Hz, acceleration 1.9 g (RMS), in line with EN 60068-2-64                                         |
| Shock                        |                             | 40 g shock spectrum, in line with MIL-STD-810E                                                                |
| <b>EMC</b>                   |                             | in line with EMC Directive 2014/30/EC, IEC/EN 61326-1 (table 2), IEC/EN 61326-2-1, CISPR 11/EN 55011(class B) |
| <b>Calibration interval</b>  |                             | 2 years                                                                                                       |
| <b>Safety</b>                |                             | in line with IEC/EN 61010-1                                                                                   |
| <b>RoHS</b>                  |                             | in line with EN 50581                                                                                         |
| <b>Mechanical data</b>       |                             |                                                                                                               |
| Dimensions                   | probe box (W × H × L)       | approx. 29 mm × 41 mm × 96 mm (1.14 in × 1.61 in × 3.78 in)                                                   |
| Weight                       | probe box only              | approx. 90 g (0.2 lb)                                                                                         |
| <b>Probe interface</b>       |                             | Rohde & Schwarz probe interface                                                                               |

## Ordering information

| Designation                                                                                                                                                                                                                                                                                                                                                                                                                     | Type         | Order No.    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| <b>Passive probes</b>                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |
| 8.0 GHz transmission line probe, 10:1, 500 $\Omega$ , 0.3 pF, 20 V (RMS)<br>Incl. signal pin, solder-in (50); ground pin, solder-in (10); signal pin (2); ground pin, pogo (2); signal adapter, square pin (2); ground adapter, square pin (2); SMA(f) to BNC(m) adapter; marker band kit; accessory box; carrying case; operating manual                                                                                       | R&S®RT-ZZ80  | 1409.7608.02 |
| <b>Active probes</b>                                                                                                                                                                                                                                                                                                                                                                                                            |              |              |
| 1.0 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.9 pF, BNC<br>Incl. spring tip 0.5 mm; solid tip 0.5 mm; marker band kit; ground blade; ground pin; L-adapter; Y-lead adapter; ground lead, 6 cm; ground lead, 12 cm; ground lead, angled, 5 cm; ground lead, angled, 10 cm; micro clip (2); protective cap; power adapter; operating manual                                                                        | R&S®RT-ZS10L | 1333.0815.02 |
| 1.0 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.8 pF<br>Incl. R&S®RT-ZA2 accessory set; R&S®ProbeMeter; micro button                                                                                                                                                                                                                                                                                               | R&S®RT-ZS10  | 1410.4080.02 |
| 1.0 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.8 pF<br>Incl. signal pin (5); ground pin, pogo (2); ground pin, solderable, offset (2); marker band kit; mini clip (1); lead 15 cm (5.9 in) (1)                                                                                                                                                                                                                    | R&S®RT-ZS10E | 1418.7007.02 |
| 1.5 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.8 pF<br>Incl. R&S®RT-ZA2 accessory set; R&S®ProbeMeter; micro button                                                                                                                                                                                                                                                                                               | R&S®RT-ZS20  | 1410.3502.02 |
| 3.0 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.8 pF<br>Incl. R&S®RT-ZA2 accessory set; R&S®ProbeMeter; micro button                                                                                                                                                                                                                                                                                               | R&S®RT-ZS30  | 1410.4309.02 |
| 6.0 GHz active voltage probe, single-ended, 1 M $\Omega$ , 0.3 pF<br>Incl. R&S®ProbeMeter; micro button<br>Incl. signal pin, solder-in (100); ground pin, solder-in (20); signal pin (5); ground pin, pogo (5); signal adapter, square pin (2); ground adapter, square pin (2); marker band kit; mini clip (2); micro clip (2); lead 6 cm (2.4 in) (2); lead 15 cm (5.9 in) (2); accessory box; carrying case; operating manual | R&S®RT-ZS60  | 1418.7307.02 |

| Designation                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type         | Order No.    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| <b>Differential probes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |              |
| 1.0 GHz active voltage probe, differential, 1 M $\Omega$ , 0.6 pF<br>Incl. R&S®ProbeMeter; micro button, R&S®RT-ZA15 external attenuator<br>See R&S®RT-ZD20 for additional equipment included                                                                                                                                                                                                                                                                                           | R&S®RT-ZD10  | 1410.4715.02 |
| 1.5 GHz active voltage probe, differential, 1 M $\Omega$ , 0.6 pF<br>Incl. R&S®ProbeMeter; micro button<br>Incl. signal pin, solder-in (10); signal pin, variable spacing (4); browser adapter; adapter, square pin (2); flex adapter, solder-in 4 cm (1.6 in) and 10 cm (3.9 in);<br>flex adapter, square pin 4 cm (1.6 in) and 10 cm (3.9 in); lead 6 cm (2.4 in) (2);<br>lead 15 cm (5.9 in) (1); mini clip (2); micro clip (2); marker band kit; carrying case;<br>operating manual | R&S®RT-ZD20  | 1410.4409.02 |
| 3.0 GHz active voltage probe, differential, 1 M $\Omega$ , 0.6 pF<br>See R&S®RT-ZD20 for equipment included                                                                                                                                                                                                                                                                                                                                                                             | R&S®RT-ZD30  | 1410.4609.02 |
| 4.5 GHz active voltage probe, differential, 1 M $\Omega$ , 0.4 pF<br>Incl. R&S®ProbeMeter; micro button<br>Incl. signal pin, solder-in (100); socket adapter, variable spacing (2); browser adapter,<br>rigid (2); browser adapter, spring loaded (2); lead 6 cm (2.4 in) (2); lead 15 cm (5.9 in) (1);<br>mini clip (2); micro clip (2); marker band kit; carrying case; operating manual                                                                                              | R&S®RT-ZD40  | 1410.5205.02 |
| <b>Power rail probes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |              |
| 2.0 GHz power rail probe, 1:1, low noise, 50 k $\Omega$ , large offset range $\pm 60$ V<br>Incl. R&S®ProbeMeter;<br>Incl. SMA extension cable, 1 m (39,4 in) (1), R&S®RT-ZA26 pigtail cable,<br>15 cm (5.9 in) (3); R&S®RT-ZA25 power rail browser kit (1); solder wire (1); adhesive pads<br>(7); marker band kit; carrying case; operating manual                                                                                                                                     | R&S®RT-ZPR20 | 1800.5006.02 |
| 4.0 GHz power rail probe, 1:1, low noise, 50 k $\Omega$ , large offset range $\pm 60$ V<br>Incl. R&S®ProbeMeter;<br>Incl. SMA extension cable low loss, 1.05 m (41.3 in) (1), R&S®RT-ZA26 pigtail cable,<br>15 cm (5.9 in) (3); R&S®RT-ZA25 power rail browser kit (1); solder wire (1); adhesive pads<br>(7); marker band kit; carrying case; operating manual                                                                                                                         | R&S®RT-ZPR40 | 1800.5406.02 |

| Designation                                                                                                                                                                                                                                                                                                                                                                                      | Type         | Order No.    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| <b>Modular probes</b>                                                                                                                                                                                                                                                                                                                                                                            |              |              |
| 1.5 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>Incl. lead 15 cm (5.9 in) (1); Ag plated wire 0.1 mm (0.04 in) (1); Ag plated wire 0.2 mm (0.08 in) (1); solder wire (1); adhesive pads (7); solder-in resistor for R&S®RT-ZMA15 (20); solder lead for R&S®RT-ZMA12/15 (20); marker band kit; carrying case; operating manual | R&S®RT-ZM15  | 1800.4700.02 |
| 3.0 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>See R&S®RT-ZM15 for additional equipment included                                                                                                                                                                                                                             | R&S®RT-ZM30  | 1419.3005.02 |
| 6.0 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>See R&S®RT-ZM15 for additional equipment included                                                                                                                                                                                                                             | R&S®RT-ZM60  | 1419.3105.02 |
| 9.0 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>See R&S®RT-ZM15 for additional equipment included                                                                                                                                                                                                                             | R&S®RT-ZM90  | 1419.3205.02 |
| 13.0 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>See R&S®RT-ZM15 for additional equipment included                                                                                                                                                                                                                            | R&S®RT-ZM130 | 1800.4500.02 |
| 16.0 GHz modular probe amplifier, differential, 400 k $\Omega$ , multimode<br>Incl. R&S®ProbeMeter; micro button<br>See R&S®RT-ZM15 for additional equipment included                                                                                                                                                                                                                            | R&S®RT-ZM160 | 1800.4600.02 |
| Storage case, for six R&S®RT-ZMA1x tip cables                                                                                                                                                                                                                                                                                                                                                    | R&S®RT-ZMA1  | 1409.3911.02 |
| Tip cable, solder in, length: 15 cm, multimode compatible                                                                                                                                                                                                                                                                                                                                        | R&S®RT-ZMA10 | 1419.4301.02 |
| Tip cable, solder in, extended temperature, length: 15 cm, multimode compatible                                                                                                                                                                                                                                                                                                                  | R&S®RT-ZMA11 | 1419.4318.02 |
| Tip cable, square pin, for 1.27 mm pin header, length: 15 cm, multimode compatible                                                                                                                                                                                                                                                                                                               | R&S®RT-ZMA12 | 1419.4324.02 |
| Tip cable, flex connect, solder-in, 15 cm, multimode compatible                                                                                                                                                                                                                                                                                                                                  | R&S®RT-ZMA14 | 1338.1010.02 |
| Tip cable, quick connect, for solder in resistor connection, length: 15 cm, multimode compatible                                                                                                                                                                                                                                                                                                 | R&S®RT-ZMA15 | 1419.4224.02 |

| Designation                                                                                                                                                                                    | Type         | Order No.    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| Browser module, variable span from 0.5 mm to 8 mm, spring-loaded<br>Incl. spring loaded resistor tips (2 pairs)                                                                                | R&S®RT-ZMA30 | 1419.4353.02 |
| SMA module, 2.92 mm/3.5 mm/SMA, differential, 100 Ω, DC termination,<br>multimode compatible; Incl. lead 11 cm (4.3 in) (1)                                                                    | R&S®RT-ZMA40 | 1419.4201.02 |
| Extended temperature kit, 1 m matched cable pair, multimode compatible<br>Incl. R&S®RT-ZMA11 (1); Ag plated wire 0.1 mm (0.04 in) (1); Ag plated wire 0.2 mm<br>(0.08 in) (1); solder wire (1) | R&S®RT-ZMA50 | 1419.4218.02 |
| <b>Microwave probes</b>                                                                                                                                                                        |              |              |
| Differential microwave probe, 20 GHz, 0.3 mm pitch                                                                                                                                             | DPSS201503   | 1801.4649.02 |
| Differential microwave probe, 20 GHz, 0.4 mm pitch                                                                                                                                             | DPSS201504   | 1801.4655.02 |
| Differential microwave probe, 20 GHz, 0.5 mm pitch                                                                                                                                             | DPSS201505   | 1801.4661.02 |
| Differential microwave probe, 20 GHz, 0.8 mm pitch                                                                                                                                             | DPSS201508   | 1801.4678.02 |
| Differential microwave probe, 20 GHz, 1.0 mm pitch                                                                                                                                             | DPSS201510   | 1801.4684.02 |
| Differential microwave probe, 20 GHz, 1.2 mm pitch                                                                                                                                             | DPSS201512   | 1801.4690.02 |
| Single-ended microwave probe, 20 GHz, 0.25 mm pitch                                                                                                                                            | SPGR201502   | 1801.4703.02 |
| Single-ended microwave probe, 20 GHz, 0.4 mm pitch                                                                                                                                             | SPGR201504   | 1801.4710.02 |
| Single-ended microwave probe, 20 GHz, 0.5 mm pitch                                                                                                                                             | SPGR201505   | 1801.4726.02 |
| Single-ended microwave probe, 18 GHz, 0.8 mm pitch                                                                                                                                             | SPGR181508   | 1801.4732.02 |
| Single-ended microwave probe, 18 GHz, 1.0 mm pitch                                                                                                                                             | SPGR181510   | 1801.4749.02 |
| Single-ended microwave probe, 16 GHz, 1.2 mm pitch                                                                                                                                             | SPGR161512   | 1801.4755.02 |
| Single-ended microwave probe, 16 GHz, 1.4 mm pitch                                                                                                                                             | SPGR161514   | 1801.4761.02 |
| Single-ended microwave probe, 16 GHz, 1.6 mm pitch                                                                                                                                             | SPGR161516   | 1801.4778.02 |
| D probe handle for hand probing                                                                                                                                                                | DP-HAND01    | 1801.4826.02 |

| Designation                                                                                                                                                                                                                                                                                                                                                                                   | Type        | Order No.    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| <b>Accessories and sets</b>                                                                                                                                                                                                                                                                                                                                                                   |             |              |
| Spare accessory set for R&S®RT-ZS10/-ZS10E/-ZS20/-ZS30 active voltage probes<br>Contains: signal pin (10); ground pin, pogo (5); ground pin, solderable, offset (10); ground adapter, square pin (2); marker band kit; mini clip (2); micro clip (2); lead 6 cm (2.4 in) (2); lead 15 cm (5.9 in) (2); accessory box; carrying case; operating manual                                         | R&S®RT-ZA2  | 1416.0405.02 |
| Pin set for R&S®RT-ZS10/-ZS10E/-ZS20/-ZS30 active voltage probes<br>Contains: signal pin (20); ground pin, pogo (5); ground pin, solderable, offset (20); ground adapter, square pin (2); marker band kit                                                                                                                                                                                     | R&S®RT-ZA3  | 1416.0411.02 |
| Mini clips, contains: mini clip (10)                                                                                                                                                                                                                                                                                                                                                          | R&S®RT-ZA4  | 1416.0428.02 |
| Micro clips, contains: micro clip (4)                                                                                                                                                                                                                                                                                                                                                         | R&S®RT-ZA5  | 1416.0434.02 |
| Lead set, contains: lead 6 cm (2.4 in) (5); lead 15 cm (5.9 in) (5)                                                                                                                                                                                                                                                                                                                           | R&S®RT-ZA6  | 1416.0440.02 |
| Differential pin set for R&S®RT-ZD20/-ZD30<br>Contains: signal pin, solder-in (20); signal pin, variable spacing (10); browser adapter (2); adapter, square pin (2)                                                                                                                                                                                                                           | R&S®RT-ZA7  | 1417.0609.02 |
| Differential pin set for R&S®RT-ZD40<br>Contains: signal pin, solder-in (100); socket adapter, variable spacing (2); browser adapter, rigid (2); browser adapter, spring loaded (2)                                                                                                                                                                                                           | R&S®RT-ZA8  | 1417.0867.02 |
| Probe box to N/USB adapter                                                                                                                                                                                                                                                                                                                                                                    | R&S®RT-ZA9  | 1417.0909.02 |
| SMA(f) to BNC(m) adapter                                                                                                                                                                                                                                                                                                                                                                      | R&S®RT-ZA10 | 1416.0457.02 |
| External attenuator for R&S®RT-ZD10/-ZD20/-ZD30, incl. adjustment tool                                                                                                                                                                                                                                                                                                                        | R&S®RT-ZA15 | 1410.4744.02 |
| Power rail browser kit<br>Contains: power rail browser, ground lead with alligator clip, ground spring (5), IC caps (green, blue, gray, brown, black), insulating cap, tips (1 screwed on probe) (5), spring tip (5), sprung hook, micro SMD clip, dual adapter, flexible ground lead with adapter, coding rings (2 yellow, 2 red, 2 green, 2 blue), short tube (screwed on probe), long tube | R&S®RT-ZA25 | 1800.5329.00 |
| Pigtail cable, solder-in, length: 15 cm, for R&S®RT-ZPR20                                                                                                                                                                                                                                                                                                                                     | R&S®RT-ZA26 | 1800.5258.00 |
| 3D probe positioner                                                                                                                                                                                                                                                                                                                                                                           | R&S®RT-ZAP  | 1326.3641.02 |
| Power deskew fixture                                                                                                                                                                                                                                                                                                                                                                          | R&S®RT-ZF20 | 1800.0004.02 |
| Test fixture for probe characterization                                                                                                                                                                                                                                                                                                                                                       | R&S®RT-ZF30 | 1333.2099.02 |

| <b>Service options</b>                                              |         |                                                         |
|---------------------------------------------------------------------|---------|---------------------------------------------------------|
| Extended warranty, one year                                         | R&S®WE1 | Please contact your local Rohde & Schwarz sales office. |
| Extended warranty, two years                                        | R&S®WE2 |                                                         |
| Extended warranty, three years                                      | R&S®WE3 |                                                         |
| Extended warranty, four years                                       | R&S®WE4 |                                                         |
| Extended warranty with calibration coverage, one year               | R&S®CW1 |                                                         |
| Extended warranty with calibration coverage, two years              | R&S®CW2 |                                                         |
| Extended warranty with calibration coverage, three years            | R&S®CW3 |                                                         |
| Extended warranty with calibration coverage, four years             | R&S®CW4 |                                                         |
| Extended warranty with accredited calibration coverage, one year    | R&S®AW1 |                                                         |
| Extended warranty with accredited calibration coverage, two years   | R&S®AW2 |                                                         |
| Extended warranty with accredited calibration coverage, three years | R&S®AW3 |                                                         |
| Extended warranty with accredited calibration coverage, four years  | R&S®AW4 |                                                         |

**Extended warranty with a term of one to four years (WE1 to WE4)**

Repairs carried out during the contract term are free of charge <sup>4</sup>. Necessary calibration and adjustments carried out during repairs are also covered.

**Extended warranty with calibration (CW1 to CW4)**

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs <sup>4</sup> and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

**Extended warranty with accredited calibration (AW1 to AW4)**

Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs <sup>4</sup> and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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<sup>4</sup> Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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**ISO 9001**

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**ISO 14001**

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