

R&S®SMZ Frequency Multiplier Specifications



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Definitions

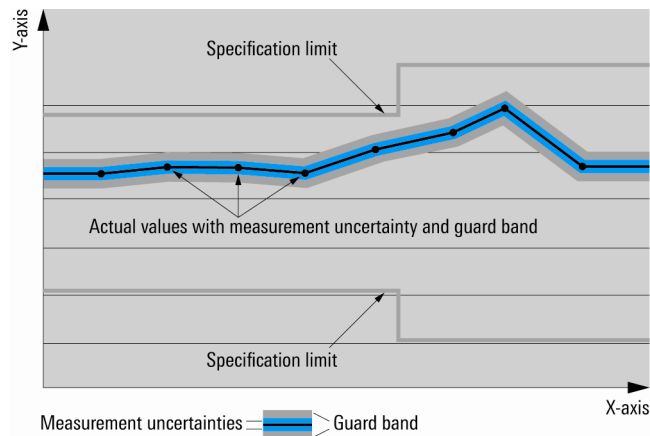
General

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
- All internal automatic adjustments performed, if applicable

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.

Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)

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

Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: "parameter: value".

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

Specifications

RF performance

Frequency

| | | |
|--------------|------------|----------------------|
| Input range | R&S®SMZ75 | 8.3 GHz to 12.5 GHz |
| | R&S®SMZ90 | 10 GHz to 15 GHz |
| | R&S®SMZ110 | 12.5 GHz to 18.4 GHz |
| | R&S®SMZ170 | 9.1 GHz to 14.2 GHz |
| Output range | R&S®SMZ75 | 50 GHz to 75 GHz |
| | R&S®SMZ90 | 60 GHz to 90 GHz |
| | R&S®SMZ110 | 75 GHz to 110 GHz |
| | R&S®SMZ170 | 110 GHz to 170 GHz |

Level

| | | |
|-----------------------|--|---------------------|
| Input | R&S®SMZ75, R&S®SMZ90, R&S®SMZ110, R&S®SMZ170 | |
| | input level for specified output level | +6.7 dBm to 7.3 dBm |
| | level range for operation | +6 dBm to 10 dBm |
| | input impedance VSWR in 50 Ω system | < 2 |
| | input connector | K female (50 Ω) |
| Output | input damage level | > +16 dBm |
| | output level at specified input level | |
| | R&S®SMZ75, R&S®SMZ90, R&S®SMZ110 | +5 dBm (typ.) |
| | R&S®SMZ170 | +8 dBm (typ.) |
| | with R&S®SMZ-B75M, R&S®SMZ-B90M, R&S®SMZ-B110M option mechanically controlled attenuator | |
| | maximum output level at specified input level | +4 dBm (typ.) |
| | minimum output level at specified input level | < -25 dBm |
| | level uncertainty | |
| | > ±0 dBm | < 1.0 dB |
| | ±0 dBm to > -10 dBm | < 1.5 dB |
| | -10 dBm to -20 dBm | < 2.0 dB |
| | with R&S®SMZ-B75E, R&S®SMZ-B90E, R&S®SMZ-B110E option electronically controlled attenuator | |
| | maximum output level at specified input level | +1 dBm (typ.) |
| | minimum output level at specified input level | < -15 dBm |
| | resolution | 0.01 dB |
| | level uncertainty | |
| | > ±0 dBm | < 1.0 dB |
| ±0 dBm to > -5 dBm | < 1.5 dB | |
| -5 dBm to -10 dBm | < 2.0 dB | |
| output impedance VSWR | < 1.7 | |

Spectral purity

| | | |
|------------------|--|------------------|
| Harmonics | R&S®SMZ75, R&S®SMZ90, R&S®SMZ110, R&S®SMZ170 | < -20 dBc (typ.) |
| Subharmonics | R&S®SMZ75, R&S®SMZ90, R&S®SMZ110, R&S®SMZ170 | < -20 dBc (typ.) |
| In-band spurious | R&S®SMZ75, R&S®SMZ90, R&S®SMZ110, R&S®SMZ170 | < -20 dBc (typ.) |

Connectors

Front panel connector

| | | |
|------------------------|-------------------------|-----------------|
| Test port adapter HP/A | RF output port | |
| | R&S [®] SMZ75 | waveguide WR15 |
| | R&S [®] SMZ90 | waveguide WR12 |
| | R&S [®] SMZ110 | waveguide WR10 |
| | R&S [®] SMZ170 | waveguide WR6.5 |

Rear panel connectors

| | | |
|--------------------|---|---------------------------|
| RF input connector | RF IN | K female (50 Ω) |
| | connector type | DIN 45323 power connector |
| | voltage | +9 V ± 540 mV |
| | R&S [®] SMZ75, R&S [®] SMZ90, R&S [®] SMZ110 | |
| | current | < 1 A |
| | R&S [®] SMZ170 | |
| | current | < 2 A |

General data

| | | |
|--|---|---|
| DC power adapter | | |
| To be delivered with R&S [®] SMZ75, R&S [®] SMZ90, R&S [®] SMZ110 | | 1307.8929.00 |
| To be delivered with R&S [®] SMZ170 | | 3589.6959.00 |
| AC input voltage range | | 100 V to 240 V ± 10 % |
| AC supply frequency | | 50 Hz to 60 Hz, -6 %/+5 % |
| Max. input current | R&S [®] SMZ75, R&S [®] SMZ90, R&S [®] SMZ110 | 0,045 A |
| | R&S [®] SMZ170 | 0,09 A |
| Power consumption, fully equipped, 230 V AC | R&S [®] SMZ75, R&S [®] SMZ90, R&S [®] SMZ110 | 10 W (meas.) |
| | R&S [®] SMZ170 | 20 W (meas.) |
| EMC | | |
| Electromagnetic compatibility | | in line with EN 55011 class A, EN 61326-1 |
| Immunity to interfering field strength | | up to 10 V/m |
| Mechanical resistance | | |
| Vibration | sinusoidal | 5 Hz to 150 Hz, max. 2 g at 55 Hz, max. 0.5 g at 55 Hz to 150 Hz, in line with EN 60068-2-6 |
| | random | 10 Hz to 300 Hz, acceleration 1.2 g RMS in line with EN 60068-2-64 |
| Shock | | 40 g shock spectrum, in line with MIL-STD-810E method No. 516.4, procedure I |
| Environmental conditions | | |
| Temperature range | operating temperature range | +18 °C to +30 °C |
| | permissible temperature range | +5 °C to +40 °C |
| | storage | -40 °C to +71 °C |
| Climatic resistance | test: +40 °C/80 % rel. humidity | in line with EN 60068-2-30 |
| Dimensions and weight | | |
| Dimensions | W × H × D (with feet height adjusted to 12 mm) | 114 mm × 78 mm × 278 mm (4.49 in × 3.07 in × 10.94 in) |
| Weight | when fully equipped (including DC power adapter) | 1.9 kg (4.19 lb) |
| Calibration interval | | |
| Recommended calibration interval | operation 40 h/week in the full range of the specified environmental conditions | 3 years |

Ordering information

| Designation | Type | Order No. |
|---|----------------------------|--------------|
| Base unit | | |
| Frequency Multiplier, 50 GHz to 75 GHz | R&S®SMZ75 | 1417.4004K02 |
| Frequency Multiplier, 60 GHz to 90 GHz | R&S®SMZ90 | 1417.4504K02 |
| Frequency Multiplier, 75 GHz to 110 GHz | R&S®SMZ110 | 1417.5000K02 |
| Frequency Multiplier, 110 GHz to 170 GHz | R&S®SMZ170 | 1417.5500K02 |
| Including waveguide-to-waveguide adapter, DC power adapter, USB cable, hex ball driver 3/32, operating manual, CD-ROM with operating manual | | |
| Hardware options | | |
| Mechanically Controlled Attenuator for the R&S®SMZ75 | R&S®SMZ-B75M ¹ | 1417.6007.02 |
| Electronically Controlled Attenuator for the R&S®SMZ75 | R&S®SMZ-B75E ¹ | 1417.6107.02 |
| Mechanically Controlled Attenuator for the R&S®SMZ90 | R&S®SMZ-B90M ¹ | 1417.6507.02 |
| Electronically Controlled Attenuator for the R&S®SMZ90 | R&S®SMZ-B90E ¹ | 1417.6607.02 |
| Mechanically Controlled Attenuator for the R&S®SMZ110 | R&S®SMZ-B110M ¹ | 1417.7003.02 |
| Electronically Controlled Attenuator for the R&S®SMZ110 | R&S®SMZ-B110E ¹ | 1417.7103.02 |
| Software option | | |
| Software License for external PC software | R&S®SMZ-K1 | 1417.8400.02 |
| Recommended extras | | |
| Hardcopy manual (English) | | 1417.4027.32 |
| Coaxial cable with SMA connectors 50 Ω (length 0.5 m) | | 3586.9963.00 |
| Coaxial cable with SMA connectors 50 Ω (length 1.0 m) | | 3586.9970.00 |
| Waveguide-to-waveguide adapter WR6.5, HP/A compatible (as test port saver) | | 1314.5815.00 |
| Waveguide-to-waveguide adapter WR10, HP/A compatible (as test port saver) | | 1307.7074.00 |
| Waveguide-to-waveguide adapter WR12, HP/A compatible (as test port saver) | | 1314.5796.00 |
| Waveguide-to-waveguide adapter WR15, HP/A compatible (as test port saver) | | 1314.5780.00 |
| USB cable USB/A – USB/B (length 2.0 m) | | 1507.0567.00 |
| Hex ball driver 3/32 | | 1307.8670.00 |

| Service options | | |
|--|------------|---|
| Extended Warranty, one year | R&S®WE1SMZ | Please contact your local Rohde & Schwarz sales office. |
| Extended Warranty, two years | R&S®WE2SMZ | |
| Extended Warranty, three years | R&S®WE3SMZ | |
| Extended Warranty, four years | R&S®WE4SMZ | |
| Extended Warranty with Calibration Coverage, one year | R&S®CW1SMZ | |
| Extended Warranty with Calibration Coverage, two years | R&S®CW2SMZ | |
| Extended Warranty with Calibration Coverage, three years | R&S®CW3SMZ | |
| Extended Warranty with Calibration Coverage, four years | R&S®CW4SMZ | |

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

Repairs carried out during the contract term are free of charge². Necessary calibration and adjustments carried out during repairs are also covered. Simply contact the forwarding agent we name; your product will be picked up free of charge and returned to you in top condition a couple of days later.

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 repairs² and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

For product brochure, see PD 5214.4336.12 and www.rohde-schwarz.com

¹ Factory-installed option (only a mechanically or electronically controlled attenuator can be fitted; no attenuator option is available for the R&S®SMZ170).

² Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Service that adds value

- | Worldwide
- | Local and personalized
- | Customized and flexible
- | Uncompromising quality
- | Long-term dependability

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

- | Energy-efficient products
- | Continuous improvement in environmental sustainability
- | ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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R&S®SMZ

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