

R&S® ZCxxx

MILLIMETERWAVE CONVERTERS

Specifications

Specifications
Version 18.00




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CONTENTS

| | |
|--|-----------|
| Definitions | 3 |
| General information | 4 |
| Specifications..... | 5 |
| Test port | 5 |
| Source input (RF IN)..... | 7 |
| Local oscillator input (LO IN)..... | 7 |
| Measurement output (MEAS OUT) | 7 |
| Reference output (REF OUT) | 7 |
| USB connector (USB ) | 7 |
| Power supply input (POWER SUPPLY)..... | 8 |
| System characteristics | 8 |
| General data..... | 23 |
| Ordering information | 26 |

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.



Non-traceable specifications with limits (n. trc.)

Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

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 designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

General information

The R&S®ZCxxx and RPG ZCxxx millimeterwave converters are optional for the following vector network analyzers:

- R&S®ZNA26, R&S®ZNA43, R&S®ZNA50, R&S®ZNA67
- R&S®ZVA24, R&S®ZVA40, R&S®ZVA50, R&S®ZVA67

The converters facilitate measurements in the millimeterwave frequency range from 50 GHz to 1100 GHz.

The R&S®ZCxxx millimeterwave converters are available for the frequency bands:

- 50 GHz to 75 GHz (R&S®ZC75)
- 60 GHz to 90 GHz (R&S®ZC90) ¹
- 60 GHz to 90 GHz (R&S®ZC90E) ^{1, 2}
- 75 GHz to 110 GHz (R&S®ZC110)
- 90 GHz to 140 GHz (R&S®ZC140)
- 110 GHz to 170 GHz (R&S®ZC170, model .02)
- 110 GHz to 170 GHz, high frequency input (R&S®ZC170, model .03)
- 110 GHz to 170 GHz, dual-source (R&S®ZCDS170)
- 140 GHz to 220 GHz (R&S®ZC220)
- 170 GHz to 260 GHz (RPG ZC260) ¹
- 220 GHz to 330 GHz (R&S®ZC330)
- 260 GHz to 400 GHz (RPG ZC400) ¹
- 330 GHz to 500 GHz (R&S®ZC500, model .02)
- 330 GHz to 500 GHz, high frequency input (R&S®ZC500, model .03)
- 500 GHz to 750 GHz (RPG ZC750) ¹
- 750 GHz to 1100 GHz (RPG ZC1100) ¹

The millimeter wave converters consist of a dedicated reflectometer module containing a directional coupler, a frequency multiplier for generating the source signal and two harmonic mixers as downconverters. Some converter models are also fitted with a manually adjustable attenuator in order to change the output power. In addition, the millimeter wave converters allow output power leveling and power sweeps by adjusting the RF input power.

The R&S®ZNA vector network analyzers must be configured with the R&S®ZNA-K8 option and either the R&S®ZNAxx-B16 or R&S®ZNA-B26 option. Option R&S®ZNA-B8 provides an output of the internal LO signal on the rear panel of the R&S®ZNA. This option allows each port of the R&S®ZNA vector network analyzers to be fitted with a millimeter wave converter if all converters share the same LO signal.

The R&S®ZVAxx vector network analyzer must be equipped with the R&S®ZVAxx-B16 and R&S®ZVA-K8 options.

The R&S®ZCxxx and RPG ZCxxx millimeterwave converters come with the following accessories:

- Hex ball driver
- Two coaxial cables with SMA connectors for the reference and measurement output signals
- Waveguide-to-waveguide adapter (test port adapter, factory mounted)
- DC cable and USB cable
- Waveguide flange screws and dowel pins
- Documentation

The R&S®ZCxxx and RPG ZCxxx millimeterwave converters must be operated with the R&S®ZCPS power supply module (see ordering information; one module supplies two converters).

¹ The following vector network analyzer models are recommended: R&S®ZNAxx, R&S®ZVA24 (model .28), R&S®ZVA40 (model .48), R&S®ZVA67 (model .02 and model .04).

² R&S®ZNAxx vector network analyzers do not support the electronic attenuator.

Specifications

Test port

| | | |
|----------------------|--|---|
| Frequency range | R&S®ZC75 | 50 GHz to 75 GHz |
| | R&S®ZC90 and R&S®ZC90E | 60 GHz to 90 GHz |
| | R&S®ZC110 | 75 GHz to 110 GHz |
| | R&S®ZC140 | 90 GHz to 140 GHz |
| | R&S®ZC170 and R&S®ZCDS170 | 110 GHz to 170 GHz |
| | R&S®ZC220 | 140 GHz to 220 GHz |
| | RPG ZC260 | 170 GHz to 260 GHz |
| | R&S®ZC330 | 220 GHz to 330 GHz |
| | RPG ZC400 | 260 GHz to 400 GHz |
| | R&S®ZC500 | 330 GHz to 500 GHz |
| | RPG ZC750 | 500 GHz to 750 GHz |
| | RPG ZC1100 | 750 GHz to 1100 GHz |
| Waveguide designator | R&S®ZC75 | WR15 |
| | R&S®ZC90 and R&S®ZC90E | WR12 |
| | R&S®ZC110 | WM-2540 (WR10) |
| | R&S®ZC140 | WM-2032 (WR8.0) |
| | R&S®ZC170 and R&S®ZCDS170 | WM-1651 (WR6.5) |
| | R&S®ZC220 | WM-1295 (WR5.1) |
| | RPG ZC260 | WM-1092 (WR4.3) |
| | R&S®ZC330 | WM-864 (WR3.4) |
| | RPG ZC400 | WM-710 |
| | R&S®ZC500 | WM-570 |
| | RPG ZC750 | WM-380 |
| | RPG ZC1100 | WM-250 |
| Connector type | anti-cocking flange | Rohde & Schwarz precision waveguide flange, compatible with flange types UG-387/U-M and IEEE 1785.2 |
| Output power | at +7 dBm input power from the R&S®ZNA/R&S®ZVA | |
| | R&S®ZC75 | |
| | 50 GHz to 75 GHz | > +10 dBm, typ. +12 dBm |
| | R&S®ZC90 | |
| | 60 GHz to 90 GHz | > +7 dBm, typ. +10 dBm |
| | R&S®ZC90E | |
| | 60 GHz to 90 GHz | > +2 dBm, typ. +6 dBm |
| | R&S®ZC110 | |
| | 75 GHz to 110 GHz | > +12 dBm (n. trc.), typ. +15 dBm |
| | R&S®ZC140 | |
| | 90 GHz to 95 GHz | > +5 dBm (n. trc.), typ. +7 dBm |
| | 95 GHz to 135 GHz | > +7 dBm (n. trc.), typ. +9 dBm |
| | 135 GHz to 140 GHz | > +5 dBm (n. trc.), typ. +7 dBm |
| | R&S®ZC170 | |
| | 110 GHz to 170 GHz | > +6 dBm (n. trc.), typ. +9 dBm |
| | R&S®ZCDS170 | |
| | 110 GHz to 170 GHz | > +3 dBm (n. trc.), typ. +6 dBm |
| | R&S®ZC220 | |
| | 140 GHz to 220 GHz | > -2 dBm (n. trc.), typ. +1 dBm |
| | RPG ZC260 | |
| | 170 GHz to 260 GHz | > -6 dBm (n. trc.), typ. -2 dBm |
| | R&S®ZC330 | |
| | 220 GHz to 330 GHz | > -10 dBm (n. trc.), typ. -7 dBm |
| | RPG ZC400 | |
| | 260 GHz to 400 GHz | > -15 dBm (n. trc.), typ. -12 dBm |
| | R&S®ZC500 | |
| | 330 GHz to 500 GHz | > -15 dBm (n. trc.), typ. -11 dBm |
| | RPG ZC750 | |
| | 500 GHz to 750 GHz | > -25 dBm (n. trc.), typ. -18 dBm |
| | RPG ZC1100 | |
| | 750 GHz to 950 GHz | > -30 dBm (n. trc.), typ. -25 dBm |
| | 950 GHz to 1100 GHz | > -32 dBm (n. trc.), typ. -27 dBm |

| | | |
|--|--------------------------------------|-------------------|
| Output power attenuation | R&S®ZC75, manually adjustable | 0 dB to 40 dB |
| | R&S®ZC90, no manual adjustment | |
| | R&S®ZC90E, electronically adjustable | 0 dB to 25 dB |
| | R&S®ZC110, no manual adjustment | |
| | R&S®ZC140, manually adjustable | 0 dB to 40 dB |
| | R&S®ZC170, manually adjustable | 0 dB to 40 dB |
| | R&S®ZCDS170, no manual adjustment | |
| | R&S®ZC220, manually adjustable | 0 dB to 40 dB |
| | RPG ZC260, manually adjustable | 0 dB to 40 dB |
| | R&S®ZC330, manually adjustable | 0 dB to 40 dB |
| | RPG ZC400, manually adjustable | 0 dB to 40 dB |
| | R&S®ZC500, manually adjustable | 0 dB to 40 dB |
| | RPG ZC750, manually adjustable | 0 dB to 40 dB |
| | RPG ZC1100, no manual adjustment | |
| Output power flatness across the waveguide band at minimum attenuation (peak-to-peak) | at 0 dB attenuator setting | |
| | R&S®ZC75 | < 7 dB (n. trc.) |
| | R&S®ZC90 and R&S®ZC90E | < 7 dB (n. trc.) |
| | R&S®ZC110 | < 6 dB (n. trc.) |
| | R&S®ZC140 | < 6 dB (n. trc.) |
| | R&S®ZC170 and R&S®ZCDS170 | < 7 dB (n. trc.) |
| | R&S®ZC220 | < 7 dB (n. trc.) |
| | RPG ZC260 | < 7 dB (n. trc.) |
| | R&S®ZC330 | < 7 dB (n. trc.) |
| | RPG ZC400 | < 13 dB (n. trc.) |
| | R&S®ZC500 | < 13 dB (n. trc.) |
| | RPG ZC750 | < 16 dB (n. trc.) |
| | RPG ZC1100 | < 16 dB (n. trc.) |
| | | |
| Deviation of output power linearity, using electronic attenuator and polynomial coefficients provided by Rohde & Schwarz | R&S®ZC90E | < 4 dB |
| Damage level | R&S®ZC75 | +20 dBm |
| | R&S®ZC90 and R&S®ZC90E | +20 dBm |
| | R&S®ZC110 | +20 dBm |
| | R&S®ZC140 | +20 dBm |
| | R&S®ZC170 and R&S®ZCDS170 | +20 dBm |
| | R&S®ZC220 | +20 dBm |
| | RPG ZC260 | +10 dBm |
| | R&S®ZC330 | +20 dBm |
| | RPG ZC400 | +10 dBm |
| | R&S®ZC500 | +10 dBm |
| | RPG ZC750 | +5 dBm |
| | RPG ZC1100 | +5 dBm |

Source input (RF IN)

| | | | |
|---|------------------------|--------------------------|------|
| Connector type | | 2.92 mm, female | |
| Frequency range and multiplication factor | R&S®ZC75 | 12.500 GHz to 18.750 GHz | × 4 |
| | R&S®ZC90 and R&S®ZC90E | 10.000 GHz to 15.000 GHz | × 6 |
| | R&S®ZC110 | 12.500 GHz to 18.333 GHz | × 6 |
| | R&S®ZC140 | 15.000 GHz to 23.333 GHz | × 6 |
| | R&S®ZC170 (model .02) | 9.167 GHz to 14.167 GHz | × 12 |
| | R&S®ZC170 (model .03) | 18.334 GHz to 28.334 GHz | × 6 |
| | R&S®ZCDS170 | 27.500 GHz to 42.500 GHz | × 4 |
| | R&S®ZC220 | 11.667 GHz to 18.333 GHz | × 12 |
| | RPG ZC260 | 14.166 GHz to 21.666 GHz | × 12 |
| | R&S®ZC330 | 12.222 GHz to 18.333 GHz | × 18 |
| | RPG ZC400 | 14.444 GHz to 22.222 GHz | × 18 |
| | R&S®ZC500 (model .02) | 9.027 GHz to 13.889 GHz | × 36 |
| | R&S®ZC500 (model .03) | 18.056 GHz to 27.778 GHz | × 18 |
| | RPG ZC750 | 13.888 GHz to 20.833 GHz | × 36 |
| | RPG ZC1100 | 13.888 GHz to 20.370 GHz | × 54 |
| Input power range | | -15 dBm to +10 dBm | |

Local oscillator input (LO IN)

| | | | |
|---|---------------------------|--------------------------|------|
| Connector type | | 2.92 mm, female | |
| Frequency range and multiplication factor | R&S®ZC75 | 8.287 GHz to 12.454 GHz | × 6 |
| | R&S®ZC90 and R&S®ZC90E | 14.930 GHz to 22.430 GHz | × 4 |
| | R&S®ZC110 | 9.340 GHz to 13.715 GHz | × 8 |
| | R&S®ZC140 | 11.215 GHz to 17.465 GHz | × 8 |
| | R&S®ZC170 and R&S®ZCDS170 | 10.972 GHz to 16.972 GHz | × 10 |
| | R&S®ZC220 | 11.643 GHz to 18.310 GHz | × 12 |
| | RPG ZC260 | 14.143 GHz to 21.643 GHz | × 12 |
| | R&S®ZC330 | 9.155 GHz to 13.738 GHz | × 24 |
| | RPG ZC400 | 12.986 GHz to 19.986 GHz | × 20 |
| | R&S®ZC500 | 13.530 GHz to 20.822 GHz | × 24 |
| | RPG ZC750 | 13.881 GHz to 20.826 GHz | × 36 |
| | RPG ZC1100 | 15.619 GHz to 22.911 GHz | × 48 |
| Input power range | | +5 dBm to +10 dBm | |

Measurement output (MEAS OUT)

| | | |
|-----------------|--|-------------------|
| Connector type | | SMA, female |
| Frequency range | | 5 MHz to 2000 MHz |

Reference output (REF OUT)

| | | |
|-----------------|--|-------------------|
| Connector type | | SMA, female |
| Frequency range | | 5 MHz to 2000 MHz |

USB connector (USB)

| | | |
|----------------|--|-------------|
| Connector type | | USB, type B |
|----------------|--|-------------|

Power supply input (POWER SUPPLY)

| | | |
|-------------------|------------------------|--|
| Connector type | | 19-pin miniature circular connector with push-pull locking |
| Power consumption | R&S®ZC75 | 5 W |
| | R&S®ZC90 and R&S®ZC90E | 11 W |
| | R&S®ZC110 | 16 W |
| | R&S®ZC140 | 14 W |
| | R&S®ZC170 | 12 W |
| | R&S®ZCDS170 | 20 W |
| | R&S®ZC220 | 20 W |
| | RPG ZC260 | 12 W |
| | R&S®ZC330 | 30 W |
| | RPG ZC400 | 10 W |
| | R&S®ZC500 | 48 W |
| | RPG ZC750 | 30 W |
| | RPG ZC1100 | 30 W |

System characteristics

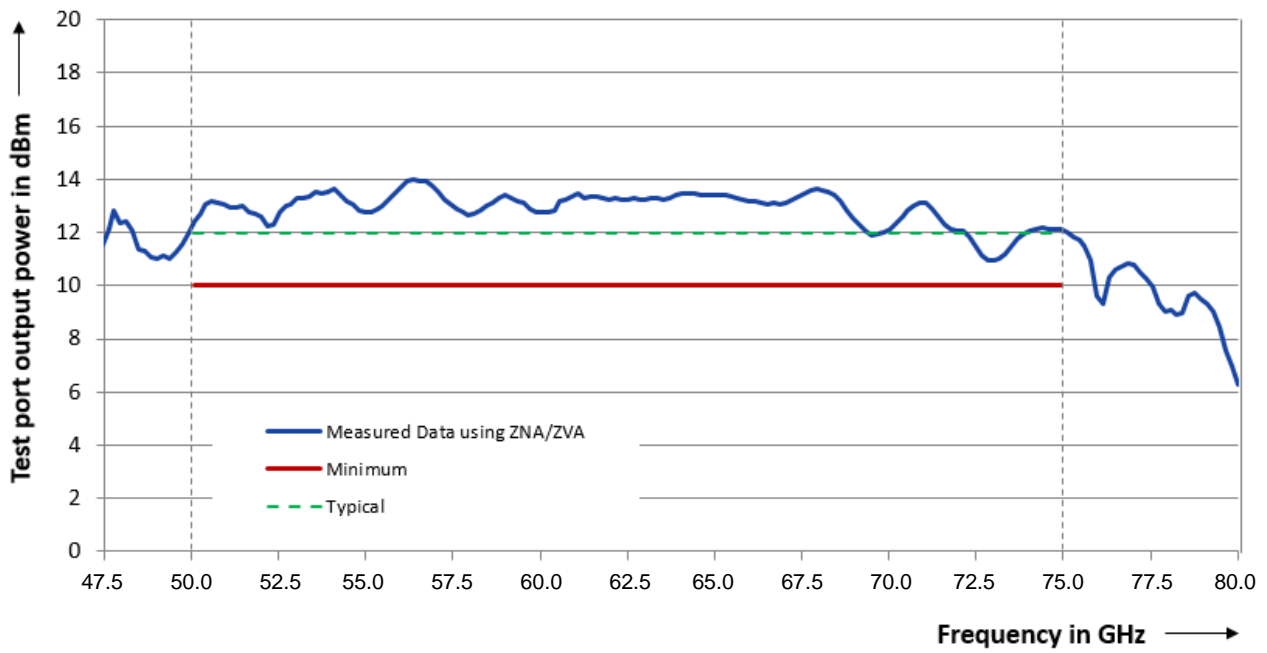
| | | |
|---|--|---------------------|
| Trace stability ³ | R&S®ZC75 | < 0.1 dB and < 1.5° |
| | R&S®ZC90 and R&S®ZC90E | < 0.1 dB and < 1.5° |
| | R&S®ZC110 | < 0.1 dB and < 1.5° |
| | R&S®ZC140 | < 0.15 dB and < 2° |
| | R&S®ZC170 and R&S®ZCDS170 | < 0.3 dB and < 4° |
| | R&S®ZC220 | < 0.3 dB and < 4° |
| | RPG ZC260 | < 0.4 dB and < 4° |
| | R&S®ZC330 | < 0.4 dB and < 6° |
| | RPG ZC400 | < 0.5 dB and < 6° |
| | R&S®ZC500 | < 0.5 dB and < 6° |
| | RPG ZC750 | < 0.5 dB and < 6° |
| | RPG ZC1100 | < 0.5 dB and < 6° |
| Source match (without system error correction) | non-traceable specifications with limits (n. trc.) | |
| | R&S®ZC75 | > 25 dB |
| | R&S®ZC90 and R&S®ZC90E | > 25 dB |
| | R&S®ZC110 | > 25 dB |
| | R&S®ZC140 | > 25 dB (n. trc.) |
| | R&S®ZC170 and R&S®ZCDS170 | > 25 dB (n. trc.) |
| | R&S®ZC220 | > 25 dB (n. trc.) |
| | RPG ZC260 | > 20 dB (n. trc.) |
| | R&S®ZC330 | > 20 dB (n. trc.) |
| | RPG ZC400 | > 20 dB (n. trc.) |
| | R&S®ZC500 | > 20 dB (n. trc.) |
| | RPG ZC750 | > 15 dB (n. trc.) |
| | RPG ZC1100 | > 15 dB (n. trc.) |
| Directivity (without system error correction) | non-traceable specifications with limits (n. trc.) | |
| | R&S®ZC75 | > 25 dB |
| | R&S®ZC90 and R&S®ZC90E | > 30 dB |
| | R&S®ZC110 | > 25 dB |
| | R&S®ZC140 | > 25 dB (n. trc.) |
| | R&S®ZC170 and R&S®ZCDS170 | > 25 dB (n. trc.) |
| | R&S®ZC220 | > 25 dB (n. trc.) |
| | RPG ZC260 | > 20 dB (n. trc.) |
| | R&S®ZC330 | > 20 dB (n. trc.) |
| | RPG ZC400 | > 20 dB (n. trc.) |
| | R&S®ZC500 | > 20 dB (n. trc.) |
| | RPG ZC750 | > 15 dB (n. trc.) |
| | RPG ZC1100 | > 10 dB (n. trc.) |

³ Trace stability is defined as the maximum deviation of the max. or min. hold trace of the reflection factor from its initial (reference) trace when measuring a converter whose waveguide port is terminated with a short. The data is valid if the ambient temperature of the R&S®ZNA/R&S®ZVA and the converter has not changed by more than 1 K over 1 h, the output power of the converter is unattenuated and the measurement bandwidth is set to 100 Hz.

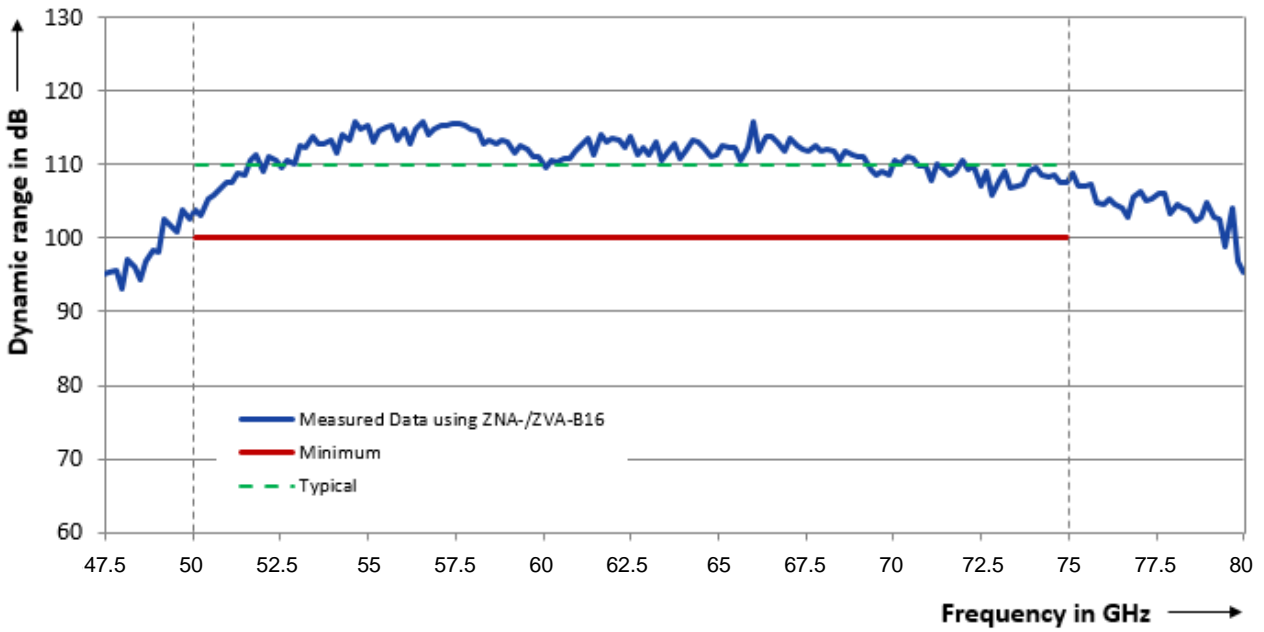
| | | |
|--|---------------------------|-----------------------|
| Effective source match (with system error correction) | R&S®ZC75 | > 35 dB (meas.) |
| | R&S®ZC90 and R&S®ZC90E | > 35 dB (meas.) |
| | R&S®ZC110 | > 35 dB (meas.) |
| | R&S®ZC140 | > 30 dB (meas.) |
| | R&S®ZC170 and R&S®ZCDS170 | > 30 dB (meas.) |
| | R&S®ZC220 | > 30 dB (meas.) |
| | RPG ZC260 | > 30 dB (meas.) |
| | R&S®ZC330 | > 30 dB (meas.) |
| | RPG ZC400 | > 30 dB (meas.) |
| | R&S®ZC500 | > 30 dB (meas.) |
| | RPG ZC750 | > 25 dB (meas.) |
| | RPG ZC1100 | > 25 dB (meas.) |
| Effective directivity (with system error correction) | R&S®ZC75 | > 35 dB (meas.) |
| | R&S®ZC90 and R&S®ZC90E | > 35 dB (meas.) |
| | R&S®ZC110 | > 35 dB (meas.) |
| | R&S®ZC140 | > 30 dB (meas.) |
| | R&S®ZC170 and R&S®ZCDS170 | > 30 dB (meas.) |
| | R&S®ZC220 | > 30 dB (meas.) |
| | RPG ZC260 | > 30 dB (meas.) |
| | R&S®ZC330 | > 27 dB (meas.) |
| | RPG ZC400 | > 27 dB (meas.) |
| | R&S®ZC500 | > 23 dB (meas.) |
| | RPG ZC750 | > 23 dB (meas.) |
| | RPG ZC1100 | > 17 dB (meas.) |
| Dynamic range ^{4 5} | R&S®ZC75 | > 100 dB, typ. 110 dB |
| | R&S®ZC90 | > 110 dB, typ. 120 dB |
| | R&S®ZC90E | > 105 dB, typ. 118 dB |
| | R&S®ZC110 | > 110 dB, typ. 120 dB |
| | R&S®ZC140 | > 105 dB, typ. 120 dB |
| | R&S®ZC170 | > 90 dB, typ. 105 dB |
| | R&S®ZCDS170 | > 87 dB, typ. 102 dB |
| | R&S®ZC220 | > 100 dB, typ. 115 dB |
| | RPG ZC260 | > 100 dB, typ. 110 dB |
| | R&S®ZC330 | > 100 dB, typ. 115 dB |
| | RPG ZC400 | > 80 dB, typ. 95 dB |
| | R&S®ZC500 | > 85 dB, typ. 105 dB |
| | RPG ZC750 | > 80 dB, typ. 90 dB |
| | RPG ZC1100 | > 60 dB, typ. 75 dB |
| Dual-tone source intermodulation (third order) | R&S®ZCDS170 | > 60 dB |

⁴ Dynamic range is defined as the difference between the data trace of the transmission magnitude with maximum test port output power and both test ports through-connected on the one hand and the RMS value of the data trace of the transmission magnitude produced by noise and crosstalk with the test ports short-circuited on the other hand. The specification is valid without system error correction and at 10 Hz measurement bandwidth. The dynamic range can be increased by using a measurement bandwidth of 1 Hz

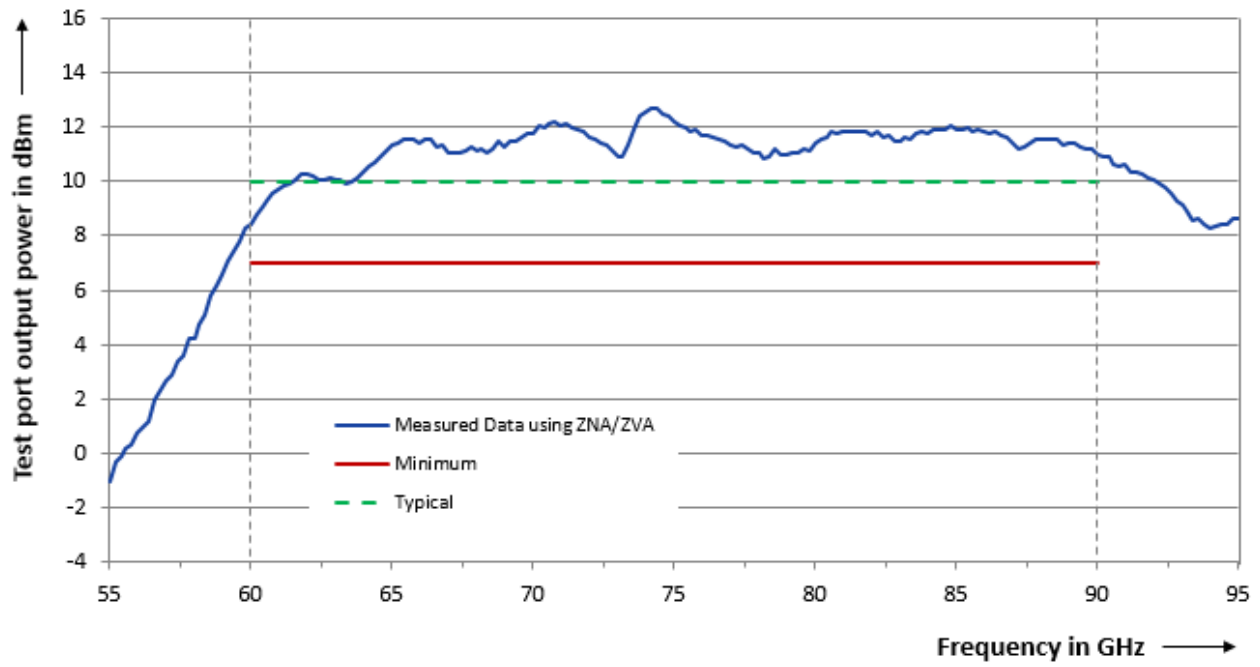
⁵ Dynamic range is specified using one of the following R&S®ZVA models: R&S®ZVA24 (model .28), R&S®ZVA40 (model .48), R&S®ZVA67 (model .02 or model .04). The dynamic range may be effectively reduced for other R&S®ZVAXx models.



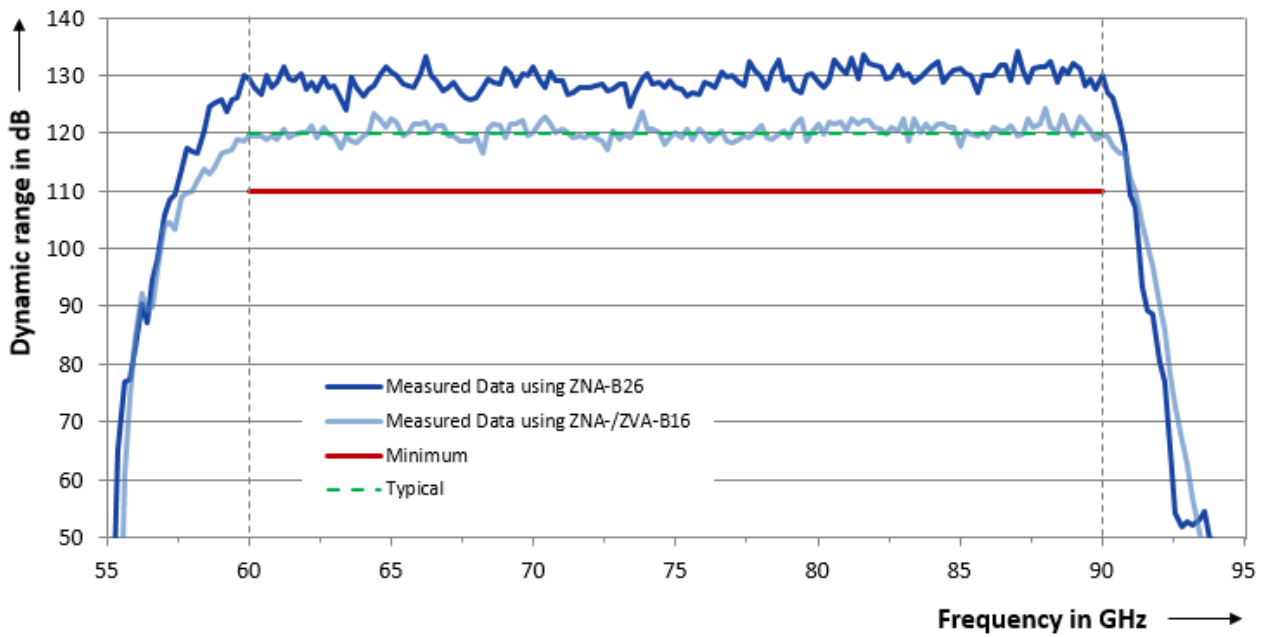
Test port output power versus frequency of the R&S®ZC75



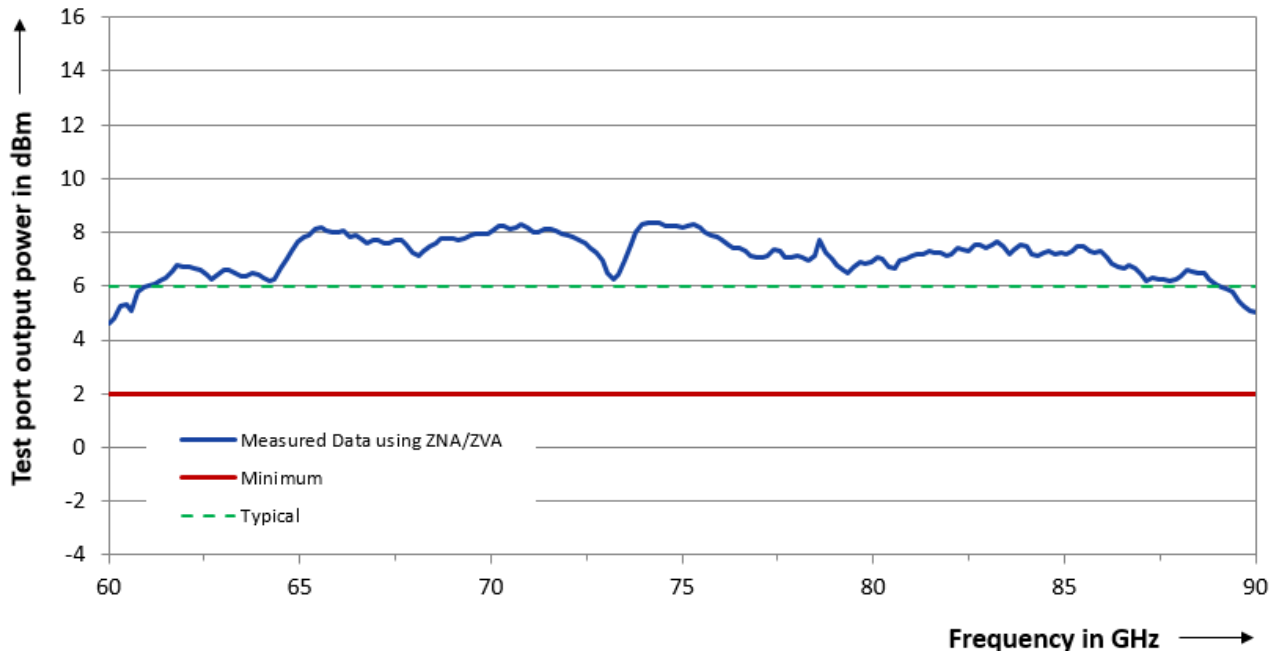
Dynamic range versus frequency of the R&S®ZC75



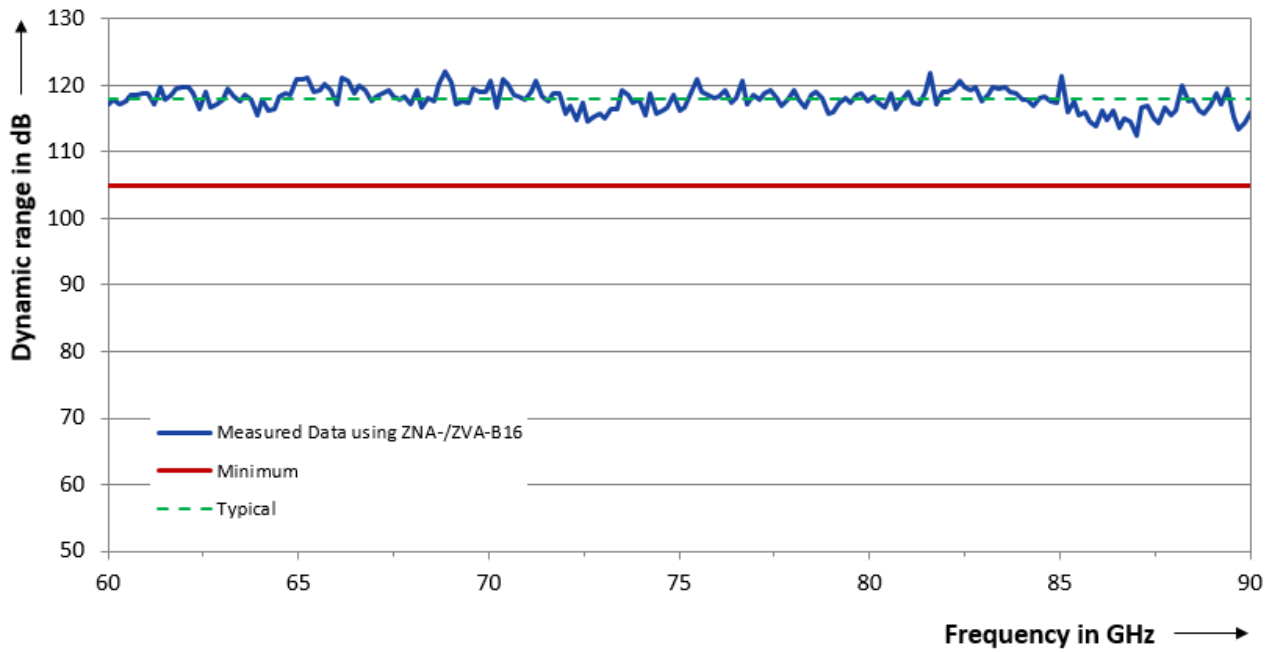
Test port output power versus frequency of the R&S®ZC90



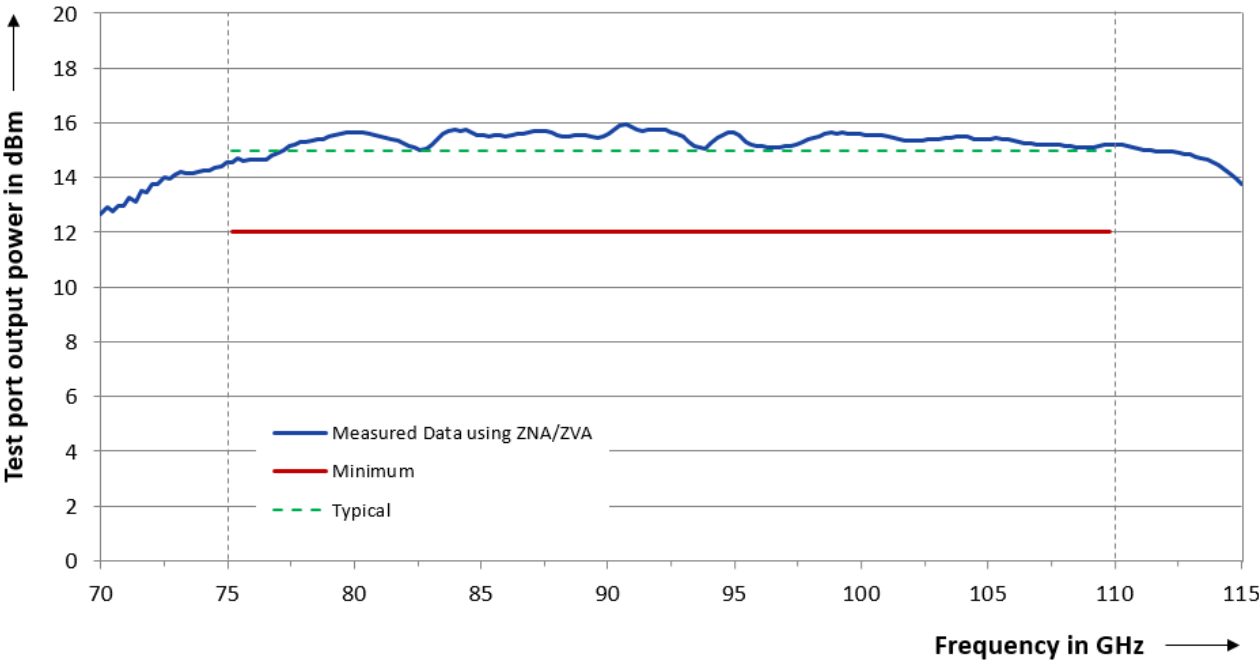
Dynamic range versus frequency of the R&S®ZC90



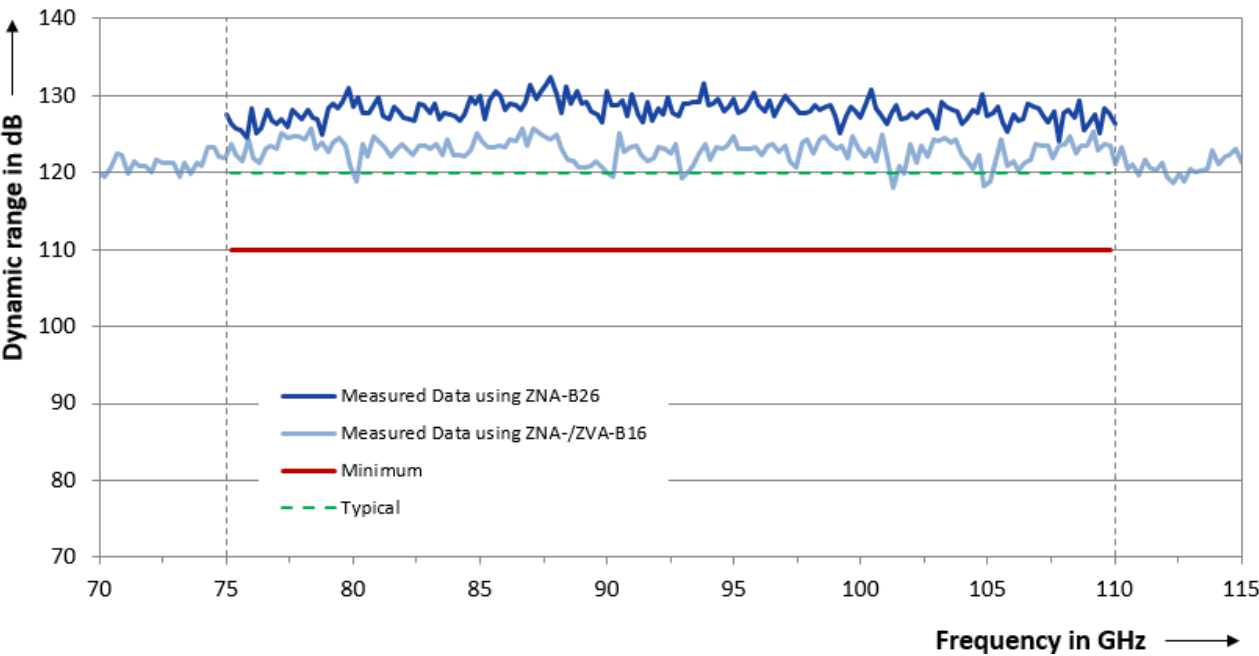
Test port output power versus frequency of the R&S®ZC90E



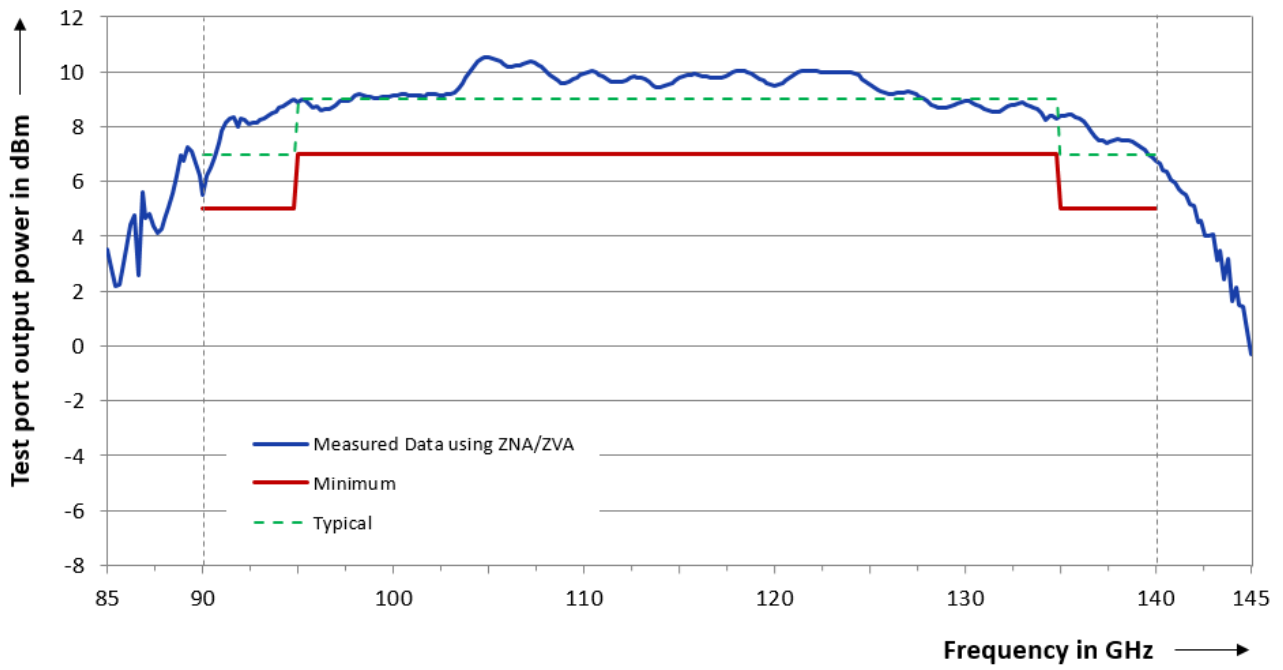
Dynamic range versus frequency of the R&S®ZC90E



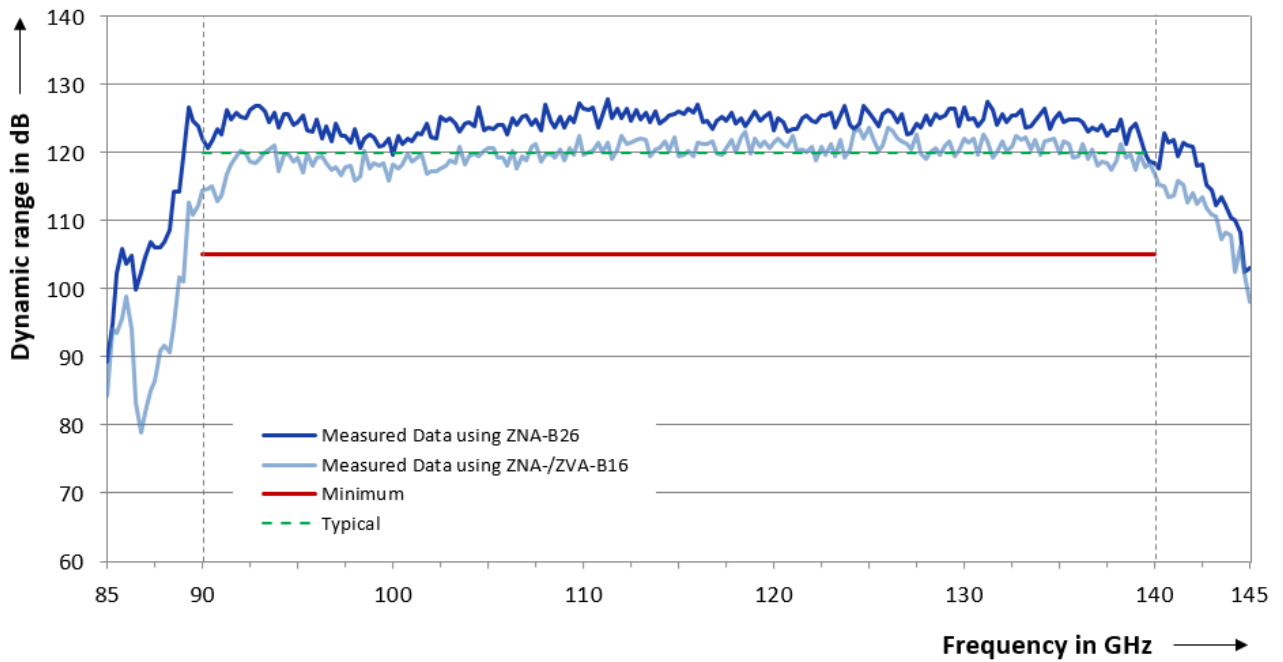
Test port output power versus frequency of the R&S®ZC110



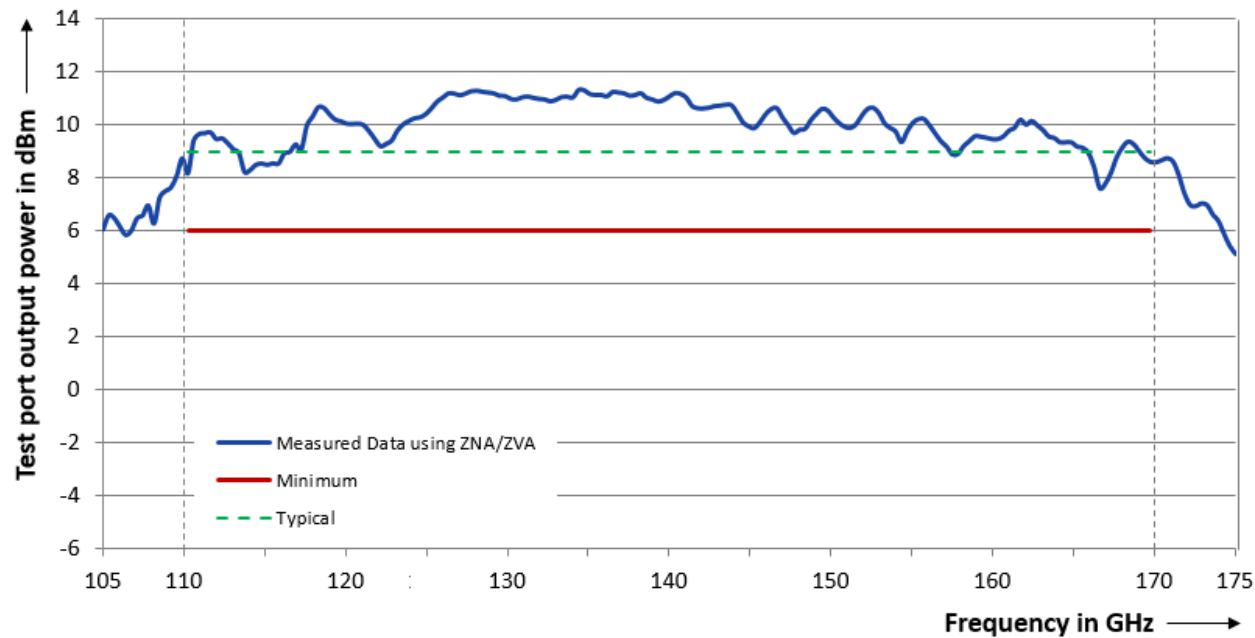
Dynamic range versus frequency of the R&S®ZC110



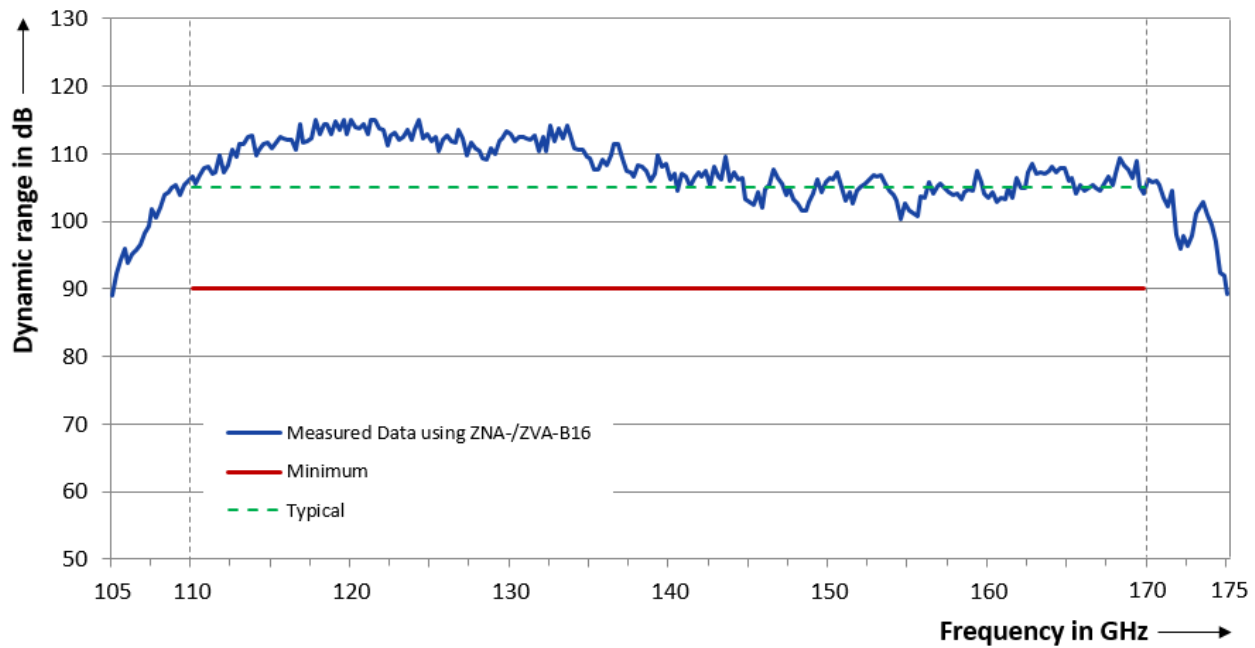
Test port output power versus frequency of the R&S®ZC140



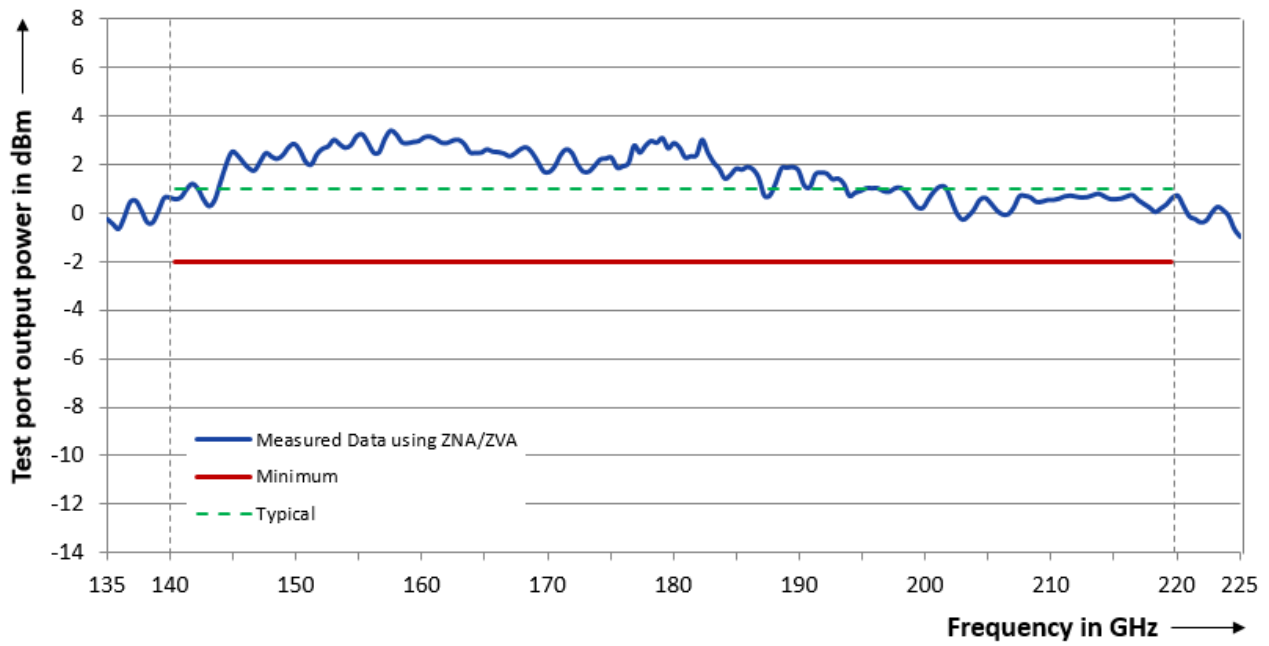
Dynamic range versus frequency of the R&S®ZC140



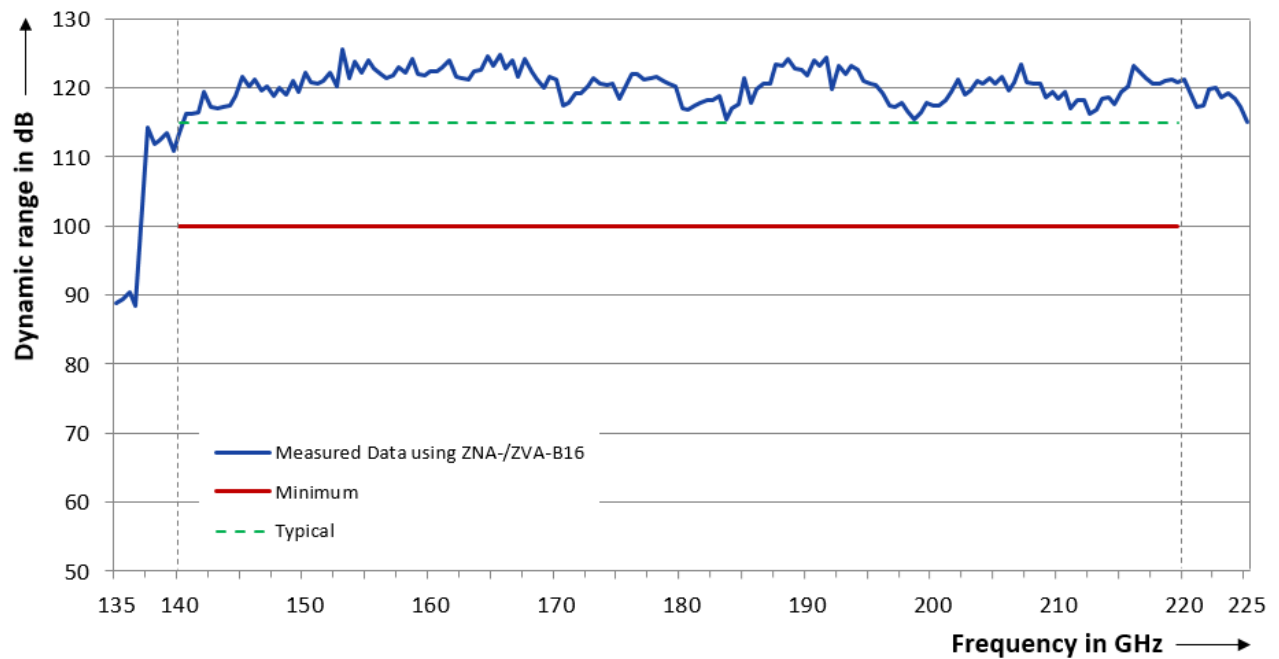
Test port output power versus frequency of the R&S®ZC170



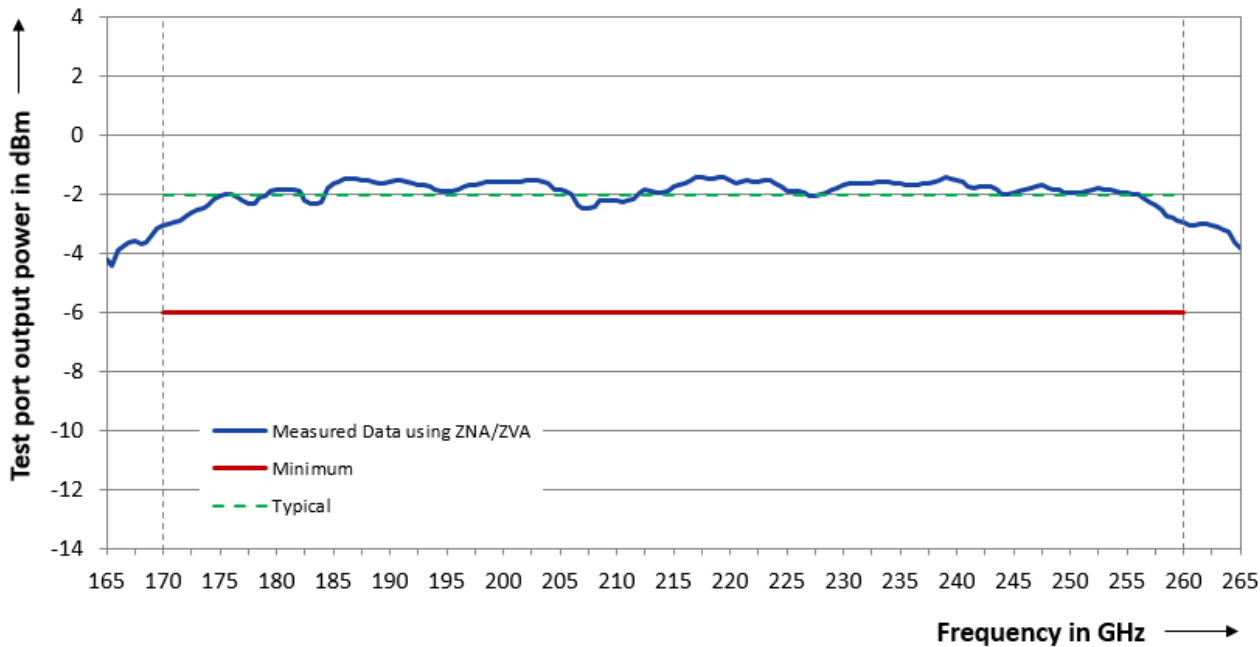
Dynamic range versus frequency of the R&S®ZC170



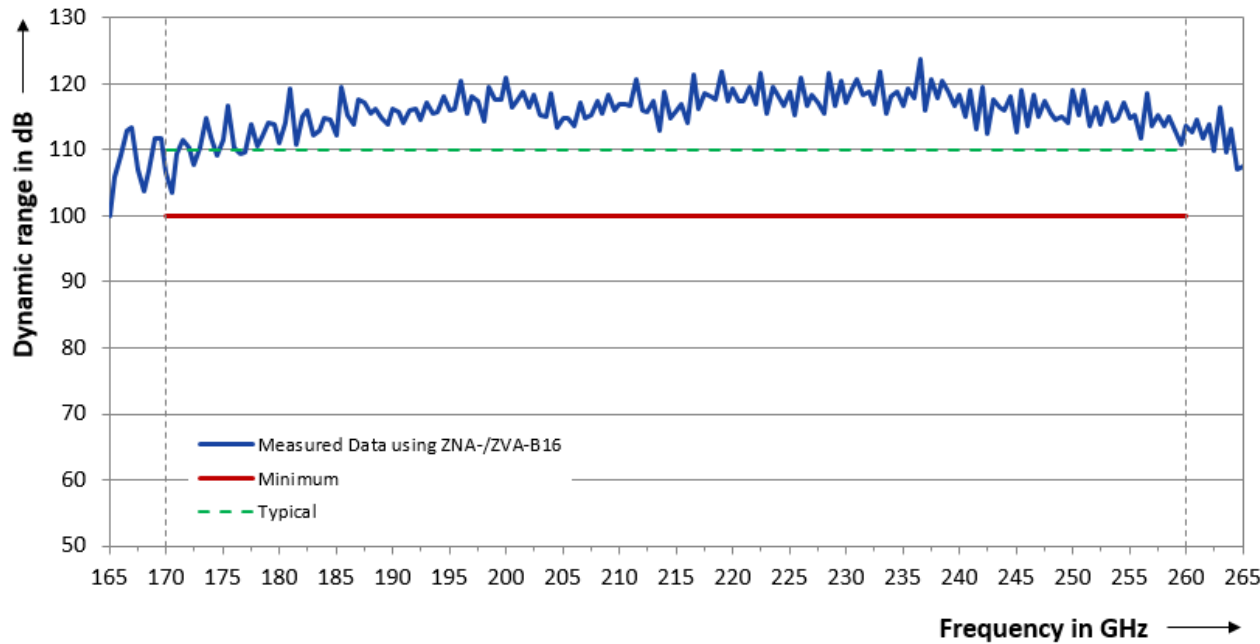
Test port output power versus frequency of the R&S®ZC220



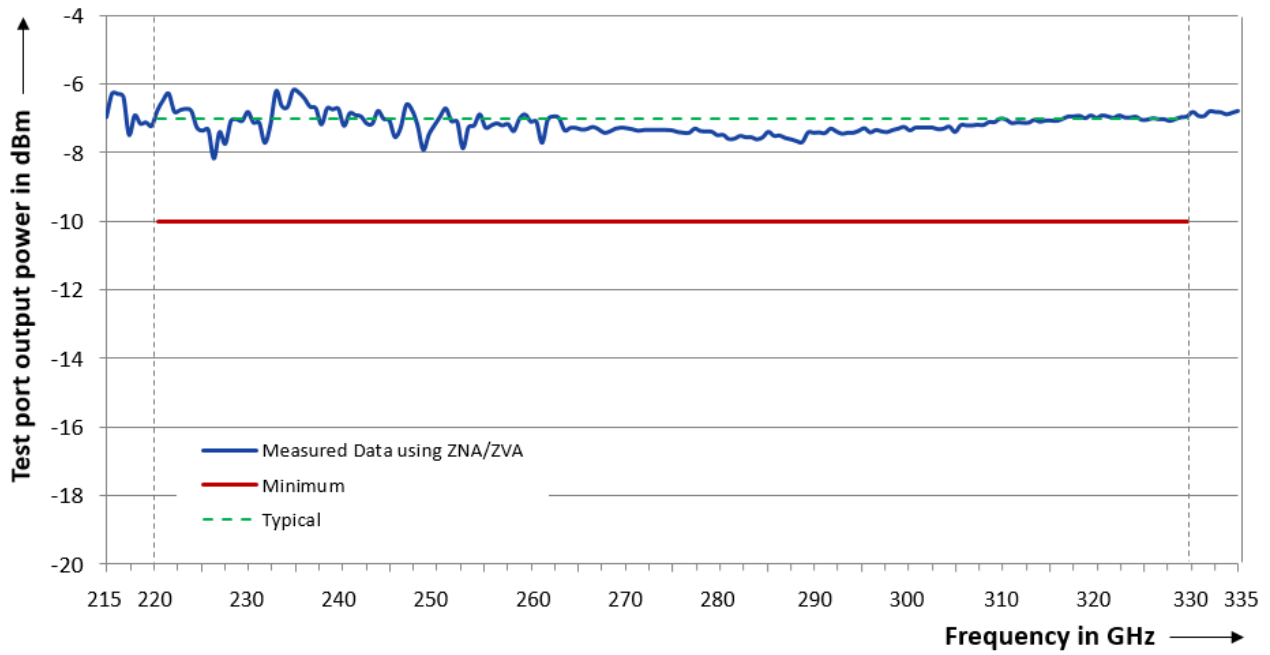
Dynamic range versus frequency of the R&S®ZC220



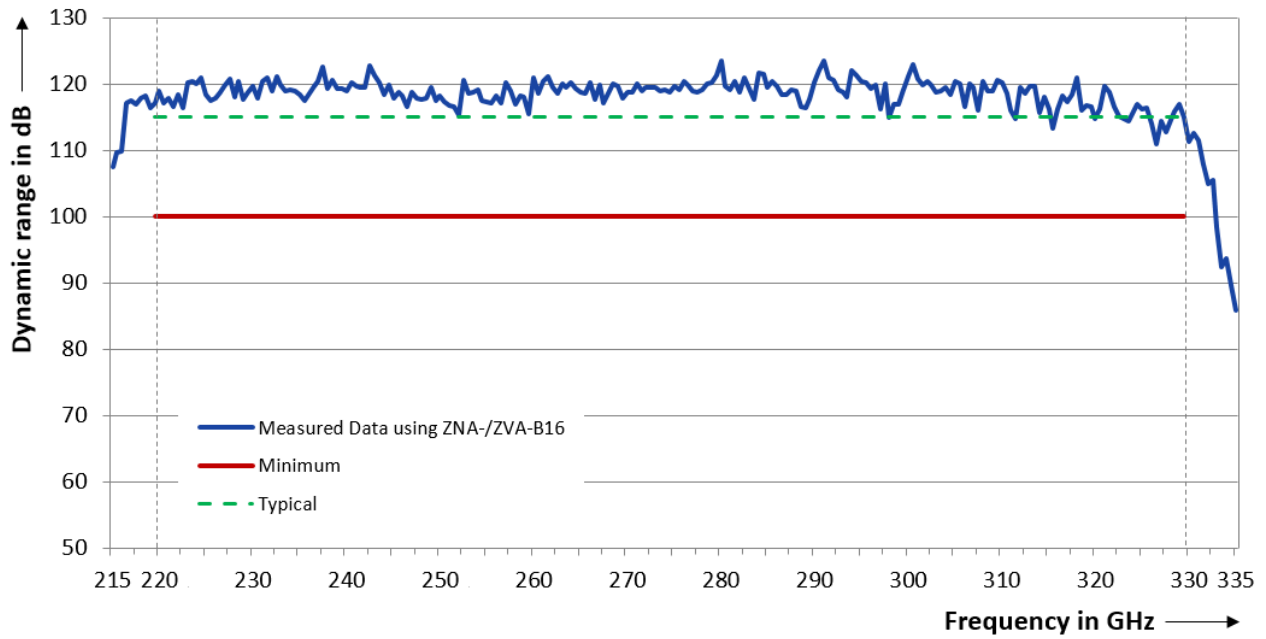
Test port output power versus frequency of the RPG ZC260



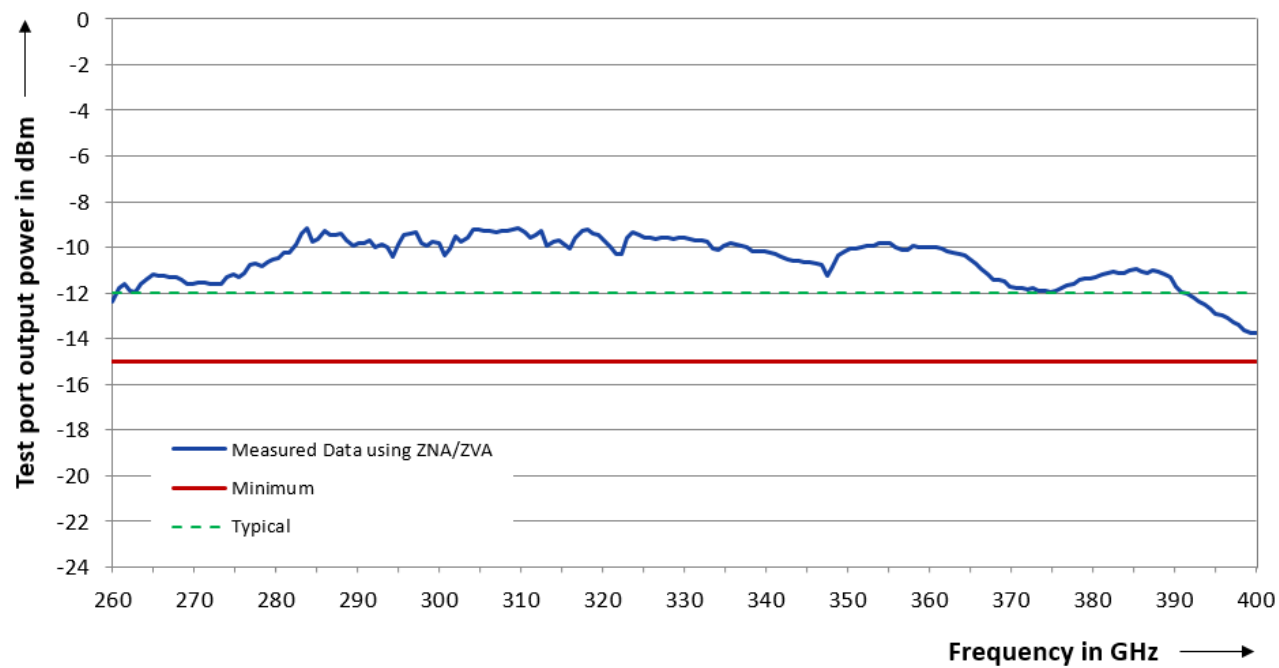
Dynamic range versus frequency of the RPG ZC260



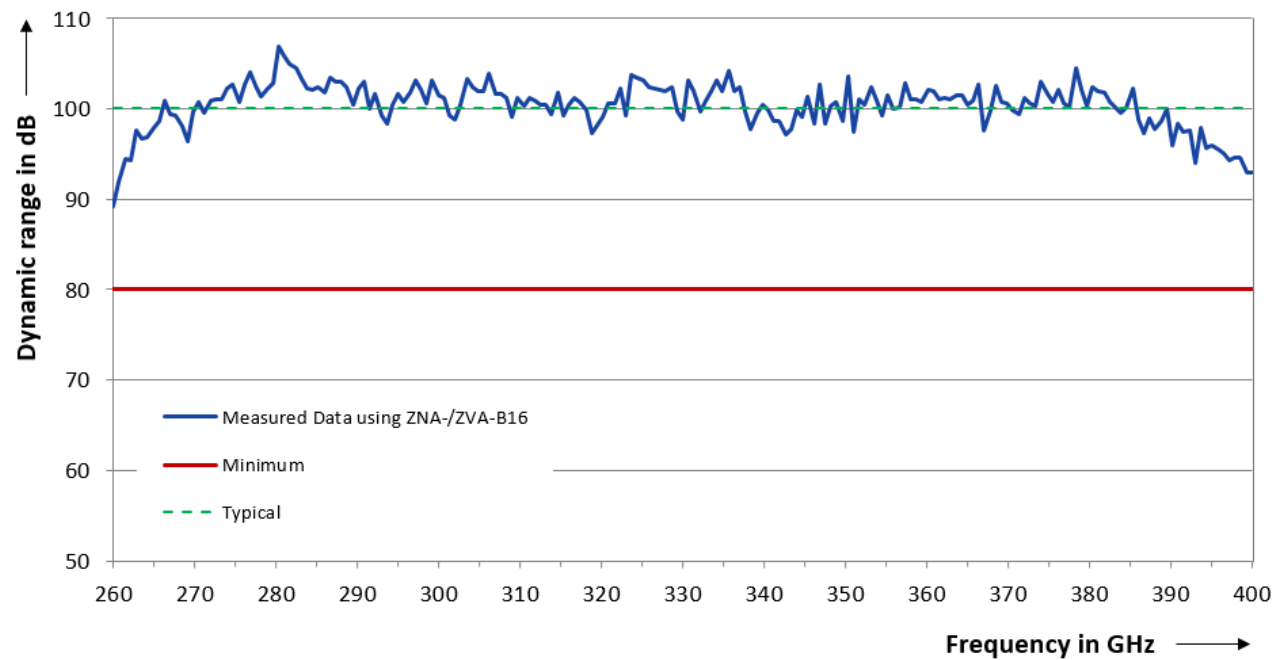
Test port output power versus frequency of the R&S®ZC330



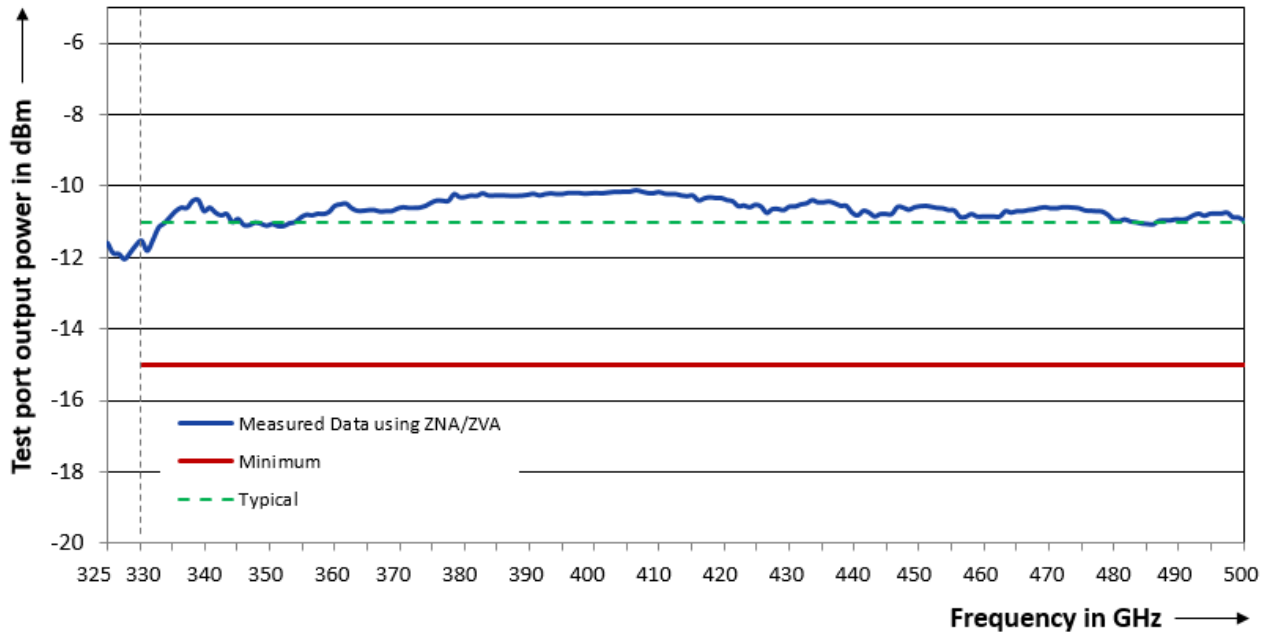
Dynamic range versus frequency of the R&S®ZC330



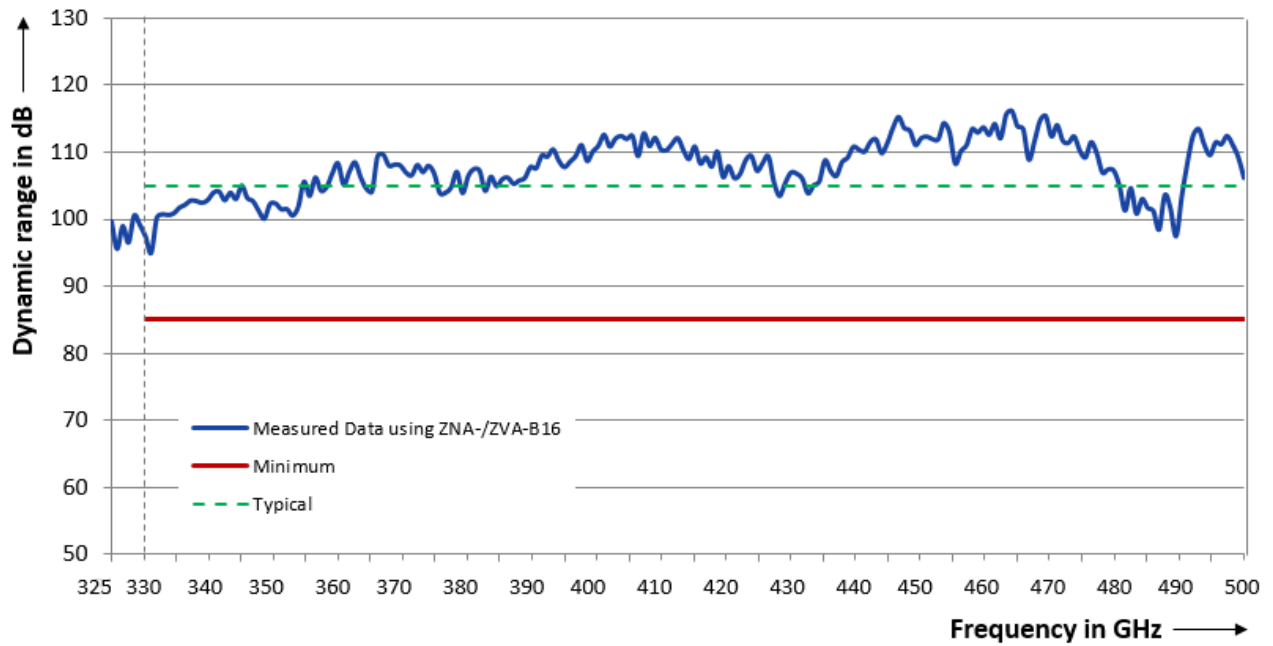
Test port output power versus frequency of the RPG ZC400



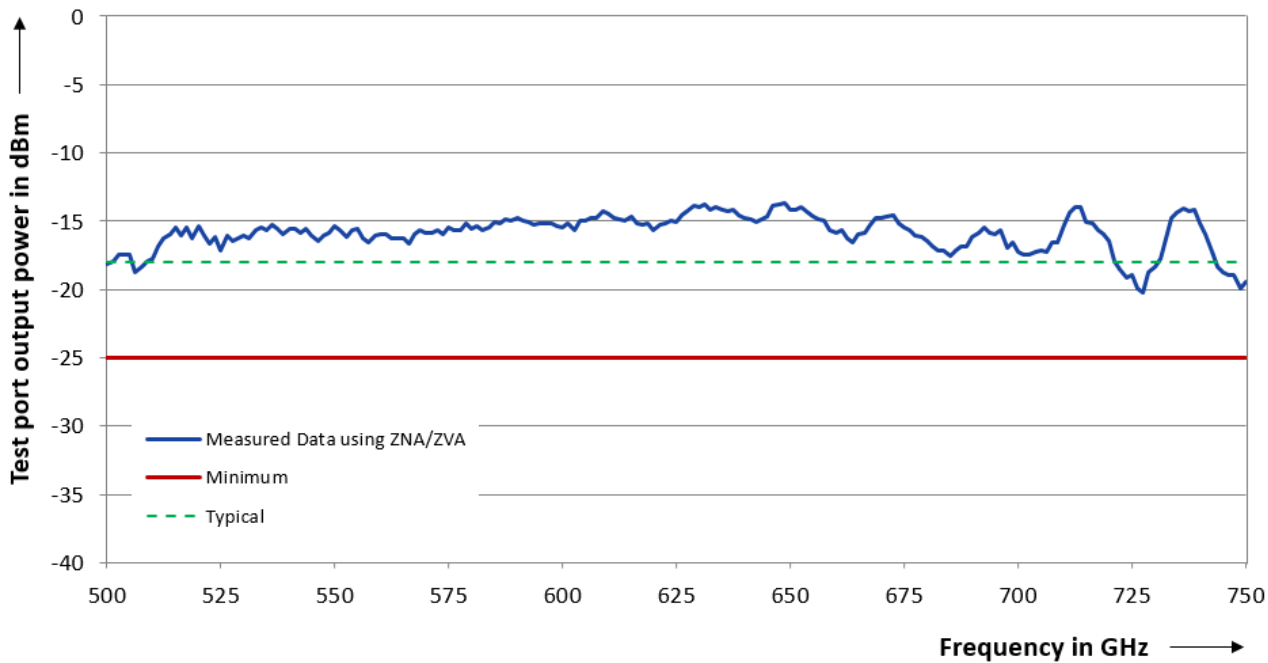
Dynamic range versus frequency of the RPG ZC400



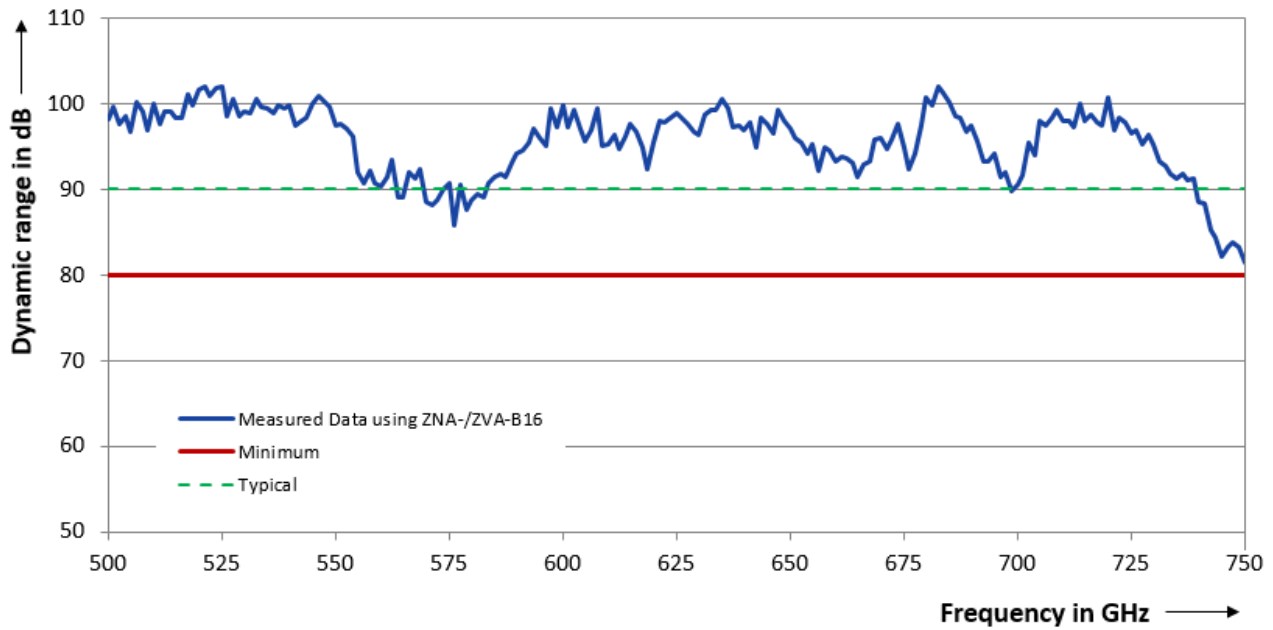
Test port output power versus frequency of the R&S®ZC500



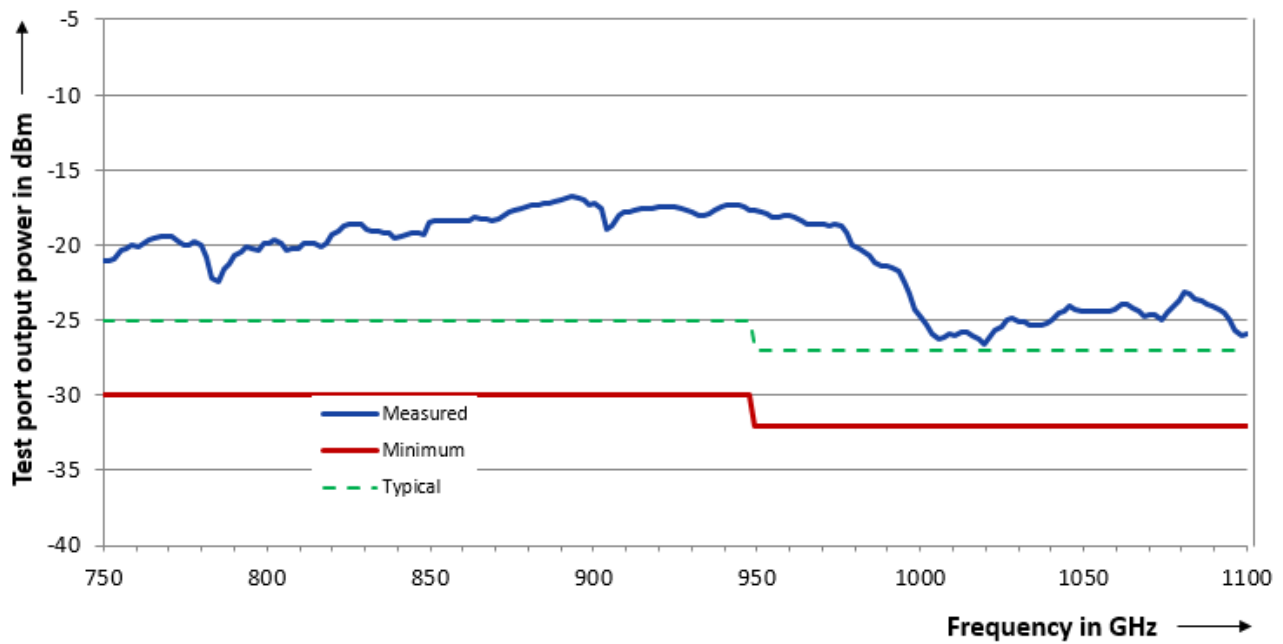
Dynamic range versus frequency of the R&S®ZC500



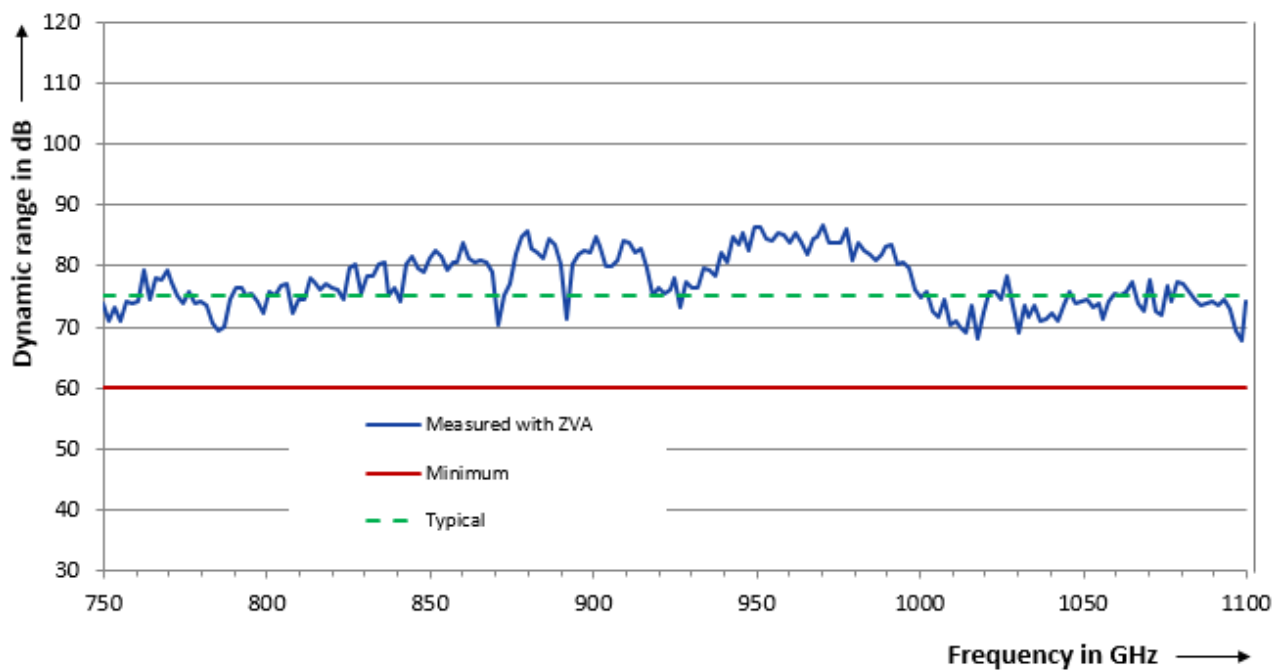
Test port output power versus frequency of the RPG ZC750



Dynamic range versus frequency of the RPG ZC750



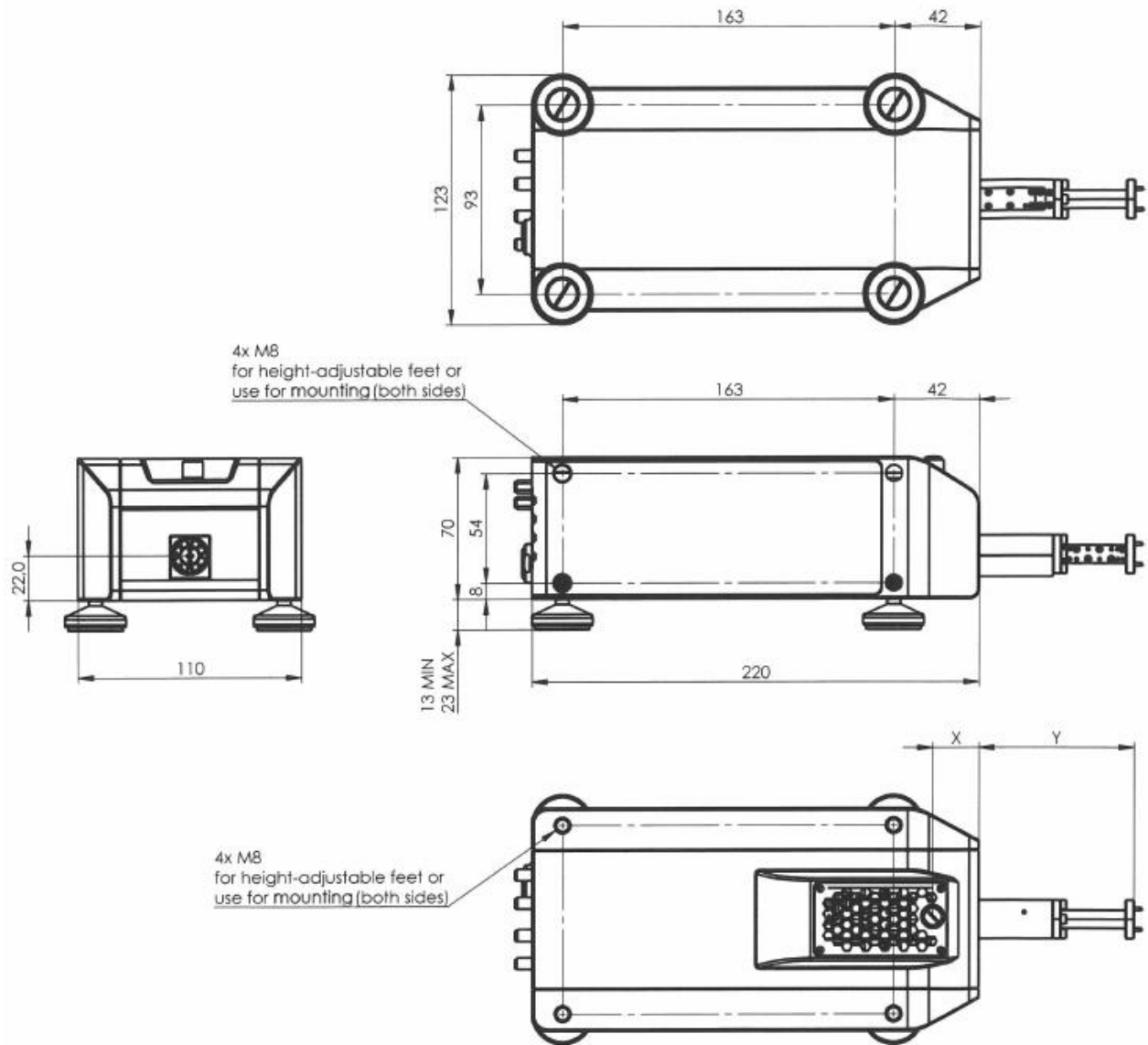
Test port output power versus frequency of the RPG ZC1100



Dynamic range versus frequency of the RPG ZC1100

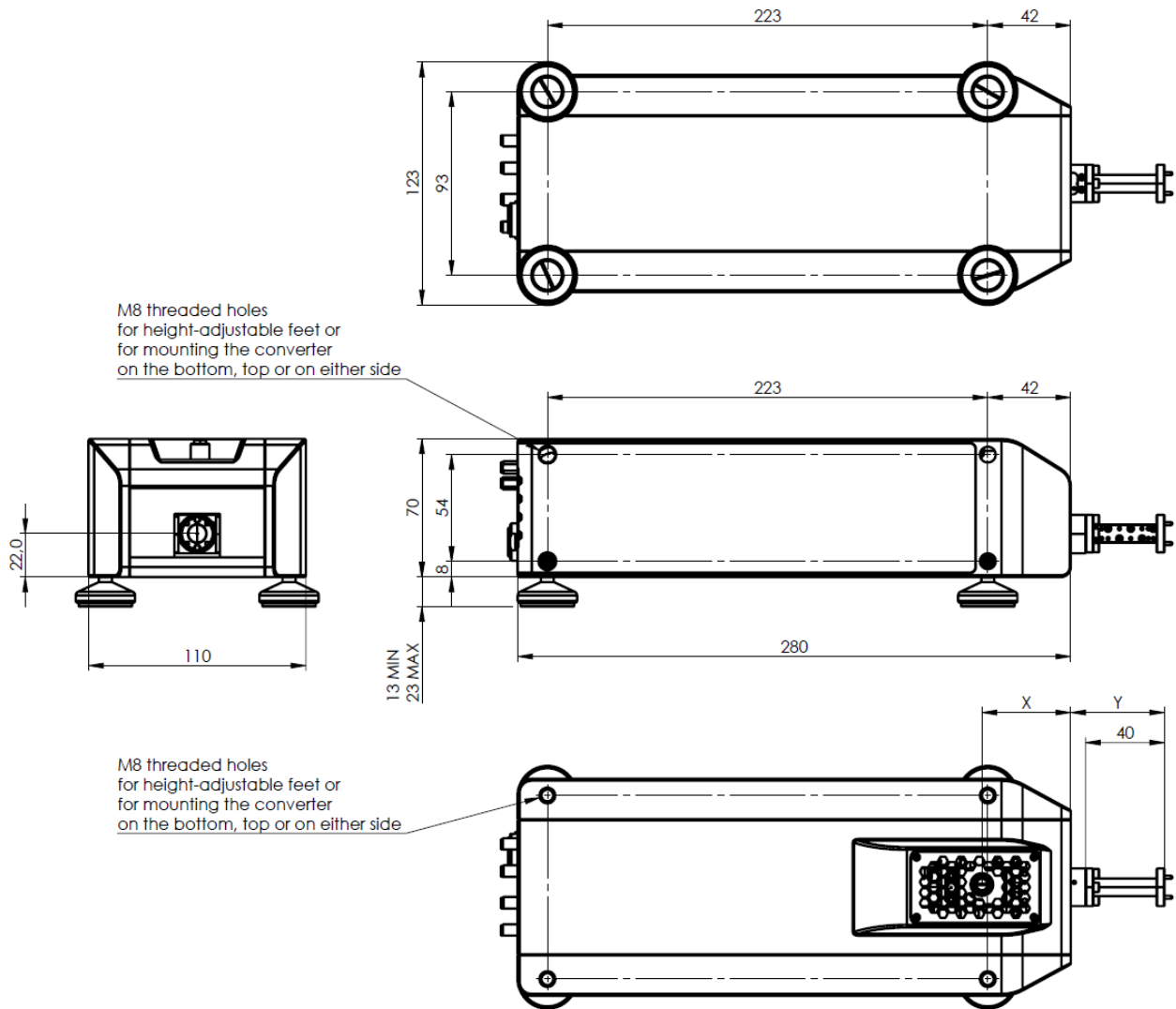
General data

| | | |
|------------------------|---|--|
| Temperature loading | operating temperature range | +18 °C to +28 °C |
| | permissible temperature range | +5 °C to +40 °C |
| | storage temperature range | –40 °C to +70 °C |
| | | in line with IEC 60068-2-1 and IEC 60068-2-2 |
| Damp heat | | +40 °C at 80 % rel. humidity, in line with IEC 60068-2-30 |
| Mechanical resistance | vibration, sinusoidal | 5 Hz to 150 Hz, in line with IEC 60068-2-6 |
| | vibration, random | 8 Hz to 500 Hz, in line with IEC 60068-2-64 |
| | shock | 40 g shock spectrum, in line with MIL-STD-810, method 516, procedure I |
| Operation | permissible altitude | 3000 m above sea level |
| Conformity marking | | CE |
| Dimensions (W × H × D) | without protruding coupler and test port adapter, with feet height adjusted to 12.1 mm (0.5 in), see also dimensional drawings on the next two pages | |
| | R&S®ZC90, R&S®ZC110 | 123 mm × 88.4 mm × 228.3 mm (4.84 in × 3.48 in × 8.99 in) |
| | R&S®ZC75, R&S®ZC90E, R&S®ZC140, R&S®ZC170 and R&S®ZCDS170, R&S®ZC220, RPG ZC260, R&S®ZC330, RPG ZC400, R&S®ZC500, RPG ZC750, RPG ZC1100 | 123 mm × 88.4 mm × 288.3 mm (4.84 in × 3.48 in × 11.35 in) |
| Number of feet | | 4 |
| Feet height | user-adjustable | 12.1 mm to 29.1 mm (0.5 in to 1.1 in) |
| Weight | | 3 kg (7 lb) |
| Shipping weight | | 5 kg (11 lb) |



Dimensions (in mm) of the R&S®ZCxxx millimeterwave converters

| Type | Waveguide | Dimension X (distance between converter front panel and center of attenuator screw) | Dimension Y (distance between converter front panel and waveguide flange surface) |
|-----------|----------------|---|---|
| R&S®ZC90 | WR12 | N/A | 83.0 mm |
| R&S®ZC110 | WM-2540 (WR10) | N/A | 76.5 mm |



Dimensions (in mm) of the R&S®ZCxxx and RPG ZCxxx millimeterwave converters

| Type | Waveguide | Dimension X (distance between converter front panel and center of attenuator screw) | Dimension Y (distance between converter front panel and waveguide flange surface) |
|------------|-----------------|---|---|
| R&S®ZC75 | WR15 | 70.1 mm | 70.5 mm |
| R&S®ZC90E | WR12 | N/A | 83.0 mm |
| R&S®ZC140 | WM-2032 (WR8.0) | 70.0 mm | 64.5 mm |
| R&S®ZC170 | WM-1651 (WR6.5) | 68.1 mm | 64.4 mm |
| R&S®ZC220 | WM-1295 (WR5.1) | 61.9 mm | 59.5 mm |
| RPG ZC260 | WM-1092 (WR4.3) | 52.0 mm | 65.5 mm |
| R&S®ZC330 | WM-864 (WR3.4) | 45.0 mm | 47.5 mm |
| RPG ZC400 | WM-710 | 52.0 mm | 50.5 mm |
| R&S®ZC500 | WM-570 | 34.0 mm | 46.5 mm |
| RPG ZC750 | WM-380 | 28.5 mm | 43.5 mm |
| RPG ZC1100 | WM-250 | N/A | 25.5 mm |

Ordering information

| Designation | Type | Order No. |
|--|---------------|--------------|
| Millimeterwave converter, WR15 | R&S®ZC75 | 1323.8259.02 |
| Millimeterwave converter, WR12 | R&S®ZC90 | 1323.7600.02 |
| Millimeterwave converter, WR12 EL ATT | R&S®ZC90E | 1323.7600.04 |
| Millimeterwave converter, WM-2540 | R&S®ZC110 | 1323.7617.02 |
| Millimeterwave converter, WM-2032 | R&S®ZC140 | 1323.7623.02 |
| Millimeterwave converter, WM-1651 | R&S®ZC170 | 1323.7630.02 |
| Millimeterwave converter, WM-1651, high frequency input | R&S®ZC170 | 1323.7630.03 |
| Millimeterwave converter, WM-1651, dual-source | R&S®ZCDS170 | 3724.7952.02 |
| Millimeterwave converter, WM-1295 | R&S®ZC220 | 1323.7646.02 |
| Millimeterwave converter, WM-1092 | RPG ZC260 | 3628.5682.02 |
| Millimeterwave converter, WM-864 | R&S®ZC330 | 1323.7669.02 |
| Millimeterwave converter, WM-710 | RPG ZC400 | 3656.9220.02 |
| Millimeterwave converter, WM-570 | R&S®ZC500 | 1323.7681.02 |
| Millimeterwave converter, WM-570, high frequency input | R&S®ZC500 | 1323.7681.03 |
| Millimeterwave converter, WM-380 | RPG ZC750 | 1323.7717.02 |
| Millimeterwave converter, WM-250 | RPG ZC1100 | 1323.7723.02 |
| Millimeterwave converter set transport case | R&S®ZCSTC | 1323.7730.00 |
| Millimeterwave converter power supply (supplies two converters) | R&S®ZCPS | 1325.6101.02 |
| Long cable for R&S®ZCPS (length: 160 cm, 40 cm longer than the standard DC connection cable delivered with each converter) | R&S®ZCPSC | 1323.7952.00 |
| Test cable, 3.5 mm (f) to 3.5 mm (m), length: 910 mm (two cables per converter required) | R&S®ZV-Z193 | 1306.4520.36 |
| Test cable, 2.92 mm (f) to 2.92 mm (m), length: 910 mm (two cables per converter required) | R&S®ZV-Z195 | 1306.4536.36 |
| Waveguide calibration kit, WR15 (without sliding match) | R&S®ZV-WR15 | 1307.7500.30 |
| Waveguide calibration kit, WR15 (with sliding match) | R&S®ZV-WR15 | 1307.7500.31 |
| Waveguide calibration kit, WR12 (without sliding match), | R&S®ZV-WR12 | 1307.7700.10 |
| Waveguide calibration kit, WR12 (with sliding match), | R&S®ZV-WR12 | 1307.7700.11 |
| Waveguide calibration kit, WR10 (without sliding match), compatible with WM-2540 converter | R&S®ZV-WR10 | 1307.7100.10 |
| Waveguide calibration kit, WR10 (with sliding match), compatible with WM-2540 converter | R&S®ZV-WR10 | 1307.7100.11 |
| Waveguide calibration kit, WR08 (without sliding match), compatible with WM-2032 converter | R&S®ZV-WR08 | 1307.7900.10 |
| Waveguide calibration kit, WR08 (with sliding match), compatible with WM-2032 converter | R&S®ZV-WR08 | 1307.7900.11 |
| Waveguide calibration kit, WR06 (without sliding match), compatible with WM-1651 converter | R&S®ZV-WR06 | 1311.8807.10 |
| Waveguide calibration kit, WR06 (with sliding match), compatible with WM-1651 converter | R&S®ZV-WR06 | 1311.8807.11 |
| Waveguide calibration kit, WR05 (without sliding match), compatible with WM-1295 converter | R&S®ZV-WR05 | 1307.8106.10 |
| Waveguide calibration kit, WR05 (with sliding match), compatible with WM-1295 converter | R&S®ZV-WR05 | 1307.8106.11 |
| Waveguide calibration kit, WR03 (without sliding match), compatible with WM-864 converter | R&S®ZV-WR03 | 1307.7300.30 |
| Waveguide calibration kit, WR03 (with sliding match), compatible with WM-864 converter | R&S®ZV-WR03 | 1307.7300.31 |
| Waveguide calibration kit, WM-1092 (without sliding match) | RPG ZCWM-1092 | 3628.5699.02 |
| Waveguide calibration kit, WM-710 (without sliding match) | RPG ZCWM-710 | 1339.4070.02 |
| Waveguide calibration kit, WM-570 (without sliding match) | R&S®ZCWM-570 | 1322.3099.10 |
| Waveguide calibration kit, WM-380 (without sliding match) | RPG ZCWM-380 | 1322.3101.02 |
| Waveguide calibration kit, WM-250 (without sliding match) | RPG ZCWM-250 | 1322.3118.02 |
| Millimeterwave converter support | R&S®ZNA-K8 | 1332.5388.02 |
| 2-way power divider, 40 GHz | R&S®ZN-Z1229 | 3691.8162.02 |
| 4-way power divider, 40 GHz | R&S®ZN-Z1230 | 3691.8179.02 |
| Millimeterwave adaption kit, for R&S®ZNA26/43, two converters | R&S®ZCAKN | 1332.6178.43 |
| Millimeterwave adaption kit, for R&S®ZNA26/43, four converters | R&S®ZCAKN | 1332.6178.44 |
| Millimeterwave adaption kit, for R&S®ZNA50/67, two converters | R&S®ZCAKN | 1332.6178.67 |
| Millimeterwave adaption kit, for R&S®ZNA50/67, four converters | R&S®ZCAKN | 1332.6178.68 |
| Torque wrench, for waveguide flange screws | R&S®ZV-Z1000 | 1314.5467.02 |
| Angled wrench, for waveguide flange screws | R&S®ZCAW | 1175.1960.00 |
| Angled torque wrench, for waveguide flange screws, 0.58 Nm | R&S®ZCTW | 1175.2014.02 |
| Angled torque wrench, for waveguide flange screws, 0.2 Nm | R&S®ZCTW | 1175.2014.03 |

| Service options | | |
|---|---------|--|
| Extended warranty, one year | R&S®WE1 | 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 ⁶. 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 ⁶ 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 ⁶ and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

⁶ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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

Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

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