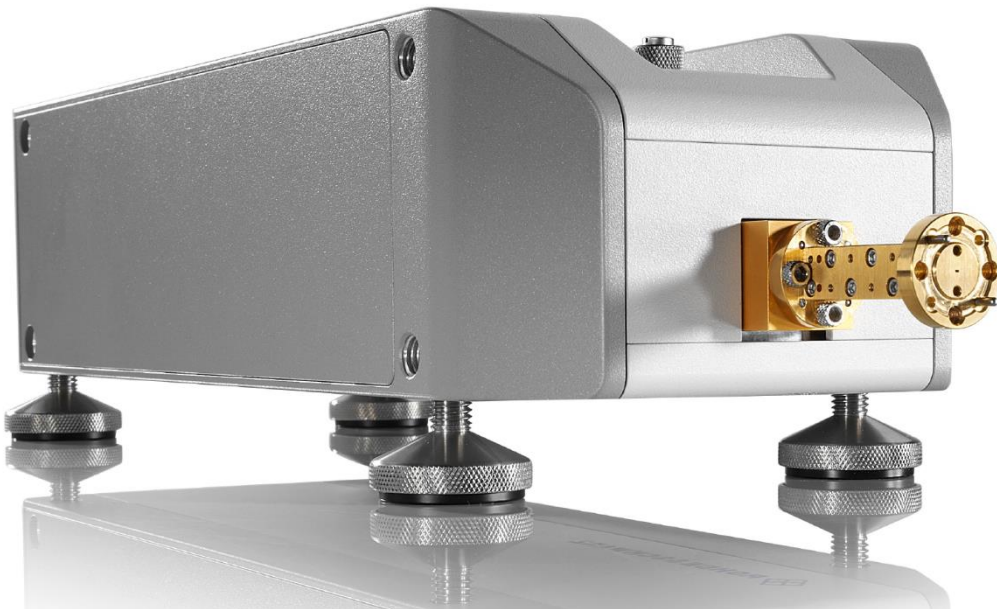


RPG ZTXRxxx

Millimeter-Wave Transceiver

Specifications



Definitions

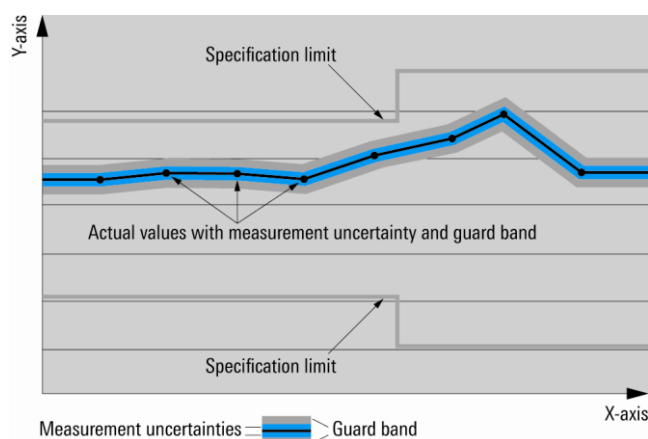
General

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 Radiometer Physics 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 indicated as follows: “parameter: value”.

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

General information

The RPG ZTXRxxx millimeter-wave transceivers are optional for the following four-port vector network analyzers:

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

The RPG ZTXRxxx millimeter-wave transceivers are available for the frequency bands from:

- 50 GHz to 75 GHz (RPG ZTXR75)
- 60 GHz to 90 GHz (RPG ZTXR90)
- 75 GHz to 110 GHz (RPG ZTXR110)
- 90 GHz to 140 GHz (RPG ZTXR140)
- 110 GHz to 170 GHz (RPG ZTXR170)
- 140 GHz to 220 GHz (RPG ZTXR220)
- 170 GHz to 260 GHz (RPG ZTXR260)
- 220 GHz to 330 GHz (RPG ZTXR330)
- 260 GHz to 400 GHz (RPG ZTXR400)
- 330 GHz to 500 GHz (RPG ZTXR500)
- 500 GHz to 750 GHz (RPG ZTXR750)
- 750 GHz to 1100 GHz (RPG ZTXR1100)

The R&S®ZNAxx 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. Together with the R&S®ZNA-B8 option, each port of the R&S®ZNAxx network analyzers can be equipped with a millimeterwave converter using the dedicated mmWave converter LO from the rear panel of the R&S®ZNAxx.

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

The RPG ZTXRxxx millimeter-wave transceivers 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 RPG ZTXRxxx millimeter-wave transceivers must be operated with the R&S®ZCPS power supply module (available as an option; one module supplies two converters).

Specifications

Test port

Frequency range	RPG ZTXR75	50 GHz to 75 GHz
	RPG ZTXR90	60 GHz to 90 GHz
	RPG ZTXR110	75 GHz to 110 GHz
	RPG ZTXR140	90 GHz to 140 GHz
	RPG ZTXR170	110 GHz to 170 GHz
	RPG ZTXR220	140 GHz to 220 GHz
	RPG ZTXR260	170 GHz to 260 GHz
	RPG ZTXR330	220 GHz to 330 GHz
	RPG ZTXR400	260 GHz to 400 GHz
	RPG ZTXR500	330 GHz to 500 GHz
	RPG ZTXR750	500 GHz to 750 GHz
	RPG ZTXR1100	750 GHz to 1100 GHz
Waveguide designator	RPG ZTXR75	WR-15
	RPG ZTXR90	WR-12
	RPG ZTXR110	WM-2546 (WR10)
	RPG ZTXR140	WM-2032 (WR 8)
	RPG ZTXR170	WM-1651 (WR 6.5)
	RPG ZTXR220	WM-1295 (WR 5.1)
	RPG ZTXR260	WM-1092 (WR 4.3)
	RPG ZTXR330	WM-864 (WR 3.4)
	RPG ZTXR400	WM-710
	RPG ZTXR500	WM-570
	RPG ZTXR750	WM-380
	RPG ZTXR1100	WM-250
Connector type (anti cocking flange)	RPG ZTXR75	R&S precision waveguide flange (compatible with UG-387/U-M and IEEE1785.2)
	RPG ZTXR90	
	RPG ZTXR110	
	RPG ZTXR140	
	RPG ZTXR170	
	RPG ZTXR220	
	RPG ZTXR260	
	RPG ZTXR330	
	RPG ZTXR400	
	RPG ZTXR500	
	RPG ZTXR750	
	RPG ZTXR1100	
Output power attenuation	RPG ZTXR75, manually adjustable	0 dB to 40 dB
	RPG ZTXR90, manually adjustable	0 dB to 40 dB
	RPG ZTXR110, manually adjustable	0 dB to 40 dB
	RPG ZTXR140, manually adjustable	0 dB to 40 dB
	RPG ZTXR170, manually adjustable	0 dB to 40 dB
	RPG ZTXR220, manually adjustable	0 dB to 40 dB
	RPG ZTXR260, manually adjustable	0 dB to 40 dB
	RPG ZTXR330, manually adjustable	0 dB to 40 dB
	RPG ZTXR400, manually adjustable	0 dB to 40 dB
	RPG ZTXR500, manually adjustable	0 dB to 40 dB
	RPG ZTXR750, manually adjustable	0 dB to 40 dB
	RPG ZTXR1100, manually adjustable	0 dB to 40 dB
Output power flatness across the waveguide band at minimum attenuation (peak-to-peak)	RPG ZTXR75	< 7 dB (n. trc.)
	RPG ZTXR90	< 7 dB (n. trc.)
	RPG ZTXR110	< 6 dB (n. trc.)
	RPG ZTXR140	< 6 dB (n. trc.)
	RPG ZTXR170	< 7 dB (n. trc.)
	RPG ZTXR220	< 7 dB (n. trc.)
	RPG ZTXR260	< 7 dB (n. trc.)
	RPG ZTXR330	< 7 dB (n. trc.)
	RPG ZTXR400	< 13 dB (n. trc.)
	RPG ZTXR500	< 13 dB (n. trc.)
	RPG ZTXR750	< 16 dB (n. trc.)
	RPG ZTXR1100	< 16 dB (n. trc.)

Source input (RF IN)

Connector type	2.92 mm, female		
Frequency range and multiplication factor	RPG ZTXR75	12.500 GHz to 18.750 GHz	× 4
	RPG ZTXR90	10.000 GHz to 15.000 GHz	× 6
	RPG ZTXR110	12.500 GHz to 18.333 GHz	× 6
	RPG ZTXR140	15.000 GHz to 23.333 GHz	× 6
	RPG ZTXR170	9.167 GHz to 14.167 GHz	× 12
	RPG ZTXR220	11.667 GHz to 18.333 GHz	× 12
	RPG ZTXR260	14.166 GHz to 21.666 GHz	× 12
	RPG ZTXR330	12.222 GHz to 18.333 GHz	× 18
	RPG ZTXR400	14.444 GHz to 22.222 GHz	× 18
	RPG ZTXR500	9.027 GHz to 13.889 GHz	× 36
	RPG ZTXR750	13.888 GHz to 20.833 GHz	× 36
RPG ZTXR1100	13.888 GHz to 20.370 GHz	× 54	
Input power range	-15 dBm to +10 dBm (Typ. + 7 dBm)		

Local oscillator input (LO IN)

Connector type	2.92 mm, female		
Frequency range and multiplication factor	RPG ZTXR75	8.287 GHz to 12.454 GHz	× 6
	RPG ZTXR90	14.930 GHz to 22.430 GHz	× 4
	RPG ZTXR110	9.340 GHz to 13.715 GHz	× 8
	RPG ZTXR140	11.215 GHz to 17.465 GHz	× 8
	RPG ZTXR170	10.972 GHz to 16.972 GHz	× 10
	RPG ZTXR220	11.643 GHz to 18.310 GHz	× 12
	RPG ZTXR260	14.143 GHz to 21.643 GHz	× 12
	RPG ZTXR330	9.155 GHz to 13.738 GHz	× 24
	RPG ZTXR400	14.444 GHz to 22.222 GHz	× 20
	RPG ZTXR500	9.027 GHz to 13.889 GHz	× 24
	RPG ZTXR750	13.888 GHz to 20.833 GHz	× 36
RPG ZTXR1100	13.888 GHz to 20.370 GHz	× 48	
Input power range	+5 dBm to +10 dBm (Typ. + 7 dBm)		

Reference output (Ref OUT)

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

USB connector (USB)

Connector type	universal serial bus (USB), type B
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Power supply input (POWER SUPPLY)

Connector type	19-pin miniature circular connector with push-pull locking	
Power consumption	RPG ZTXR75	9 W
	RPG ZTXR90	9 W
	RPG ZTXR110	16 W
	RPG ZTXR140	12 W
	RPG ZTXR170	11 W
	RPG ZTXR220	15 W
	RPG ZTXR260	11 W
	RPG ZTXR330	19 W
	RPG ZTXR400	8 W
	RPG ZTXR500	26 W
RPG ZTXR750	24 W	
RPG ZTXR1100	24 W	

System characteristics

Outputpower	at +7dBm input power from the R&S@ZNA/R&S@ZVA	
	R&S@ZTXR75	
	50 GHz to 75 GHz	> +10 dBm (n. trc.), typ. +12 dBm
	R&S@ZTXR90	
	60 GHz to 90 GHz	> +7 dBm (n. trc.), typ. +10 dBm
	R&S@ZTXR110	
	75 GHz to 110 GHz	+12 dBm (n. trc.), typ. +15 dBm
	R&S@ZTXR140	
	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@ZTXR170	
	110 GHz to 170 GHz	> +6 dBm (n. trc.), typ. +9 dBm
	R&S@ZTXR220	
	140 GHz to 220 GHz	> -2 dBm (n. trc.), typ. +1 dBm
	R&S@ZTXR260	
	170 GHz to 260 GHz	> -6 dBm (n. trc.), typ. -2 dBm
	R&S@ZTXR330	
	220 GHz to 330 GHz	> -10 dBm (n. trc.), typ. -7 dBm
	R&S@ZTXR400	
260 GHz to 400 GHz	> -15 dBm (n. trc.), typ. -12 dBm	
R&S@ZTXR500		
330 GHz to 500 GHz	> -15 dBm (n. trc.), typ. -11 dBm	
R&S@ZTXR750		
500 GHz to 750 GHz	> -25 dBm (n. trc.), typ. -18 dBm	
R&S@ZTXR1100		
750 GHz to 1100 GHz	> -30 dBm (n. trc.), typ. -25 dBm	

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
Damp heat		in line with IEC 60068-2-1 and IEC 60068-2-2 +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	10 Hz to 300 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
Dimensions (W × H × D)	without protruding coupler and test port adapter, with feet height adjusted to 12.1 mm (0.5 in)	123 mm × 88.38 mm × 322.5 mm (4.84 in × 3.48 in × 12.70 in)
Dimensions (W × H × D)	without protruding coupler and test port adapter, with feet height adjusted to 12.1 mm (0.5 in)	123 mm × 88.38 mm × 262.5 mm (4.84 in × 3.48 in × 10.33 in)
Number of feet	alternatively	4
Feet height	user-adjustable	12.1 mm to 29.1 mm (0.5 in to 1.1 in)
Weight		2.5 kg (7 lb)
Shipping weight		5 kg (11 lb)

Ordering information

Designation	Type	Order No.
Transceiver WR-15	RPG ZTXR75	24000046
Transceiver WR-12	RPG ZTXR90	
Transceiver WM-2546	RPG ZTXR110	24000043
Transceiver WM-2032	RPG ZTXR140	24000050
Transceiver WM-1651	RPG ZTXR170	
Transceiver WM1295	RPG ZTXR220	24000019
Transceiver WM-1092	RPG ZTXR260	
Transceiver WM-864	RPG ZTXR330	24000051
Transceiver WM-710	RPG ZTXR400	
Transceiver WM-570	RPG ZTXR500	
Transceiver WM-380	RPG ZTXR750	24000039
Transceiver WM-250	RPG ZTXR1100	
Converter Set Transport Case	R&S®ZCSTC	1323.7730.00
Converter Power Supply (supplies two converters)	R&S®ZCPS	1325.6101.02
Long Cable for 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
Or 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 WR-15 compatible with Receiver ZTXR75		
Waveguide Calibration Kit WR-12 compatible with Receiver ZTXR90	RPG WR12	1307.7700.10 (without sliding match) 1307.7700.11 (with sliding match)
Waveguide Calibration Kit WM-2546 compatible with Receiver ZTXR110	RPG ZCWM-2546	
Waveguide Calibration Kit WM-2032 compatible with Receiver ZTXR140	RPG ZCWM-2032	
Waveguide Calibration Kit WM-1651 compatible with Receiver ZTXR170	RPG ZCWM-1651	
Waveguide Calibration Kit WM-1295 compatible with Receiver ZTXR220	RPG ZCWM-1295	
Waveguide Calibration Kit WM-1092 compatible with Receiver ZTXR260	RPG ZCWM-1092	3628.5699.02 (without sliding match)
Waveguide Calibration Kit WM-864 compatible with Receiver ZTXR330	RPG ZCWM-864	
Waveguide Calibration Kit WM-710 compatible with Receiver ZTXR400	RPG ZCWM-710	
Waveguide Calibration Kit WM-570 compatible with Receiver ZTXR500	RPG ZCWM-570	1322.3099.10 (without sliding match)
Waveguide Calibration Kit WM-380 compatible with Receiver ZTXR750	RPG ZCWM-380	1322.3101.02 (without sliding match)
Waveguide Calibration Kit WM-250 compatible with Receiver ZTXR1100	RPG ZCWM-250	1322.3118.02 (without sliding match)
Converter Control Software	R&S®ZVA-K8	1307.7022.02
Adapter Kit, including a power divider and two right angle SMA (m/m) adapters (required if R&S®ZVA24 var. 28 or R&S®ZVA40 var. 48 (VNAs with four sources) is used)	R&S®ZCAK	1323.7746.24
Adapter Kit, including four 1.85 mm (f) to 2.92 mm (m) adapters and four 1.85 mm (m) to 2.92 mm (f) adapters (required if R&S®ZVA50 is used)	R&S®ZCAK	1323.7746.50
Adapter Kit, including a power divider, two right angle SMA (m/m) adapters, three 1.85 mm (f) to 2.92 mm (m) adapters and four 1.85 mm (m) to 2.92 mm (f) adapters (required if R&S®ZVA67 is used)	R&S®ZCAK	1323.7746.67
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	R&S®ZCTW	1175.2014.02

Service options		
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 a term of one to four years (WE1 to WE4)

Repairs carried out during the contract term are free of charge ¹. 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 ¹ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

For product brochure, see PD 3607.1471.12 and www.rohde-schwarz.com

¹ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.