

COMBINER KITS

Specifications

R&S®SMW-ZKK Combiner Kit 40 GHz

R&S®SMW-ZKV Combiner Kit 67 GHz

Data Sheet
Version 01.01

ROHDE & SCHWARZ

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Definitions

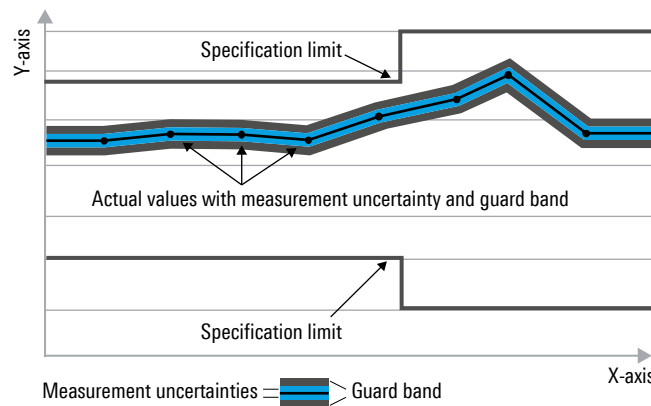
General

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
- 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.

In line with the 3GPP/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (MSPS) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, MSPS, kbps, ksps and Msample/s are not SI units.

Specifications

Mechanical data

Connector type (any port)	R&S®SMW-ZKK	2.92 mm, female
	R&S®SMW-ZKV	1.85 mm, female

Measurement range

Impedance		50 Ω
Frequency range	R&S®SMW-ZKK	1 GHz to 40 GHz
	R&S®SMW-ZKV	1 GHz to 67 GHz
Maximum input power	R&S®SMW-ZKK	30 dBm
	R&S®SMW-ZKV	30 dBm

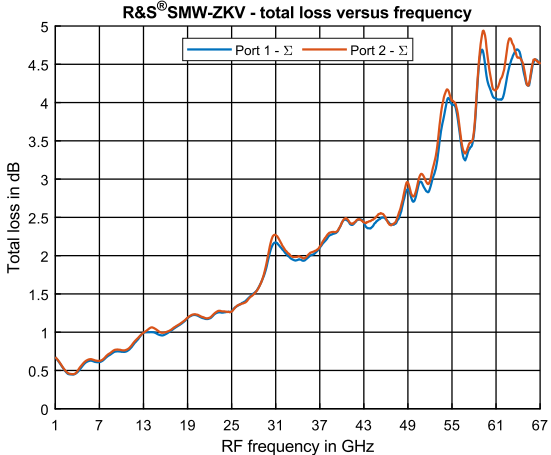
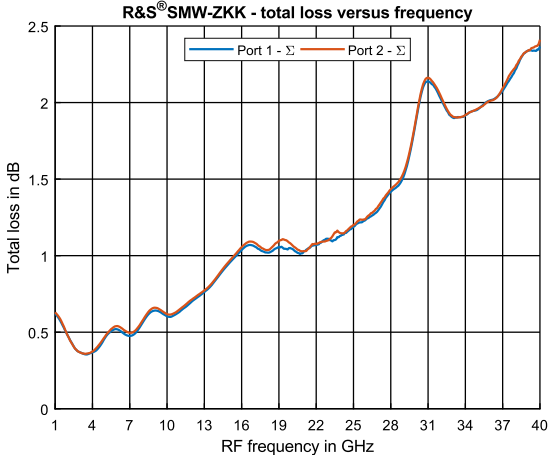
Electrical data (cable)

Parameter	Combiner kit	Frequency	Specification
Transmission loss	R&S®SMW-ZKK	0.1 GHz to 40 GHz	< 0.8 dB, < 0.4 dB (meas.)
	R&S®SMW-ZKV	0.1 GHz to 67 GHz	< 1.5 dB, < 0.5 dB (meas.)
Return loss	R&S®SMW-ZKK	0.1 GHz to 40 GHz	> 15 dB, > 20 dB (meas.)
	R&S®SMW-ZKV	0.1 GHz to 67 GHz	> 15 dB, > 20 dB (meas.)

Electrical data (combiner)

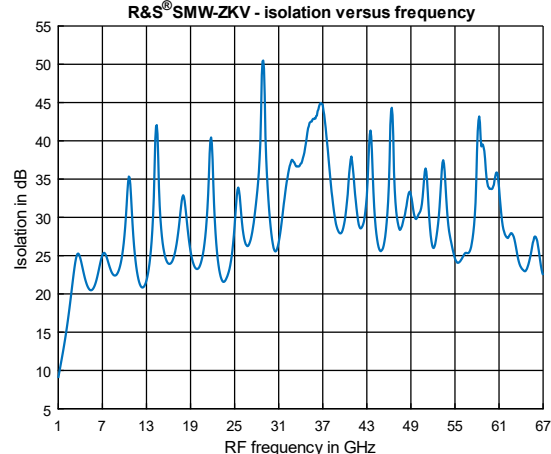
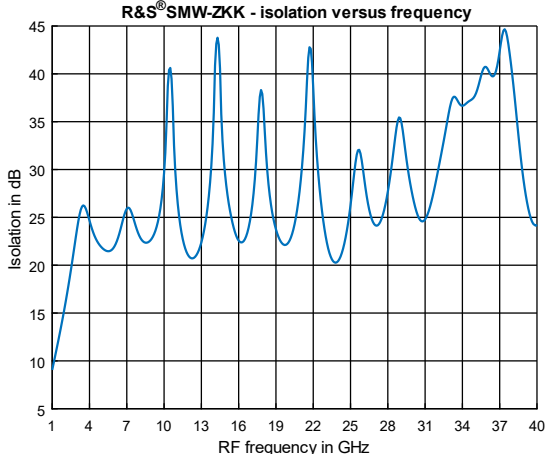
Parameter	Combiner kit	Frequency	Specification
Insertion loss above 3.0 dB	R&S®SMW-ZKK	1 GHz to 3 GHz	< 1.0 dB, < 0.6 dB (meas.)
		3 GHz to 20 GHz	< 2.0 dB, < 1.1 dB (meas.)
		20 GHz to 40 GHz	< 3.0 dB, < 2.3 dB (meas.)
	R&S®SMW-ZKV	1 GHz to 3 GHz	< 1.0 dB, < 0.7 dB (meas.)
		3 GHz to 20 GHz	< 2.0 dB, < 1.2 dB (meas.)
		20 GHz to 40 GHz	< 3.0 dB, < 2.4 dB (meas.)
		40 GHz to 50 GHz	< 3.5 dB, < 2.9 dB (meas.)
Isolation	R&S®SMW-ZKK	50 GHz to 67 GHz	< 4.0 dB, < 5.0 dB (meas.)
		1 GHz to 3 GHz	> 7.0 dB, > 9.0 dB (meas.)
		3 GHz to 20 GHz	> 18.0 dB, > 19.5 dB (meas.)
	R&S®SMW-ZKV	20 GHz to 40 GHz	> 18.0 dB, > 20.0 dB (meas.)
		1 GHz to 3 GHz	> 6.0 dB, > 9.0 dB (meas.)
		3 GHz to 20 GHz	> 18.0 dB, > 20.4 dB (meas.)
		20 GHz to 40 GHz	> 18.0 dB, > 21.4 dB (meas.)
VSWR (port 1 and port 2)	R&S®SMW-ZKK	40 GHz to 50 GHz	> 20.0 dB, > 25.0 dB (meas.)
		50 GHz to 67 GHz	> 20.0 dB, > 22.0 dB (meas.)
		1 GHz to 3 GHz	< 1.26 (meas.)
	R&S®SMW-ZKV	3 GHz to 20 GHz	< 1.25 (meas.)
		20 GHz to 40 GHz	< 1.25 (meas.)
		1 GHz to 3 GHz	< 1.23 (meas.)
		3 GHz to 20 GHz	< 1.20 (meas.)
VSWR (port Σ)	R&S®SMW-ZKK	20 GHz to 40 GHz	< 1.23 (meas.)
		40 GHz to 50 GHz	< 1.26 (meas.)
		50 GHz to 67 GHz	< 1.65 (meas.)
	R&S®SMW-ZKV	1 GHz to 3 GHz	< 1.80 (meas.)
		3 GHz to 20 GHz	< 1.80 (meas.)
		20 GHz to 40 GHz	< 1.31 (meas.)
		40 GHz to 50 GHz	< 1.24 (meas.)
VSWR (port Σ)	R&S®SMW-ZKK	50 GHz to 67 GHz	< 1.65 (meas.)
		1 GHz to 3 GHz	< 1.80 (meas.)
		3 GHz to 20 GHz	< 1.31 (meas.)
	R&S®SMW-ZKV	20 GHz to 40 GHz	< 1.24 (meas.)
		40 GHz to 50 GHz	< 1.34 (meas.)
		1 GHz to 3 GHz	< 1.80 (meas.)
		3 GHz to 20 GHz	< 1.25 (meas.)

Total loss over frequency



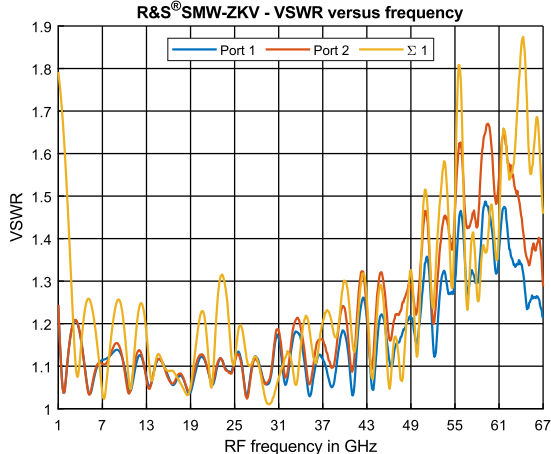
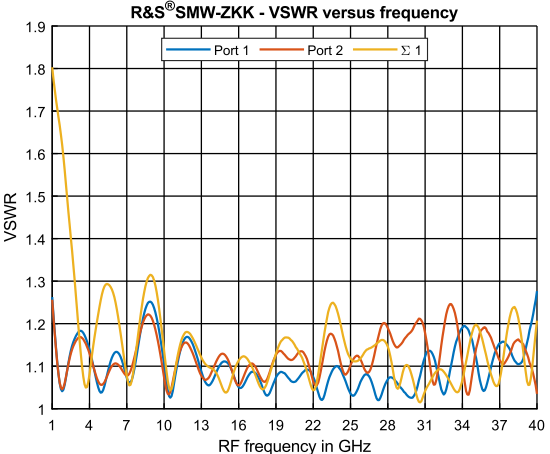
Total loss over frequency, for R&S[®]SMW-ZKK (left) and R&S[®]SMW-ZKV (right)

Isolation over frequency



Isolation over frequency, for R&S[®]SMW-ZKK (left) and R&S[®]SMW-ZKV (right)

VSWR over frequency

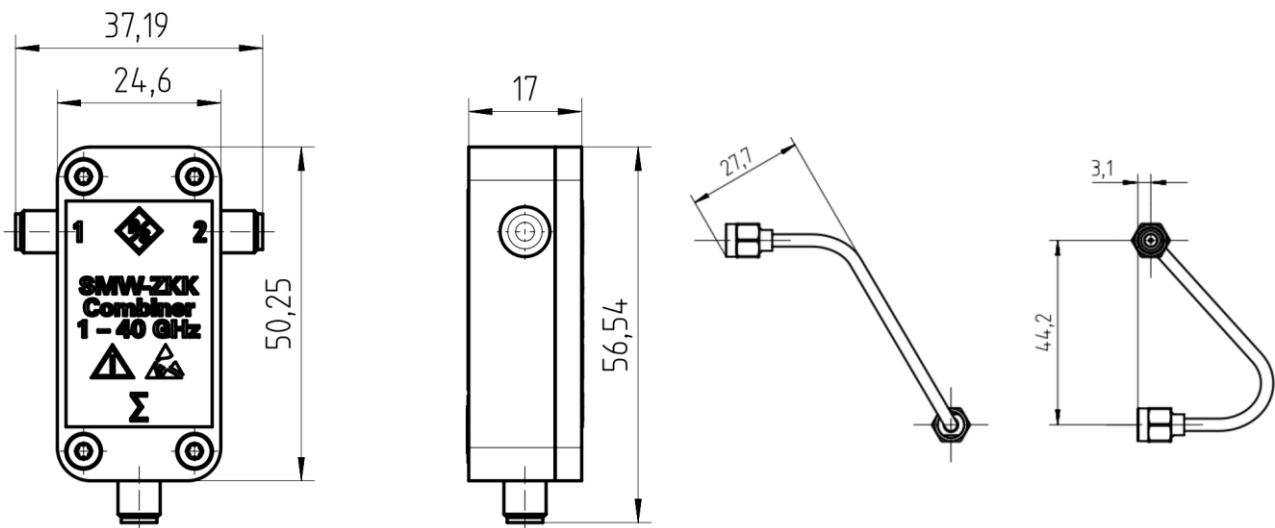


VSWR over frequency, for R&S[®]SMW-ZKK (left) and R&S[®]SMW-ZKV (right)

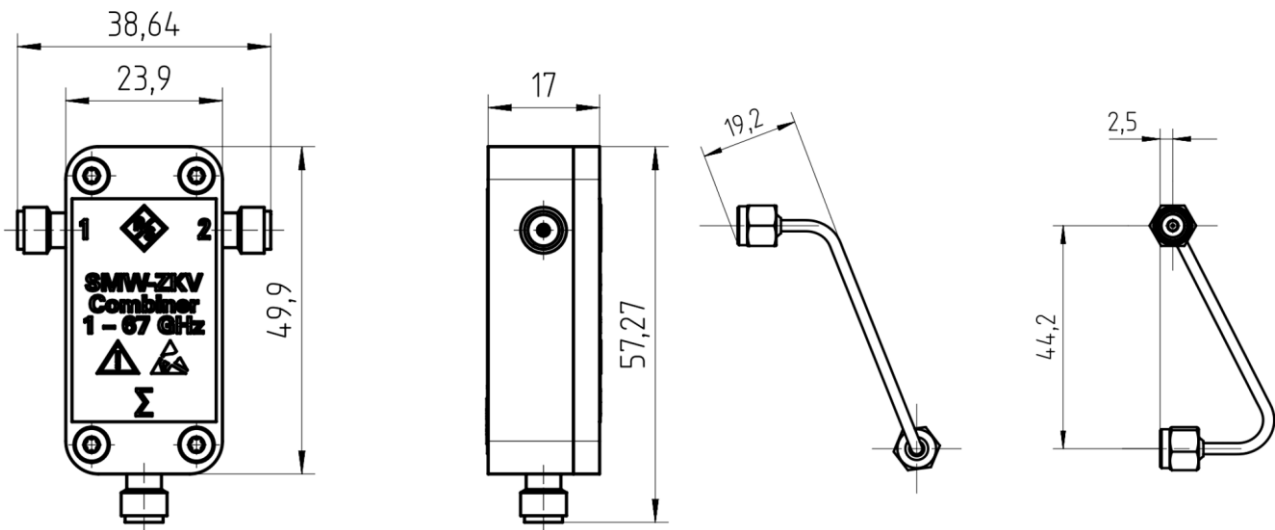
General data

Temperature loading	operating temperature range	+5 °C to +45 °C
	storage temperature range	-20 °C to +60 °C
Dimensions (W x H x D)	R&S®SMW-ZKK (combiner)	37.2 mm x 56.5 mm x 17 mm (1.46 in x 2.23 in x 0.66 in)
	R&S®SMW-ZKV (combiner)	38.6 mm x 57.3 mm x 17 mm (1.52 in x 2.26 in x 0.66 in)
Weight	R&S®SMW-ZKK (combiner)	40 g (0.09 lb)
	R&S®SMW-ZKV (combiner)	

Dimensions (in mm)



Front and side view of the R&S®SMW-ZKK combiner and cable



Front and side view of the R&S®SMW-ZKV combiner and cable

Ordering information

Designation	Type	Order No.
Combiner kit 40 GHz, 2.92 mm	R&S®SMW-ZKK	1434.7908.02
Combiner kit 67 GHz, 1.85 mm	R&S®SMW-ZKV	1434.7989.02

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