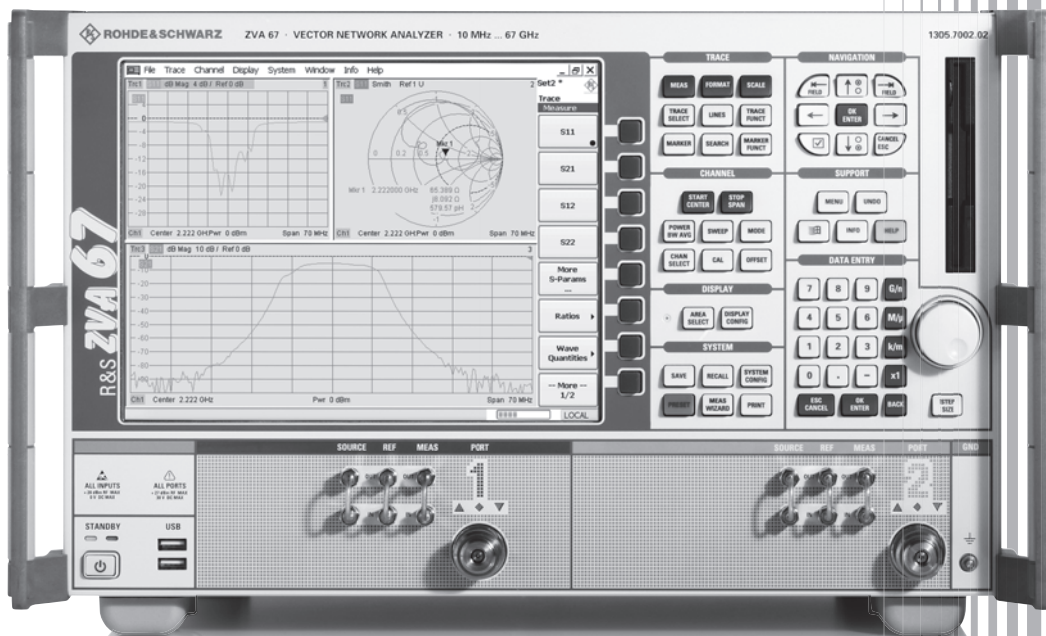


# R&S® ZVA

## Vector Network Analyzer

### Specifications



**75** Years of  
Driving  
Innovation

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Specifications are valid under the following conditions:

90 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal adjustments performed. Data designated „overrange“ and data without tolerance limits is not binding. Unless otherwise stated, specifications apply to test ports and a nominal source power of –10 dBm.

## Measurement range

Impedance		50 $\Omega$
Test port connector	R&S® ZVA8	type N, female
	R&S® ZVA24	3.5 mm, male
	R&S® ZVA40	2.92 mm, male
	R&S® ZVA40	2.4 mm, male
	R&S® ZVA50	2.4 mm, male
	R&S® ZVA67	1.85 mm, male
Number of test ports		2 or 4
Frequency range	R&S® ZVA8	300 kHz to 8 GHz
	R&S® ZVA24	10 MHz to 24 GHz
	R&S® ZVA40	10 MHz to 40 GHz
	R&S® ZVA50	10 MHz to 50 GHz
	R&S® ZVA67	10 MHz to 67 GHz
Static frequency accuracy	without optional oven quartz	$8 \times 10^{-6}$
	with optional oven quartz	$1 \times 10^{-7}$
Frequency resolution		1 Hz
Number of measurement points	user-selectable	1 to 60001
Measurement bandwidths	1/2/5 steps	1 Hz to 1 MHz
Dynamic range of the R&S® ZVA8 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2 and from PORT 3 to PORT 4	
	300 kHz to 50 MHz	>100 dB, typ. 110 dB
	50 MHz to 100 MHz	>120 dB, typ. 130 dB
	100 MHz to 4 GHz	>130 dB, typ. 140 dB
	4 GHz to 7 GHz	>125 dB, typ. 135 dB
	7 GHz to 8 GHz	>120 dB, typ. 130 dB
Dynamic range of the R&S® ZVA24 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2 and from PORT 3 to PORT 4	
	10 MHz to 100 MHz	>90 dB, typ. 105 dB
	100 MHz to 700 MHz	>105 dB, typ. 120 dB
	700 MHz to 2 GHz	>125 dB, typ. 130 dB
	2 GHz to 13 GHz	>130 dB, typ. 135 dB
	13 GHz to 24 GHz	>125 dB, typ. 130 dB
Dynamic range of the R&S® ZVA40 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2 and from PORT 3 to PORT 4	
	10 MHz to 50 MHz	>90 dB, typ. 100 dB
	50 MHz to 500 MHz	>105 dB, typ. 115 dB
	500 MHz to 2 GHz	>125 dB, typ. 135 dB
	2 GHz to 20 GHz	>130 dB, typ. 140 dB
	20 GHz to 24 GHz	>125 dB, typ. 135 dB
	24 GHz to 32 GHz	>115 dB, typ. 125 dB
	32 GHz to 40 GHz	>110 dB, typ. 115 dB
Dynamic range of the R&S® ZVA50 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2 and from PORT 3 to PORT 4	
	10 MHz to 50 MHz	>90 dB, typ. 100 dB
	50 MHz to 500 MHz	>105 dB, typ. 115 dB
	500 MHz to 2 GHz	>125 dB, typ. 135 dB
	2 GHz to 20 GHz	>130 dB, typ. 140 dB
	20 GHz to 24 GHz	>125 dB, typ. 135 dB
	24 GHz to 32 GHz	>120 dB, typ. 130 dB
	32 GHz to 40 GHz	>115 dB, typ. 125 dB
	40 GHz to 50 GHz	>110 dB, typ. 120 dB

Dynamic range of the R&S®ZVA67 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2	
	10 MHz to 50 MHz	>70 dB, typ. 90 dB
	50 MHz to 500 MHz	>100 dB, typ. 115 dB
	500 MHz to 2 GHz	>115 dB, typ. 125 dB
	2 GHz to 24 GHz	>125 dB, typ. 135 dB
	24 GHz to 32 GHz	>120 dB, typ. 130 dB
	32 GHz to 40 GHz	>115 dB, typ. 125 dB
	40 GHz to 50 GHz	>110 dB, typ. 120 dB
	50 GHz to 65 GHz	>107 dB, typ. 115 dB
	65 GHz to 67 GHz	>100 dB, typ. 110 dB
	67 GHz to 70 GHz	typ. 103 dB
The dynamic range is defined as the difference between the actually available maximum source power and the rms value of the data trace of the transmission magnitude, which is produced by noise and crosstalk with the test ports short-circuited. 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. At single frequencies below 100 MHz, the dynamic range can be affected by spurious signals.		

Dynamic range at optional measurement input (direct generator/receiver access option) of the R&S®ZVA8	from PORT 1 to MEAS 2 IN	
	300 kHz to 10 MHz	typ. >125 dB
	10 MHz to 100 MHz	typ. >135 dB
	100 MHz to 8 GHz	typ. >145 dB
Dynamic range at optional measurement input (direct generator/receiver access option) of the R&S®ZVA24	from PORT 1 to MEAS 2 IN	
	10 MHz to 100 MHz	typ. >135 dB
	100 MHz to 13 GHz	typ. >145 dB
	13 GHz to 20 GHz	typ. >140 dB
	20 GHz to 24 GHz	typ. >130 dB
Dynamic range at optional measurement input (direct generator/receiver access option) of the R&S®ZVA40	from PORT 1 to MEAS 2 IN	
	10 MHz to 100 MHz	typ. >140 dB
	100 MHz to 20 GHz	typ. >150 dB
	20 GHz to 24 GHz	typ. >140 dB
	24 GHz to 32 GHz	typ. >130 dB
	32 GHz to 40 GHz	typ. >120 dB
Dynamic range at optional measurement input (direct generator/receiver access option) of the R&S®ZVA50	from PORT 1 to MEAS 2 IN	
	10 MHz to 100 MHz	typ. >140 dB
	100 MHz to 20 GHz	typ. >150 dB
	20 GHz to 24 GHz	typ. >145 dB
	24 GHz to 32 GHz	typ. >140 dB
	32 GHz to 40 GHz	typ. >135 dB
	40 GHz to 50 GHz	typ. >130 dB
Dynamic range at optional measurement input (direct generator/receiver access option) of the R&S®ZVA67	from PORT 1 to MEAS 2 IN	
	10 MHz to 100 MHz	typ. >140 dB
	100 MHz to 20 GHz	typ. >145 dB
	20 GHz to 24 GHz	typ. >145 dB
	24 GHz to 32 GHz	typ. >140 dB
	32 GHz to 40 GHz	typ. >135 dB
	40 GHz to 50 GHz	typ. >130 dB
	50 GHz to 67 GHz	typ. >125 dB

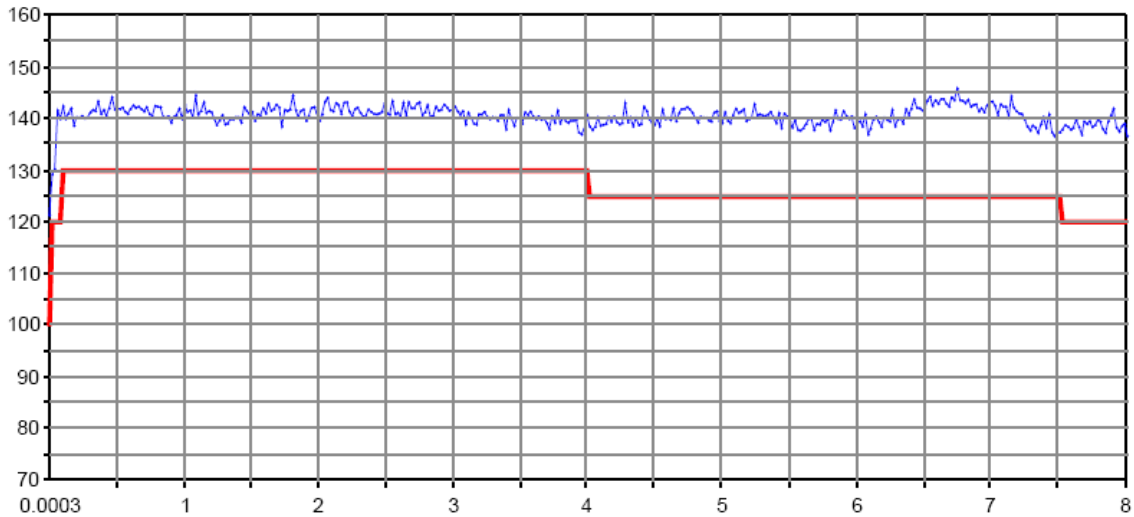


Diagram: Dynamic range in dB versus frequency in GHz of the R&S®ZVA8

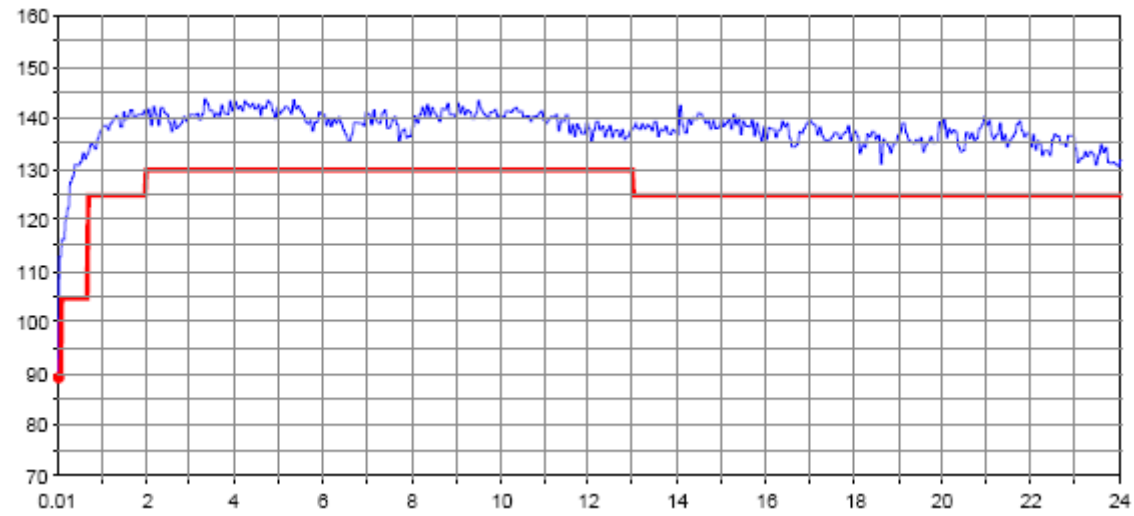


Diagram: Dynamic range in dB versus frequency in GHz of the R&S®ZVA24

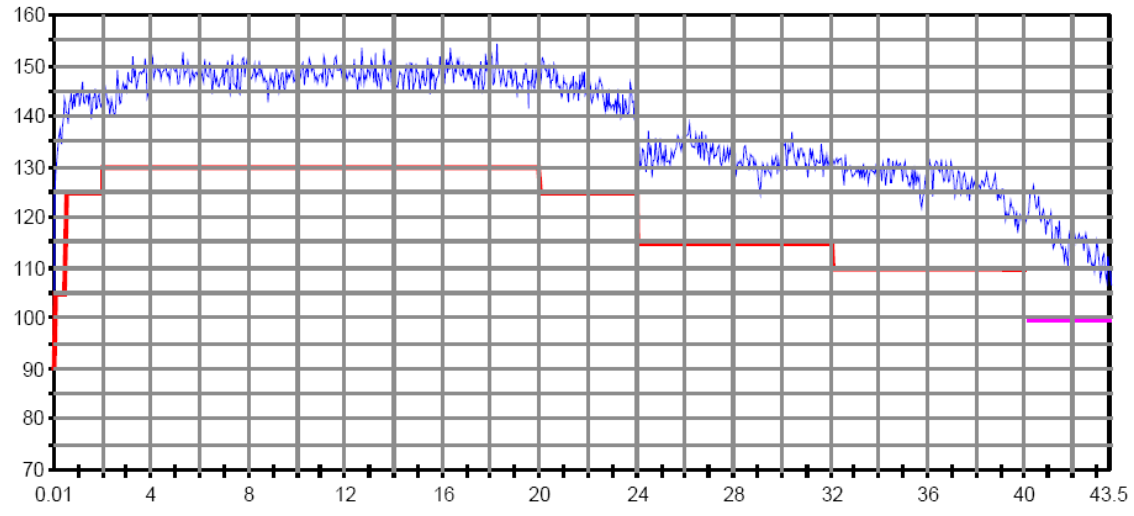


Diagram: Dynamic range in dB versus frequency in GHz of the R&S®ZVA40

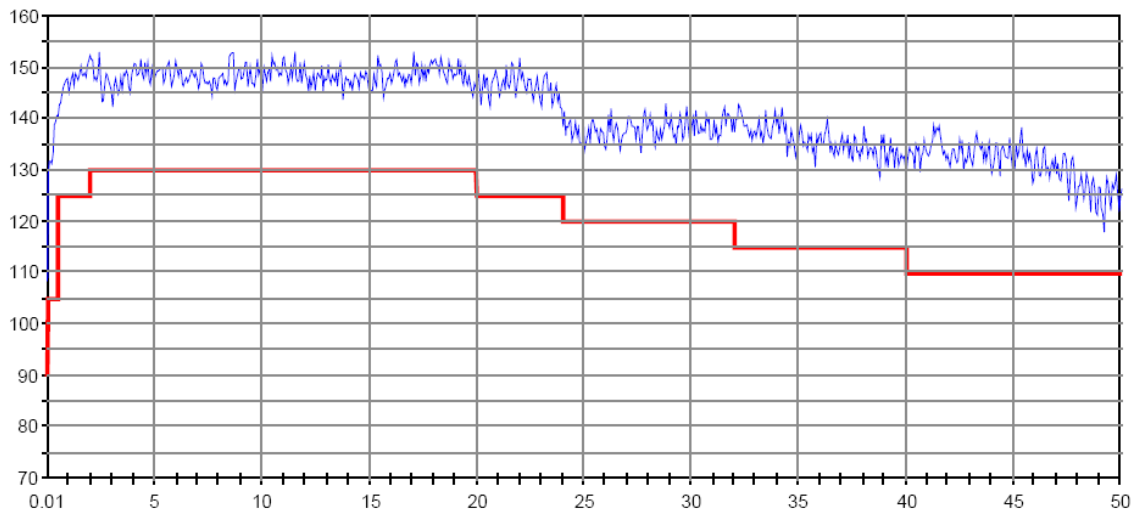


Diagram: Dynamic range in dB versus frequency in GHz of the R&S®ZVA50

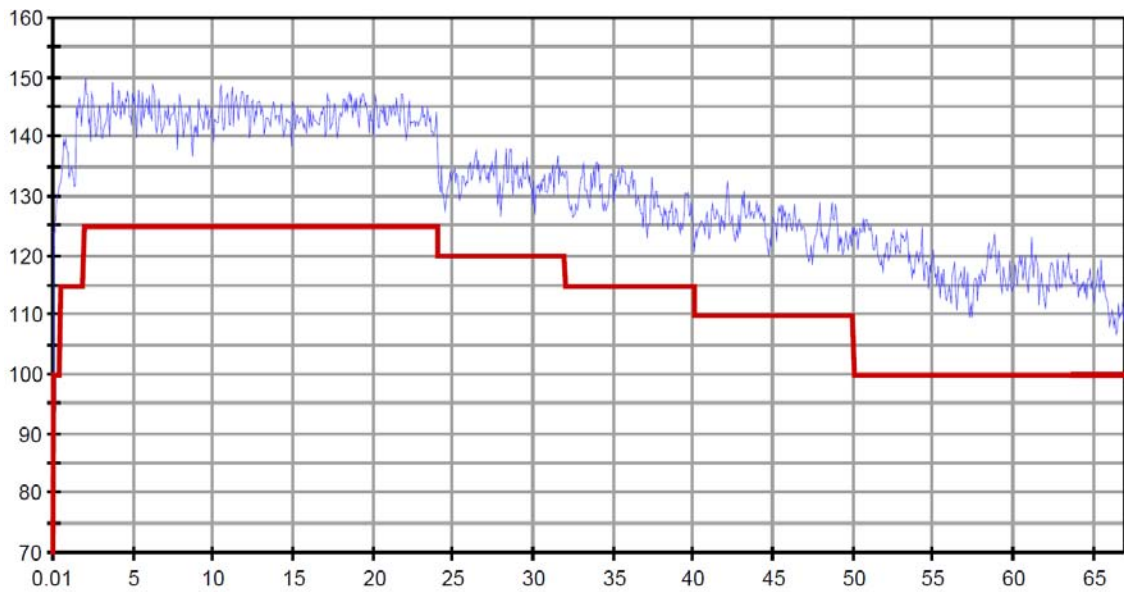


Diagram: Dynamic range in dB versus frequency in GHz of the R&S®ZVA67

## Measurement speed

Measurement time per point	CW mode, 1 MHz measurement bandwidth	<3.5 $\mu$ s
Data transfer time	for 201 measurements points	
	via IEC/IEEE bus	<2.9 ms
	via VX11 over 100 Mbit/s LAN	<1.3 ms
	via RSIB over 100 Mbit/s LAN	<0.7 ms
Switching time between channels	with no more than 2001 points	<1 ms
Switching time between two preloaded instrument settings	with no more than 2001 points	<10 ms

### Sweep times of the R&S®ZVA8, R&S®ZVA24, R&S®ZVA40 and R&S®ZVA50

Sweep times depend on the number of measurement points, the measurement bandwidth, and the start and stop frequencies. They include times for retrace and internal band switching and are valid with ALC and display switched off.

Number of measurement points	51	101	201	401	801	1601
R&S®ZVA with start frequency 5 GHz, stop frequency 5.2 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	2.6 ms	4.0 ms	6.8 ms	12 ms	23 ms	42 ms
With TOSM calibration	3.8 ms	6.5 ms	11.6 ms	22 ms	41 ms	124 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	2.1 ms	3.0 ms	4.7 ms	8.0 ms	15 ms	26 ms
With TOSM calibration	2.8 ms	4.5 ms	7.5 ms	14 ms	26 ms	94 ms
R&S®ZVA with start frequency 6 GHz, stop frequency 8 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	3.6 ms	6.4 ms	11.5 ms	19 ms	31 ms	50 ms
With TOSM calibration	4.8 ms	8.9 ms	16.3 ms	29 ms	49 ms	132 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	3.1 ms	5.4 ms	9.4 ms	14.7 ms	23 ms	35 ms
With TOSM calibration	3.8 ms	6.8 ms	12.2 ms	20.5 ms	33 ms	103 ms
R&S®ZVA8 with start frequency 10 MHz and stop frequency 8 GHz						
R&S®ZVA24 with start frequency 10 MHz and stop frequency 24 GHz						
R&S®ZVA40 with start frequency 10 MHz and stop frequency 40 GHz						
R&S®ZVA50 with start frequency 10 MHz and stop frequency 50 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	8.6 ms	13 ms	19.4 ms	32 ms	55 ms	92 ms
With TOSM calibration	9.9 ms	15.5 ms	25 ms	41 ms	74 ms	173 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	8.2 ms	12 ms	17.4 ms	28 ms	47 ms	75 ms
With TOSM calibration	8.8 ms	13.4 ms	20.2 ms	33 ms	57 ms	143 ms

Table: Sweep times of the R&S®ZVA8, R&S®ZVA24, R&S®ZVA40 and R&S®ZVA50

<b>Sweep times of the R&amp;S® ZVA67</b>						
Sweep times depend on the number of measurement points, the measurement bandwidth, and the start and stop frequencies. They include times for retrace and internal band switching and are valid with ALC and display switched off.						
<b>Number of measurement points</b>	<b>51</b>	<b>101</b>	<b>201</b>	<b>401</b>	<b>801</b>	<b>1601</b>
R&S® ZVA67 with start frequency 6 GHz, stop frequency 12 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	1.8 ms	3 ms	6 ms	11 ms	22 ms	42 ms
With TOSM calibration	3 ms	6 ms	11 ms	21 ms	41 ms	116 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	1.2 ms	2 ms	4 ms	7 ms	14 ms	25 ms
With TOSM calibration	2 ms	4 ms	7 ms	13 ms	25 ms	84 ms
R&S® ZVA67 with start frequency 10 MHz and stop frequency 67 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	2.8 ms	4 ms	7 ms	12 ms	23 ms	42 ms
With TOSM calibration	4.1 ms	7 ms	12 ms	22 ms	42 ms	116 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	2.2 ms	3 ms	4.6 ms	8 ms	14 ms	26 ms
With TOSM calibration	3 ms	5 ms	8 ms	14 ms	26 ms	85 ms

Table: Sweep times of the R&amp;S® ZVA67



## Measurement accuracy

This data is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 K after calibration. Validity of the data is conditional on the use of a suitable calibration kit. This calibration kit is used to achieve the effective system data specified below. Frequency points, measurement bandwidth, and sweep time have to be identical for measurement and calibration (no interpolation allowed).

<b>Accuracy of transmission measurements</b>		
<b>R&amp;S®ZVA8</b>		
300 kHz to 1 MHz	for +15 dB to –45 dB	<1 dB or <6°
1 MHz to 50 MHz	for +15 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<1 dB or <6°
50 MHz to 8 GHz	for +15 dB to +5 dB	<0.2 dB or <2°
	for +5 dB to –55 dB	<0.1 dB or <1°
	for –55 dB to –70 dB	<0.2 dB or <2°
	for –70 dB to –85 dB	<1 dB or <6°
<b>R&amp;S®ZVA24</b>		
10 MHz to 50 MHz	for +15 dB to –30 dB	<1 dB or <6°
50 MHz to 400 MHz	for +15 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<1 dB or <6°
400 MHz to 700 MHz	for +15 dB to –50 dB	<0.2 dB or <2°
	for –50 dB to –65 dB	<1 dB or <6°
700 MHz to 24 GHz	for +15 dB to +5 dB	<0.2 dB or <2°
	for +5 dB to –55 dB	<0.1 dB or <1°
	for –55 dB to –70 dB	<0.2 dB or <2°
	for –70 dB to –85 dB	<1 dB or <6°
<b>R&amp;S®ZVA40</b>		
10 MHz to 50 MHz	for +15 dB to –30 dB	<1 dB or <6°
50 MHz to 250 MHz	for +15 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<1 dB or <6°
250 MHz to 700 MHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
700 MHz to 2 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –50 dB	<0.1 dB or <1°
	for –50 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
2 GHz to 24 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –55 dB	<0.1 dB or <1°
	for –55 dB to –70 dB	<0.2 dB or <2°
	for –70 dB to –85 dB	<1 dB or <6°
24 GHz to 32 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –45 dB	<0.2 dB or <2°
	for –45 dB to –60 dB	<0.3 dB or <3°
	for –60 dB to –75 dB	<1 dB or <6°
32 GHz to 40 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –40 dB	<0.2 dB or <2°
	for –40 dB to –55 dB	<0.4 dB or <4°
	for –55 dB to –70 dB	<1 dB or <6°

R&S®ZVA50		
10 MHz to 50 MHz	for +15 dB to –30 dB	<1 dB or <6°
50 MHz to 250 MHz	for +15 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<1 dB or <6°
250 MHz to 700 MHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
700 MHz to 2 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –50 dB	<0.1 dB or <1°
	for –50 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
2 GHz to 24 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –55 dB	<0.1 dB or <1°
	for –55 dB to –70 dB	<0.2 dB or <2°
	for –70 dB to –85 dB	<1 dB or <6°
24 GHz to 32 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –45 dB	<0.2 dB or <2°
	for –45 dB to –60 dB	<0.3 dB or <3°
	for –60 dB to –75 dB	<1 dB or <6°
32 GHz to 40 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –40 dB	<0.2 dB or <2°
	for –40 dB to –55 dB	<0.4 dB or <4°
	for –55 dB to –70 dB	<1 dB or <6°
40 GHz to 50 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –35 dB	<0.2 dB or <2°
	for –35 dB to –50 dB	<0.4 dB or <4°
	for –50 dB to –65 dB	<1 dB or <6°

<b>R&amp;S®ZVA67</b>		
10 MHz to 50 MHz	for +15 dB to –30 dB	<1 dB or <6°
50 MHz to 250 MHz	for +15 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<1 dB or <6°
250 MHz to 700 MHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
700 MHz to 2 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –50 dB	<0.1 dB or <1°
	for –50 dB to –65 dB	<0.2 dB or <2°
	for –65 dB to –80 dB	<1 dB or <6°
2 GHz to 24 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –55 dB	<0.1 dB or <1°
	for –55 dB to –70 dB	<0.2 dB or <2°
	for –70 dB to –85 dB	<1 dB or <6°
24 GHz to 32 GHz	for +15 dB to +5 dB	<0.3 dB or <3°
	for +5 dB to –45 dB	<0.2 dB or <2°
	for –45 dB to –60 dB	<0.3 dB or <3°
	for –60 dB to –75 dB	<1 dB or <6°
32 GHz to 40 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –40 dB	<0.2 dB or <2°
	for –40 dB to –55 dB	<0.4 dB or <4°
	for –55 dB to –70 dB	<1 dB or <6°
40 GHz to 50 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –35 dB	<0.2 dB or <2°
	for –35 dB to –50 dB	<0.4 dB or <4°
	for –50 dB to –65 dB	<1 dB or <6°
50 GHz to 67 GHz	for +15 dB to +5 dB	<0.4 dB or <4°
	for +5 dB to –30 dB	<0.2 dB or <2°
	for –30 dB to –45 dB	<0.4 dB or <4°
	for –45 dB to –60 dB	<1 dB or <6°
Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz, and a nominal source power of –10 dBm.		

<b>Trace stability</b>		
Trace noise of S11 (rms)	at 0 dBm source power, 0 dB reflection, and 1 kHz measurement bandwidth	
R&S®ZVA8	300 kHz to 8 GHz	<0.004 dB, typ. 0.001 dB
R&S®ZVA24	700 MHz to 24 GHz	<0.004 dB, typ. 0.001 dB
R&S®ZVA40	700 MHz to 24 GHz	<0.004 dB, typ. 0.001 dB
	24 GHz to 40 GHz	<0.015 dB, typ. 0.004 dB
R&S®ZVA50	700 MHz to 24 GHz	<0.004 dB, typ. 0.001 dB
	24 GHz to 50 GHz	<0.015 dB, typ. 0.004 dB
R&S®ZVA67	700 MHz to 24 GHz	<0.004 dB, typ. 0.001 dB
	24 GHz to 48 GHz	<0.015 dB, typ. 0.004 dB
	48 GHz to 67 GHz	<0.03 dB, typ. 0.01 dB
Temperature dependence	at 0 dB transmission or reflection	
	up to 24 GHz	<0.05 dB/K or <0.4°/K
	24 GHz to 67 GHz	<0.1 dB/K or <1°/K

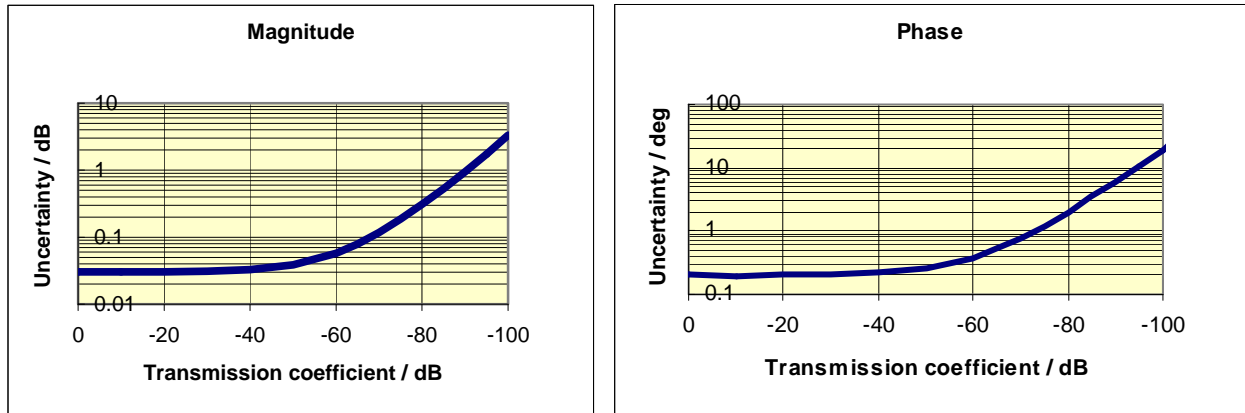


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA8 in the frequency range 300 kHz to 50 MHz

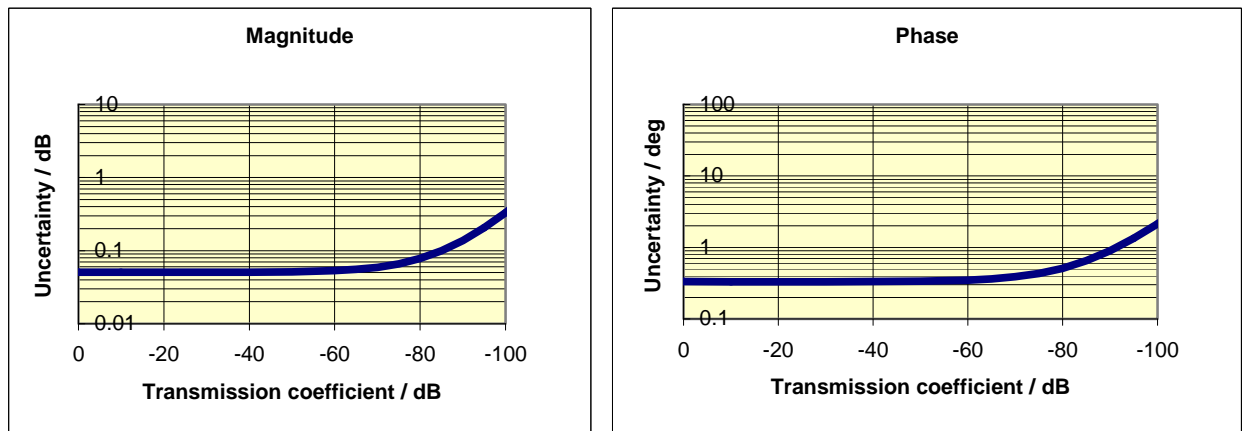


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA8 in the frequency range 50 MHz to 8 GHz

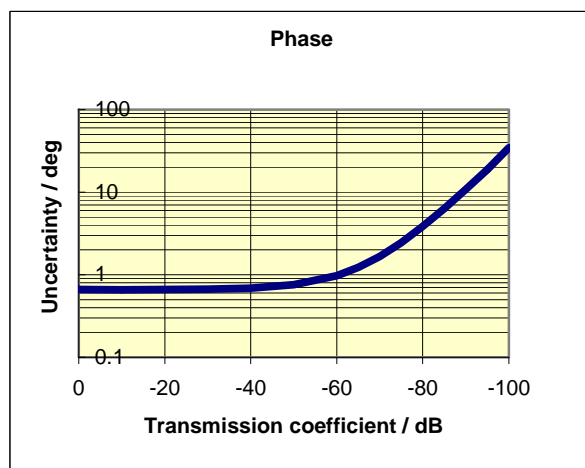
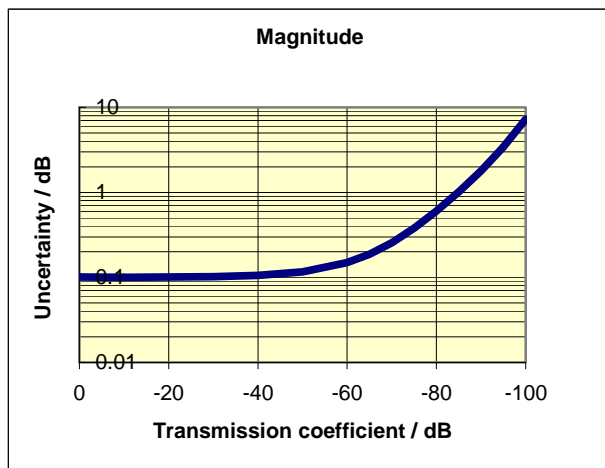


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S® ZVA24 in the frequency range 10 MHz to 700 MHz

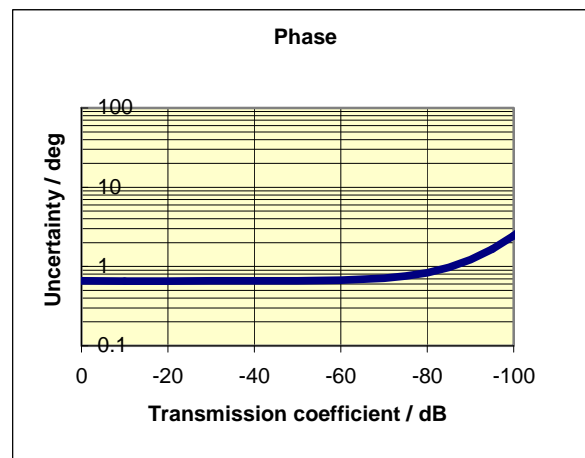
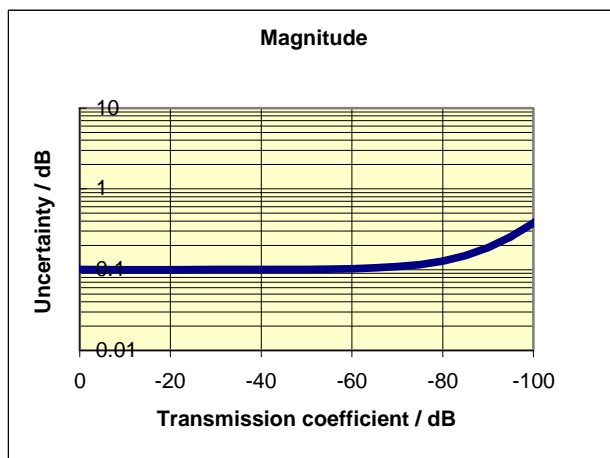


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S® ZVA24 in the frequency range 700 MHz to 24 GHz

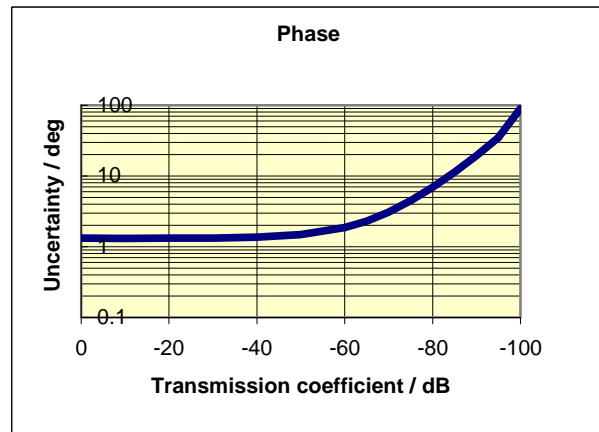
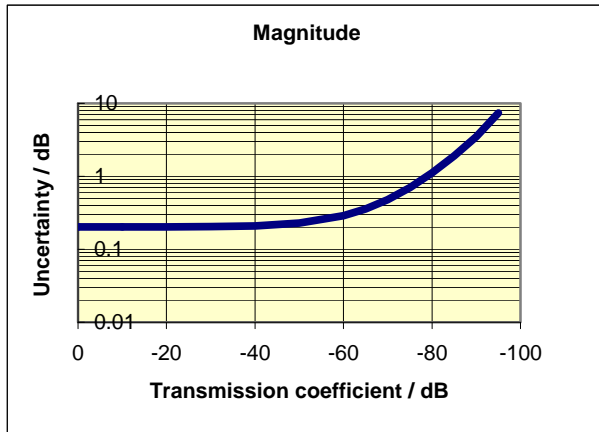


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 10 MHz to 700 MHz

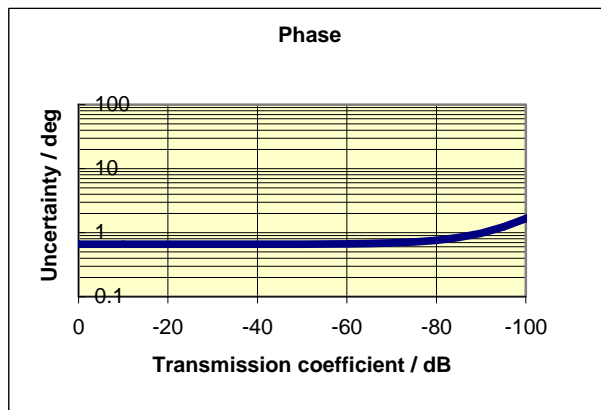
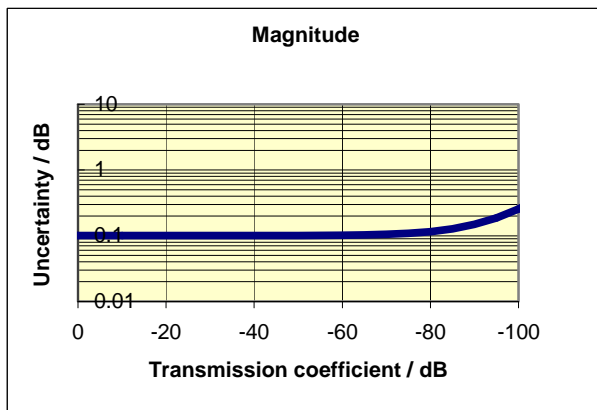


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 700 MHz to 24 GHz

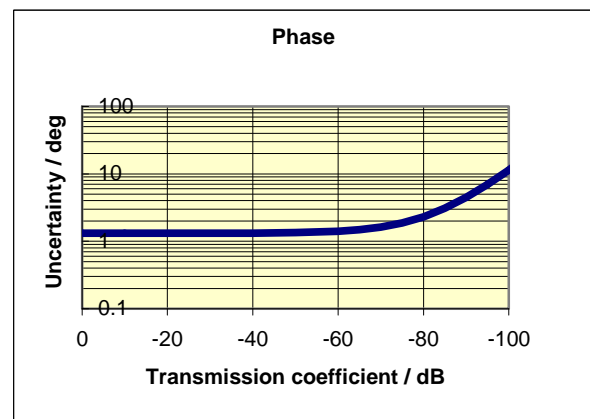
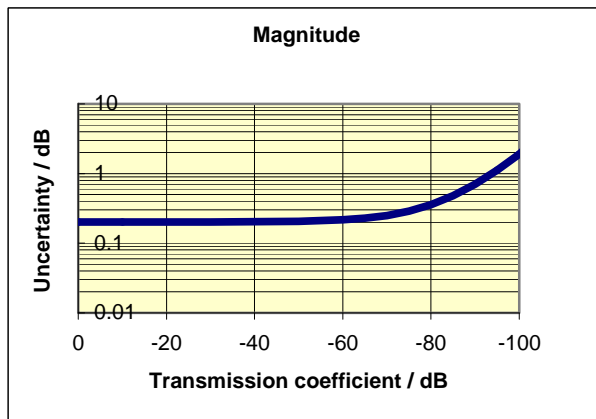


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 24 GHz to 40 GHz

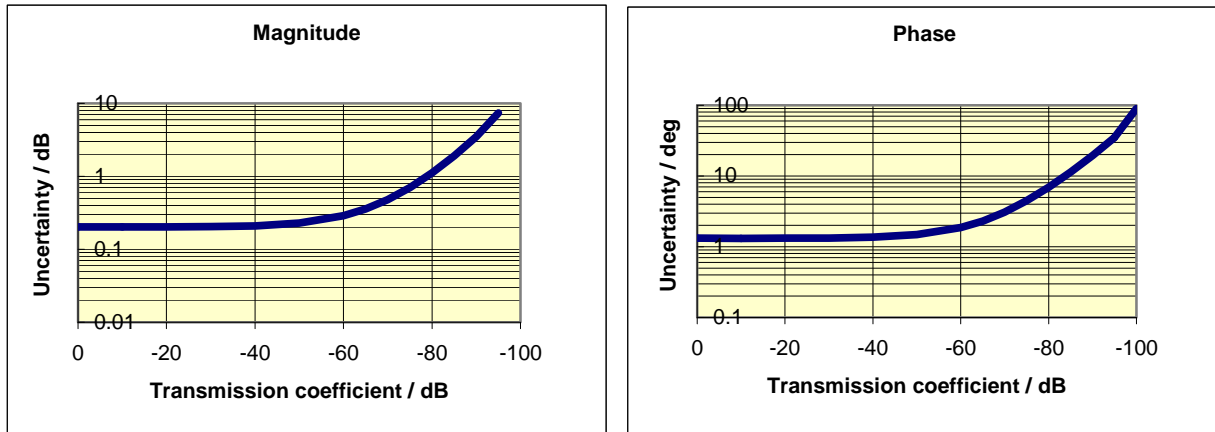


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA50 and of the R&S®ZVA67 in the frequency range 10 MHz to 700 MHz

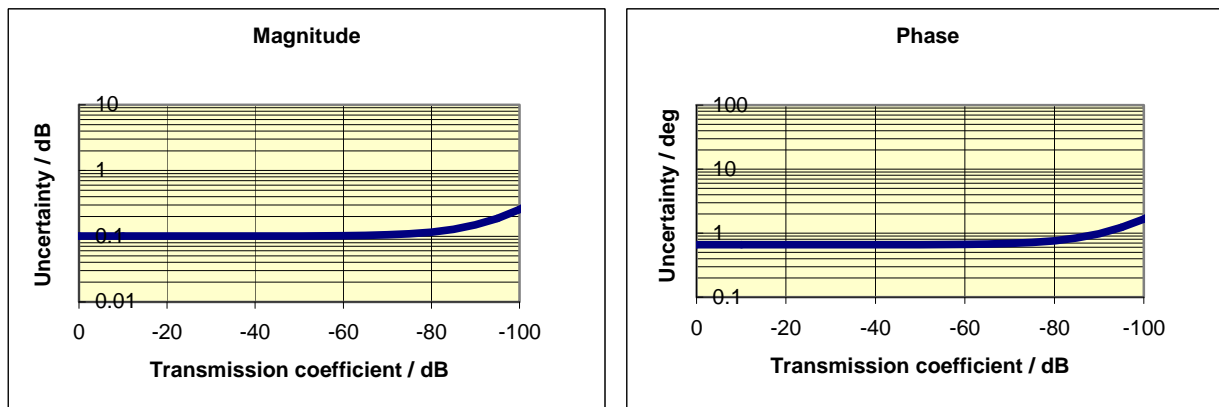


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA50 and of the R&S®ZVA67 in the frequency range 700 MHz to 24 GHz

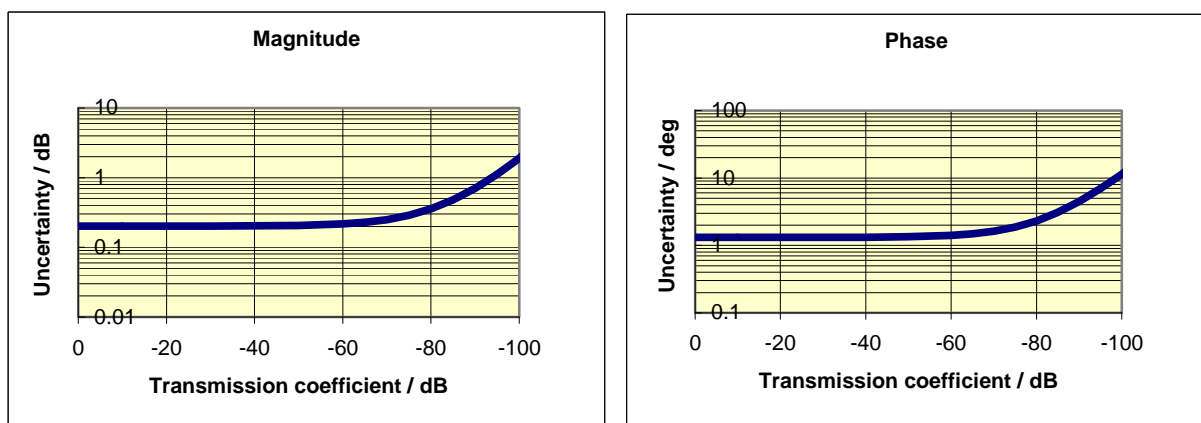


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA50 and of the R&S®ZVA67 in the frequency range 24 GHz to 50 GHz

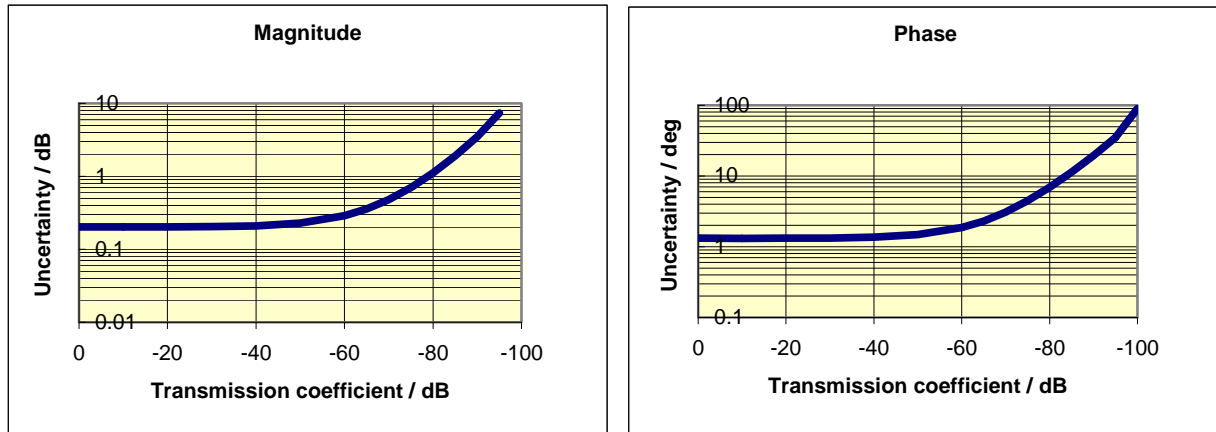


Diagram: Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA67 in the frequency range 50 GHz to 67 GHz



**Accuracy of reflection measurements****R&S®ZVA8**

300 kHz to 1 MHz	for +10 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°
1 MHz to 8 GHz	for +10 dB to +3 dB	<0.6 dB or <4°
	for +3 dB to –15 dB	<0.4 dB or <3°
	for –15 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°

**R&S®ZVA24**

10 MHz to 50 MHz	for +3 dB to –15 dB	<1 dB or <6°
	for –15 dB to –25 dB	<3 dB or <20°
50 MHz to 24 GHz	for +10 dB to +3 dB	<0.6 dB or <4°
	for +3 dB to –15 dB	<0.4 dB or <3°
	for –15 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°

**R&S®ZVA40**

10 MHz to 50 MHz	for +3 dB to –15 dB	<1 dB or <6°
	for –15 dB to –25 dB	<3 dB or <20°
50 MHz to 40 GHz	for +10 dB to +3 dB	<0.6 dB or <4°
	for +3 dB to –15 dB	<0.4 dB or <3°
	for –15 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°

**R&S®ZVA50**

10 MHz to 50 MHz	for +3 dB to –15 dB	<1 dB or <6°
	for –15 dB to –25 dB	<3 dB or <20°
50 MHz to 50 GHz	for +10 dB to +3 dB	<0.6 dB or <4°
	for +3 dB to –15 dB	<0.4 dB or <3°
	for –15 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°

**R&S®ZVA67**

10 MHz to 50 MHz	for +3 dB to –15 dB	<1 dB or <6°
	for –15 dB to –25 dB	<3 dB or <20°
50 MHz to 67 GHz	for +10 dB to +3 dB	<0.6 dB or <4°
	for +3 dB to –15 dB	<0.4 dB or <3°
	for –15 dB to –25 dB	<1 dB or <6°
	for –25 dB to –35 dB	<3 dB or <20°

Specifications are based on an isolating DUT, a measurement bandwidth of 10 Hz, and a nominal source power of –10 dBm.

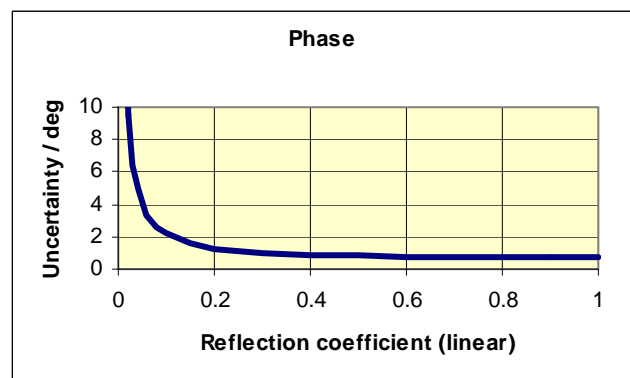
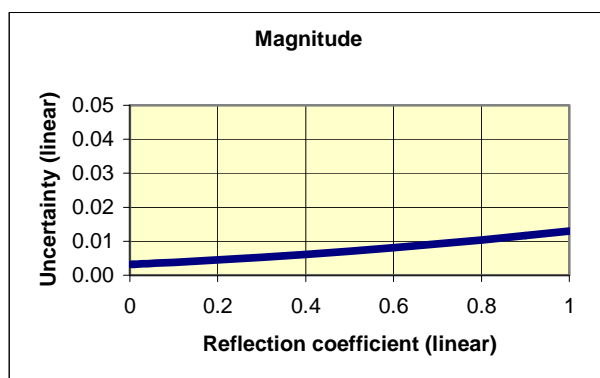


Diagram: Typical accuracy of reflection magnitude and reflection phase measurements of the R&S®ZVA8 in the frequency range 1 MHz to 8 GHz, of the R&S®ZVA24 in the frequency range 50 MHz to 24 GHz, of the R&S®ZVA40 in the frequency range 50 MHz to 40 GHz, of the R&S®ZVA50 in the frequency range 50 MHz to 50 GHz, and of the R&S®ZVA67 in the frequency range 50 MHz to 67 GHz

## Effective system data

This data is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 K after calibration. The data is based on a measurement bandwidth of 10 Hz and system error calibration by means of a suitable calibration kit. Frequency points, measurement bandwidth, and sweep time have to be identical for measurement and calibration (no interpolation allowed).

<b>R&amp;S®ZVA8</b>		
Directivity	1 MHz to 4 GHz	>46 dB, typ. 50 dB
	4 GHz to 8 GHz	>40 dB, typ. 50 dB
Source match	1 MHz to 4 GHz	>40 dB, typ. 46 dB
	4 GHz to 8 GHz	>36 dB, typ. 40 dB
Reflection tracking	1 MHz to 4 GHz	<0.04 dB, typ. 0.01 dB
	4 GHz to 8 GHz	<0.1 dB, typ. 0.01 dB
Load match	300 kHz to 4 GHz	>46 dB, typ. 50 dB
	4 GHz to 8 GHz	>40 dB, typ. 46 dB
Transmission tracking	1 MHz to 4 GHz	<0.06 dB, typ. 0.01 dB
	4 GHz to 8 GHz	<0.1 dB, typ. 0.05 dB
<b>R&amp;S®ZVA24</b>		
Directivity	10 MHz to 700 MHz	>36 dB, typ. 40 dB
	700 MHz to 24 GHz	>40 dB, typ. 50 dB
Source match	10 MHz to 700 MHz	>30 dB, typ. 48 dB
	700 MHz to 24 GHz	>30 dB, typ. 48 dB
Reflection tracking	10 MHz to 700 MHz	<0.3 dB, typ. 0.05 dB
	700 MHz to 24 GHz	<0.3 dB, typ. 0.05 dB
Load match	10 MHz to 700 MHz	>36 dB, typ. 40 dB
	700 MHz to 24 GHz	>40 dB, typ. 50 dB
Transmission tracking	10 MHz to 700 MHz	<0.2 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.1 dB, typ. 0.05 dB
<b>R&amp;S®ZVA40</b>		
Directivity	10 MHz to 700 MHz	>30 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 40 GHz	>30 dB, typ. 40 dB
Source match	10 MHz to 700 MHz	>30 dB, typ. 36 dB
	700 MHz to 24 GHz	>30 dB, typ. 40 dB
	24 GHz to 40 GHz	>30 dB, typ. 36 dB
Reflection tracking	10 MHz to 700 MHz	<0.3 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.3 dB, typ. 0.1 dB
	24 GHz to 40 GHz	<0.3 dB, typ. 0.2 dB
Load match	10 MHz to 700 MHz	>32 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 40 GHz	>32 dB, typ. 40 dB
Transmission tracking	10 MHz to 700 MHz	<0.2 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.1 dB, typ. 0.05 dB
	24 GHz to 40 GHz	<0.2 dB, typ. 0.1 dB
<b>R&amp;S®ZVA50</b>		
Directivity	10 MHz to 700 MHz	>30 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 50 GHz	>30 dB, typ. 40 dB
Source match	10 MHz to 700 MHz	>30 dB, typ. 36 dB
	700 MHz to 24 GHz	>30 dB, typ. 40 dB
	24 GHz to 50 GHz	>30 dB, typ. 36 dB
Reflection tracking	10 MHz to 700 MHz	<0.3 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.3 dB, typ. 0.1 dB
	24 GHz to 50 GHz	<0.3 dB, typ. 0.2 dB
Load match	10 MHz to 700 MHz	>32 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 50 GHz	>32 dB, typ. 40 dB
Transmission tracking	10 MHz to 700 MHz	<0.2 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.1 dB, typ. 0.05 dB
	24 GHz to 50 GHz	<0.2 dB, typ. 0.1 dB

R&S®ZVA67		
Directivity	10 MHz to 700 MHz	>30 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 40 GHz	>30 dB, typ. 40 dB
	40 GHz to 67 GHz	>26 dB, typ. 36 dB
Source match	10 MHz to 700 MHz	>30 dB, typ. 36 dB
	700 MHz to 24 GHz	>30 dB, typ. 40 dB
	24 GHz to 40 GHz	>30 dB, typ. 36 dB
	40 GHz to 67 GHz	>26 dB, typ. 32 dB
Reflection tracking	10 MHz to 700 MHz	<0.3 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.3 dB, typ. 0.1 dB
	24 GHz to 40 GHz	<0.3 dB, typ. 0.2 dB
	40 GHz to 67 GHz	<0.4 dB, typ. 0.2 dB
Load match	10 MHz to 700 MHz	>32 dB, typ. 40 dB
	700 MHz to 24 GHz	>36 dB, typ. 46 dB
	24 GHz to 40 GHz	>32 dB, typ. 40 dB
	40 GHz to 67 GHz	>28 dB, typ. 36 dB
Transmission tracking	10 MHz to 700 MHz	<0.2 dB, typ. 0.1 dB
	700 MHz to 24 GHz	<0.1 dB, typ. 0.05 dB
	24 GHz to 40 GHz	<0.2 dB, typ. 0.1 dB
	40 GHz to 67 GHz	<0.3 dB, typ. 0.1 dB

## Test port output

Power range (without optional step attenuators and without optional direct generator/receiver access)	R&S®ZVA8	
	300 kHz to 50 MHz	–40 dBm to +10 dBm, typ. –45 to +14 dBm
	50 MHz to 4 GHz	–40 dBm to +13 dBm, typ. –45 to +15 dBm
	4 GHz to 7 GHz	–40 dBm to +10 dBm, typ. –45 to +13 dBm
	7 GHz to 8 GHz	–40 dBm to +8 dBm, typ. –45 to +12 dBm
	R&S®ZVA24	
	10 MHz to 13 GHz	–30 dBm to +13 dBm, typ. –40 to +18 dBm
	13 GHz to 24 GHz	–30 dBm to +10 dBm, typ. –40 to +16 dBm
	R&S®ZVA40	
	10 MHz to 50 MHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 to +18 dBm
	20 GHz to 32 GHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	32 GHz to 40 GHz	–30 dBm to +6 dBm, typ. –40 to +12 dBm
	R&S®ZVA50	
	10 MHz to 50 MHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 to +18 dBm
	20 GHz to 32 GHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	32 GHz to 50 GHz	–30 dBm to +6 dBm, typ. –40 to +12 dBm
	R&S®ZVA67	
	10 MHz to 50 MHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 to +18 dBm
	20 GHz to 32 GHz	–30 dBm to +10 dBm, typ. –40 to +15 dBm
	32 GHz to 50 GHz	–30 dBm to +6 dBm, typ. –40 to +12 dBm
	50 GHz to 67 GHz	–30 dBm to +2 dBm, typ. –40 to +6 dBm
	67 GHz to 70 GHz	typ. –30 to +2 dBm
Power accuracy (with ALC on and without power calibration)	R&S®ZVA8 at –10 dBm	<2 dB
	in temperature range +18 °C to +28 °C 50 MHz to 8 GHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA24 at –10 dBm	<3 dB
	in temperature range +18 °C to +28 °C 500 MHz to 24 GHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA40 at –10 dBm	<3 dB
	in temperature range +18 °C to +28 °C 500 MHz to 24 GHz 24 GHz to 40 GHz	<0.8 dB, typ. 0.3 dB <2 dB, typ. 0.8 dB
	R&S®ZVA50 at –10 dBm	<3 dB
	in temperature range +18 °C to +28 °C 500 MHz to 24 GHz 24 GHz to 50 GHz	<0.8 dB, typ. 0.3 dB <2 dB, typ. 0.8 dB
	R&S®ZVA67 at –10 dBm	<3 dB
	in temperature range +18 °C to +28 °C 500 MHz to 24 GHz 24 GHz to 67 GHz	<0.8 dB, typ. 0.3 dB <2 dB, typ. 1 dB
Power linearity in temperature range +18 °C to +28 °C (with ALC on and without power calibration)	referenced to –10 dBm	
	above 50 MHz	<2 dB
	R&S®ZVA8 above 50 MHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA24 above 500 MHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA40 above 500 MHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA50 above 500 MHz	<0.8 dB, typ. 0.3 dB
	R&S®ZVA67 above 500 MHz	<0.8 dB, typ. 0.3 dB
Power resolution		0.01 dB

Harmonics (output power referenced to maximum specified output power)	R&S®ZVA8	
	300 kHz to 50 MHz at -3 dB	typ. <-30 dBc
	50 MHz to 4 GHz at -5 dB	<-20 dBc, typ. <-30 dBc
	4 GHz to 7 GHz at -2 dB	<-20 dBc, typ. <-30 dBc
	7 GHz to 8 GHz at 0 dB	<-20 dBc, typ. <-30 dBc
	R&S®ZVA24	
	10 MHz to 50 MHz at -3 dB	typ. <-30 dBc
	50 MHz to 13 GHz at -3 dB	<-20 dBc, typ. <-30 dBc
	13 GHz to 24 GHz at 0 dB	<-20 dBc, typ. <-30 dBc
	R&S®ZVA40	
	10 MHz to 50 MHz at -3 dB	typ. <-30 dBc
	50 MHz to 20 GHz at -3 dB	<-20 dBc, typ. <-30 dBc
	20 GHz to 40 GHz at 0 dB	<-20 dBc, typ. <-30 dBc
	R&S®ZVA50	
	10 MHz to 50 MHz at -3 dB	typ. <-30 dBc
	50 MHz to 20 GHz at -3 dB	<-20 dBc, typ. <-30 dBc
	20 GHz to 50 GHz at -5 dB	<-20 dBc, typ. <-30 dBc
	R&S®ZVA67	
	10 MHz to 50 MHz at -3 dB	typ. <-20 dBc
	50 MHz to 5 GHz at -3 dB	<-15 dBc, typ. <-25 dBc
	5 GHz to 67 GHz at -3 dB	<-20 dBc, typ. <-30 dBc

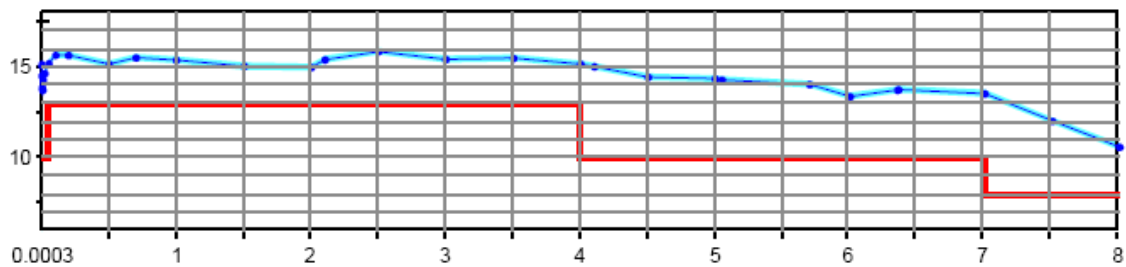


Diagram: Maximum output power in dBm versus frequency in GHz of the R&amp;S®ZVA8

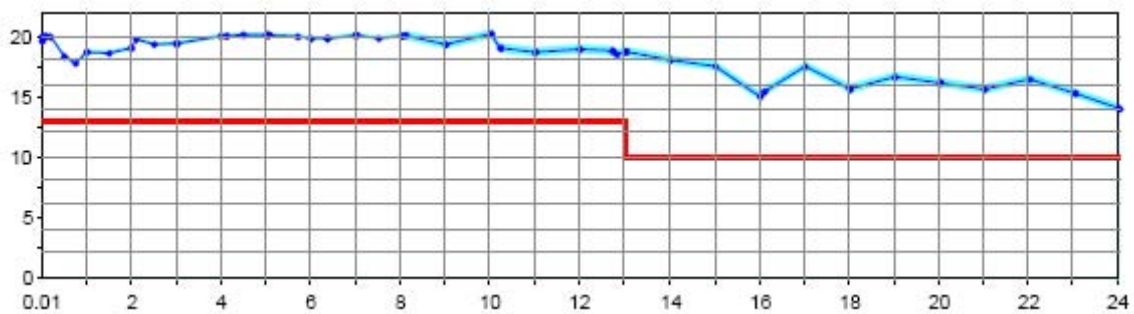


Diagram: Maximum output power in dBm versus frequency in GHz of the R&amp;S®ZVA24

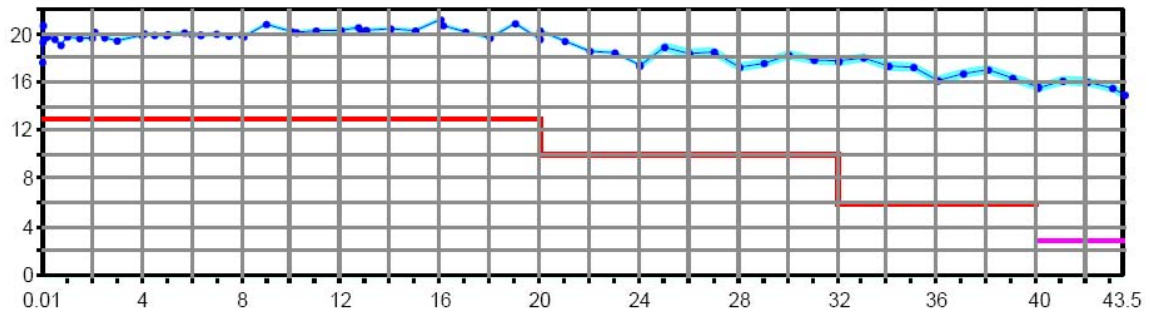


Diagram: Maximum output power in dBm versus frequency in GHz of the R&S®ZVA40

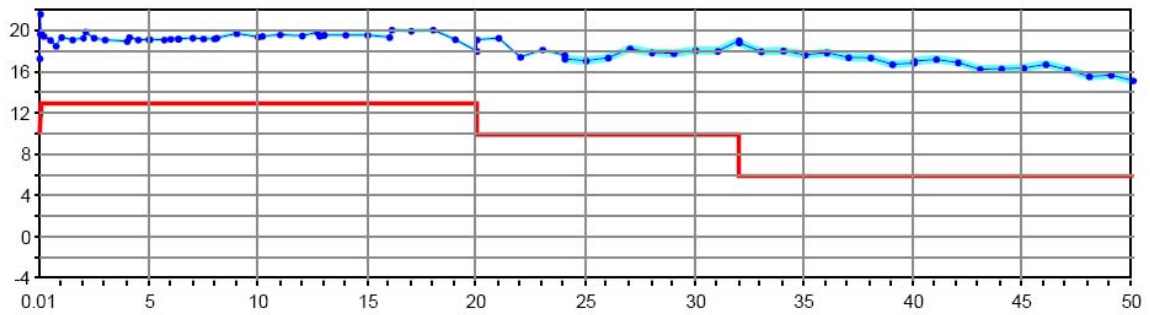


Diagram: Maximum output power in dBm versus frequency in GHz of the R&S®ZVA50

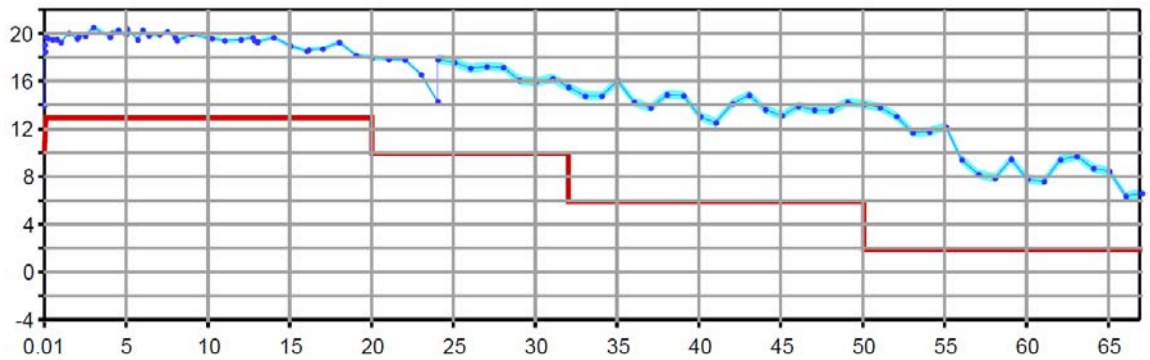


Diagram: Maximum output power in dBm versus frequency in GHz of the R&S®ZVA67

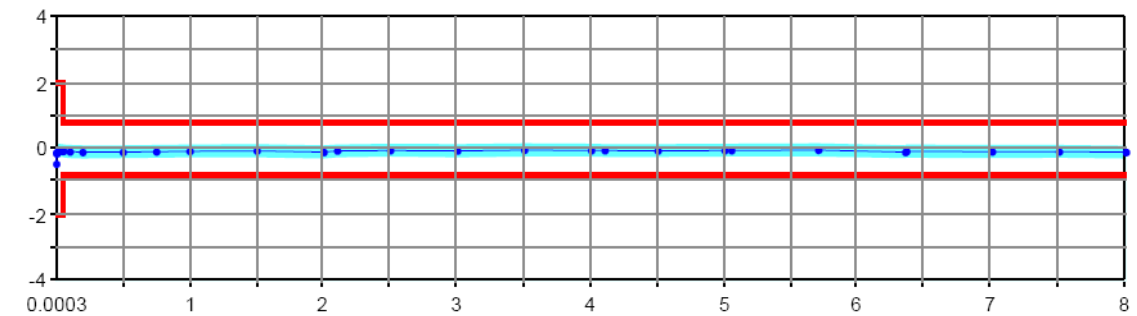


Diagram: Output power accuracy in dB versus frequency in GHz of the R&S®ZVA8

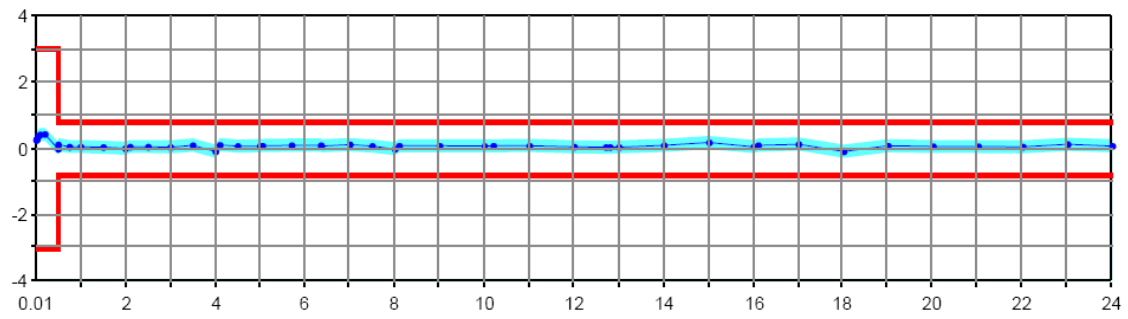


Diagram: Output power accuracy in dB versus frequency in GHz of the R&S®ZVA24

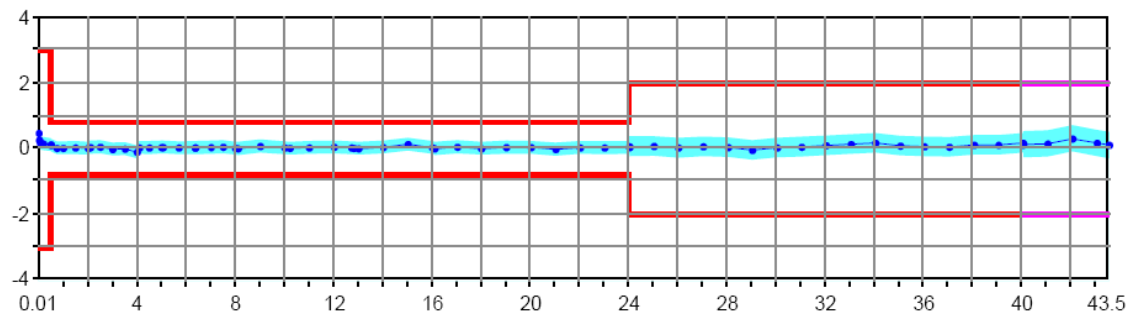


Diagram: Output power accuracy in dB versus frequency in GHz of the R&S®ZVA40

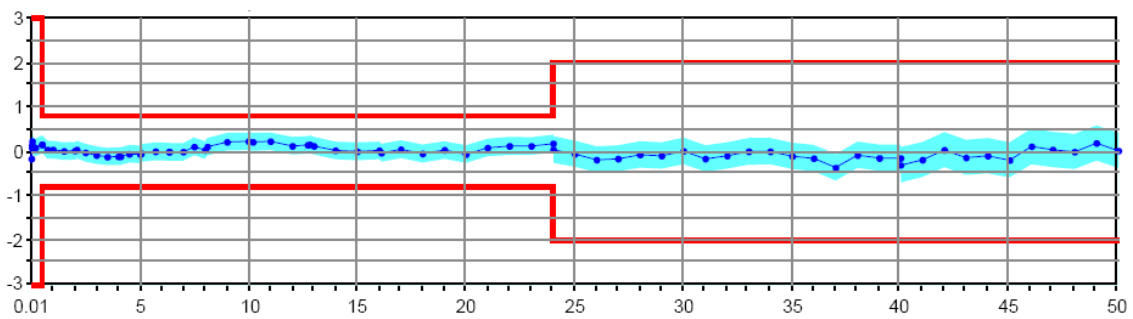


Diagram: Output power accuracy in dB versus frequency in GHz of the R&S®ZVA50

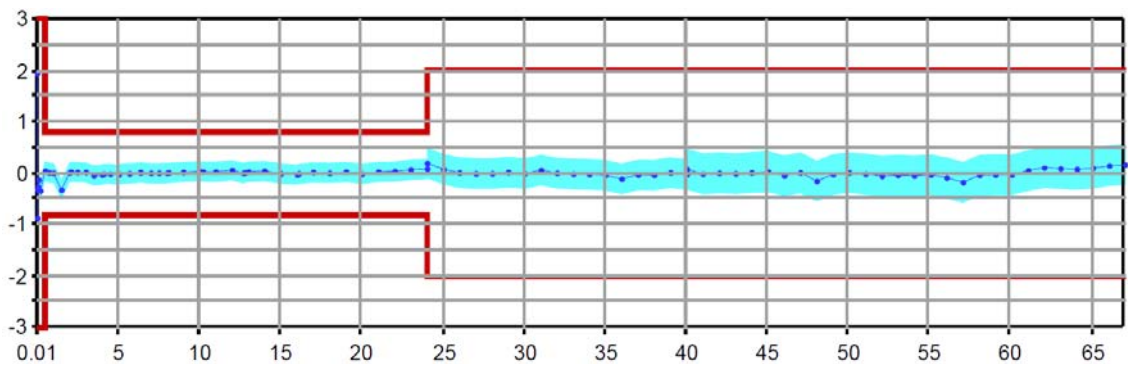


Diagram: Output power accuracy in dB versus frequency in GHz of the R&S®ZVA67

## Test port input

Match	without system error correction	
	R&S® ZVA8	
	300 kHz to 7 GHz	>16 dB
	7 GHz to 8 GHz	>14 dB
	R&S® ZVA24	
	10 MHz to 50 MHz	>10 dB
	50 MHz to 2 GHz	>12 dB
	2 GHz to 24 GHz	>8 dB
	R&S® ZVA40	
	10 MHz to 4 GHz	>12 dB
	4 GHz to 20 GHz	>8 dB
	20 GHz to 40 GHz	>6 dB
	R&S® ZVA50	
	10 MHz to 50 MHz	>8 dB
	50 MHz to 10 GHz	>10 dB
	10 GHz to 20 GHz	>8 dB
	20 GHz to 40 GHz	>6 dB
	40 GHz to 50 GHz	>5 dB
	R&S® ZVA67	
	10 MHz to 50 MHz	>8 dB
	50 MHz to 10 GHz	>10 dB
	10 GHz to 20 GHz	>9 dB
	20 GHz to 40 GHz	>8 dB
	40 GHz to 67 GHz	>6 dB
Maximum nominal input level	R&S® ZVA8	
	300 kHz to 8 GHz	+13 dBm
	R&S® ZVA24	
	10 MHz to 13 GHz	+15 dBm
	13 GHz to 24 GHz	+10 dBm
	R&S® ZVA40	
	10 MHz to 13 GHz	+10 dBm
	13 GHz to 24 GHz	+6 dBm
	24 GHz to 40 GHz	+3 dBm
	R&S® ZVA50	
	10 MHz to 13 GHz	+10 dBm
	13 GHz to 24 GHz	+6 dBm
	24 GHz to 50 GHz	+3 dBm
	R&S® ZVA67	
	10 MHz to 13 GHz	+10 dBm
	13 GHz to 24 GHz	+6 dBm
	24 GHz to 67 GHz	+3 dBm



Power measurement accuracy	at -10 dBm without power calibration in temperature range 18 °C to 28 °C	
	R&S® ZVA8	
	10 MHz to 8 GHz	<1 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	<1 dB
	13 GHz to 24 GHz	<2 dB
	R&S® ZVA40	
	10 MHz to 50 MHz	<2 dB
	50 MHz to 13 GHz	<1 dB
	13 GHz to 24 GHz	<2 dB
	24 GHz to 40 GHz	<3 dB
	R&S® ZVA50	
	10 MHz to 50 MHz	<2 dB
	50 MHz to 13 GHz	<1 dB
	13 GHz to 24 GHz	<2 dB
	24 GHz to 50 GHz	<3 dB
	R&S® ZVA67	
	10 MHz to 50 MHz	<2 dB
	50 MHz to 13 GHz	<1 dB
	13 GHz to 24 GHz	<2 dB
	24 GHz to 50 GHz	<3 dB
	50 GHz to 67 GHz	<4 dB

Receiver linearity	referenced to –10 dBm in temperature range 18 °C to 28 °C	
	R&S®ZVA8	
	for +20 dB to –60 dB 50 MHz to 8 GHz	<0.1 dB
	for –60 dB to –85 dB 50 MHz to 8 GHz	typ. <0.1 dB
	R&S®ZVA24	
	for +20 dB to –30 dB 50 MHz to 700 MHz	<0.1 dB
	for –30 dB to –50 dB 50 MHz to 700 MHz	typ. <0.1 dB
	for +20 dB to +10 dB 700 MHz to 24 GHz	<0.3 dB
	for +10 dB to –45 dB 700 MHz to 24 GHz	<0.1 dB
	for –45 dB to –80 dB 700 MHz to 24 GHz	typ. <0.1 dB
	R&S®ZVA40	
	for +20 dB to –30 dB 50 MHz to 250 MHz	<0.1 dB
	for –30 dB to –50 dB 50 MHz to 250 MHz	typ. <0.1 dB
	for +10 dB to +5 dB 250 MHz to 40 GHz	<0.3 dB
	for +5 dB to –45 dB 250 MHz to 40 GHz	<0.1 dB
	for –45 dB to –65 dB 250 MHz to 40 GHz	typ. <0.1 dB
	R&S®ZVA50	
	for +20 dB to –30 dB 50 MHz to 250 MHz	<0.1 dB
	for –30 dB to –50 dB 50 MHz to 250 MHz	typ. <0.1 dB
	for +10 dB to +5 dB 250 MHz to 50 GHz	<0.3 dB
	for +5 dB to –45 dB 250 MHz to 50 GHz	<0.1 dB
	for –45 dB to –65 dB 250 MHz to 50 GHz	typ. <0.1 dB
	R&S®ZVA67	
	for +15 dB to –30 dB 50 MHz to 250 MHz	<0.1 dB
	for –30 dB to –50 dB 50 MHz to 250 MHz	typ. <0.1 dB
	for +10 dB to +5 dB 250 MHz to 67 GHz	<0.3 dB
	for +5 dB to –45 dB 250 MHz to 67 GHz	<0.1 dB
	for –45 dB to –60 dB 250 MHz to 67 GHz	typ. <0.1 dB
Damage level		+27 dBm
Damage DC voltage		30 V

Noise level (without optional step attenuators and without optional direct generator/receiver access)	at 10 Hz measurement bandwidth	
	R&S®ZVA8	
	300 kHz to 100 MHz	<-100 dBm
	100 MHz to 8 GHz	<-115 dBm
	R&S®ZVA24	
	10 MHz to 100 MHz	typ. <-80 dBm
	100 MHz to 700 MHz	<-80 dBm
	700 MHz to 2 GHz	<-110 dBm
	2 GHz to 13 GHz	<-115 dBm
	13 GHz to 24 GHz	<-110 dBm
	R&S®ZVA40	
	10 MHz to 100 MHz	typ. <-80 dBm
	100 MHz to 500 MHz	<-80 dBm
	500 MHz to 2 GHz	<-110 dBm
	2 GHz to 20 GHz	<-115 dBm
	20 GHz to 24 GHz	<-110 dBm
	24 GHz to 32 GHz	<-100 dBm
	32 GHz to 40 GHz	<-95 dBm
	R&S®ZVA50	
	10 MHz to 100 MHz	typ. <-80 dBm
	100 MHz to 500 MHz	<-80 dBm
	500 MHz to 2 GHz	<-110 dBm
	2 GHz to 20 GHz	<-115 dBm
	20 GHz to 24 GHz	<-110 dBm
	24 GHz to 32 GHz	<-105 dBm
	32 GHz to 40 GHz	<-100 dBm
	40 GHz to 50 GHz	<-95 dBm
	R&S®ZVA67	
	10 MHz to 100 MHz	typ. <-80 dBm
	100 MHz to 500 MHz	<-90 dBm
	500 MHz to 2 GHz	<-105 dBm
	2 GHz to 24 GHz	<-115 dBm
	24 GHz to 40 GHz	<-105 dBm
	40 GHz to 50 GHz	<-100 dBm
	50 GHz to 67 GHz	<-95 dBm
Noise level at optional measurement input (direct generator/receiver access option)	at 10 Hz measurement bandwidth	
	R&S®ZVA8	
	100 MHz to 8 GHz	typ. <-130 dBm
	R&S®ZVA24	
	100 MHz to 24 GHz	typ. <-130 dBm
	R&S®ZVA40	
	100 MHz to 24 GHz	typ. <-130 dBm
	24 GHz to 40 GHz	typ. <-120 dBm
	R&S®ZVA50	
	100 MHz to 24 GHz	typ. <-130 dBm
	24 GHz to 40 GHz	typ. <-120 dBm
	40 GHz to 50 GHz	typ. <-115 dBm
	R&S®ZVA67	
	100 MHz to 24 GHz	typ. <-130 dBm
	24 GHz to 40 GHz	typ. <-120 dBm
	40 GHz to 50 GHz	typ. <-115 dBm
	50 GHz to 67 GHz	typ. <-110 dBm
The noise level is defined as the rms value of the indicated noise floor.		

## Additional front panel connectors

<b>USB</b>	(two) universal serial bus connectors for connecting USB devices (USB 1.1); two additional USB connectors at the rear panel
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## Optional front panel connectors

<b>SOURCE OUT</b>	output of internal source signal
<b>SOURCE IN</b>	input for external source signal
<b>REF OUT</b>	output of internal reference signal
<b>REF IN</b>	input for external reference signal
<b>MEAS OUT</b>	output of internal measurement signal
<b>MEAS IN</b>	input for external measurement signal

## Display

<b>Screen</b>	26 cm (10.4") diagonal color LCD
<b>Resolution</b>	800 × 600 × 262144 pixels (high color)

## Rear panel connectors

<b>IEC BUS</b>	remote control in line with IEEE 488, IEC 60625; 24 pins
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<b>LAN 1</b>	first local area network connector, 8 pins, RJ-45
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<b>LAN 2</b>	second local area network connector, 8 pins, RJ-45
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<b>USB</b>	(two) universal serial bus connectors for connecting USB devices (USB 1.1); two additional USB connectors at the front panel
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<b>10 MHz REF</b>	alternatively input or output for external frequency reference signal	
Connector type		BNC, female
Input frequency		10 MHz
Maximum permissible deviation		1 kHz
Input power		-3 dBm ± 8 dB
Input impedance		50 Ω
Output frequency		10 MHz
Output frequency accuracy		80 Hz
Output power		-3 dBm ± 8 dB at 50 Ω

<b>DC MEAS 1 V</b>	DC measurement input	
Connector type		4-pin mini DIN, female
Voltage range		–1 V to +1 V
Measurement accuracy		2.5 % of reading + 2.5 mV
Resolution		12 bit
Sample rate		3 MHz
Input impedance		>10 k $\Omega$
Damage voltage		30 V

<b>DC MEAS 10 V</b>	DC measurement input	
Connector type		4-pin mini DIN, female
Voltage range		–10 V to +10 V
Measurement accuracy		2.5 % of reading + 25 mV
Resolution		12 bit
Sample rate		3 MHz
Input impedance		>10 k $\Omega$
Damage voltage		30 V

<b>PORT BIAS</b>	DC bias input for PORT	
Connector type		BNC, female
Maximum nominal input voltage		30 V
Maximum nominal input current		200 mA
Damage voltage		30 V
Damage current		500 mA

<b>MONITOR</b>	IBM-PC-compatible VGA monitor connector, 15-pin Sub-D (for external monitor)	
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<b>USER CONTROL</b>	several control and trigger signals, 25-pin Sub-D, 3.3 V TTL for controlling external generators, for limit checks, sweep signals, etc.	
FOOT SWITCH 1 and FOOT SWITCH 2	pin 24 and pin 25 (inputs)	control inputs
DRIVE PORT 1 to DRIVE PORT 4	pin 16 to pin 19 (outputs)	indicate driving port
CHANNEL BIT 0 to CHANNEL BIT 3	pin 8 to pin 11 (outputs)	channel-specific user-configurable bits
PASS 1 and PASS 2	pin 13 and pin 14 (outputs)	pass/fail results of limit checks
BUSY	pin 4 (output)	measurements running
READY FOR TRIGGER	pin 6 (output)	ready for trigger
EXT GEN TRIGGER	pin 21 (output)	control signal for external generator
EXT GEN BLANK	pin 22 (input)	handshake signal from external generator
EXTERNAL TRIGGER	pin 2 (input)	trigger input for analyzer

<b>EXT TRIGGER</b>	trigger input for analyzer	
Connector type		BNC, female
TTL-signal (edge-triggered)		3 V
Polarity (user-selectable)		positive or negative
Minimum pulse width		1 $\mu$ s
Input impedance		>10 k $\Omega$

## Options

Generator step attenuators	R&S®ZVA8, R&S®ZVA24, and R&S®ZVA40: Generator step attenuators extend the lower limit of the output power range by 70 dB. R&S®ZVA50 and R&S®ZVA67: Generator step attenuators extend the lower limit of the output power range by 50 dB.	
Frequency range	R&S®ZVA8	300 kHz to 8 GHz
	R&S®ZVA24	10 MHz to 24 GHz
	R&S®ZVA40	10 MHz to 40 GHz
	R&S®ZVA50	10 MHz to 50 GHz
	R&S®ZVA67	10 MHz to 67 GHz
Power range	R&S®ZVA8	
	300 kHz to 8 GHz	upper limit is reduced by 1 dB
	300 kHz to 8 GHz	lower limit is extended by 70 dB
	R&S®ZVA24	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	10 MHz to 24 GHz	lower limit is extended by 70 dB
	R&S®ZVA40	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 40 GHz	upper limit is reduced by 3 dB
	10 MHz to 40 GHz	lower limit is extended by 70 dB
	R&S®ZVA50	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 50 GHz	upper limit is reduced by 3 dB
	10 MHz to 50 GHz	lower limit is extended by 50 dB
	R&S®ZVA67	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 67 GHz	upper limit is reduced by 3 dB
	10 MHz to 67 GHz	lower limit is extended by 50 dB
Power accuracy	at -10 dBm without power calibration	identical to specifications without optional step attenuators
Power linearity (with ALC off)	R&S®ZVA8, R&S®ZVA24, and R&S®ZVA40	
	above -70 dBm	<2 dB
	from -70 dBm to -100 dBm	<3 dB
	R&S®ZVA50 and R&S®ZVA67	
	above -50 dBm	<2 dB
	from -50 dBm to -80 dBm	<3 dB
Dynamic range	R&S®ZVA8	
	300 kHz to 8 GHz	is reduced by 1 dB
	R&S®ZVA24	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	R&S®ZVA40	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 40 GHz	is reduced by 3 dB
	R&S®ZVA50	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 50 GHz	is reduced by 3 dB
	R&S®ZVA67	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 67 GHz	is reduced by 3 dB

<b>Receiver step attenuators</b>	These attenuators permit the level of the input signal to be attenuated in 5 dB steps up to 35 dB.	
Frequency range	R&S® ZVA8	300 kHz to 8 GHz
	R&S® ZVA24	10 MHz to 24 GHz
	R&S® ZVA40	10 MHz to 40 GHz
	R&S® ZVA50	10 MHz to 50 GHz
	R&S® ZVA67	10 MHz to 67 GHz
Attenuation		0 dB to 35 dB
Attenuation steps		5 dB
Attenuation accuracy		<2 dB
Dynamic range	R&S® ZVA8	
	300 kHz to 8 GHz	is reduced by 1 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	R&S® ZVA40	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 40 GHz	is reduced by 3 dB
	R&S® ZVA50	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 50 GHz	is reduced by 3 dB
	R&S® ZVA67	
	10 MHz to 13 GHz	is reduced by 1 dB
	13 GHz to 24 GHz	is reduced by 2 dB
	24 GHz to 67 GHz	is reduced by 3 dB
Noise level	R&S® ZVA8	
	300 kHz to 8 GHz	is increased by 1 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	R&S® ZVA40	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 40 GHz	is increased by 3 dB
	R&S® ZVA50	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 50 GHz	is increased by 3 dB
	R&S® ZVA67	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 67 GHz	is increased by 3 dB

<b>Direct generator/receiver access</b>	These options permit direct access to the internal source output as well as to the internal reference and measurement receiver inputs via front panel connectors. Dynamic range with direct access utilizing these inputs is stated in the "Measurement range" section. If all the front panel jumper cables are directly connected between the outputs and inputs, the following specifications for the vector network analyzer apply.	
Front panel connectors	R&S® ZVA8	SMA, female
	R&S® ZVA24	2.92 mm, female
	R&S® ZVA40	2.92 mm, female
	R&S® ZVA50	1.85 mm, female
	R&S® ZVA67	1.85 mm, female
Frequency range	R&S® ZVA8	300 kHz to 8 GHz
	R&S® ZVA24	10 MHz to 24 GHz
	R&S® ZVA40	10 MHz to 40 GHz
	R&S® ZVA50	10 MHz to 50 GHz
	R&S® ZVA67	10 MHz to 67 GHz
Dynamic range	R&S® ZVA8	
	300 kHz to 8 GHz	is reduced by 2 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	is reduced by 2 dB
	13 GHz to 24 GHz	is reduced by 4 dB
	R&S® ZVA40	
	10 MHz to 13 GHz	is reduced by 2 dB
	13 GHz to 24 GHz	is reduced by 4 dB
	24 GHz to 40 GHz	is reduced by 6 dB
	R&S® ZVA50	
	10 MHz to 13 GHz	is reduced by 2 dB
	13 GHz to 24 GHz	is reduced by 4 dB
	24 GHz to 50 GHz	is reduced by 6 dB
	R&S® ZVA67	
	10 MHz to 13 GHz	is reduced by 2 dB
	13 GHz to 24 GHz	is reduced by 4 dB
	24 GHz to 67 GHz	is reduced by 6 dB
Power range	R&S® ZVA8	
	300 kHz to 8 GHz	upper limit is reduced by 1 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	R&S® ZVA40	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 40 GHz	upper limit is reduced by 3 dB
	R&S® ZVA50	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 50 GHz	upper limit is reduced by 3 dB
	R&S® ZVA67	
	10 MHz to 13 GHz	upper limit is reduced by 1 dB
	13 GHz to 24 GHz	upper limit is reduced by 2 dB
	24 GHz to 67 GHz	upper limit is reduced by 3 dB
Match	R&S® ZVA40	
	10 MHz to 4 GHz	is reduced by 2 dB



Noise level	R&S® ZVA8	
	300 kHz to 8 GHz	is increased by 1 dB
	R&S® ZVA24	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	R&S® ZVA40	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 40 GHz	is increased by 3 dB
	R&S® ZVA50	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 50 GHz	is increased by 3 dB
	R&S® ZVA67	
	10 MHz to 13 GHz	is increased by 1 dB
	13 GHz to 24 GHz	is increased by 2 dB
	24 GHz to 67 GHz	is increased by 3 dB

## General data

Temperature loading	in line with IEC 60068-2-1 and IEC 60068-2-2	
	operating temperature range	+5 °C to +40 °C
	permissible temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
Damp heat		+40 °C at 95 % 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 IEC 60068-2-27, MIL-STD 810
Calibration interval		1 year
EMC, RF emission	According to EN 55011 class A, operation is not covered in residential, commercial, and business areas nor in small-size companies. Thus, the instrument must not be operated in residential, commercial, and business areas nor in small-size companies unless additional measures are taken to ensure that EN 55011 class B is met.	in line with CISPR 11/EN 55011 group 1 class A (for a shielded test setup) The instrument complies with the emission requirements stipulated by EN 55011 and EN 61326-1 class A. This means that the instrument is suitable for use in industrial environments.
EMC, immunity		in line with IEC/EN 61326-1, immunity industrial environment (excluding operating frequency)
Safety		in line with IEC 61010-1, EN 61010-1, and UL 3111-1
Power supply		100 V to 240 V (AC) with tolerance $\pm 10$ %, 50 Hz to 60 Hz with tolerance $\pm 5$ %, safety class I to VDE 411
Power consumption	R&S®ZVA8, R&S®ZVA24, R&S®ZVA40, and R&S®ZVA50	450 W, typ. 310 W (standby: typ. 10 W)
	R&S®ZVA67 only	650 W, typ. 450 W (standby: typ. 10 W)
Test mark		VDE, GS, CSA, CSA-NRTL/C, CE conformity mark
Dimensions ( W × H × D )		465.1 mm × 286.2 mm × 495.0 mm (18.31 in × 11.27 in × 19.49 in)
Weight		25 kg (55 lb)
Shipping weight		37 kg (82 lb)

## Ordering information

Designation	Type	Order No.
Vector Network Analyzer, 8 GHz, 2 ports	R&S®ZVA8	1145.1110.08
Vector Network Analyzer, 8 GHz, 4 ports	R&S®ZVA8	1145.1110.10
Vector Network Analyzer, 24 GHz, 2 ports	R&S®ZVA24	1145.1110.24
Vector Network Analyzer, 24 GHz, 4 ports	R&S®ZVA24	1145.1110.26
Vector Network Analyzer, 40 GHz, 2 ports, 2.92 mm	R&S®ZVA40	1145.1110.40
Vector Network Analyzer, 40 GHz, 4 ports, 2.92 mm	R&S®ZVA40	1145.1110.42
Vector Network Analyzer, 40 GHz, 2 ports, 2.4 mm	R&S®ZVA40	1145.1110.43
Vector Network Analyzer, 40 GHz, 4 ports, 2.4 mm	R&S®ZVA40	1145.1110.45
Vector Network Analyzer, 50 GHz, 2 ports	R&S®ZVA50	1145.1110.50
Vector Network Analyzer, 50 GHz, 4 ports	R&S®ZVA50	1145.1110.52
Vector Network Analyzer, 67 GHz, 2 ports	R&S®ZVA67	1305.7002.02
<b>Options</b>		
Direct Generator/Receiver Access		
for the R&S®ZVA8 with two ports	R&S®ZVA8-B16	1164.0209.08
for the R&S®ZVA8 with four ports	R&S®ZVA8-B16	1164.0209.10
for the R&S®ZVA24 with two ports	R&S®ZVA24-B16	1164.0209.24
for the R&S®ZVA24 with four ports	R&S®ZVA24-B16	1164.0209.26
for the R&S®ZVA40 with two ports	R&S®ZVA40-B16	1164.0209.40
for the R&S®ZVA40 with four ports	R&S®ZVA40-B16	1164.0209.42
for the R&S®ZVA50 with two ports	R&S®ZVA50-B16	1164.0209.50
for the R&S®ZVA50 with four ports	R&S®ZVA50-B16	1164.0209.52
for the R&S®ZVA67	R&S®ZVA67-B16	1164.0209.67
Generator Step Attenuator Port 1		
for the R&S®ZVA8	R&S®ZVA8-B21	1164.0009.02
for the R&S®ZVA24	R&S®ZVA24-B21	1164.0109.02
for the R&S®ZVA40	R&S®ZVA40-B21	1302.5409.02
for the R&S®ZVA50	R&S®ZVA50-B21	1305.5616.02
for the R&S®ZVA67	R&S®ZVA67-B21	1305.7077.02
Generator Step Attenuator Port 2		
for the R&S®ZVA8	R&S®ZVA8-B22	1164.0015.02
for the R&S®ZVA24	R&S®ZVA24-B22	1164.0115.02
for the R&S®ZVA40	R&S®ZVA40-B22	1302.5415.02
for the R&S®ZVA50	R&S®ZVA50-B22	1305.5622.02
for the R&S®ZVA67	R&S®ZVA67-B22	1305.7083.02
Generator Step Attenuator Port 3		
for the R&S®ZVA8 with four ports	R&S®ZVA8-B23	1164.0021.02
for the R&S®ZVA24 with four ports	R&S®ZVA24-B23	1164.0121.02
for the R&S®ZVA40 with four ports	R&S®ZVA40-B23	1302.5421.02
for the R&S®ZVA50 with four ports	R&S®ZVA50-B23	1305.5639.02
Generator Step Attenuator Port 4		
for the R&S®ZVA8 with four ports	R&S®ZVA8-B24	1164.0038.02
for the R&S®ZVA24 with four ports	R&S®ZVA24-B24	1164.0138.02
for the R&S®ZVA40 with four ports	R&S®ZVA40-B24	1302.5438.02
for the R&S®ZVA50 with four ports	R&S®ZVA50-B24	1305.5645.02

Receiver Step Attenuator Port 1		
for the R&S® ZVA8	R&S® ZVA8-B31	1164.0044.02
for the R&S® ZVA24	R&S® ZVA24-B31	1164.0144.02
for the R&S® ZVA40	R&S® ZVA40-B31	1302.5444.02
for the R&S® ZVA50	R&S® ZVA50-B31	1305.5716.02
for the R&S® ZVA67	R&S® ZVA67-B31	1305.7119.02
Receiver Step Attenuator Port 2		
for the R&S® ZVA8	R&S® ZVA8-B32	1164.0050.02
for the R&S® ZVA24	R&S® ZVA24-B32	1164.0150.02
for the R&S® ZVA40	R&S® ZVA40-B32	1302.5450.02
for the R&S® ZVA50	R&S® ZVA50-B32	1305.5722.02
for the R&S® ZVA67	R&S® ZVA67-B32	1305.7125.02
Receiver Step Attenuator Port 3		
for the R&S® ZVA8 with four ports	R&S® ZVA8-B33	1164.0067.02
for the R&S® ZVA24 with four ports	R&S® ZVA24-B33	1164.0167.02
for the R&S® ZVA40 with four ports	R&S® ZVA40-B33	1302.5467.02
for the R&S® ZVA50 with four ports	R&S® ZVA50-B33	1305.5739.02
Receiver Step Attenuator Port 4		
for the R&S® ZVA8 with four ports	R&S® ZVA8-B34	1164.0073.02
for the R&S® ZVA24 with four ports	R&S® ZVA24-B34	1164.0173.02
for the R&S® ZVA40 with four ports	R&S® ZVA40-B34	1302.5473.02
for the R&S® ZVA50 with four ports	R&S® ZVA50-B34	1305.5745.02
Oven Quartz (OCXO)	R&S® ZVAB-B4	1164.1757.02
Time Domain	R&S® ZVAB-K2	1164.1657.02
Frequency Conversion	R&S® ZVA-K4	1164.1863.02
Mixer Phase Measurement	R&S® ZVA-K5	1311.3128.02
True Differential Mode	R&S® ZVA-K6	1164.1540.02
Pulsed Measurements		
Pulsed Measurements	R&S® ZVA-K7	1164.1511.02
Pulsed Measurements with increased recording time for 2-port models	R&S® ZVA-B7	1164.1492.02
Pulsed Measurements with increased recording time for 4-port models	R&S® ZVA-B7	1164.1492.03
Mixer Delay without LO Access	R&S® ZVA-K9	1311.3128.02
5 MHz Receiver Bandwidth	R&S® ZVA-K17	1164.1070.02
Internal Pulse Generators	R&S® ZVA-K27	1164.1892.02

For product brochure, see PD 5213.5680.12 and [www.rohde-schwarz.com](http://www.rohde-schwarz.com).







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