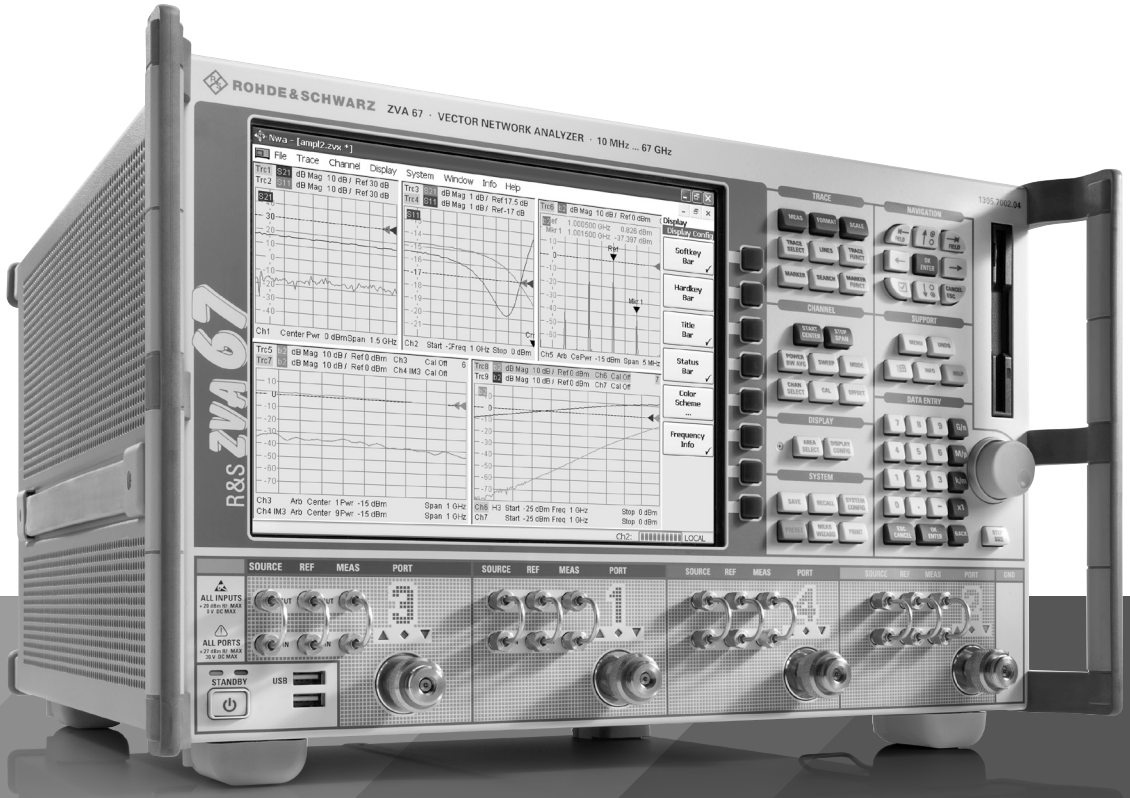
R&S®ZVA
VECTOR NETWORK ANALYZER

Specifications



Data Sheet
Version 14.00

ROHDE&SCHWARZ
Make ideas real

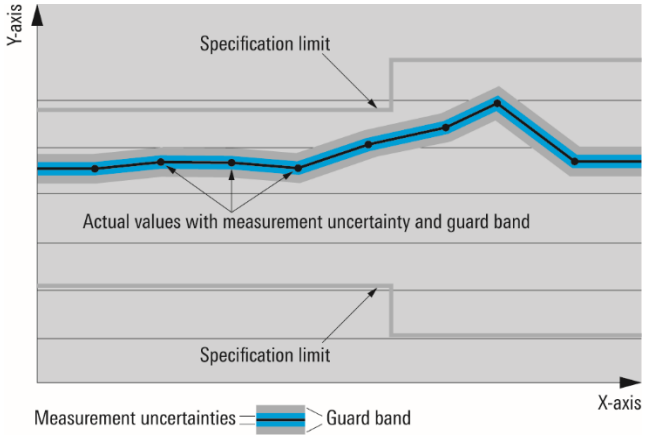
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 90 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 <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

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

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

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

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

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

Specifications

Unless otherwise stated, specifications apply to test ports and a nominal source power of –10 dBm.

Measurement range

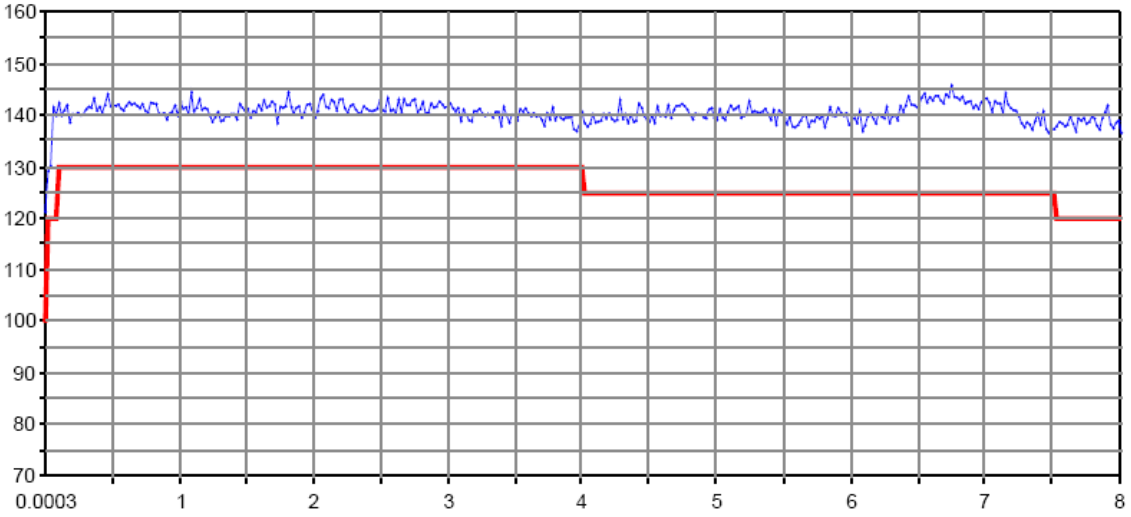
Impedance		50 Ω
Test port connector	R&S®ZVA8	type N, female
	R&S®ZVA24	3.5 mm, male, ruggedized
	R&S®ZVA40	2.92 mm, male, ruggedized
	R&S®ZVA40	2.4 mm, male, ruggedized
	R&S®ZVA50	2.4 mm, male, ruggedized
	R&S®ZVA67	1.85 mm, male, ruggedized
Number of test ports		2 or 4
Frequency range	R&S®ZVA8	300 kHz 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	8×10^{-6}
	with optional oven quartz	1×10^{-7}
Frequency resolution		1 Hz
Number of measurement points	user-selectable	1 to 60001
Number of traces	per diagram area	20
Measurement bandwidths	1/2/5 steps	1 Hz to 1 MHz [1]
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 [2]
	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 [2]
	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	> 118 dB, typ. 125 dB
	40 GHz to 43.5 GHz	typ. 125 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 40 GHz	> 120 dB, typ. 130 dB
	40 GHz to 45 GHz	> 115 dB, typ. 125 dB
	45 GHz to 50 GHz	> 110 dB, typ. 120 dB

[1] With R&S®ZVA-K17 option: 1 Hz to 5 MHz.

[2] R&S®ZVA24 and R&S®ZVA40 with four ports, four sources: 10 MHz to 20 MHz: > 70 dB.

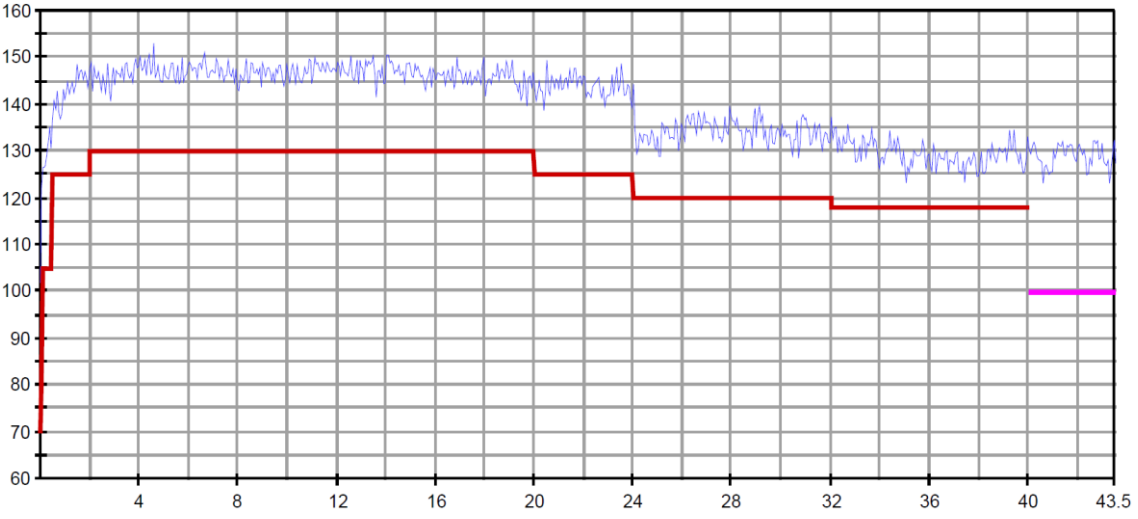
Dynamic range of the R&S®ZVA67 (without optional step attenuators and without optional direct generator/receiver access)	from PORT 1 to PORT 2 and from PORT 3 to PORT 4	
	10 MHz to 50 MHz	> 70 dB, typ. 90 dB
	50 MHz to 500 MHz	> 110 dB, typ. 125 dB
	500 MHz to 2 GHz	> 125 dB, typ. 135 dB
	2 GHz to 24 GHz	> 130 dB, typ. 140 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	> 115 dB, typ. 125 dB
	50 GHz to 65 GHz	> 107 dB, typ. 115 dB
	65 GHz to 67 GHz	> 105 dB, typ. 115 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. For the R&S®ZVA24 and R&S®ZVA40 with four ports, four sources and the R&S®ZVA67, at single frequencies below 1.5 GHz, the dynamic range may 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 43.5 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

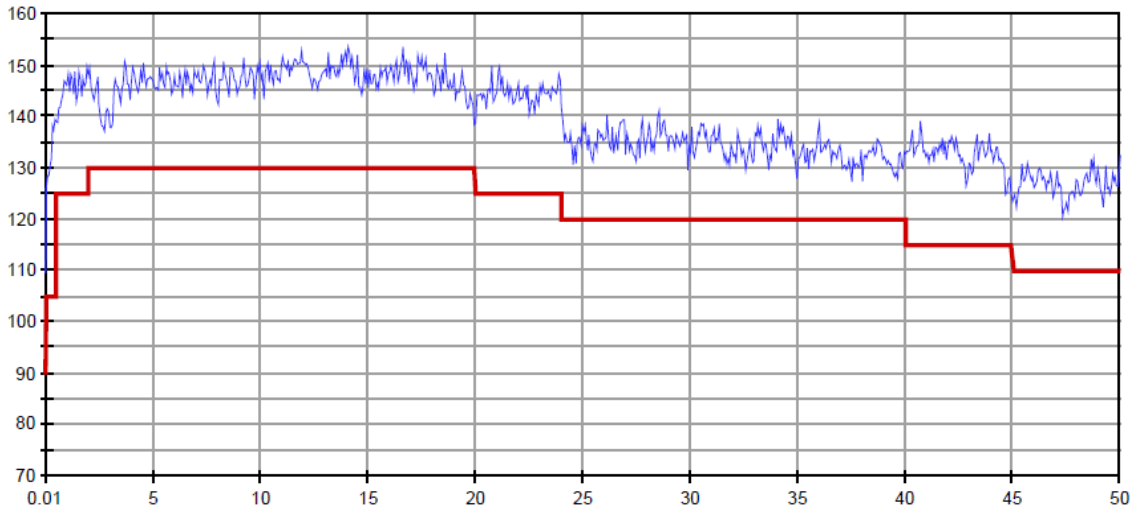


Dynamic range in dB versus frequency in GHz of the R&S®ZVA8

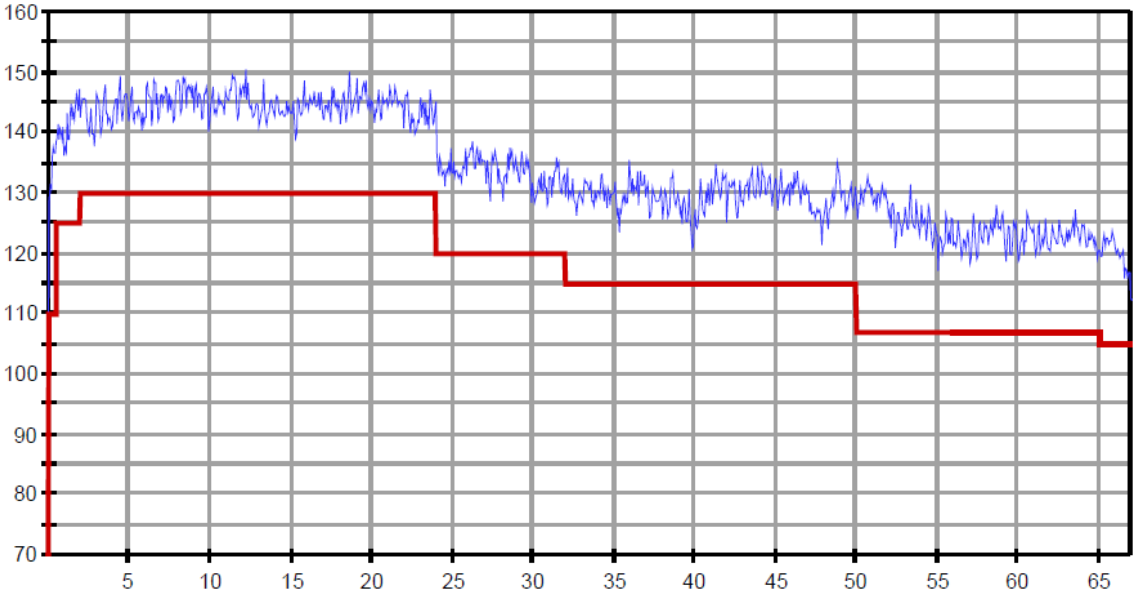
Dynamic range in dB versus frequency in GHz of the R&S®ZVA24



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



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



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 µs
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, stop frequency 8 GHz; R&S®ZVA24 with start frequency 10 MHz, stop frequency 24 GHz; R&S®ZVA40 with start frequency 10 MHz, stop frequency 40 GHz; R&S®ZVA50 with start frequency 10 MHz, 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

Sweep times of the R&S®ZVA67						
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. Furthermore the “Channel: Mode: Alternating Sweeps” must be activated.						
Number of measurement points	**51**	**101**	**201**	**401**	**801**	**1601**
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	2 ms	3 ms	6 ms	11 ms	21 ms	42 ms
With TOSM calibration	4 ms	6 ms	12 ms	22 ms	42 ms	125 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	1.5 ms	2 ms	4 ms	7 ms	13 ms	25 ms
With TOSM calibration	3 ms	4 ms	8 ms	14 ms	26 ms	90 ms
R&S®ZVA67 with start frequency 10 MHz, stop frequency 67 GHz						
For a measurement bandwidth of 100 kHz						
With full one-port calibration or with correction switched off	3 ms	4 ms	7 ms	12 ms	22 ms	42 ms
With TOSM calibration	6 ms	8 ms	14 ms	24 ms	44 ms	125 ms
For a measurement bandwidth of 1 MHz						
With full one-port calibration or with correction switched off	2.5 ms	3 ms	5 ms	8 ms	14 ms	25 ms
With TOSM calibration	5 ms	6 ms	10 ms	16 ms	28 ms	90 ms

Measurement accuracy

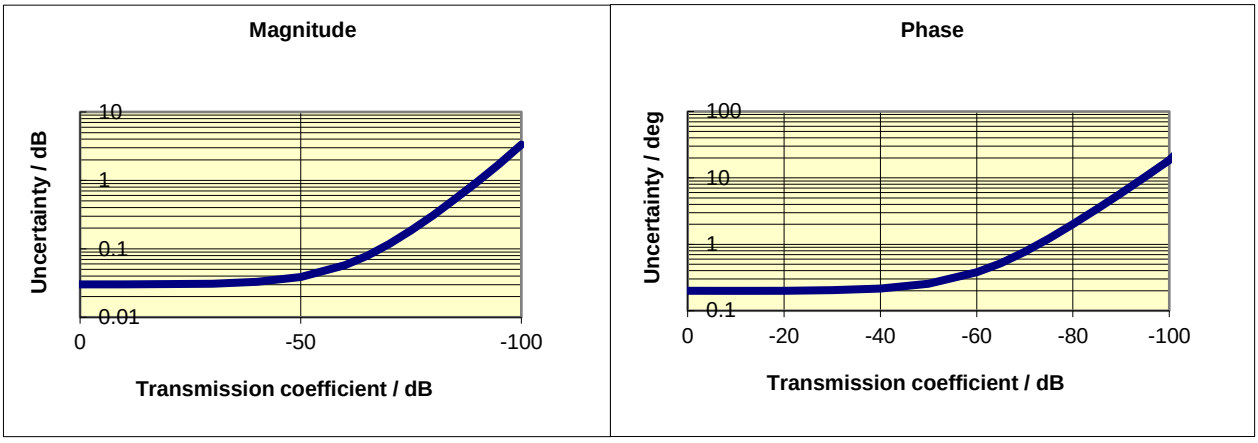
This data is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 K after calibration. Validity of the data is conditional on the use of a suitable calibration kit. This calibration kit is used to achieve the effective system data specified below. Frequency points,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

Accuracy of transmission measurements		
R&S®ZVA8		
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°
R&S®ZVA24		
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°
R&S®ZVA40		
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°

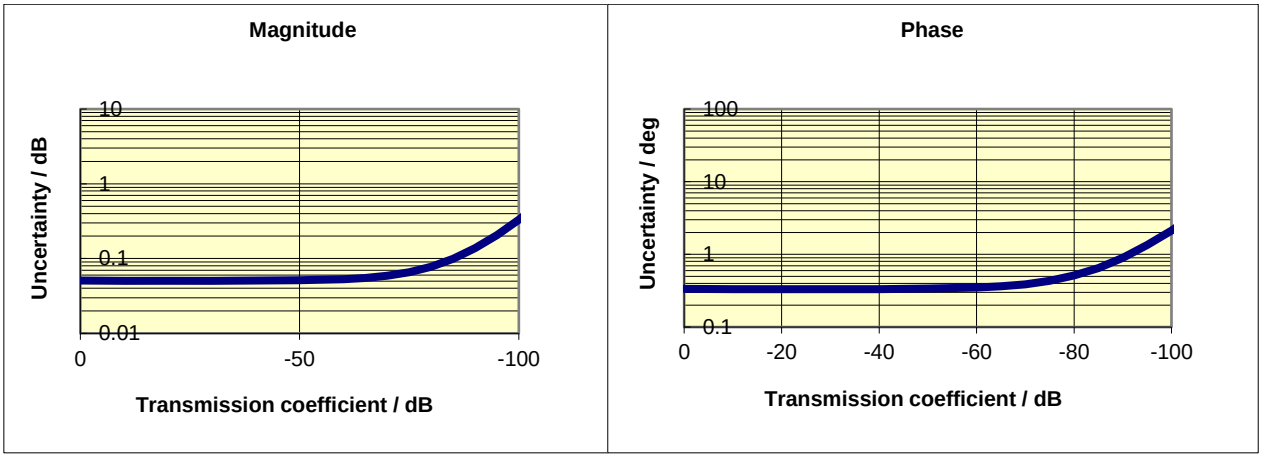
R&S®ZVA50		
10 MHz to 50 MHz	for +15 dB to –30 dB	< 1 dB or < 6°
50 MHz to 250 MHz	for +15 dB to –30 dB	< 0.2 dB or < 2°
	for –30 dB to –45 dB	< 1 dB or < 6°
250 MHz to 700 MHz	for +15 dB to +5 dB	< 0.3 dB or < 3°
	for +5 dB to –65 dB	< 0.2 dB or < 2°
	for –65 dB to –80 dB	< 1 dB or < 6°
700 MHz to 2 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°

R&S®ZVA67		
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.		

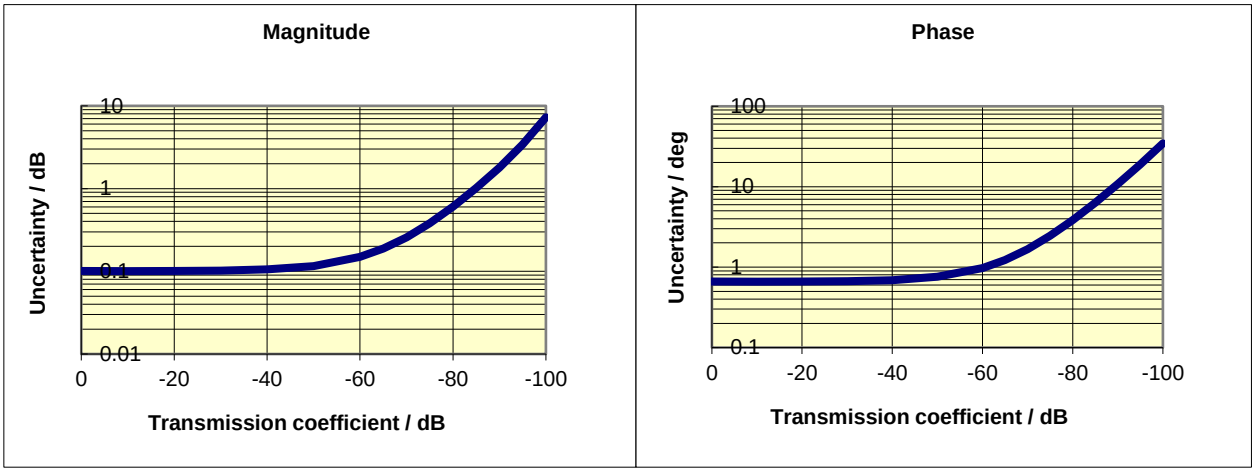
Trace stability		
Trace noise of S11 (RMS)	at 0 dBm source power, 0 dB reflection and 1 kHz measurement bandwidth	
R&S®ZVA8	300 kHz to 8 GHz	< 0.004 dB, typ. 0.001 dB
R&S®ZVA24	700 MHz to 24 GHz	< 0.004 dB, typ. 0.001 dB
R&S®ZVA40	700 MHz to 24 GHz	< 0.004 dB, typ. 0.001 dB
	24 GHz to 40 GHz	< 0.015 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



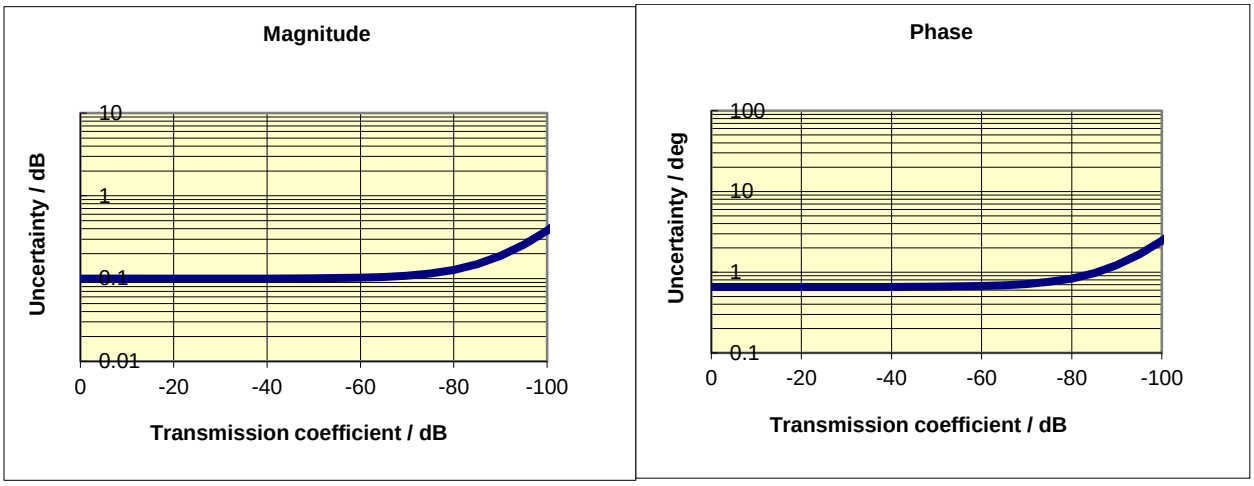
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA8 in the frequency range 300 kHz to 50 MHz



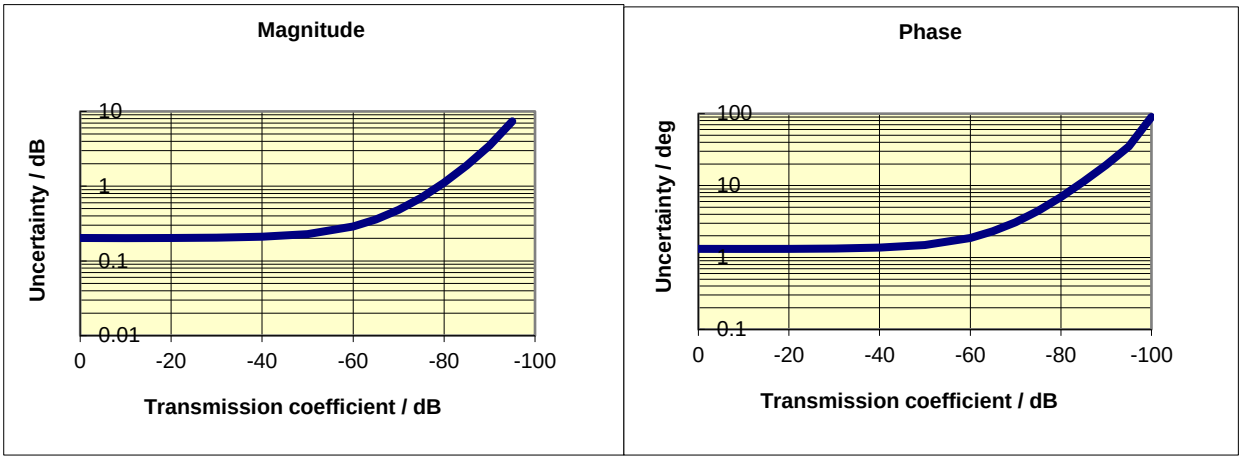
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA8 in the frequency range 50 MHz to 8 GHz



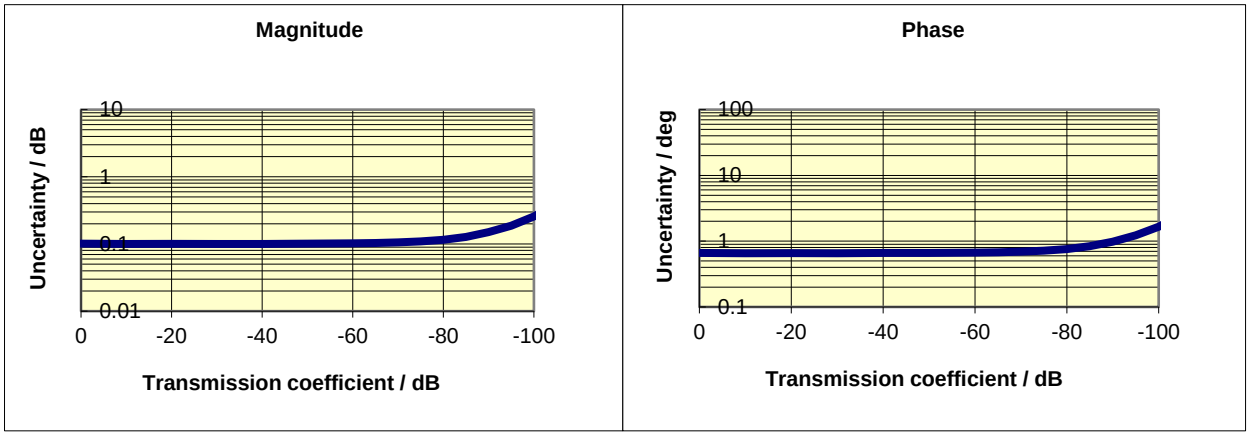
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA24 in the frequency range 10 MHz to 700 MHz



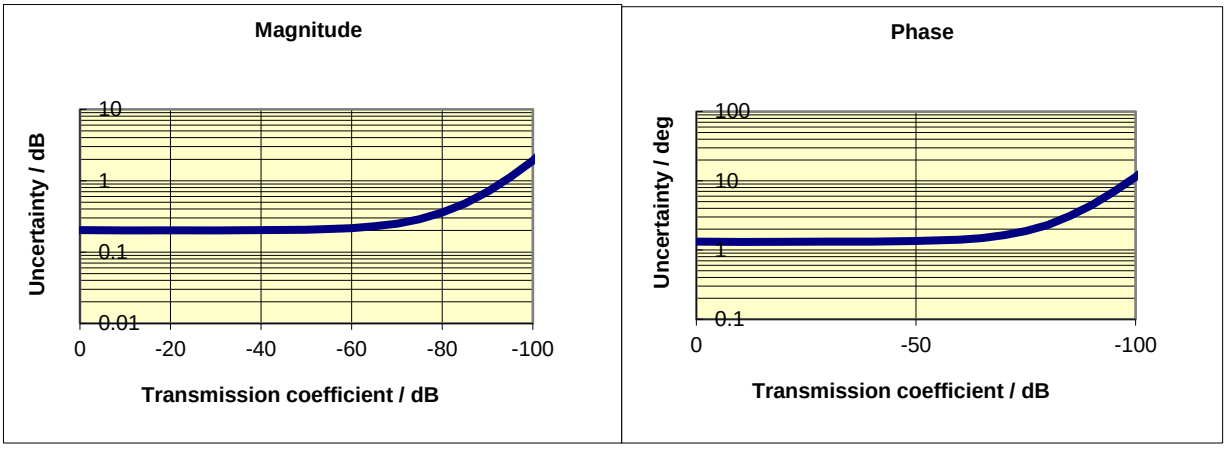
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA24 in the frequency range 700 MHz to 24 GHz



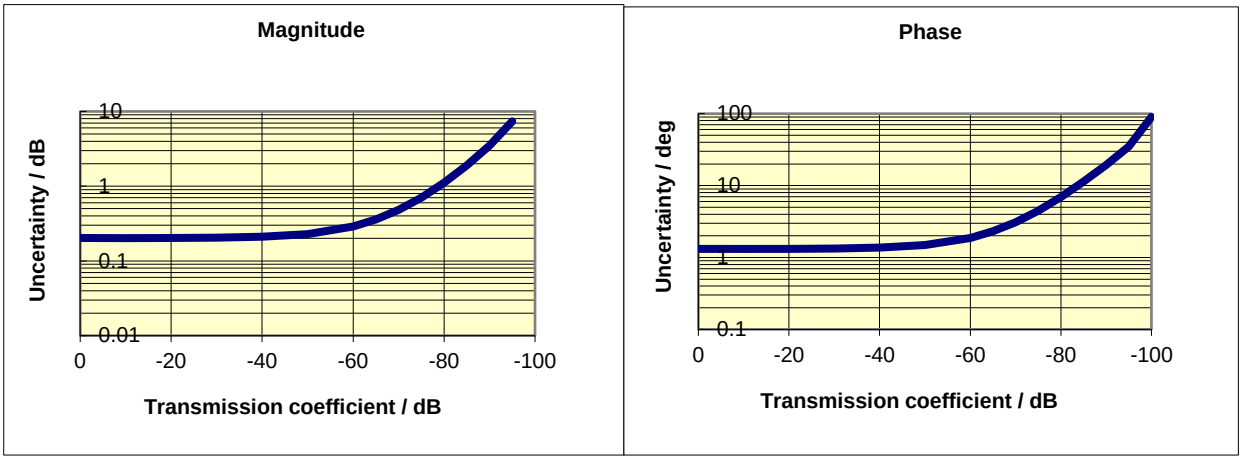
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 10 MHz to 700 MHz



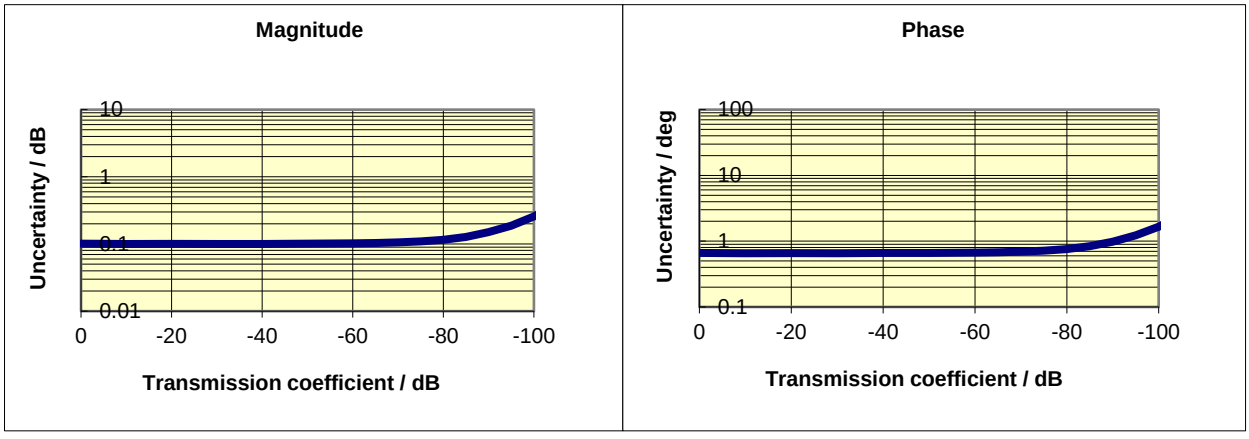
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 700 MHz to 24 GHz



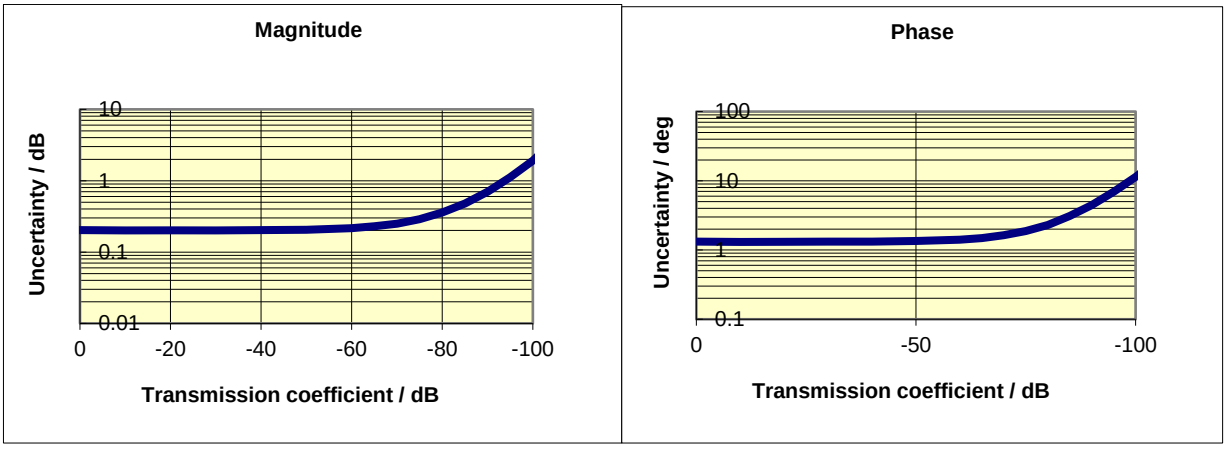
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA40 in the frequency range 24 GHz to 40 GHz



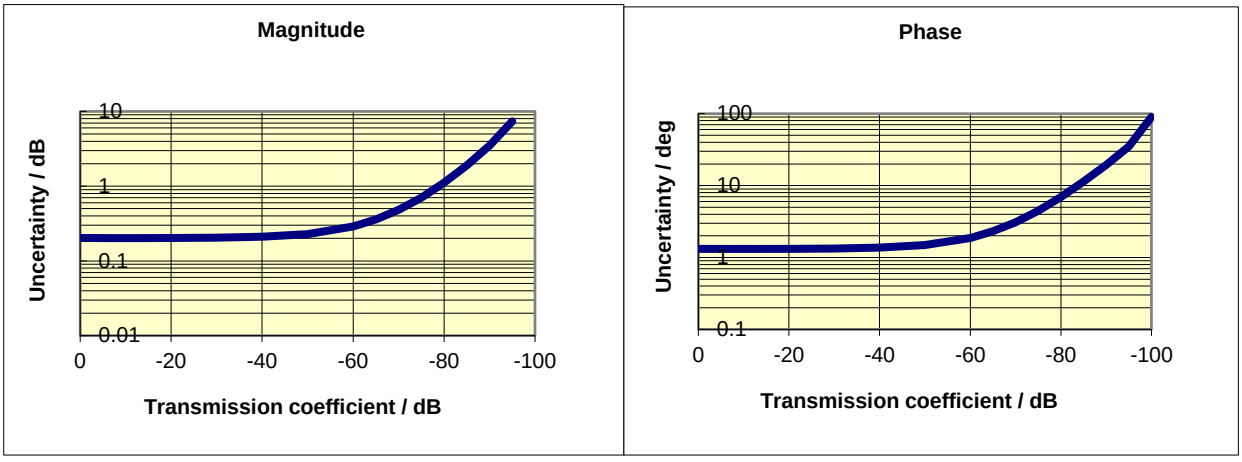
Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA50 and R&S®ZVA67 in the frequency range 10 MHz to 700 MHz



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

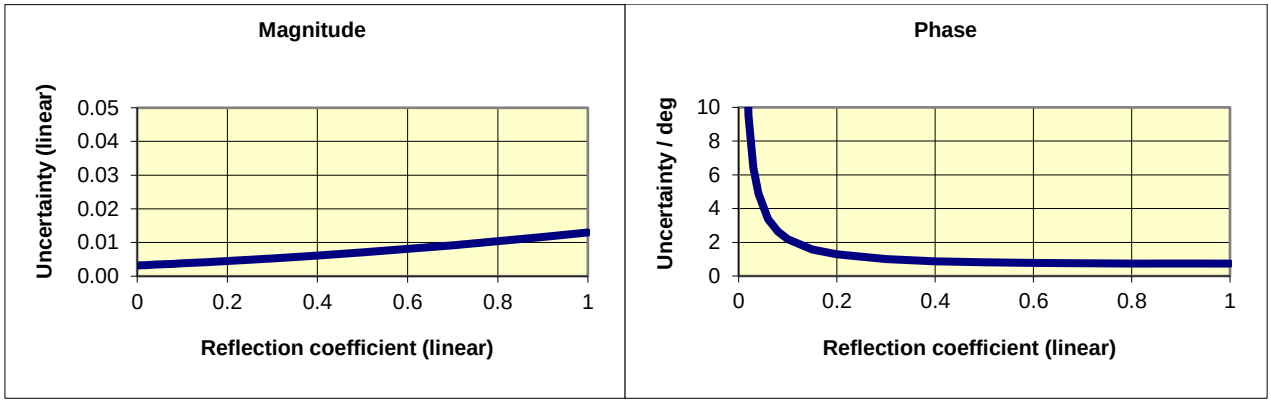


Typical accuracy of transmission magnitude and transmission phase measurements of the R&S®ZVA50 and R&S®ZVA67 in the frequency range 24 GHz to 50 GHz



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.		



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 using the previously mentioned calibration kit. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation allowed).

R&S®ZVA8 and R&S®ZV-Z270		
Directivity	10 MHz to 700 MHz	> 36 dB, typ. 46 dB
	700 MHz to 8 GHz	> 40 dB, typ. 46 dB
Source match	10 MHz to 700 MHz	> 30 dB, typ. 43 dB
	700 MHz to 8 GHz	> 36 dB, typ. 43 dB
Reflection tracking	10 MHz to 700 MHz	< 0.2 dB, typ. 0.04 dB
	700 MHz to 8 GHz	< 0.1 dB, typ. 0.02 dB
Load match	10 MHz to 700 MHz	> 36 dB, typ. 46 dB
	700 MHz to 8 GHz	> 40 dB, typ. 46 dB
Transmission tracking	10 MHz to 700 MHz	< 0.2 dB, typ. 0.04 dB
	700 MHz to 8 GHz	< 0.1 dB, typ. 0.02 dB
R&S®ZVA24 and R&S®ZV-Z235		
Directivity	10 MHz to 700 MHz	> 36 dB, typ. 46 dB
	700 MHz to 24 GHz	> 40 dB, typ. 46 dB
Source match	10 MHz to 700 MHz	> 30 dB, typ. 43 dB
	700 MHz to 24 GHz	> 36 dB, typ. 43 dB
Reflection tracking	10 MHz to 700 MHz	< 0.2 dB, typ. 0.04 dB
	700 MHz to 24 GHz	< 0.1 dB, typ. 0.02 dB
Load match	10 MHz to 700 MHz	> 36 dB, typ. 46 dB
	700 MHz to 24 GHz	> 40 dB, typ. 46 dB
Transmission tracking	10 MHz to 700 MHz	< 0.2 dB, typ. 0.04 dB
	700 MHz to 24 GHz	< 0.1 dB, typ. 0.02 dB
R&S®ZVA40 and R&S®ZV-Z229		
Directivity	10 MHz to 700 MHz	> 33 dB, typ. 36 dB
	700 MHz to 24 GHz	> 38 dB, typ. 42 dB
	24 GHz to 40 GHz	> 33 dB, typ. 36 dB
Source match	10 MHz to 700 MHz	> 30 dB, typ. 36 dB
	700 MHz to 24 GHz	> 36 dB, typ. 40 dB
	24 GHz to 40 GHz	> 30 dB, typ. 36 dB
Reflection 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
Load match	10 MHz to 700 MHz	> 33 dB, typ. 36 dB
	700 MHz to 24 GHz	> 38 dB, typ. 42 dB
	24 GHz to 40 GHz	> 33 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. 0.04 dB
	24 GHz to 40 GHz	< 0.2 dB, typ. 0.08 dB
R&S®ZVA50 and R&S®ZV-Z224		
Directivity	10 MHz to 700 MHz	> 33 dB, typ. 40 dB
	700 MHz to 24 GHz	> 40 dB, typ. 46 dB
	24 GHz to 50 GHz	> 33 dB, typ. 36 dB
Source match	10 MHz to 700 MHz	> 30 dB, typ. 40 dB
	700 MHz to 24 GHz	> 36 dB, typ. 40 dB
	24 GHz to 50 GHz	> 30 dB, typ. 36 dB
Reflection 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
Load match	10 MHz to 700 MHz	> 33 dB, typ. 40 dB
	700 MHz to 24 GHz	> 38 dB, typ. 42 dB
	24 GHz to 50 GHz	> 33 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 50 GHz	< 0.2 dB, typ. 0.1 dB

R&S®ZVA67 and R&S®ZV-Z218		
Directivity	10 MHz to 700 MHz	> 30 dB, typ. 36 dB
	700 MHz to 24 GHz	> 36 dB, typ. 42 dB
	24 GHz to 67 GHz	> 32 dB, typ. 38 dB
Source match	10 MHz to 700 MHz	> 30 dB, typ. 36 dB
	700 MHz to 24 GHz	> 36 dB, typ. 42 dB
	24 GHz to 67 GHz	> 30 dB, typ. 36 dB
Reflection 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 67 GHz	< 0.2 dB, typ. 0.1 dB
Load match	10 MHz to 700 MHz	> 30 dB, typ. 36 dB
	700 MHz to 24 GHz	> 36 dB, typ. 42 dB
	24 GHz to 67 GHz	> 30 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 67 GHz	< 0.2 dB, typ. 0.1 dB

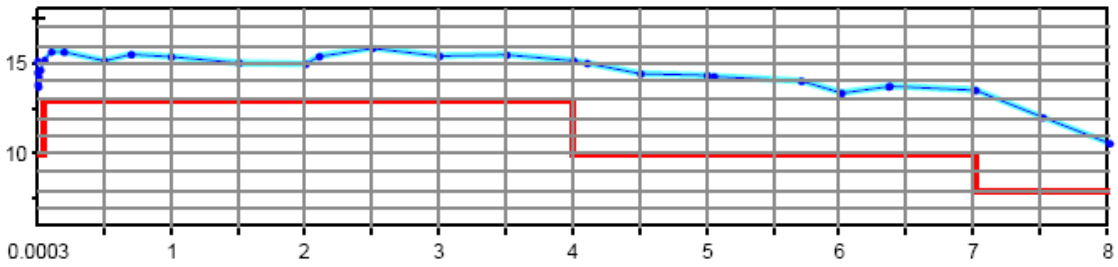
Test port output

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 dBm to +14 dBm
	50 MHz to 4 GHz	–40 dBm to +13 dBm, typ. –45 dBm to +15 dBm
	4 GHz to 7 GHz	–40 dBm to +10 dBm, typ. –45 dBm to +13 dBm
	7 GHz to 8 GHz	–40 dBm to +8 dBm, typ. –45 dBm to +12 dBm
	R&S®ZVA24	
	10 MHz to 13 GHz	–30 dBm to +13 dBm [3], typ. –40 dBm to +18 dBm
	13 GHz to 24 GHz	–30 dBm to +10 dBm, typ. –40 dBm to +16 dBm
	R&S®ZVA40	
	10 MHz to 50 MHz	–30 dBm to +10 dBm [4], typ. –40 dBm to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 dBm to +18 dBm
	20 GHz to 32 GHz	–30 dBm to +10 dBm, typ. –40 dBm to +15 dBm
	32 GHz to 40 GHz	–30 dBm to +9 dBm, typ. –40 dBm to +12 dBm
	40 GHz to 43.5 GHz	typ. –40 dBm to +12 dBm
	R&S®ZVA50	
	10 MHz to 50 MHz	–30 dBm to +10 dBm, typ. –40 dBm to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 dBm to +18 dBm
	20 GHz to 35 GHz	–30 dBm to +12 dBm, typ. –40 dBm to +15 dBm
	35 GHz to 50 GHz	–30 dBm to +10 dBm, typ. –40 dBm to +12 dBm
	R&S®ZVA67	
	10 MHz to 50 MHz	–30 dBm to +10 dBm, typ. –40 dBm to +15 dBm
	50 MHz to 20 GHz	–30 dBm to +13 dBm, typ. –40 dBm to +18 dBm
	20 GHz to 32 GHz	–30 dBm to +10 dBm, typ. –40 dBm to +15 dBm
	32 GHz to 50 GHz	–30 dBm to +8 dBm, typ. –40 dBm to +12 dBm
	50 GHz to 60 GHz	–30 dBm to +5 dBm, typ. –40 dBm to +6 dBm
	60 GHz to 64 GHz	–30 dBm to +4 dBm, typ. –40 dBm to +6 dBm
	64 GHz to 67 GHz	–30 dBm to +2 dBm, typ. –40 dBm to +6 dBm
	67 GHz to 70 GHz	typ. –30 dBm to +2 dBm

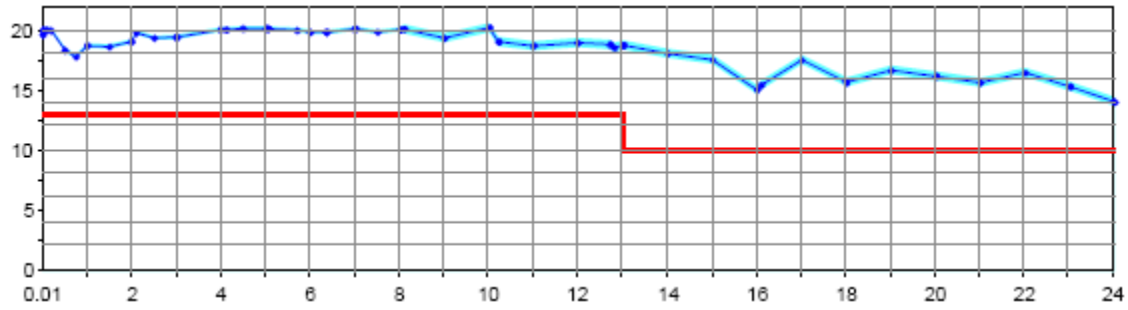
[3] R&S®ZVA24 with four ports, four sources: 10 MHz to 20 MHz: –30 dBm to +3 dBm.

[4] R&S®ZVA40 with four ports, four sources: 10 MHz to 20 MHz: –30 dBm to +5 dBm.

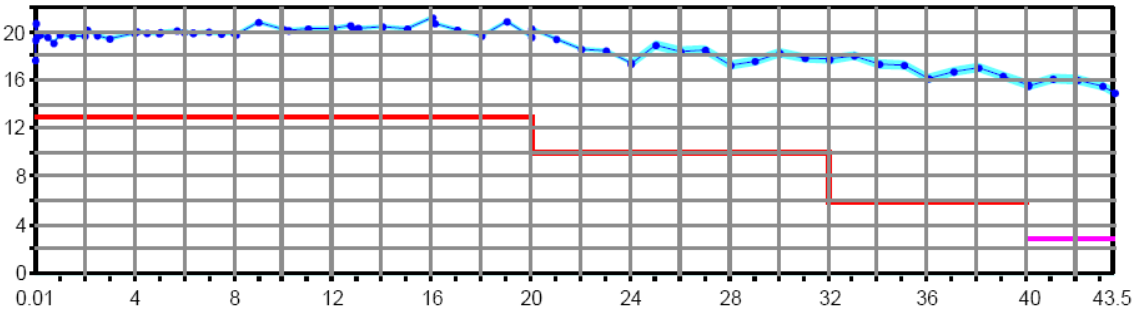
Power accuracy	referenced to –10 dBm, temperature range +18 °C to +28 °C, ALC on, without power calibration	
	R&S®ZVA8	
	10 MHz to 50 MHz	< 2 dB
	50 MHz to 8 GHz	< 0.8 dB, typ. 0.3 dB
	R&S®ZVA24	
	10 MHz to 50 MHz	< 3 dB
	500 MHz to 24 GHz	< 0.8 dB, typ. 0.3 dB
	R&S®ZVA40	
	10 MHz to 50 MHz	< 3 dB
	500 MHz to 24 GHz	< 0.8 dB, typ. 0.3 dB
	24 GHz to 40 GHz	< 2 dB, typ. 0.8 dB
	40 GHz to 43.5 GHz	typ. 0.8 dB
	R&S®ZVA50	
	10 MHz to 50 MHz	< 3 dB
	500 MHz to 24 GHz	< 0.8 dB, typ. 0.3 dB
	24 GHz to 50 GHz	< 2 dB, typ. 0.8 dB
	R&S®ZVA67	
	10 MHz to 50 MHz	< 3 dB
	500 MHz to 24 GHz	< 0.8 dB, typ. 0.3 dB
	24 GHz to 67 GHz	< 2 dB, typ. 1 dB
Power linearity	referenced to –10 dBm, temperature range +18 °C to +28 °C, with ALC on, without power calibration	
	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



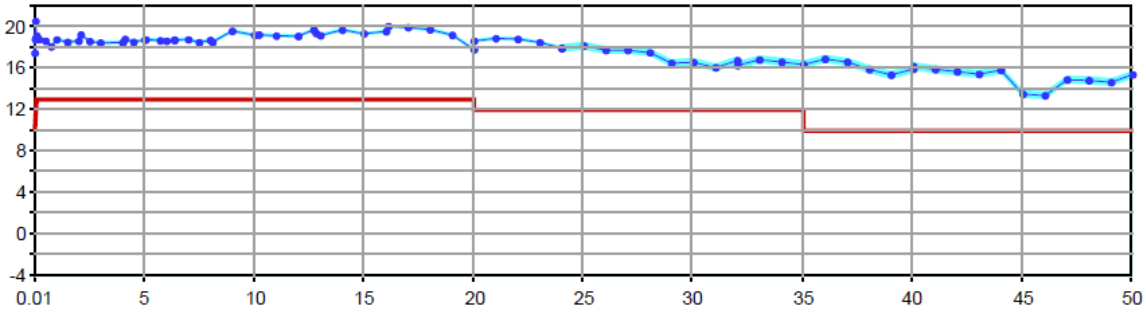
Maximum output power in dBm versus frequency in GHz of the R&S®ZVA8



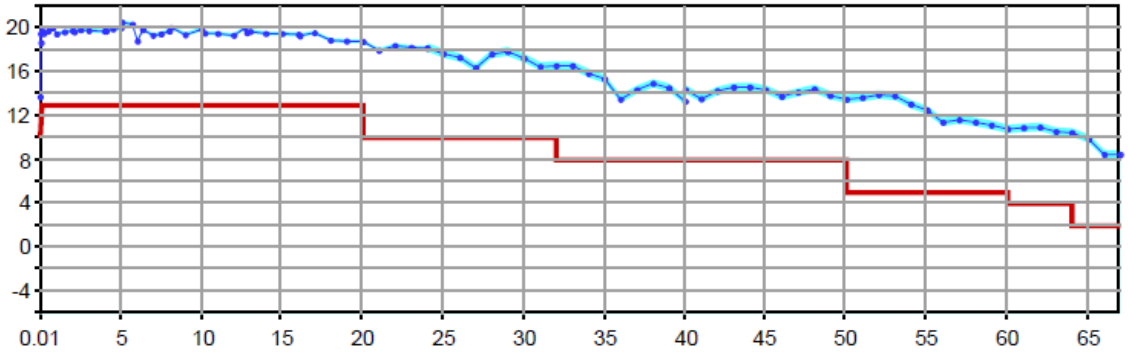
Maximum output power in dBm versus frequency in GHz of the R&S®ZVA24



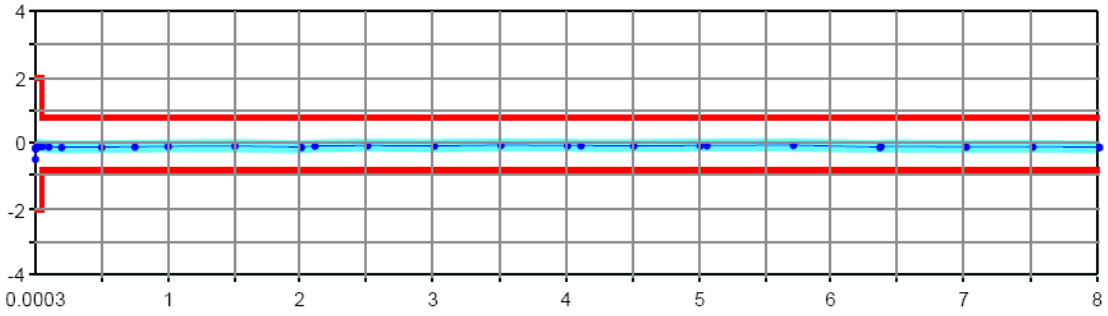
Maximum output power in dBm versus frequency in GHz of the R&S®ZVA40



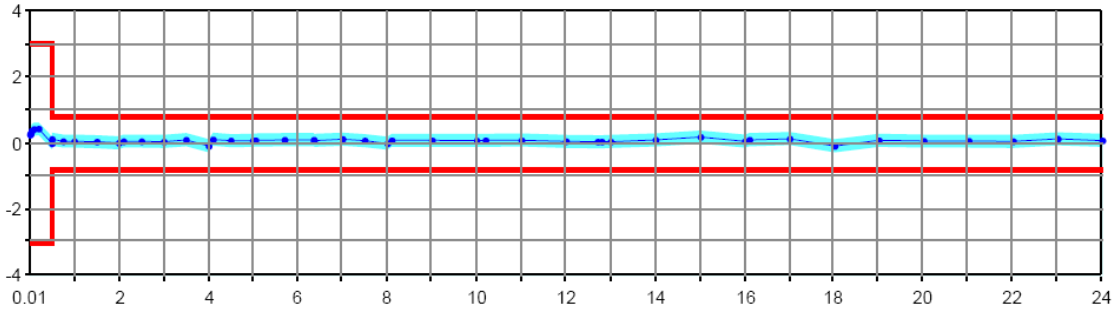
Maximum output power in dBm versus frequency in GHz of the R&S®ZVA50



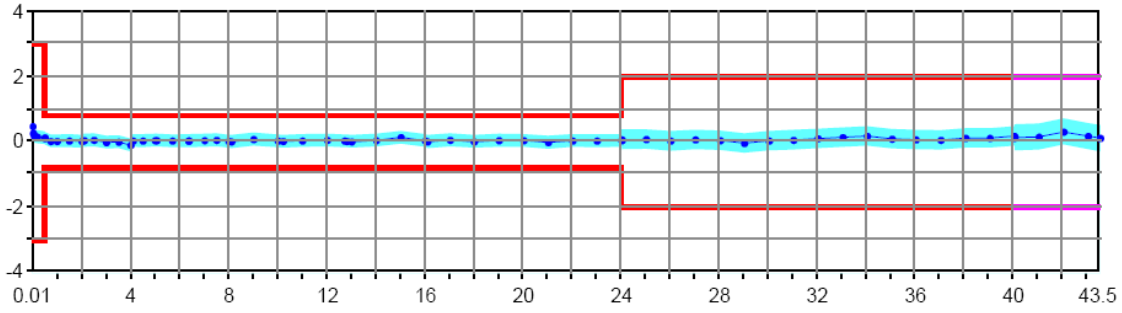
Maximum output power in dBm versus frequency in GHz of the R&S®ZVA67



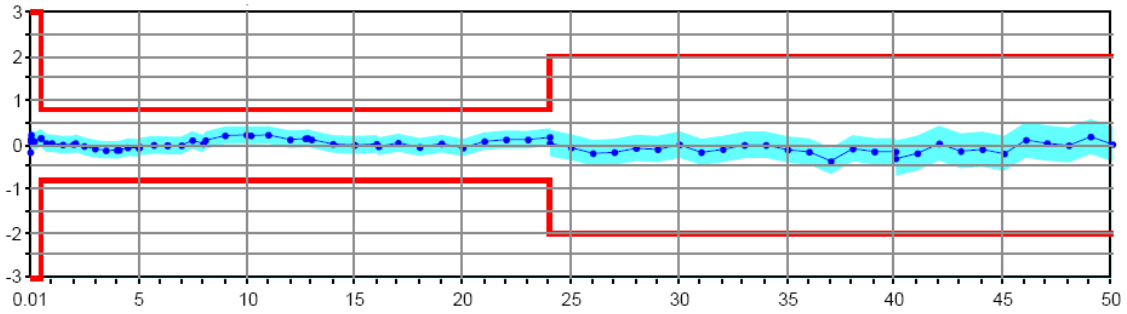
Output power accuracy in dB versus frequency in GHz of the R&S®ZVA8



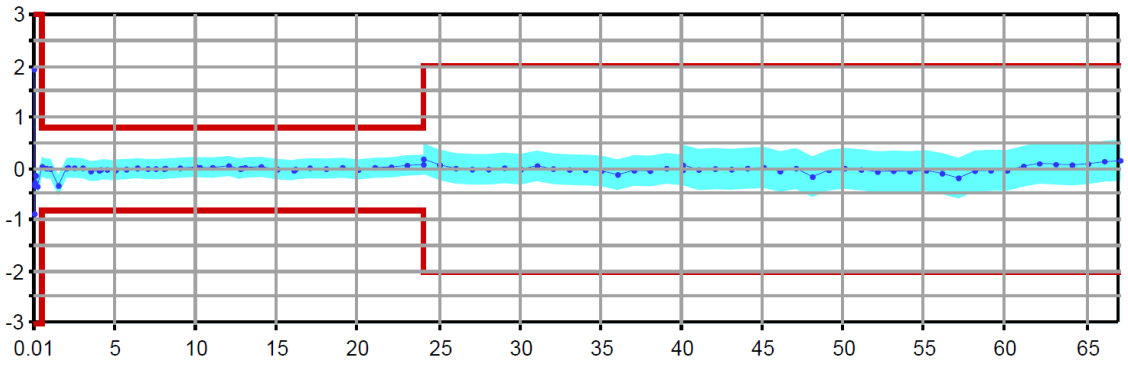
Output power accuracy in dB versus frequency in GHz of the R&S®ZVA24



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



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



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 50 MHz	< 2 dB
	50 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
	40 GHz to 43.5 GHz	typ. < 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	< –105 dBm
	32 GHz to 40 GHz	< –100 dBm
	40 GHz to 43.5 GHz	typ. < –100 dBm
	R&S®ZVA50	
	10 MHz to 100 MHz	typ. < –80 dBm
	100 MHz to 500 MHz	< –100 dBm
	500 MHz to 24 GHz	< –115 dBm
	24 GHz to 40 GHz	< –110 dBm
	40 GHz to 50 GHz	< –100 dBm
	R&S®ZVA67	
	10 MHz to 100 MHz	typ. < –80 dBm
	100 MHz to 500 MHz	< –105 dBm
	500 MHz to 2 GHz	< –110 dBm
	2 GHz to 24 GHz	< –118 dBm
	24 GHz to 40 GHz	< –105 dBm
	40 GHz to 50 GHz	< –102 dBm
	50 GHz to 67 GHz	< –100 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. For the R&S®ZVA24 and R&S®ZVA40 with four ports, four sources and the R&S®ZVA67 at single frequencies below 1.5 GHz, the noise level may be affected by spurious signals.		

Additional front panel connectors

USB	(two) universal serial bus connectors for connecting USB devices (USB 2.0); two additional USB connectors at the rear panel

Optional front panel connectors

SOURCE OUT	output of internal source signal
SOURCE IN	input for external source signal
REF OUT	output of internal reference signal
REF IN	input for external reference signal
MEAS OUT	output of internal measurement signal
MEAS IN	input for external measurement signal

Display

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

Rear panel connectors

IEC BUS	remote control in line with IEEE 488, IEC 60625; 24 pins

LAN 1	first local area network connector, 8 pins, 8P8C RJ-45 Western modular jack

LAN 2	second local area network connector, 8 pins, 8P8C RJ-45 Western modular jack

USB	(two) universal serial bus connectors for connecting USB devices (USB 2.0); two additional USB connectors at the front panel

10 MHz REF	alternatively input or output for external frequency reference signal	
Connector type		BNC, female
Input frequency		10 MHz
Maximum permissible deviation		1 kHz
Input power		–5 dBm to +10 dBm
Input impedance		50 Ω
Output frequency		10 MHz
Output frequency accuracy		80 Hz
Output power		–5 dBm to +10 dBm at 50 Ω

DC MEAS 1 V	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
Bandwidth		<100 kHz
Input impedance		> 10 kΩ
Damage voltage		30 V

DC MEAS 10 V	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
Bandwidth		<100 kHz
Input impedance		> 10 kΩ
Damage voltage		30 V

PORT BIAS	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

MONITOR	IBM-PC-compatible VGA monitor connector, 15-pin D-Sub (for external monitor)

CASCADE	output for pulse and sync LVDS signals from internal pulse generator, for connection to R&S®ZVAX CASCADE IN, 8P8C RJ-45 western modular jack

USER CONTROL	several control and trigger signals, 25-pin D-Sub, 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

EXT TRIGGER	trigger input for analyzer	
Connector type		BNC, female
TTL signal (edge-triggered)		3 V
Polarity (user-selectable)		positive or negative
Minimum pulse width		1 µs
Input impedance		> 10 kΩ

Options

Pulsed measurements (R&S®ZVA-K7, R&S®ZVA-B7)	enlarged memory for increased number of pulse samples	
Recording time	with R&S®ZVA-K7 only	≤ 3 ms
	with R&S®ZVA-K7 and R&S®ZVA-B7	≤ 24 ms
Measurement bandwidths	1/2/5 steps	1 Hz to 30 MHz

Universal control interface I/O port (R&S®ZVA-B14)	several control and trigger signals, 36-pin Centronics connector, 3.3 V TTL for controlling external devices, limit checks, sweep signals, etc.	
Agilent handler interface compatibility	type 3	
Input signals	pin 2, pin 18	3.3 V TTL, 5 V tolerant
Output signals	pin 3 to pin 17, pin 19 to pin 21, pin 30 to pin 34, pin 36	3.3 V TTL, 5 V tolerant
Input/output signals	pin 22 to pin 29	3.3 V TTL, 5 V tolerant
+5 V output	pin 35	+5 V, max. 100 mA
Response time of write strobe signal	pin 32	1 µs
Pulse width of write strobe signal	pin 32	1 µs
Pulse width of external trigger signal	pin 18	> 1 µs
Pulse width of sweep end signal	pin 34	> 10 µs

Direct generator/receiver access (R&S®ZVA-B16)	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. If all front panel jumper cables are directly connected between the outputs and inputs, the following vector network analyzer specifications 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

Generator step attenuators (R&S®ZVA-B2x)	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 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

Receiver step attenuators (R&S®ZVA-B3x)	These attenuators permit the input signal level 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

General data

Environmental conditions		
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
	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
Product conformity		
Electromagnetic compatibility		
Emission	in line with EN 55011 class A, operation in residential, commercial and business areas or in small-size companies is not covered; therefore the instrument may not be operated in residential, commercial and business areas or in small-size companies unless additional measures are taken to ensure that EN 55011 class B is complied with	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, making the instrument suitable for use in industrial environments
Immunity		in line with IEC/EN 61326-1, immunity for industrial environments (excluding operating frequency)
Electrical safety		in line with IEC 61010-1, EN 61010-1 and UL 3111-1
International safety approvals		VDE, GS, CSA, CSA-NRTL/C, CE conformity mark
Power rating		
Power supply		100 V to 240 V (AC) ± 10 %, 50 Hz to 60 Hz ± 5 %, in line with safety class I to VDE 411
Power consumption	R&S®ZVA8, R&S®ZVA24 (1 or 2 sources), R&S®ZVA40 (1 or 2 sources) and R&S®ZVA50	450 W, typ. 310 W (standby: typ. 10 W)
	R&S®ZVA24 (4 sources), R&S®ZVA40 (4 sources) and R&S®ZVA67	650 W, typ. 450 W (standby: typ. 10 W)
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, two ports	R&S®ZVA8	1145.1110.08
Vector network analyzer, 8 GHz, four ports	R&S®ZVA8	1145.1110.10
Vector network analyzer, 24 GHz, two ports	R&S®ZVA24	1145.1110.24
Vector network analyzer, 24 GHz, four ports, two sources	R&S®ZVA24	1145.1110.26
Vector network analyzer, 24 GHz, four ports, four sources	R&S®ZVA24	1145.1110.28
Upgrade vector network analyzer, 24 GHz, four ports, two sources to four sources	R&S®ZVA24-U5	1312.7710.28
Vector network analyzer, 40 GHz, two ports, 2.92 mm	R&S®ZVA40	1145.1110.40
Vector network analyzer, 40 GHz, four ports, 2.92 mm, two sources	R&S®ZVA40	1145.1110.42
Vector network analyzer, 40 GHz, four ports, 2.92 mm, four sources	R&S®ZVA40	1145.1110.48
Upgrade vector network analyzer, 40 GHz, four ports, two sources to four sources	R&S®ZVA40-U5	1312.7710.48
Vector network analyzer, 40 GHz, two ports, 2.4 mm	R&S®ZVA40	1145.1110.43
Vector network analyzer, 40 GHz, four ports, 2.4 mm	R&S®ZVA40	1145.1110.45
Vector network analyzer, 50 GHz, two ports	R&S®ZVA50	1145.1110.50
Vector network analyzer, 50 GHz, four ports	R&S®ZVA50	1145.1110.52
Vector network analyzer, 67 GHz, two ports, two sources	R&S®ZVA67	1305.7002.02
Vector network analyzer, 67 GHz, four ports, four sources	R&S®ZVA67	1305.7002.04
Options		
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 with two ports	R&S®ZVA67-B16	1164.0209.67
for the R&S®ZVA67 with four ports	R&S®ZVA67-B16	1164.0209.69
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
for the R&S®ZVA67 with four ports	R&S®ZVA67-B23	1305.7090.02
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
for the R&S®ZVA67 with four ports	R&S®ZVA67-B24	1305.7102.02

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
for the R&S®ZVA67 with four ports	R&S®ZVA67-B33	1305.7131.02
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
for the R&S®ZVA67 with four ports	R&S®ZVA67-B34	1305.7148.02
Oven-controlled crystal oscillator (OCXO)	R&S®ZVAB-B4	1164.1757.02
External attenuator control for R&S®ZVA-Z90E/-Z110E	R&S®ZVA-B8	1307.6026.02
Cable set for R&S®ZVA-K9 (using R&S®ZVA8)	R&S®ZVA-B9	1305.6541.02
Cable set for R&S®ZVA-K9 (using R&S®ZVA24 or R&S®ZVA40 with 2.92 mm)	R&S®ZVA-B9	1305.6541.03
Cable set for R&S®ZVA-K9 (using R&S®ZVA40 with 2.4 mm, R&S®ZVA50 or R&S®ZVA67)	R&S®ZVA-B9	1305.6541.04
Universal control interface I/O port	R&S®ZVAB-B14	1305.6306.02
Removable hard disc (for R&S®FMR7/3, R&S®FMR7/6, R&S®FMR9, R&S®FMR11)	R&S®ZVAB-B18	1164.0715.04
Additional removable SSD, 500 Gbyte (for R&S®FMR11, Windows 10)	R&S®ZVAB-B19	1164.1111.07
Upgrade to Windows 10 IoT Enterprise LTSC 2019		
for R&S®ZVA with R&S®FMR6	R&S®ZVA-U1110	1312.7856.03
for R&S®ZVT with R&S®FMR6	R&S®ZVA-U1110	1312.7856.04
for R&S®ZVA/R&S®ZVT with R&S®FMR7/3, R&S®FMR7/6	R&S®ZVA-U1110	1312.7856.05
for R&S®ZVA/R&S®ZVT with R&S®FMR9	R&S®ZVA-U1110	1312.7856.06
for R&S®ZVA/R&S®ZVT with R&S®FMR11	R&S®ZVA-U1110	1312.7856.02
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	1311.3134.02
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 two-port models	R&S®ZVA-B7	1164.1492.02
Pulsed measurements with increased recording time for four-port models	R&S®ZVA-B7	1164.1492.03
Converter control software	R&S®ZVA-K8	1307.7022.02
Mixer delay without LO access	R&S®ZVA-K9	1311.3128.02
Long distance mixer delay	R&S®ZVA-K10	1164.1805.02
5 MHz receiver bandwidth	R&S®ZVA-K17	1164.1070.02
Internal pulse generators	R&S®ZVA-K27	1164.1892.02
Noise figure measurements	R&S®ZVA-K30	1164.1828.02
Frequency converting noise figure measurements	R&S®ZVA-K31	1317.8938.02

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 with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
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 a term of one to four years (WE1 to WE2)
Repairs carried out during the contract term are free of charge [5]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW2)
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 [5] 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 AW2)
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 [5] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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

Service that adds value

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

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

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

Certified Quality Management
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ISO 14001

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