



Version
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Vector Network Analyzer R&S® ZVT 8

Specifications



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Specifications apply under the following conditions:

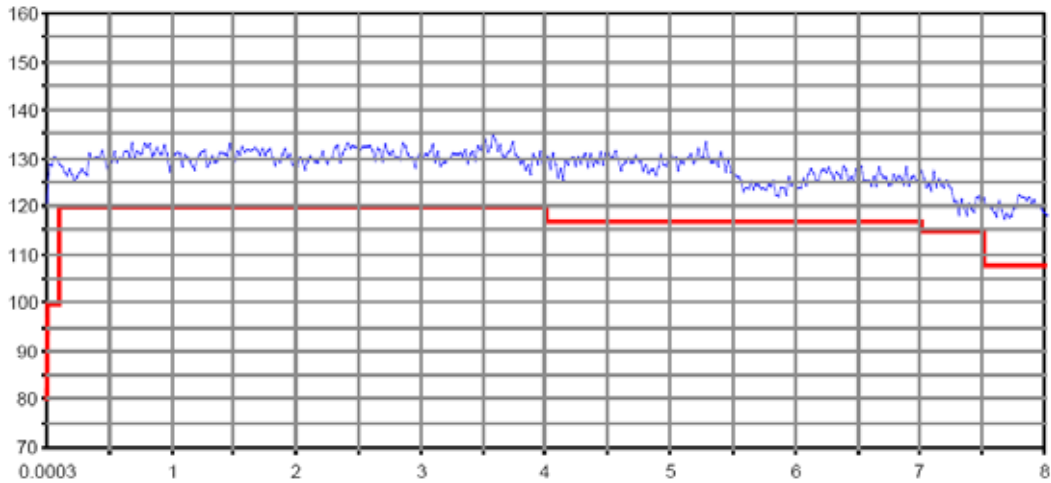
90 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal adjustments performed. Data designated "overrange" and data without tolerance limits is not binding. Unless stated otherwise, specifications apply to test ports and a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

Measurement range

Impedance		50 Ω
Test port connector		N, female
Number of test ports	without Additional PORT option with Additional PORT options	2 3, 4, 5, 6, 7, or 8
Frequency range		300 kHz to 8 GHz
Static frequency accuracy	without optional oven quartz with optional oven quartz	8×10^{-6} 1×10^{-7}
Frequency resolution		1 Hz
Number of measurement points	per trace	2 to 20001
Measurement bandwidths	1/2/5 steps	1 Hz to 1 MHz
Dynamic range	from PORT 1 to any other PORT 300 kHz to 5 MHz 5 MHz to 100 MHz 100 MHz to 4 GHz 4 GHz to 7 GHz 7 GHz to 7.5 GHz 7.5 GHz to 8 GHz	>80 dB, typ. 100 dB >100 dB, typ. 120 dB >120 dB, typ. 130 dB >117 dB, typ. 127 dB >115 dB, typ. 120 dB >108 dB, typ. 118 dB

The dynamic range is defined as the difference between the maximum source power and the rms value of the data trace of the transmission magnitude produced by noise and crosstalk with 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.

Dynamic range in dB versus frequency in GHz of the R&S ZVT8



Measurement speed

Measurement time	for 201 measurement points, with span 100 MHz, 500 kHz measurement bandwidth, ALC and display switched off with center frequency 1.1 GHz with center frequency 5.1 GHz	<6 ms <4.5 ms
Measurement time per point	CW mode, 1 MHz measurement bandwidth	<3.5 μ s
Data transfer time	for 201 measurement points via IEC/IEEE bus via VX11 over 100 Mbit/s LAN via RSIB over 100 Mbit/s LAN	<2.9 ms <1.3 ms <0.7 ms
Time for measurement and data transfer	for 201 measurement points, with start frequency 1 GHz, stop frequency 1.1 GHz, 500 kHz measurement bandwidth, and display switched off (No additional time for data transfer is needed, as it is performed simultaneously during the measurement.)	<6 ms
Switching time between channels	with not more than 2001 points	<1 ms
Switching time between two preloaded instrument settings	with not more than 2001 points	<10 ms

Sweep times of the R&S ZVT8

Number of measurement points	51	101	201	401	801	1601
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Start frequency 5 GHz, stop frequency 5.2 GHz, ALC off, and measurement bandwidth 100 kHz						
with full one-port calibration or with correction switched off	2.4 ms	3.9 ms	6.3 ms	11 ms	20.4 ms	40.2 ms
with TOSM calibration	4.7 ms	8.6 ms	16.4 ms	32.4 ms	65 ms	170 ms

Start frequency 6 GHz, stop frequency 8 GHz, ALC off, and measurement bandwidth 100 kHz						
with full one-port calibration or with correction switched off	3.4 ms	6.2 ms	11 ms	17.3 ms	28.2 ms	49 ms
with TOSM calibration	5.3 ms	9.8 ms	18 ms	33 ms	63 ms	160 ms

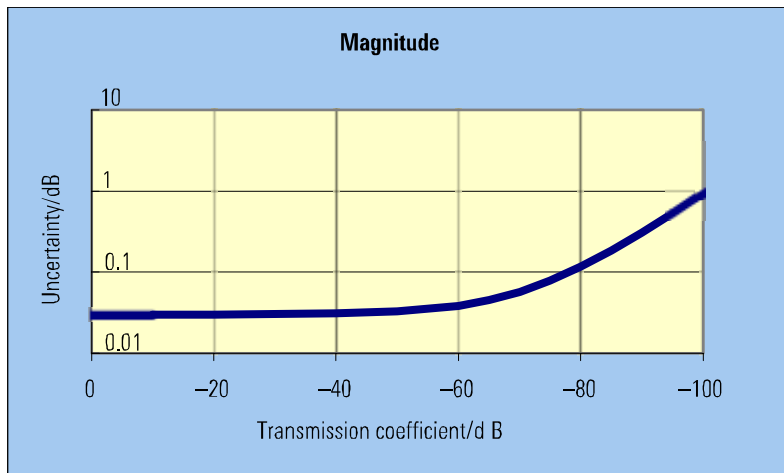
Start frequency 10 MHz, stop frequency 8 GHz, ALC off, and measurement bandwidth 100 kHz						
with full one-port calibration or with correction switched off	8.4 ms	12.6 ms	19.5 ms	30.5 ms	53.2 ms	88.2 ms
with TOSM calibration	10.3 ms	16.6 ms	28 ms	47 ms	81 ms	190 ms

Measurement accuracy

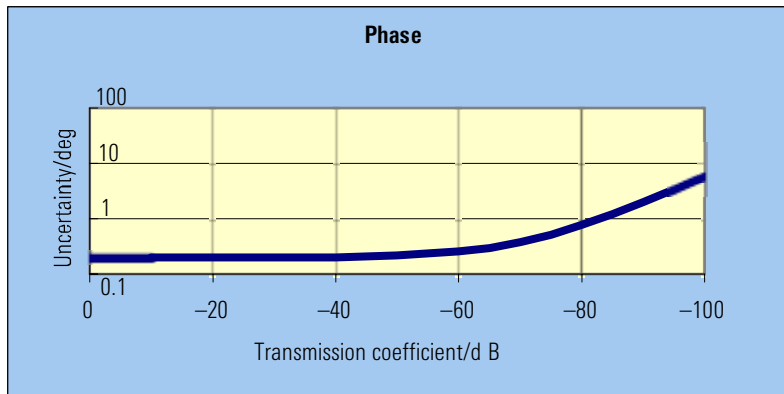
This data applies to temperatures between 18 °C and 28 °C, provided the temperature has not varied by more than 1 K after calibration. The specified data depends on the use of a suitable calibration kit by which the effective system data specified below is achieved. Frequency points have to be identical for measurement and calibration (no interpolation allowed).

Accuracy of transmission measurements		
300 kHz to 50 MHz	for +15 dB to -30 dB for -30 dB to -45 dB	<0.2 dB or <2° <1 dB or <6°
50 MHz to 8 GHz	for +15 dB to +5 dB for +5 dB to -55 dB for -55 dB to -70 dB for -70 dB to -85 dB	<0.2 dB or <2° <0.1 dB or <1° <0.2 dB or <2° <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.		

Typical accuracy of transmission magnitude measurements

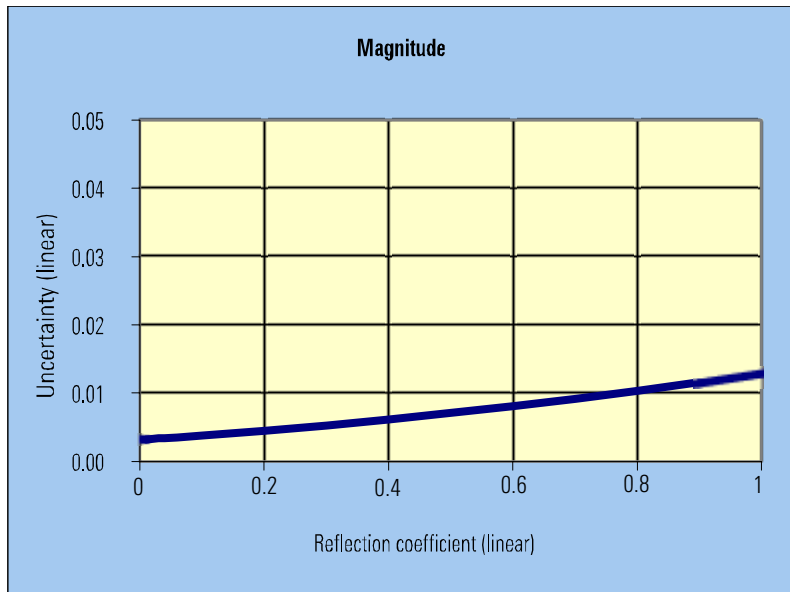


Typical accuracy of transmission phase measurements

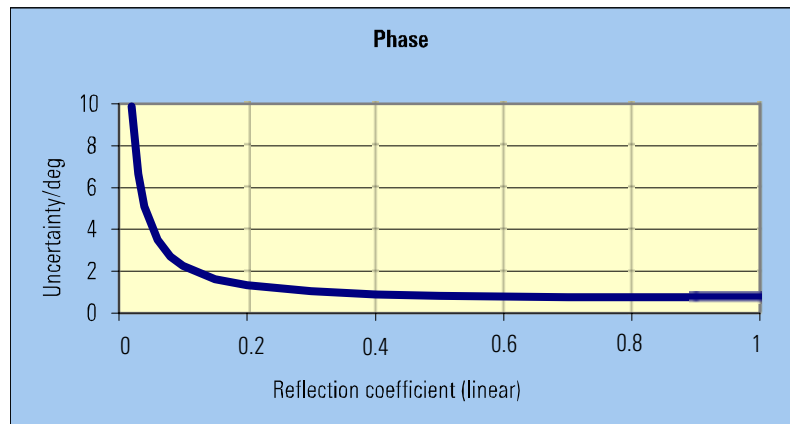


Accuracy of reflection measurements		
300 kHz to 8 GHz	for +10 dB to +3 dB for +3 dB to -15 dB for -15 dB to -25 dB for -25 dB to -35 dB	<0.6 dB or <4° <0.4 dB or <3° <1 dB or <6° <3 dB or <20°
Specifications are based on an isolating DUT, a measurement bandwidth of 10 Hz, and a nominal source power of -10 dBm.		

Typical accuracy of reflection magnitude measurements



Typical accuracy of reflection phase measurements



Trace stability		
Trace noise of S11 (rms) 300 kHz to 8 GHz	at 0 dBm source power and 0 dB reflection and 1 kHz measurement bandwidth	<0.004 dB, typ. 0.001 dB
Temperature dependence	at 0 dB transmission or reflection	<0.05 dB/K or <0.4°/K

Effective system data

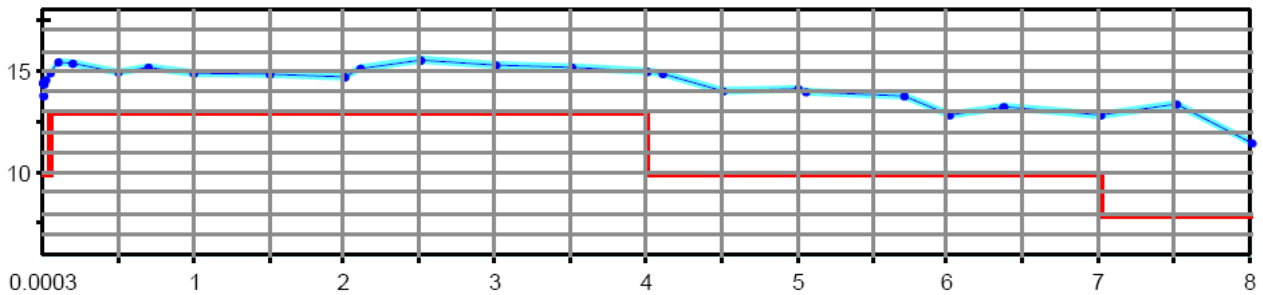
This data applies to temperatures between 18 °C and 28 °C, provided the temperature has not varied by more than 1 K after calibration. The data is based on a measurement bandwidth of 10 Hz and system error calibration by means of a suitable calibration kit.

Directivity	300 kHz to 4 GHz 4 GHz to 8 GHz	>46 dB, typ. 50 dB >40 dB, typ. 50 dB
Source match	300 kHz to 4 GHz 4 GHz to 8 GHz	>40 dB, typ. 46 dB >36 dB, typ. 40 dB
Reflection tracking	300 kHz to 4 GHz 4 GHz to 8 GHz	<0.04 dB, typ. 0.01 dB <0.1 dB, typ. 0.01 dB
Load match	300 kHz to 4 GHz 4 GHz to 8 GHz	>46 dB, typ. 50 dB >40 dB, typ. 46 dB
Transmission tracking	300 kHz to 4 GHz 4 GHz to 8 GHz	<0.06 dB, typ. 0.01 dB <0.2 dB, typ. 0.05 dB

Test port output

Power range	300 kHz to 50 MHz 50 MHz to 4 GHz 4 GHz to 7 GHz 7 GHz to 8 GHz	-40 dBm to +10 dBm, typ. -45 dBm to +14 dBm -40 dBm to +13 dBm, typ. -45 dBm to +15 dBm -40 dBm to +10 dBm, typ. -45 dBm to +13 dBm -40 dBm to +8 dBm, typ. -45 dBm to +12 dBm
Power accuracy	at -10 dBm without power calibration in temperature range 18 °C to 28 °C 50 MHz to 8 GHz	<2 dB <0.8 dB, typ. 0.3 dB
Power linearity	referenced to -10 dBm in temperature range 18 °C to 28 °C above 50 MHz	<2 dB <0.8 dB, typ. 0.2 dB
Power resolution		0.01 dB
Harmonics	50 MHz to 8 GHz at +8 dBm	<-20 dBc, typ. <-30 dBc

Maximum output power in dBm versus frequency in GHz of the R&S ZVT8



Test port input

Match	without system error correction 300 kHz to 7 GHz 7 GHz to 8 GHz	>16 dB >14 dB
Maximum nominal input level		+13 dBm
Power measurement accuracy	at -10 dBm without power calibration in temperature range 18 °C to 28 °C 10 MHz to 8 GHz	1 dB
Receiver linearity	referenced to -10 dBm in temperature range 18 °C to 28 °C for +20 dB to -60 dB 50 MHz to 6 GHz 6 GHz to 8 GHz	0.1 dB 0.2 dB
Damage level		+27 dBm
Damage DC voltage		30 V
Noise level	at 10 Hz measurement bandwidth 300 kHz to 100 MHz 100 MHz to 4 GHz 4 GHz to 8 GHz	<-70 dBm <-110 dBm <-105 dBm
The noise level is defined as the rms value of the indicated noise floor.		

Additional front-panel connectors

USB	(two) USB connectors for USB devices (USB 1.1); two additional USB connectors at the rear panel
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Rear-panel connectors

IEC BUS	remote control in accordance with IEEE488, IEC60625; 24 pins
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LAN 1	first LAN connector, 8 pins, RJ-45
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LAN 2	second LAN connector, 8 pins, RJ-45
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USB	(two) USB connectors for USB devices (USB 1.1); two additional USB connectors at the front panel
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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		0 dBm ± 3 dB
Input impedance		50 Ω
Output frequency		10 MHz
Output frequency accuracy		80 Hz
Output power		-3 dBm ± 8 dB 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
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
Input impedance		>10 k Ω
Damage voltage		30 V

PORT BIAS 1 to PORT BIAS 8	DC bias input for PORT 1 to PORT 8	
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)	
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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 (selectable)		positive or negative
Minimum pulse width		1 μ s
Input impedance		>10 k Ω

General specifications

Temperature loading	operating temperature range storage temperature range	5 °C to 40 °C –40 °C to +70 °C meets IEC 60068-2-1 and IEC 60068-2-2
Damp heat		40 °C at 95 % rel. humidity, meets IEC 60068-2-30
Mechanical resistance	vibration, sinusoidal	5 Hz to 150 Hz meets IEC 60068-2-6
	vibration, random	10 Hz to 300 Hz, meets IEC 60068-2-64
	shock	40 g shock spectrum, meets IEC 60068-2-27, MIL-STD-810
Calibration interval		1 year
EMC, RF emission		meets CISPR 11/EN 55011 group 1 class B for a shielded test setup
EMC, other emissions and immunity		meets IEC/EN 61326; emission: class B; immunity: industrial environment (excluding operating frequency)
Safety		meets IEC 61010-1, EN61010-1, and UL 61010B-1, CSA C22.2 No. 1010.1
Power supply		100 V to 240 V (AC) \pm 10 %, 50 Hz to 60 Hz \pm 5 %, protection class I to VDE 411
Power consumption		650 W, typ. 420 W (standby: typ. 15 W)
Certification mark		VDE, GS, c CSA us
Dimensions (W x H x D)		465.1 mm x 286.2 mm x 495.0 mm
Weight		26 kg

Ordering information

Designation	Type	Order No.
Vector Network Analyzer, 8 GHz, 2 ports	R&S ZVT8	1300.0000.08
Options		
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
Direct Gen/Rec Access for PORT 1	R&S ZVT8-B16	1300.1706.11
Direct Gen/Rec Access for PORT 2	R&S ZVT8-B16	1300.1706.12
Direct Gen/Rec Access for PORT 3 ¹	R&S ZVT8-B16	1300.1706.13
Direct Gen/Rec Access for PORT 4 ¹	R&S ZVT8-B16	1300.1706.14
Direct Gen/Rec Access for PORT 5 ¹	R&S ZVT8-B16	1300.1706.15
Direct Gen/Rec Access for PORT 6 ¹	R&S ZVT8-B16	1300.1706.16
Direct Gen/Rec Access for PORT 7 ¹	R&S ZVT8-B16	1300.1706.17
Direct Gen/Rec Access for PORT 8 ¹	R&S ZVT8-B16	1300.1706.18
Additional PORT 3	R&S ZVT8-B63	1300.1506.03
Additional PORT 4 ²	R&S ZVT8-B64	1300.1506.04
Additional PORT 5 ²	R&S ZVT8-B65	1300.1506.05
Additional PORT 6 ²	R&S ZVT8-B66	1300.1506.06
Additional PORT 7 ²	R&S ZVT8-B67	1300.1506.07
Additional PORT 8 ²	R&S ZVT8-B68	1300.1506.08

¹ Requires Additional PORT companion option.

² Requires all Additional PORT options with lower port numbers.

For product brochure, see PD 0758.0651.12
and www.rohde-schwarz.com
(search term: ZVT8)



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