

1-Port USB VNA - R180

Extended Specifications



- **Patent US 9,291,657** - No test cable needed
- **Frequency range:** 1 MHz - 18 GHz
- **Measurement time per point:** 100 min typ.
- **Automation programming** in LabView, Python, MATLAB, .NET, etc.
- Up to **100,001 measurement points**
- **Time domain and gating** included standard

EXTEND YOUR REACH™

Specifications¹

Measurement Range

Impedance	50 Ohm
Test port connector	
R180-01 *	type N, female
R180-02	type N, male
R180-11 *	3.5 mm, female
R180-12 *	3.5 mm, male
Number of test ports	1
Options **	IP54
Cooling	active
Frequency range	1 MHz to 18 GHz
Full frequency accuracy	$\pm 2.5 \cdot 10^{-6}$
Frequency resolution	50 Hz
Number of measurement points	2 to 100,001
Measurement bandwidths (with 1/3 steps)	10 Hz to 100 kHz
Cable loss measurement range	35 dB
Dynamic range ²	
1 MHz to 6 GHz	110 dB typ.
6 GHz to 18 GHz	94 dB typ.

Measurement Accuracy³

Accuracy of reflection measurements ⁴	Magnitude / Phase
-15 dB to 0 dB	± 0.5 dB / $\pm 5^\circ$
-25 dB to -15 dB	± 1.5 dB / $\pm 10^\circ$
-35 dB to -25 dB	± 5.5 dB / $\pm 30^\circ$
Accuracy of transmission magnitude measurements ⁵	Magnitude
1 MHz to 6 GHz	
-50 dB to 0 dB	± 1 dB
6 GHz to 18 GHz	
-40 dB to 0 dB	± 1 dB
Trace noise magnitude ⁶	0.010 dB rms
Temperature dependence	0.020 dB/°C

Effective System Data

1 MHz to 18 GHz	
Directivity	42 dB
Source match	35 dB
Reflection tracking	± 0.10 dB

*Special Order

**Must be specified at time of order. R180 models cannot be retrofitted to have the IP54 option.

[1] All specifications subject to change without notice. [2] Measurement of |S₂₁| and |S₁₂| using two reflectometers, both being connected to the same USB hub, applies over the temperature range of (23 ± 5) °C after 30 minutes of warming-up, with less than 1 °C deviation from the calibration temperature at output power 0 dBm and IF bandwidth 100 Hz. [3] Reflection and transmission measurement accuracy applies over the temperature range of (73 ± 9) °F or (23 ± 5) °C after 30 minutes of warming-up, with less than 1 °C deviation from calibration temperature, at 0 dBm output power and IF BW 100 Hz. Frequency points have to be identical for measurement and calibration (no interpolation allowed). [4] Reflection specifications are based on an isolating DUT. [5] Transmission specifications are based on a matched DUT. Measurement of |S₂₁| and |S₁₂| using two devices, both being connected to the same USB hub. [6] IF bandwidth 3 kHz. © Copper Mountain Technologies - www.coppermountaintech.com - Rev. 2019Q1

Specifications¹

Uncorrected System Performance

1 MHz to 18 GHz	
Directivity	10 dB (15 dB typ.)
Source match	10 dB (15 dB typ.)

Test Port

Power range	-15 dBm to 0 dBm
Power resolution	0.05 dB typ.
Power accuracy	±1.5 dB typ.
Interference immunity	+17 dBm
Damage level	+23 dBm
Damage DC voltage	50 V

Measurement Speed

Time per point	100 µs typ.
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Frequency Reference Input

Port	Ref 10 MHz/TRIG OUT
External reference frequency	10 MHz
Input level	0 dBm to 4 dBm
Input impedance	50 Ohm
Connector type	SMA, female

Frequency Reference Output

Port	Ref 10 MHz/TRIG OUT
Internal reference frequency	10 MHz
Output reference signal level at 50 Ohm impedance	-1 dBm to 5 dBm
Connector type	SMA, female

Trigger Input

Port	TRIG IN / OUT
External trigger source	3.3 V CMOS, TTL compatible
Pulse width	≥1 µs
Polarity	positive or negative
Input impedance	≥10 kOhm
Connector type	SMA, female

Specifications¹

Trigger Output

Port	TRIG IN / OUT
Max output current	20 mA
Trigger output	3.3 V CMOS, TTL compatible
Polarity	positive or negative
Connector type	SMA, female

System & Power

Operating system	Windows 7 and above
CPU frequency	1.0 GHz
RAM	2 GB
Interface	USB 2.0
Connector type	USB type C, female
External power supply	5 VDC \pm 5%
External power connector type	PJ-075DH-SMT (Plug 1.35 x 3.5 mm)
Power consumption	8 W

Calibration

Recommended factory adjustment interval	3 Years
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Dimensions

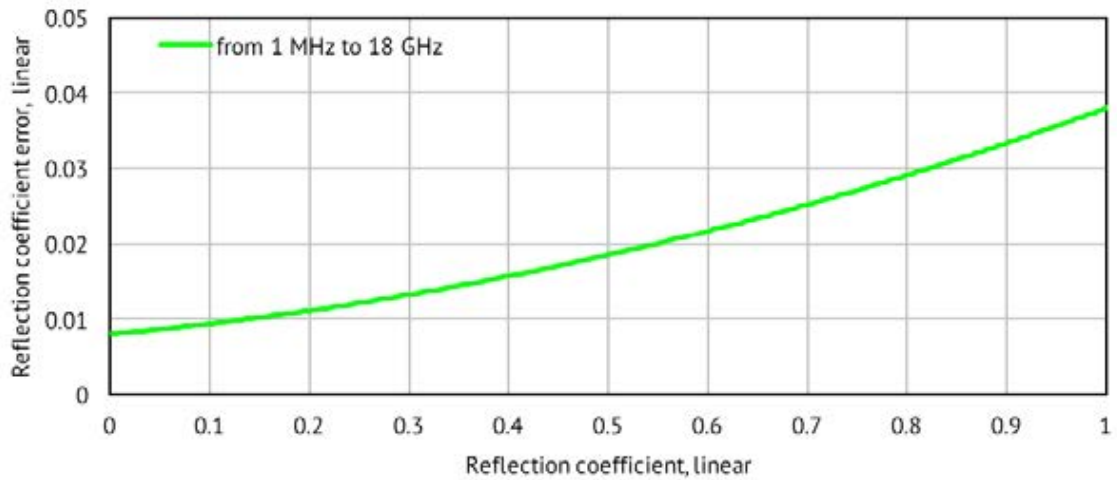
Weight	0.5 kg (17.6 oz)
R180-01	
Length	128 mm
Width	96 mm
Height	36 mm
R180-02	
Length	126 mm
Width	96 mm
Height	36 mm
R180-11, R180-12	
Length	121 mm
Width	96 mm
Height	36 mm

Environmental Specifications

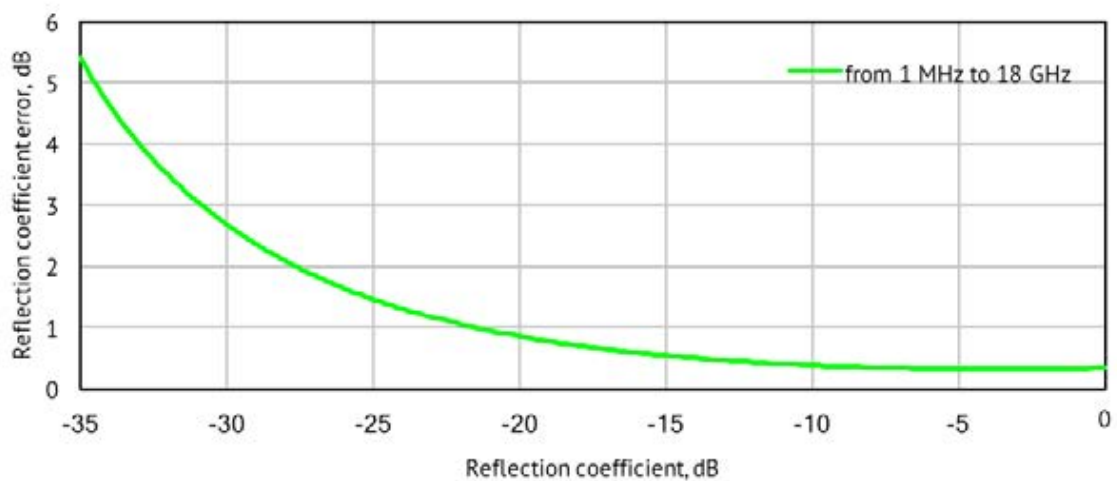
Operating temperature	+5 °C to +40 °C (41 °F to 104 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to 158 °F)
Humidity	90 % at 25 °C (77 °F)
Atmospheric pressure	70.0 kPa to 106.7 kPa

Reflection Accuracy Plots

Reflection Magnitude Errors



Specifications are based on isolating DUT ($S_{21} = S_{12} = 0$)



Specifications are based on isolating DUT ($S_{21} = S_{12} = 0$)

