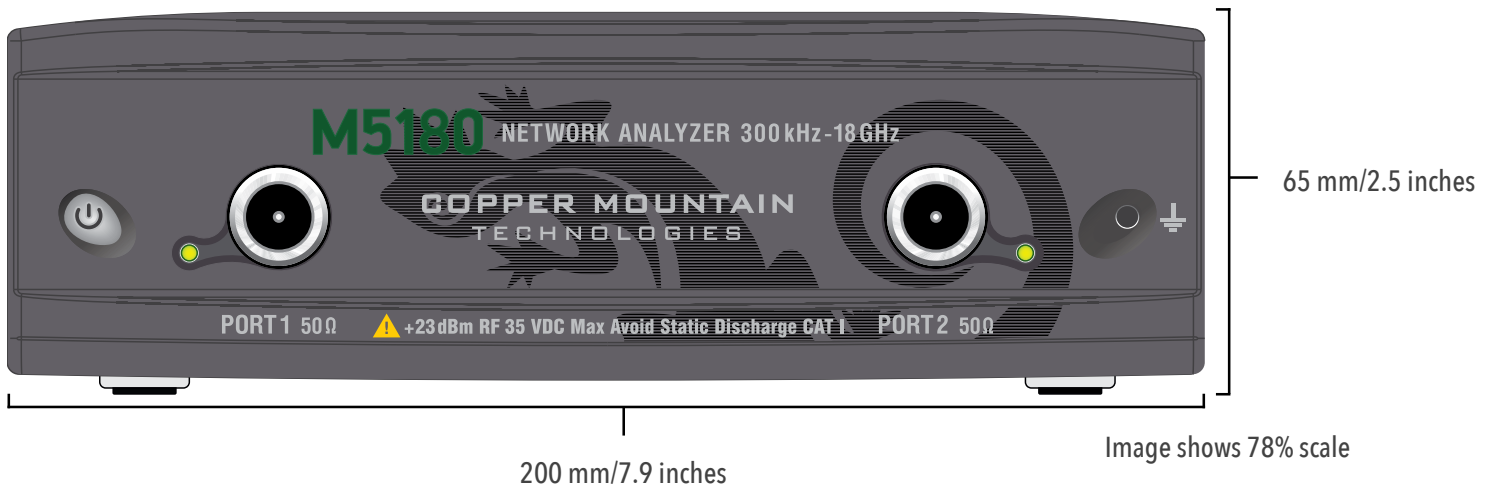


M5180 Specifications¹



Primary Specifications

Impedance	50 Ohm
Test port connector	type N, female
Number of test ports	2
Frequency range	300 kHz to 18 GHz
Full frequency accuracy	$\pm 5 \cdot 10^{-6}$
Frequency resolution	1 Hz
Number of measurement points	2 to 200,001
Measurement bandwidths (with 1/1.5/2/3/5/7 steps)	1 Hz to 300 kHz
Dynamic range ²	
300 kHz to 10 MHz	115 dB
10 MHz to 7 GHz	130 dB (135 dB typ.)
7 GHz to 12 GHz	125 dB (130 dB typ.)
12 GHz to 16 GHz	122 dB (125 dB typ.)
16 GHz to 18 GHz	116 dB (120 dB typ.)
Crosstalk ^{2a}	
300 kHz to 5 GHz	-
5 GHz to 7.5 GHz	-120 dB typ.
7.5 GHz to 8.5 GHz	-110 dB typ.
8.5 GHz to 15 GHz	-120 dB typ.
15 GHz to 18 GHz	-100 dB typ.

Effective System Data

300 kHz to 10 GHz	
Directivity	46 dB
Source match	40 dB
Load match	46 dB
Reflection tracking	± 0.10 dB
Transmission tracking	± 0.08 dB
10 GHz to 18 GHz	
Directivity	42 dB
Source match	38 dB
Load match	42 dB
Reflection tracking	± 0.10 dB
Transmission tracking	± 0.08 dB

Measurement Accuracy

Accuracy of transmission measurements ⁴	Magnitude / Phase
300 kHz to 10 MHz	
0 dB to +10 dB	± 0.2 dB / $\pm 2^\circ$
-35 dB to 0 dB	± 0.1 dB / $\pm 1^\circ$
-55 dB to -35 dB	± 0.2 dB / $\pm 2^\circ$
-75 dB to -55 dB	± 1.0 dB / $\pm 6^\circ$
10 MHz to 7 GHz	
0 dB to +10 dB	± 0.2 dB / $\pm 2^\circ$
-50 dB to 0 dB	± 0.1 dB / $\pm 1^\circ$
-70 dB to -50 dB	± 0.2 dB / $\pm 2^\circ$
-90 dB to -70 dB	± 1.0 dB / $\pm 6^\circ$
7 GHz to 16 GHz	
0 dB to +10 dB	± 0.2 dB / $\pm 2^\circ$
-45 dB to 0 dB	± 0.1 dB / $\pm 1^\circ$
-65 dB to -45 dB	± 0.2 dB / $\pm 2^\circ$
-85 dB to -65 dB	± 1.0 dB / $\pm 6^\circ$
16 GHz to 18 GHz	
0 dB to +5 dB	± 0.2 dB / $\pm 2^\circ$
-40 dB to 0 dB	± 0.1 dB / $\pm 1^\circ$
-60 dB to -40 dB	± 0.2 dB / $\pm 2^\circ$
-80 dB to -60 dB	± 1.0 dB / $\pm 6^\circ$
Accuracy of reflection measurements ⁵	Magnitude / Phase
300 kHz to 10 GHz	
-15 dB to 0 dB	± 0.4 dB / $\pm 3^\circ$
-25 dB to -15 dB	± 1.0 dB / $\pm 6^\circ$
-35 dB to -25 dB	± 3.0 dB / $\pm 20^\circ$
10 GHz to 18.0 GHz	
-15 dB to 0 dB	± 0.5 dB / $\pm 4^\circ$
-25 dB to -15 dB	± 1.5 dB / $\pm 10^\circ$
-35 dB to -25 dB	± 5.5 dB / $\pm 30^\circ$
Trace noise magnitude (IF bandwidth 3 kHz)	
300 kHz to 9 GHz	0.002 dB rms
9 GHz to 18 GHz	0.004 dB rms
Temperature dependence	
300 kHz to 7 GHz	0.02 dB/°C
7 GHz to 18 GHz	0.04 dB/°C

[1] All specifications subject to change without notice. [2] The dynamic range is defined as the difference between the specified maximum power level and the specified noise floor. The specification applies at 10 Hz IF bandwidth. [2a] Uncorrected crosstalk is defined at maximum specified output power level. Dynamic range of the analyzer may be limited on the lower end by either crosstalk or noise floor. [3] Reflection and transmission measurement accuracy applies over the temperature range of (73 ± 9) °F or (23 ± 5) °C after 40 minutes of warming-up, with less than 1 °C deviation from the full two-port calibration temperature, at output power of 0 dBm. Frequency points have to be identical for measurement and calibration (no interpolation allowed). [4] Transmission specifications are based on a matched DUT, and IF bandwidth of 10 Hz. [5] Reflection specifications are based on an isolating DUT. [6] Specification applies over entire frequency range, at output power of 0 dBm. © Copper Mountain Technologies - www.coppermountaintech.com - Rev. 2019Q1

Uncorrected System Performance

300 kHz to 7 GHz	
Directivity	15 dB
Source match	12 dB
Load match	15 dB
7 GHz to 14 GHz	
Directivity	10 dB
Source match	10 dB
Load match	12 dB
14 GHz to 16 GHz	
Directivity	8 dB
Source match	10 dB
Load match	12 dB
16 GHz to 18 GHz	
Directivity	6 dB
Source match	10 dB
Load match	12 dB

Test Port Output

Power range	
300 kHz to 16 GHz	-40 dBm to +10 dBm
16 GHz to 18 GHz	-40 dBm to +6 dBm
Power accuracy	
	±1.5 dB
Power resolution	
	0.05 dB
Harmonic distortion ⁶	
	-15 dBc
Non-harmonic spurious ⁶	
300 kHz to 16 GHz	-20 dBc
16 GHz to 18 GHz	-15 dBc

Test Port Input

Noise floor	
300 kHz to 10 MHz	-115 dBm/Hz
10 MHz to 7 GHz	-130 dBm/Hz (135 dBm/Hz typ.)
7 GHz to 12 GHz	-125 dBm/Hz (130 dBm/Hz typ.)
12 GHz to 16 GHz	-122 dBm/Hz (127 dBm/Hz typ.)
16 GHz to 18 GHz	-120 dBm/Hz (125 dBm/Hz typ.)
Damage level	
	+23 dBm
Damage DC voltage	
	35 V

Measurement Speed

Time per point	30 μs typ.
Port switchover time	0.2 ms

Frequency Reference Input

Port	10 MHz Ref In/Out
External reference frequency	10 MHz
Input level	-1 dBm to 5 dBm
Input impedance	50 Ohm
Connector type	BNC, female

Frequency Reference Output

Port	10 MHz Ref In/Out
Internal reference frequency	10 MHz
Output reference signal level at 50 Ohm impedance	1 dBm to 5 dBm
Connector type	BNC, female

Frequency Trigger Input

Port	Ext Trig In
Input level	
Low threshold voltage	0.5 V
High threshold voltage	2.7 V
Input level range	
	0 V to +5 V
Pulse width	
	≥2 μs
Polarity	
	positive or negative
Input impedance	
	≥10 kOhm
Connector type	
	BNC, female

Frequency Trigger Output

Port	Ext Trig Out
Maximum output current	
	20 mA
Output level	
Low level voltage	0.0 V
High level voltage	3.5 V
Polarity	
	positive or negative
Connector type	
	BNC, female

System & Power

Operating system	Windows 7 and above
CPU frequency	1.0 GHz
RAM	512 MB
Interface	USB 2.0
Connector type	USB B
Power supply	110-240 V, 50/60 Hz
Power consumption	32 W
Input power	9 V DC to 15 V DC
Input power consumption DC	25 W

Factory Adjustment

Recommended factory adjustment interval	3 years
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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