

# S5180 Specifications<sup>1</sup>

## Primary Specifications<sup>3</sup>

Impedance	50 Ohm
Test port connector	type N, female
Number of test ports	2
Frequency range	100 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 <sup>2</sup>	
100 kHz to 1 MHz	100 dB
1 MHz to 6.5 GHz	130 dB
6.5 GHz to 12 GHz	125 dB
12 GHz to 16 GHz	122 dB
16 GHz to 18 GHz	118 dB
Crosstalk <sup>2a</sup>	
100 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

<b>100 kHz to 10 GHz</b>	
Directivity	46 dB
Source match	40 dB
Load match	46 dB
Reflection tracking	$\pm 0.10$ dB
Transmission tracking	$\pm 0.08$ dB
<b>10 GHz to 18 GHz</b>	
Directivity	42 dB
Source match	38 dB
Load match	42 dB
Reflection tracking	$\pm 0.10$ dB
Transmission tracking	$\pm 0.08$ dB

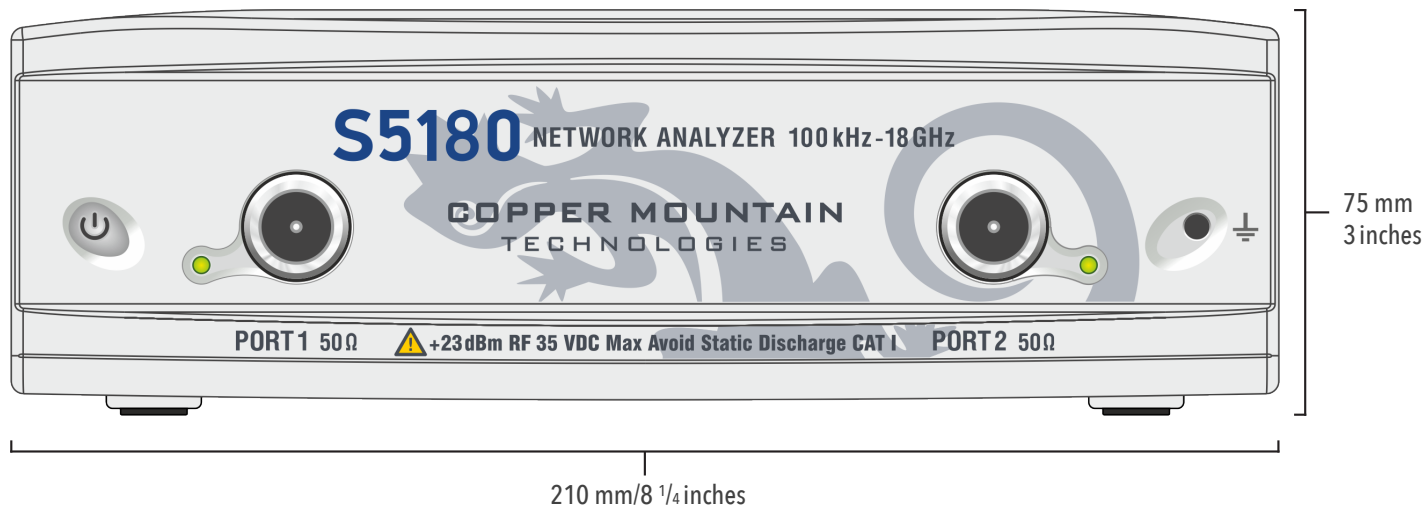
## Uncorrected System Performance

<b>100 kHz to 1 MHz</b>	
Directivity	10 dB
Source match	8 dB
Load match	12 dB
<b>1 MHz to 6.5 GHz</b>	
Directivity	15 dB
Source match	12 dB
Load match	15 dB
<b>6.5 GHz to 12 GHz</b>	
Directivity	10 dB
Source match	8 dB
Load match	10 dB
<b>12 GHz to 18 GHz</b>	
Directivity	10 dB
Source match	8 dB
Load match	10 dB

## Measurement Accuracy

<b>Accuracy of transmission measurements<sup>4</sup></b>		Magnitude / Phase
100 kHz to 1 MHz		
0 dB to +10 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-30 dB to 0 dB		$\pm 0.1$ dB / $\pm 1^\circ$
-50 dB to -30 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-70 dB to -50 dB		$\pm 1.0$ dB / $\pm 6^\circ$
1 MHz to 6.5 GHz		
0 dB to +10 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-60 dB to 0 dB		$\pm 0.1$ dB / $\pm 1^\circ$
-80 dB to -60 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-100 dB to -80 dB		$\pm 1.0$ dB / $\pm 6^\circ$
6.5 GHz to 12 GHz		
0 dB to +10 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-55 dB to 0 dB		$\pm 0.1$ dB / $\pm 1^\circ$
-75 dB to -55 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-95 dB to -75 dB		$\pm 1.0$ dB / $\pm 6^\circ$
12 GHz to 16 GHz		
0 dB to +10 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-50 dB to 0 dB		$\pm 0.1$ dB / $\pm 1^\circ$
-70 dB to -50 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-92 dB to -70 dB		$\pm 1.0$ dB / $\pm 6^\circ$
16 GHz to 18 GHz		
0 dB to +6 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-50 dB to 0 dB		$\pm 0.1$ dB / $\pm 1^\circ$
-70 dB to -50 dB		$\pm 0.2$ dB / $\pm 2^\circ$
-92 dB to -70 dB		$\pm 1.0$ dB / $\pm 6^\circ$
<b>Accuracy of reflection measurements<sup>5</sup></b>		Magnitude / Phase
100 kHz to 10 GHz		
-15 dB to 0 dB		$\pm 0.4$ dB / $\pm 3^\circ$
-25 dB to -15 dB		$\pm 1.0$ dB / $\pm 6^\circ$
-35 dB to -25 dB		$\pm 3.0$ dB / $\pm 20^\circ$
10 GHz to 18 GHz		
-15 dB to 0 dB		$\pm 0.5$ dB / $\pm 4^\circ$
-25 dB to -15 dB		$\pm 1.5$ dB / $\pm 10^\circ$
-35 dB to -25 dB		$\pm 5.5$ dB / $\pm 30^\circ$
<b>Trace noise magnitude (IF bandwidth 3 kHz)</b>		
100 kHz to 1 MHz		0.010 dB rms
1 MHz to 6.5 GHz		0.002 dB rms
6.5 GHz to 12 GHz		0.003 dB rms
12 GHz to 18 GHz		0.004 dB rms

[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. Crosstalk may limit the dynamic range of the analyzer at low IF bandwidth. [3] Reflection and transmission measurement accuracy applies over the temperature range of (73  $\pm$  9) °F or (23  $\pm$  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. [\*] Power accuracy applies over temperature range from 18 °C to 28 °C. [6] Specification applies over frequency range from 300 kHz to upper frequency limit, at output power of 0 dBm. © Copper Mountain Technologies - www.coppermountaintech.com - Rev. 2022Q1



## Test Port Output

Power range	
100 kHz to 16 GHz	-45 dBm to +10 dBm
16 GHz to 18 GHz	-45 dBm to +6 dBm
Power accuracy*	±2 dB
Power resolution	0.05 dB
Harmonic distortion <sup>6</sup>	-15 dBc
Non-harmonic spurious <sup>6</sup>	
100 kHz to 16 GHz	-20 dBc
16 GHz to 18 GHz	-15 dBc

## Test Port Input

Noise floor	
100 kHz to 1 MHz	-100 dBm/Hz
1 MHz to 6.5 GHz	-130 dBm/Hz
6.5 GHz to 12 GHz	-125 dBm/Hz
12 GHz to 18 GHz	-122 dBm/Hz
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

## Factory Adjustment

Recommended Factory Adjustment Interval	3 Years
---	---------

## 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

## 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	1.5 GHz
RAM	1 GB
Interface	USB 2.0
Connector type	USB B
Input power (VNA)	11 V DC to 15 V DC
Input power consumption (VNA)	35 W
Power supply (Main Outlet)	110-240 V, 50/60 Hz
Power consumption (Main Outlet)	40 W

## 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