814/1

COPPER MOUNTAIN® TECHNOLOGIES

- **Frequency range:** 100 kHz - 8 GHz
- **Dynamic range:** 140 dB (10 Hz IF bandwidth) typ.
- **Measurement time per point:** 100 µs per point, min typ.
- **16 logical channels with 16 traces** each max
- **Automation programming** in LabView, Python, MATLAB, .NET, etc.
- Multiple **precision calibration** methods and automatic calibration
- **Time domain and gating** conversion included
- **Fixture simulation**
- **Frequency offset mode**, including vector mixer calibration measurements
- Up to **500,001 measurement points**

EXTEND YOUR REACH™

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Specifications[1]

Measurement Range

Impedance	50 Ohm
Test port connector	type N, female
Number of test ports	2
Direct access	Source, Ref, and Meas
Frequency range	100 kHz to 8.0 GHz
Full frequency accuracy	$\pm 5 \cdot 10^{-6}$
Frequency resolution	1 Hz
Number of measurement points	2 to 500,001
Measurement bandwidths (with 1/1.5/2/3/5/7 steps)	1 Hz to 30 kHz
Dynamic range[2]	
100 kHz to 300 kHz	115 dB (125 dB typ.)
300 kHz to 6.0 GHz	135 dB (140 dB typ.)
6.0 GHz to 8.0 GHz	130 dB (140 dB typ.)

Measurement Accuracy[3]

Accuracy of transmission measurements[4]	Magnitude / Phase
100 kHz to 300 kHz	
-40 dB to +5 dB	±0.2 dB / ±2°
-60 dB to -40 dB	±1.0 dB / ±6°
300 kHz to 8.0 GHz	
+5 dB to +15 dB	±0.2 dB / ±2°
-50 dB to +5 dB	±0.1 dB / ±1°
-70 dB to -50 dB	±0.2 dB / ±2°
-90 dB to -70 dB	±1.0 dB / ±6°
Accuracy of reflection measurements[5]	Magnitude / Phase
-15 dB to 0 dB	±0.4 dB / ±3°
-25 dB to -15 dB	±1.0 dB / ±6°
-35 dB to -25 dB	±3.0 dB / ±20°
Trace noise magnitude (IF bandwidth 3 kHz)	
100 kHz to 300 kHz	0.010 dB rms
300 kHz to 8.0 GHz	0.001 dB rms
Temperature dependence	0.02 dB/°C

Effective System Data

100 kHz to 300 kHz	
Directivity	46 dB
Source match	40 dB
Load match	46 dB
Reflection tracking	±0.10 dB
Transmission tracking	±0.14 dB
300 kHz to 8.0 GHz	
Directivity	46 dB
Source match	40 dB
Load match	46 dB
Reflection tracking	±0.10 dB
Transmission tracking	±0.08 dB

Uncorrected System Performance

100 kHz to 300 kHz	
Directivity	15 dB
Source match	18 dB
Load match	18 dB
300 kHz to 8.0 GHz	
Directivity	18 dB
Source match	18 dB
Load match	18 dB

Test Port Output

Power range	
100 kHz to 300 kHz	-55 dBm to +10 dBm
300 kHz to 6.0 GHz	-60 dBm to +10 dBm
6.0 GHz to 8.0 GHz	-60 dBm to +5 dBm
Power accuracy	
100 kHz to 300 kHz	
-55 dBm to -30 dBm	±3.0 dB
-30 dBm to +10 dBm	±1.5 dB
300 kHz to 8.0 GHz	±1.5 dB
Power resolution	0.05 dB
Harmonic distortion[6]	-25 dBc
Non-harmonic spurious[6]	-30 dBc

Test Port Input

Noise floor	
100 kHz to 300 kHz	-120 dBm/Hz
300 kHz to 8.0 GHz	-135 dBm/Hz
Damage level	+26 dBm
Damage DC voltage	35 V
Direct receiver access ports	
Maximum operating input power level	
Ref	-3 dBm
Source	15 dBm
Meas	-3 dBm
Damage level	
Ref	13 dBm
Source	26 dBm
Meas	13 dBm
Damage DC voltage	
Ref	0 V
Source	35 V
Meas	0 V

[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. [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 -20 dBm from 100 kHz to 300 kHz and =5 dBm over 300 kHz to 8 GHz. 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 frequency range from 300 kHz to upper frequency limit, at output power of 0 dBm.

Specifications[1]

Measurement Speed

Time per Point	100 µs typ.		
Port switchover time	10 ms		
Typical cycle time vs number of measurement points			
Frequency range	Number of points	Uncorrected	2-port calibration
100 kHz to 300 kHz (IF bandwidth 30 kHz)	51	13.1 ms	45.5 ms
	201	51.3 ms	122.0 ms
	401	102.3 ms	230.5 ms
	1601	408.3 ms	840.5 ms
300 kHz to 8.0 GHz (IF bandwidth 30 kHz)	51	6.5 ms	32.4 ms
	201	21.1 ms	61.7 ms
	401	40.5 ms	100.3 ms
	1601	157.7 ms	333.0 ms

Frequency Reference Input

Port	10 MHz Ref In
External reference frequency	10 MHz
Input level	0 dBm to 4 dBm
Input impedance	50 Ohm
Connector type	BNC, female

Frequency Reference Output

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

Trigger Input

Port	Ext Trig
Input level	
Low threshold voltage	0.5 V
High threshold voltage	2.7 V
Input level range	+3 V to + 5 V
Pulse width	≥1 µs
Polarity	positive or negative
Input impedance	≥10 kOhm
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	40 W

Calibration

Recommended Factory Adjustment Interval	3 Years

Dimensions

Length	324 mm
Width	415 mm
Height	96 mm
Weight	7 kg (247 oz)

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

Technology is supposed to move. It's supposed to change and update and progress. It's not meant to sit stagnant year after year simply because that's how things have always been done.

The engineers at Copper Mountain Technologies are creative problem solvers. They know the people using VNAs don't just need one giant machine in a lab. They know that VNAs are needed in the field, requiring portability and flexibility. Data needs to be quickly transferred, and a test setup needs to be easily automated and recalled for various applications. The engineers at Copper Mountain Technologies are rethinking the way VNAs are developed and used.

Copper Mountain Technologies' VNAs are designed to work with the Windows or Linux PC you already use via USB interface. After installing the test software, you have a top-quality VNA at a fraction of the cost of a traditional analyzer. The result is a faster, more effective test process that fits into the modern workspace. This is the creativity that makes Copper Mountain Technologies stand out above the crowd.

We're creative. We're problem solvers.

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