Compact VNA - TR1300/1

COPPER MOUNTAIN™ TECHNOLOGIES

Extended Specifications

- **Frequency range:** 300 kHz - 1.3 GHz
- **Wide output power adjustment range:** -55 dBm to +3 dBm
- **Dynamic range:** 135 dB (10 Hz IF bandwidth) typ.
- **Measurement time per point:** 150 µs per point, min typ.
- Up to **16 logical channels with 16 traces** each max
- **Automation programming** in LabView, Python, MATLAB, .NET, etc.
- **Time domain and gating** conversion included
- **Frequency offset mode**, including vector mixer calibration measurements
- Up to **16,001 measurement points**
- Multiple **precision calibration** methods and automatic calibration

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
Frequency range	300 kHz to 1.3 GHz
Full frequency accuracy	$\pm 5 \cdot 10^{-6}$
Frequency resolution	1 Hz
Number of measurement points	2 to 16,001
Measurement bandwidths (with 1/1.5/2/3/5/7 steps)	10 Hz to 30 kHz
Dynamic range[2]	130 dB (135 dB typ.)

Measurement Accuracy[3]

Accuracy of transmission measurements[4]	Magnitude / Phase ($S_{11} = S_{22} = 0$)	Magnitude / Phase ($S_{11} = S_{22} = 0.1$)
+10 dB to +13 dB	±0.2 dB / ±2°	±0.2 dB / ±2°
-50 dB to +10 dB	±0.1 dB / ±1°	±0.15 dB / ±1.5°
-70 dB to -50 dB	±0.2 dB / ±2°	±0.2 dB / ±2°
-85 dB to -70 dB	±1.0 dB / ±6°	±1.0 dB / ±6°
Accuracy of reflection measurements[5]	Magnitude / Phase	
-15 dB to 0 dB	±0.4 dB / ±4°	
-25 dB to -15 dB	±1.5 dB / ±7°	
-35 dB to -25 dB	±4.0 dB / ±22°	
Trace noise magnitude (IF bandwidth 3 kHz)	0.002 dB rms	
Temperature dependence	0.02 dB/°C	

Effective System Data

300 kHz to 1.3 GHz	
Directivity	45 dB
Source match	40 dB
Load match	28 dB
Reflection tracking	±0.10 dB
Transmission tracking	±0.08 dB

Uncorrected System Performance

300 kHz to 1.3 GHz	
Directivity	18 dB
Source match	15 dB
Load match	28 dB

Test Port Output

Power range	-55 dBm to +3 dBm
Power accuracy	±1.5 dB
Power resolution	0.05 dB

[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 one-path two-port calibration temperature, at output power of -10 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.

Specifications[1]

Test Port Input

Noise floor	-137 dBm/Hz
Damage level	+26 dBm
Damage DC voltage	35 V

Measurement Speed

Time per point	150 µs typ.

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

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	10 W
Input power	9 V DC to 15 V DC
Input power consumption DC	8 W

Calibration

Recommended factory adjustment interval	3 years

Dimensions

Length	285 mm
Width	142 mm
Height	40 mm
Weight	1.5 kg (53 oz)

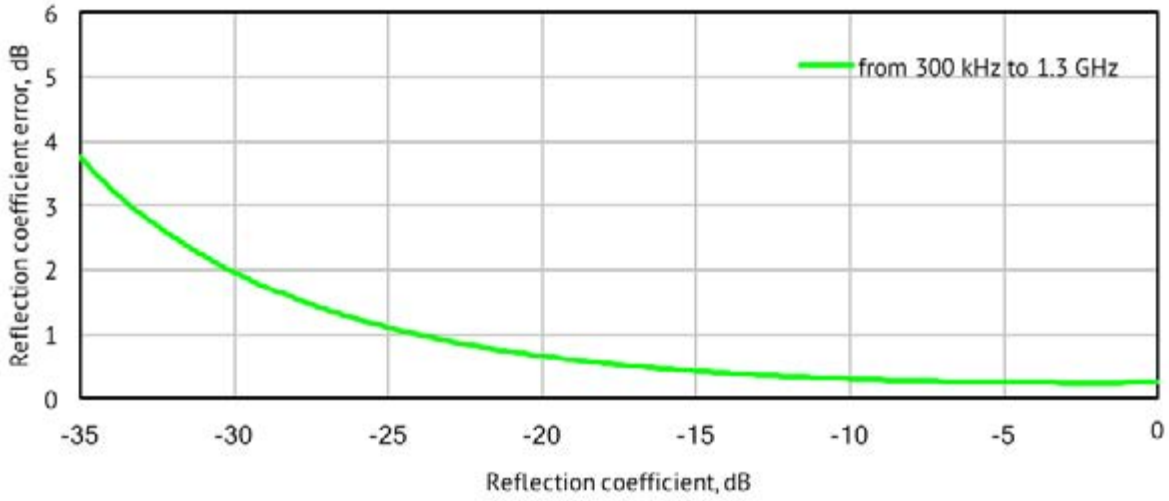
Environmental Specifications

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

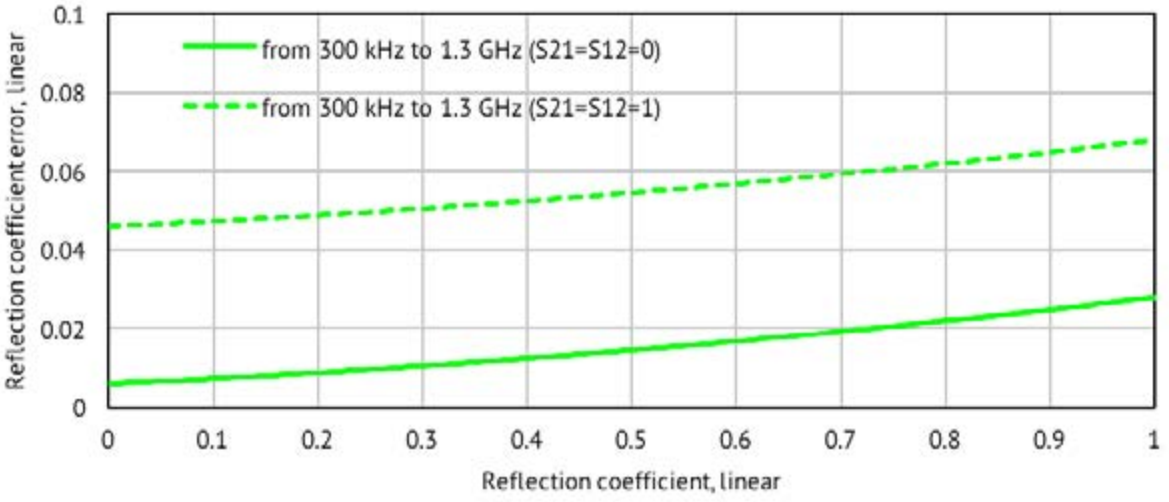
Reflection Accuracy Plots

Reflection Magnitude Errors

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

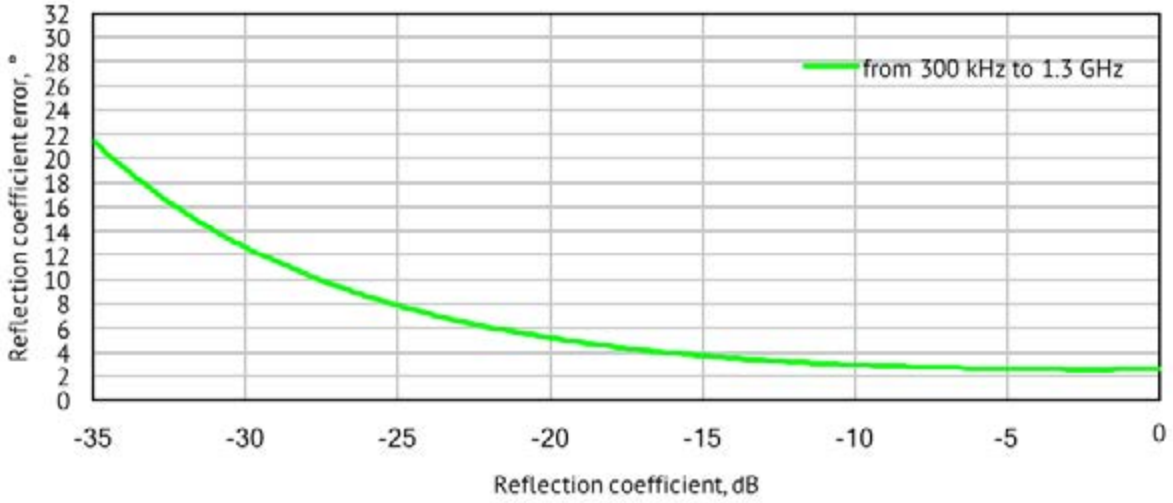


Specifications are based on isolating DUT ($S_{21} = S_{12} = 0$)



Reflection/Transmission Accuracy Plots

Reflection Phase Errors



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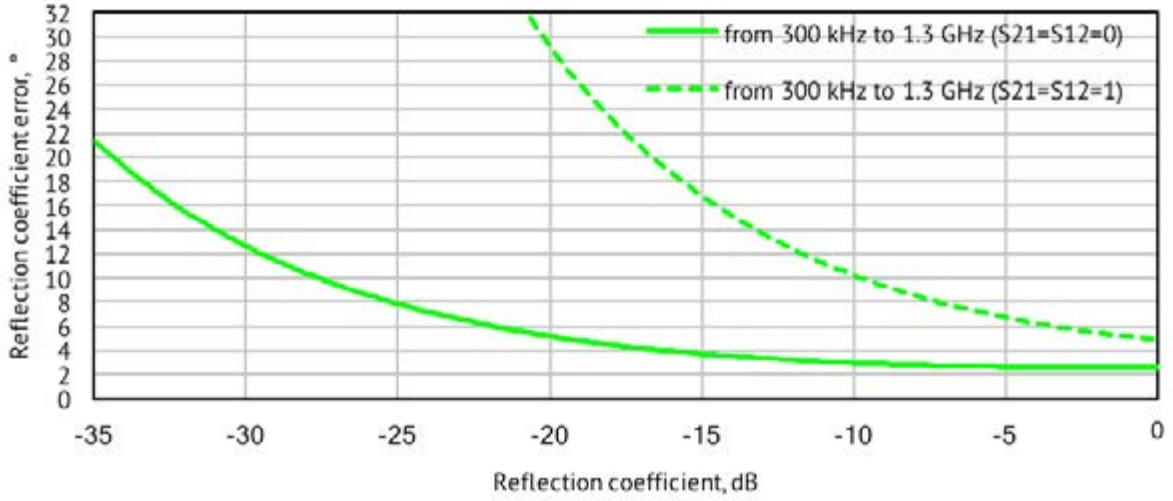
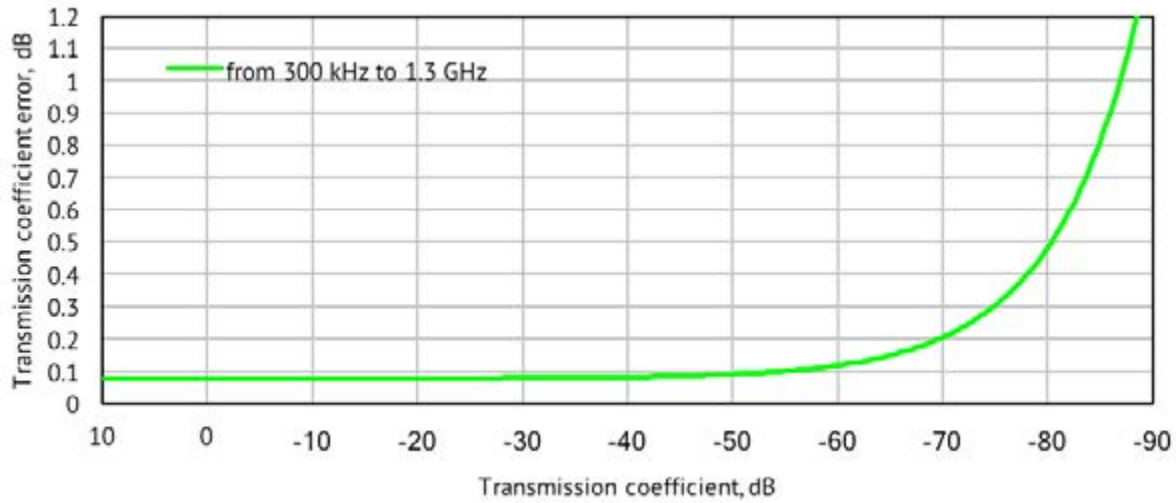


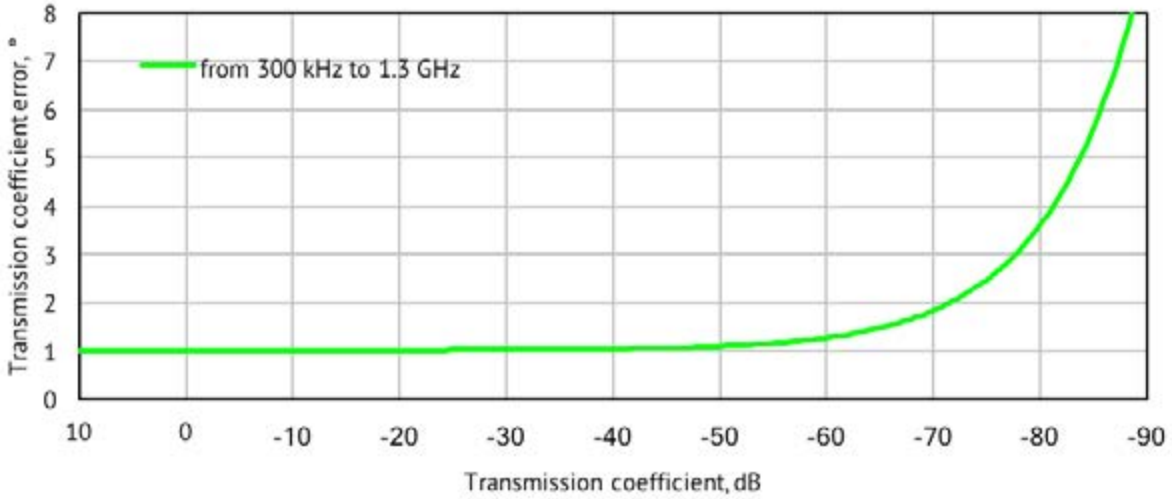
Transmission Magnitude Errors



Specifications are based on matched DUT, and IF bandwidth of 10 Hz

Transmission Accuracy Plots

Transmission Phase Errors



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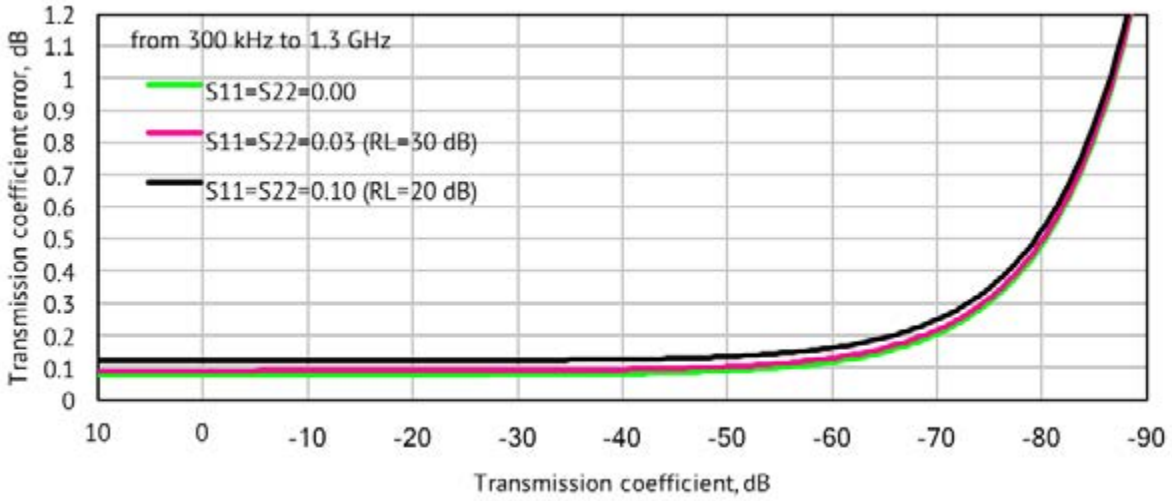
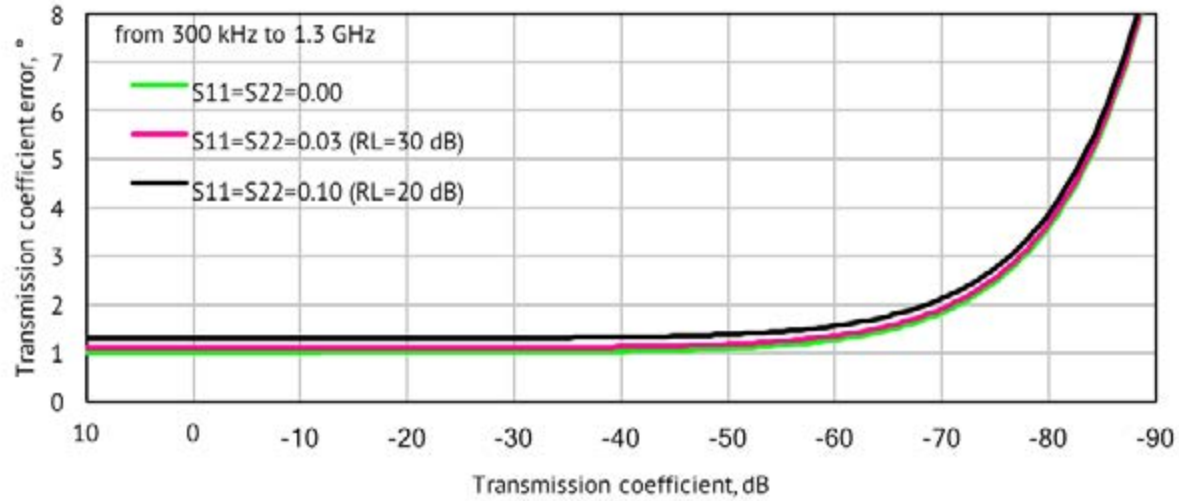


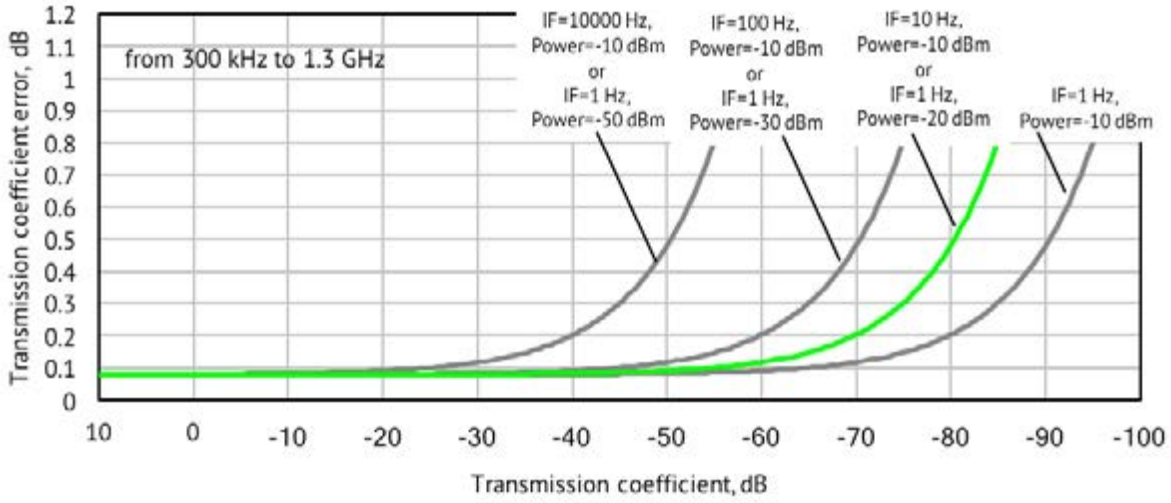
Transmission Phase Errors for Unmatched Devices



Specifications are based on matched DUT, and IF bandwidth of 10 Hz

Transmission Accuracy Plots

Transmission errors for matched devices vs Output power and IF Bandwidth



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 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.

	TR1300/1	TR5048	TR7530
Frequency Range	300 kHz to 1.3 GHz	20 kHz to 4.8 GHz	20 kHz to 3 GHz
S-parameters	S_{11}, S_{21}	S_{11}, S_{21}	S_{11}, S_{21}
Port Impedance	50 Ohm	50 Ohm	75 Ohm

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