Compact VNA - TR7530

Extended Specifications

COPPER MOUNTAIN™
TECHNOLOGIES

- **Frequency range:** 20 kHz - 3 GHz
- **Wide output power adjustment range:** -50 dBm to +5 dBm
- **Dynamic range:** 123 dB (10 Hz IF bandwidth) typ.
- **Measurement time per point:** 250 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 **200,001 measurement points**
- Multiple **precision calibration** methods and automatic calibration

EXTEND YOUR REACH™

Specifications[1]

Measurement Range

Impedance	75 Ohm
Test port connector	type N, female
Number of test ports	2
Frequency range	20 kHz to 3.0 GHz
Full frequency accuracy	$\pm 5 \cdot 10^{-6}$
Frequency resolution	10 Hz
Number of measurement points	2 to 200,001
Measurement bandwidths (with 1/1.5/2/3/5/7 steps)	1 Hz to 30 kHz
Dynamic range[2]	
20 kHz to 300 kHz	75 dB (100 dB typ.)
300 kHz to 3.0 GHz	120 dB (123 dB typ.)

Measurement Accuracy[3]

Accuracy of transmission measurements[4]	Magnitude / Phase ($S_{11} = S_{22} = 0$)	Magnitude / Phase ($S_{11} = S_{22} = 0.1$)
20 kHz to 300 kHz		
-15 dB to +10 dB	± 0.2 dB / $\pm 2°$	± 0.4 dB / $\pm 3°$
-35 dB to -15 dB	± 1.0 dB / $\pm 6°$	± 1.5 dB / $\pm 7°$
300 kHz to 3.0 GHz		
0 dB to +10 dB	± 0.2 dB / $\pm 2°$	± 0.3 dB / $\pm 3°$
-40 dB to 0 dB	± 0.15 dB / $\pm 1.5°$	± 0.25 dB / $\pm 2°$
-60 dB to -40 dB	± 0.2 dB / $\pm 2°$	± 0.3 dB / $\pm 3°$
-80 dB to -60 dB	± 1.0 dB / $\pm 6°$	± 1.0 dB / $\pm 6°$
Accuracy of reflection measurements[5]	Magnitude / Phase	
-15 dB to 0 dB	± 0.4 dB / $\pm 3°$	
-25 dB to -15 dB	± 1.0 dB / $\pm 6°$	
-35 dB to -25 dB	± 3.0 dB / $\pm 20°$	
Trace noise magnitude (IF bandwidth 3 kHz)		
20 kHz to 300 kHz	0.050 dB rms	
300 kHz to 3.0 GHz	0.002 dB rms	
Temperature dependence	0.02 dB/°C	

Effective System Data

20 kHz to 3.0 GHz	
Directivity	46 dB
Source match	40 dB
Load match	15 dB
Reflection tracking	± 0.10 dB
Transmission tracking	± 0.14 dB
300 kHz to 3.0 GHz	
Directivity	46 dB
Source match	40 dB
Load match	22 dB
Reflection tracking	± 0.10 dB
Transmission tracking	± 0.14 dB

Specifications[1]

Uncorrected System Performance

20 kHz to 300 kHz	
Directivity	12 dB
Source match	15 dB
Load match	15 dB
300 kHz to 3.0 GHz	
Directivity	15 dB (18 dB typ.)
Source match	15 dB
Load match	22 dB

Test Port Output

Power range	-50 dBm to +5 dBm
Power accuracy	±1.0 dB
Power resolution	0.05 dB
Harmonic distortion[6]	-20 dBc
Non-harmonic spurious[6]	-30 dBc

Test Port Input

Noise floor	
20 kHz to 300 kHz	-80 dBm/Hz
300 kHz to 3.0 GHz	-125 dBm/Hz
Damage level	+23 dBm
Damage DC voltage	35 V

Measurement Speed

Time per point	250 μs typ.
Port switchover time	10 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

Specifications[1]

Trigger Input

Port		Ext Trig
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
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	12 W
Input power	9 V DC to 15 V DC
Input power consumption DC	10 W

Calibration

Recommended factory adjustment interval	3 years

Dimensions

Length	267 mm
Width	160 mm
Height	44 mm
Weight	1.3 kg (46 oz)

Environmental Specifications

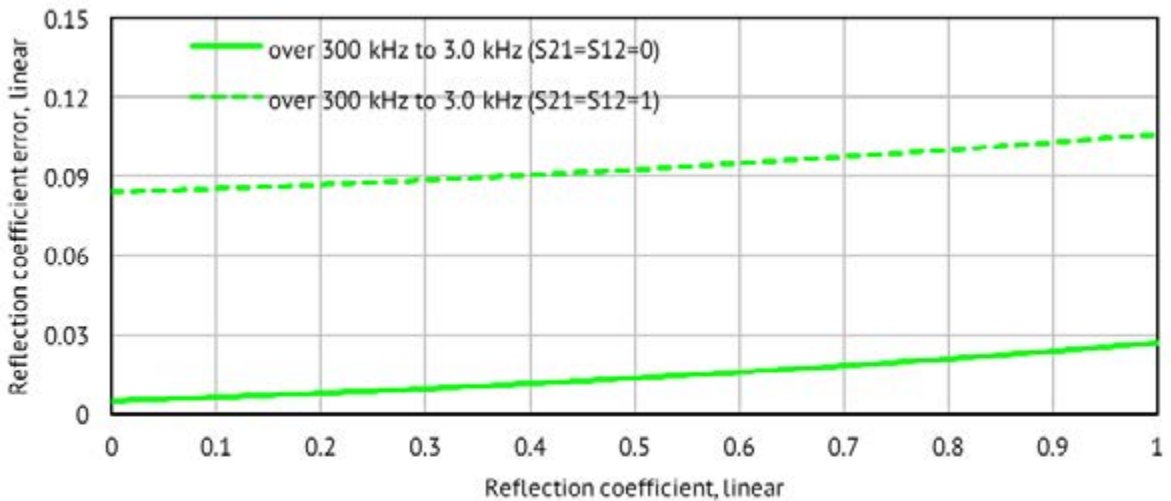| Operating temperature	+5 °C to +40 °C (41 °F to 104 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to 158 °F)
Humidity	90 % at 25 °C (77 °F)
Atmospheric pressure	70.0 kPa to 106.7 kPa

Reflection Accuracy Plots

Reflection Magnitude Errors

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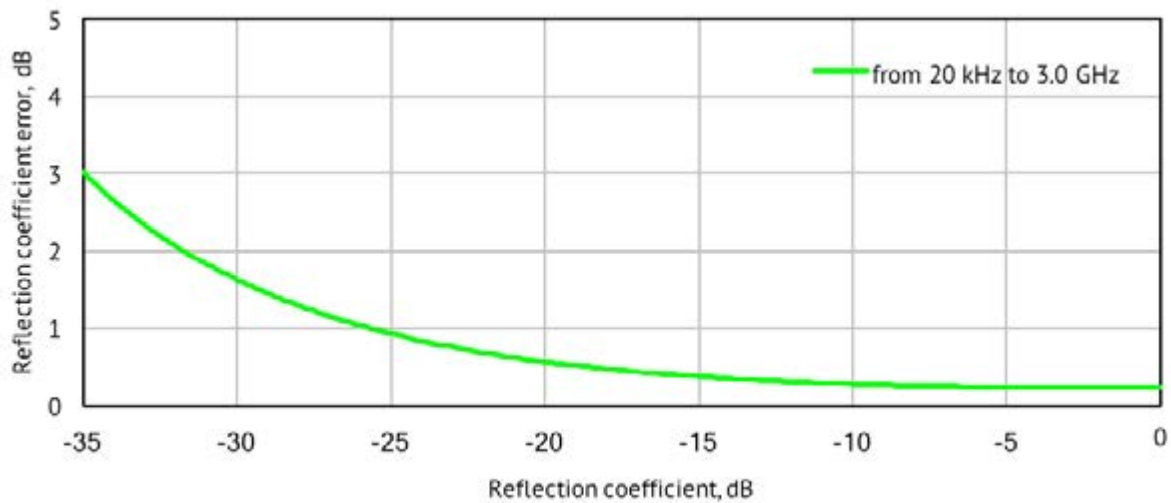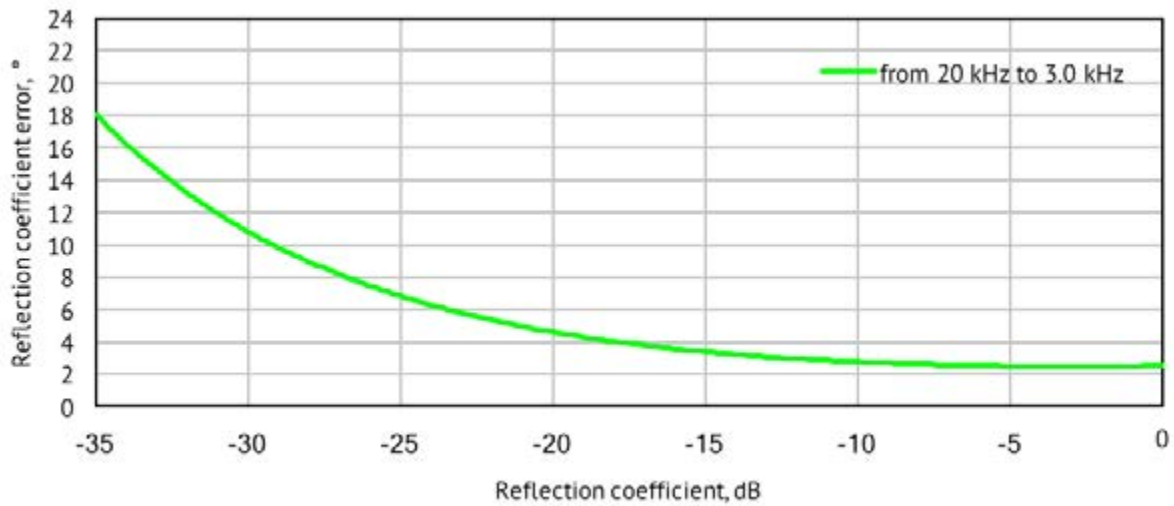

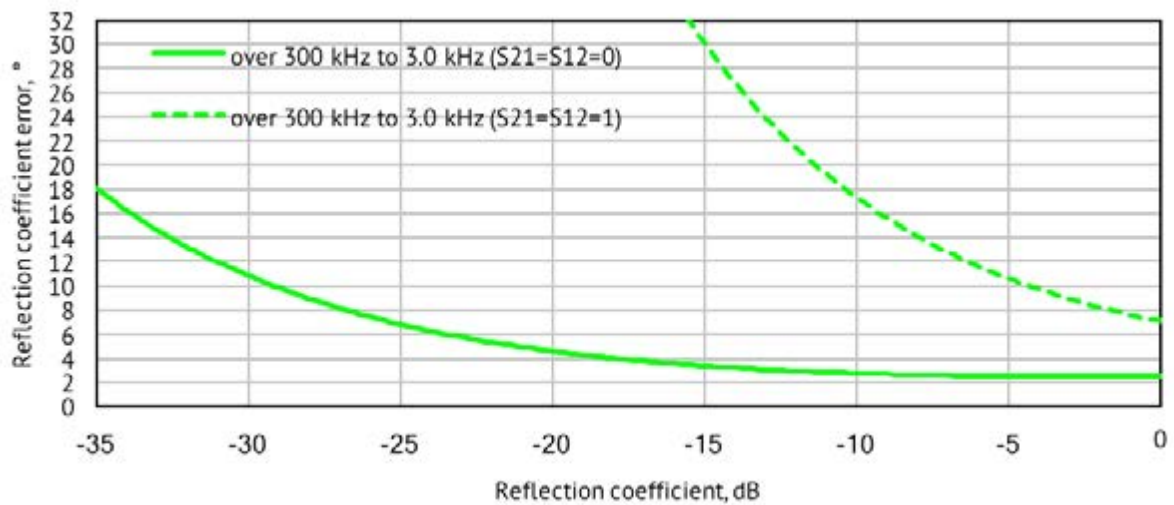Specifications are based on isolating DUT ($S_{21} = S_{12} = 0$)
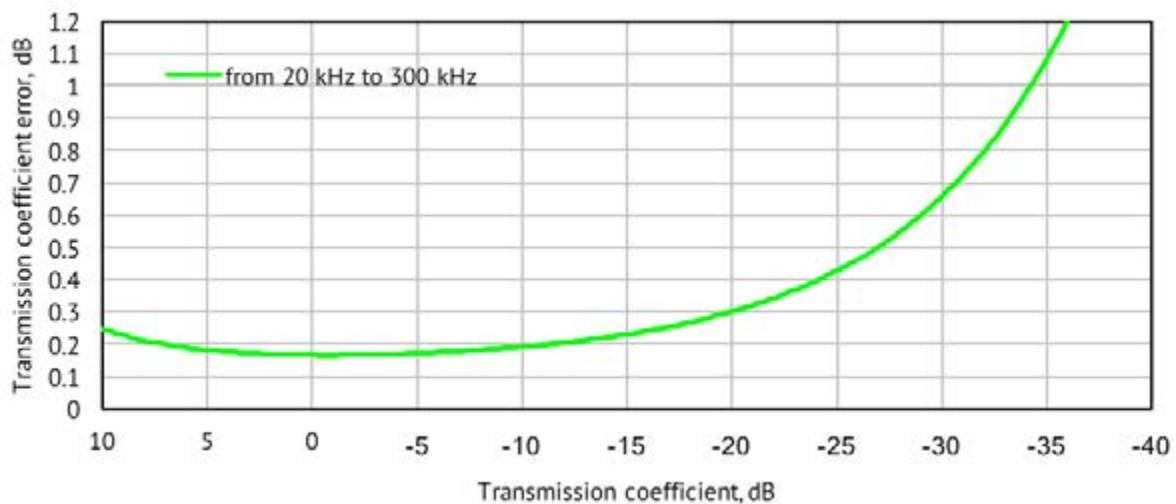
Reflection/Transmission Accuracy Plots

Reflection Phase Errors

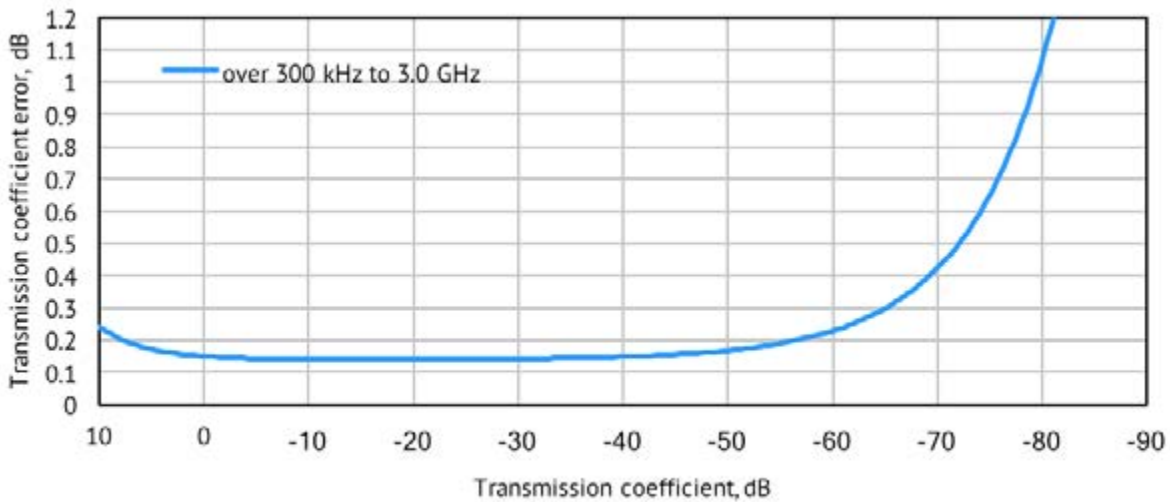Specifications are based on isolating DUT ($S_{21} = S_{12} = 0$)

Transmission Magnitude Errors

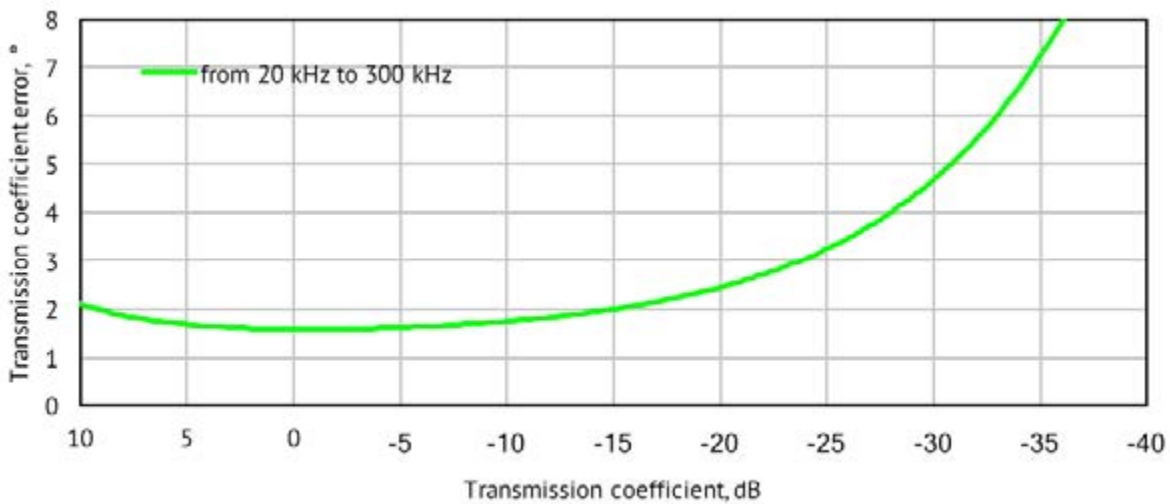Specifications are based on matched DUT, and IF bandwidth of 10 Hz

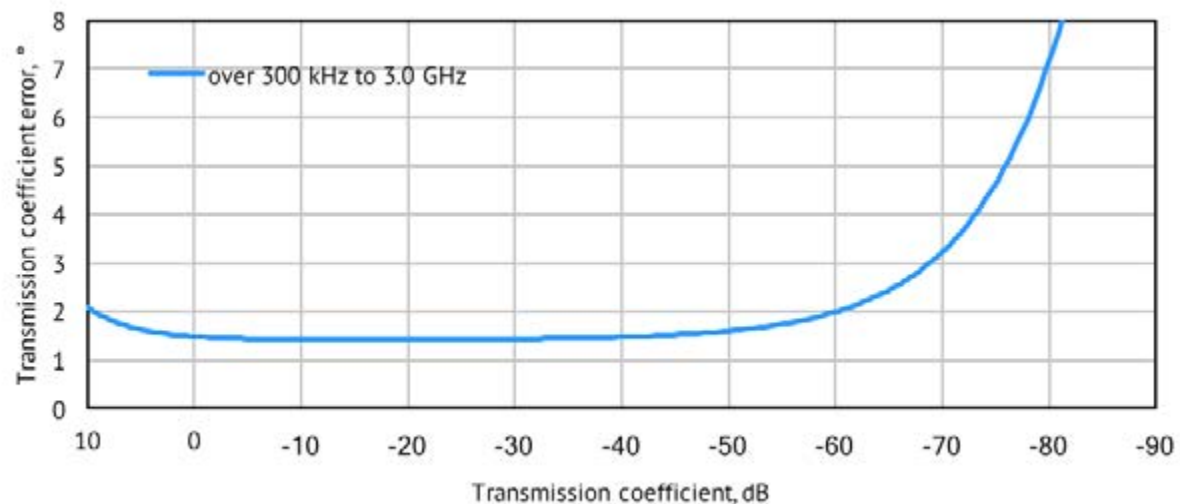# Transmission Accuracy Plots

Transmission Magnitude Errors

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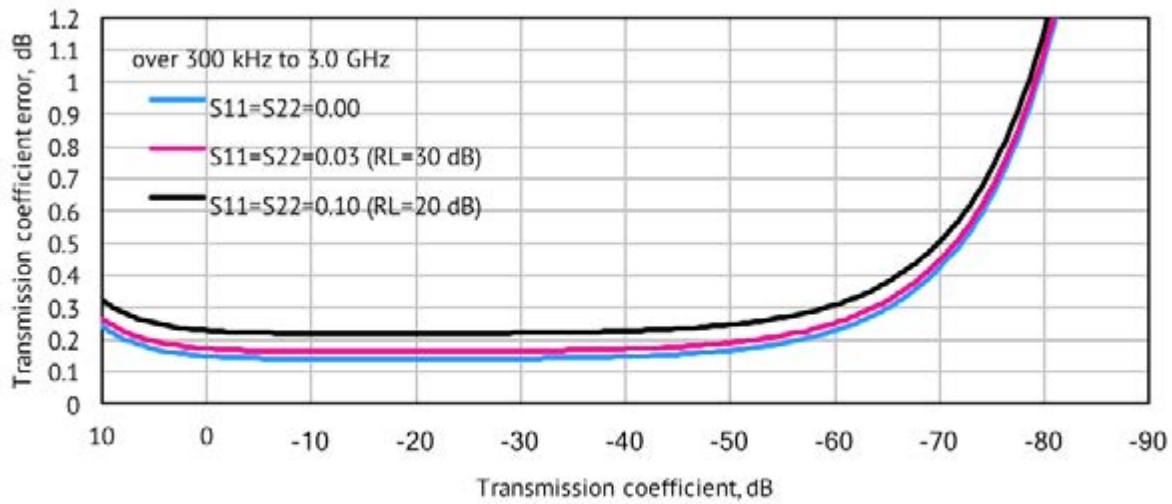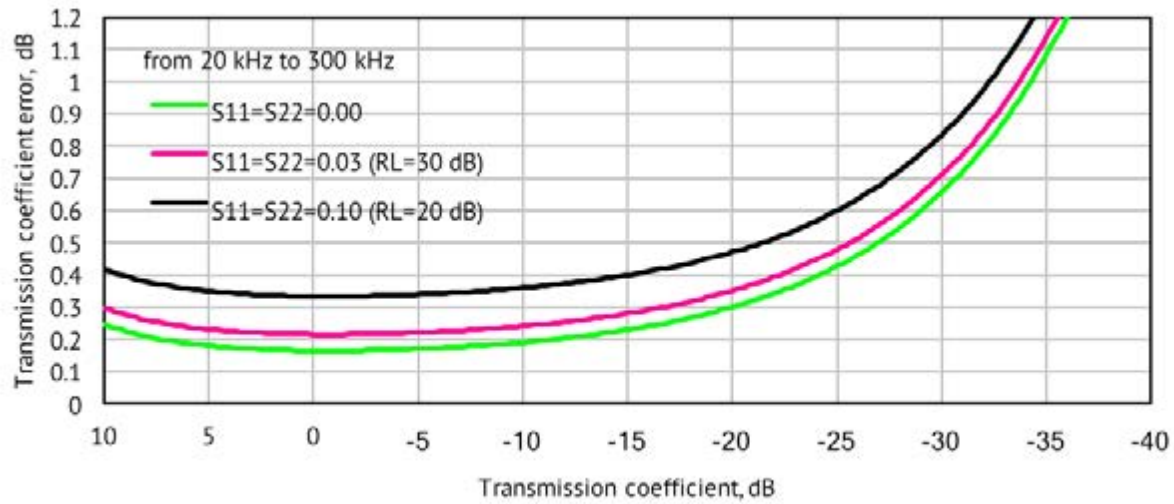
Transmission Phase Errors

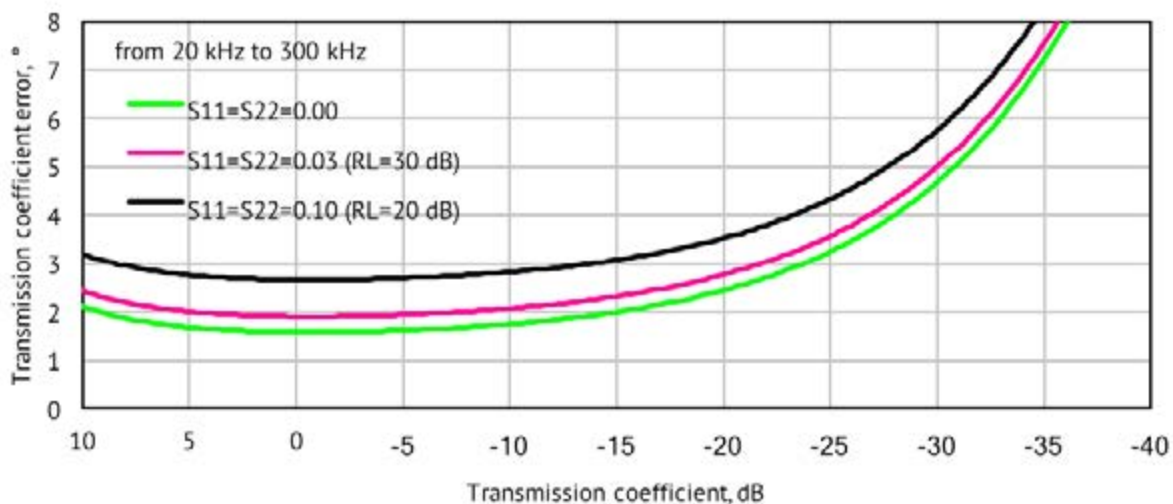Specifications are based on matched DUT, and IF bandwidth of 10 Hz

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

Transmission Accuracy Plots
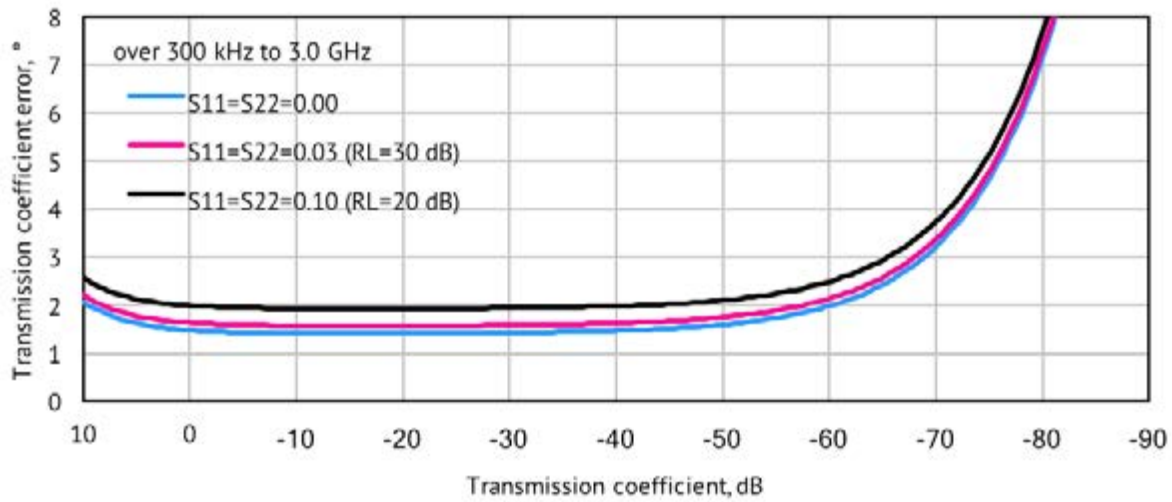
Transmission magnitude errors for unmatched devices

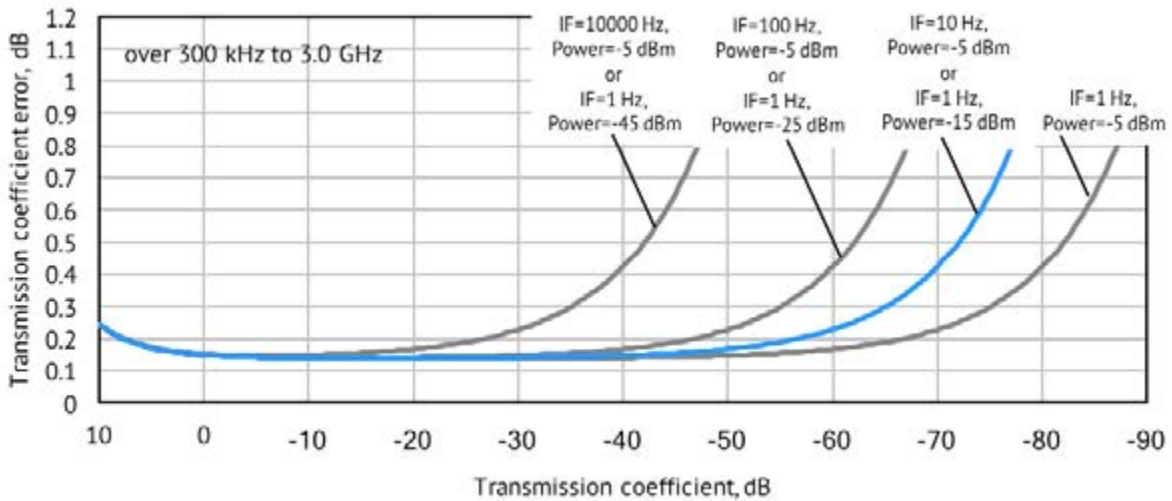**Transmission phase errors for unmatched devices**

Transmission Accuracy Plots

Transmission phase errors for unmatched devices

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