COPPER MOUNTAIN® TECHNOLOGIES

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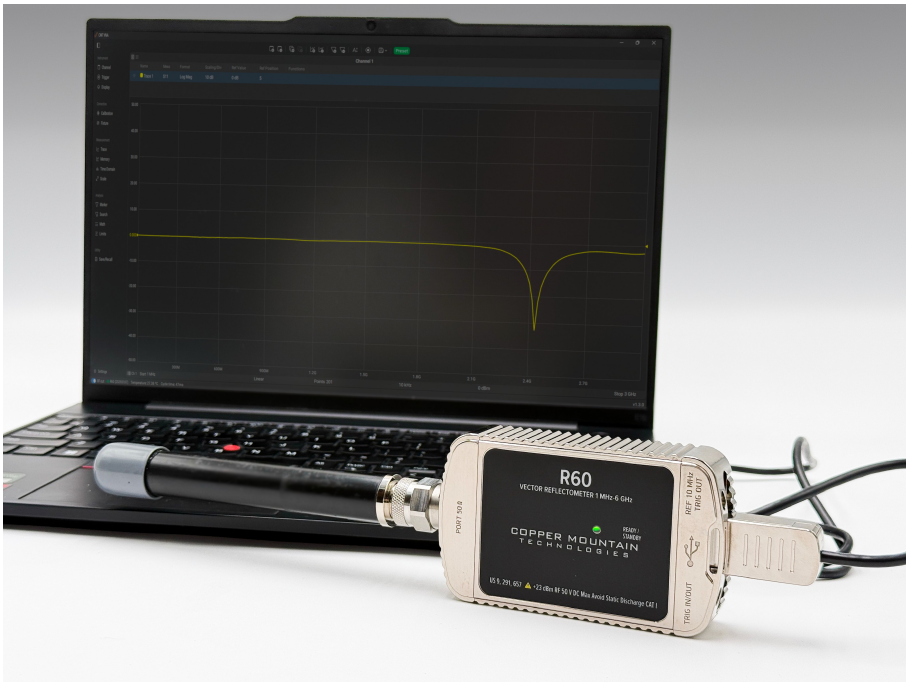
1-Port Series Vector Network Analyzer Specifications



R60	1 MHz to 6 GHz
R140B	85 MHz to 14 GHz
Software	CMT VNA software, Windows and Linux, demo mode supported

Revision 26.00 22.05.2026

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Latin America: +1.954.495.3459
Singapore: +65.63.23.6546
EMEA: +44 75 03 69 21 13

General Overview

Main Parameters

R60

Configuration	Reflectometer, 50 Ohm
Measured parameters	S11 as Log magnitude, DTF, Smith, and more
Frequency range	1 MHz to 6 GHz
Sweep types	linear frequency, log frequency, segment
Effective directivity	
1 MHz to 6 GHz	46 dB
Measurement time per point	100 µs
Measurement points per sweep	up to 100,001
Connection	USB
Software	CMT VNA, Windows or Linux

R140B

Configuration	Reflectometer, 50 Ohm
Measured parameters	S11 as Log magnitude, DTF, Smith, and more
Frequency range	85 MHz to 15 GHz
Sweep types	linear frequency, log frequency, segment
Effective directivity	
85 MHz to 4.8 GHz	45 dB
4.8 GHz to 14 GHz	42 dB
Measurement time per point	170 µs
Measurement points per sweep	up to 100,001
Output power setting	high or low
Connection	USB
Software	CMT VNA, Windows or Linux
Demo mode	Free software option

CMT VNA software runs natively on Windows and Linux. It can also be used on x86 or ARM processors on PCs, tablets, or simple-board computers including Raspberry Pi.

Service

Accredited Calibration Labs

Periodic verification is used to check the instrument to ensure that it is operating within its specifications. Two years is recommended, but the interval should be determined by your organization's quality policy.

Our Indianapolis and Cyprus calibration laboratories are accredited in accordance with the recognized international standard ISO/IEC 17025 (2017) and meet the requirements of ANSI/NCSL Z540-1994-1.

Warranty, Service, & Repairs

All our products come with a standard three-year warranty from date of shipment. During that time we will repair or replace any product malfunctioning due to defective parts or labor.

While we pride ourselves on quality of our instruments, should your VNA malfunction for any reason, we will gladly offer a loaner unit while we service yours. With our USB VNAs where all data is stored on your PC, a simple swap of the measurement module assures uninterrupted workflow and little or no downtime.

The Crown Customer Service Package

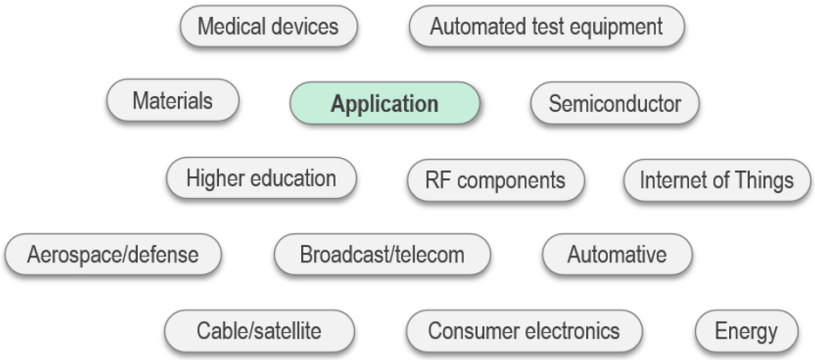
The package includes support that goes beyond the analyzer. Our expert engineers give guidance to customers using CMT analyzers regarding their measurement setup, automation, and much more. This package provides an unparalleled level of service before, during, and after the purchase of the analyzer. And the best part? It's included with every purchase from every company. We are always here to provide reliable and timely customer support.

Automation Support

We understand that your time is valuable, which is why our team strives to provide rapid support for engineers using automation in their testing. Because we want to keep you working, our Crown Customer Service package includes help with setting up your testing automation for your analyzer. Our engineers have lots of experience with many coding languages, like C++, Python, MATLAB*, Visual Basic (Excel)*, and LabVIEW*.

Supporting Unique Applications

Technological advancements have engineers using analyzers for more things than ever before.



Customers are using CMT analyzers in industries such as agriculture, automotive R&D and manufacturing tests, medical applications, the expansive network of IoT and IIoT, energy, and more. Determining the ideal analyzer often requires extensive research, so the Crown Customer Support Package includes a consultation with our technical staff to discuss your specific application and recommend the best options. This support package comes at no charge with the purchase of a Copper Mountain Technologies VNA.

Having Issues with Your Analyzer?

We have built and supply high-quality test equipment we are proud of and stand behind. However, we know that issues happen, and when they do, we are here to help. Be it software support, repairs, or just a routine annual verification, the Crown Customer Service Package includes beyond-average rapid support for all of these occurrences. Our service and support teams do all they can to get the analyzer back to making accurate measurements as soon as possible.

For more detailed information, please visit our website:

https://coppermountaintech.com/crown-customer-service-package/

Hardware Specifications

1-Port Series

R60

Measurement Range

Impedance	50 Ohm
Test port connector	type N, male
Number of test ports	1
Frequency range	1 MHz to 6 GHz
Full frequency accuracy	$\pm 2.5 \cdot 10^{-6}$
Frequency resolution	20 Hz
Number of measurement points	2 to 100,001
Measurement bandwidths (with 1/3 steps)	10 Hz to 100 kHz
Cable loss measurement range	35 dB
Dynamic range[2]	109 dB typ

[2] Measurement of |S21| and |S12| using two reflectometers, both being connected to the same USB hub, applies over the temperature range of (23 ± 5)°C after 30 minutes of warming-up, with less than 1°C deviation from the calibration temperature at high output power and IF bandwidth 100 Hz.

Measurement Accuracy[3]

Accuracy of reflection measurements[4]	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°
Accuracy of transmission magnitude measurements[5]	
-50 dB to 0 dB	±0.4 dB / ±3°
Trace noise magnitude[6]	0.005 dB rms
Temperature dependence	0.015 dB/°C

[3] Reflection and transmission measurement accuracy applies over the temperature range of (73 ± 9) °F or (23 ± 5) °C after 30 minutes of warming up, with less than 1°C deviation from calibration temperature, at 0 dBm output power and IF BW 100 Hz. Frequency points have to be identical for measurement and calibration (no interpolation allowed).

[4] Reflection specifications are based on an isolating DUT.

[5] Transmission specifications are based on a matched DUT. Measurement of |S21|and |S12| using two devices, both being connected to the same USB hub.

[6] IF bandwidth 1 kHz.

Effective System Data

1 MHz to 6 GHz	
Directivity	46 dB
Source match	40 dB
Reflection tracking	±0.05 dB

Factory-Calibrated System Data

1 MHz to 4 GHz	
Directivity	36 dB
4 GHz to 6 GHz	
Directivity	32 dB

Uncorrected System Performance

1 MHz to 6 GHz	
Directivity	15 dB (18 dB typ.)
Source match	15 dB (18 dB typ.)

Test Port

Power range	-35 dBm to -3 dBm (-40 dB to 0 dB, typ.)
Power resolution	0.25 dB typ.
Power accuracy	±1.5 dB typ.
Interference immunity	+17 dBm
Damage level	+23 dBm
Damage DC voltage	50 V

Measurement Speed

Time per point	100 µs typ.

Frequency Reference Input

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

Frequency Reference Output

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

Trigger Input

Port	TRIG IN/OUT
External trigger source	3.3 V CMOS, TTL compatible
Pulse width	≥1 µs
Polarity	positive or negative
Input impedance	≥10 kOhm
Connector type	SMA, female

Trigger Output

Port	TRIG IN/OUT
Max output current	20 mA
Trigger output	3.3 V CMOS, TTL compatible
Polarity	positive or negative
Connector type	SMA, female

System & Power

CMT VNA software:	
Operating system (min requirements)	Windows 10, Ubuntu 24.04
CPU	4 core 2.0 GHz (x64 or arm64)
RAM	8 GB
Interface	USB 2.0
Connector type	Mini USB B
Power consumption	3.5 W

Calibration

Recommended factory adjustment interval	3 Years

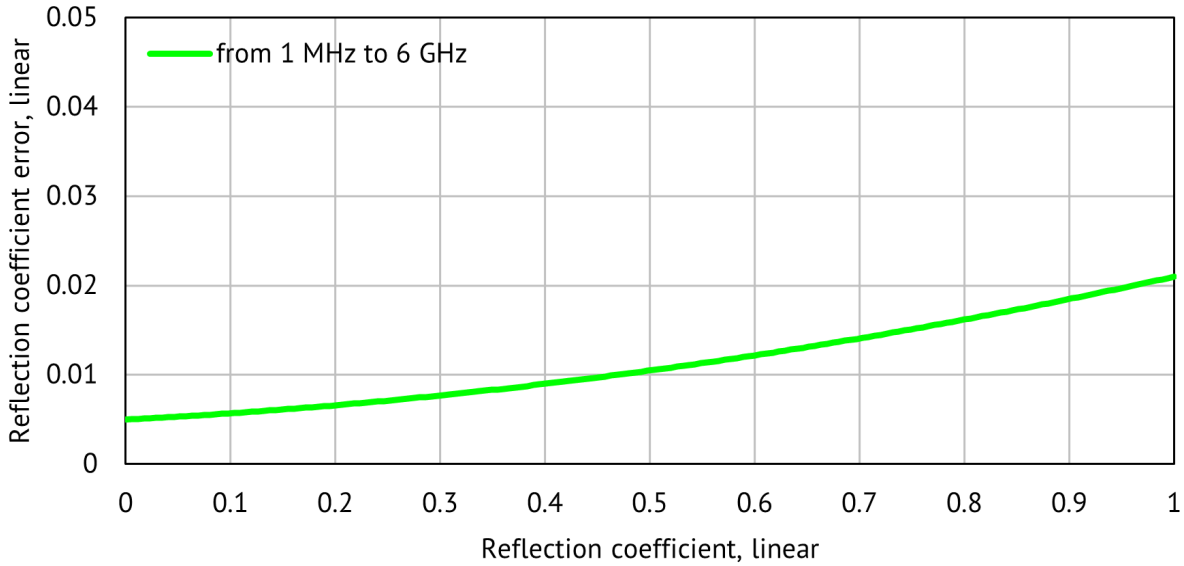
Dimensions

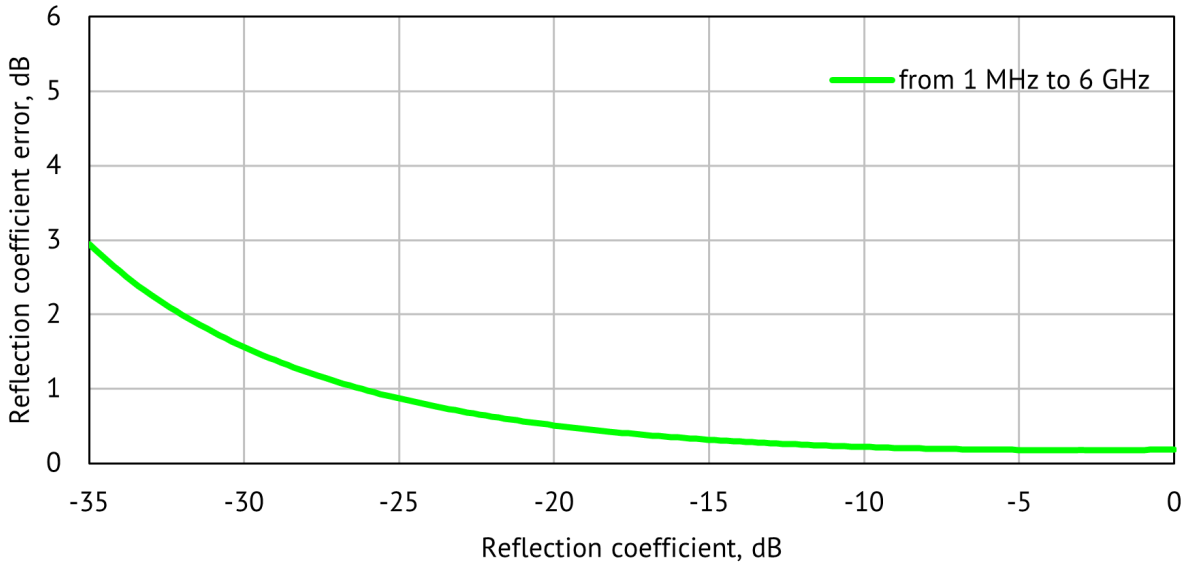
Weight	0.35 kg (12.3 oz)
Length	161 mm
Width	65 mm
Height	28 mm

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

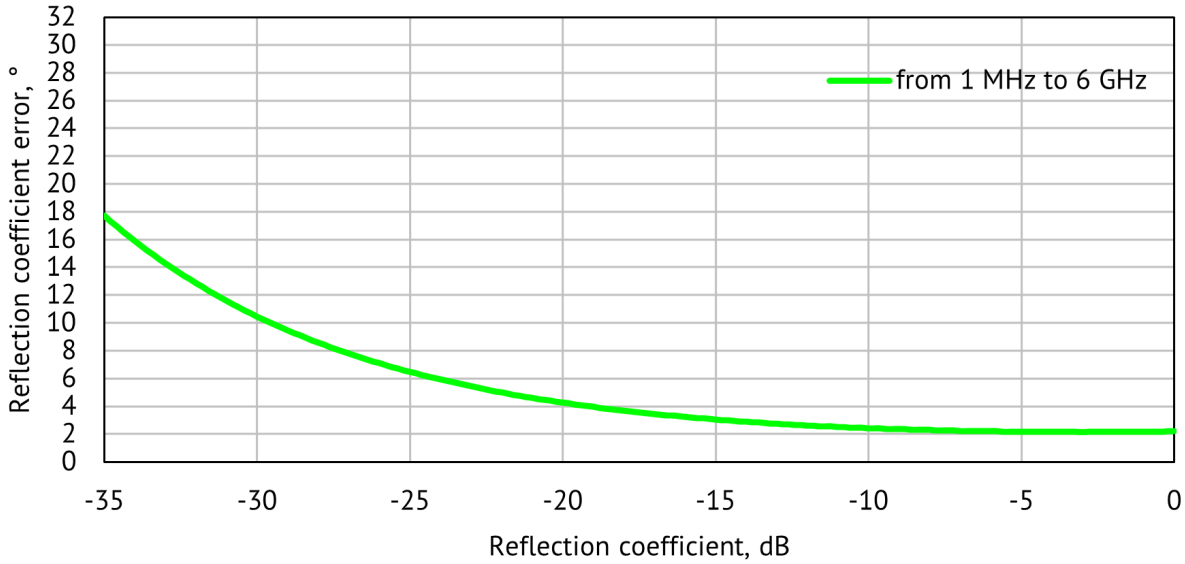
Reflection Magnitude Errors





Specifications are based on an isolating DUT (S21 = S12 = 0)

Reflection Phase Errors



Specifications are based on isolating DUT (S21 = S12 = 0)

R140B

Measurement Range

Impedance	50 Ohm
Test port connector	
R140B-01	type N, female
R140B-02	type N, male
R140B-11	3.5 mm, female
R140B-12	3.5 mm, male
Number of test ports	1
Frequency range	85 MHz to 15 GHz
Full frequency accuracy	$\pm 2.5 \cdot 10^{-6}$
Frequency resolution	25 Hz
Number of measurement points	2 to 100,001
Measurement bandwidths (with 1/3 steps)	10 Hz to 300 kHz
Cable loss measurement range	
85 MHz to 4.8 GHz	35 dB
4.8 GHz to 14 GHz	30 dB
Dynamic range[2]	
85 MHz to 4.8 GHz	115 dB typ.
4.8 GHz to 14 GHz	100 dB typ.

[2] Measurement of |S21| and |S12| using two reflectometers, both being connected to the same USB hub, applies over the temperature range

of (23 ± 5) °C after 30 minutes of warming-up, with less than 1°C deviation from the calibration temperature at high output power and IF bandwidth 100 Hz.

Measurement Accuracy[3]

Accuracy of reflection measurements[4]	Magnitude/Phase
85 MHz to 4.8 GHz	
-15 dB to 0 dB	±0.4 dB / ±4°
-25 dB to -15 dB	±1.2 dB / ±8°
-35 dB to -25 dB	±4.0 dB / ±22°
4.8 GHz to 14 GHz	
-15 dB to 0 dB	±0.5 dB / ±5°
-25 dB to -15 dB	±1.5 dB / ±10°
-35 dB to -25 dB	±5.5 dB / ±30°
Accuracy of transmission magnitude measurements[5]	
85 MHz to 4.8 GHz	
-50 dB to 0 dB	±1 dB
4.8 GHz to 14 GHz	
-40 dB to 0 dB	±1 dB
Trace noise magnitude[6]	
85 MHz to 4.8 GHz	0.002 dB rms
4.8 GHz to 14 GHz	0.006 dB rms
Temperature dependence	
85 MHz to 4.8 GHz	0.008 dB/°C
4.8 GHz to 14 GHz	0.025 dB/°C

[3] Reflection and transmission measurement accuracy applies over the temperature range of (73 ± 9) °F or (23 ± 5) °C after 30 minutes of warming up, with less than 1°C deviation from calibration temperature, at 0 dBm output power and IF BW 100 Hz. Frequency points have to be identical for measurement and calibration (no interpolation allowed).

[4] Reflection specifications are based on an isolating DUT.

[5] Transmission specifications are based on a matched DUT. Measurement of |S21|and |S12| using two devices, both being connected to the same USB hub.

[6] IF bandwidth 1 kHz.

Effective System Data

85 MHz to 4.8 GHz	
Directivity	45 dB
Source match	37 dB
Reflection tracking	±0.10 dB
4.8 GHz to 14 GHz	
Directivity	42 dB
Source match	35 dB
Reflection tracking	±0.20 dB

Uncorrected System Performance

85 MHz to 14 GHz	
Directivity	10 dB (15 dB typ.)
Source match	10 dB (15 dB typ.)

Test Port

Output power	
High level	3 dBm
Low level	-20 dBm
Interference immunity	+17 dBm
Damage level	+23 dBm
Damage DC voltage	50 V

Measurement Speed

Time per point	170 µs typ.

Frequency Reference Input

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

Frequency Reference Output

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

Trigger Input

Port	Ext Trig
External trigger source	3.3 V CMOS, TTL compatible
Pulse width	≥1 µs
Polarity	positive or negative
Input impedance	≥10 kOhm
Connector type	SMA, female

System & Power

CMT VNA software:	
Operating system (min requirements)	Windows 10, Ubuntu 24.04
CPU	4 core 2.0 GHz (x64 or arm64)
RAM	8 GB
Interface	USB 2.0
Connector type	Mini USB B
Power consumption	3.5 W

Calibration

Recommended factory adjustment interval	3 Years

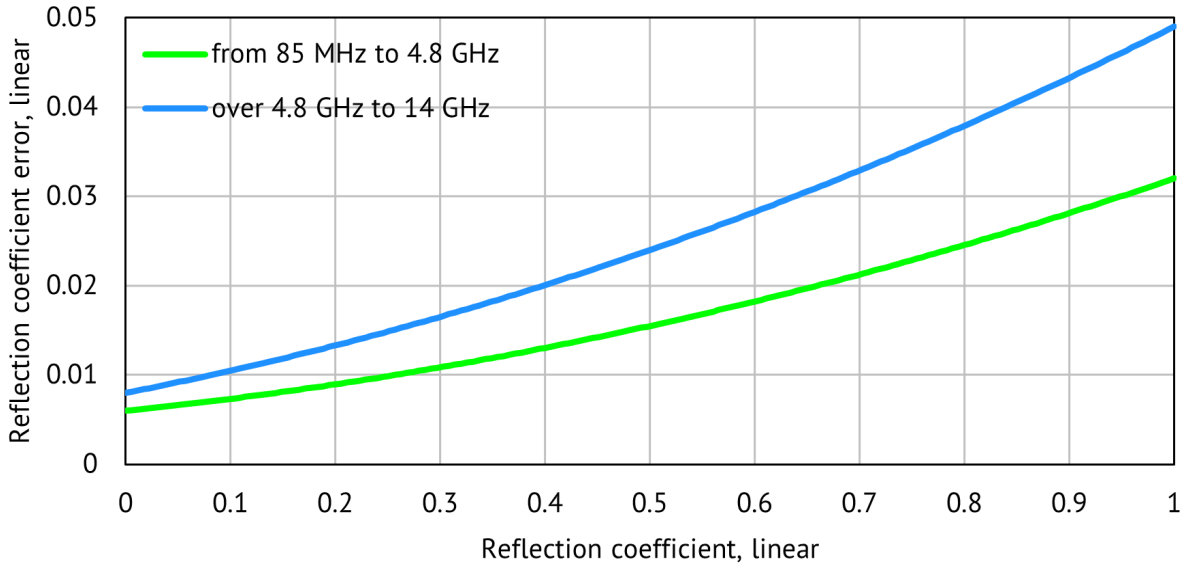
Dimensions

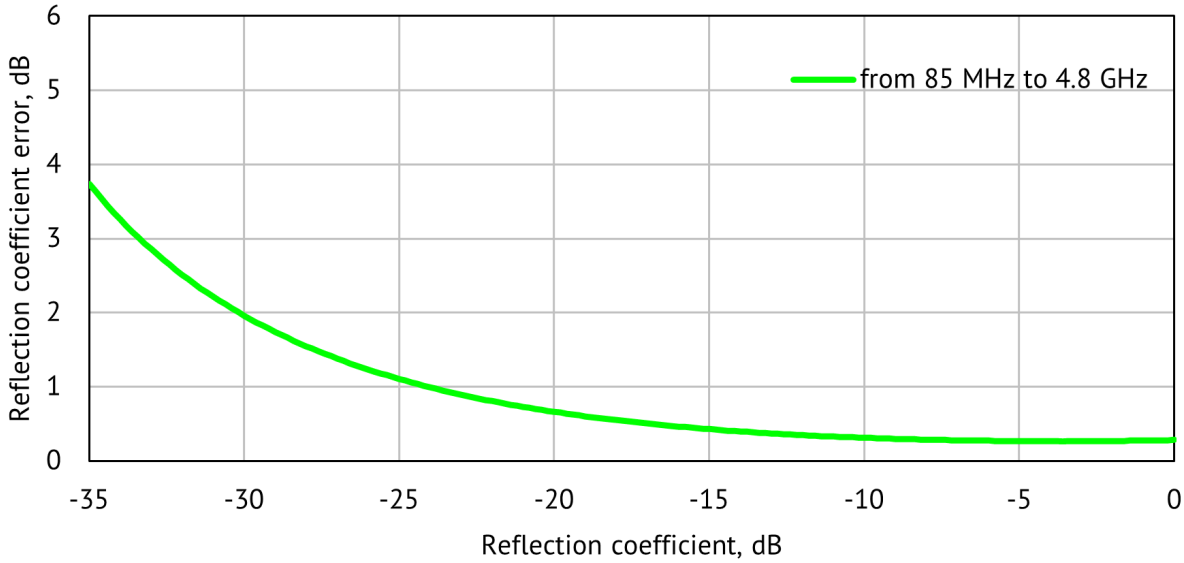
Weight	0.3 kg (10.6 oz)
Length	127 mm
Width	62 mm
Height	30 mm

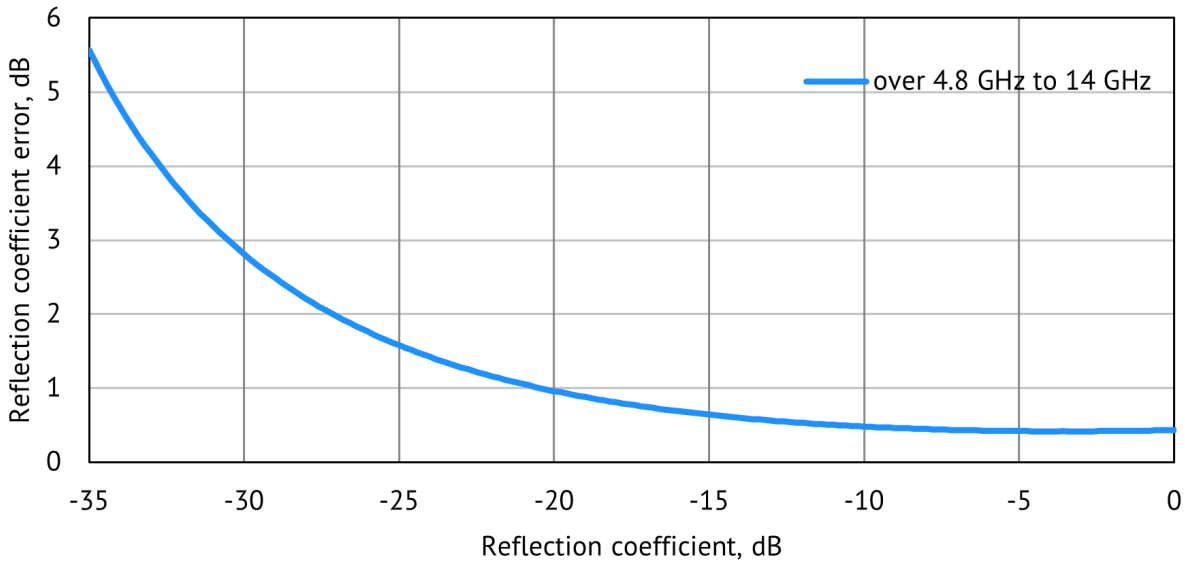
Environmental Specifications

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 Magnitude Errors







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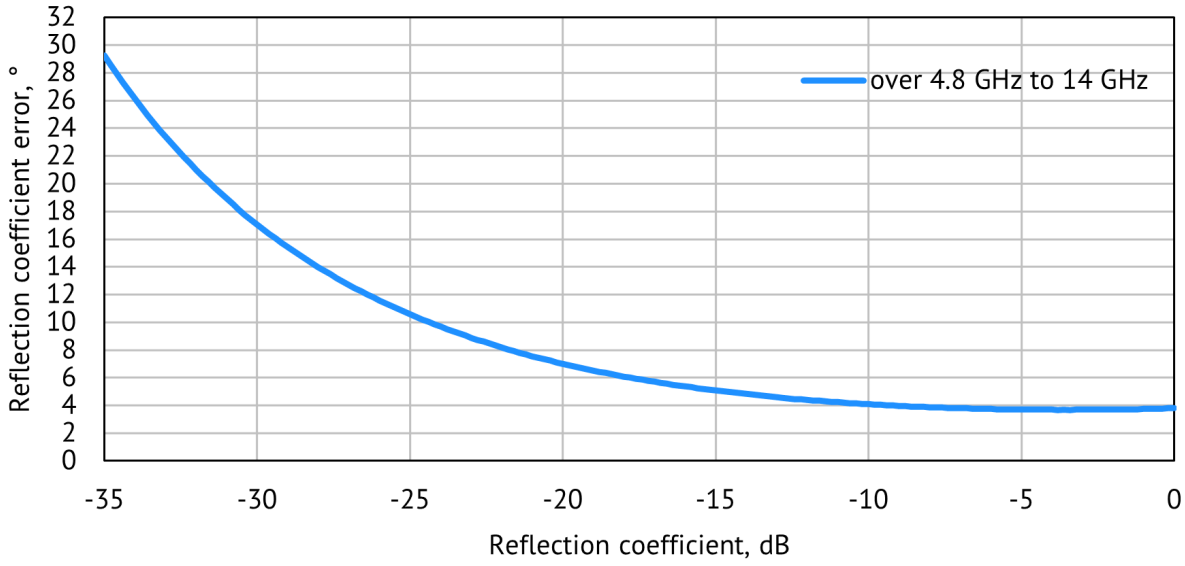
Reflection Phase Errors



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