

# Multiport Series: SN5090

VNAs available in 6-, 8-, 10-, 12-, 14-, and 16-ports



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- **Frequency range:** 300 kHz - 9 GHz
- **Wide output power range:** -45 dBm to +10 dBm
- **Dynamic range:** 140 dB typ (10 Hz IFBW)
- **Measurement time per point:** 24  $\mu$ s per point, min typ.
- **Time domain and gating** conversion included
- **Up to 500,001 measurement points**
- **Precision calibration** methods and automatic calibration

# SN5090-\*\* Specifications

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

Impedance	50 Ohm
Test port connector	type N, female
Number of test ports	6, 8, 10, 12, 14, 16
Frequency range	300 kHz to 9 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 300 kHz
Dynamic range <sup>2</sup>	
300 kHz to 5 MHz	110 dB (125 dB typ.)
5 MHz to 6 GHz	138 dB (140 dB typ.)
6 GHz to 9 GHz	125 dB (130 dB typ.)

## Measurement Accuracy

Accuracy of transmission measurements <sup>4</sup>	Magnitude / Phase
300 kHz to 5 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 / $\pm 6^\circ$
5 MHz to 6 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 / $\pm 2^\circ$
-98 dB to -80 dB	$\pm 1.0$ dB / $\pm 6^\circ$
6 GHz to 9 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 / $\pm 2^\circ$
-93 dB to -75 dB	$\pm 1.0$ dB / $\pm 6^\circ$
Accuracy of reflection measurements <sup>5</sup>	Magnitude / Phase
-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 / $\pm 20^\circ$
Trace noise magnitude (IF bandwidth 3 kHz)	
300 kHz to 6 GHz	0.002 dB rms
6 GHz to 9 GHz	0.004 dB rms
Temperature dependence	
300 kHz to 6 GHz	0.02 dB/°C
6 GHz to 9 GHz	0.04 dB/°C

## Effective System Data

300 kHz to 9 GHz	
Directivity	46 dB
Source match	40 dB
Load match	46 dB
Reflection tracking	$\pm 0.10$ dB
Transmission tracking	$\pm 0.08$ dB

## Uncorrected System Performance

300 kHz to 6 GHz	
Directivity	15 dB
Source match	15 dB
Load match	15 dB
6 GHz to 9 GHz	
Directivity	10 dB
Source match	15 dB
Load match	15 dB

## Test Port Output

Power range	
300 kHz to 6 GHz	-45 dBm to +10 dBm
6 GHz to 9 GHz	-45 dBm to +2 dBm
Power accuracy	$\pm 1.5$ 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. This specification applies at 10 Hz IF bandwidth. [3] Reflection and transmission measurement accuracy applies over the temperature range of  $(73 \pm 9)^\circ\text{F}$  or  $(23 \pm 5)^\circ\text{C}$  after 40 minutes of warming-up, with less than  $1^\circ\text{C}$  deviation from the full 2-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. [6] Specification applies over entire frequency range, at output power of 0 dBm. [7] Display update: OFF. © Copper Mountain Technologies - [www.coppermountaintech.com](http://www.coppermountaintech.com) - Rev. 2022Q2

# SN5090-\*\* Specifications

## Test Port Input

<b>Noise floor</b>	
300 kHz to 5 MHz	-110 dBm/Hz
5 MHz to 6 GHz	-138 dBm/Hz
6 GHz to 9 GHz	-133 dBm/Hz
<b>Damage level</b>	+26 dBm
<b>Damage DC voltage</b>	35 V

## Measurement Speed

Time per point	24 $\mu$ s typ.	
Port switchover time	200 $\mu$ s	
<b>Typical cycle time vs number of measurement points*</b>		
Number of points (IF bandwidth 300 kHz)	Uncorrected (1-port)	2-port calibration
51	4	8
201	9	17
401	14	28
1601	40.1	68.9

## Frequency Reference Input

<b>Port</b>	Ref IN 10 MHz
<b>External reference frequency</b>	10 MHz
<b>Input level</b>	-3 dBm to 3 dBm
<b>Input impedance</b>	50 Ohm

## Frequency Reference Output

<b>Port</b>	Ref OUT 10 MHz
<b>Internal reference frequency</b>	10 MHz
<b>Output reference signal level at 50 Ohm impedance</b>	-1 dBm to 3 dBm
<b>Connector type</b>	BNC, male

## Trigger Input

<b>Port</b>	Ext Trig In
<b>Input level</b>	
Low threshold voltage	1.1 V
High threshold voltage	2.6 V
<b>Input level range</b>	0 V to + 5 V
<b>Pulse width</b>	$\geq 2 \mu$ s
<b>Polarity</b>	positive or negative

## Trigger Output

<b>Port</b>	Ext Trig Out
<b>Maximum output current</b>	20 mA
<b>Output level</b>	
Low level voltage	0.0 to 0.6 V
High level voltage	3.0 to 3.8 V
<b>Polarity</b>	positive or negative
<b>Connector type</b>	BNC, male

## System & Power

<b>Operating system</b>	Windows 7 and above
<b>CPU frequency</b>	1.5 GHz
<b>RAM</b>	1 GB
<b>Interface</b>	USB 2.0
<b>Connector type</b>	USB B
<b>Power supply</b>	100-253 V, 50/60 Hz
<b>Power consumption</b>	
SN5090-06	50 W
SN5090-08	60 W
SN5090-10	65 W
SN5090-12	75 W
SN5090-14	80 W
SN5090-16	85 W

## Factory Adjustment

<b>Recommended factory adjustment interval</b>	3 years
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## Dimensions

<b>Length</b>	436 mm
<b>Width</b>	425 mm
<b>Height</b>	96 mm
<b>Weight</b>	
SN5090-06	12.8 kg
SN5090-08	12.9 kg
SN5090-10	13.8 kg
SN5090-12	13.9 kg
SN5090-14	14.9 kg
SN5090-16	15.0 kg

## Environmental Specifications

<b>Operating temperature</b>	+5 °C to +40 °C (41 °F to 104 °F)
<b>Storage temperature</b>	-50 °C to +70 °C (-58 °F to 158 °F)
<b>Humidity</b>	90 % at 25 °C (77 °F)
<b>Atmospheric pressure</b>	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.***



## Multiport VNAs Overview

	SN5090-6	SN5090-8	SN5090-10	SN5090-12	SN5090-14	SN5090-16
Frequency Range	300 kHz to 9 GHz	300 kHz to 9 GHz	300 kHz to 9 GHz	300 kHz to 9 GHz	300 kHz to 9 GHz	300 kHz to 9 GHz
Number of Ports	6 ports	8 ports	10 ports	12 ports	14 ports	16 ports

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