Technical Specifications

PXIe Vector Network Analyzer

VNA1009M

30 MHz to 9 GHz

中科四点零
RF-Cube

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Definitions

Specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Typical (typ) describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80 percent of the units exhibit with a 90 percent confidence level at room temperature (approximately 25 °C). Typical performance does not include measurement uncertainty.

Nominal (nom) values indicate the expected mean or average performance, or an attribute whose performance is by design. This data is not warranted and is measured at room temperature (approximately 25 °C).

Measured (meas) describes an attribute measured during the design phase for purposes of communicating expected performance. This data is not warranted and is measured at room temperature (approximately 25 °C).

Software Application

Measurement Capabilities	
Measured parameters	S11、S21、S22、S12
Number of measurement channels	256
Data traces	16 /channel
Measured points	2-4096 pts/trace
Data display formats	Logarithmic amplitude, linear amplitude, phase、
Sweep Features	
Linear frequency sweep	Support (minimum resolution 1kHz)
Frequency scan segmentation	Support (up to 256 segments/channel)
Power sweep	Support (1 dB minimum step)
Trigger modes	
Continuous trigger	Support
Single trigger	Support (Manual and external)
Trace functions	
Averaging	Support (up to 100 times)
IF bandwidth	1000kHz/300kHz/100kHz/30kHz/10kHz/3kHz/1kHz/300Hz/100Hz/30Hz/10Hz
Scale	Support
Marker functions	
Marker numbers	8 /trace
Reference marker	Support
Calibration functions	
Mechanical calibration	Support
Electronic calibration	Support for ancillary products (no third-party electronic calibrators)
Calibrated algorithm	Single-port (OSL), two-port (TR, ER, SOLT, TRL, UT)
Impedance conversion	Support
Port extension	Support
Embedding	Support
De-Embedding	Support
System settings	
Status storage	Support
Status restored	Support
Data storage	Support (sNp format)
Restore the presets	Support

System Specifications

Frequency range	
Model number	VNA1009-M
Frequency range	30MHz～9GHz
Resolution	1kHz
Frequency accuracy	±3ppm
Frequency switching speed	
Lockout time	15us
Dynamic Range	
30MHz～0.5GHz	96 dB
0.5GHz～6GHz	102 dB
6GHz～9GHz	96 dB

Corrected performance (Use mechanical calibration Module)

Directivity	
30MHz～0.5GHz	40 dB
0.5GHz～6GHz	38 dB
6GHz～9GHz	36 dB
Source Match	
30MHz～0.5GHz	39 dB
0.5GHz～6GHz	34 dB
6GHz～9GHz	33 dB
Load Match	
30MHz～0.5GHz	40 dB
0.5GHz～6GHz	38 dB
6GHz～9GHz	36 dB
Transmission Tracking	
30MHz～0.5GHz	±0.08 dB
0.5GHz～6GHz	±0.12 dB
6GHz～9GHz	±0.18 dB
Reflection Tracking	
30MHz～0.5GHz	±0.07 dB
0.5GHz～6GHz	±0.10 dB
6GHz～9GHz	±0.15 dB

Test Port Output

Maximum output port power	
30MHz～0.5GHz	+10 dBm
0.5GHz～6GHz	+10 dBm
6GHz～9GHz	+10 dBm
Nominal power	
30MHz～9GHz	0 dBm
Power range	
30MHz～0.5GHz	+10 dBm～ -30 dBm
0.5GHz～6GHz	+10 dBm～ -30 dBm
6GHz～9GHz	+10 dBm～ -30 dBm
Power level accuracy	
30MHz～0.5GHz	±1.0 dB
0.5GHz～6GHz	±1.0 dB
6GHz～9GHz	±1.0 dB
Source harmonics	
30MHz～0.5GHz	-6 dBc
0.5GHz～6.5GHz	-8 dBc
6.5GHz～9GHz	-20 dBc

Test Port Input

Test port input damage level	
30MHz～9GHz	>+27 dBm，>±35 VDC，>1000V ESD
Receiver level accuracy	
30MHz～9GHz	±1 dB
Noise floor	
30MHz～0.5GHz	-90 dBm
0.5GHz～6GHz	-96 dBm
6GHz～9GHz	-90 dBm
Magnitude trace noise	
30MHz～0.5GHz	0.006 dB rms
0.5GHz～6GHz	0.006 dB rms
6GHz～9GHz	0.006 dB rms
Phase trace noise	
30MHz～0.5GHz	0.04° rms
0.5GHz～6GHz	0.04° rms
6GHz～9GHz	0.04° rms

Measurement speed

Typical cycle time (full frequency span, 1000 kHz IF bandwidth, includes data transfer)			
Number of points	201	401	801
Uncorrected	11 ms	16.7 ms	29.1 ms
2-port calibration	18.7 ms	29.9 ms	53.8 ms
Typical cycle time(full frequency span, 100 kHz IF bandwidth, includes data transfer)			
Number of points	201	401	801
Uncorrected	11.7 ms	19.9 ms	35.3ms
2-port calibration	20.7 ms	35.5ms	64.88 ms

General Specifications

Remote programming	
Interfaces	PXIe (for PXI hybrid slots)
Control languages	Factory defined SCPI
Power requirements	
12VDC，20W maximum	
Operating temperature range	
0 to 50℃	
Storage temperature range	
-20 to 70℃	
Operating and storage altitude	
Up to 15,000 feet	
Humidity	
Relative humidity type test:95%, +40°C (non-condensing)	
Memorizer	
Depends on the PC	
Weight	
≤0.5kg	
Size	
Single-slot PXI： Height: 128.4mm±1mm Width: 19.9mm±1mm Length: 212.6mm±1mm	
Recommended calibration cycle	
24 months	
ISO compliant	
This instrument is manufactured in an ISO-9001 registered facility in concurrence with RF-Cube commitment to quality.	

Connectors

Front panel connectors	
Test Port (Port 1/2)	RF signals are input/output via SMA female connectors Impedance: 50Ω（nominal) Input damage level：+27dBm
Reference input	Connector：MMPX Accept a 10 MHz reference signal used to frequency lock the internal time base; nominal input level 0 dBm to 10 dBm, impedance 50 Ω, sine wave.
10MHz output	Connector：MMPX Output the 10 MHz reference signal used by internal time base. level nominally +3 dBm; nominal output impedance 50 Ω; input damage level is +18 dBm.
Local oscillator input/output	Connector: SMA female Impedance: 50Ω（nominal) Output nominal level: -2dBm Input damage level: +20dBm
Trigger in	Connector: MMPX Trigger Type: Edge Impedance: 1kΩ（nominal) Level Range: 3.3V CMOS (TTL Compatible, 5V Tolerant)
Trigger out	Connector: MMPX Level Range: 3.3V CMOS (TTL Compatible, 5V Tolerant)
The trigger output is ready	Connector: MMPX Impedance: 50Ω（nominal) Level Range: 3.3V CMOS (TTL Compatible, 5V Tolerant)