



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
 Powai, Mumbai 400076.

PR No. 1000029935 (Rfx No. 6100001473)
Detailed Technical Specifications for Vector Network Analyser

Vector Network Analyser Specifications- (Qty 1)

Waveform type	Sinusoidal
Frequency range	1 Hz to 50 MHz
Signal level range	-30 dBm to 13 dBm, 0.007 VRMS to 1 VRMS (@ 50 Ω load)
Source level accuracy	± 0.3 dB (1 Hz to 1 MHz), ± 0.6 dB (1 MHz to 50 MHz)
Source level frequency response (flatness)	± 0.3 dB (typical, referring to 10 MHz)
Frequency accuracy after adjustment	± 2 ppm ± quantisation error (= 0.5 · step size)
Frequency stability	± 2 ppm (< 1 year after adjustment) ± 4 ppm (< 3 years after adjustment)
Frequency step size / resolution	0.00605 Hz (1 Hz to 100 Hz) 0.03632 Hz (100 Hz to 50 MHz)
Source impedance	50 Ω
Return loss (1 Hz to 50 MHz)	> 30 dB, > 35 dB (typical)
Spurious signals & harmonics	< -55 dB (typical)
Connector type	BNC

Input impedance (software switchable)	High: 1 MΩ ± 2% 40...55 pF Low: 50 Ω
Return loss @ 50 Ω input impedance	> 28 dB, > 35 dB typical (1 Hz to 50 MHz)
Receiver bandwidth - RBW (software selectable)	1 Hz, 3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 5 kHz
Noise floor (S21 measurement) RBW = 10 Hz, PSOURCE = 13 dBm, Attenuator CH1: 20 dB, CH2: 0 dB	1 Hz to 10 kHz: -115 dB (typical) 10 kHz to 10 MHz: -125 dB (typical) 10 MHz to 50 MHz: -105 dB (typical)
Input attenuators (software selectable)	0 dB, 10 dB, 20 dB, 30 dB, 40 dB
Input sensitivity / range	100 mVRMS full scale @ 0 dB input attenuator 10 VRMS full scale @ 40 dB input attenuator
No of Input Channels	2
Input channels dynamic range	> 100 dB
Gain error	< 0.1 dB
Phase error	< 0.5°
Connector type	BNC

Must Include in the box

- Vector Network Analyzer
- Analyzer Suite on DVD Printed Quick Start Guide (English)

- Power supply (100 V - 240 V / 47 Hz - 63 Hz)
- USB cable
- 4 x 0.5 m BNC cable 50 Ω (m - m)
- 1 x BNC T-adapter (f - f - f)
- 1 x BNC straight adapter (f - f)
- 1 x BNC 50 Ω load (m)
- 1 x BNC short circuit (m) Test objects: quartz filter and IF filter on a PCB

Required Accessories for Vector Network Analyser

1. Wide band Injection Transformer-(Qty 1)

- Usable frequency range 1 Hz – 10 MHz
- Insertion loss < 0.5 dB @ 10 kHz
- 3 dB frequency range 7 Hz – 5 MHz
- Prim-Sec Isolation voltage 600 V CAT II
- prim-Sec capacitance 120 pF @ 1kHz
- Max. volt-second 3.5e-3 Vs
- DC saturation current 15 mA

2. Signal Power Amplifier -(Qty -1)

- Frequency range DC – 50 MHz
- Gain (1 Hz – 50 MHz) 12 dB \pm 0.25 dB into 50 Ω
- Signal connector type BNC
- Maximum input signal \leq 1 VRMS (\cong 13 dBm / 2.83 VPP)
- Input impedance 50 Ω
- Input return loss > 30 dB
- Damage level 10 VPP
- Maximum output amplitude 25 dBm (\cong 11.3 VPP) into 50 Ω
- Output impedance 50 Ω
- Output return loss > 30 dB
- Output DC offset < 10 mV
- Damage reverse power 1 W
- Input to CH1 attenuation 14.5 dB typ. (output terminated with 50 Ω)
- Input to CH2 attenuation 20.8 dB typ. (output terminated with 50 Ω)
- Output to CH2 voltage gain -33 dB typ. (\cong x0.022) into 50 Ω
- CH1 / CH2 return loss > 25 dB
- Rating Supply voltage range 10 – 36 VDC

3. Impedance Test Fixture for Thru-Hole components (Qty-1)

- Frequency range 1 Hz to 50 MHz
- Recommended impedance measurement range 20 m Ω to 600 k Ω
- Calibration Board accuracy 100 Ω \pm 0.1%, 15 ppm/ $^{\circ}$ C

Must include in the box

1. Calibration board
2. Fixture

3. BNC/BNC cables and all required cables for interfacing with the Vector Network Analyser
4. **Impedance Test Fixture for Surface Mount components (Qty-1)**
 - Frequency range 1 Hz to 50 MHz
 - Recommended impedance measurement range 20 mΩ to 600 kΩ

Must include in the box

1. Load Calibration Resistors 100 Ω ± 0.1%
2. Fixture
3. BNC/BNC cables and all required cables for interfacing with the Vector Network Analyser

Warranty- 1 Year from the date of Invoice.