

SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, LONGOWAL

NAME OF FIRM/AGENCY

Technical Bid **E-tender No. :PUR/23/2019-20**

Category: B **Department: Electronics and Communication Engg (Project)**

S.No. **Name of Item/ Equipment** **Detailed Specifications (General)** **Quantity**

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| 1 | Vector Network Analyzer (VNA) | <p>Benchtop model with 4- Ports & In-built display (26.3 cm (10.4 in) diagonal color active matrix LCD; 1024 (horizontal) X 768 (vertical) resolution, Touch Screen)</p> <p>Frequency Range 300KHz to 20GHz or better</p> <p>Aging Rate +/- 0.1 ppm/yr maximum or better</p> <p># Bandwidth 1 Hz to 15 MHz or better</p> <p>Frequency Resolution 1Hz or better</p> <p>Test port dynamic range with FBW: 10 Hz 128dB @ 3GHz or better</p> <p>105dB @ 20GHz or better</p> <p>Typical dynamic range 139dB @ 3GHz or better</p> <p>121dB @ 20GHz or better</p> <p>Directivity with Cal Kit 44 dB @ 3GHz or better</p> <p>44dB @ 20GHz or better</p> <p>Source Match with Cal Kit 31 dB @ 3 GHz or better</p> <p>31 dB @ 20 GHz or better</p> <p>Load Match with Cal Kit 44 dB @ 3 GHz or better</p> <p>44 dB @ 20 GHz or better</p> <p>Reflection Tracking with Cal Kit +/- 0.06 dB @ 3GHz or better</p> <p>+/- 0.06 dB @ 20GHz or better</p> <p>Transmission Tracking with Cal Kit +/- 0.07 dB @ 3GHz or better</p> <p>+/- 0.07 dB @ 3GHz</p> <p>+/- 0.11 dB @ 20GHz or better</p> <p>1.0 dB @ 3 GHz or better</p> <p>Crosstalk -108 dB @ 20 GHz or better</p> <p>Trace Noise at IFBW = 10Hz 7m dB rms @ 5GHz (IFBW=1kHz) or better</p> <p>10m dB rms @ 20GHz or better</p> <p>Trace Stability 0.01 dB/°C @ 3 GHz or better</p> <p>0.03 dB/°C @ 20GHz or better</p> <p>+/- 4dBm @ 3 GHz typ. +/- 4dBm or better</p> <p>-2 dBm @ 20GHz typ. +/- 4dBm or better</p> <p>Noise Level -115 dBm/Hz @ 3GHz or better</p> <p>-115 dBm/Hz @ 20GHz or better</p> <p>Test port Connector 3.5 mm (male) ruggedized with 50 Ohm impedance</p> <p>Input damage level >+27 dBm; <EVMC or better</p> <p>Measurements & Display Format Full 2 port 4 parameter measurement S11, S22, S12, S12, S12 & display formats should have Log magnitude, Linear magnitude, VSWR, Polar, Delay, Phase, Real, Imaginary, Smith chart, Inverted Smith etc.</p> <p>Sweep Types Frequency sweep both forward & reverse Power sweep both forward and reverse Arbitrary Segment Sweep Linear, phase.</p> <p>Calibration Types Supported thru, SOLT, DSO17, Enhance response, 1-port reflection, Open /Short response, Thru response. Software featuring for de-embedding, port matching, and impedance transformation.</p> <p>Interfaces 4 ports on front and 5 ports on rear panel.</p> <p>Power Requirement 50W/400 Hz for 120 to 140 VAC 50/60Hz for 220 to 240 VAC</p> <p>In-built CPU Intel® i7 GHz Celeron® with 4 GB RAM</p> <p>Software Provide Software support for RF and Microwave design in single platform containing Schematic, Layout, integrated EM simulation along with System Simulation capability & Should be capable of efficient Circuit envelope simulation for complex digitally modulated RF signals in addition to templates for designing linearizers, RF Systems, and PLL Systems.</p> <p>Spectrum Analyzer feature/future upgradable) Instrument should be upgradeable to accommodate built in high performance microwave spectrum analyzer enabling for stepped FFT sweeps & spurious searches.</p> <p>Cables Rugged phase-stable cable, 3.5 mm (m) to 3.5 mm (f), 20 GHz or more, 3.28 ft two nos. with below specs 3.5 mm(m) to 3.5 mm(f), 50 ohm nominal impedance a) 3.28 ft. or 3 meter b) Max frequency: 20 GHz or More c) Typical VSWR: 1.45 or More d) Typical insertion loss: 1.48 dB or better e) Typical phase stability: +/- 6.56 degrees or More f) Typical amplitude stability: +/- 0.25 dB or More g) Nominal velocity of propagation: 85%, Nominal dielectric constant: 1.4 or better</p> <p>Upgrade Features Instrument to have the capability to be upgraded to determine the intrinsic electromagnetic properties of many dielectric materials. Measures complex permittivity for products like Capacitor, substrates, PCB, PCB antenna, ferrites, magnetic recording heads, absorbers, SAR phantom materials, sensor. It should be able to measure parameters like ϵ_0, ϵ', ϵ'', $\tan \delta$, μ_0, μ', μ'', $\tan \delta_0$ and Cole-Cole) for solids, palette, torroids, etc. wrt to wide frequency range</p> <p>Calibration service certified calibration facility</p> <p>Warranty</p> <p>AMC</p> | 1 |
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| 2 | Calibration Kit: | <p>A compatible Mechanical calibration kit containing precision standard devices to characterize the systematic errors of network analyzers in the 3.5 mm interface is required to use with item no. 1 i.e Vector Network Analyzer. This kit should also contain adapters to change the polarity of the test port and a torque wrench for proper connection.</p> <p>Key Features & Specifications</p> <p>Type 3.5 mm (m), 50 ohm. DC to 20 GHz or more Should contain offset opens & shorts, and broadband loads & three 3.5 mm adapters One torque Wrench - 5/16 inches - 90 N-cm (8 in-lb) One 7 mm open-end wrench</p> <p>Opens +/-0.0064 to -0.0064 mm +/-0.0025 to -0.0025 in</p> <p>Shorts +/-0.0043 to -0.0043 mm +/-0.0016 to -0.0016 in</p> <p>Measurement Uncertainty:- Fixed Loads +/-0.0043 to -0.0043 mm +/-0.0016 to -0.0016 in Adaptor +/-0.0043 to -0.0043 mm +/-0.0016 to -0.0016 in</p> <p>Broad Band Loads (male & female) at freq 5 20 GHz Return loss > 35 dB</p> <p>Offset Opens (male & female) at freq 5 20 GHz +/-2.00% deviation from nominal</p> <p>Offset Shorts (male & female) at freq 5 20 GHz +/-1.75 % deviation from nominal</p> | 1 |
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Note - This calibration kit should compatible with the item no.1 i.e Vector Network Analyzer

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| 3 | RF Sensors | <p>Frequency range 10MHz to 18 GHz or more</p> <p>Measurement speed for diodes/mosfet sensor, > 400 readings/s (free run/fast buffer mode) or better</p> <p>Power linearity less than 0.8% or better</p> <p>Dynamic range -35 dBm to +20 dBm or better</p> <p>Connector Type N-Type (m), 50 Ohm</p> <p>Current requirement 400 mA (approximately)</p> <p>ADC resolution 24 bits</p> <p>Interface USB 2.0 interface, USB-TMC compliant</p> <p>Operating Temperature 0 °C to 55 °C</p> <p>Software to connect, control instrument, and automate test sequences Digital meter Analog meter Data log view Multi-list with ratio / delta function Compact mode display Single marker (up to 5 markers per graph) Dual marker (up to 2 sets of markers per graph) Graph auto-scaling Graph zooming</p> <p>Graph functions in software</p> <p>This USB sensor should be compatible with item no.1 i.e Vector Network Analyzer for highly accurate power Measurements.</p> | 1 |
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