



WR15 WR12 WR10 WR08 WR06 WR05 WR03 WR02

V15VNA2 Low Power Series WR15 Frequency Extension Modules 50 to 75 GHz

DESCRIPTION

The V15VNA2 Low Power Series provides a low power solution which expands your existing Vector Network Analyzer (VNA) capabilities so you can conduct industry-leading millimeter wave S-parameters in WR15 (50-75 GHz). These frequency extension modules connect to your existing test port(s) and leverage the inherent microwave network analyzer's performance and features to display two-port S-parameters: S_{11} , S_{21} , S_{12} , and S_{22} . Four architectures are available: 1-port, scalar 2-port, 1-path/2-port, and fully-reversing 2-port. Waveguide calibration kits are available as separate accessories.



HIGHLIGHTS

- Dynamic Range of 105 dB
- Output Power of 0 dBm
- Optional Manual Attenuation of 0 to 25 dB
- Raw Directivity of 37 dB
- Raw Test Port Match of 17 dB
- Stability of ± 0.2 dB & ± 2 deg

APPLICATIONS

- S-parameters for millimeter wave devices
- Truly broadband on-wafer device characterization
- Pulse setups to mitigate power handling considerations
- Filter passband and rejection verification
- Antenna characterization for lobes and polarization
- True differential measurements

ELECTRICAL AND PERFORMANCE SPECIFICATIONS (+25°C)

After a one hour warm-up period, the V15VNA2 module will satisfy the following specifications.

| Electrical Characteristics ¹ | MIN | TYP | MAX |
|--|---------|--------------|--------|
| System Operating Frequency | 50 GHz | -- | 75 GHz |
| Test Port Output Power ² | -- | -2.5 dBm | 0 dBm |
| System Dynamic Range ³ | 92 dB | 105 dB | -- |
| Reflection & Transmission Tracking, Magnitude ⁴ | -- | ± 0.2 dB | -- |
| Reflection & Transmission Tracking, Phase ⁴ | -- | ± 2 deg | -- |
| Raw Coupler Directivity (T/R module only) ⁵ | 35 dB | > 37 dB | -- |
| Residual Directivity (with system error correction) | -- | >40 dB | -- |
| Raw Test Port Match ⁵ | -- | > 17 dB | -- |
| Residual Source & Load Match (with system error correction) | -- | >35 dB | -- |
| Test Port Input Power @ 0.1 dB compress (T/R & T modules) ⁵ | -- | +8 dBm | -- |
| Test Port Input Damage Level | +20 dBm | -- | -- |
| Optional Manually Adjustable Attenuator (T/R & S modules) ⁶ | 0 dB | 25 dB | -- |
| Operating Temperature Range | +20 °C | +25 °C | +30 °C |

¹Specifications are typical and subject to change without notice

²As there are no internationally recognized power standards above 110 GHz, any power data supplied above 110 GHz is traceable only to OML's Calorimeter

³Measured with Keysight PNA-X (N524xA) at 10 Hz IF bandwidth

⁴At +25°C, measured for 1 hr after 1 hr warm-up. Based on "perfect" RF & LO test cables not moved after warm-up and calibration. Not tested.

⁵Not tested

⁶Available as an option (Option A)

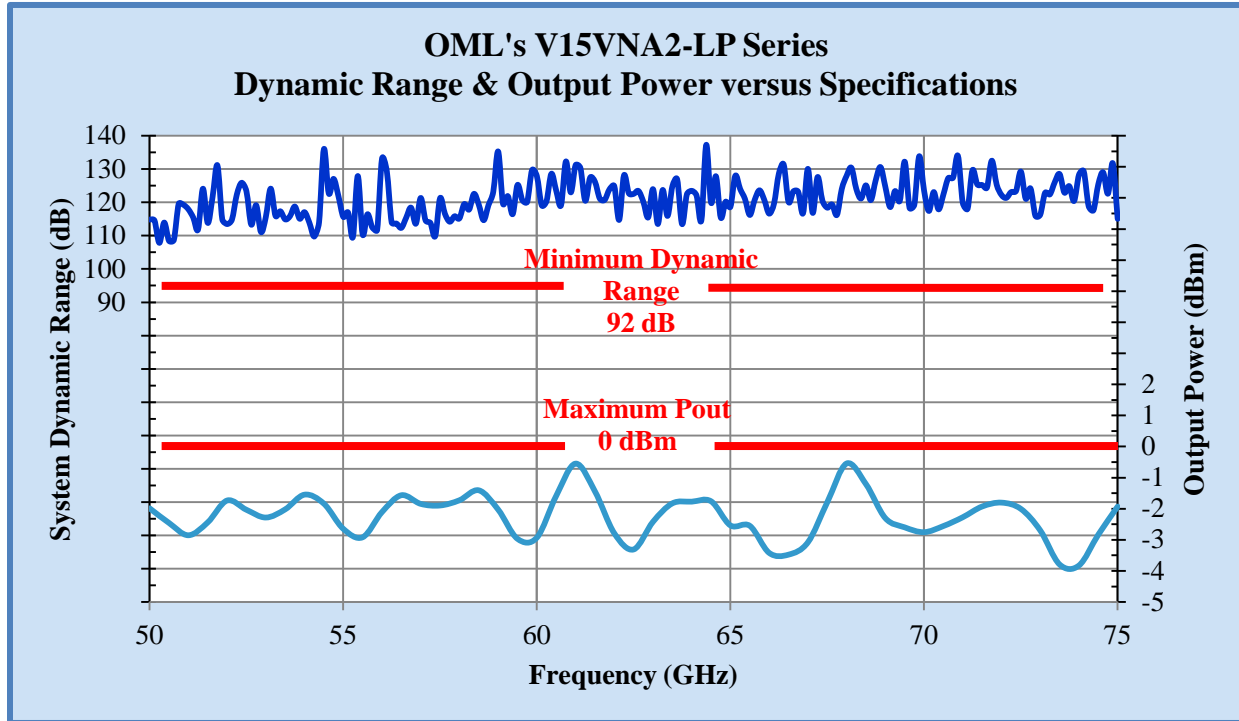
| Module Characteristics ¹ | Description |
|---|--|
| Test Port, System Output Interface ⁷ | WR-15 |
| RF System Input Interface, SMA(f), T/R & S modules | |
| RF Input Frequency | 12.5 to 18.4 GHz |
| RF Input Power | +10 dBm \pm 1.5 dB |
| RF Input Damage Level | +20 dBm |
| RF Multiply Factor | x6 |
| LO System Input Interface, SMA(f), All modules | |
| LO Input Frequency | 9.3 to 13.8 GHz |
| LO Input Power | +10 dBm \pm 1.5 dB |
| LO Input Damage Level | +20 dBm |
| LO Multiply Factor | x8 |
| IF Output Frequency, SMA(f), All modules | 5 to 300 MHz |
| DC (+12 VDC) Power Requirements: T/R & S versus T | 1.5A / 0.5A, typ |
| Size (L x W x H, excludes rubber feet & output WG length) | 13.0" x 4.3" x 2.7" (T module: L = 4.7") |
| Weight: T/R & S versus T | ≤ 6.0 lbs. / ≤ 3.0 lbs. |

⁷Test Port Flange Configuration is compatible with MIL-DTL-3922/67D (UG387/U-M)



TYPICAL PERFORMANCE

The following typical performance is possible with the V15VNA2 Series modules.



ORDER INFORMATION

| S-parameters {Architecture} | $S_{11}, S_{21}, S_{12}, S_{22}$ {Full 2-port} | (S_{11}, S_{21}) or (S_{12}, S_{22}) {1-path / 2-port} | S_{21} or S_{12} only {Scalar 2-port} | S_{11} or S_{22} only {Vector 1-port} |
|-----------------------------|--|--|---|---|
| Test Port Module(s) | V15VNA2-T/R-LP V15VNA2-T/R-LP | V15VNA2-T/R-LP V15VNA2-T | V15VNA2-S-LP V15VNA2-T | V15VNA2-T/R-LP |
| Option A | In T/R or S module, adds Manually Adjustable Attenuator (0-25 dB) to RF path | | | |
| Option RLA | In T/R or S module, adds amplifier (15 dB gain) in RF&LO paths for drive input of -5 dBm | | | |
| Option LOA | In T module, adds amplifier (15 dB gain) in LO path for drive input of -5 dBm | | | |
| Option IMD | In T/R module, adds second tone for Intermodulation Distortion Measurement | | | |

Standard accessories for each module includes: DC Power Cable (V00DCBC1), Waveguide Section (V15WG2), and 20 dB Attenuator (V15AT20).

MECHANICAL DIMENSIONS (If necessary, contact OML for more detailed drawings)

