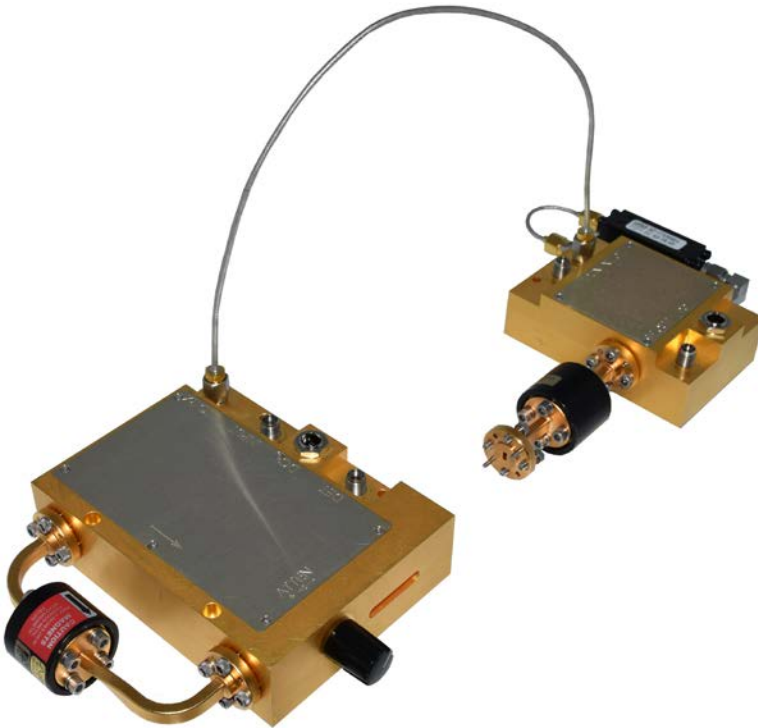


## SPARTAN TEST MODULES



Spartan-12 Test Module

### FEATURES:

- V/E band multiple test applications
- Works with any make, model, or vintage of Vector Network Analyzer
- Scalar Network Analyzer compatible
- Downconverter for spectrum analyzer testing
- Compact size

### APPLICATIONS:

- V/E band test equipment
- Insertion loss, gain, phase measurements
- Ideal for test applications that require high dynamic range (switches, filters, etc.)

## DESCRIPTION

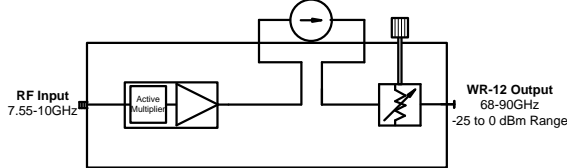
Millitech series STM Spartan Test Modules provide V- and E-Band test sets for extending network analyzer coverage to 54-69 (V) or 68-90 GHz (E). Built in detectors allow compatibility with Scalar Network Analyzers (SNA). The RX module can function as a down-converter for spectrum analyzer testing.

STM Spartan test modules provide a cost effective solution to V and E band measurements for insertion loss, gain, phase, etc.

## STM-12 ELECTRICAL SPECIFICATIONS

### E-Band Source Module Specifications

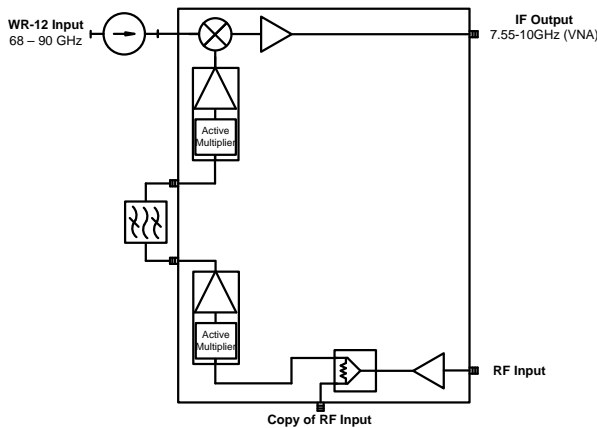
#### Source Module



<b>RF Input:</b>	7.55 – 10 GHz @ +10 dBm - SMA Connector
<b>Source Power:</b>	+4 dBm typical at max setting, 71-86 GHz
<b>Adjustable Range:</b>	25 dB
<b>Flatness:</b>	+/- 1.15 dB
<b>Harmonic Spur Levels:</b>	-20 dBc, 71-86 GHz
<b>VSWR:</b>	< 1.3:1
<b>Phase Noise:</b>	19 dB above input source

### E-Band RX Module Specifications

#### Rx Module



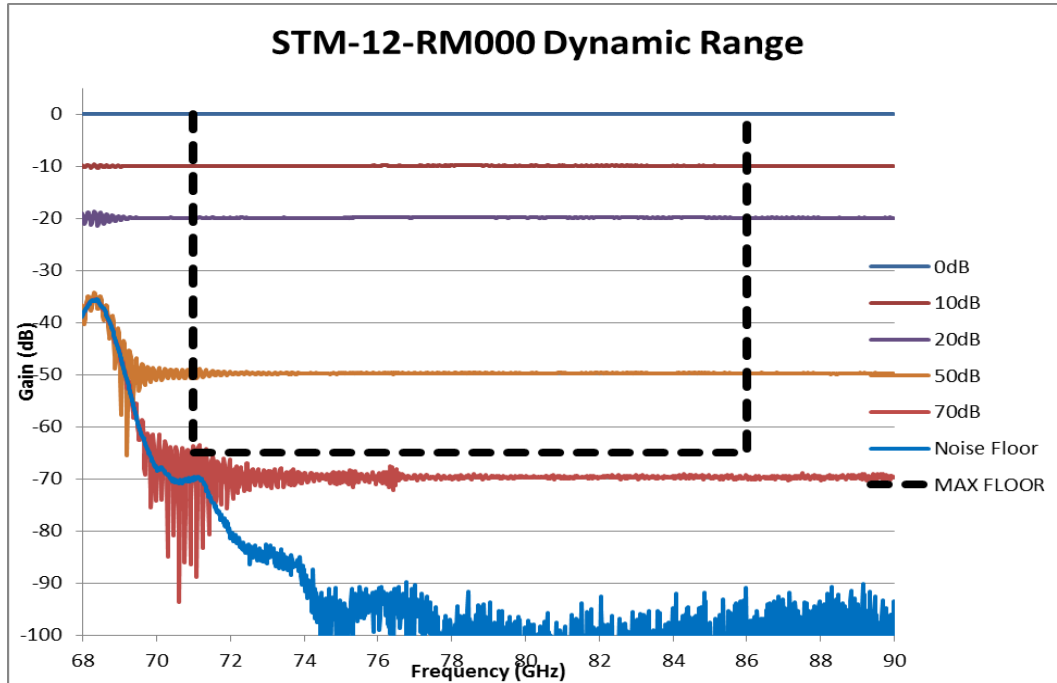
<b>RF Input:</b>	7.55 – 10 GHz @ -2 dBm - SMA Connector
<b>Dynamic Range:</b>	60 dB typical, 71-86 GHz. See plot.
<b>1 dB Compression Point:</b>	0 dBm typical at input
<b>Recommended Linear Range:</b>	-5 dBm max
<b>Noise Floor:</b>	< -65 dBm typical, 71-86 GHz
<b>VSWR:</b>	< <u>1.4:1</u>

Environmental temperature of 23°C +/- 3° with < 1°C deviation from calibration temperature.

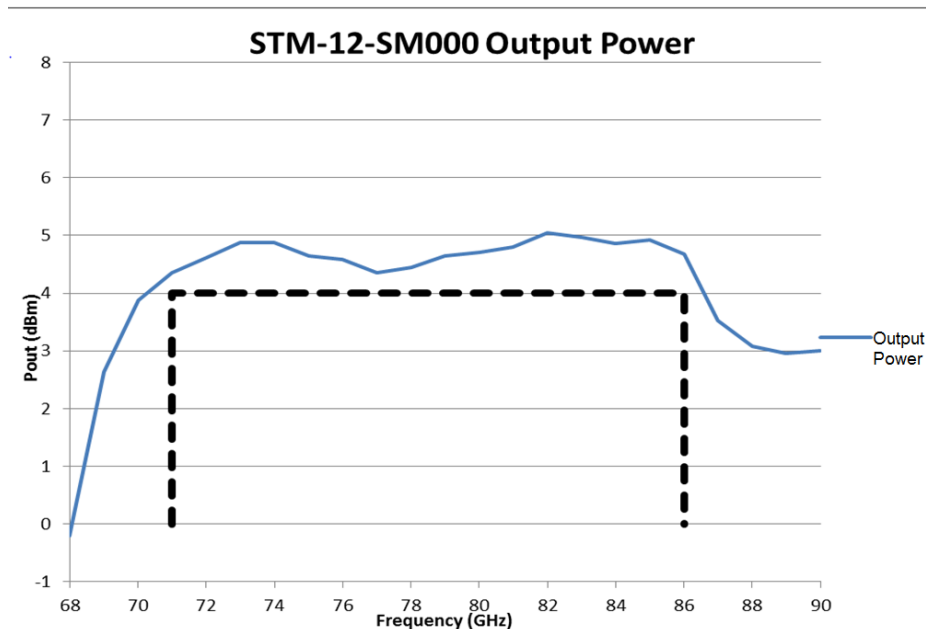
**System Temperature Stability:** 0.055 dB/°C typical, 71-86 GHz.

## MEASUREMENT RESULTS

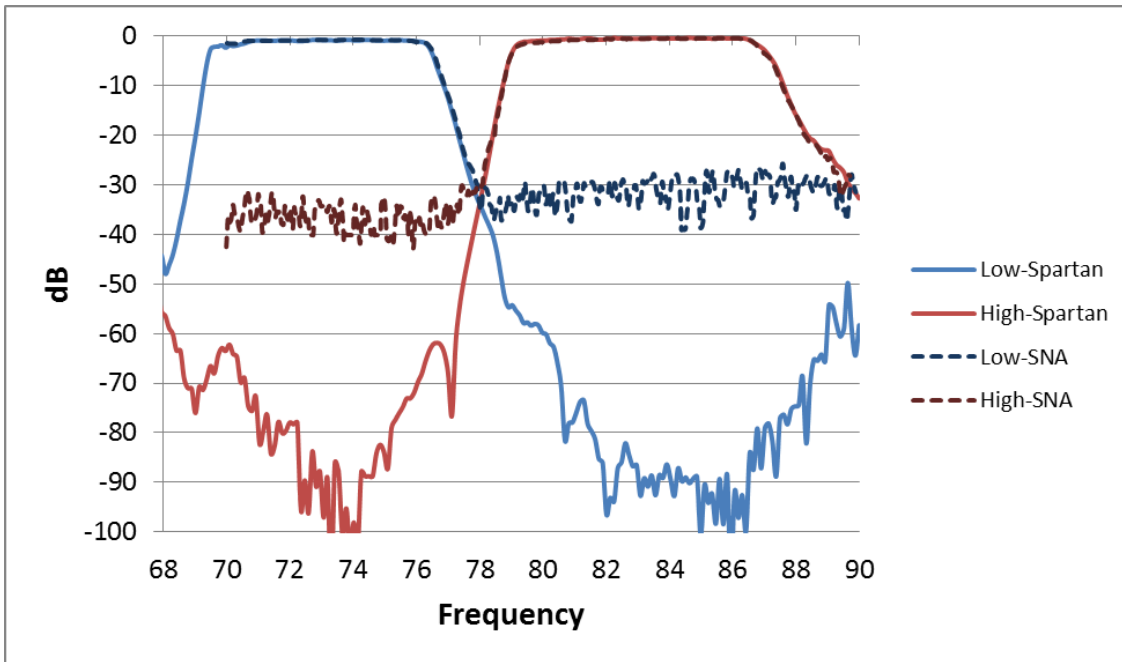
### Spartan-12 Vector Network Analyzer Dynamic Range



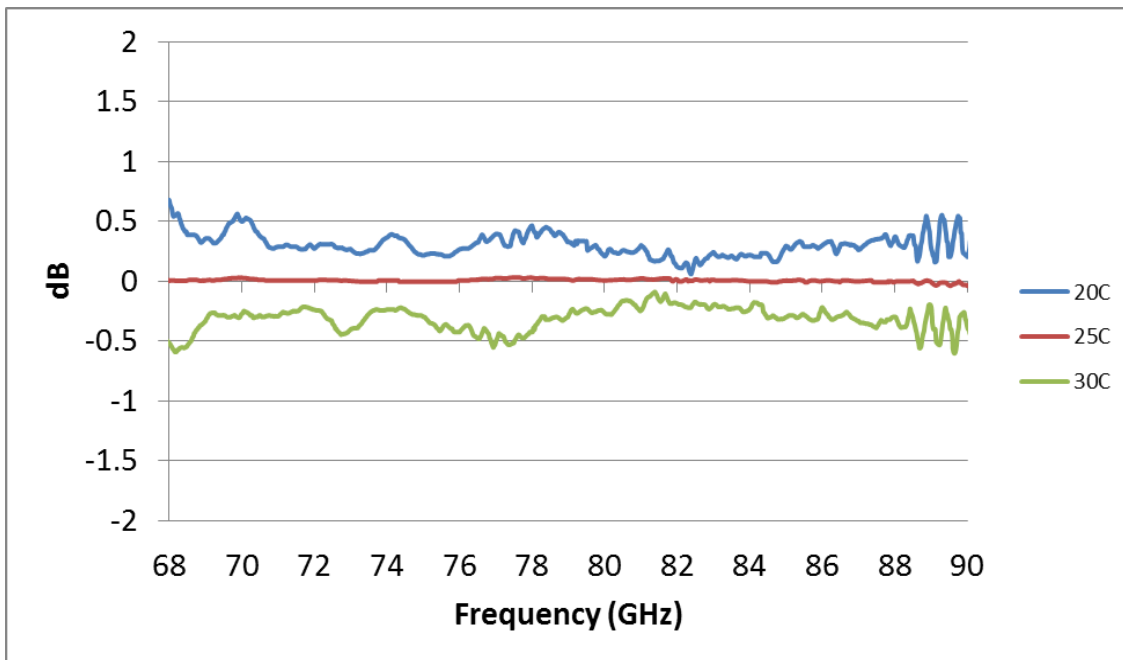
### Spartan-12 Source Power



## E-Band Diplexer Measurement Comparison: Spartan-12 Network Analyzer vs Millimeter Wave Scalar Network Analyzer

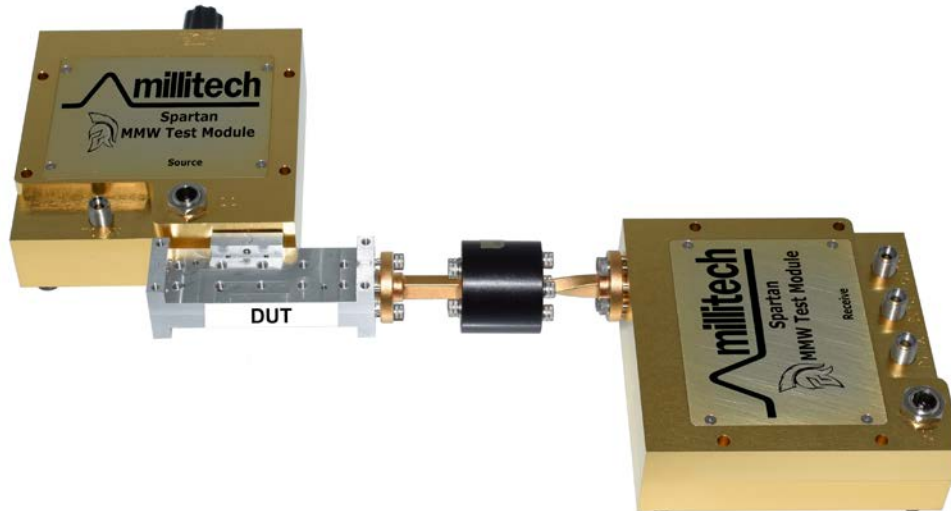


## Spartan-12 Temperature Stability



\*\*\*Normalized at 25°C. Measured at 20°C, 30°C, and then returned to 25°C. Results plotted.

## STM-15 ELECTRICAL SPECIFICATIONS



Spartan-15 test module, shown with device under test

### V-Band Source Module Specifications

<b>RF Input:</b>	6.00 – 7.67 GHz @ +12 dBm SMA Connector
<b>Source Power:</b>	-7 dBm at min attenuation setting
<b>Adjustable Range:</b>	25 dB
<b>Flatness:</b>	+/- 2.5 dB typ.
<b>Harmonic Spur Levels:</b>	-20 dBc
<b>VSWR:</b>	< 1.6:1
<b>Phase Noise:</b>	19 dB above input source

### V-Band RX Module Specifications

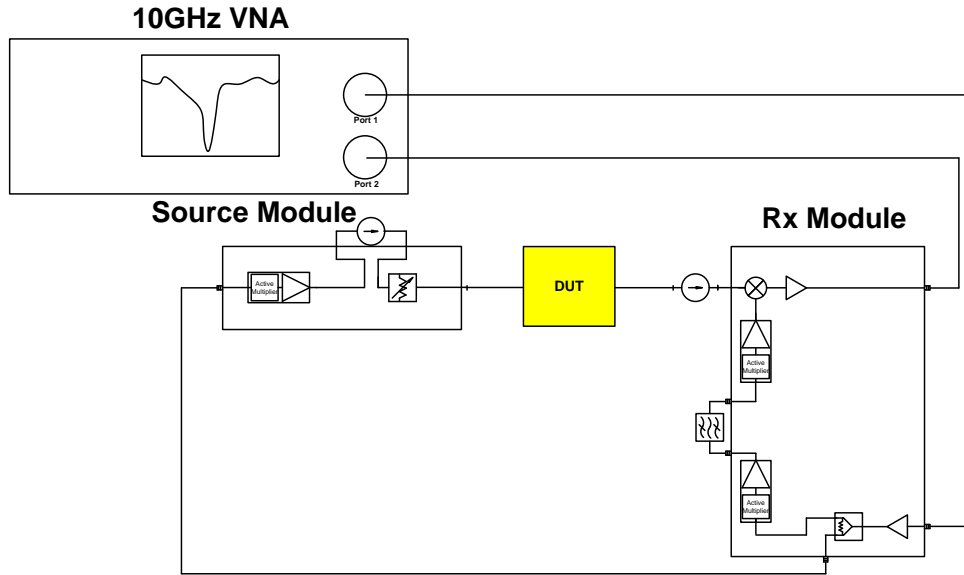
<b>RF Input:</b>	6.00 – 7.67 GHz @ -1 dBm SMA Connector
<b>Dynamic Range:</b>	60 dB typical, 57-64 GHz.
<b>1 dB Compression Point:</b>	+3 dBm typical at input
<b>Recommended Linear Range:</b>	-3 dBm max
<b>0.1 dB Compression Point:</b>	-3 dBm
<b>Noise Floor:</b>	< -70 dBm typical
<b>VSWR:</b>	< <u>1.4:1</u>

Environmental temperature of 23°C +/- 3° with < 1°C deviation from calibration temperature.

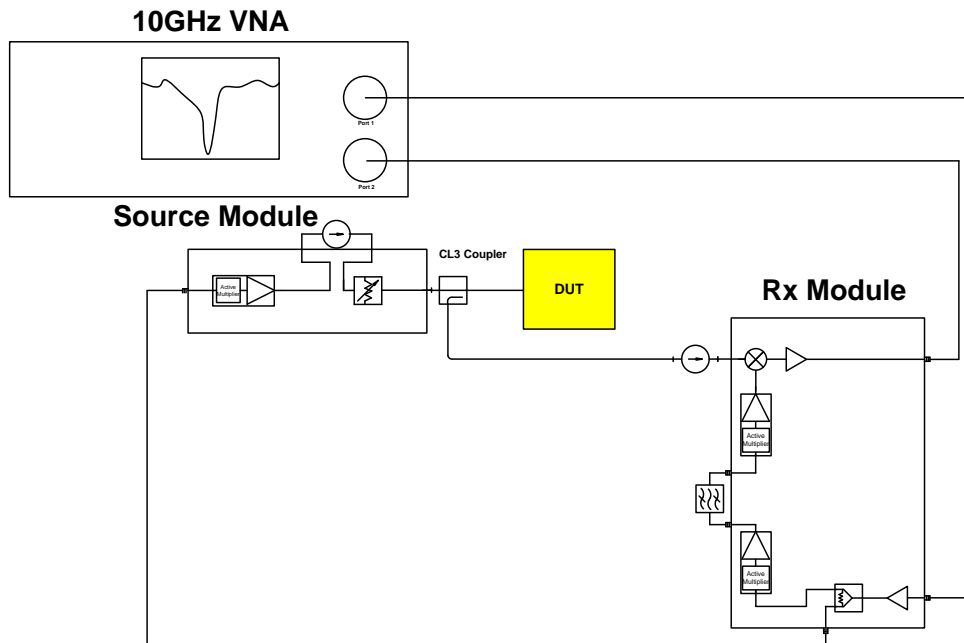
**System Temperature Stability:** 0.05 dB/°C typical, 57-64 GHz.

## APPLICATIONS

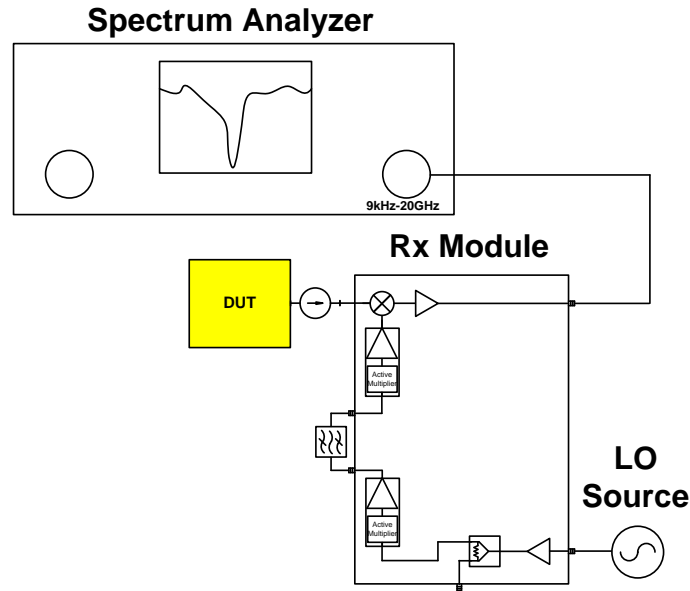
- 1) V/E-Band Vector S21 Measurement – Gain, Insertion loss, phase measurements



- 2) V/E-Band Vector S11 Measurement – Return loss measurements

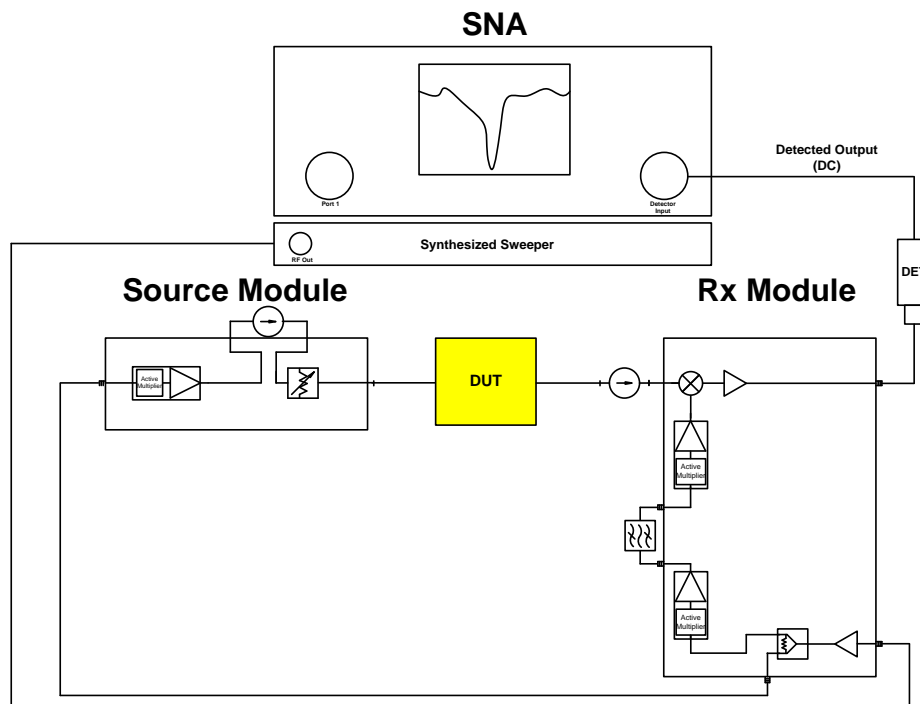


### 3) V/E-Band Spectrum Analyzer Preselector

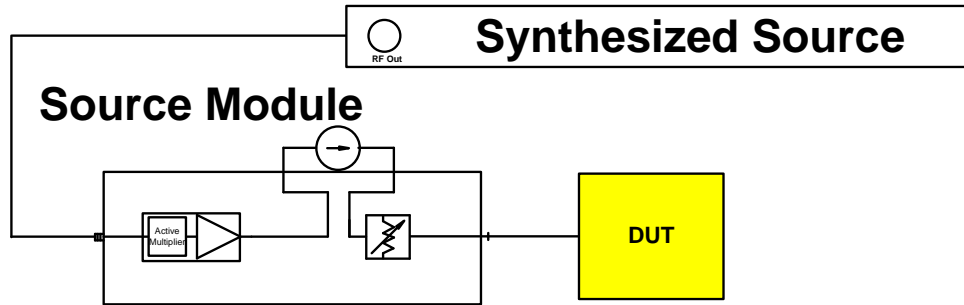


### 4) V/E-Band Scalar Network Analyzer

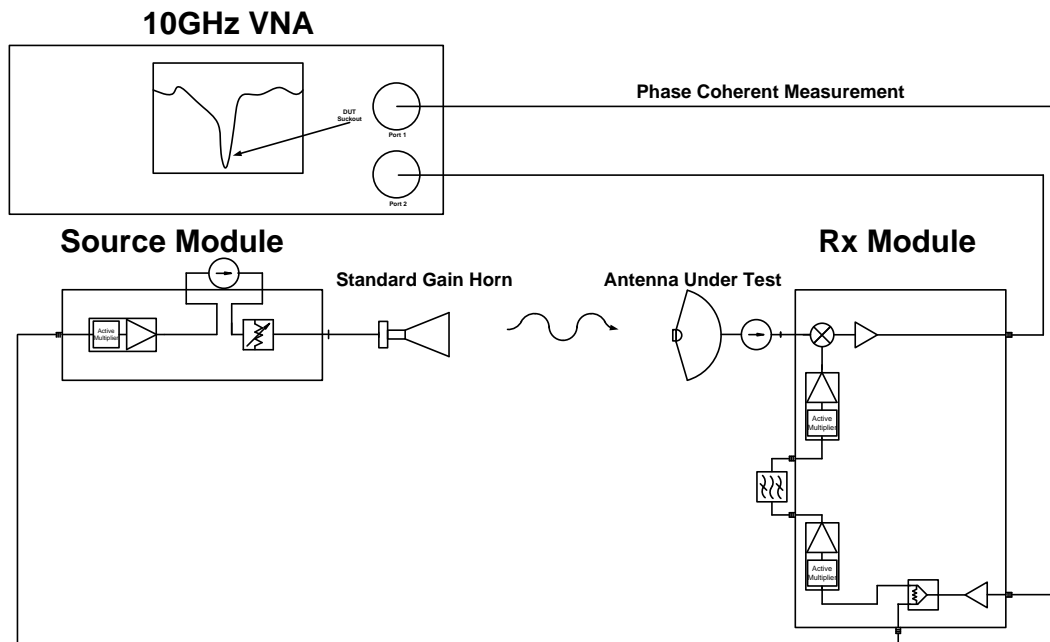
Spartan used as an SNA offers improved dynamic range versus a stand-alone millimeter wave SNA, resulting from frequency down conversion and integrated low noise amplifier.



## 5) E-Band Source



## 6) E-Band Antenna Range Measurements





## How To ORDER

### E-Band (68-90 GHz)

Spartan-12 Source Module Only:	STM-12-SM000
Spartan-12 Receive Module Only:	STM-12-RM000
Spartan-12 Kit:	STM-12-00000

### V-Band (54-69 GHz)

Spartan-15 Source Module Only:	STM-15-SM000
Spartan-15 Receive Module Only:	STM-15-RM000
Spartan-15 Kit:	STM-15-00000

### Specify Model Number STM-XX-AABBB

**XX** = Waveguide Band  
**WR** – number

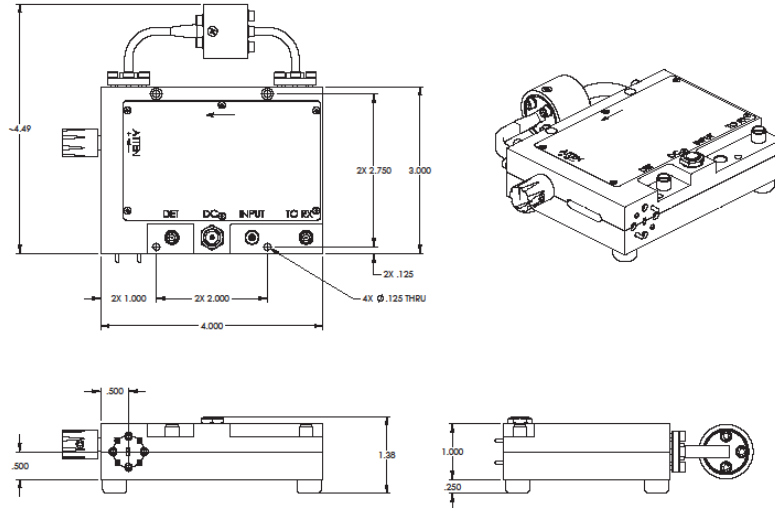
**AA** = SM or RM  
**SM** – Source Module, **RM** – Receive Module

**BBB** = Special Options

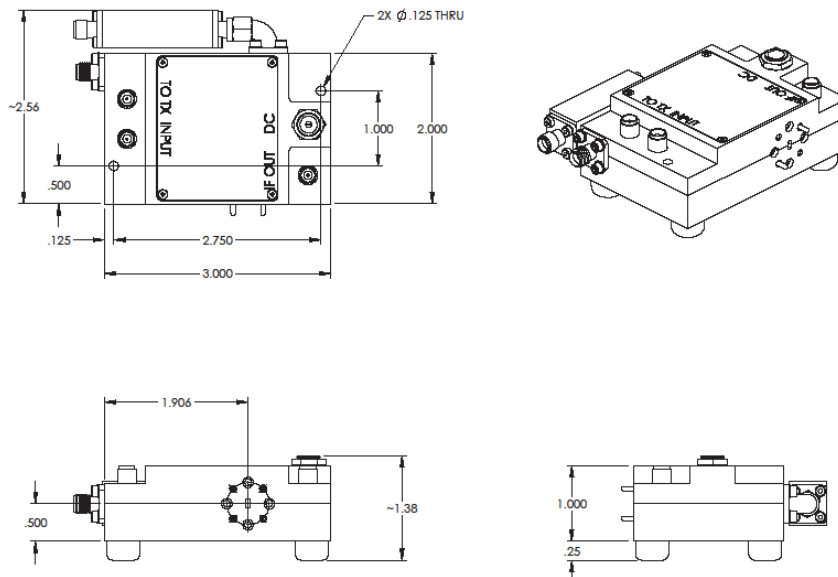
- **000** for standard
- **Contact Millitech for custom requests**

## OUTLINE DRAWINGS

### Spartan-12 Source Module

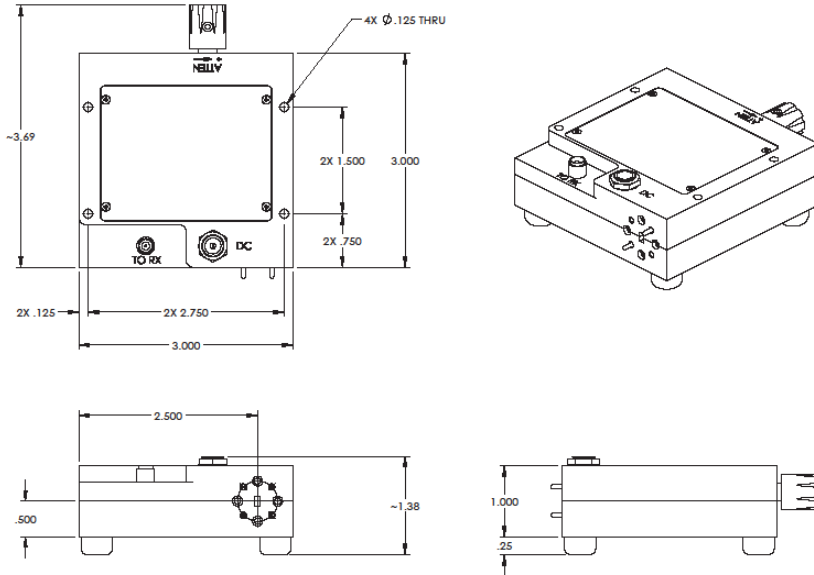


### Spartan-12 Receive Module



## OUTLINE DRAWINGS

### Spartan-15 Source Module



### Spartan-15 Receive Module

