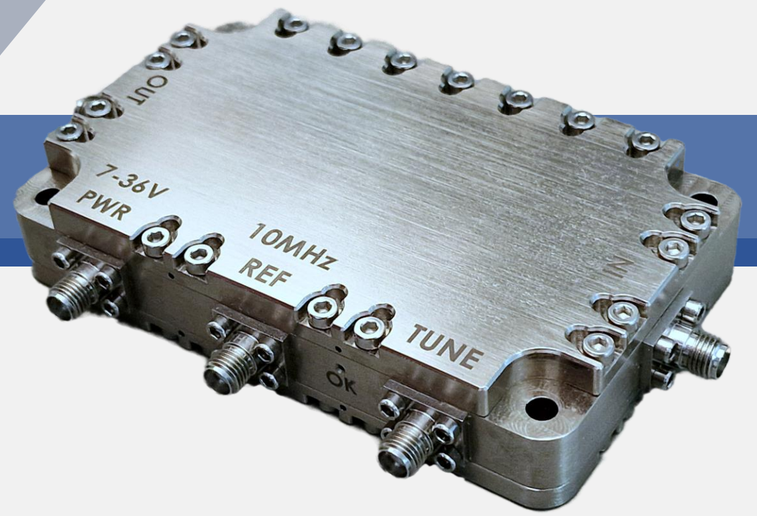
EECL European Engineering & Consultancy Ltd

X-Band LNB

ULTRA-HIGH PERFORMANCE SPACE RATED QUALITY



Introducing the X-BAND LNB: 8.0 to 8.4 GHz input. 1.3 to 1.7 GHz output.

The module is an advanced Low Noise Block (LNB) engineered for high-performance applications in satellite communications (SatCom), space, terrestrial, military, and general use. Featuring an ultra-low noise figure of 0.9 to 1.1 dB, this LNB ensures superior signal clarity even in challenging environments. Its industry-leading phase noise performance of -90 dBc/Hz at 100 kHz, combined with a 60 dB temperature-compensated gain, better than 0.4dB flatness over any 100MHz bandwidth, it delivers exceptional signal stability across a broad operating range. The unit incorporates state-of-the-art filtering technology, effectively suppressing out-of-band interference and ensuring spurious rejection of over 80 dBc. Designed for harsh environments, it boasts total latch-up protection for radiation resistance, leveraging space-rated circuits with proven flight heritage for space applications.

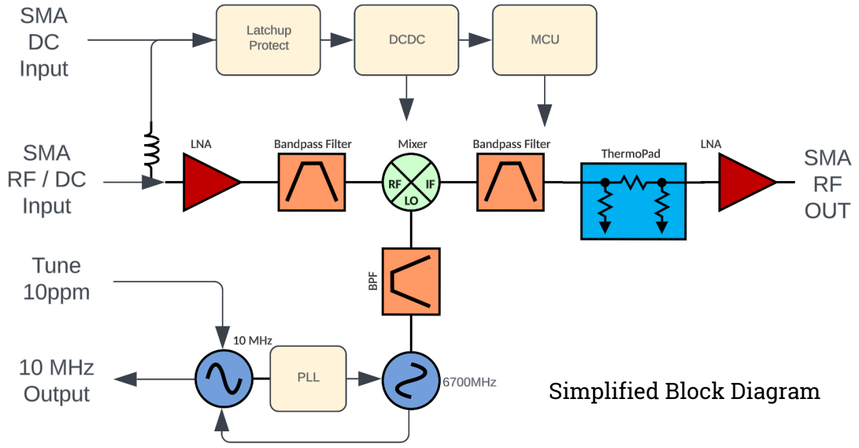
The compact and robust design integrates SMA connectors for input and output, with versatile powering options—either through phantom feed or a separate SMA connector, with support for a wide input voltage range. A highly precise internal 10 MHz reference is available, featuring a tune pin for fine adjustment, offering precise frequency control. With a low power consumption of just 3.2 watts and an optional lower cost ground-based version, the module is ideal for both critical space missions and terrestrial deployments. The internal ultra-low-noise DC-DC converter further ensures reliable operation, making it the perfect choice for high-performance, low-noise satellite signal reception in any environment.

Detailed Description

The module has 5 field replaceable SMA connectors.
1. RF Input (8.0 to 8.4 GHz)
2. RF Output (1.3 to 1.7 GHz) + optional phantom DC feed (8 to 30V)
3. Optional DC in (if not using phantom feed)
4. 10 MHz output (200 ohms impedance)
5. LO Tune (0V to 3V) biased at 1.5V, pull to steer LO frequency by 10ppm

On power up the module is operational within 300mS. The phantom DC feed is protected against reverse current flow when using the independent DC port.

An LED shows PLL lock status (on is locked).



Simplified Block Diagram

Use Cases

- Satellite Communications (SatCom)
- Space Applications
- Ground-Based Stations
- Military & Defence
- Broadcasting & Media
- Land-Based Connectivity
- Aeronautical & Maritime
- Test & Measurement
- Industrial & Commercial
- Cost-Effective Ground Units

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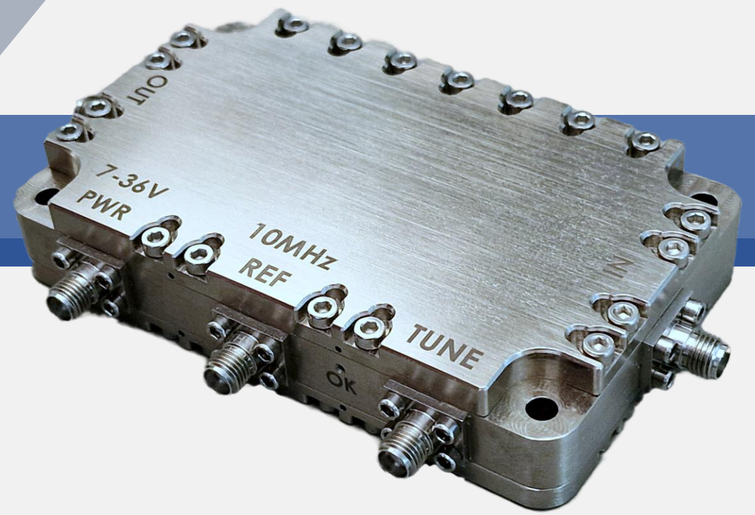

Key Specifications

INPUT	**Input Connector**	**SMA Connector**
	Input Return Loss / VSWR	**15 dB** or Higher / < **1.4 VSWR**
	Lo Leakage	Lower than **-82 dBm**
OUTPUT	**Output Connector**	**SMA Connector**
	Output Return Loss / VSWR	**12 dB** or Higher / < **1.6 VSWR**
	Lo Leakage	Lower than **-75 dBm**
RF PERFORMANCE	**Gain**	**60 dB** with **0.4 dB** Flatness over **100 MHz**
	Gain Variation over Temperature	**Less than 0.2 dB** Variation every **10°C**
	Phase Noise	**-90 dBC / Hz @ 100 kHz**
	Image and Spurs Rejection	**All Carrier related Spurs are 70 dBC – Non carrier related Spurs are -75 dBm or lower**
	Internal PLL Specs	**Min Frequency Accuracy = +/- 6.7 kHz @ LO = 6.7 GHz (1 ppm)**
		Tune Pin allows steering of the LO frequency by +/- 80 kHz

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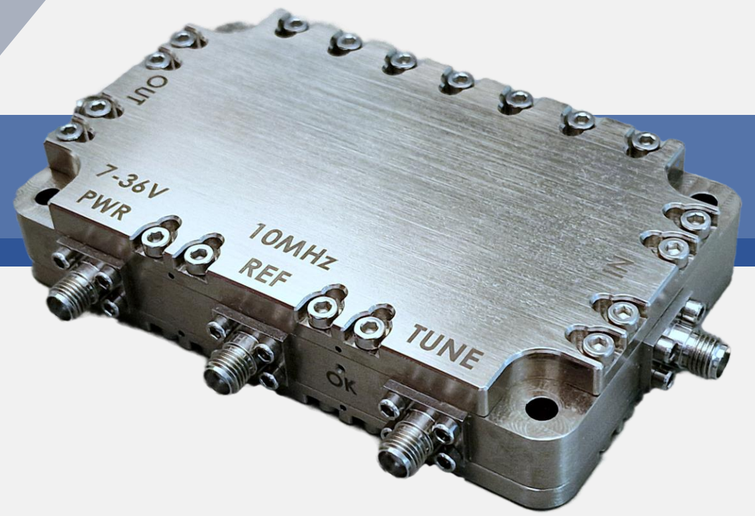

Key Specifications - Continue

SUPPLEMENTARY CONNECTORS (SMAs)	Power Connector	Power to the module can be delivered either by the use of the power connector or through the RF Output pin (Phantom Feed)
	10 MHz REF Output	The ports outputs a low phase noise high precision 10 MHz DC blocked clipped sinewave 1.4 V Pk-Pk (4mA Max load)
	Tune Pin	This port is used to steer the oscillator frequency. The nominal value is 1.65 V. Minimum and Maximum values are 0V and 3.3V
MECHANICAL CHARACTERISTICS	Sizes	100 mm L x 60 mm W x 20 mm H
	Mass	240 grams

DC CHARACTERISTICS	Recommended DC Input	+ 9V @ 375 mA to 36V @ 115 mA
	Power Consumption	3.375 W to 4 W
ABSOLUTE MAXIMUM RATINGS	Max Input Voltage	+ 40V DC
	Max RF Input Power	+ 15 dBm
	Operating Temperature	-40 to +85 °C

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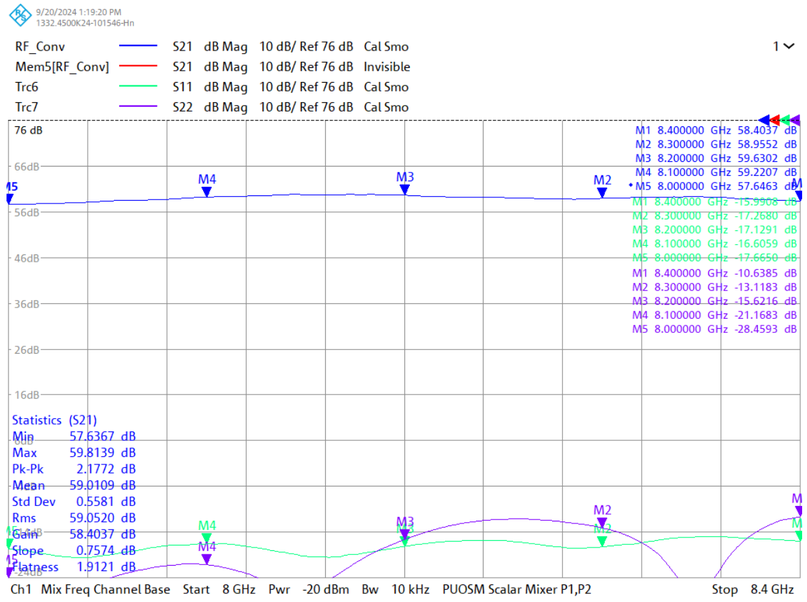
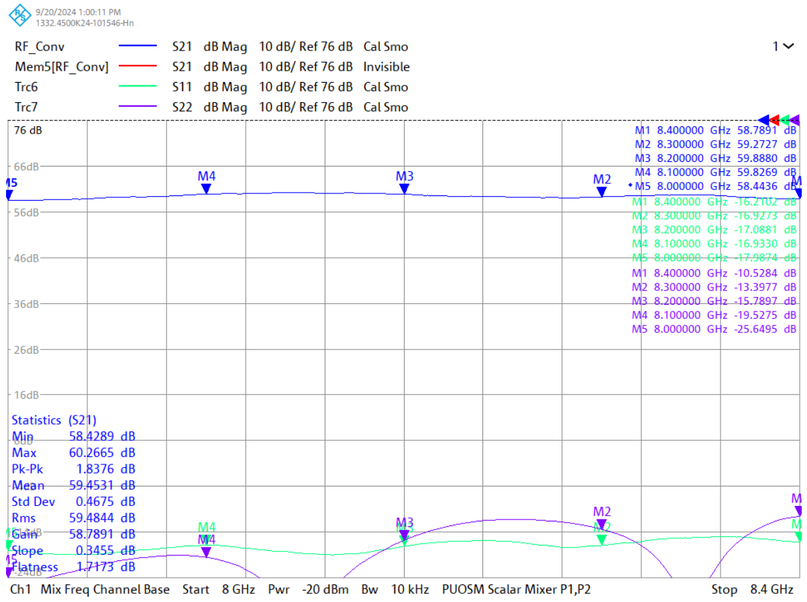
Gain and Return Loss Plot vs Temperature

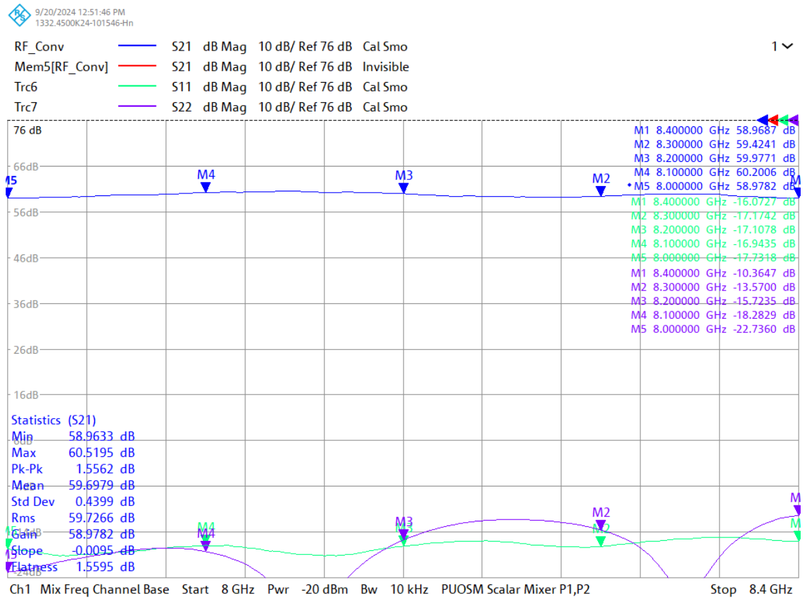
Measurement Performed at -30 °C



Measurement Performed at -20 °C



Measurement Performed at -10 °C



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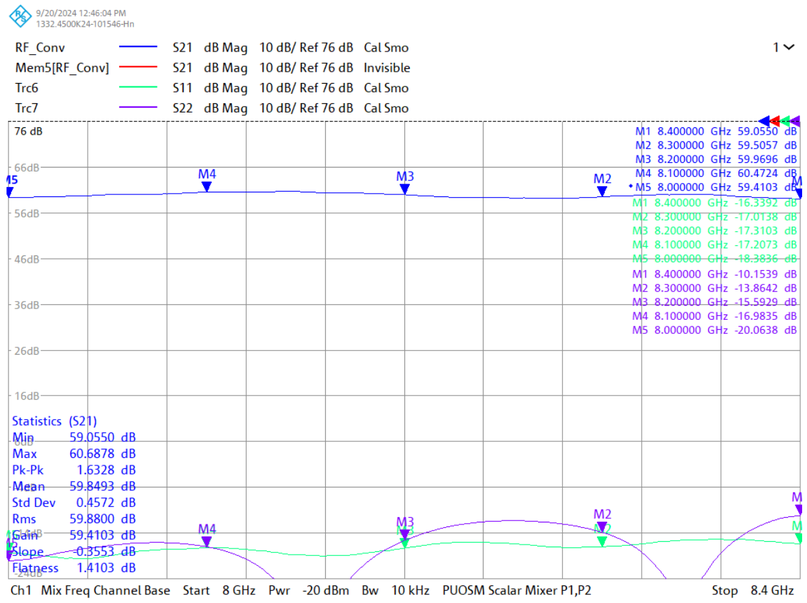
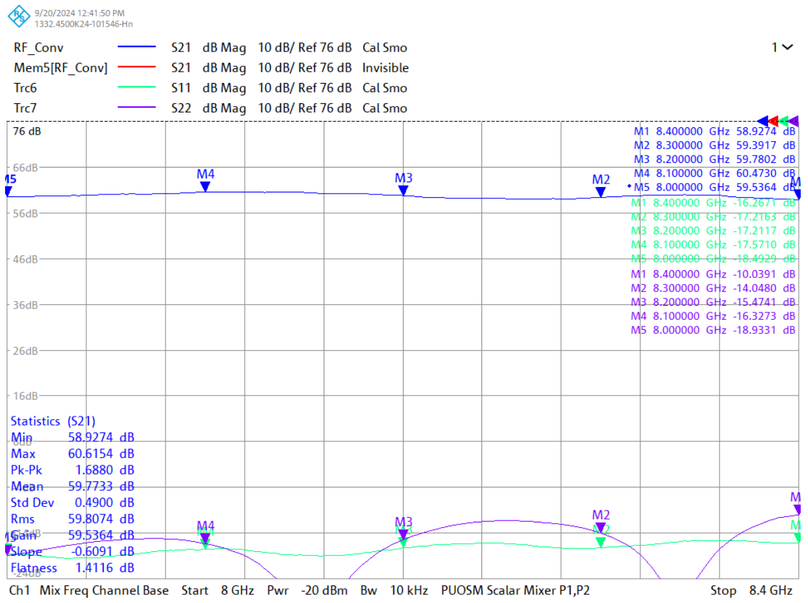
Gain and Return Loss Plot vs Temperature

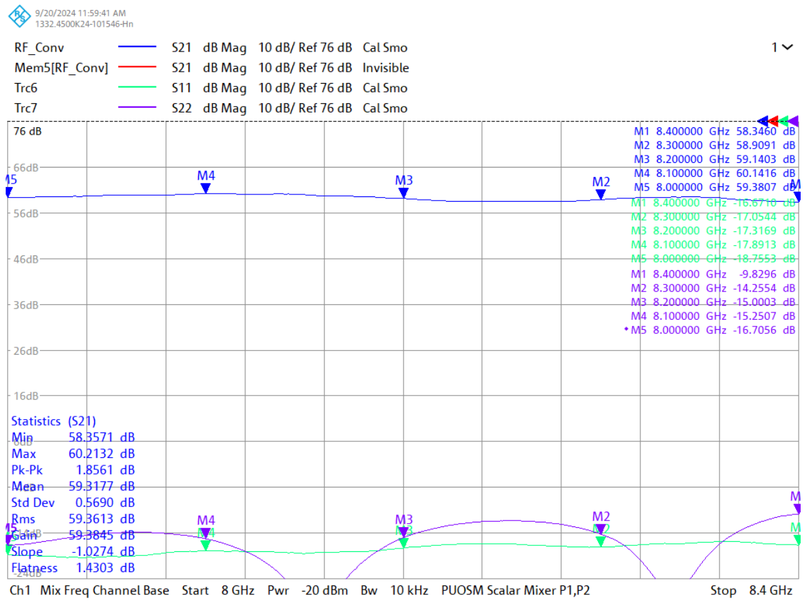
Measurement Performed at 0 °C



Measurement Performed at 10 °C



Measurement Performed at 30 °C



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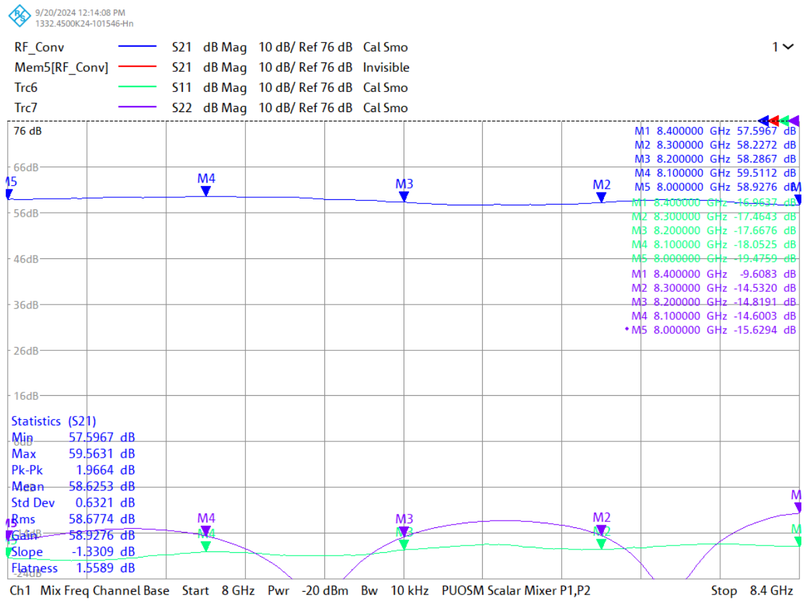
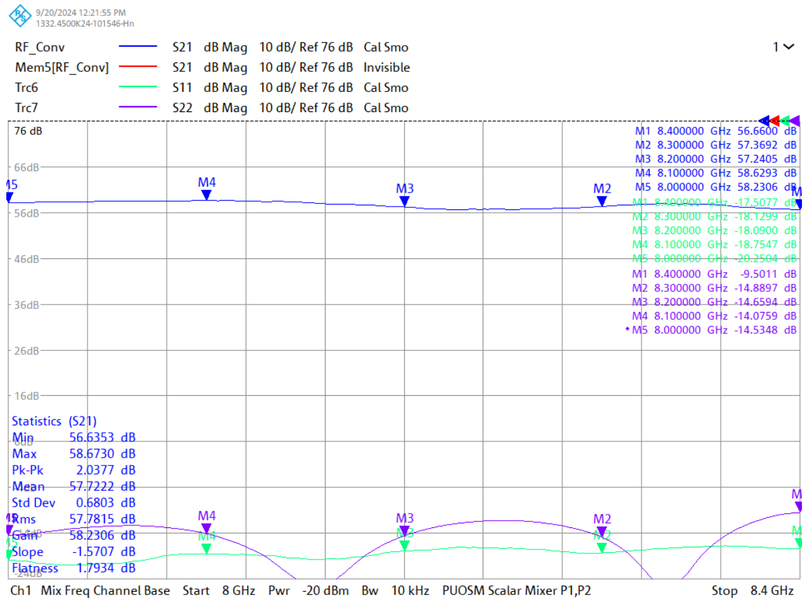
Gain and Return Loss Plot vs Temperature

Measurement Performed at 50 °C



Measurement Performed at 70 °C



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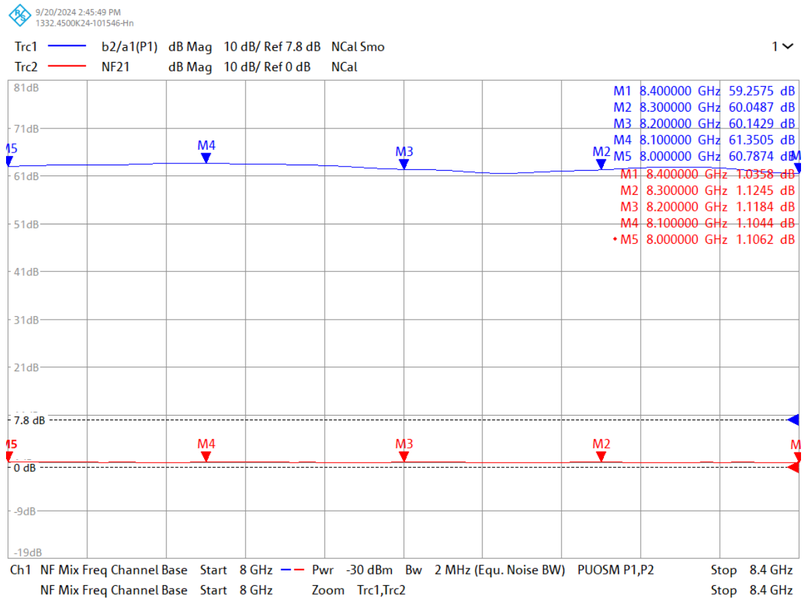
Noise Figure

Noise Figure Data was measured on a R&S ZNA-26

The data includes all connectors, SMA to PCB transition and was taken at a case temperature of 30C.

The Noise Figure reduces to 0.5dB at -10C

Measurement Performed at 30 °C



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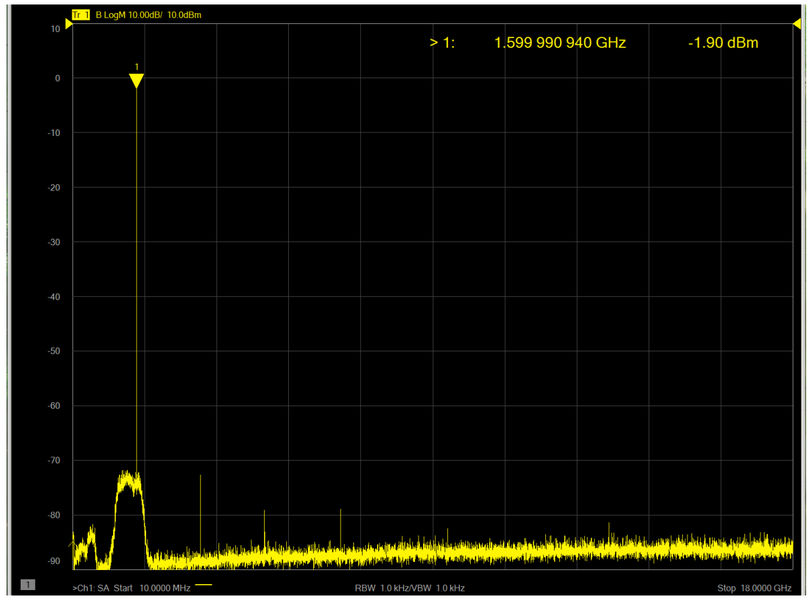
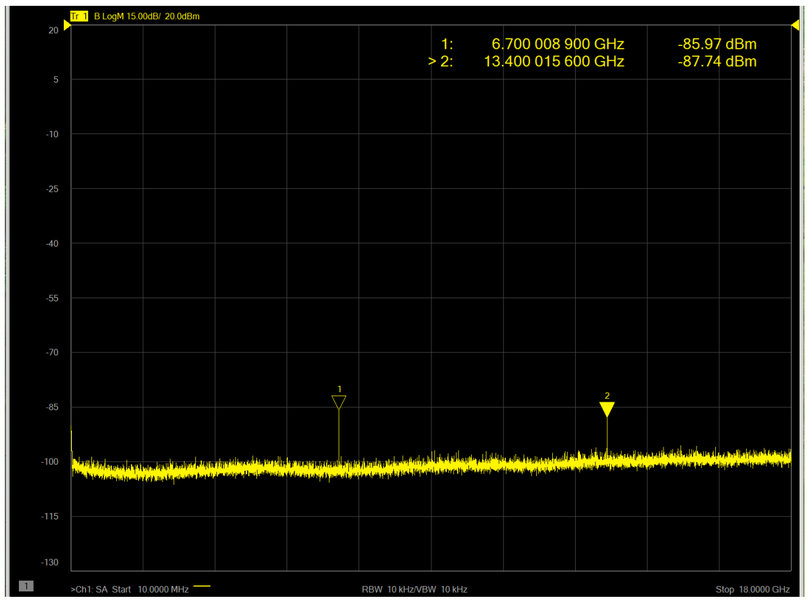
Module Performance

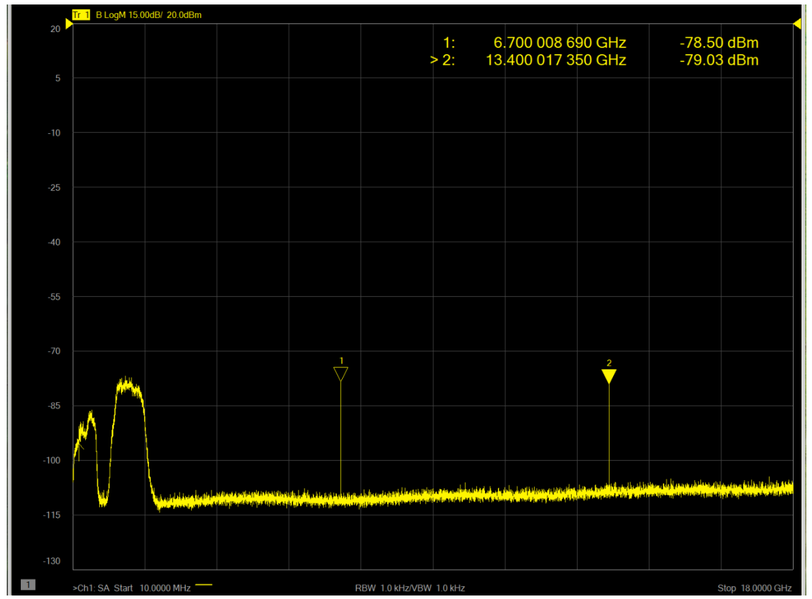
Spectrum Analyzer Measurement On Output Port with a -60dBm input signal at 8.3GHz.
All harmonics from DC-18GHz are greater than 70dBc
Nothing in band



Spectrum Analyzer Measurement on Input Port
DC-18 GHZ,
Maximum Signal -85dBm
Nothing in band



Spectrum Analyzer Measurement on Output Port with no input signal showing non-carrier related Spurs
Measurement taken at 10KHz RBW therefore the pass-band noise appears as -80dBm / bin @ 10KHz
Maximum non-carrier related spurs, -78 dBm
Nothing in band



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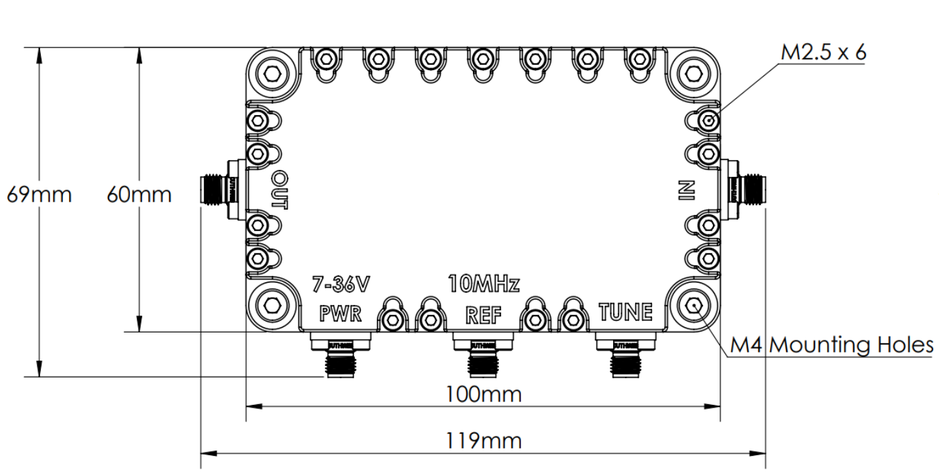
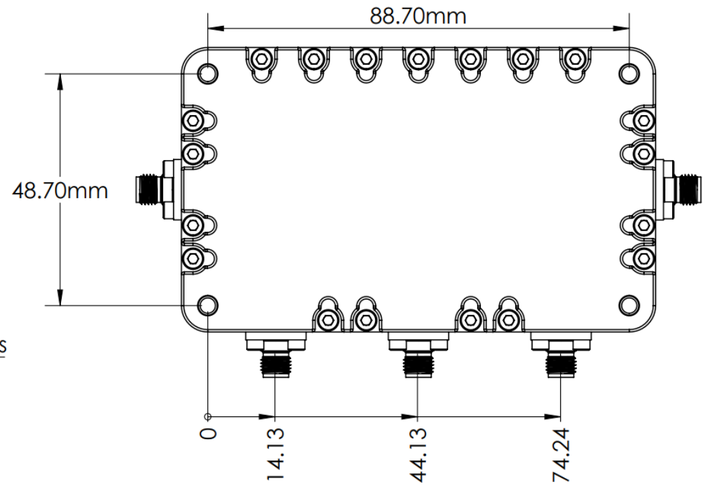
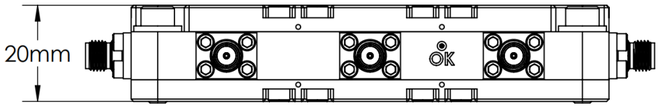
Mechanical Information







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