

Hermetically Sealed Wide Band Power Amplifier 1GHz ~ 23GHz



Features

- Gain: 15dB Typical
- Output Power +23dBm Typical
- High P1dB: +15dBm Full Band
- Supply Voltage: +10V

Typical Applications

- Wireless Infrastructure
- Military & Aerospace
- Test and Measurement

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{CC} = +10\text{V}$

| Parameter | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
|--|------------------------------------|------|------|------|------|------|--------|
| Frequency Range | 1 | | 12 | 12 | | 23 | GHz |
| Gain | 14 | 16 | | 14 | 16 | | dB |
| Gain Flatness | | ±1.5 | | | ±1.0 | | dB |
| Gain Variation Over Temperature (-40°C ~ +85°C) | | ±1.5 | | | ±2.0 | | dB |
| Noise Figure | | 3.0 | 5.0 | | 3.5 | 5.0 | dB |
| Input Return Loss | | 10 | | | 10 | | dB |
| Output Return Loss | | 18 | | | 18 | | dB |
| Output 1dB Compression Point (P1dB) | 20 | 23 | | 15 | 20 | | dBm |
| Saturated Output Power (Psat) | | 25 | | | 22 | | dBm |
| Output Third Order Intercept (OIP3) | | 33 | | | 29 | | dBm |
| Supply Current (Vcc=+10V) | | 190 | 260 | | 190 | 260 | mA |
| Weight | 1.8 Max. | | | | | | ounces |
| Impedance | 50 | | | | | | Ohms |
| Input / Output Connectors | SMA-Female | | | | | | |
| Finish | Gold Plated | | | | | | |
| Material | Aluminum | | | | | | |
| Package Sealing | Hermetically Sealed (Laser Welded) | | | | | | |

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Absolute Maximum Ratings

| | |
|-------------------|---------------|
| Operating Voltage | +15V |
| RF Input Power | +40dBm @ 25°C |

Biasing Up Procedure

| | |
|---------------------|--------------------------|
| Step 1 | Connect Ground Pin |
| Step 2 | Connect input and output |
| Step 3 | Connect +10V biasing |
| Power OFF Procedure | |
| Step 1 | Turn off +10V biasing |
| Step 2 | Remove RF connection |
| Step 3 | Remove Ground. |

Environmental Specifications and Test Standards

| Parameter | Description |
|--------------------------------|---|
| Operational Temperature | -40°C~+85°C (Case Temperature) |
| Storage Temperature | -50°C~+105°C |
| Thermal Shock | -40°C → +85°C (5 Cycles / 10 hours) |
| Random Vibration | MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis |
| High Temperature Burn In | Temperature +85°C for 72 Hours |
| Shock | 1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction). |
| Altitude | Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min) |
| Hermetically Sealed (Optional) | MIL-STD-883 (For Hermetically Sealed Units) |

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Ordering Information

| Part No. | Description |
|---------------|-----------------------------------|
| RPNA01G23GS-H | 1-23GHz Wide Band Power Amplifier |

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Amplifier Use

Ensure that the amplifier input and output ports are safely terminated into a proper 50 ohm load before turning on the power. Never operate the amplifier without a load. A proper 50 ohm load is defined as a load with impedance less than 1.9:1 or return loss larger than 10dB relative to 50 Ohm within the specified operating band width.

Power Supply Requirements

Power supply must be able to provide adequate current for the amplifier. Power supply should be able to provide 1.5 times the typical current or 1.2 times the maximum current (whichever is greater).

In most cases, RF - Lambda amplifiers will withstand severe mismatches without damage. However, operation with poor loads is discouraged. If prolonged operation with poor or unknown loads is expected, an external device such as an isolator or circulator should be used to protect the amplifier.

Ensure that the power is off when connecting or disconnecting the input or output of the amp.

Prevent overdriving the amplifier. Do not exceed the recommended input power level.

Adequate heat-sinking required for RF amplifier modules. Please inquire.

Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

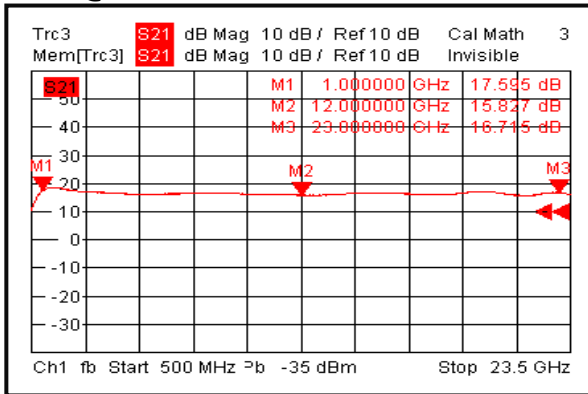
Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

What is not covered with warranty?

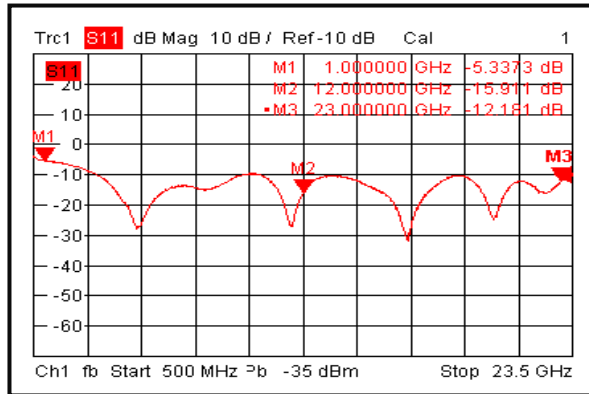
Each RF - Lambda amplifier will go through power and temperature stress testing. Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

Typical Performance Plots

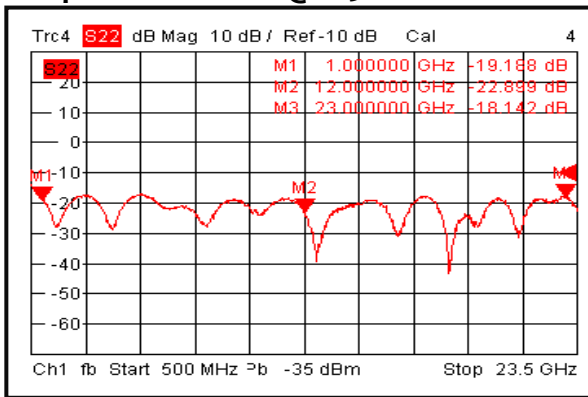
Gain @+25°C



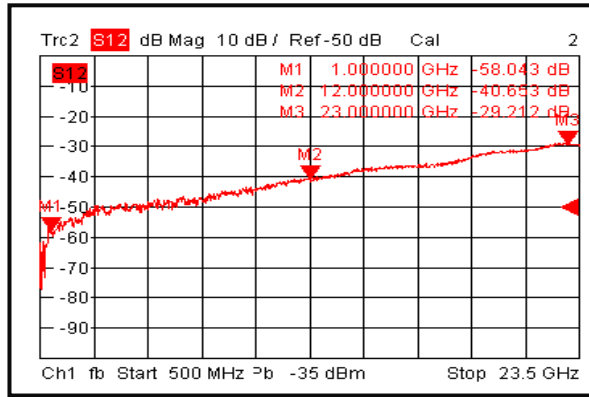
Input Return Loss @+25°C



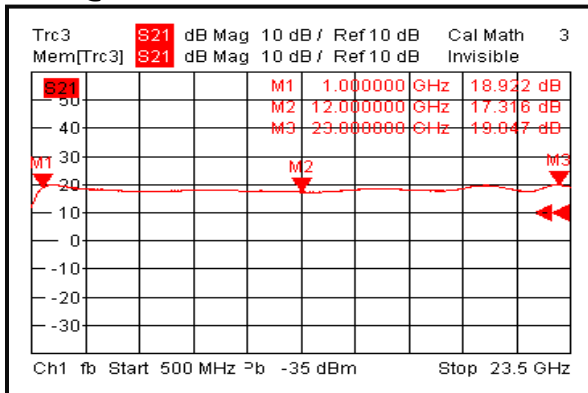
Output Return Loss @+25°C



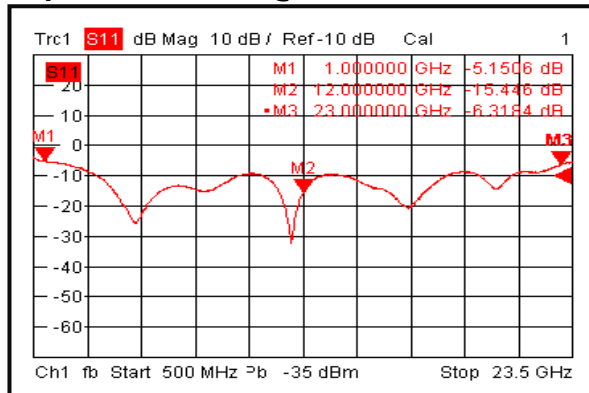
Isolation @+25°C



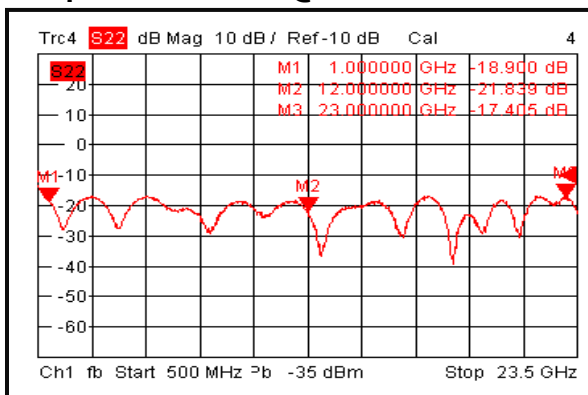
Gain @-40°C



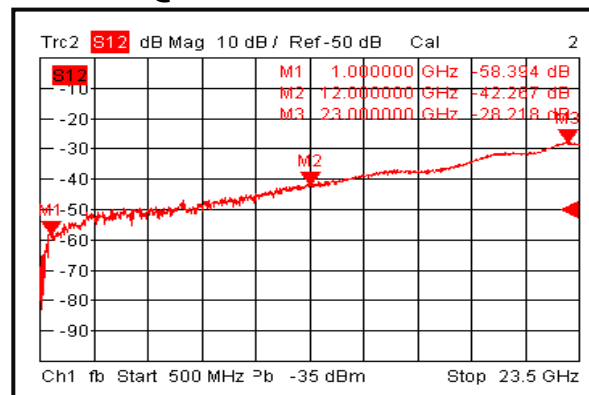
Input Return Loss @-40°C



Output Return Loss @-40°C

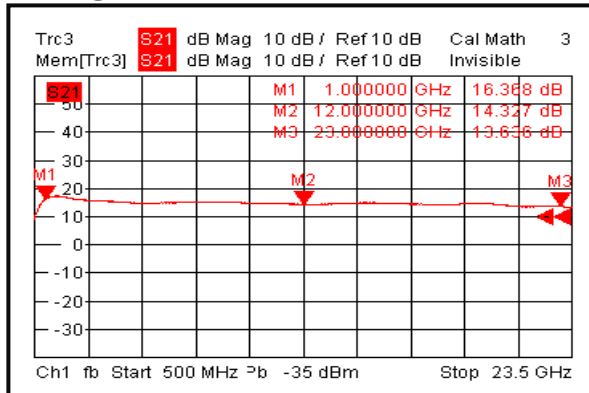


Isolation @-40°C

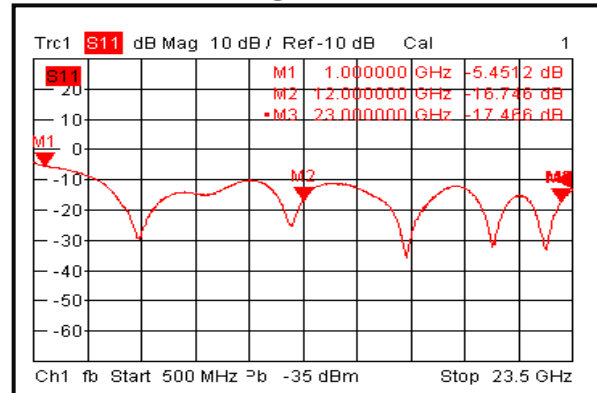


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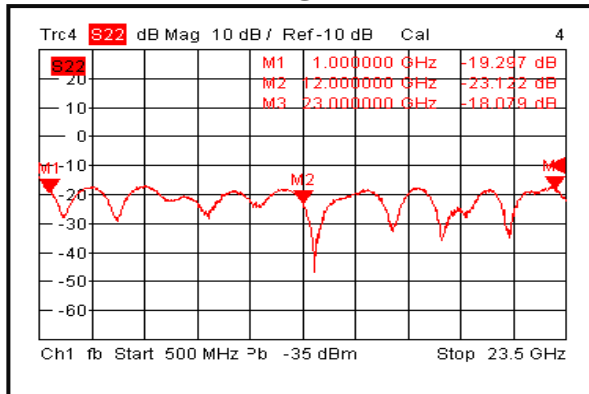
Gain @+85°C



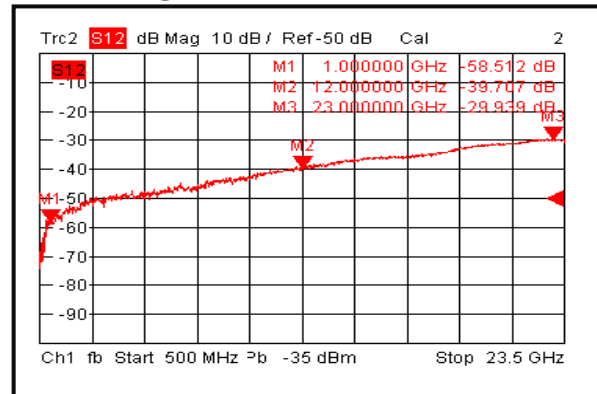
Input Return Loss @+85°C



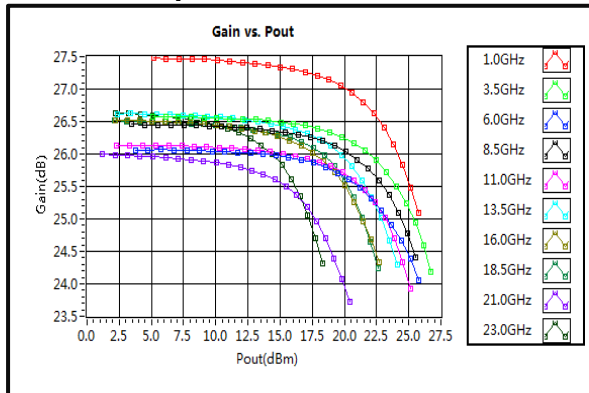
Output Return Loss @+85°C



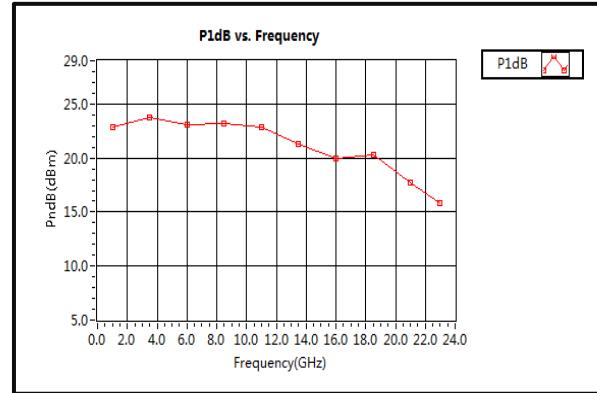
Isolation @+85°C



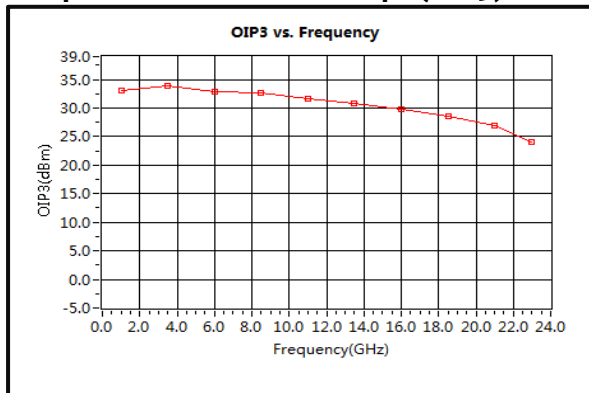
Gain vs. Output Power



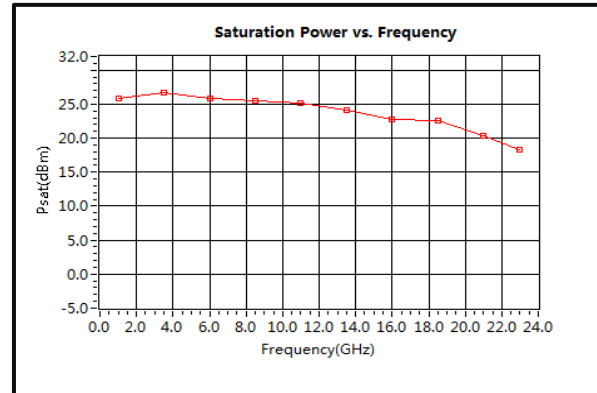
P1dB vs. Frequency



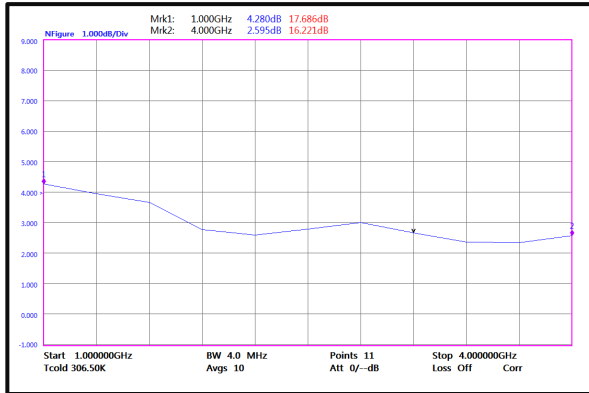
Output Third Order Intercept (OIP3)



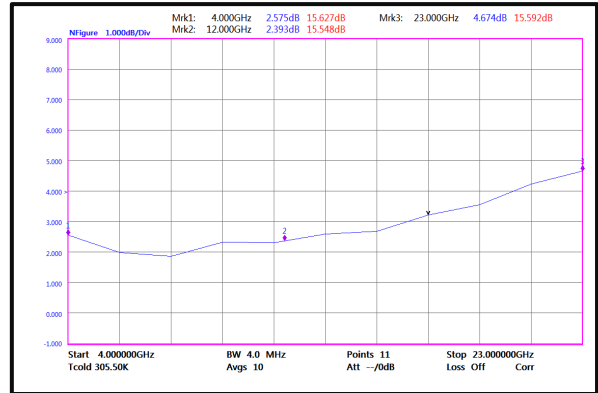
Saturation Power vs. Frequency



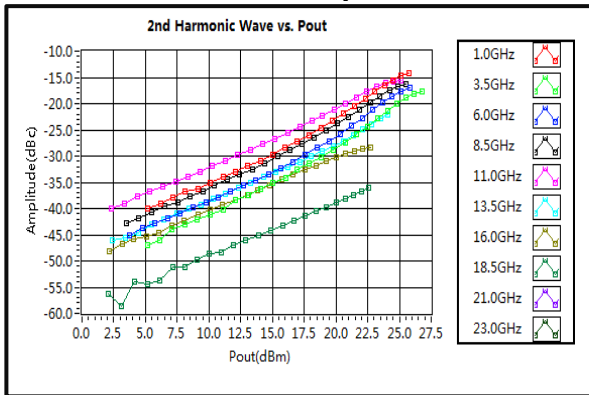
Noise Figure (1-4GHz)



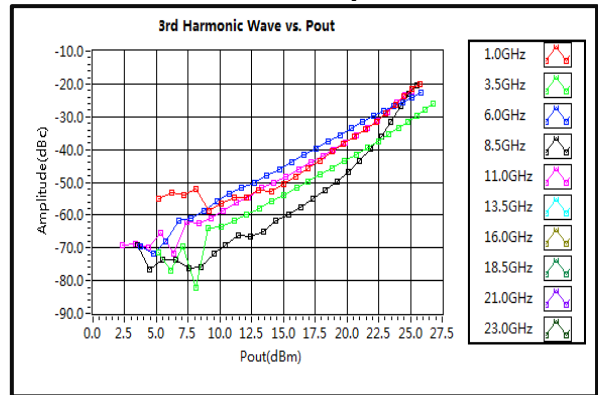
Noise Figure (4-23GHz)



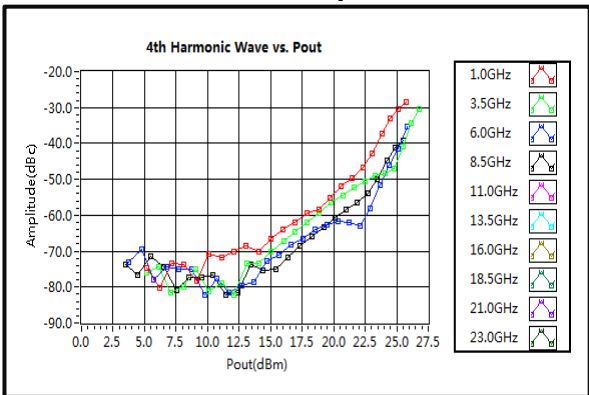
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



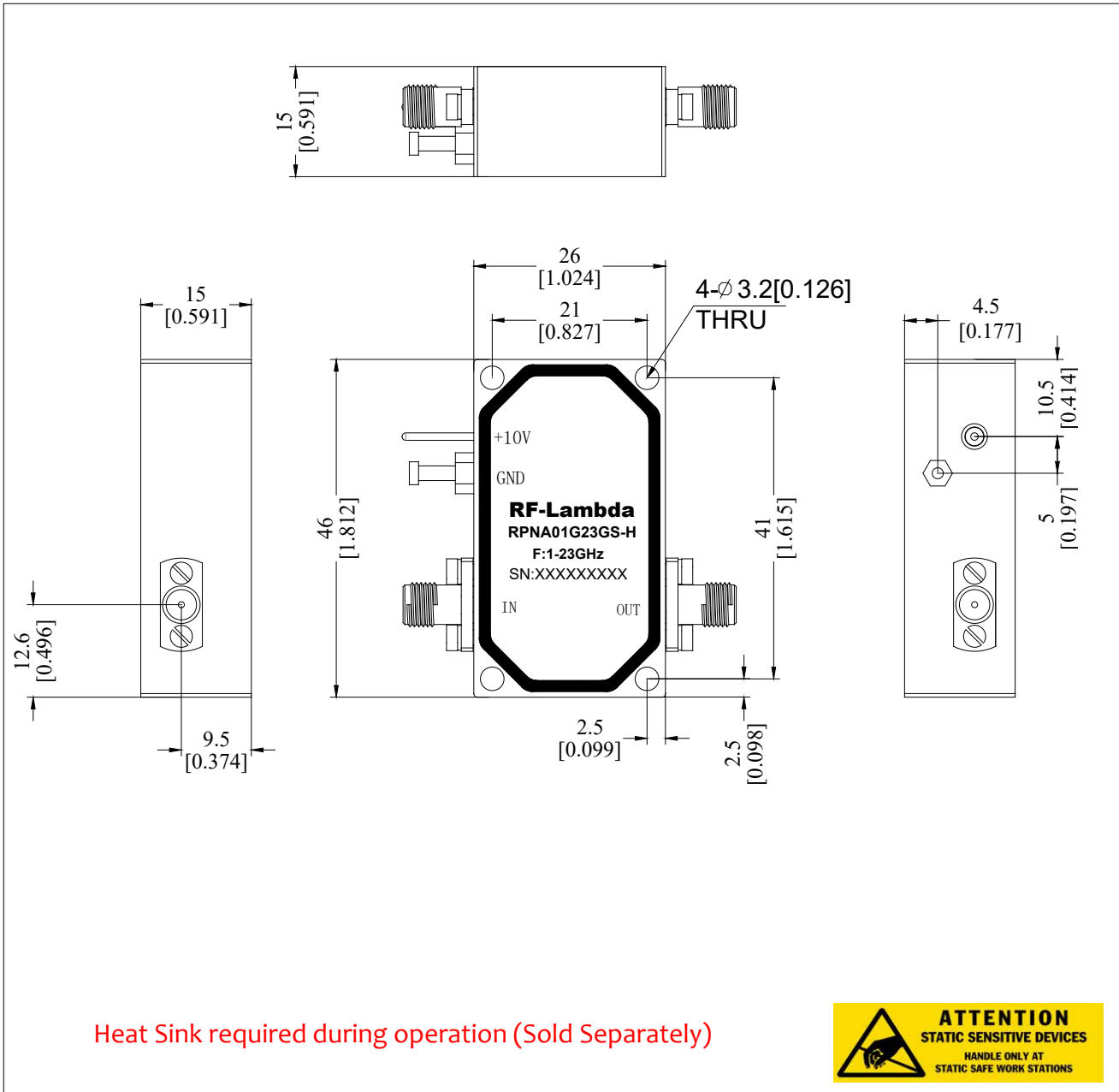
4th Harmonic Wave Output Power



Outline Drawing:

All Dimensions in mm [inches]

Housing Tolerances ± 0.1 [0.004]



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Important Notice

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