

## Ultra Wideband Solid State Power Amplifier 0.02GHz-3GHz



### Product Description

RFLUPA0030G10A is an ultra wideband solid state power amplifier with a frequency range of 0.02 to 3GHz.

The power output of this amplifier is 40dBm typical. The typical small signal gain is 43dB with a flatness of  $\pm 2.5$ dB. This power amplifier works with a +28 VDC power supply.

The working temperature of this product is between - 40°C and + 85°C.

### Features

- Ultra Wideband Solid State Power Amplifier
- Small Signal Gain 43dB Typical
- Output Saturation Power 40dBm Typical
- Supply Voltage +28VDC
- 50 Ohm Matched

### Typical Applications

- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

### Electrical Specifications (T<sub>A</sub>=+25°C),VCC=+28VDC

Parameter	Min	Typ	Max	Units
Frequency Range	0.02		3	GHz
Gain	40	43		dB
Gain Flatness		$\pm 2.5$		dB
Gain Variation Over Temperature (-40°C to +85°C)		$\pm 2.0$		dB
Input VSWR		1.6		: 1
Output 1dB Compression Point (P1dB)	37	38		dBm
Saturated Output Power (Psat)		40		dBm
Supply Current (Vcc = +28VDC)		0.85	2.2	A
Isolation S12		-55		dB
Weight	Net		0.39 Max.	lbs.
	Including Heat sink		3.4Max.	lbs.
Impedance		50		Ohms
Input / Output Connectors		SMA- Female		
Package		Epoxy Sealed (Standard)		
		Hermetically Sealed (Optional)		

**Absolute Maximum Ratings**

Parameter	Rating
Operating Voltage	+28.5V
*RF Input Power (RFIN)	+5dBm

**Bias Up Procedure**

- 1.Connect Ground Pin
- 2.Connect input and output
- 3.Connect +28V biasing

**Bias Down Procedure**

- 1.Turn off +28V biasing
- 2.Remove RF connection
- 3.Remove Ground.

**Environmental Specifications and Test Standards**

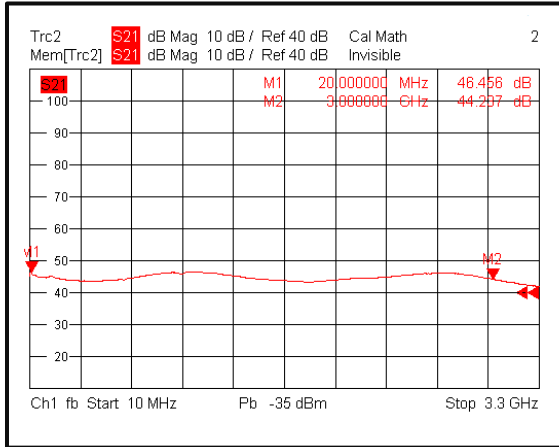
Parameter	Description
Operational Temperature	-40°C to +85°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for 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)

\*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.

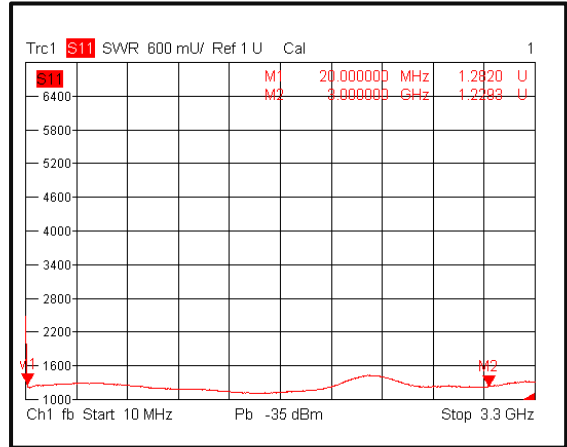
\*\*For vibration testing details please see additional information section.

**Typical Performance Plots**

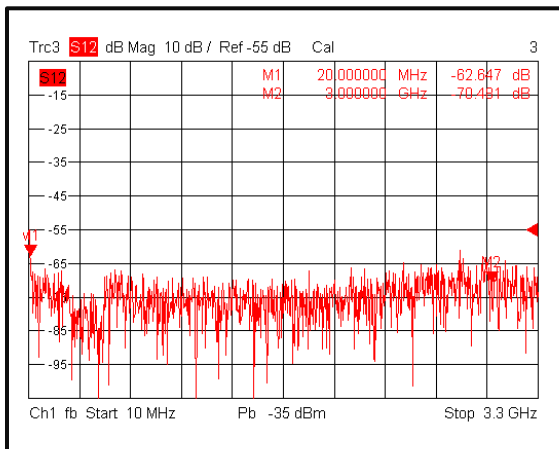
**Gain @ +25°C**



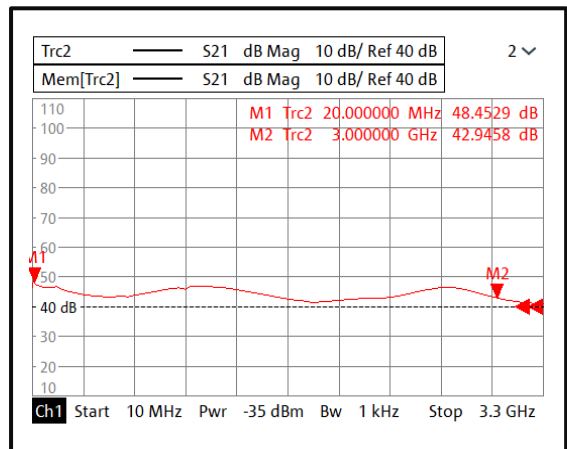
**Input VSWR @+25°C**



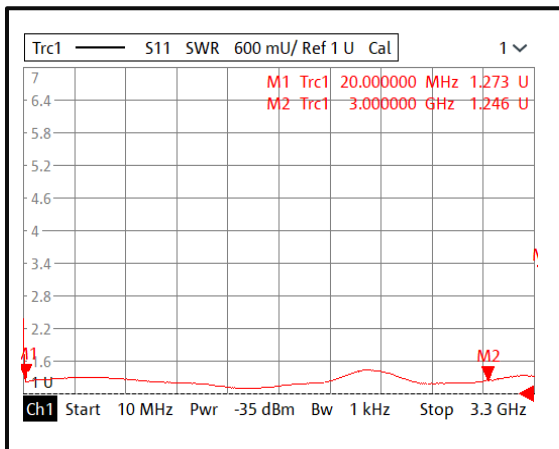
**Isolation @ +25°C**



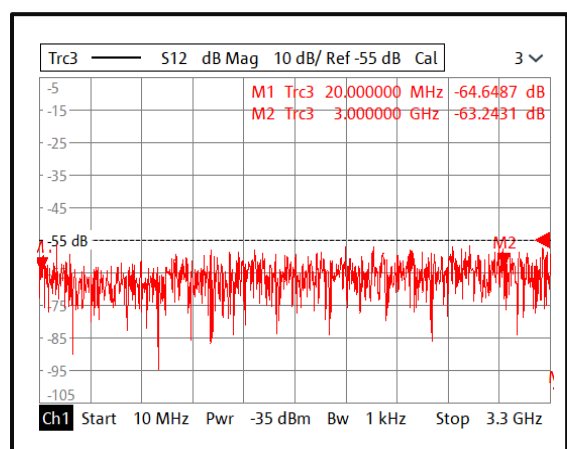
**Gain @ -40°C**



**Input VSWR @ -40°C**



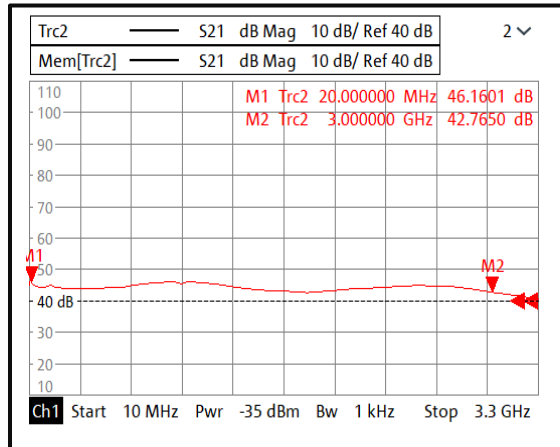
**Isolation @ -40°C**



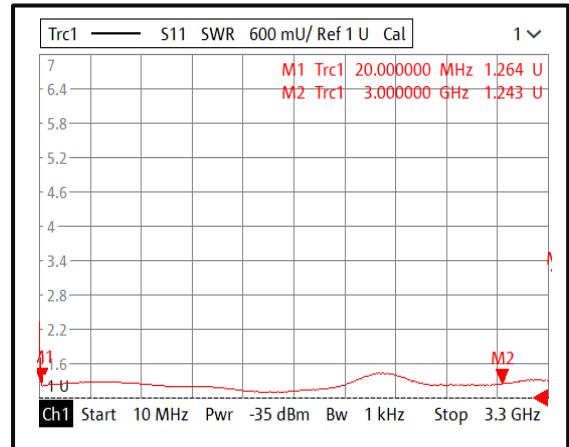
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

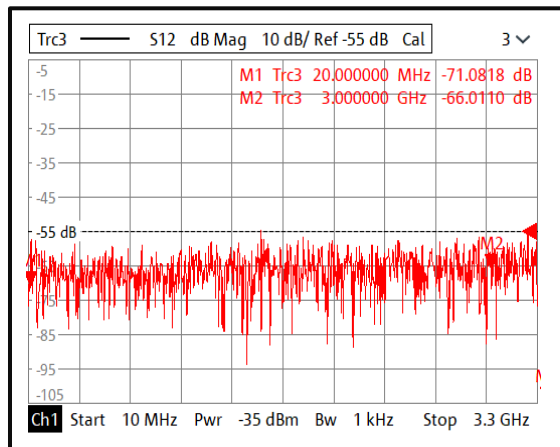
Gain @ +85°C



Input VSWR @ +85°C



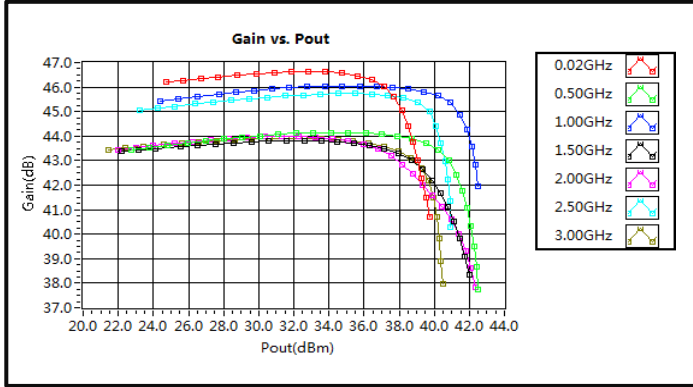
Isolation @ +85°C



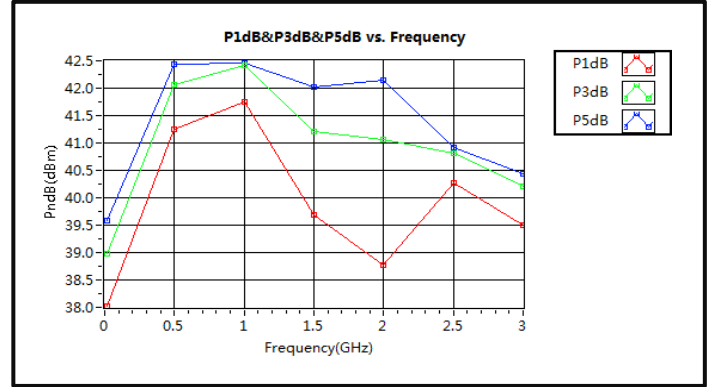
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

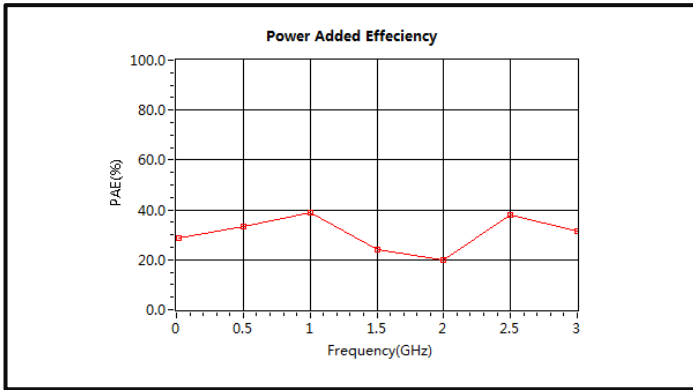
Gain vs. Output Power CW



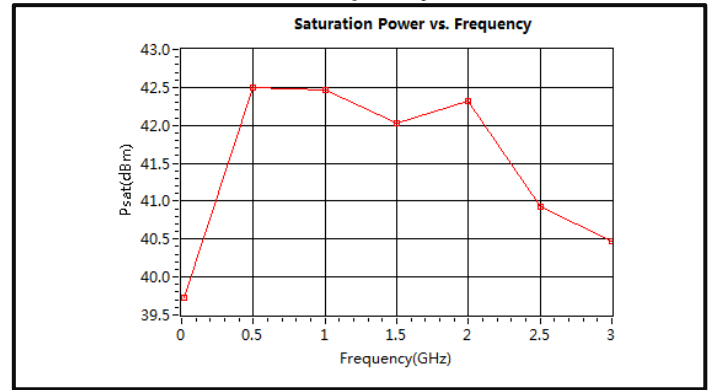
PndB vs. Frequency CW



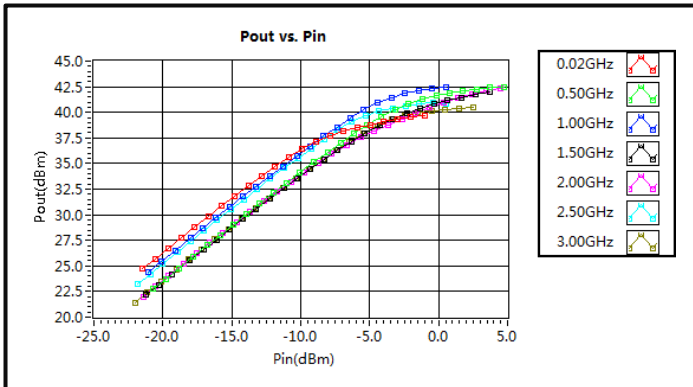
Power Added Efficiency CW



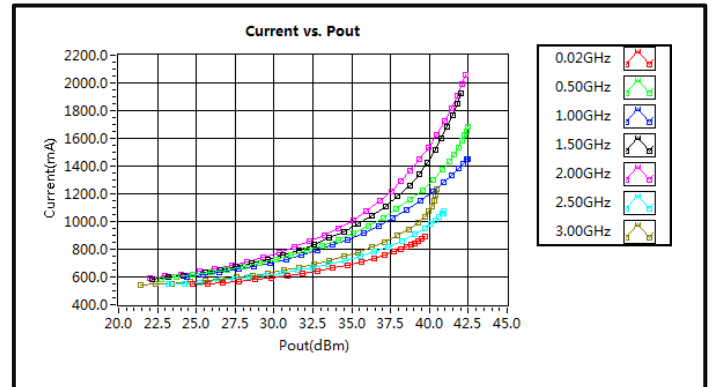
Saturation Power vs. Frequency CW



Pout vs. Pin

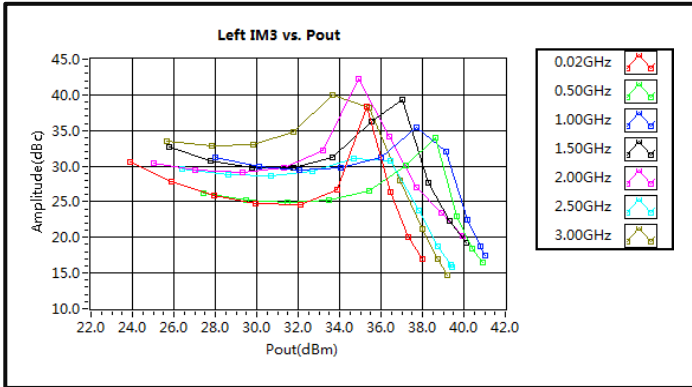


Current vs. Pout

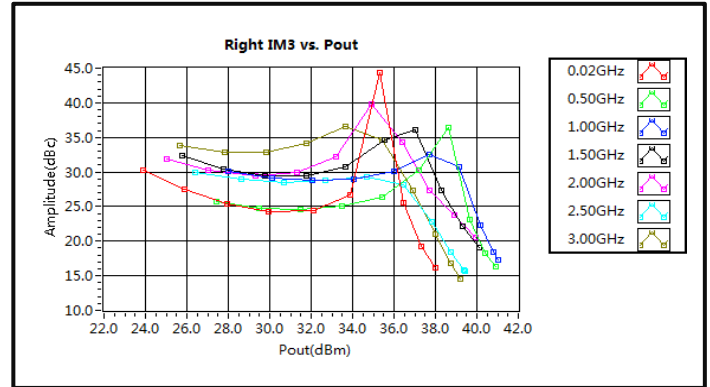


**Typical Performance Plots**

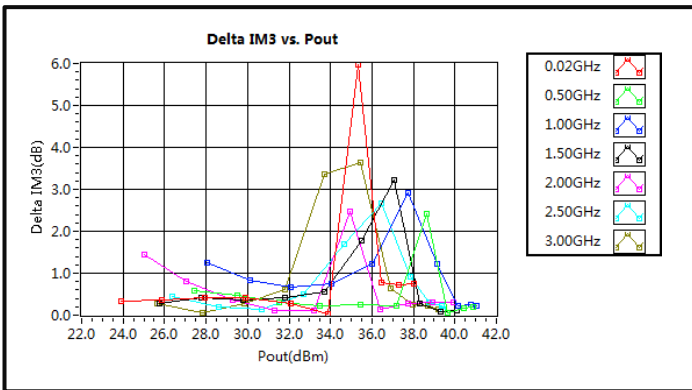
**Left IM3 vs. Pout**



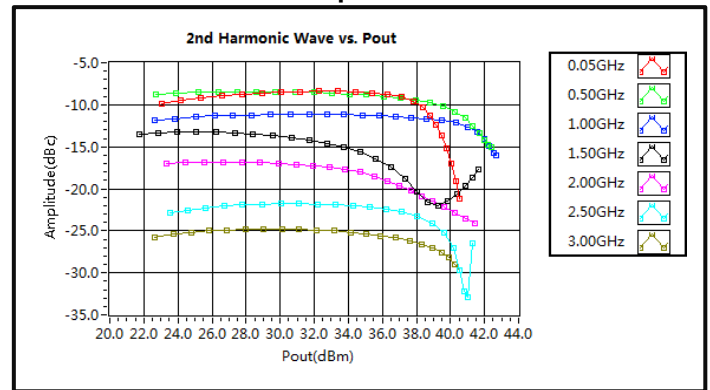
**Right IM3 vs. Pout**



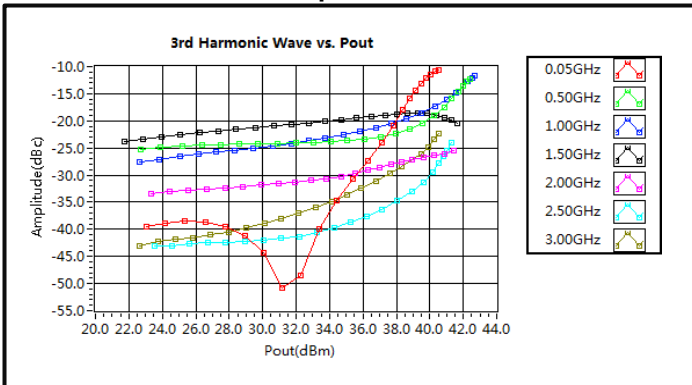
**Delta IM3 vs. Pout**



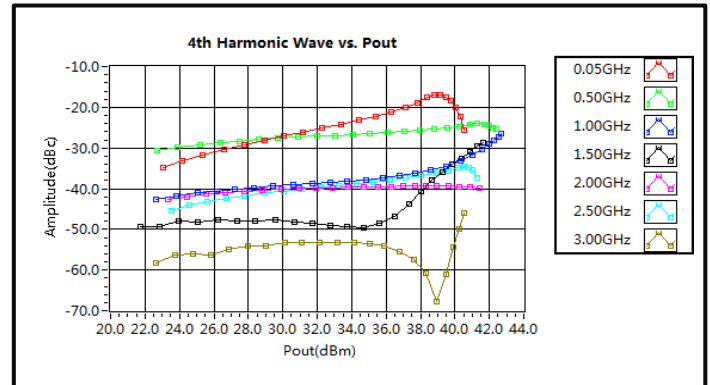
**2nd Harmonic Wave Output Power**



**3rd Harmonic Wave Output Power**

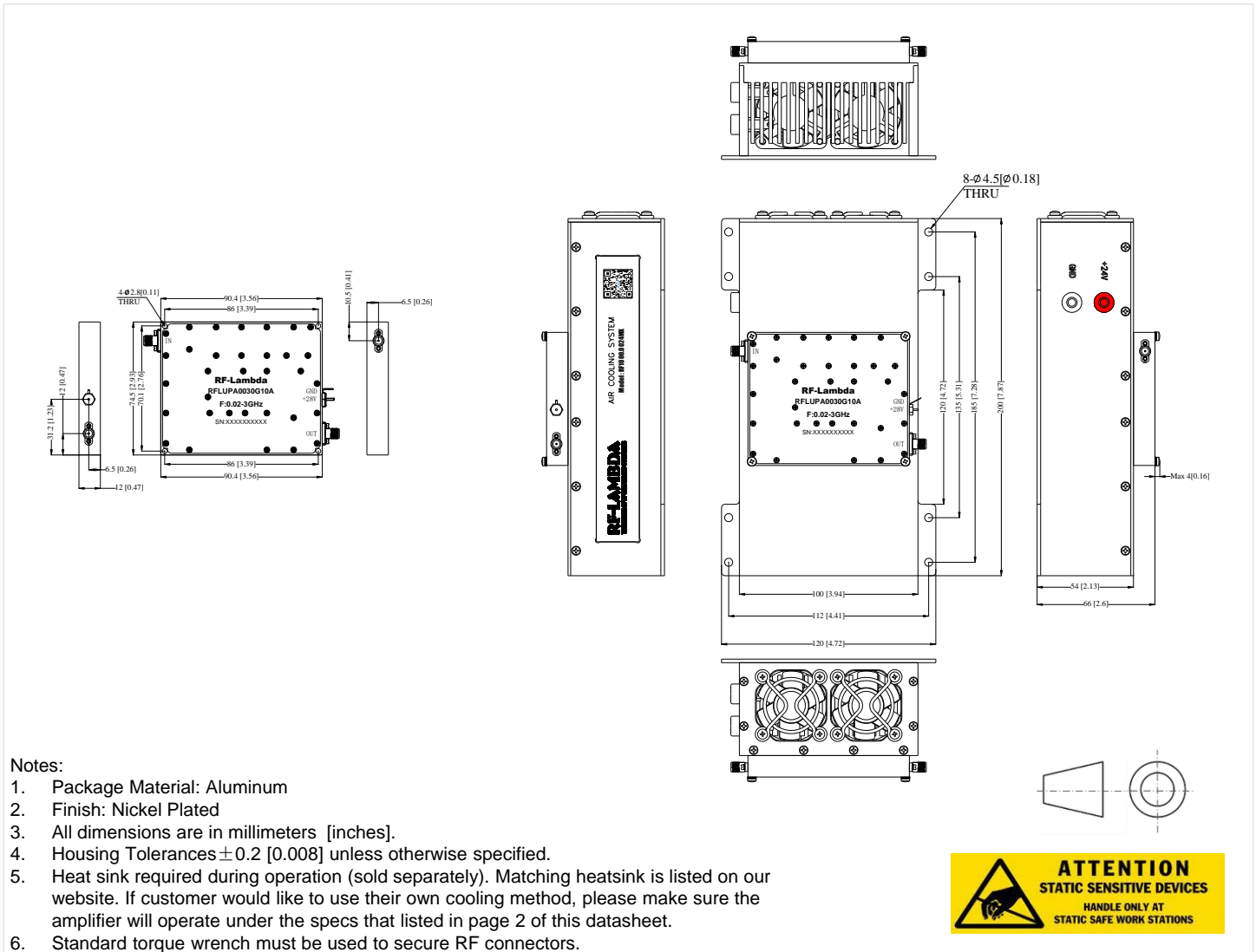


**4th Harmonic Wave Output Power**



Note: IM3 test performed with 1MHz tone spacing

**Outline Drawing**



**Packing List**

ID	Description	QTY
1	Fig a. Fan adapter	1



**Fig a.**

**Additional Information**

Documentation	Webpage
ESD Policy	<a href="https://rflambda.com/pdf/rflambda_esd_control.pdf">https://rflambda.com/pdf/rflambda_esd_control.pdf</a>
Heatsink Lookup Specifications	<a href="https://rflambda.com/search_heatsink.jsp">https://rflambda.com/search_heatsink.jsp</a>
Connector Torque Specifications	<a href="https://www.rflambda.com/pdf/Torque_Specifications.pdf">https://www.rflambda.com/pdf/Torque_Specifications.pdf</a>
Random Vibration Test Standard	<a href="https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf">https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf</a>

**Ordering Information**

Part Number	Modification	Description
RFLUPA0030G10A	Standard	0.02GHz-3GHz Solid State Power Amplifier

**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.

**Important Notice**

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