

## 7W ACPR Emission Compressed Linear Power Amplifier 3GHz-6GHz



### Product Description

RFLUPA0306GE is a 7W ACPR emission compressed linear power amplifier with a frequency range of 3 to 6GHz.

The power output of this amplifier is 37dBm typical. The typical small signal gain is 40dB with a gain flatness of  $\pm 1.5$ 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

- ACPR Emission Compressed Linear Power Amplifier
- Small Signal Gain 40dB Typical
- Output Saturation Power 39dBm 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 ( $T_A=+25^\circ\text{C}$ ), $V_{CC}=+28\text{VDC}$

Parameter	Min	Typ	Max	Units
Frequency Range	3		6	GHz
Gain	36	40		dB
Gain Flatness		$\pm 1.5$		dB
Gain Variation Over Temperature (-40°C to +85°C)		$\pm 1.0$		dB
Input VSWR		1.6	2.0	: 1
*Output Power for 1 dB Compression (P1dB)	35	37		dBm
*Saturated Output Power (Psat)		39		dBm
Supply Current ( $V_{CC} = +28\text{VDC}$ )		650	1500	mA
Isolation S12		-55		dB
Efficiency at P1dB		23		%
Input Max Power(no damage)		+8		dBm
Weight	Net	0.4 Max.		lbs.
	Including Heat sink	1.1 Max.		lbs.
Impedance		50		Ohms
Input / Output Connectors	SMA- Female			
Package	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

\* P1dB, P3dB and Psat power test signal: 200 $\mu$ s pulse width with 10% duty cycle.

\* For average CW power testing or increased duty cycle, a 5dB back off from Psat is required.

**Absolute Maximum Ratings**

Parameter	Rating
Operating Voltage	+24V~29V
*RF Input Power (RFIN)	+8dBm

**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**

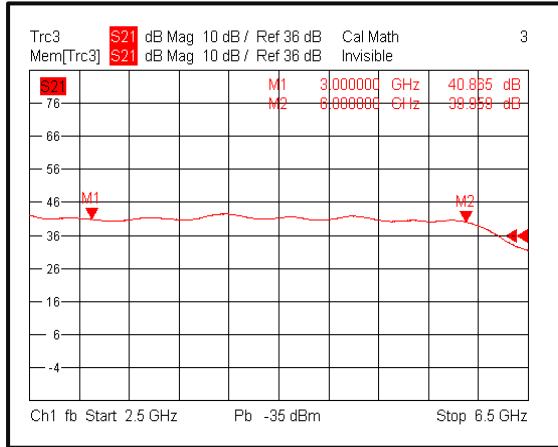
Parameter	Description
Operational Temperature	-40°C to +85°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for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

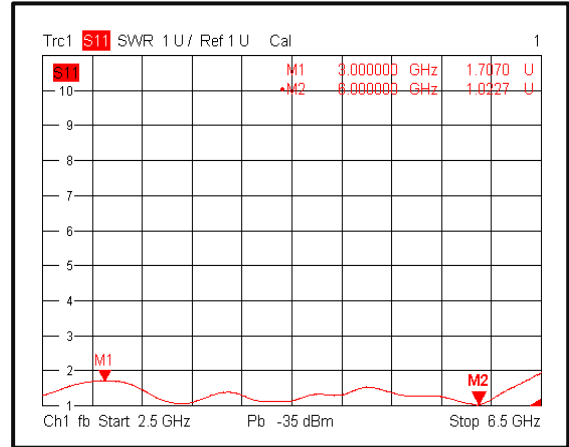
\*\*For vibration testing details please see additional information section.

Typical Performance Plots

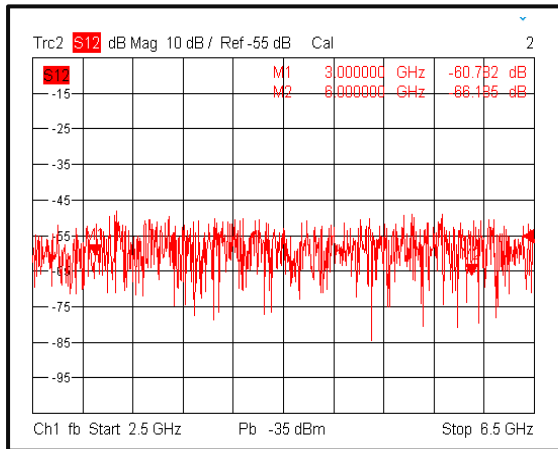
Gain@+25°C



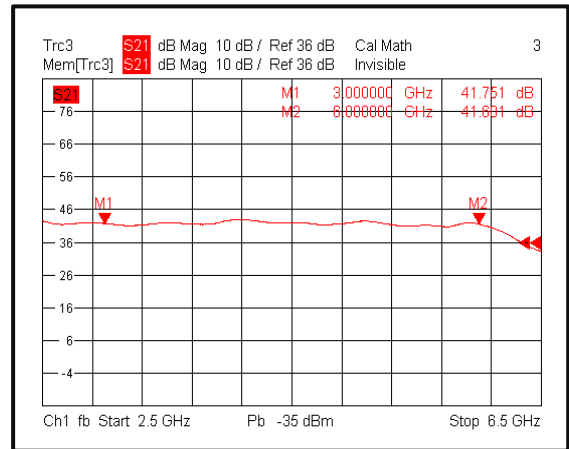
Input VSWR @+25°C



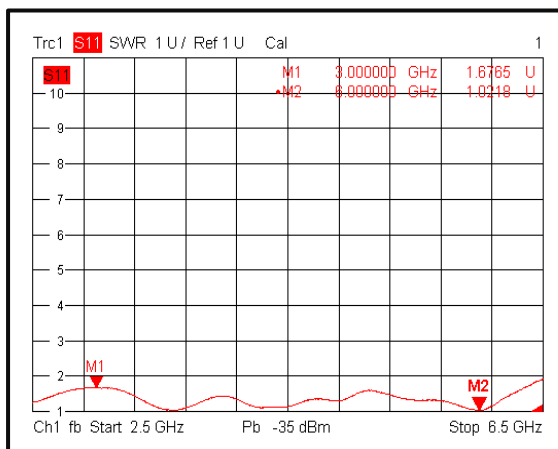
Isolation@+25°C



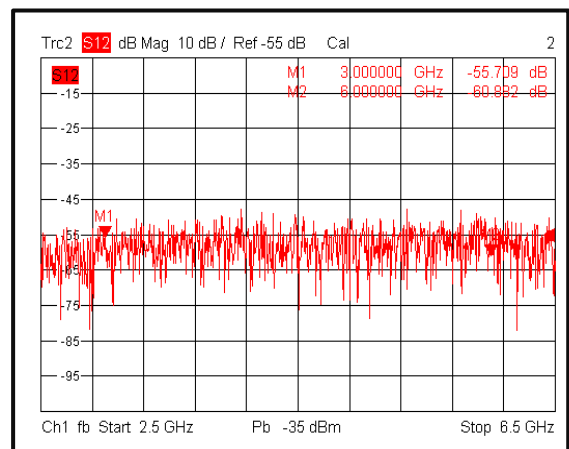
Gain@-40°C



Input VSWR @-40°C



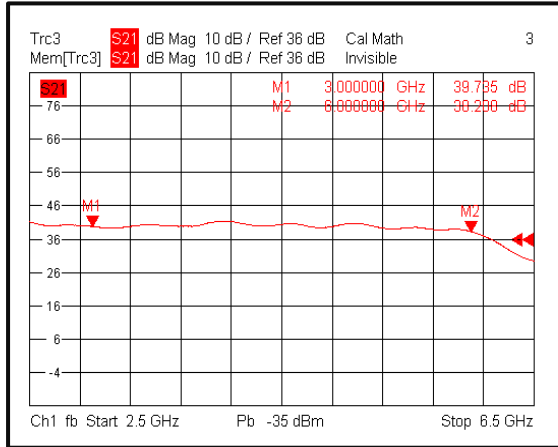
Isolation@-40°C



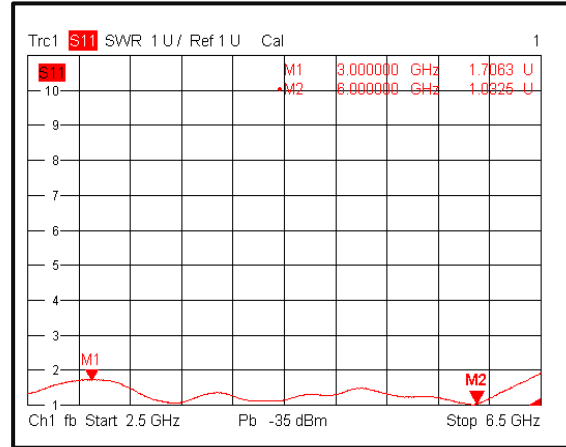
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

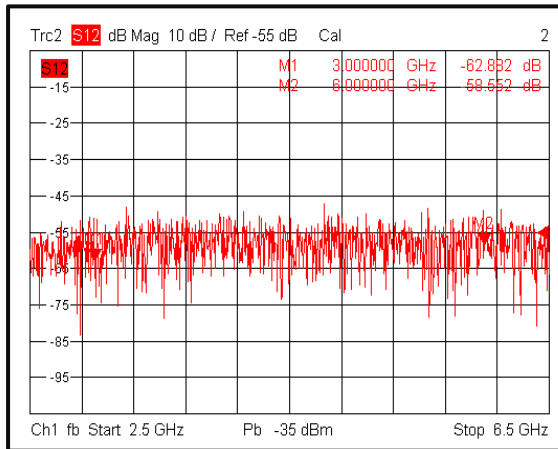
Gain@+85°C



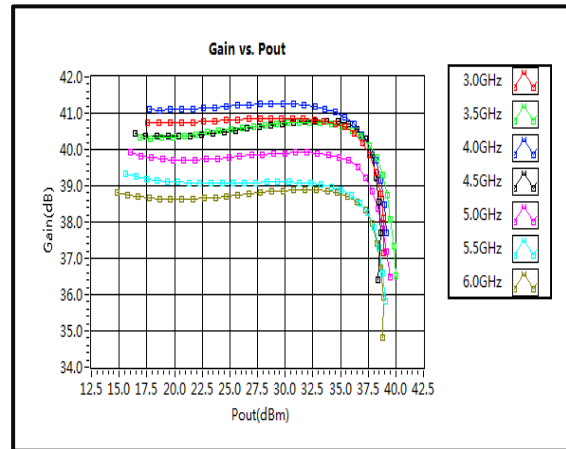
Input VSWR @+85°C



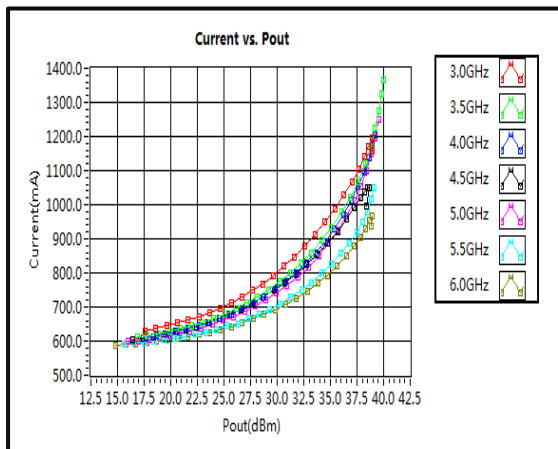
Isolation@+85°C



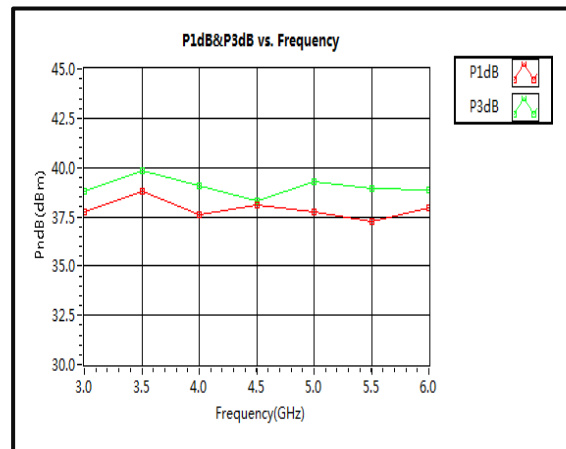
Gain vs. Output Power



Current



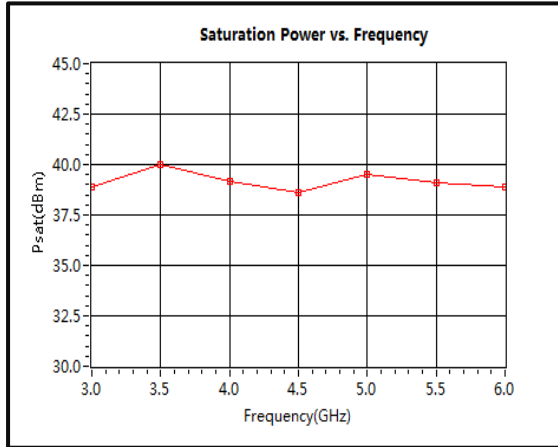
P1dB & P3dB vs. Frequency



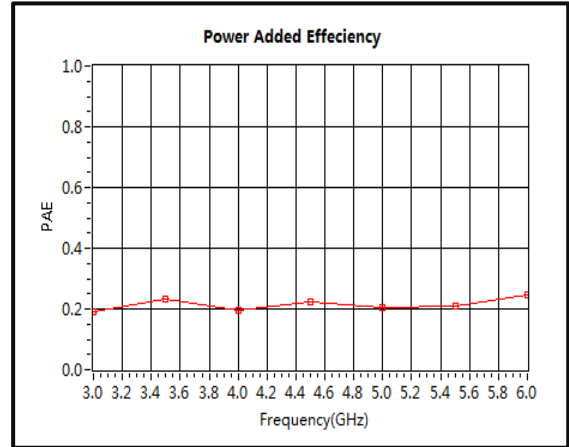
Note: Small signal VNA measurements include attenuators to protect equipment

**Typical Performance Plots**

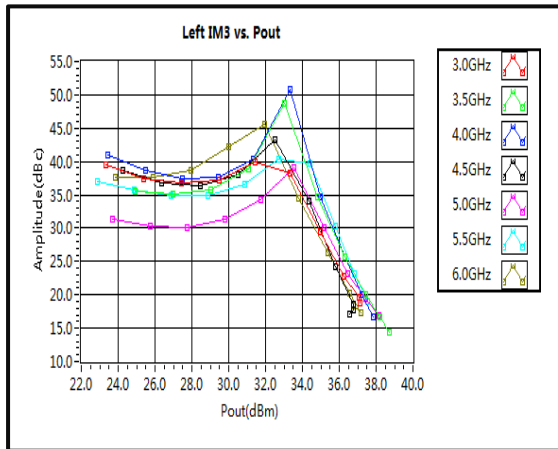
**Saturation Power vs. Frequency**



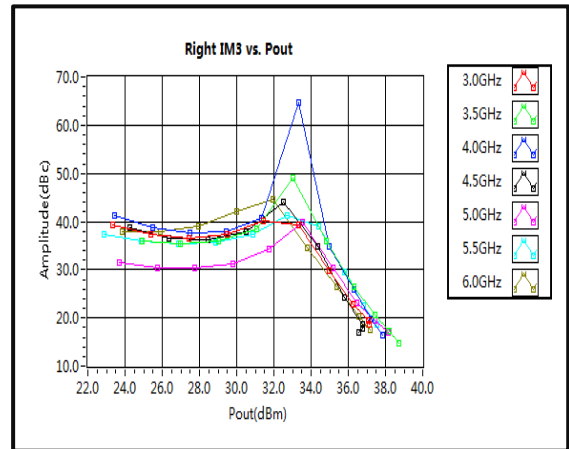
**Power Added Efficiency**



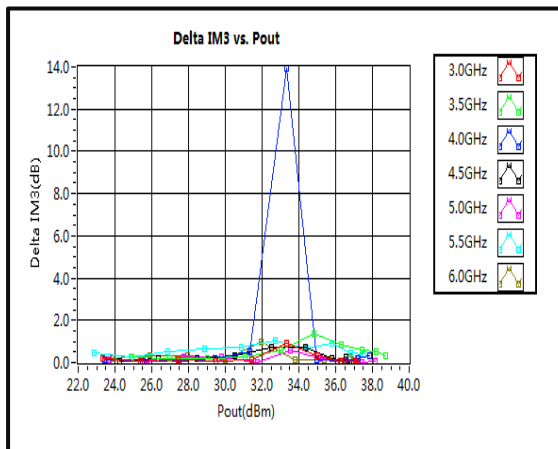
**Left IM3 vs. Pout**



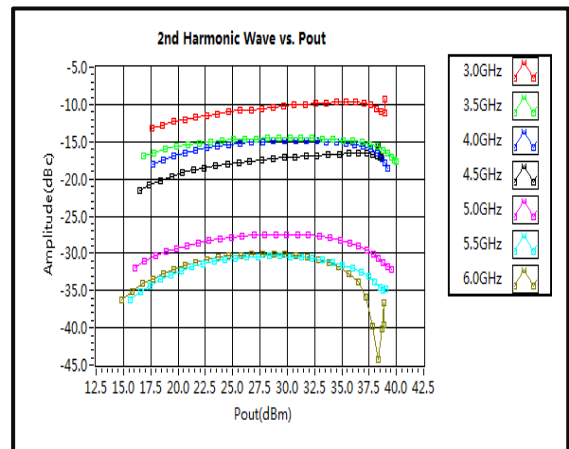
**Right IM3 vs. Pout**



**Delta IM3 vs. Pout**

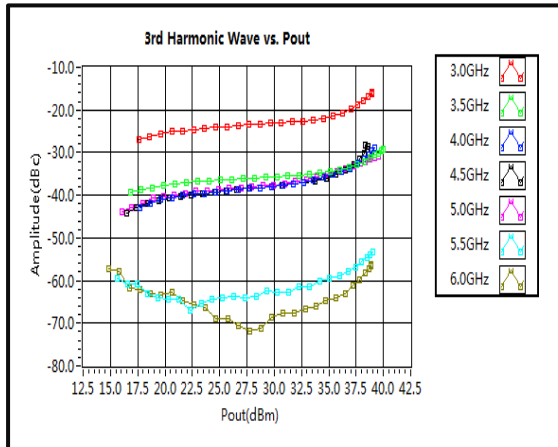


**2nd Harmonic Wave Output Power**

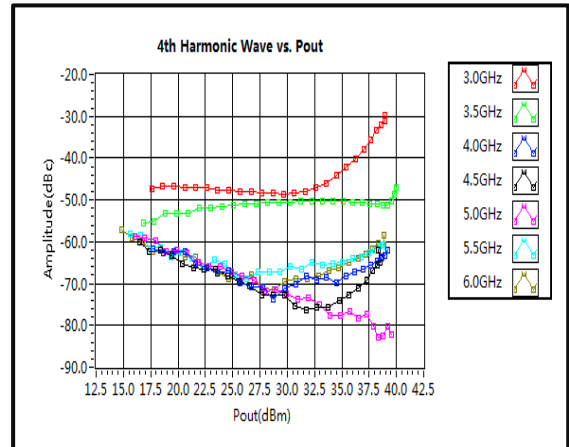


Typical Performance Plots

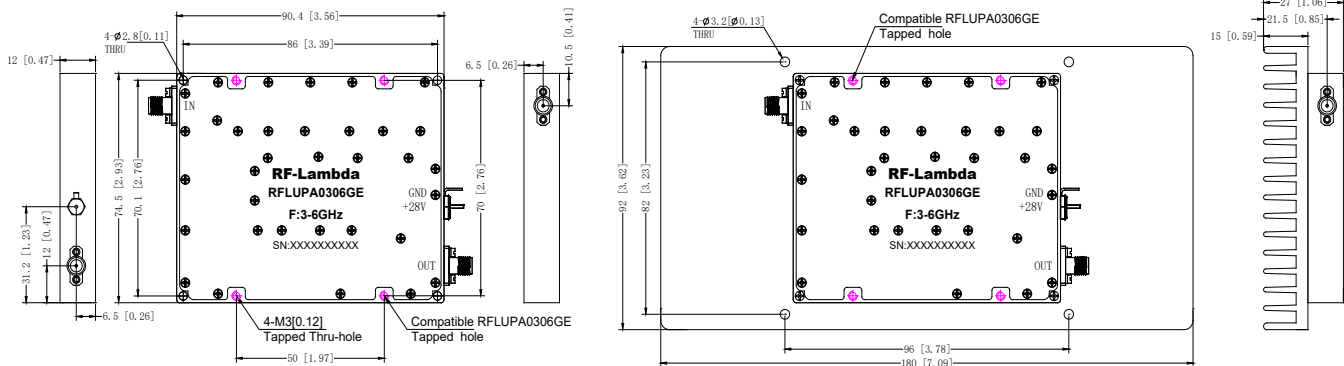
3rd Harmonic Wave Output Power



4th Harmonic Wave Output Power

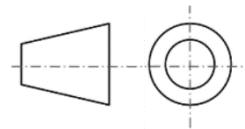


**Outline Drawing**



**Notes:**

1. Package Material: Aluminum
2. Plating: Nickel
3. All dimensions are in millimeters [inches].
4. Tolerances  $\pm 0.2$  [0.008] unless otherwise specified.
5. Heat sink required during operation (sold separately). Matching heatsink is listed on our website. If customer would like to use their own cooling method, please make sure the amplifier will operate under the specs that listed in page 2 of this datasheet.



**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
RFLUPA0306GE	Standard	3GHz-6GHz 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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