Wide Band Power Amplifier
0.5GHz-6GHz

Product Description

RFLUPA05M06G is a wideband power amplifier with a frequency range of 0.5 to 6GHz.

The power output of this amplifier is 31dBm typical. The typical small signal gain is 33dB with a gain flatness of ±2.0dB. This power amplifier works with a +12 VDC power supply.

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

Features

- Wideband Power Amplifier
- Small Signal Gain 33dB Typical
- Output Saturation Power 31dBm Typical
- Supply Voltage +12VDC
- 50 Ohm Matched Input / Output

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=+25ºC)

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.5		4	4		6	GHz
Gain	30	33	38	28	31	37	dB
Gain Flatness		±2	±2.5		±2.0	±3.0	dB
Gain Variation Over Temperature (-40ºC to +85ºC)		±1.5			±1.5		dB
Input VSWR		1.8	2.2		1.8	2.0	: 1
*Output Power for 1 dB Compression (P1dB)	28	30		28	30		dBm
*Saturated Output Power (Psat)		31			31		dBm
Supply Current (Vcc = +12VDC)		280	450		280	450	mA
Isolation S12		-60			-60		dB
Efficiency at Psat (RF Output Power / DC Power Consumption)		25			25		%
Weight	0.4 Max.						lbs.
Impedance	50						Ohms
Input / Output Connectors	SMA- Female(Input) - SMA- Female(Output)						
Package	Epoxy Sealed (Standard)						
	Hermetically Sealed (Optional)						

* P1dB, P3dB and Psat power test signal: 200μs pulse width with 10% duty cycle.
* For average CW power testing or increased duty cycle, a 5dB back off from Psat is required.

RF-LAMBDA USA LLC: www.rflambda.com
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Absolute Maximum Ratings

Parameter	Rating
Operating Voltage	+12.5V
*RF Input Power (RFIN)	+5dBm

Bias Up Procedure

1. Connect ground
2. Connect input and output with 50 Ohm source/load. (In band VSWR < 1.9:1 or >10dB return loss.)
3. Connect positive supply and make sure power supply can handle max current.

Bias Down Procedure

1. Turn off power supply and remove positive supply
2. Disconnect input and output with 50 Ohm source/load. (In band VSWR < 1.9:1 or >10dB return loss.)
3. Remove ground

Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-40ºC to +85ºC (Case Temperature)
Storage Temperature	-50ºC to +105ºC
Thermal Shock	-40ºC → +85ºC (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 +85ºC 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.

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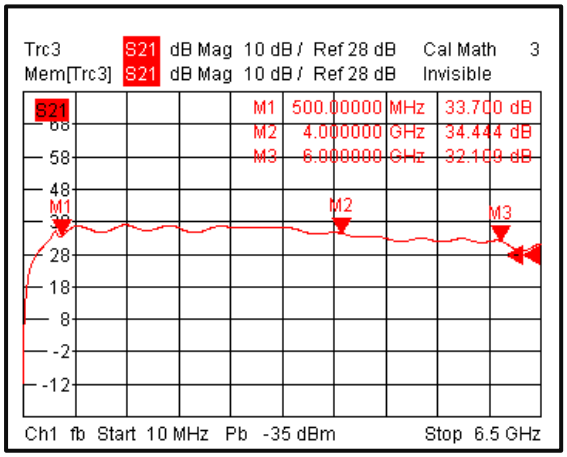
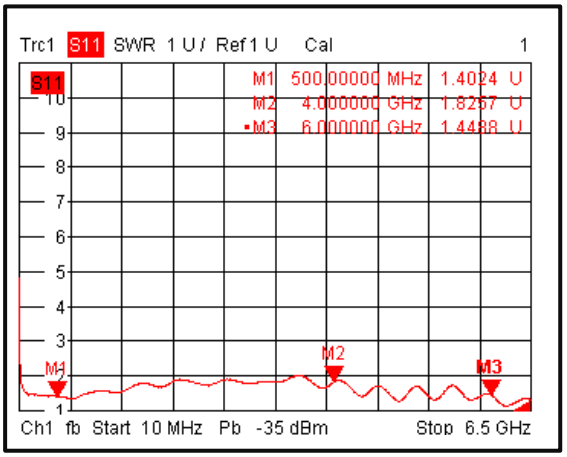
Typical Performance Plots

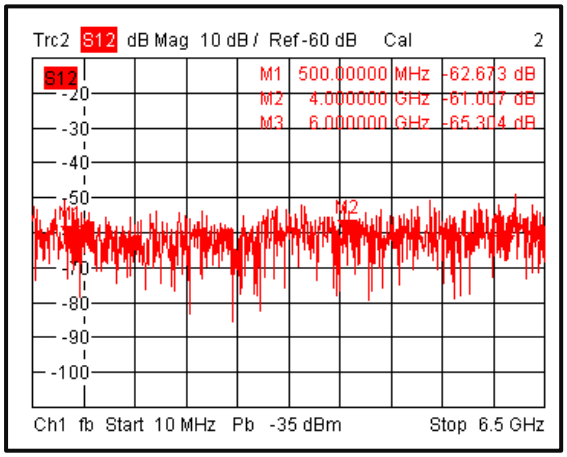
Gain@+25℃



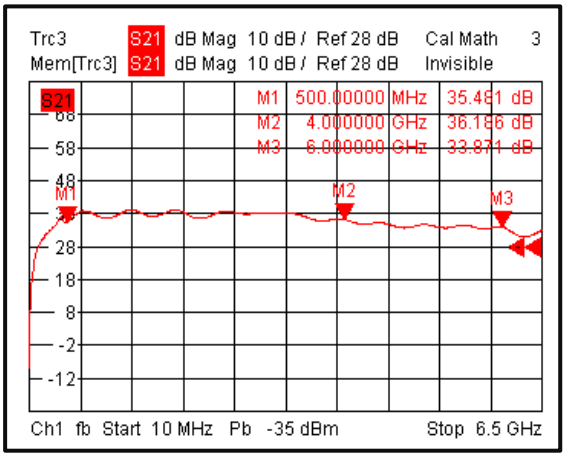
Input VSWR @+25℃



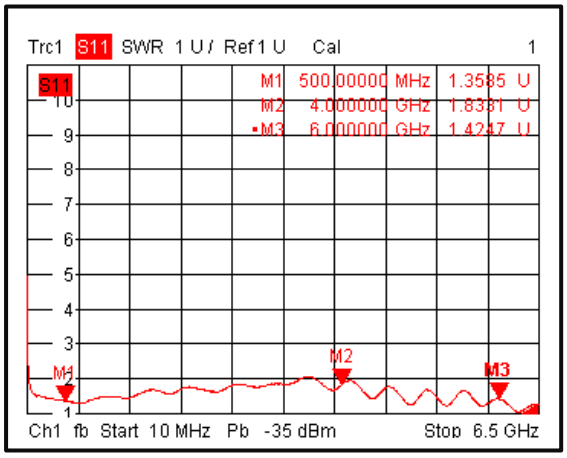
Isolation@+25℃



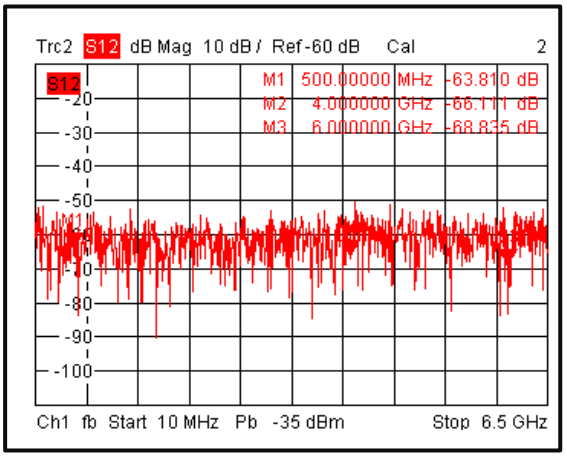
Gain@-40℃



Input VSWR @-40℃



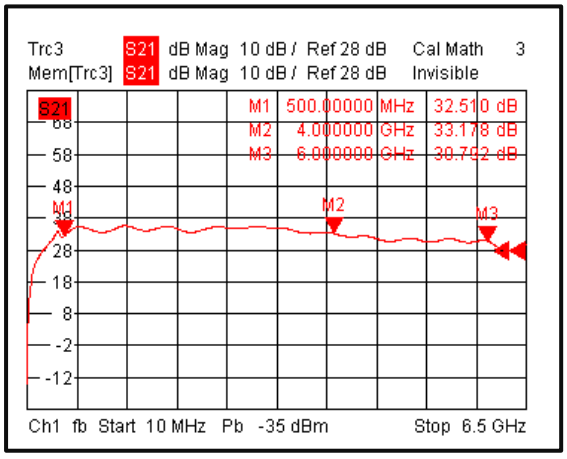
Isolation@-40℃



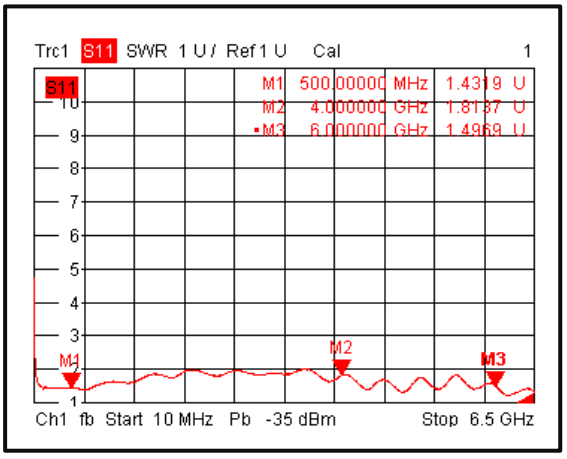
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

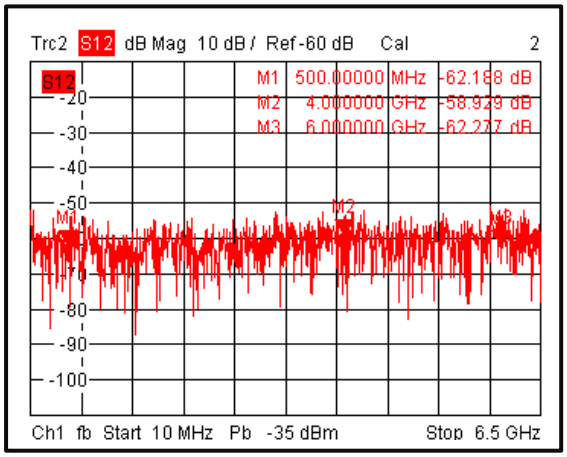
Gain@+85℃



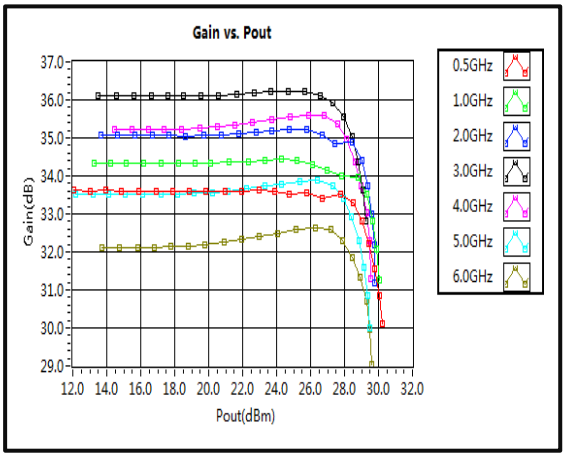
Input VSWR @+85℃



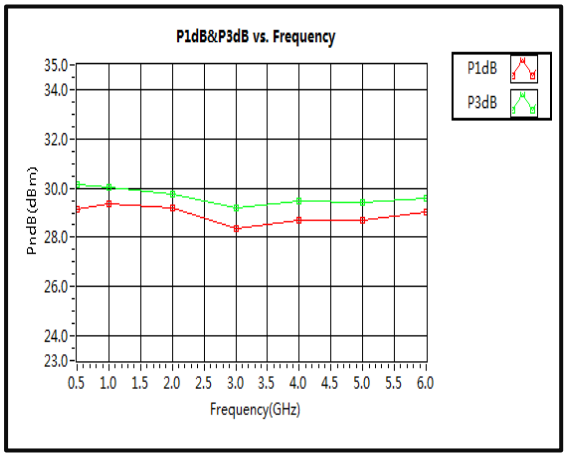
Isolation@+85℃



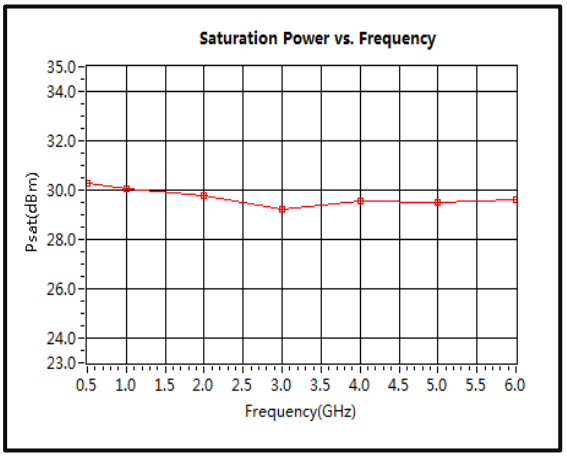
Gain vs. Output Power



P1dB & P3dB vs. Frequency



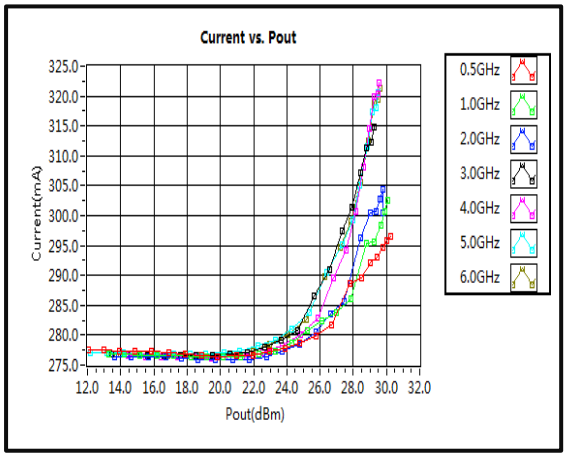
Saturation Power vs. Frequency



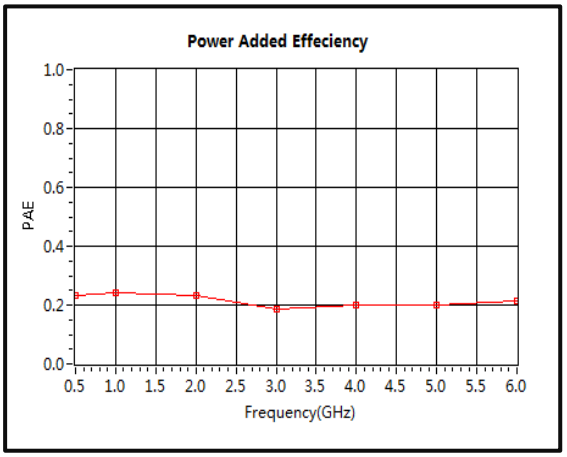
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

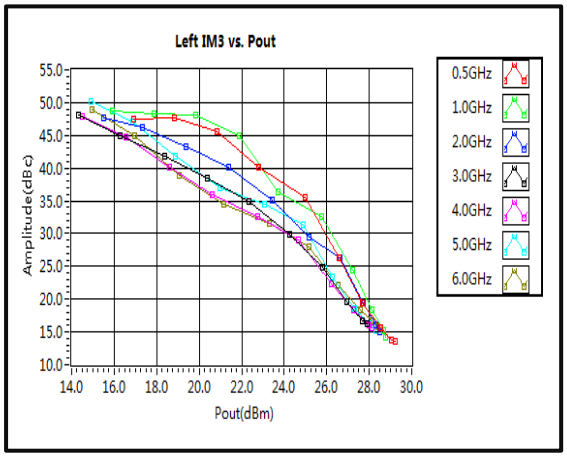
Current vs. Pout



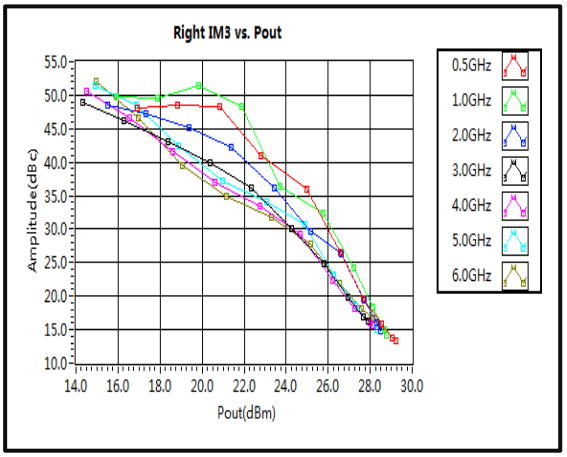
Power Added Efficiency



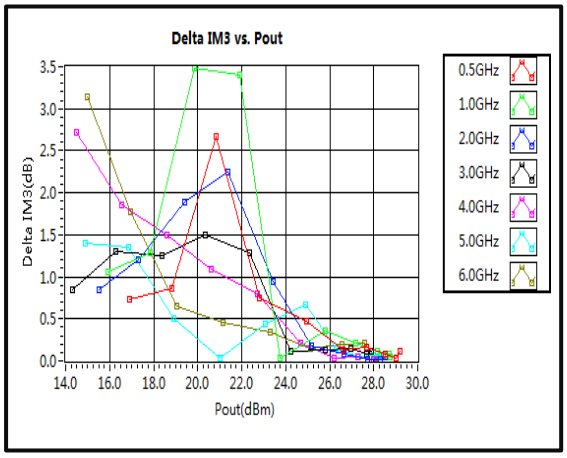
Left IM3 vs. Pout



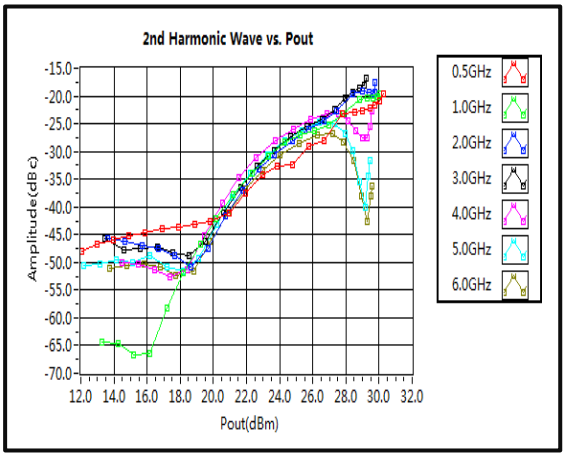
Right IM3 vs. Pout



Delta IM3 vs. Pout

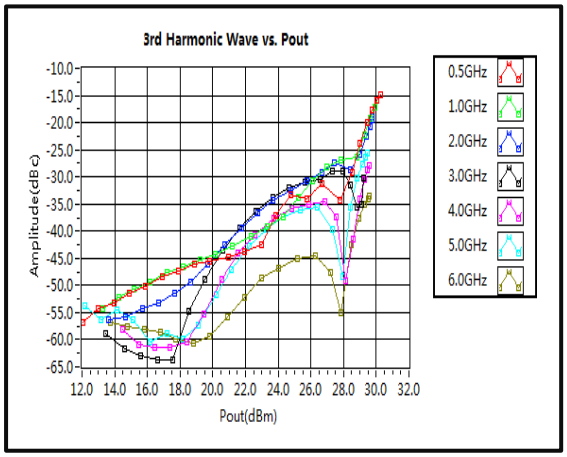


2nd Harmonic Wave Output Power

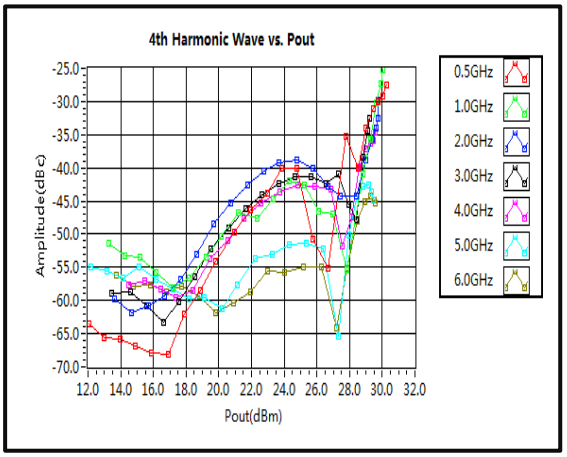


Typical Performance Plots

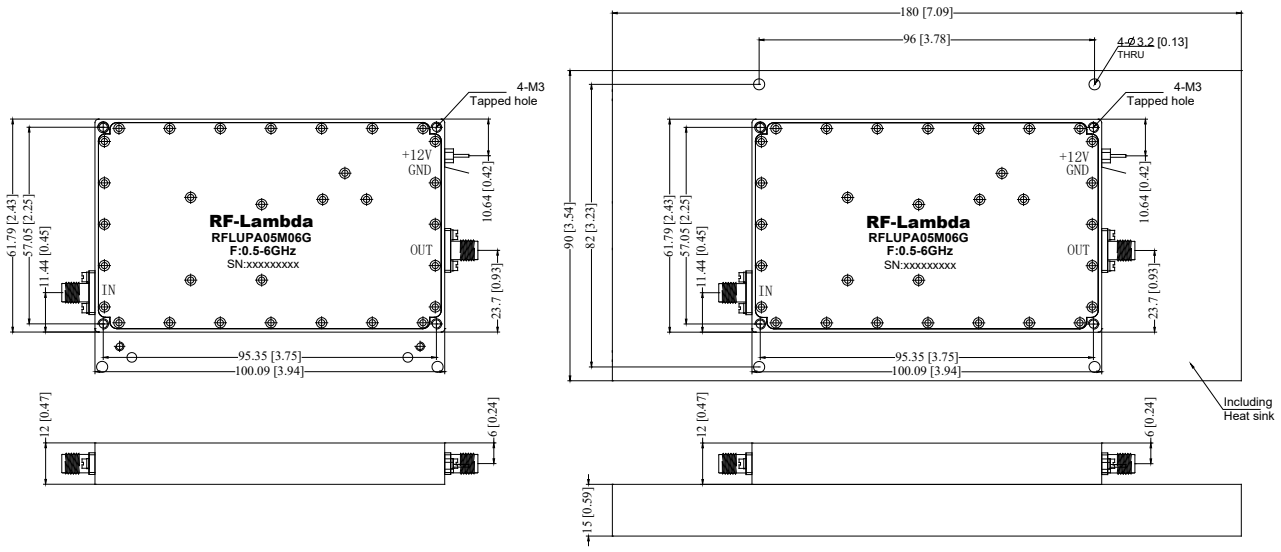
3rd Harmonic Wave Output Power



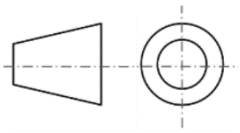
4th Harmonic Wave Output Power



Outline Drawing



Notes:
1. Package Material: Aluminum
2. Plating: Nickel
3. All dimensions are in millimeters [inches].
4. Tolerances ±0.25 [0.01] unless otherwise specified.
5. Heat sink required during operation (sold separately). Matching heatsink is listed on our website.



Additional Information

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

Ordering Information

Part Number	Modification	Description
RFLUPA05M06G	Standard	0.5GHz-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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