Ultra Wide Band AC Low Noise Amplifier 0.005GHz-46GHz

Product Description

RAMP05M46GA is an ultra wideband AC low noise amplifier with a frequency range of 0.005 to 46GHz.

The power output of this amplifier is 18 dBm typical. The typical small signal gain is 38 dB with a great flatness of ±3dB.

The AC amplifier uses a standard convenient 110V/220 VAC power supply.

Features

- Wide Band AC Low Noise Amplifier
- Small Signal Gain 38dB Typical
- Output Saturation Power 24dBm Typica
- Supply Voltage 110/220 VAC
- 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=+25ºC)

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		0.01 – 0.9			1 – 40			41 – 46		GHz
Small Signal Gain		38			37			38		dB
Gain Flatness		±3			±3			±3		dB
Gain Variation Over Temperature (-40℃~+85℃)		±3			±3			±3		dB
Noise Figure		3.0			4			7.5		dB
Input Return Loss		20			10			10		dB
Output Return Loss		20			10			10		dB
Output 1dB Compression Point (P1dB)		18			18			16		dBm
Saturated Output Power (Psat)		24			21			18		dBm
Output Third Order Intercept (OIP3)					25					dBm
Supply Current (AC 110~220V)		370			370			370		mA
Isolation S12		75			60			65		dB
Weight					-					lbs.
Impedance					50					Ohms
Input / Output Connectors					2.4mm-Female					
Package					Epoxy Sealed (Standard)					
					Hermetically Sealed (Optional)					

RF-LAMBDA USA LLC: www.rflambda.com
Sales: sales@rflambda.com Technical: support@rflambda.com

Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	110~240 VAC
*RF Input Power (RFIN)	Psat – Gain

Bias Up Procedure

1. Connect input and output with 50 Ohm source and load with in band return loss better than 10dB.
2. Connect AC Plug
3. Flip switch to “ON” position

Bias Down Procedure

1. Flip switch to “OFF” position
2. Remove AC Plug
3. Remove RF Connection

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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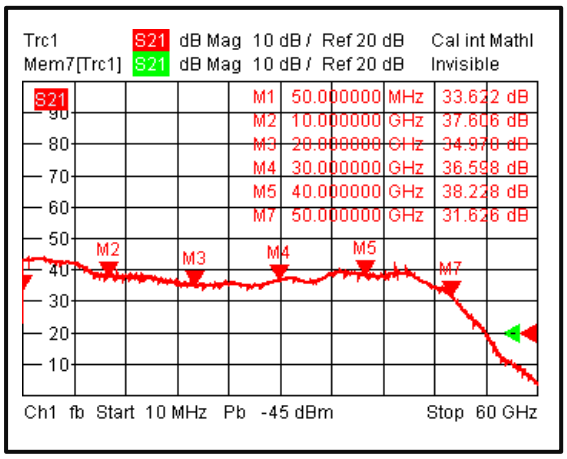
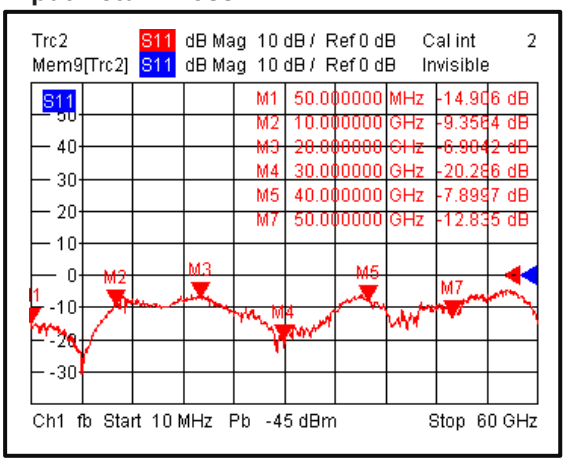
Typical Performance Plots

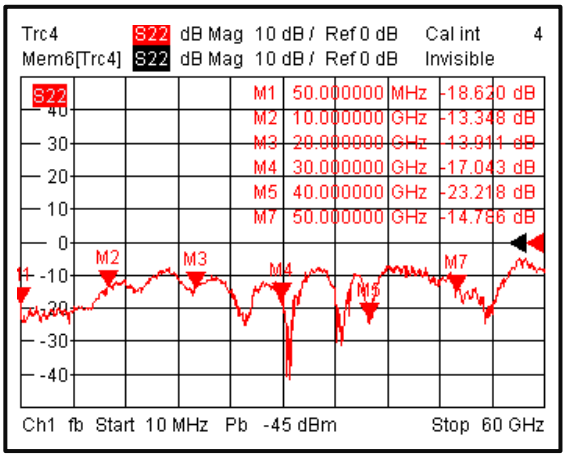
Gain



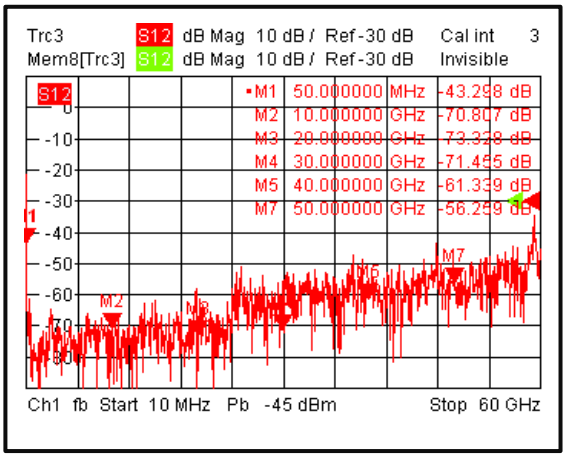
Input Return Loss



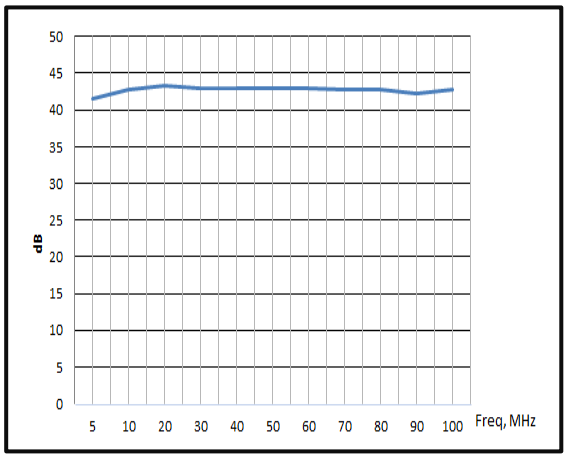
Output Return Loss



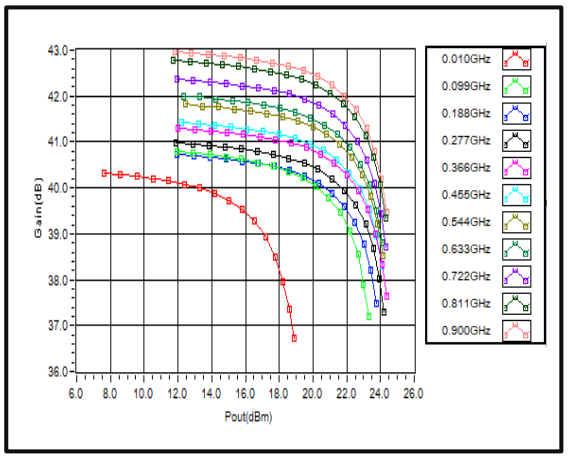
Isolation



Gain vs. Frequency(5MHz - 100MHz)

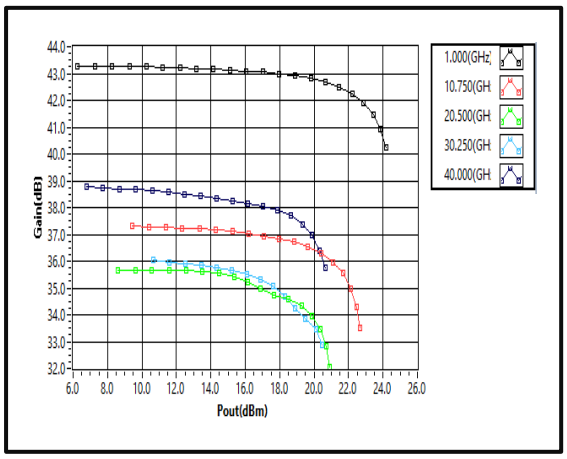


Gain vs. Output Power (0.01 ~ 0.9GHz)

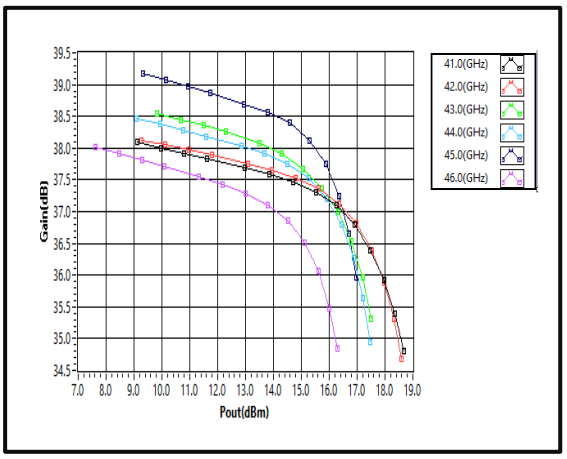


Typical Performance Plots

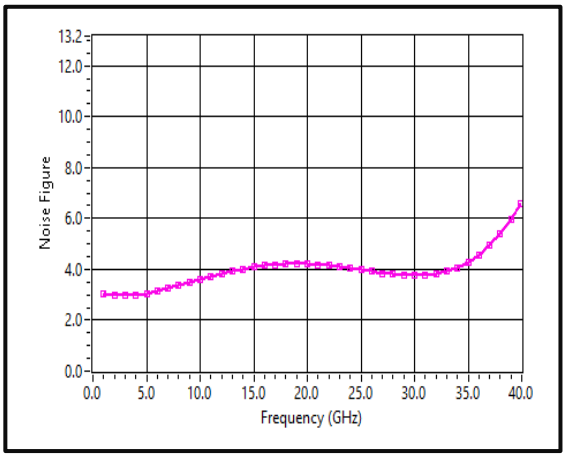
Gain vs. Output Power (1 ~ 40 GHz)



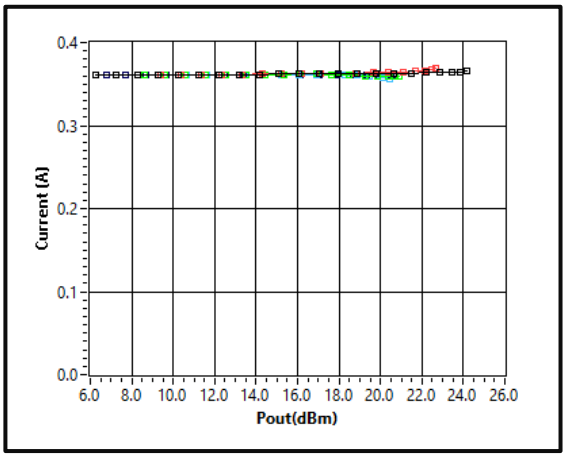
Gain vs. Output Power (41 ~46 GHz)



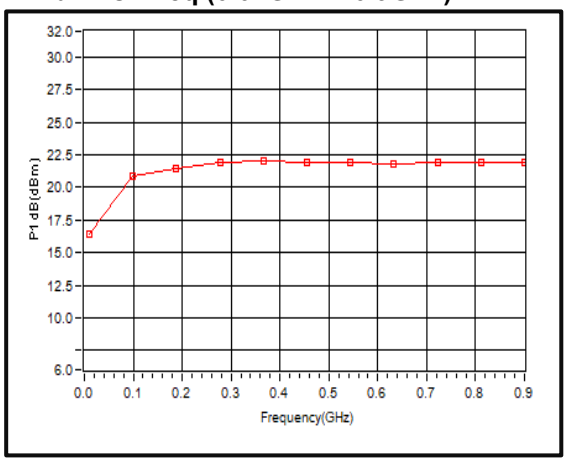
Noise Figure vs. Frequency



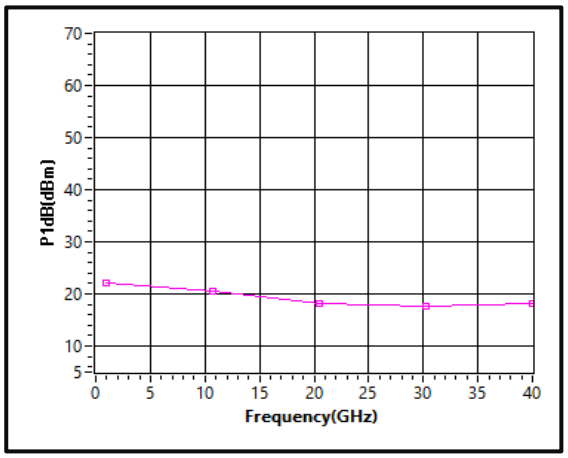
Current vs. Pout



P1dB vs. Freq (0.01GHZ ~ 0.9GHz)

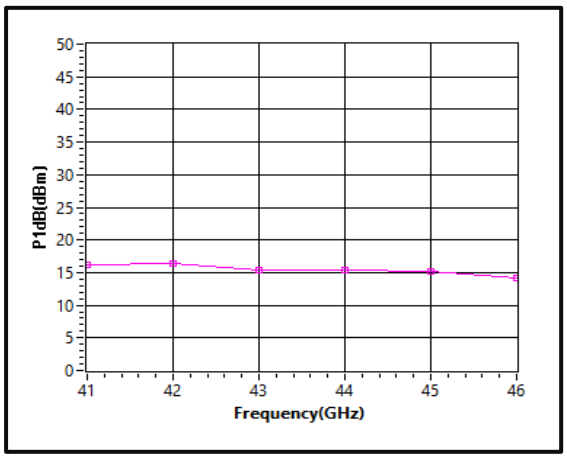


P1dB vs. Freq (1 ~ 40 GHz)

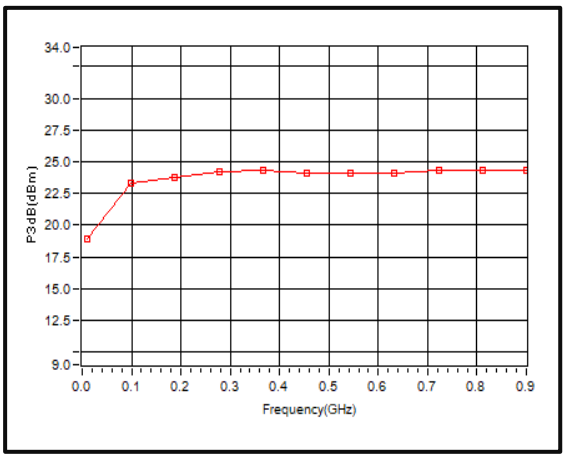


Typical Performance Plots

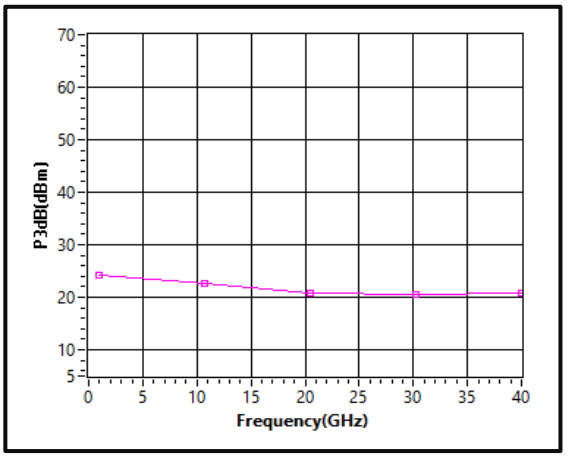
P1dB vs. Freq (41 ~ 46 GHz)



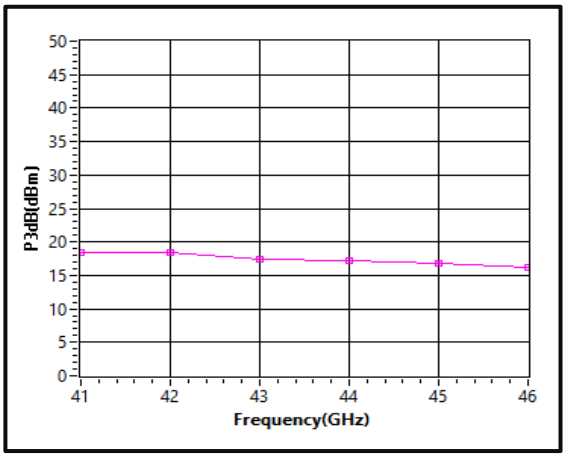
P3dB vs. Freq (0.01GHZ ~ 0.9GHz)



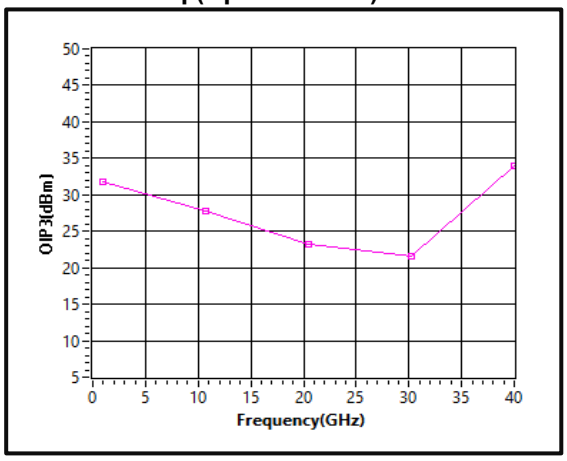
P3dB vs. Freq (1 ~ 40 GHz)



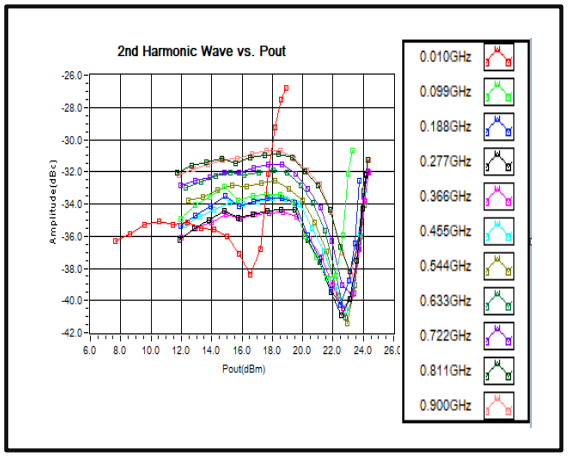
P3dB vs. Freq (41 ~ 46 GHz)



OIP3 vs. Freq (Up to 40 GHz)

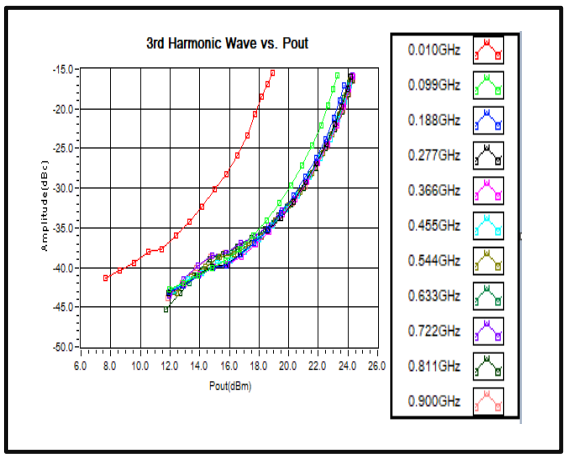


2nd Harmonic Wave Output Power (0.01–0.9GHz)

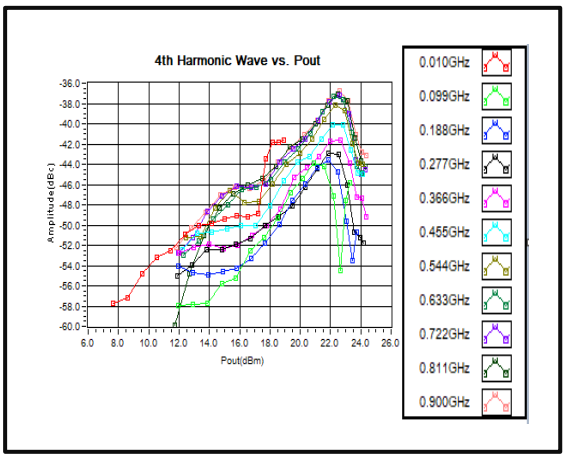


Typical Performance Plots

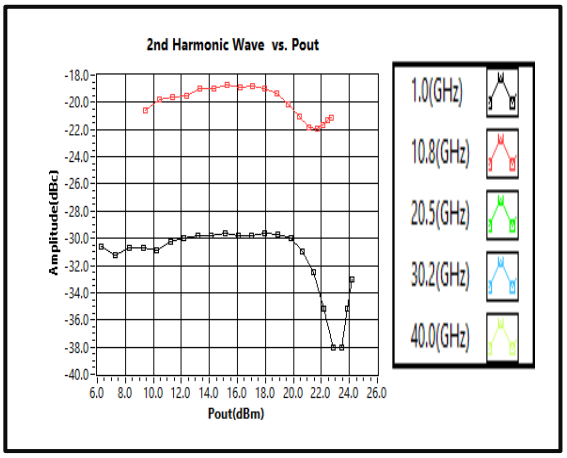
3rd Harmonic Wave Output Power (0.01–0.9GHz)



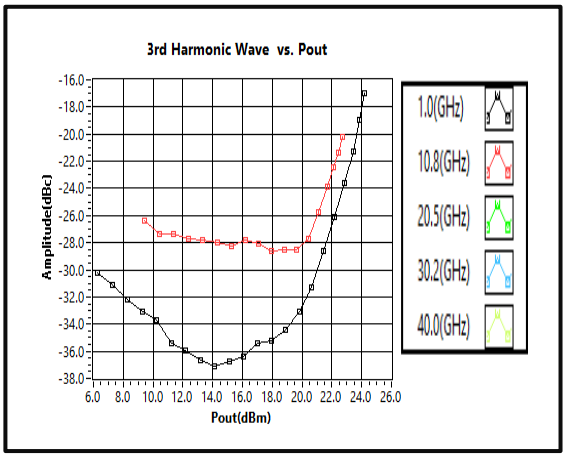
4th Harmonic Wave Output Power (0.01–0.9GHz)



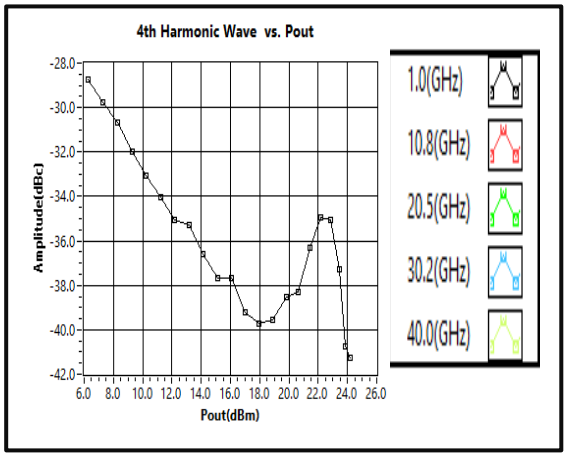
2nd Harmonic Wave Output Power (1–40GHz)



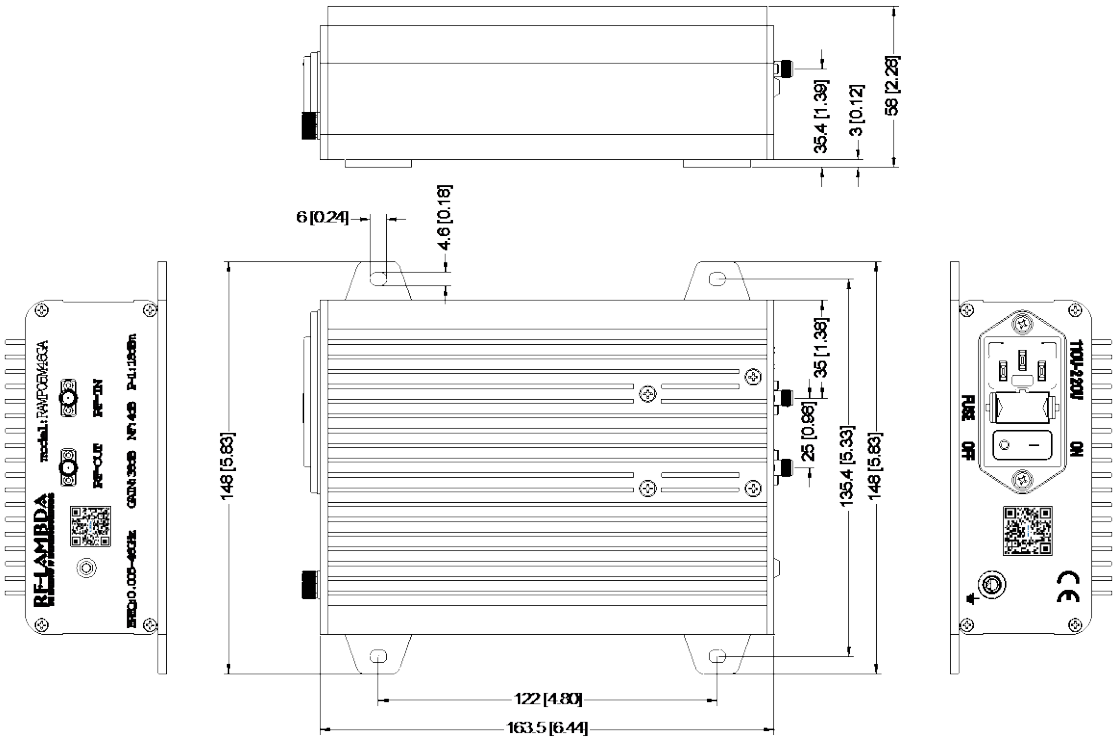
3rd Harmonic Wave Output Power (1–40GHz)



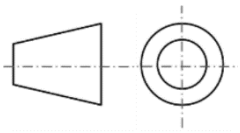
4th Harmonic Wave Output Power (1–40GHz)



Outline Drawing



Notes:
1. Package Material: Aluminum
2. Plating: Black Paint
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ±0.15 [0.006] unless otherwise specified (Excl Heat Sink).
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.
6. Standard torque wrench must be used to secure RF connectors.



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
RAMP05M46GA	Connectors 2.4mm-Female	0.005GHz-46GHz AC Low Noise 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

The information contained herein is believed to be reliable. RF-Lambda makes no warranties regarding the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for any of the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for RF-Lambda products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.
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