

Wideband Power Amplifier 0.01GHz-45GHz



Product Description

RAMP00M45GA is a wideband low noise amplifier with a frequency range of 0.01 to 45GHz.

The 1dB compression point of this amplifier is 20dBm typical. The typical small signal gain is 35dB with a gain flatness of ± 5 dB.

The power amplifier's input connector is 2.92mm and output connector is 2.92mm.

The operating temperature of this product is within -40 to +70°C.

Features

- Wideband Low Noise Amplifier
- Small Signal Gain 36dB Typical
- Output P1dB 20dBm Typical
- Supply Voltage 110/220 VAC
- 50 Ohm Matched Input/Output
- Gain Flatness ± 5 dB

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 ($T_A = +25^\circ\text{C}$)

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.01 – 15			15 – 30			30 – 45			GHz
Small Signal Gain	41			39			34			dB
Gain Variance	± 3			± 3			± 5			dB
Gain Variation Over Temperature (-40°C to +70°C)	± 3			± 5			± 10			dB
Input Return Loss	-15			-10			-10			dB
*Output 1dB Compression Point (P1dB)	22			20			17			dBm
*Saturated Output Power (Psat)	24			22			19			dBm
Supply Current ($V_{CC} = +12\text{VDC}$)	425		500	425		500	425		500	A
IM3	-28			-28			-28			dBc
Weight				2.6						lbs.
Impedance				50						Ohms
Input / Output Connectors				2.92mm (Female) / 2.92mm (Female)						
Package				Screw Sealed Painted Finish						

Note: Special screening is available with extra cost. Please inquire with sales.

Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	230VAC
*RF Input Power (RFIN)	Psat – Large Signal Gain

Bias Up Procedure

1. Connect input and output with 50 Ohm source/load. (In band VSWR < 1.9:1 or >10dB return loss.)
2. Connect Power Cable
3. Turn On Back Panel AC Power Supply Switch
4. Press Front Panel Power Switch to Power Display

Bias Down Procedure

1. Press Front Panel Power Switch to Power Off Display
2. Turn Off Back Panel AC Power Supply Switch
3. Remove Power Cable (If Moving Equipment)
4. Disconnect input and output with 50 Ohm source/load. (In band VSWR < 1.9:1 or >10dB return loss.)

Environmental Specifications and Test Standards

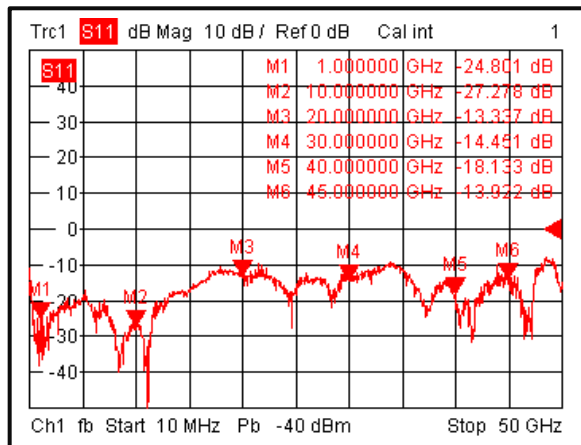
Parameter	Description
Operational Temperature	-40°C to +70°C (Case Temperature)
Storage Temperature	-55°C to +125°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for 72 Hours
Shock	MIL-STD-202G Table 213-I, Test Condition Letter K 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)

Notes:

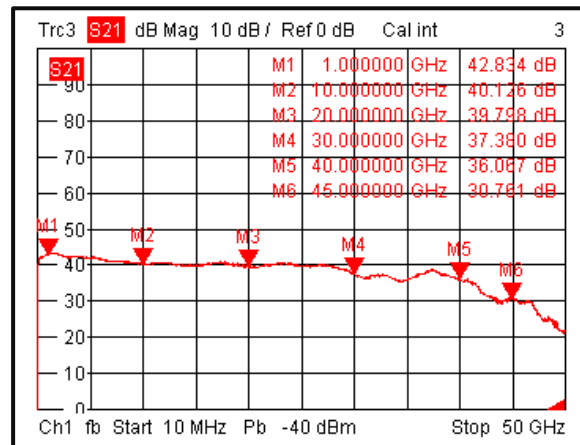
- Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
- For vibration testing details please see additional information section

Typical Performance Plots

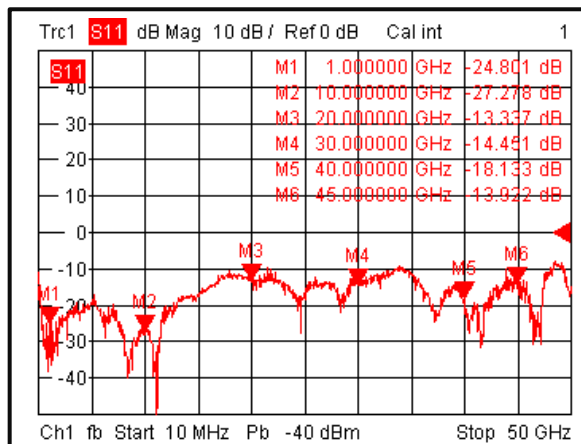
Input Return Loss @+25°C



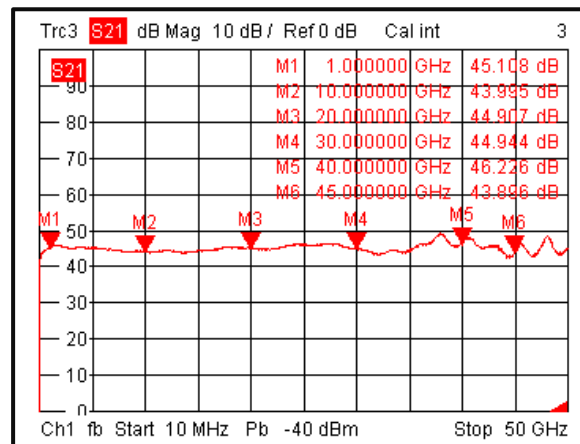
Gain vs. Frequency @+25°C



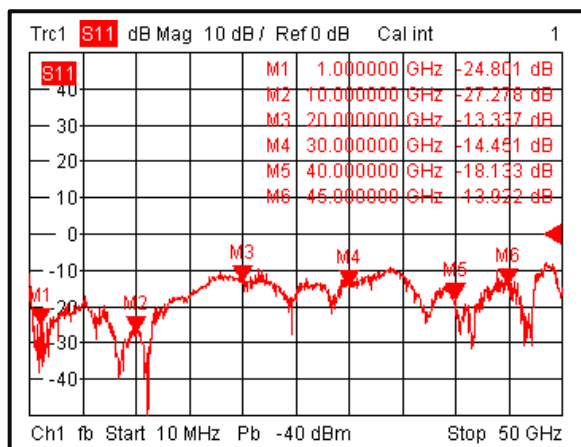
Input Return Loss @-40°C



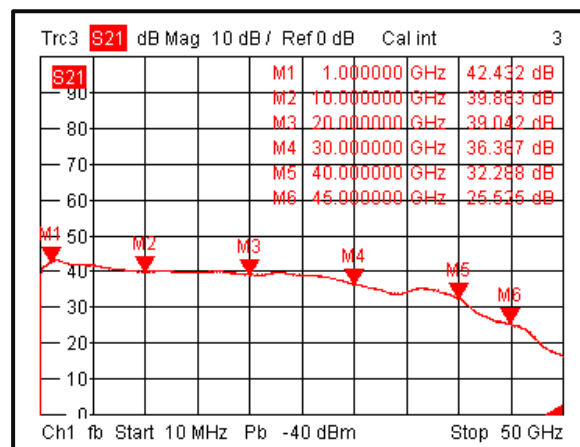
Gain vs. Frequency @-40°C



Input Return Loss @+85°C



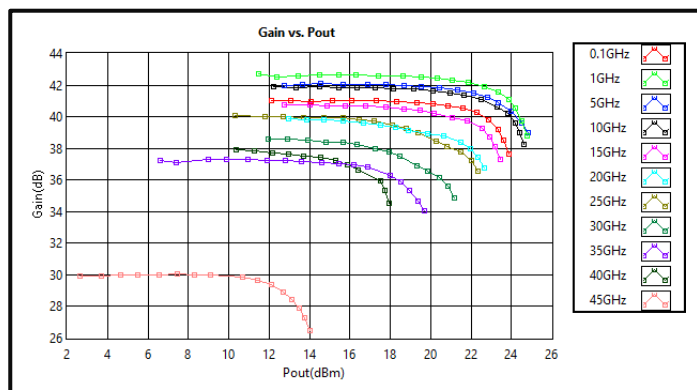
Gain vs. Frequency @+85°C



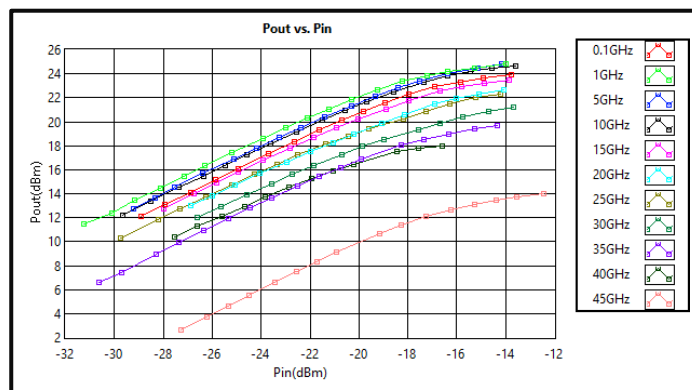
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

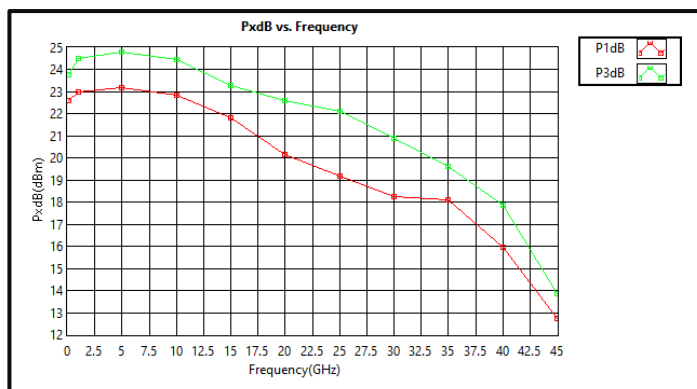
Gain vs Output Power



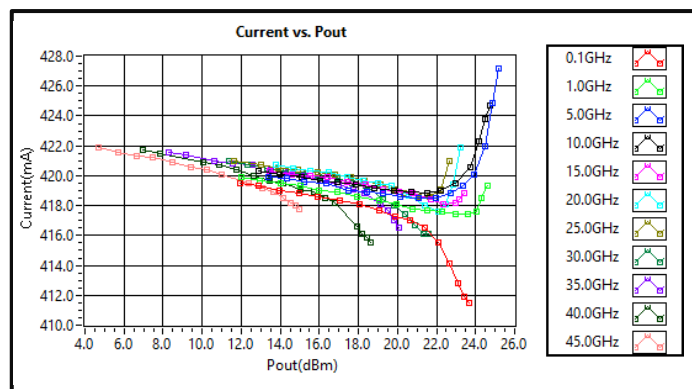
Output vs Input Power



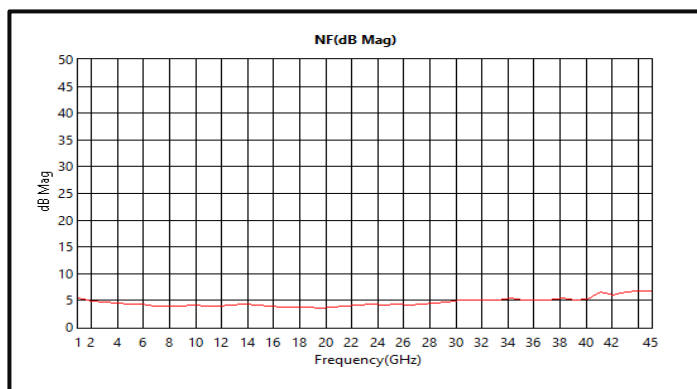
PxdB vs Frequency



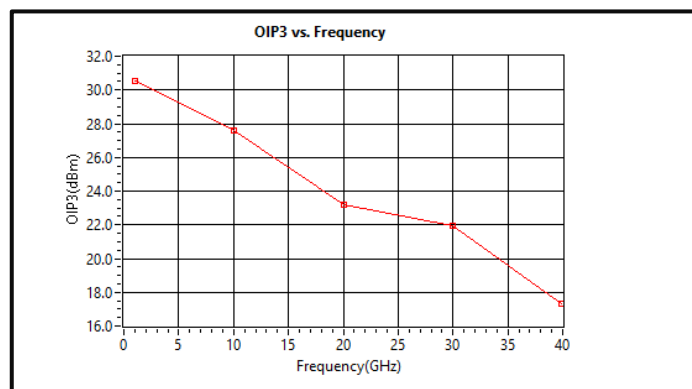
Current vs Output Power



Noise Figure vs Frequency



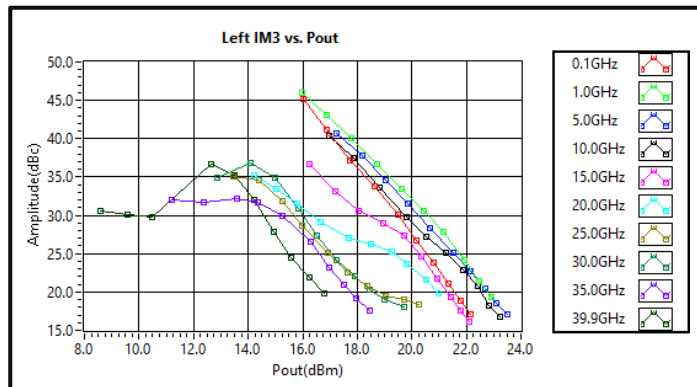
OIP3 vs Frequency



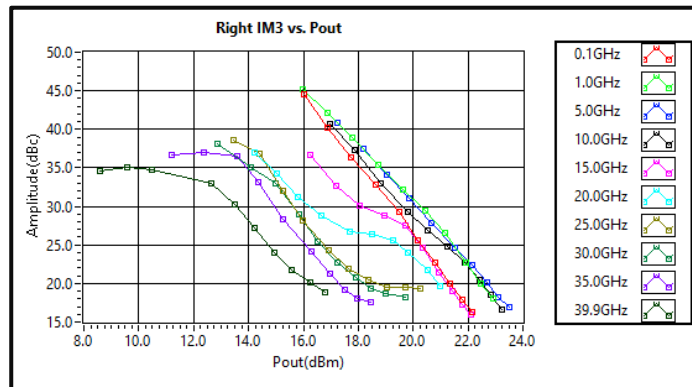
*Pulse Psat power test signal: 20μs pulse width with 10% duty cycle.

Typical Performance Plots

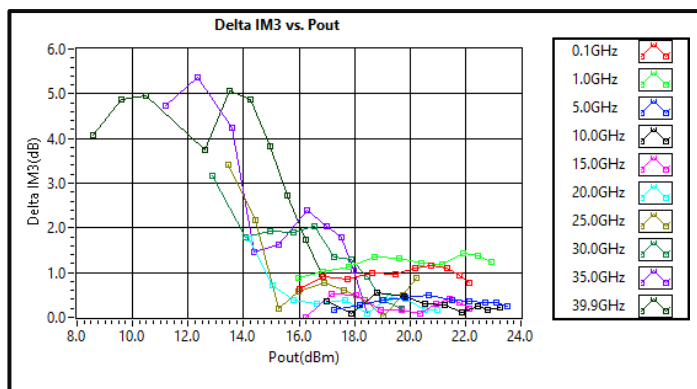
Left IM3 vs Output Power



Right IM3 vs Output Power

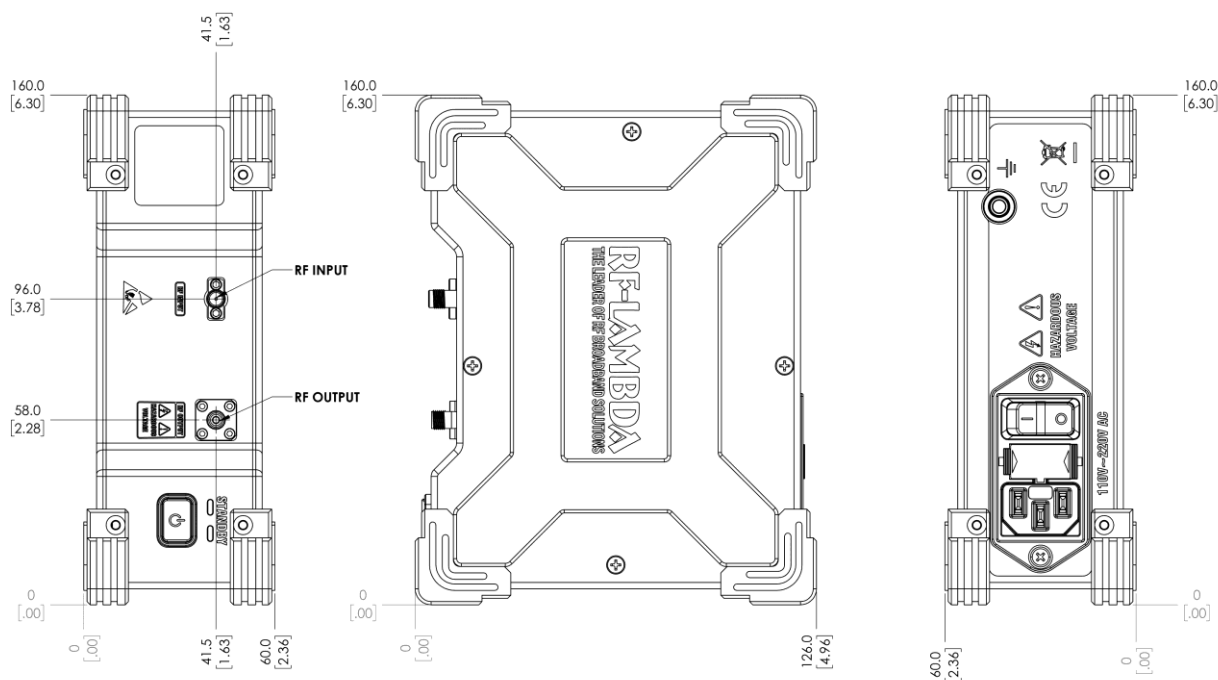


Delta IM3 vs Output Power



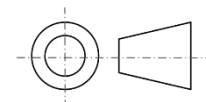
Note: IM3 test performed with 1MHz tone spacing

Outline Drawing



Notes:

1. Package Material: Aluminum and Copper
2. All dimensions are in millimeters [inches].



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
RLNA00M45GA	Input connector 2.92mm and Output connector 2.92mm	0.01GHz-45GHz DC Low Noise Amplifier
RAMP00M45GA	Input connector 2.92mm and Output connector 2.92mm	0.01GHz-45GHz AC Low Noise Amplifier



Each AC amplifier is shipped in a well protected package.

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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