



RF-LAMBDA

The power beyond expectations

RLNA12G21GB

Wide Band Low Noise Amplifier 12 – 21 GHz



Features

- Low Noise Figure 1.5dB
- Output Power: 23dBm
- High Output P1dB: 20dBm

Typical Applications

- Wireless Infrastructure.
- Aerospace and Military Applications
- Test and Measurement

Electrical Specifications, TA = +25°C, Vdd = +12V

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	12 - 16			17 – 21			GHz
Gain		42			40		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3		dB
Noise Figure		1.4			1.4		dB
Input Return Loss		13			10		dB
Output Return Loss		13			13		dB
Output Power for 1 dB Compression (P1dB)		22			20		dBm
Output Third Order Intercept (OIP3)		29			26		dBm
Supply Current		300	400		300	400	mA
Isolation S12		60			60		dB
Input Max Power (No damage)	P1dB – Gain			P1dB – Gain			dBm
Weight	75						g
Impedance	50						Ohms
Input / Output Connectors	SMA-Female						
Finish	Gold Plated						
Material	Aluminum / Copper						

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Absolute Maximum Ratings	
Supply Voltage	+16 VDC
RF Input Power	Psat – Gain

Note: 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.

Biasing Up Procedure	
Step 1	Connect input and output with 50 Ohm source/load. (in band VSWR<1.9:1 or >10dB return loss)
Step 2	Connect Ground Pin
Step 3	Connect VDC
Power OFF Procedure	
Step 1	Turn Off VDC
Step 2	Remove RF Connection
Step 3	Remove Ground

Environmental Specifications and Test Standards

Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45°C~+55°C (Case Temperature less than 85C)
Storage Temperature		-50°C~+125°C
Thermal Shock		1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & 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	MIL-STD-883	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)

Note: The operating temperature for the unit is specified at the package base. It is the user's responsibility to ensure the part is in an environment capable of maintaining the temperature within the specified limits



Ordering Information	
Part No.	Description
RLNA12G21GB	12GHz~21GHz 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.

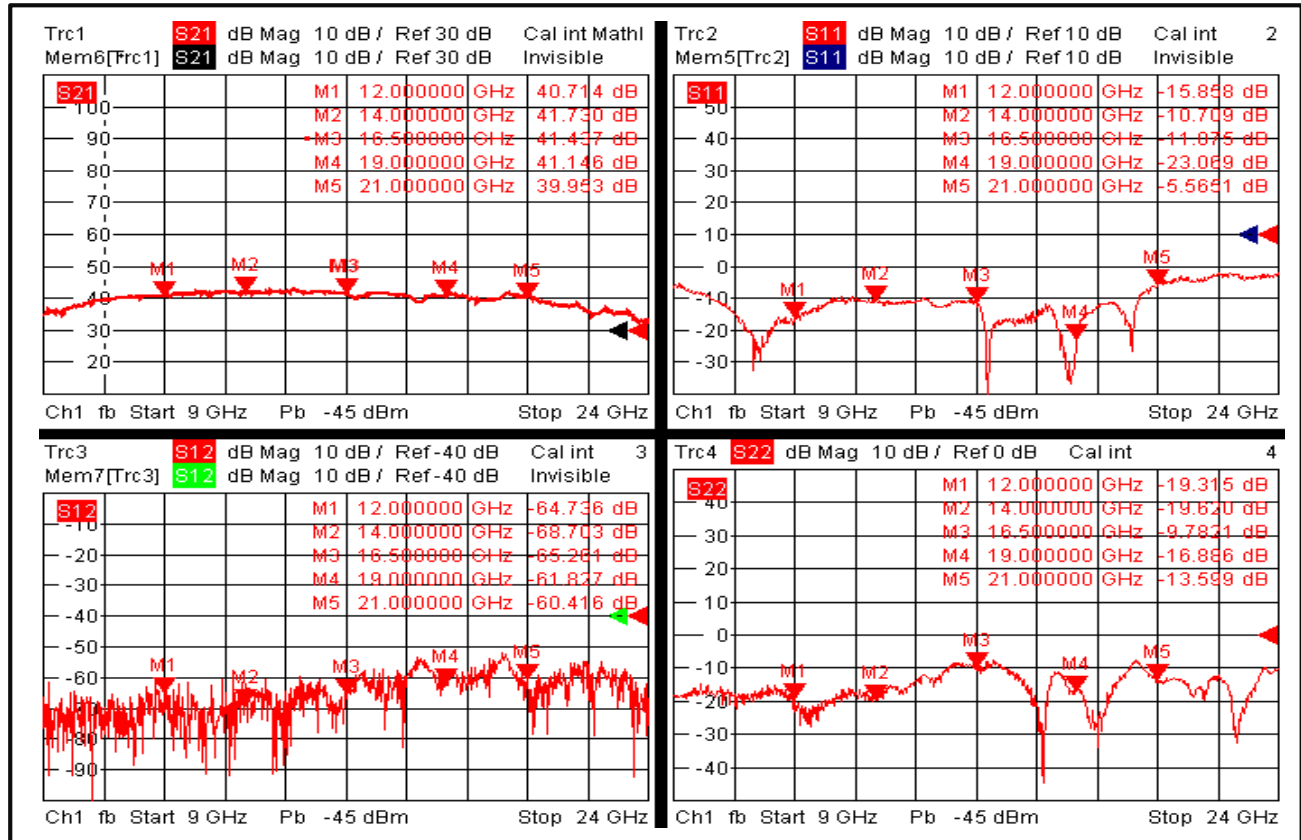


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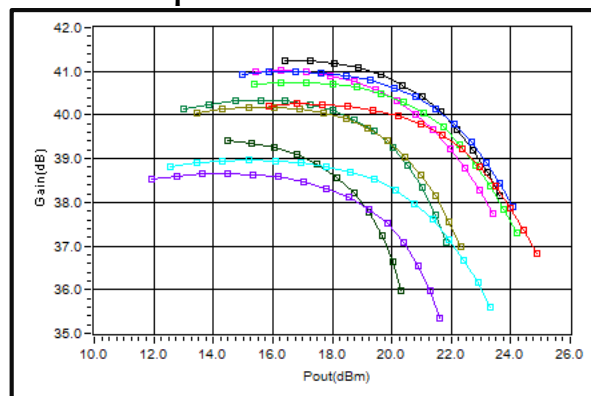
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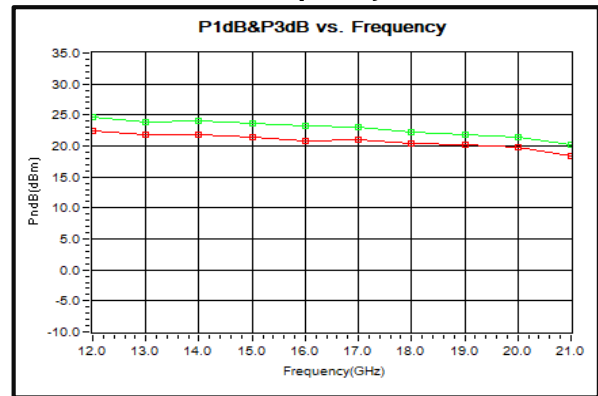
Wideband S-Parameters



Gain vs. Output Power



P1dB & P3dB vs. Frequency



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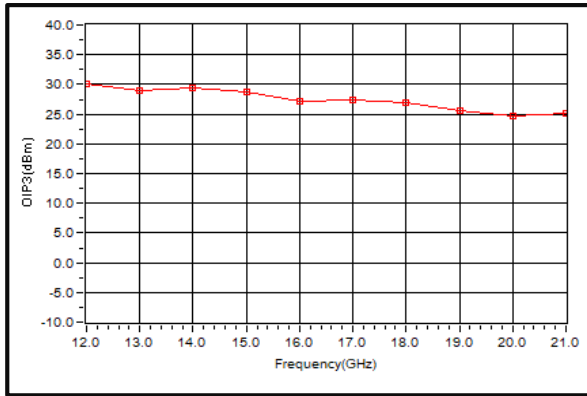


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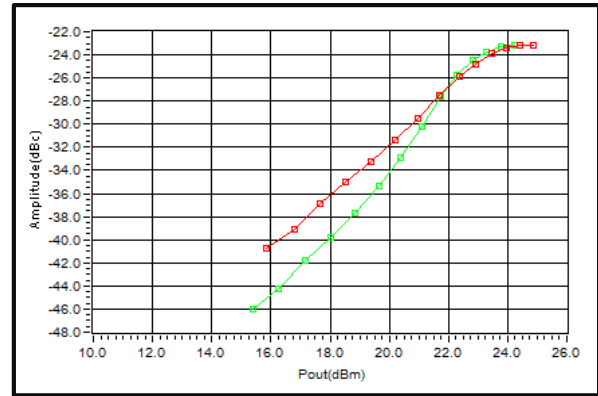
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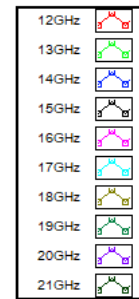
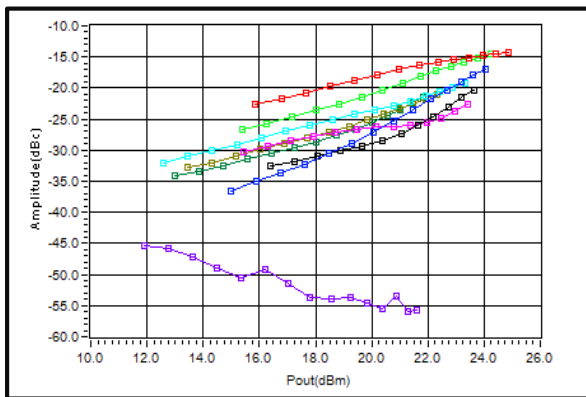
OIP3 vs. Frequency



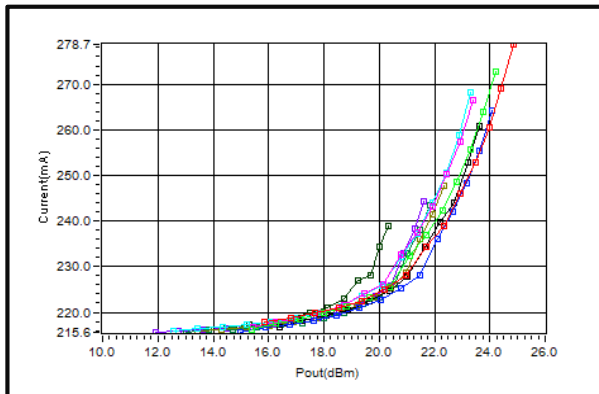
3rd Harmonic Wave vs. Pout



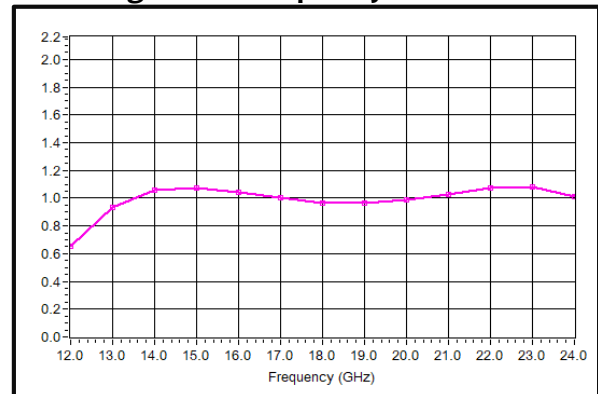
2nd Harmonic Wave vs. Pout



Current vs. Pout



Noise Figure vs. Frequency



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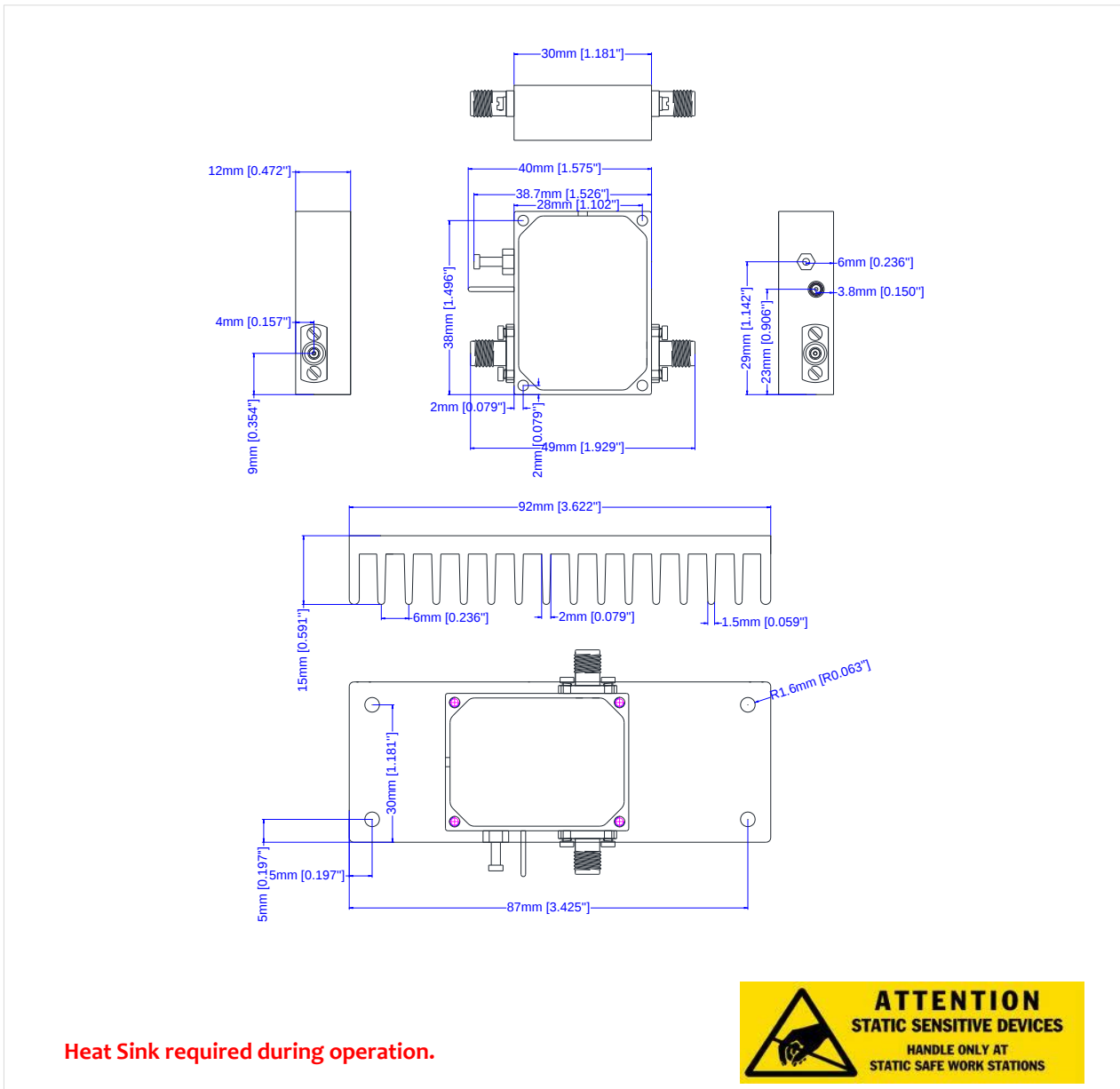
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Outline Drawing:

All Dimensions in mm [inches]



Heat Sink required during operation.



Important Notice

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