50W Linear Power Amplifier
2100MHz-2380MHz

Product Description

RFLNPA2123A is a linear power amplifier with a frequency range of 2100 to 2380MHz.

The power output of this amplifier is 47dBm typical. The typical small signal gain is 50dB with a gain flatness of ±2.0dB. This power amplifier works with an +28VDC power supply.

The working temperature of this product is between - 40 ℃ and + 60 ℃.

Features

- Linear Power Amplifier
- Functional Bandwidth : 1.8GHz to 2.4GHz
- Small Signal Gain 50dB Typical
- Output Saturation Power 47dBm 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=+25ºC)

Parameter		Min.	Typ.	Max.	Units
Frequency Range		2100		2380	MHz
Gain		48	50		dB
Gain Flatness			±2.0		dB
Gain Delta /Temp			0.025		dB/℃
Input VSWR				1.5	: 1
Max. Load VSWR (VSWR load >6:1, Pout >10W PA shut down)				6.0	: 1
ACPR	BW=3.84MHz Offset 5MHz PAR 7.0dB CCDF 0.01%)		-32		dBc
Linear Pout (WCDMA)			42		dBm
PAE (Pout=P3dB)			30		%
3rd Order Intermodulation Product(IM3)			-30		dBc
Output 1dB Compression Point (P1dB)			43		dBm
Saturated Output Power (Psat)			47		dBm
Isolation S12			-60		dB
Start Up Time (RF out Enable)			250		ns
PA Enable Settle Down Time (Current Shut Down)			5		ms
Supply Current			1.2	10	A
Weight	Net		2.3 Max.		lbs
	Including Heat Sink		8.82 Max.		
Impedance			50		Ohms
Interface and Control Connector			DB9-Male		
Input / Output Connectors			SMA-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
Operating Voltage	+30VDC
*RF Input Power (RFIN)	Psat – Large Signal Gain

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
2. Remove positive supply Connection
3. Remove RF Connection
4. Remove ground

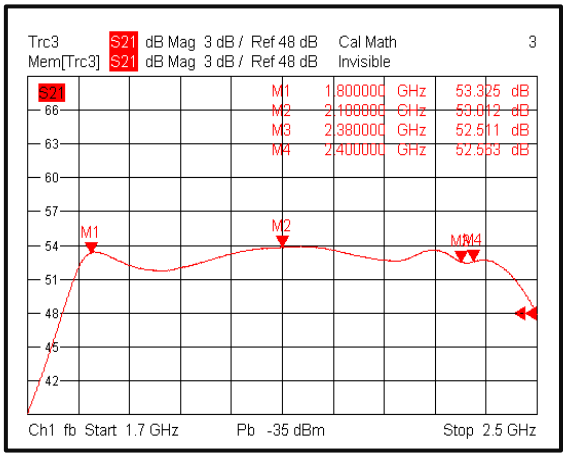
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-40ºC to +60ºC (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)

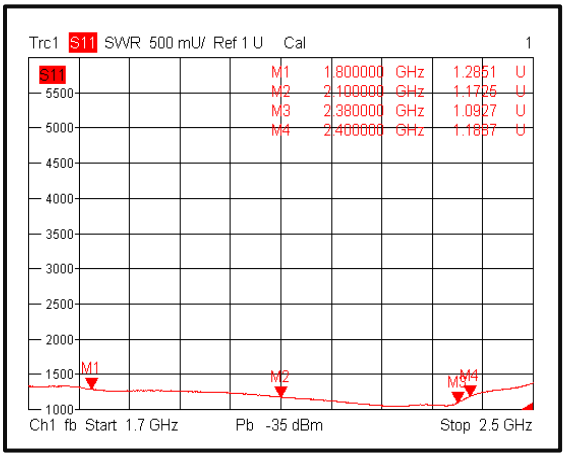
*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
**For vibration testing details please see additional information section.

Typical Performance Plots

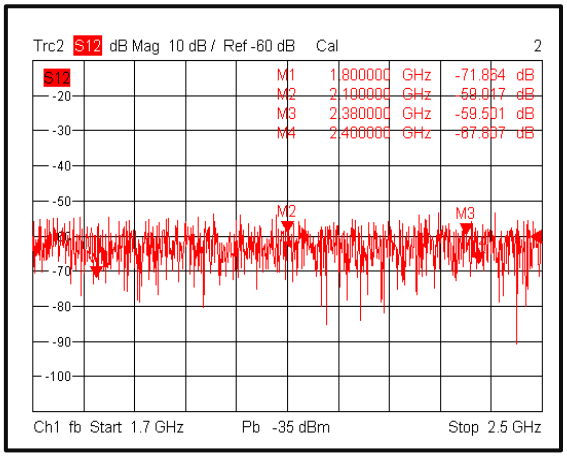
Gain@+25℃



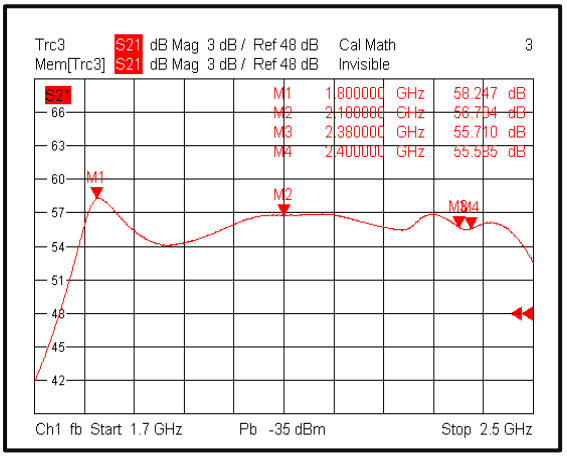
Input VSWR @+25℃



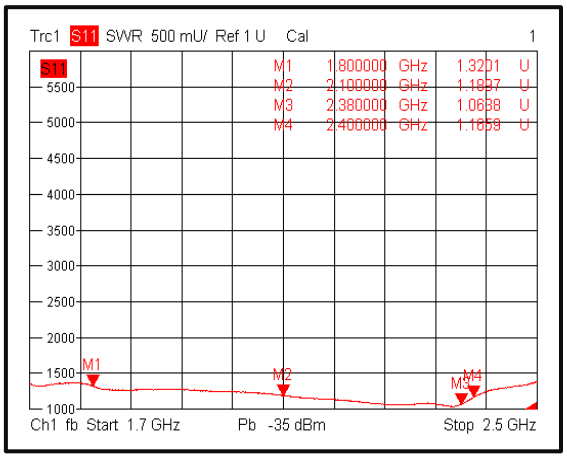
Isolation@+25℃



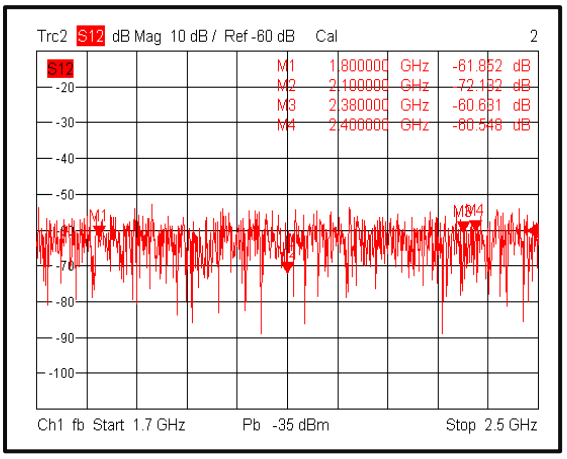
Gain@-40℃



Input VSWR @-40℃



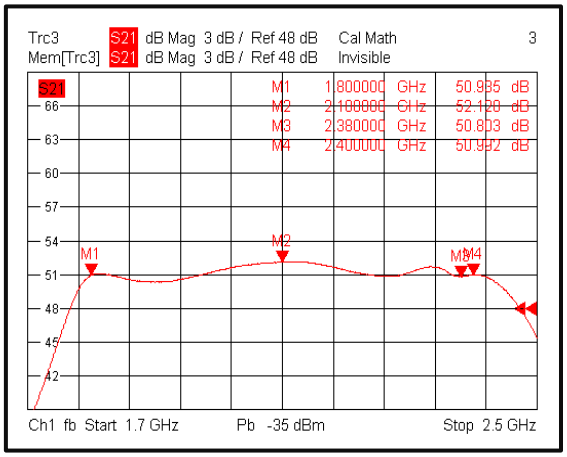
Isolation@-40℃



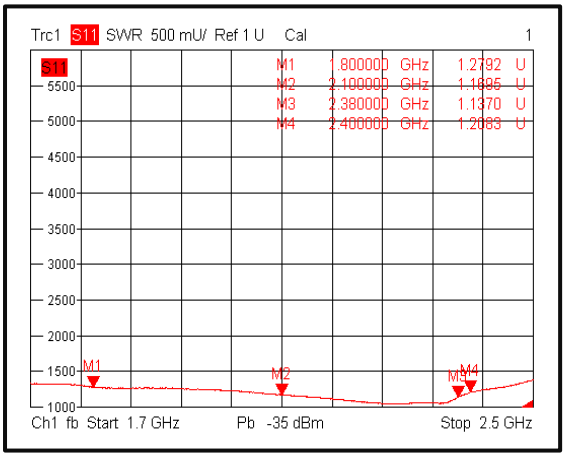
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

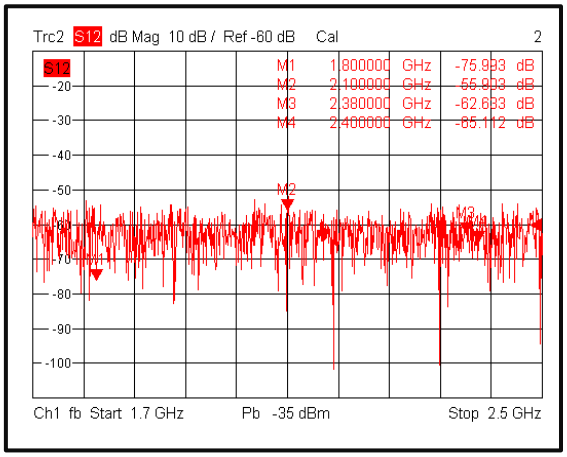
Gain@+60℃



Input VSWR @+60℃



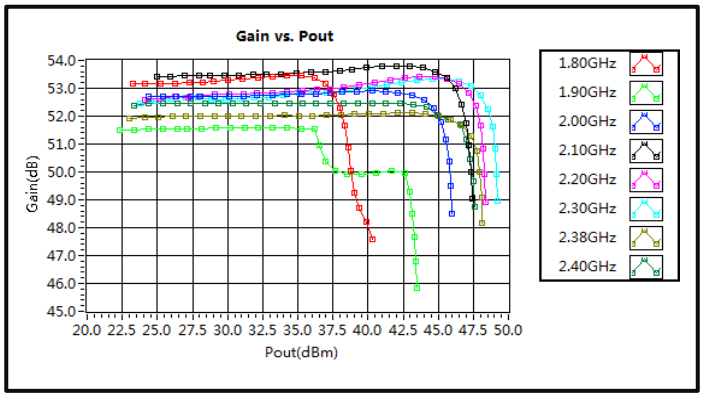
Isolation@+60℃



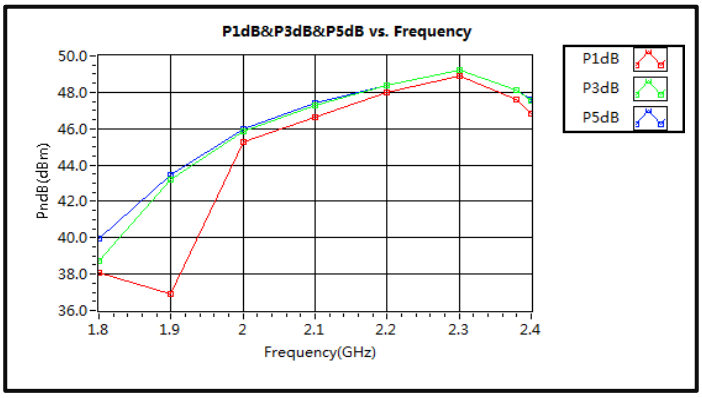
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

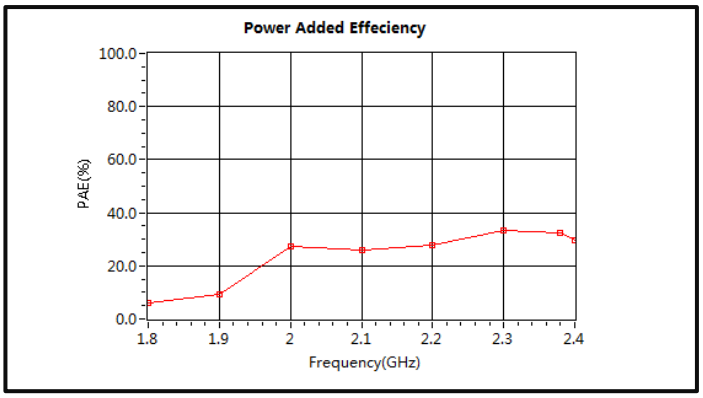
Gain vs. Output Power CW



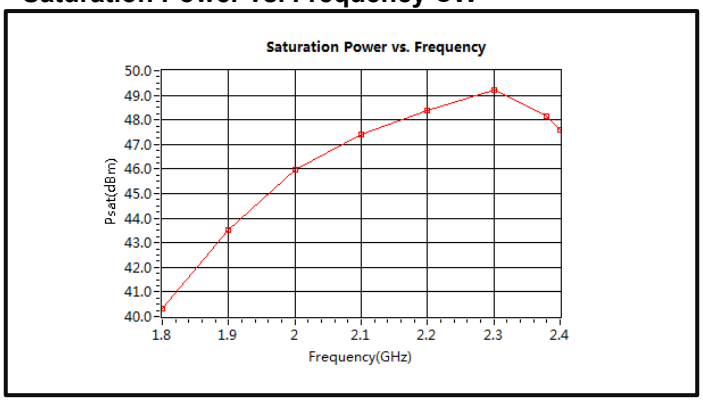
PndB vs. Frequency CW



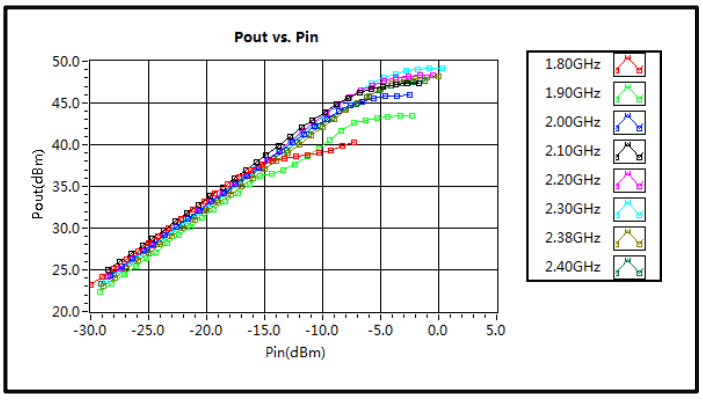
Power Added Efficiency CW



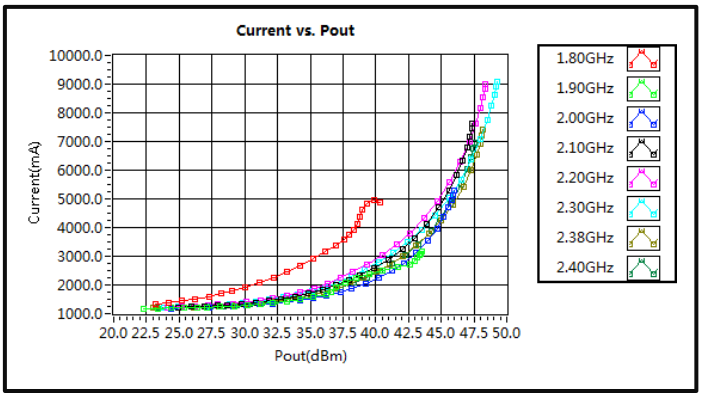
Saturation Power vs. Frequency CW



Pout vs. Pin

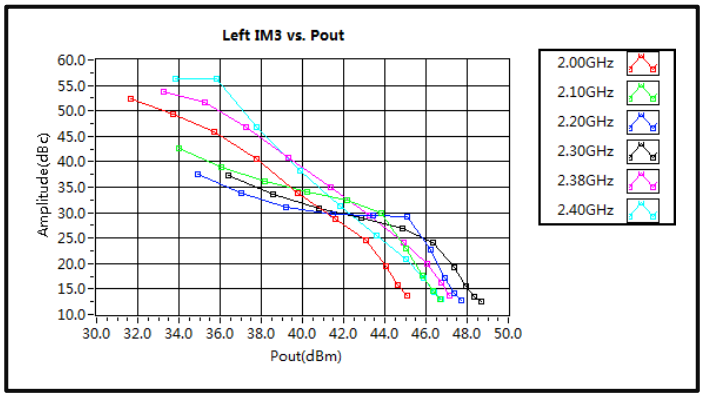


Current vs. Pout

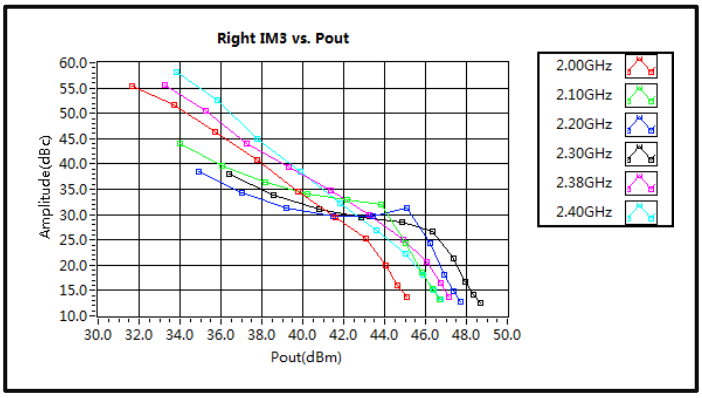


Typical Performance Plots

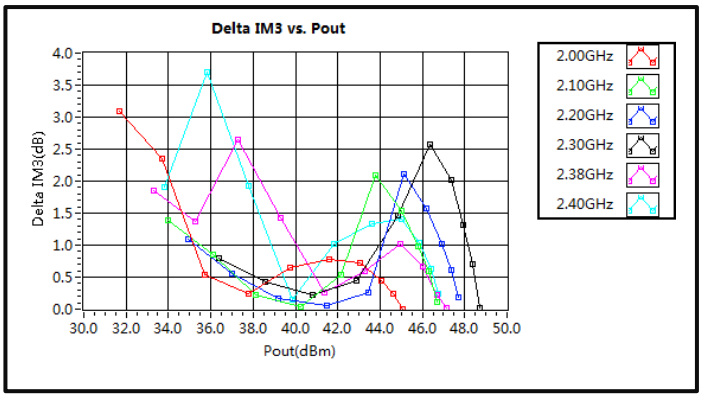
Left IM3 vs. Pout



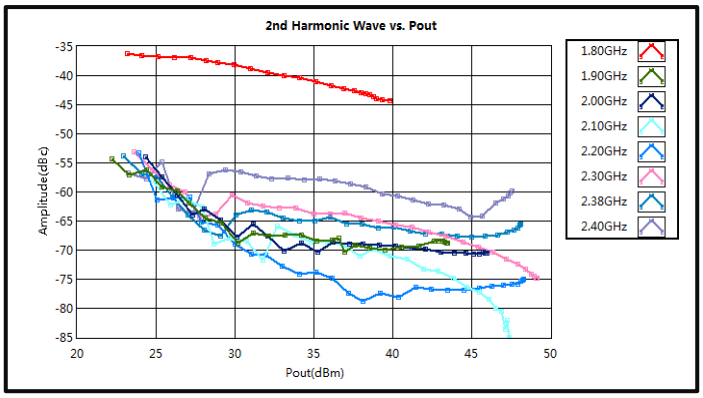
Right IM3 vs. Pout



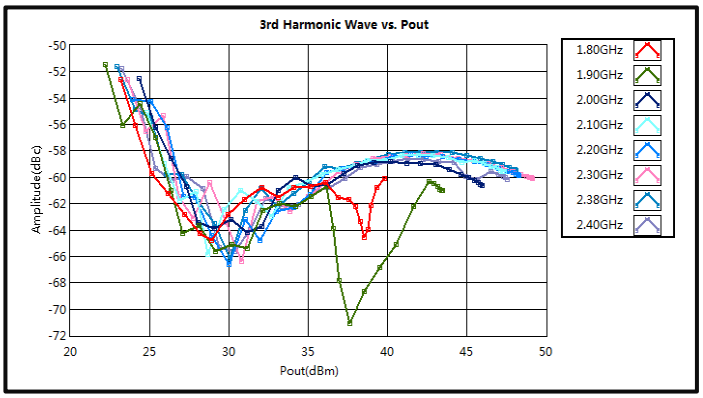
Delta IM3 vs. Pout



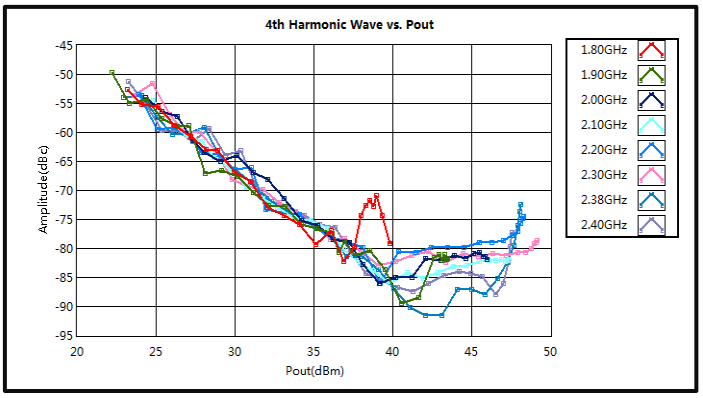
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



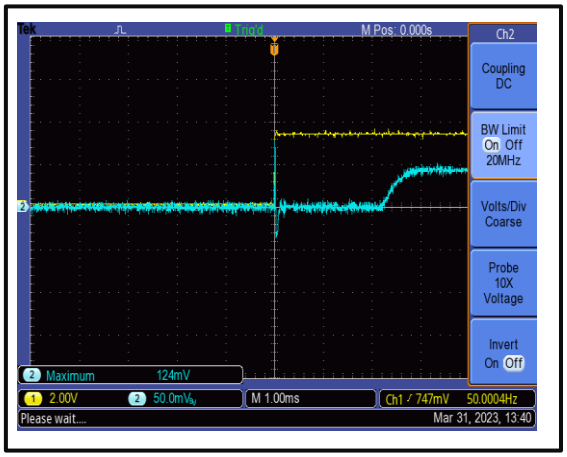
4th Harmonic Wave Output Power



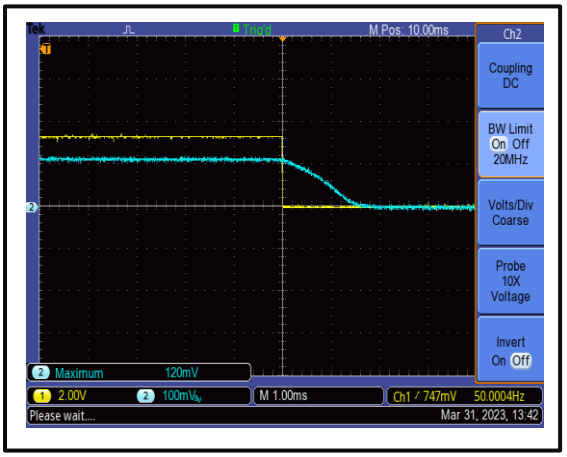
Note: IM3 test performed with 1MHz tone spacing

Typical Performance Plots

PA-Enanle Rise Time is 3 ms @+25℃

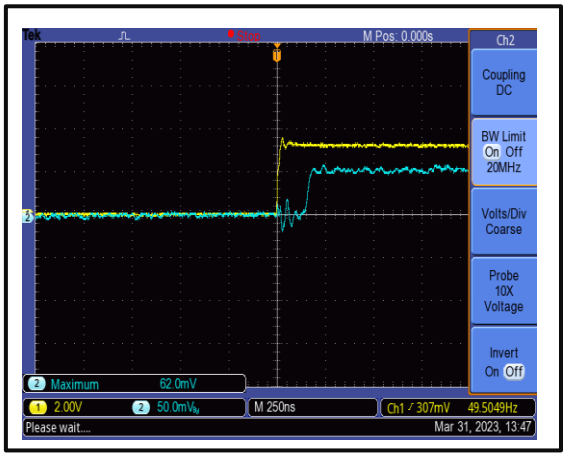


PA-Enanle Fall Time is 2 ms @+25℃

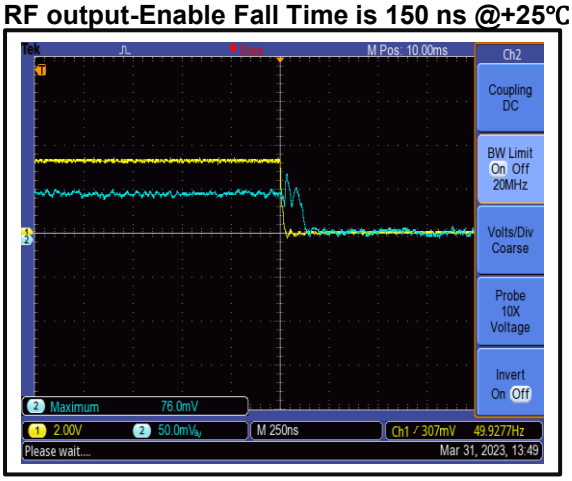


The drain control port: D-sub 9 PIN #4(Drain _OFF) .
The yellow curve is the drain control signal, the blue curve is RF output envelope.

RF output-Enable Rise Time is 200 ns @+25℃



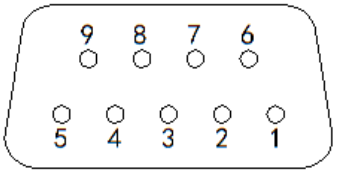
RF output-Enable Fall Time is 150 ns @+25℃



Switch control port：D-sub 9 PIN #7 (RF_Switch_Off).
The yellow curve is the switch control signal, the blue curve is RF output envelope.

Amplifier Ports Definitions

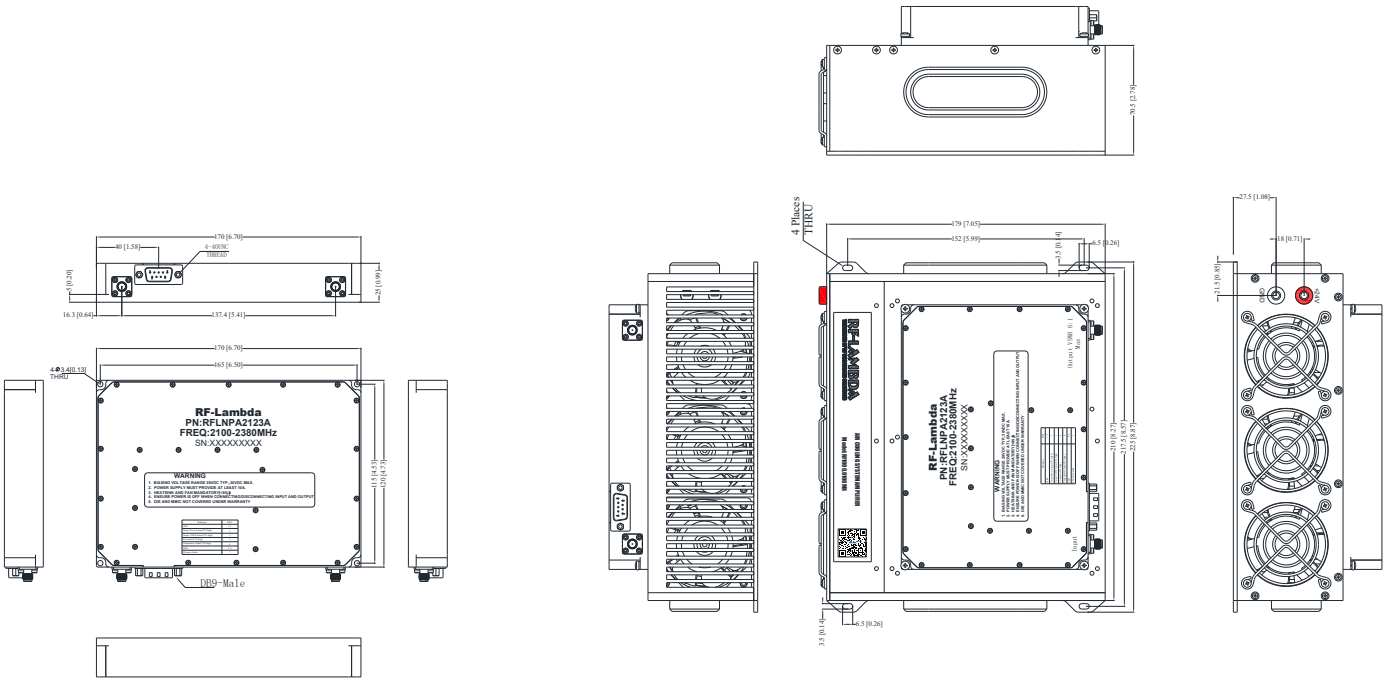
Male D-Sub is on the housing
The mating Female part number: 772-E09-213R001



PIN #	NAME	Initial State	FUNCTION	Specification
1,6	VDD	+28V	Power Supply	Supply Voltage
2	Output Power Alarm	Voltage	Indicator	Pin will be output logic HIGH when output power is over 10W,the VSWR enable
3	Output VSWR Alarm	LOW	Indicator	Pin will be output to logic HIGH when output reflection is over limit
4	PA-Enable	HIGH	Control	Applying logic LOW disable drains of amplifiers
5,9	GND	GND	Ground	Ground
7	RFoutput-Enable	HIGH	Control	Applying logic LOW disconnect RF signal of amplifiers
8	Temperature - Alarm	LOW	Indicator	Pin will be output to logic HIGH when drive over Temperature

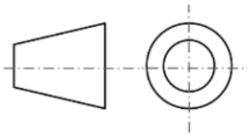
Notes:
- HIGH/LOW voltages are standard TTL signals 0V to 0.8V = LOW. 2.8V to 5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Indicator output signals can source 24mA.

Outline Drawing



Notes:

1. Package Material: Aluminum
2. Finish: Nickel Plated
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ±0.2 [0.008] 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. Including outline drawing of heat sink with fan.
7. Standard torque wrench must be used to secure RF connectors.



Packing List

ID	Description	QTY
1	Fig a. D-SUB-9 cable (RFCBLADB9)	1
2	Fig b. Screws（#4-40*5+6）	2

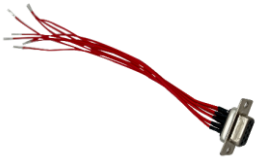


Fig a.

Fig b.

Ordering Information

Part Number	Modification	Description
RFLNPA2123A	Standard	2100MHz-2380MHz Linear 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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