Ultra Wide Band Power Amplifier
0.08GHz-1GHz

Product Description

RFLUPA0010G200B is an ultra wide band power amplifier with a frequency range of 0.08 to 1GHz.

The power output of this amplifier is 53dBm typical. The typical small signal gain is 56dB with a gain flatness of ±2.0dB.

This power amplifier works with a +28VDC power supply.

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

Features

- Ultra Wide band Power Amplifier
- Small Signal Gain 56dB Typical
- Output Saturation Power 53dBm Typical
- High P1dB +49dBm Typical
- Supply Voltage +28VDC
- 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	0.08		0.8	0.8		1	GHz
Small Signal Gain		56			56		dB
Gain Flatness		±2.0			±1.0		dB
Gain Variation Over Temperature (-40℃~+60℃)		±2.0			±2.0		dB
Input VSWR		1.5			1.5		:1
Output 1dB Compression Point (P1dB)		51.5			50		dBm
Saturated Output Power (Psat)		53			51.5		dBm
Supply Current (VDC=+28V)		3.5	28		3.5	28	A
Isolation S12		-60			-60		dB
Weight	10.2 Max.						lbs
Impedance	50						Ohms
Input / Output Connectors	SMA- Female(Input) – N- Female(Output)						
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

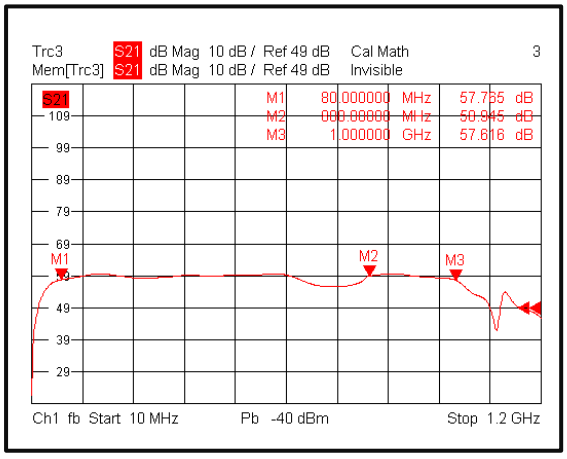
Environmental Specifications and Test Standards

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 +60ºC 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)

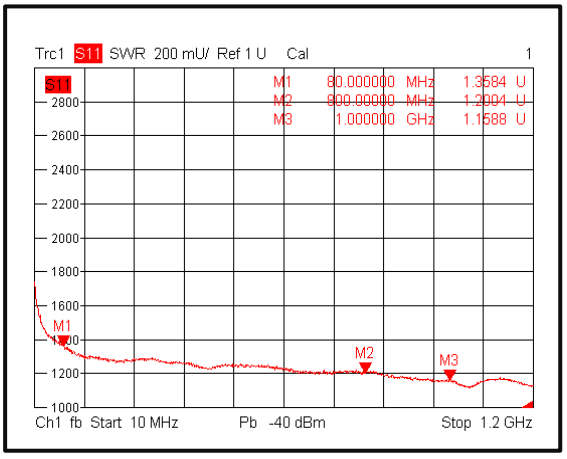
*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
**For vibration testing details please see additional information section.

Typical Performance Plots

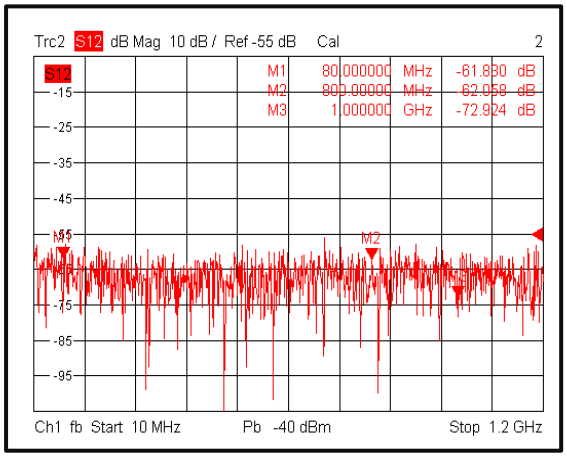
Gain @ +25℃



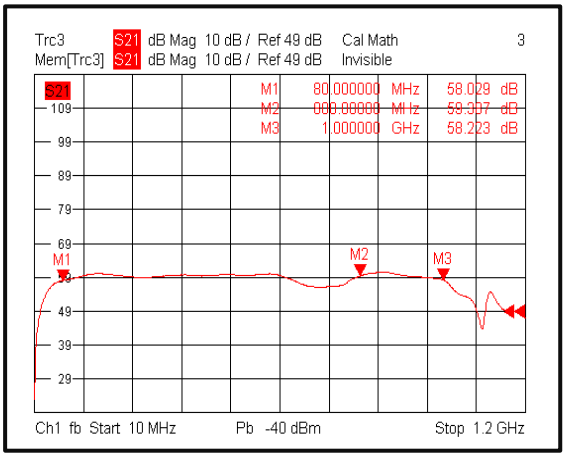
Input VSWR@+25℃



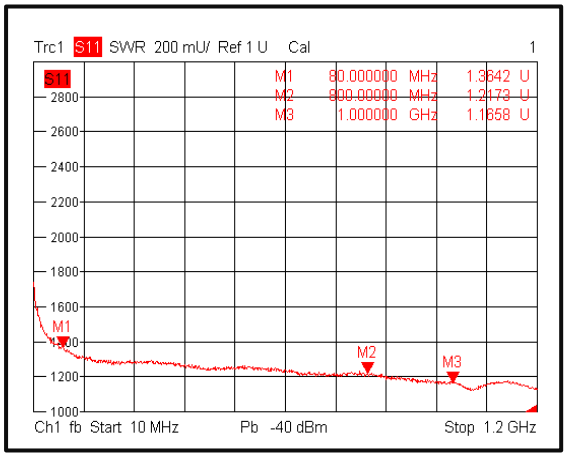
Isolation @ +25℃



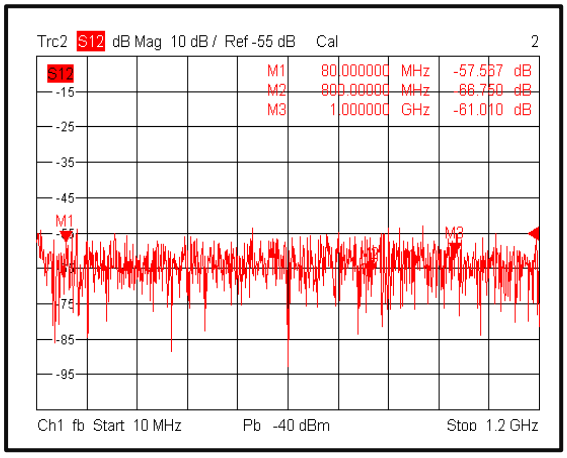
Gain @ -40℃



Input VSWR@ -40℃



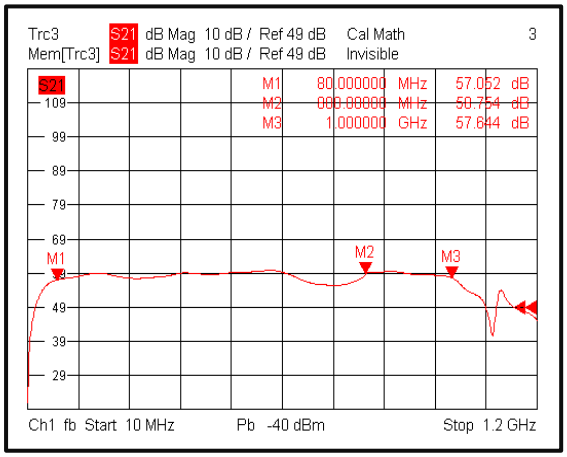
Isolation @ -40℃



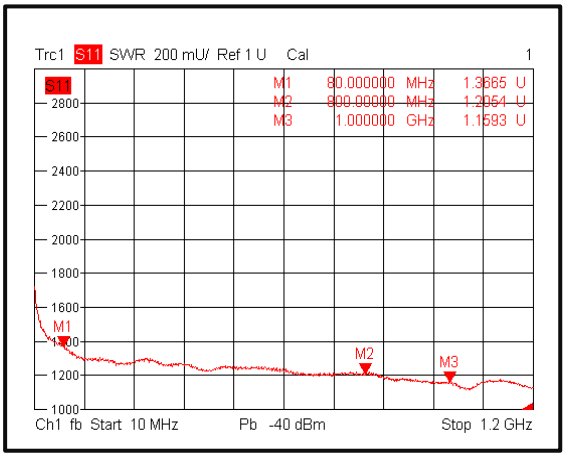
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

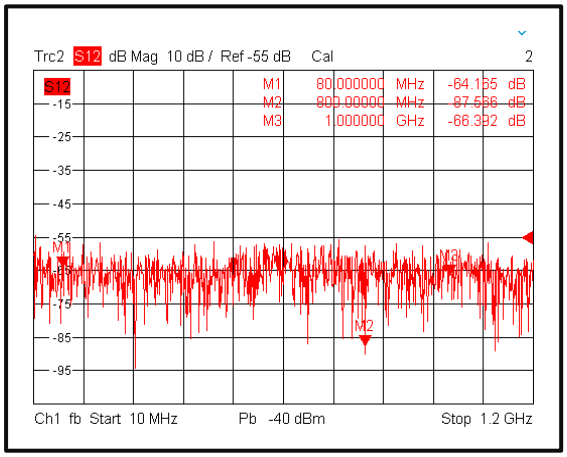
Gain @ +60℃



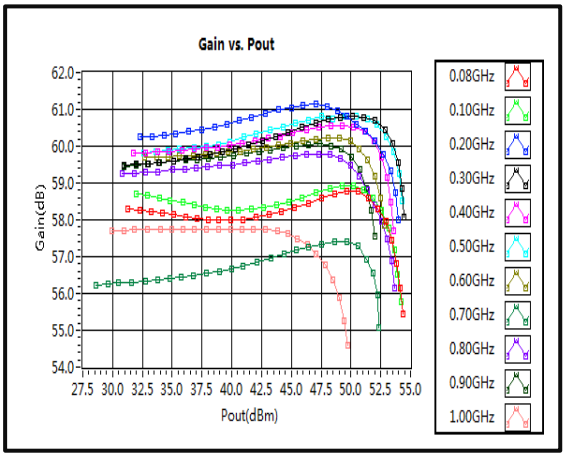
Input VSWR@ +60℃



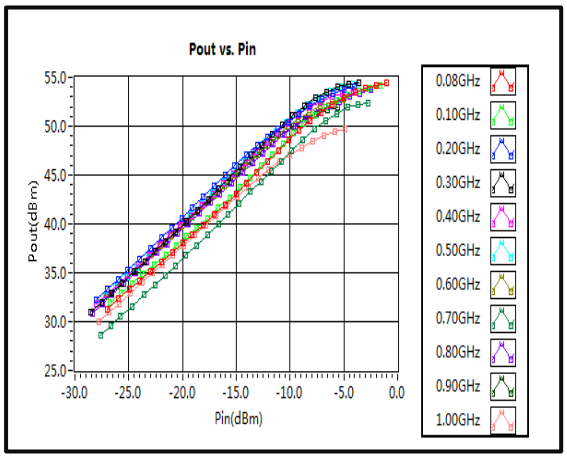
Isolation @ +60℃



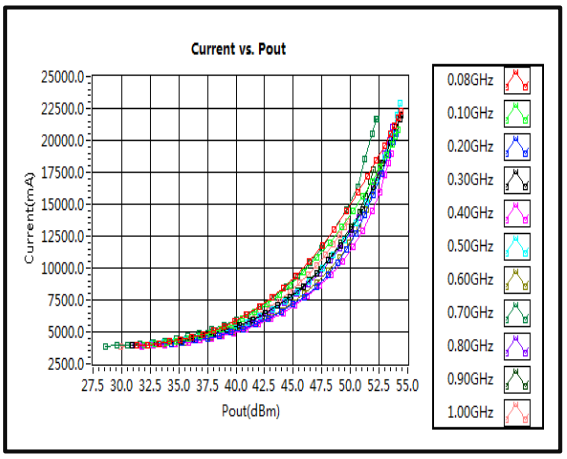
Gain vs. Output Power



Pout vs. Pin



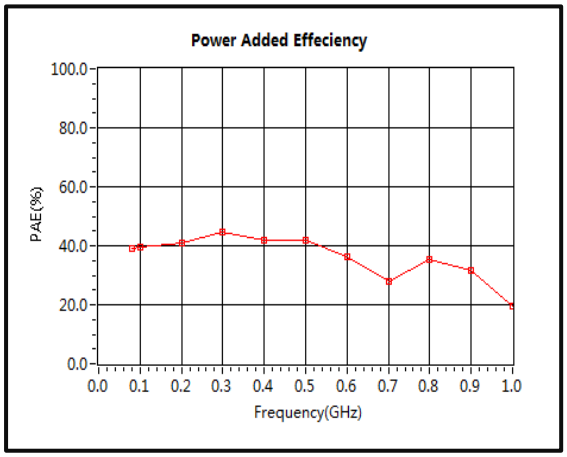
Current vs. Pout



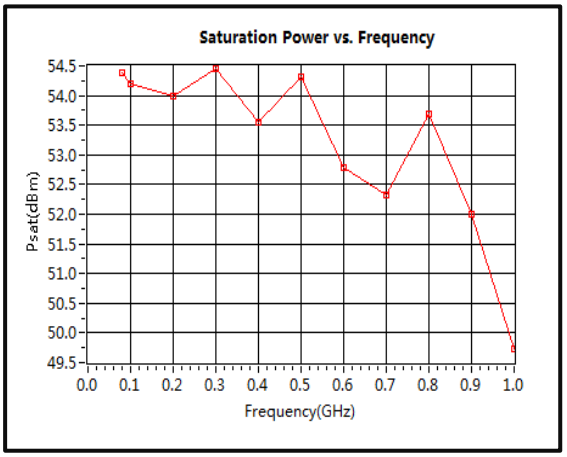
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

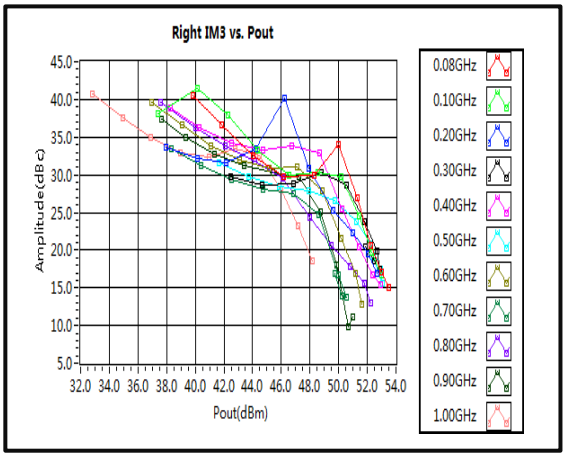
Power Added Efficiency



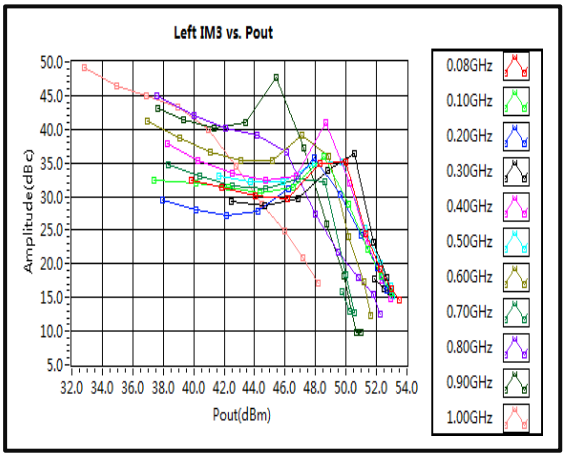
Saturation Power vs. Frequency



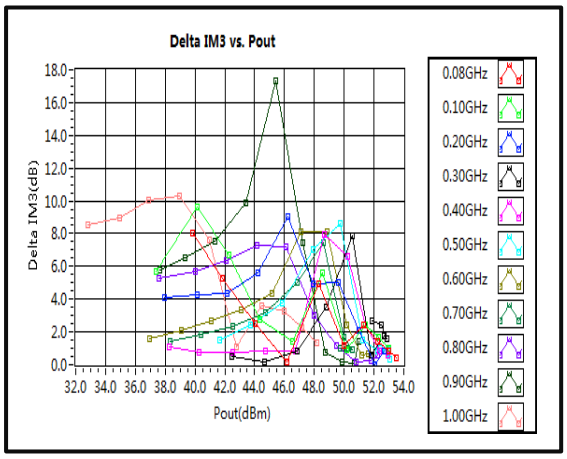
Right IM3 vs. Pout



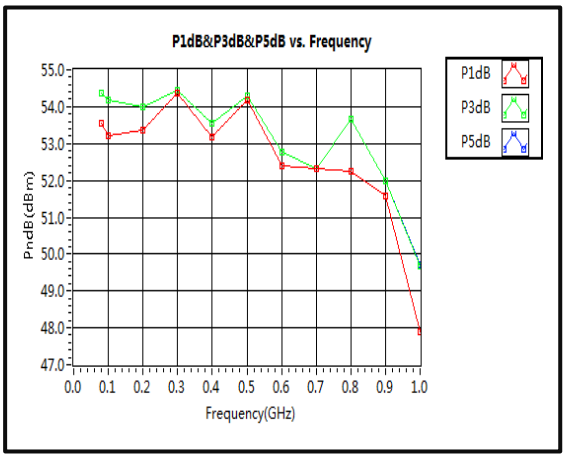
Left IM3 vs. Pout



Delta IM3 vs. Pout



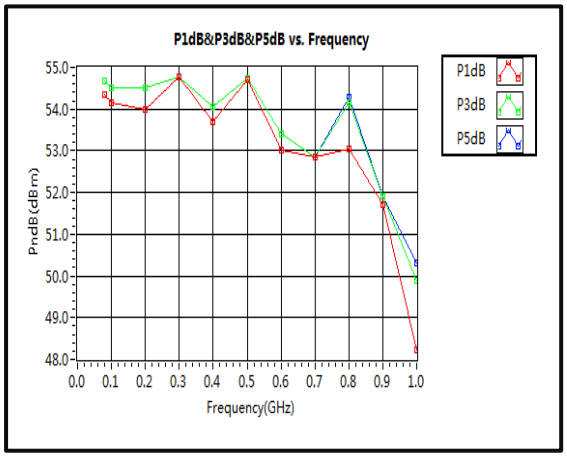
PndB vs. Frequency @+25℃



Note: Small signal VNA measurements include attenuators to protect equipment

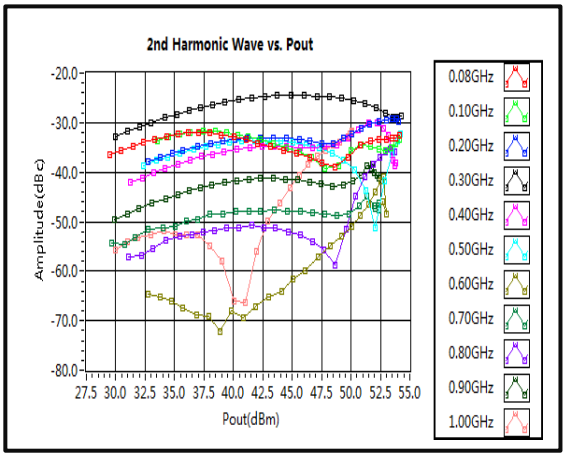
Typical Performance Plots

P1dB&P5dB vs. Frequency @-40℃

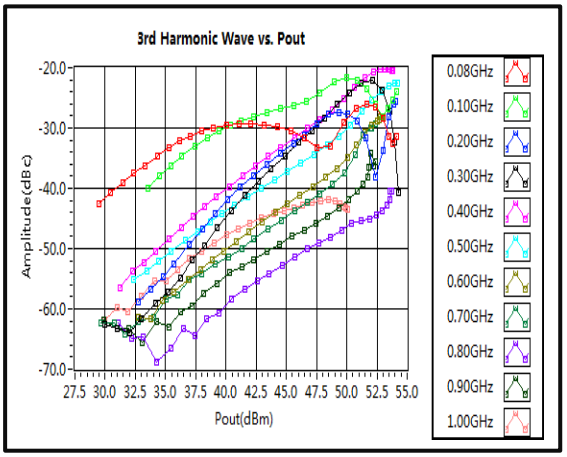


P1dB &P5dB vs. Frequency @+60℃

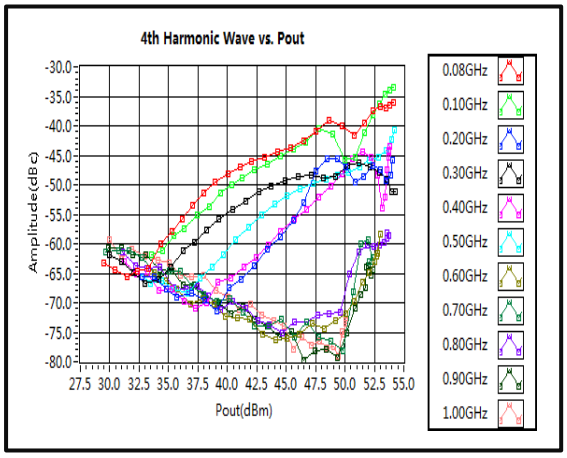
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power

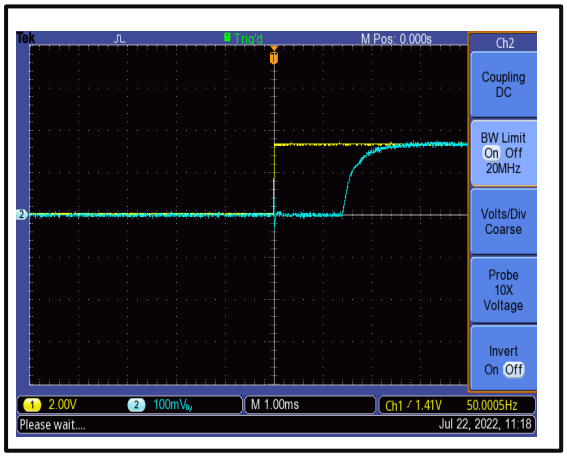


4th Harmonic Wave Output Power



Typical Performance Plots

The Drain-Enable Rise Time is 1000 us @+25℃

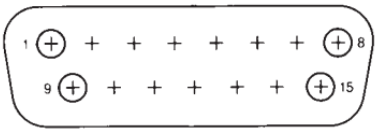


The Drain-Disable Fall Time is 1000 us @+25℃

The drain control port：D-sub 15 PIN #13 (Drain _OFF).
The yellow curve is the drain control signal, the blue curve is RF output envelope.

Protection Connector Table

Male D-Sub is on the housing
The mating Female part number: 172-E15-203R001

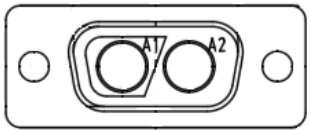


Pin #	Name	Function	Initial State	Description	Applied
1,2, 9,10	N/A	--	N/A	--	N/A
3,11	GND	Ground	GND	Ground	Yes
4	PA_OFF	Indicator	LOW	Amplifier working state, high level is off	Yes
5	RF Input Over Drive	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	Yes
6	Over Current	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached or current imbalance	No
7	Over Temp	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
8	VSWR	Indicator	LOW	Pin will be latched to logic HIGH when output reflection is over limit	No
12	Switch Disable	Control	HIGH	Applying logic LOW disconnect RF signal of amplifiers	No
13	Drain Disable	Control	HIGH	Applying logic LOW disable drains of amplifiers	Yes
14	Gate Disable	Control	HIGH	Applying logic LOW disable gates of amplifiers	No
15	Reset	Control	HIGH	Resets PA when amplifier is in protection state, applying logic LOW 1ms and amplifier can be reset	Yes

Notes:
- HIGH/LOW voltages are standard TTL signals 0 to 0.8V = LOW. 2.8V to 5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Applied=Yes means the feature is included. Applied=No means the feature is not included with this model.
- Indicator output signals can source 24mA.

Power Supply Connector Table

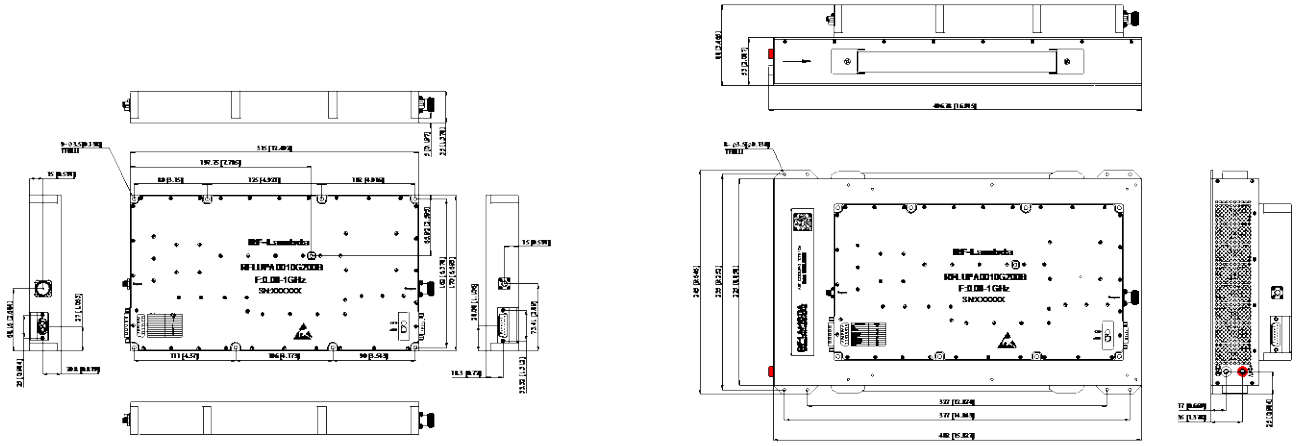
Female D-Sub is on the housing
The mating female part number: RFCBLADB2



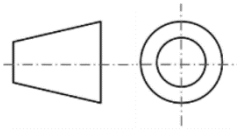
Pin #	Gender on the Housing	Function	Initial State	Description	Applied
A1	Female	VDC	VDC	Supply Voltage	Yes
A2	Male	GND	GND	GND	Yes

Notes:
- Matching connector and cable will be shipped with the product.
- If customer would like to use their own wires, 8 AWG wire is required for high current applications.

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. Standard torque wrench must be used to secure RF connectors.



Packing List

ID	Description	QTY
1	Fig a. Fan adapter	1
2	Fig b. DB15 cable (RFCBLADB15)	1
3	Fig c. DB2 cable (RFCBLADB2)	1

Fig a.

Fig b.

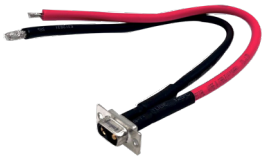


Fig c.

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
RFLUPA0010G200B	Standard	0.08-1GHz 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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