Ultra Wide Band Power Amplifier
0.7GHz-6GHz

Note: Photo is for illustration purposes only.
Please refer to outline drawing.

Product Description

RFLUPA0706G16A is an ultra wide band power amplifier with a frequency range of 0.7 to 6GHz.

The power output of this amplifier is 42dBm typical. The typical small signal gain is 45dB with a gain flatness of ±2.5dB. This power amplifier works with a +28VDC power supply.

The working temperature of this product is between - 40℃ and + 70℃.

Features

- Ultra Wide band Power Amplifier
- Small Signal Gain 45dB Typical
- Output Saturation Power 42dBm Typical
- High P1dB +40dBm 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		0.7		3	3		6	GHz
Small Signal Gain		42	45		42	45		dB
Gain Flatness			±2.5			±2.5		dB
Gain Variation Over Temperature (-40ºC to +70ºC)			±2.0			±2.0		dB
Input VSWR			1.6			1.6		: 1
Output 1dB Compression Point (P1dB)		39	40		39	40		dBm
Saturated Output Power (Psat)			42			42		dBm
Supply Current (Vcc=+28V)			0.5	3		0.5	3	A
Isolation S12			-55			-50		dB
Power Added Efficiency (PAE)			30			25		%
Turn On/Off Speed (Drain Disable)	ON		100			100		ms
	OFF		10			10		ms
Turn On/Off Speed (Gate Disable)	ON		500			500		ns
	OFF		250			250		us
Weight	Net	1.55 Max.						lbs.
	Including Heat Sink	6.74 Max.						
Impedance		50						Ohms
Input / Output Connectors		SMA-Female(Input) – SMA-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	+28.5VDC
*RF Input Power (RFIN)	+5dBm

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

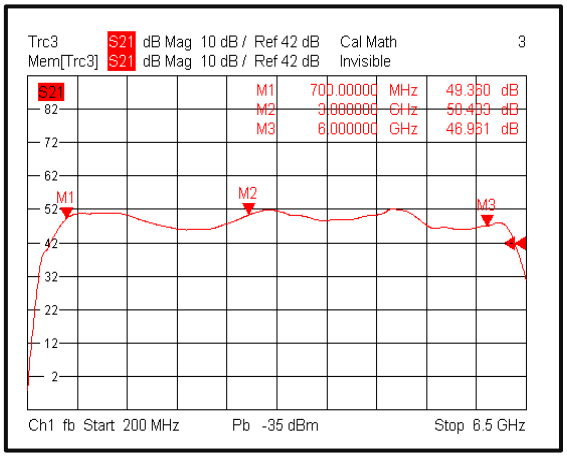
Parameter	Description
Operational Temperature	-40ºC to +70ºC (Case Temperature)
Storage Temperature	-50ºC to +105ºC
Thermal Shock	-40ºC → +85ºC (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +70ºC for 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.

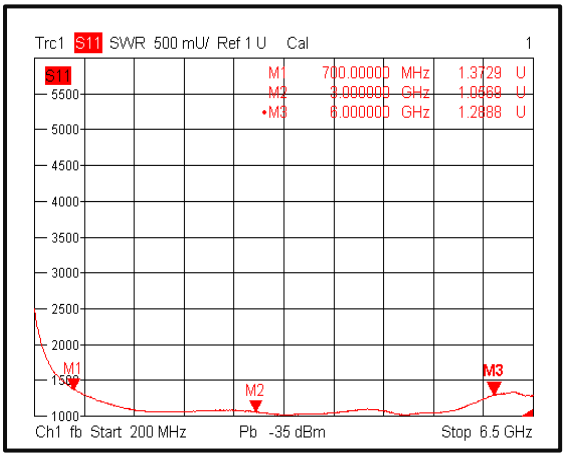
RF-LAMBDA USA LLC: www.rflambda.com
Sales: sales@rflambda.com Technical: support@rflambda.com

Typical Performance Plots

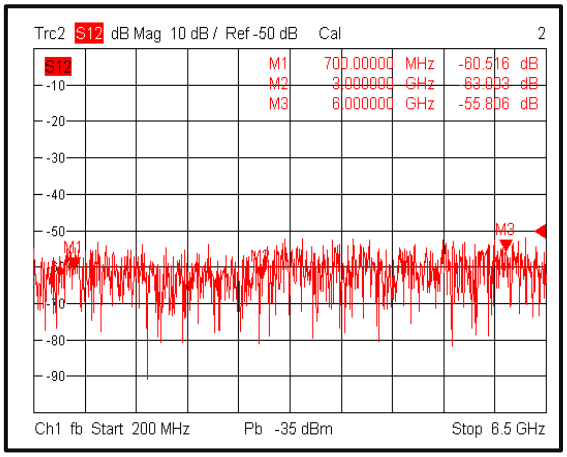
Gain@+25℃



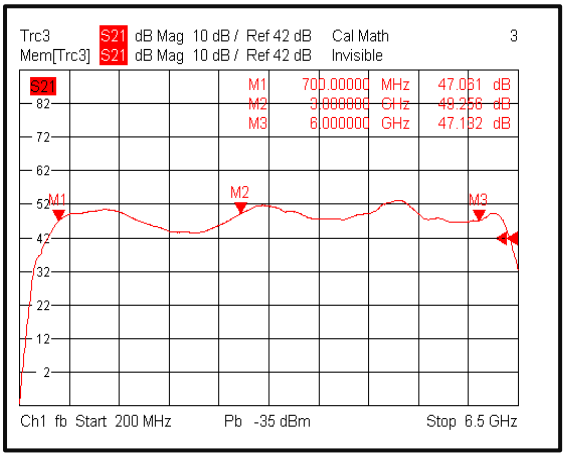
Input VSWR @+25℃



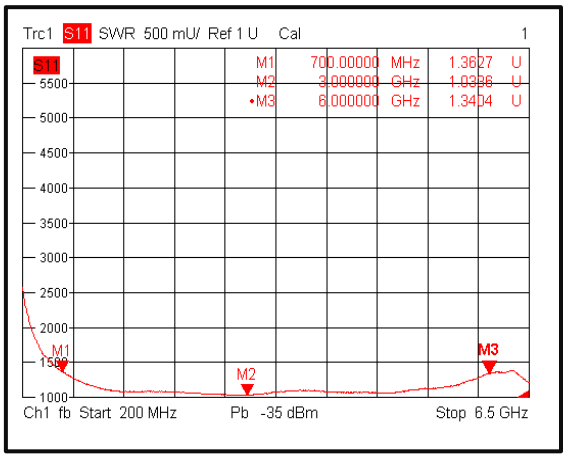
Isolation@+25℃



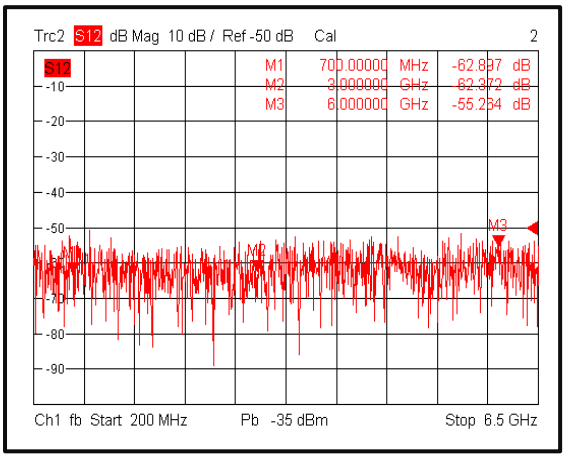
Gain @-40℃



Input VSWR @-40℃

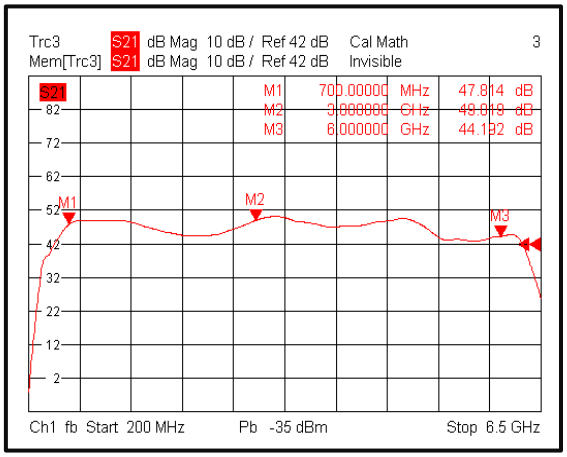


Isolation @-40℃

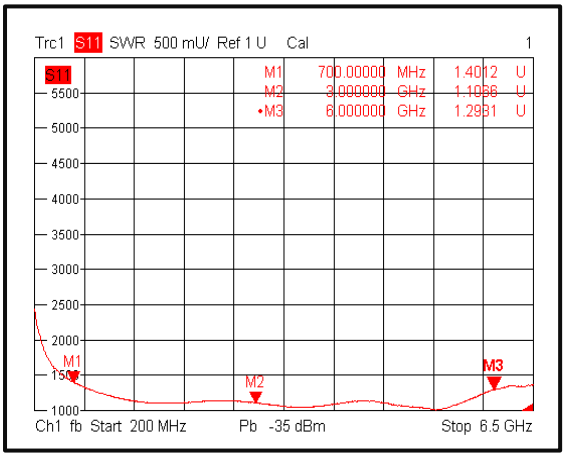


Typical Performance Plots

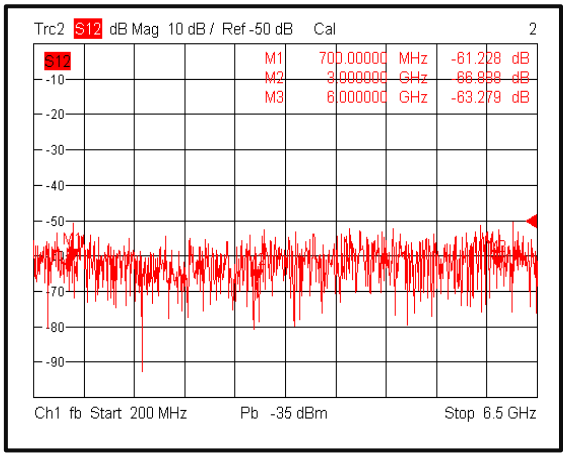
Gain@+70℃



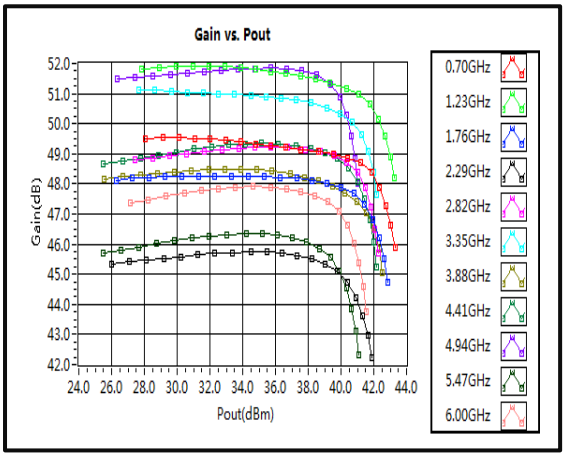
Input VSWR @+70℃



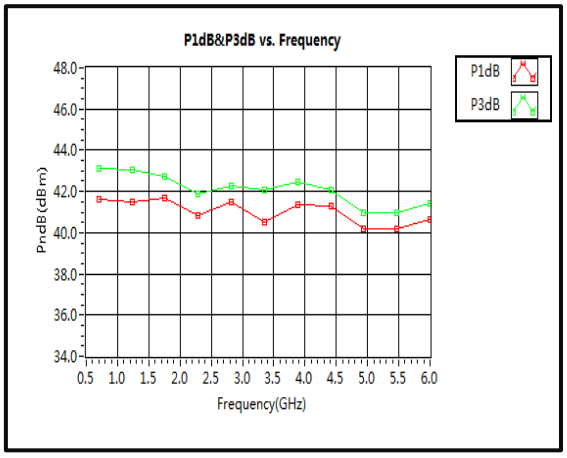
Isolation@+70℃



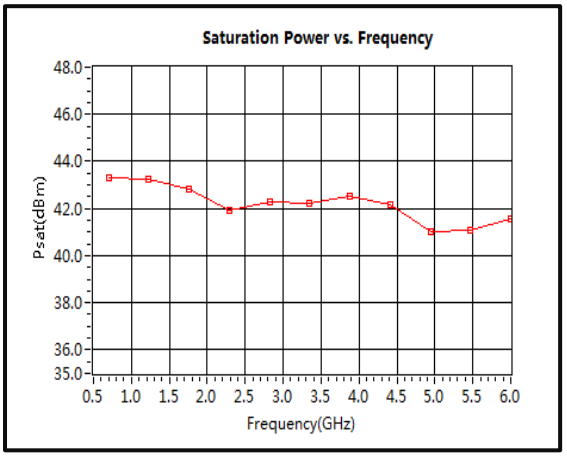
Gain vs. Output Power (CW Power)



P1dB & P3dB vs. Frequency (CW Power)

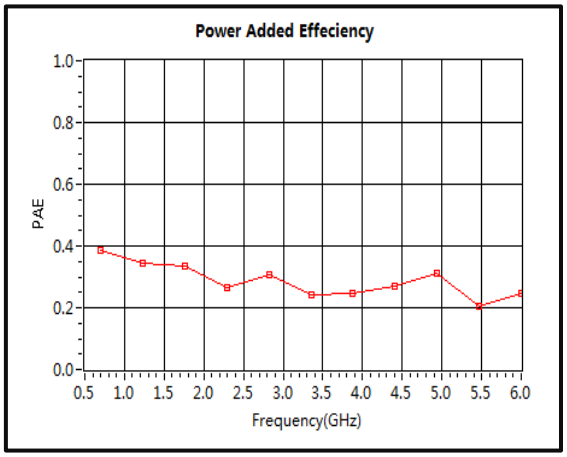


Saturation Power vs. Frequency (CW Power)

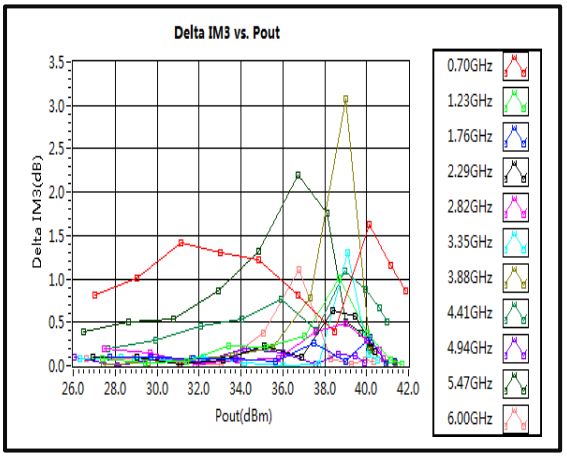


Typical Performance Plots

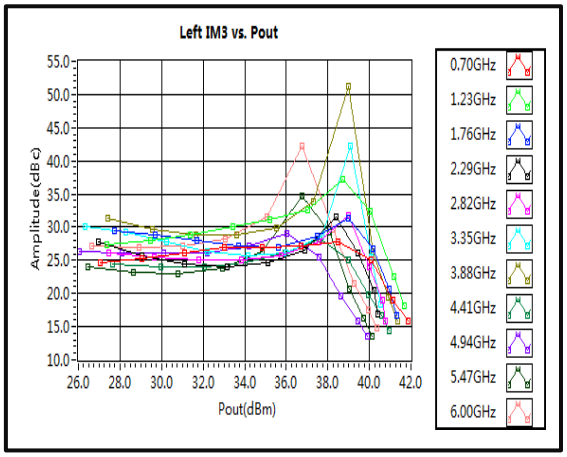
Power Added Efficiency (CW Power)



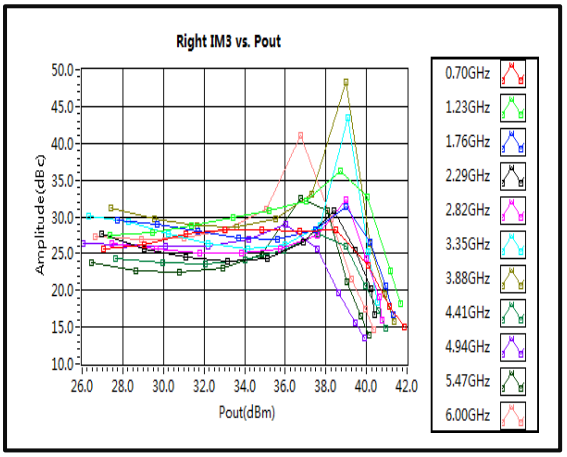
Delta IM3 vs. Pout



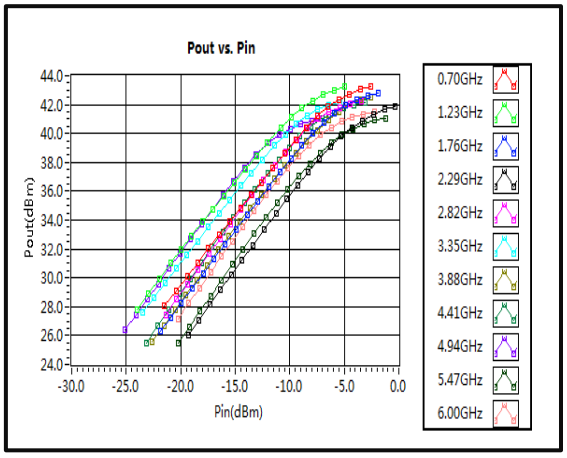
Left IM3 vs. Pout



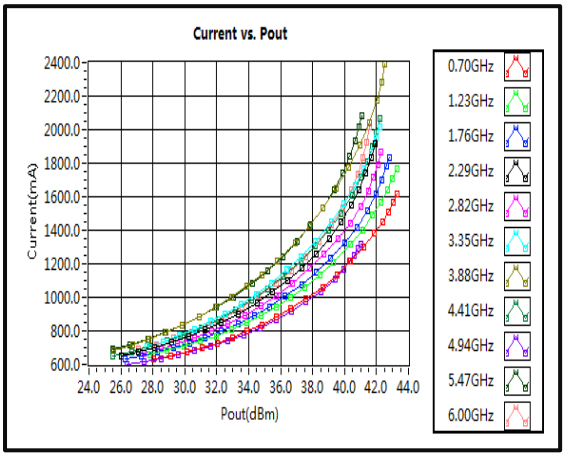
Right IM3 vs. Pout



Pout vs. Pin (CW Power)

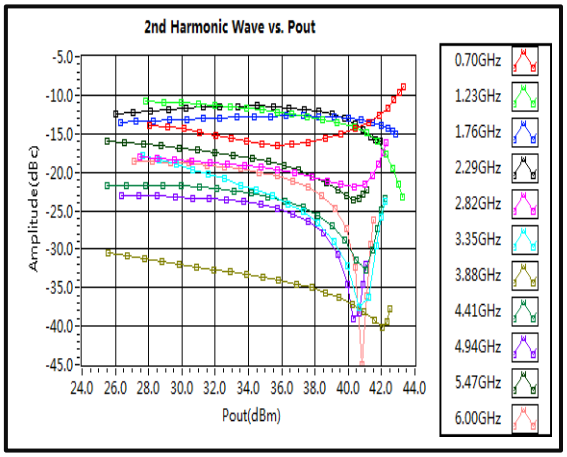


Current vs. Pout (CW Power)

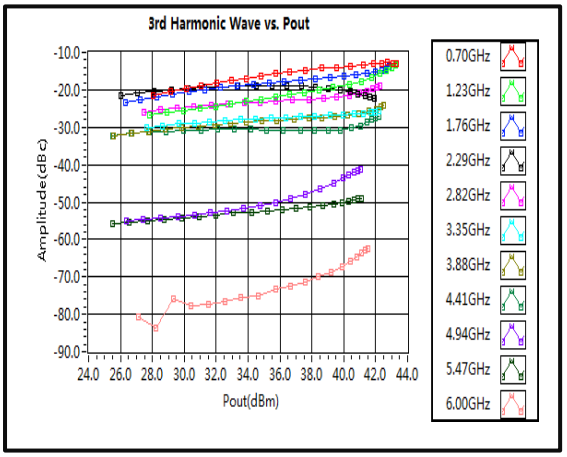


Typical Performance Plots

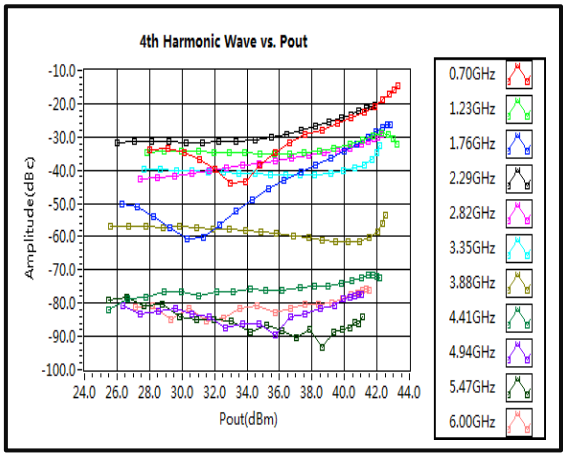
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power

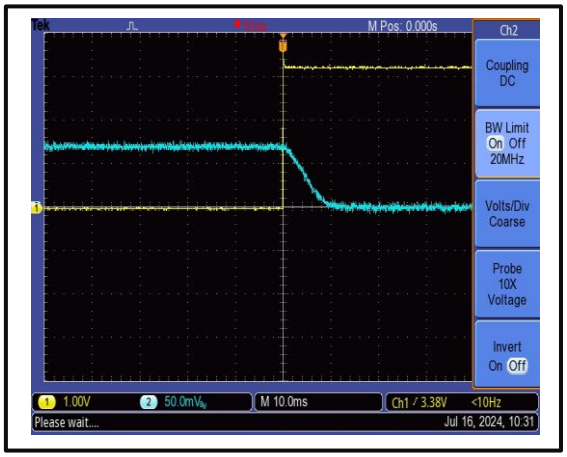


4th Harmonic Wave Output Power

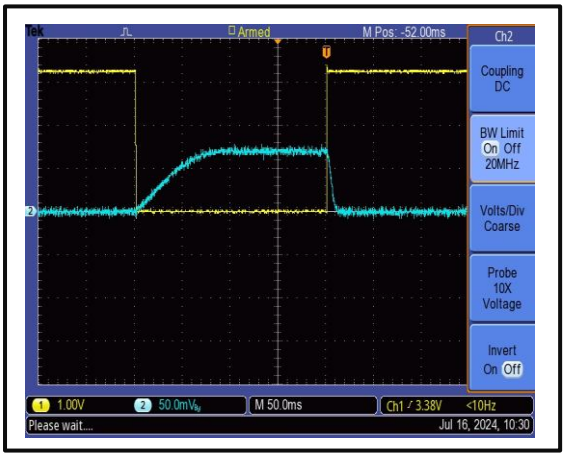


Typical Performance Plots

The Drain-Enable Rise Time is 10 ms

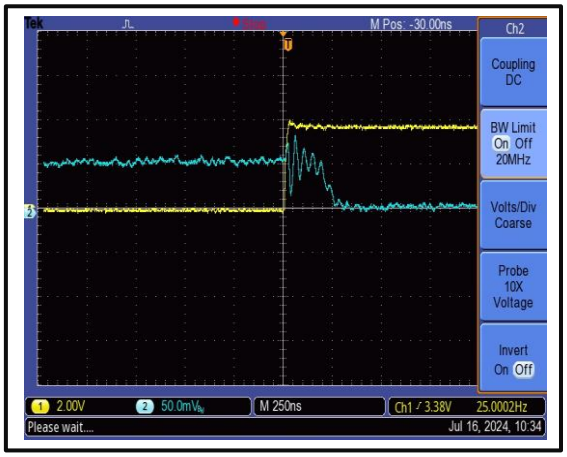


The Drain-Disable Fall Time is 100 ms

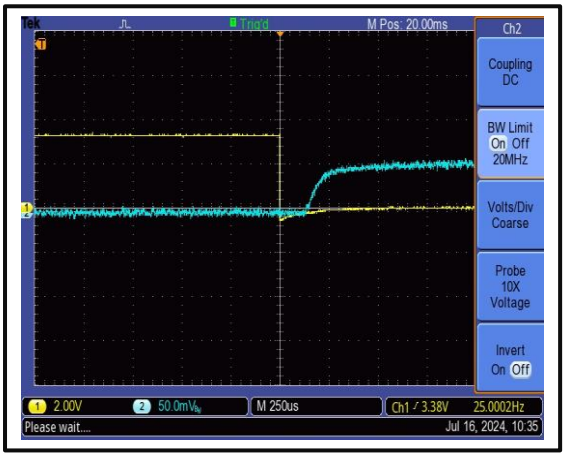


The drain control port：D-sub 15 PIN #13 (Drain Disable).
The yellow curve is the drain control signal, the blue curve is RF output envelope.

The Gate-Enable Rise Time is 250 ns



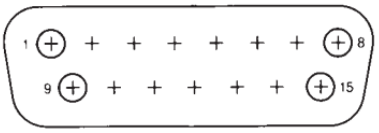
The Gate-Disable Fall Time is 250 us



The gate control port：D-sub 15 PIN #14 (Gate Disable).
The yellow curve is the gate control signal, the blue curve is RF output envelope.

Protection Connector Table

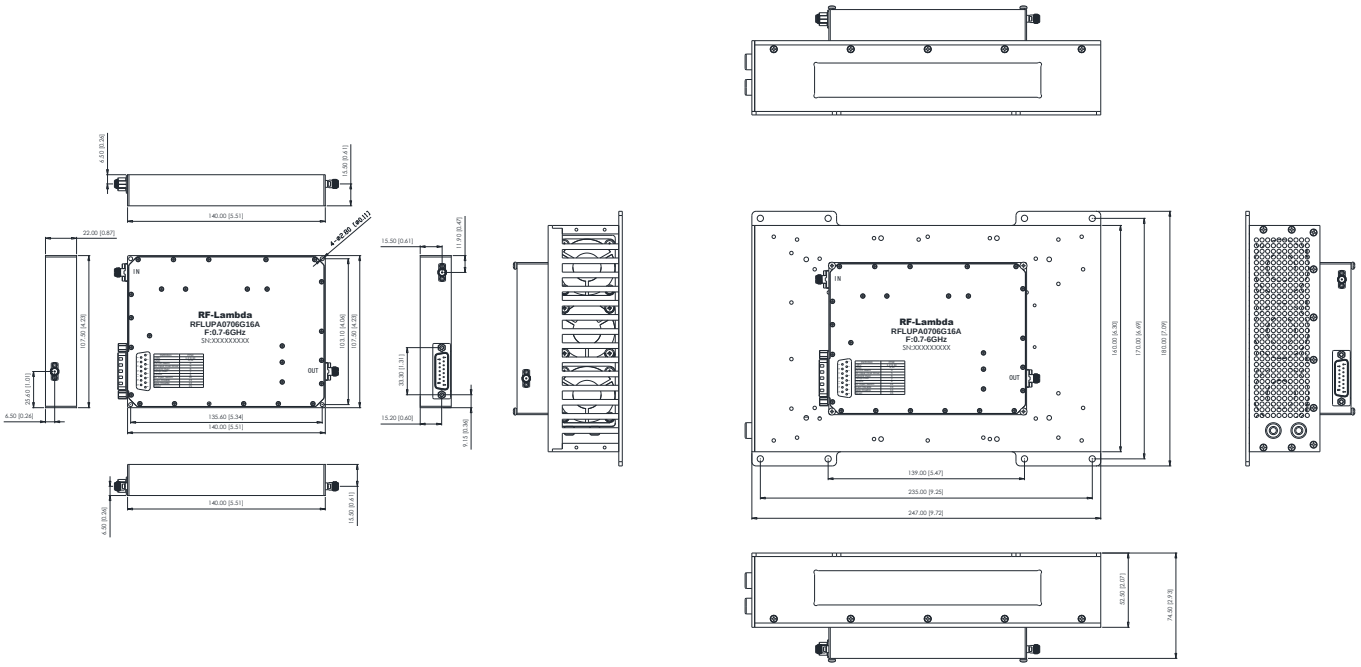
Male D-Sub is on the housing
The mating Female part number: 172-E15-203R001



Pin #	Name	Function	Initial State	Description	Applied
1,2, 9,10	VDD	Power Supply	+28V	+28V DC Supply Voltage	Yes
3,11	GND	Ground	GND	Ground	Yes
4	PA Off Alarm	Indicator	LOW	Pin will be latched to logic HIGH when any of the protection limit is reached	Yes
5	RF Input Over Drive	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	Yes
6	Current Over	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached or current imbalance	Yes
7	Temp Over	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	RF Input Switch	Control	LOW	Applying logic HIGH turns OFF RF front-end switch to terminator	No
13	Drain Disable	Control	LOW	Applying logic HIGH disable drains of amplifiers	Yes
14	Gate Disable	Control	LOW	Applying logic HIGH disable gates of amplifiers	Yes
15	Reset	Control	HIGH	Resets PA when logic LOW is applied for five more seconds and released	Yes

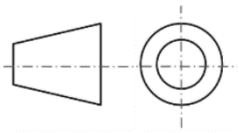
Notes:
- HIGH/LOW voltages are standard TTL signals 0.0V-0.8V = LOW. 2.8V-5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Applied=Yes means the feature is included. Applied=No means the feature is not included with this model.
- 5V reference supply can source 700mA.
- 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. 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
RFLUPA0706G16A	Standard	0.7GHz-6GHz 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

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.
RF-Lambda products are not warranted or authorized for use as critical components in medical, life-saving, or life sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

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