Ultra Wide Band Power Amplifier
0.7GHz-6GHz

Product Description

RFLUPA0706G25B is an ultra wide band power amplifier with a frequency range of 0.7 to 6GHz.

The power output of this amplifier is 46dBm typical. The typical small signal gain is 55dB with a gain flatness of ±2.5dB. This power amplifier works with a +28VDC power supply.

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

Features

- Ultra Wide band Solid State Power Amplifier
- Small Signal Gain 55dB Typical
- Output Saturation Power 46 dBm Typical
- Supply Voltage +28VDC
- 50 Ohm Matched Input/Output
- Overcurrent Protection

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
Gain		45	55		45	55		dB
Gain Flatness			±2.5			±2.5		dB
Gain Variation Over Temperature (-40℃~+70℃)			±2.0			±2.0		dB
Input VSWR			1.5			1.5		:1
Output 1dB Compression Point (P1dB)		42	45		40	42		dBm
Saturated Output Power (Psat)			46			45		dBm
Supply Current (Vcc=+28V)			0.7	7.5		0.7	7.5	A
Switching Speed (10% to 90%)			0.5			0.5		us
Isolation S12			-55			-50		dB
Weight	Net	6.4 Max						lbs.
	Including Heat sink	11.8 Max.						
Impedance		50						Ohms
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
Supply Voltage Range	+30VDC
*RF Input Power (RFIN)	+7dBm

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

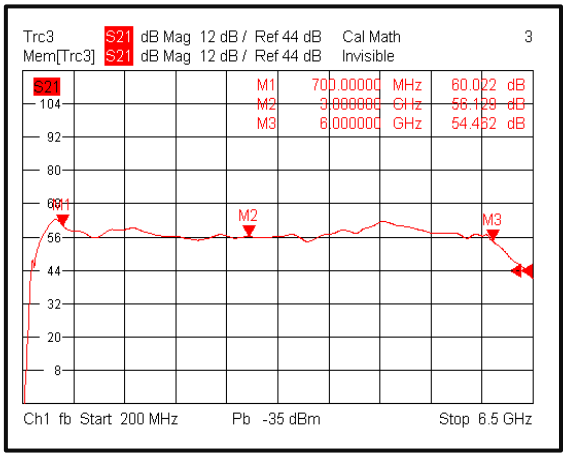
Environmental Specifications and Test Standards

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 +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)

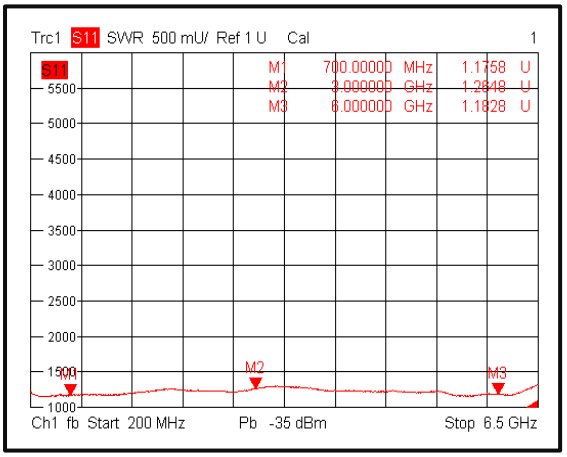
*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
**For vibration testing details please see additional information section.

Typical Performance Plots

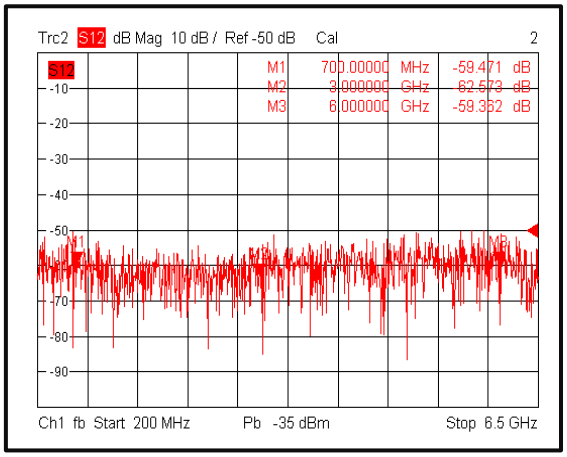
Gain@+25℃



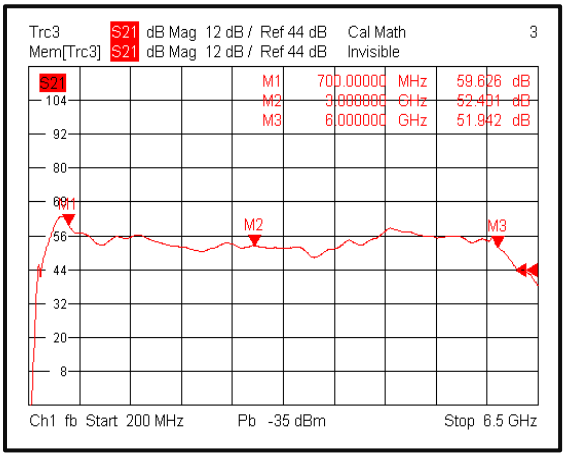
Input VSWR @+25℃



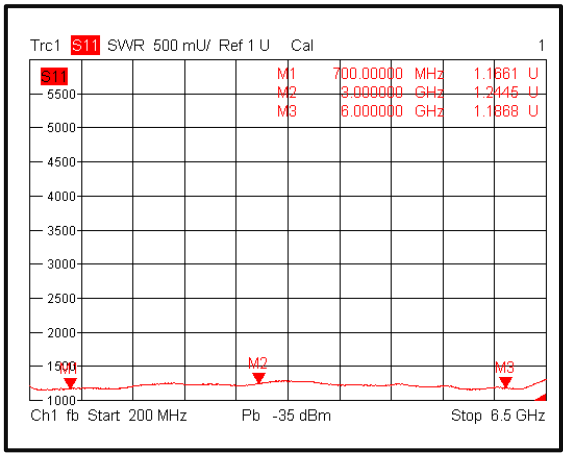
Isolation@+25℃



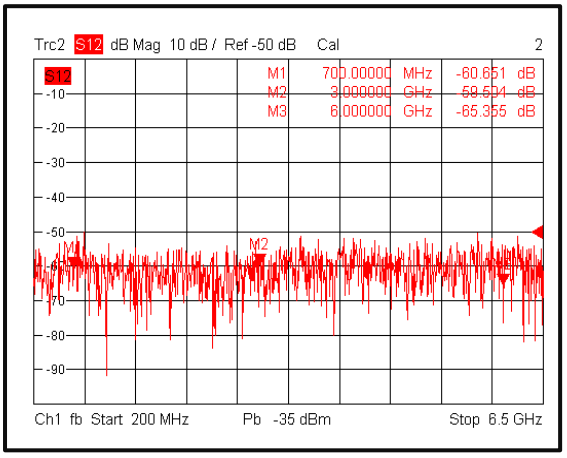
Gain@-40℃



Input VSWR @-40℃



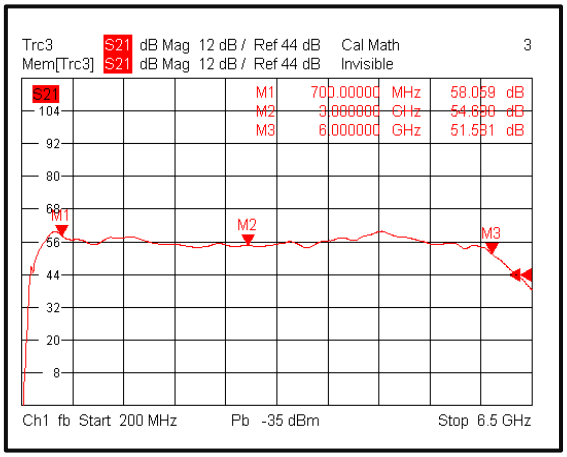
Isolation@-40℃



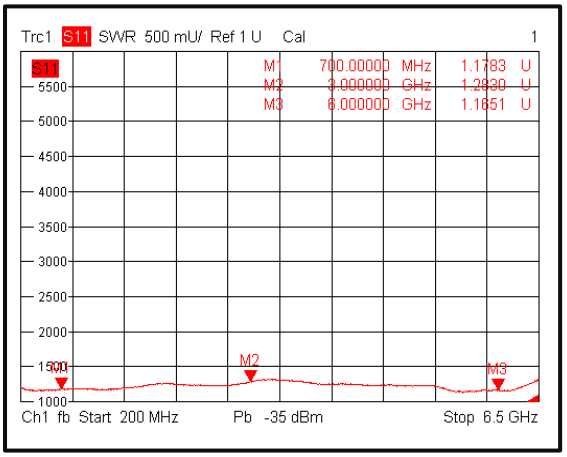
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

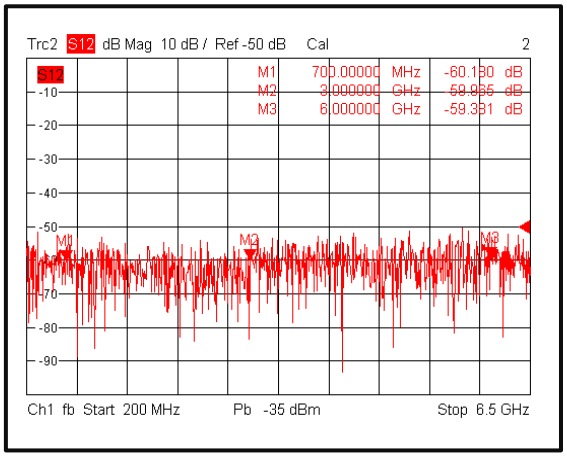
Gain@+70℃



Input VSWR @+70℃



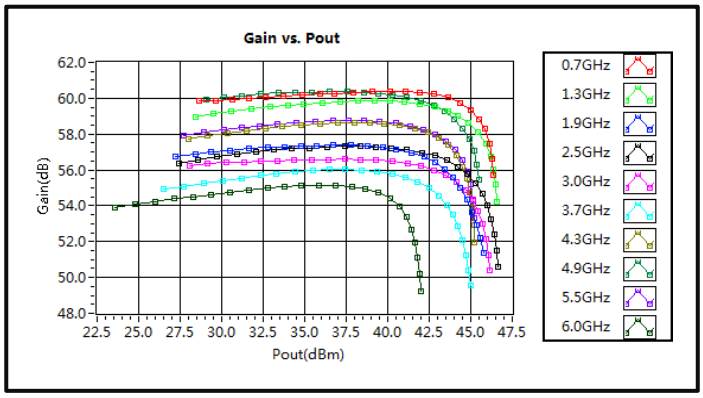
Isolation@+70℃



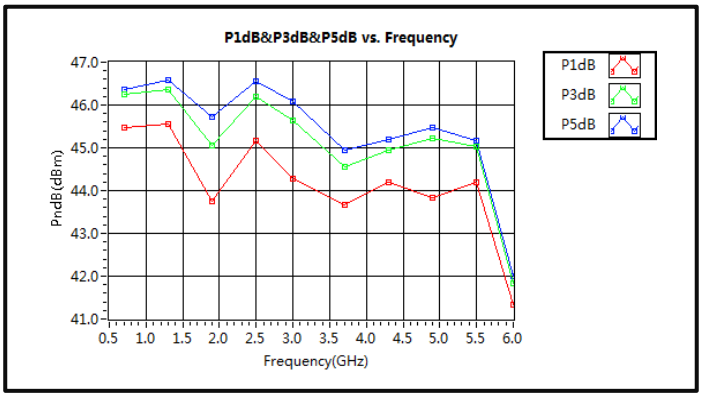
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

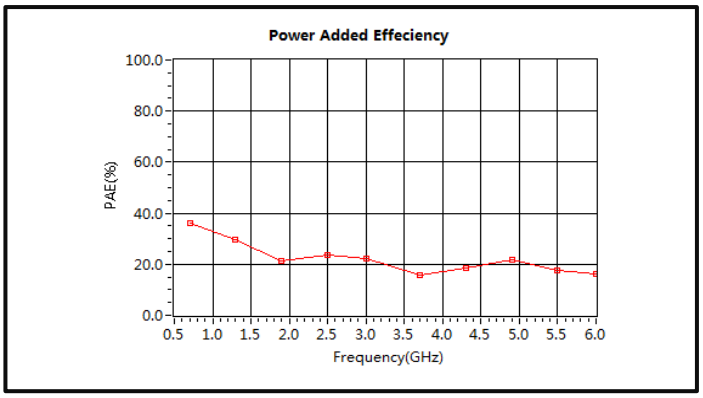
Gain vs. Output Power (CW Power)



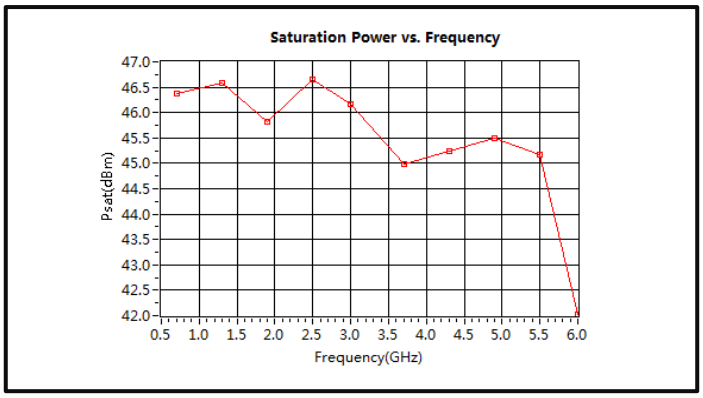
PndB vs. Frequency (CW Power)



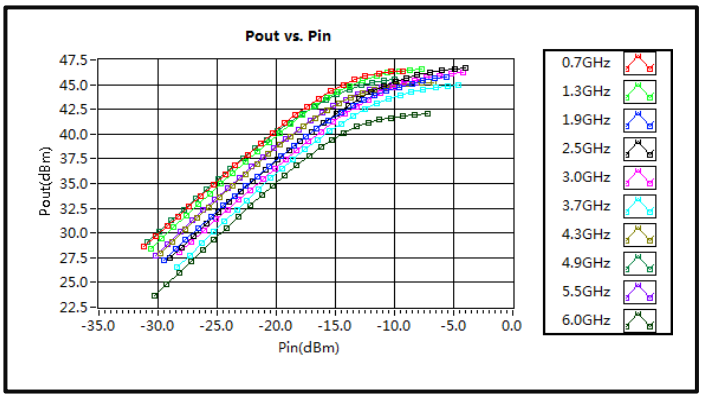
Power Added Efficiency (CW Power)



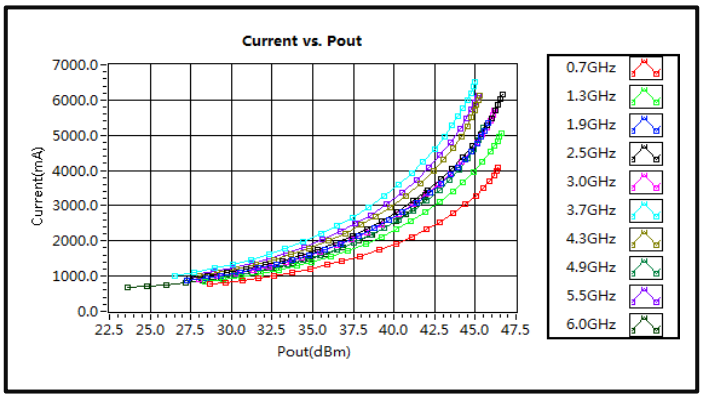
Saturation Power vs. Frequency (CW Power)



Pout vs. Pin (CW Power)

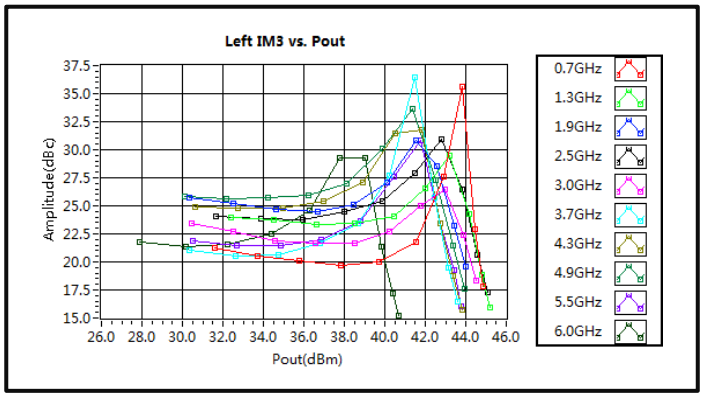


Current vs. Pout (CW Power)

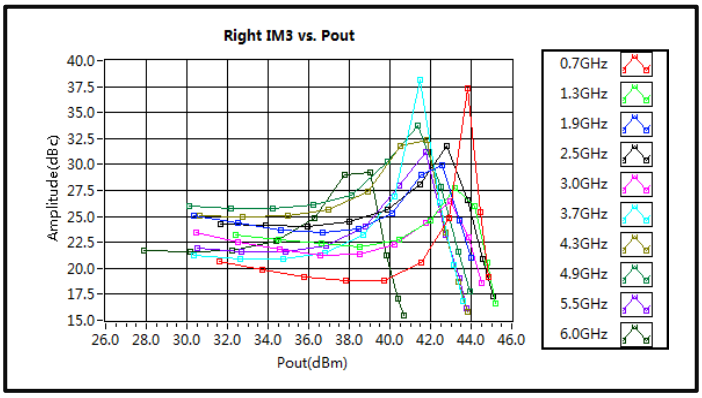


Typical Performance Plots

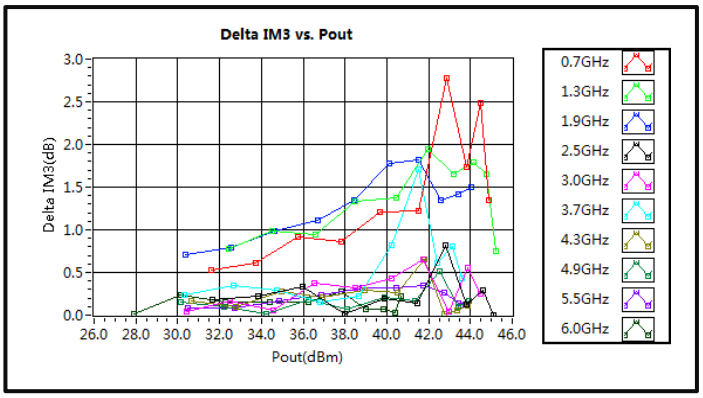
Left IM3 vs Output Power



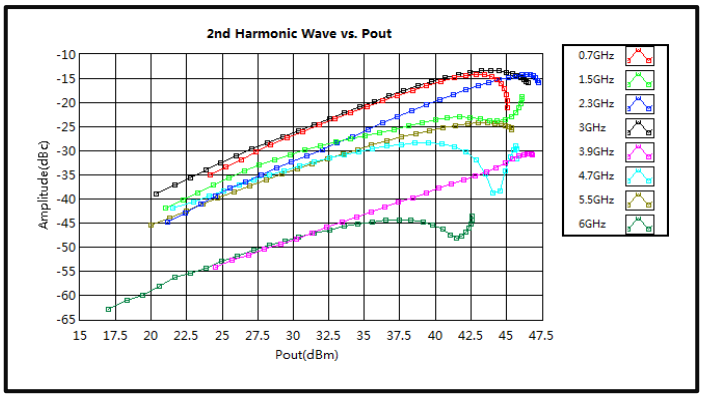
Right IM3 vs Output Power



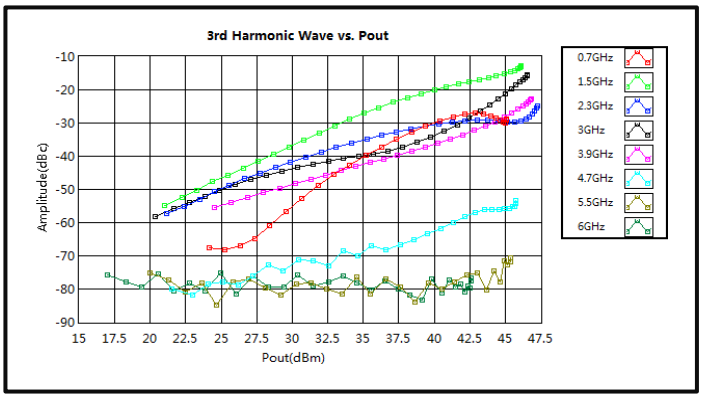
Delta IM3 vs Output Power



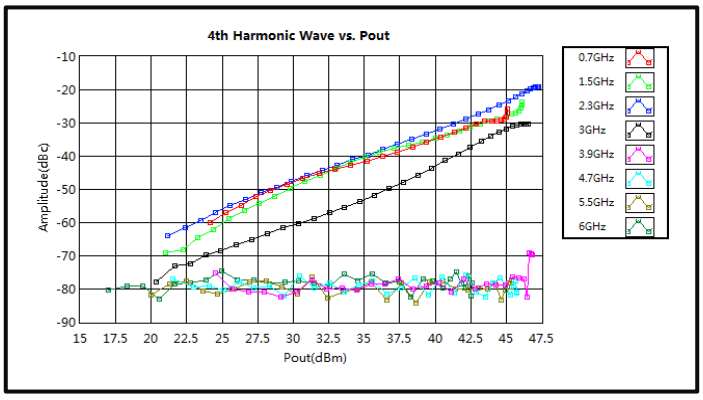
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



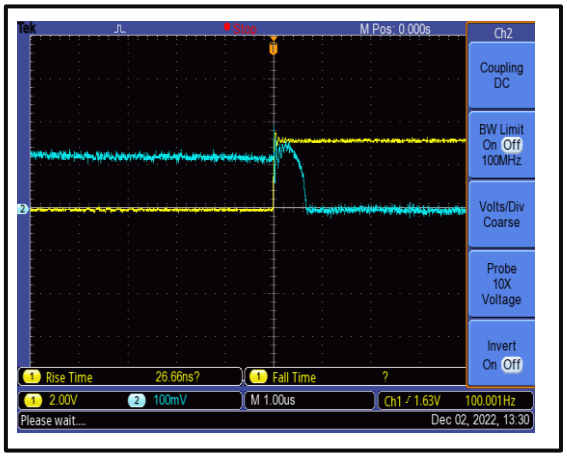
4th Harmonic Wave Output Power



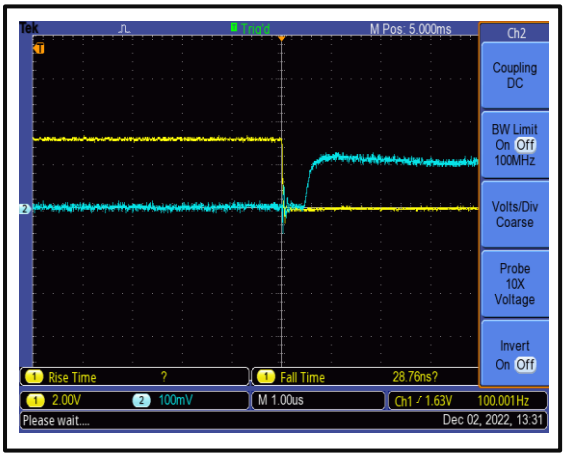
Note: IM3 test performed with 1MHz tone spacing

Typical Performance Plots

Speed

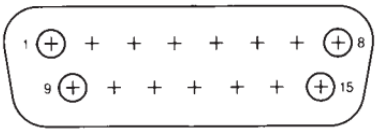


Speed



Interface Connector

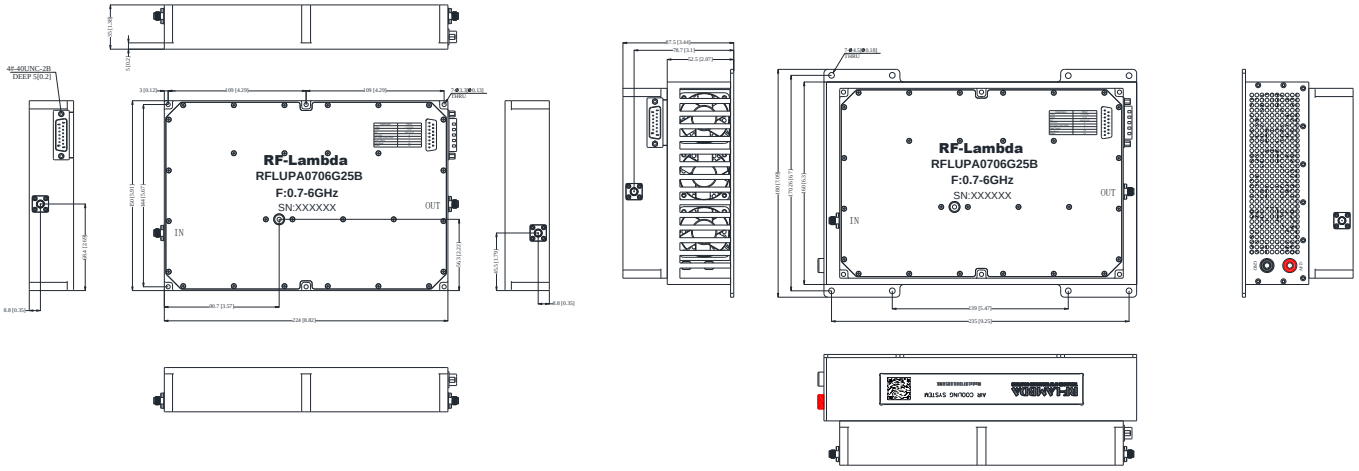
Male D-Sub is on the housing
The mating female part number: 172-E15-203R001



Pin #	Name	Function	Initial State	Description	Applied
1,2, 9,10	VDD	Power Supply	+28V	+28V DC is supply Voltage	Yes
3,11	GND	Ground	GND	Ground	Yes
6,8, 12,13	NC	/	/	/	No
4	PA_OFF	Indicator	LOW	Amplifier working state, high level is off	Yes
5	RF Input Over Drive	/	LOW	Pin will be latched to logic HIGH when input signal is over limit	No
7	Over Temp	/	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	No
14	Shutdown	Control	LOW	Applying logic high to shutdown the amplifier	Yes
15	Reset	Control	HIGH	Resets PA when logic LOW is applied and released	Yes

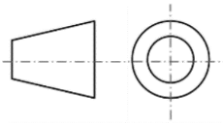
Notes:
- HIGH/LOW voltages are standard TTL signals 0V~0.8V = LOW. 2.8V~5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Applied=Yes means the feature is included. Applied=No means the feature is not included with this model.
- Indicator output signals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

Outline Drawing



Notes:

1. Package Material: Aluminum
2. Finish: Color Anodizing
3. All dimensions are in millimeters [inches].
4. Tolerances ±0.2 [0.008] unless otherwise specified.
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. DB15 cable is configured for power connection port by default (RFCBLADB15).
7. Standard torque wrench must be used to secure RF connectors.



Packing List

ID	Description	QTY
1	Fig a. DB15 cable (RFCBLADB15)	1
2	Fig b. Screws（#4-40*5+6）	2

Fig a.

Fig b.

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
RFLUPA0706G25B	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

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