

Wide Band Power Amplifier 2GHz-6GHz



Product Description

The RFLUPA02G06GD is a wideband power amplifier with a frequency range of 2 to 6GHz.

The power output of this amplifier is 55dBm typical. The typical small signal gain is 60dB with a gain flatness of ± 5 dB. This power amplifier works with a +48 VDC power supply.

The power amplifier's input and output connectors are N-Female.

The operating temperature of this product is -40 to +70°C.

Features

- Ultra Wide band Power Amplifier
- Small Signal Gain 60dB Typical
- Output Saturation Power 55dBm Typical
- Supply Voltage +48 VDC
- 50 Ohm Matched Input/Output
- Overvoltage Protection
- 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 ($T_A=+25^\circ\text{C}$)

Parameter	Min	Typ	Max	Units
Frequency Range		2 – 6		GHz
Small Signal Gain		60		dB
Gain Flatness		± 5		dB
Gain Variation Over Temperature (-40°C to +70°C)		± 3.5		dB
Input Return Loss		-10		dB
Output 1dB Compression Point (P1dB)	50	51		dBm
Saturated Output Power (Psat)	53	55		dBm
Supply Current (Output Power @ Psat)		75		A
IM3		-28		dBc
RF ON and OFF Speed		1		us
Power Added Efficiency (PAE)		20		%
Time Division Duplexing (TDD) Blanking	ON	600		us
	OFF	30		us
Weight	Amplifier	-		lbs.
	Including Heat sink	-		lbs.
Impedance		50		Ohms
Input / Output Connectors	N-Female			
Package	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	+46 VDC to +50 VDC
*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 VDC and make sure power supply can handle max current.

Bias Down Procedure

1. Turn off +48 VDC
2. Remove +48 VDC Connection
3. Remove RF Connection
4. Remove ground

Environmental Specifications and Test Standards

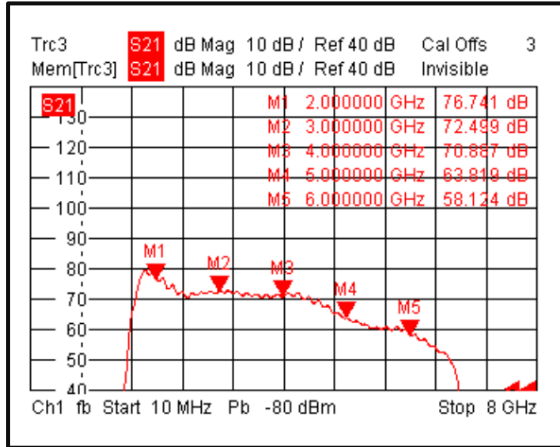
Parameter	Description
Operational Temperature	-40°C to +70°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +70°C for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

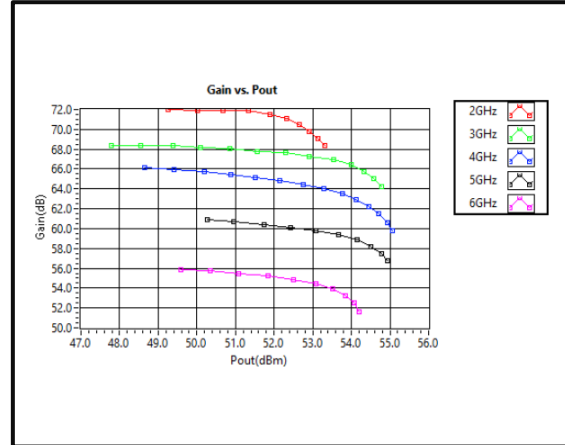
**For vibration testing details please see additional information section.

Typical Performance Plots

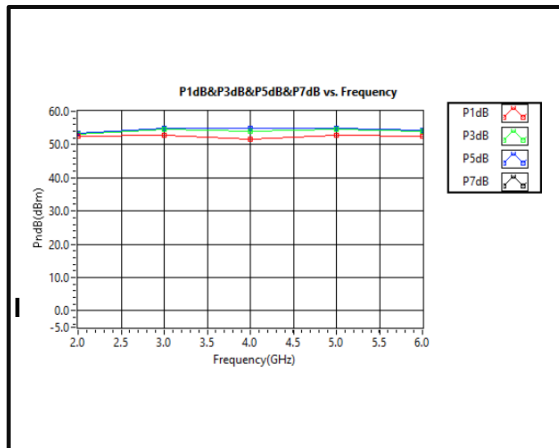
Gain



Gain vs. Output Power



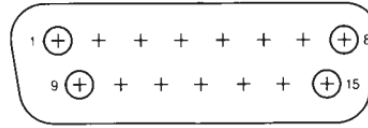
P1dB – P5dB vs. Frequency



Note: Small signal VNA measurements include attenuators to protect equipment

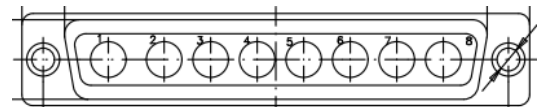
Protection Connector Table

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	+20V	+20 VDC is supply Voltage	NO
3,11	GND	Ground	GND	Ground	Yes
4	+5V_USER	Power Supply	+5V	+5V DC is supplied for reference	Yes
5	VSWR	Indicator	LOW	Pin will be latched to logic HIGH when output reflection is over limit	Yes
6	Gate Disable	Control	LOW	Applying logic HIGH disables gates of amplifiers	Yes
7	Drain Disable	Control	LOW	Applying logic HIGH disables drains of amplifiers	Yes
8	Reset	Control	HIGH	Resets PA when logic LOW is applied and released	Yes
12	Switch Disable	Control	HIGH	Applying logic LOW switches off the RF signal	Yes
13	RF Input Over Drive	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	Yes
14	Over Temp	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
15	Over Current	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached	Yes

DSUB FE 8W8 is on the housing

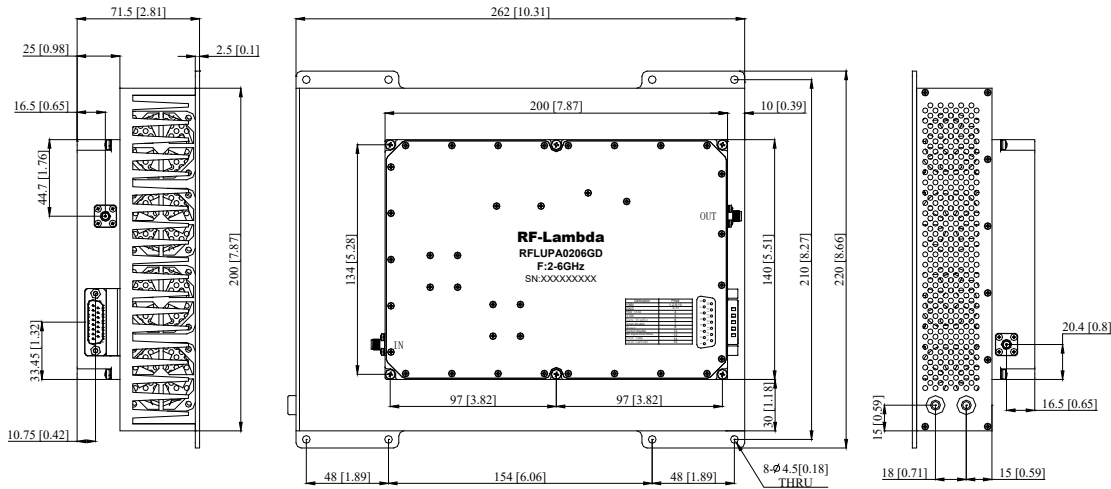


Pin #	Name	Function	Initial State	Description	Applied
1,2,3,4	VDD	Power Supply	+20V	+20 VDC is supply Voltage Resets PA when logic LOW is applied and released	Yes
5,6,7,8	GND	Ground	GND	Ground	Yes

Notes:

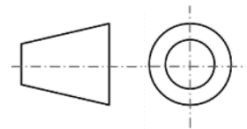
- HIGH/LOW voltages are standard TTL signals 0.0V-0.8V = LOW. 2V-5V = HIGH. Input current is 10uA.
- Matching connector and cable will be shipped with the product.
- Applied=Yes means the feature is included. Applied=No means the feature is not included with this model.
- 5V reference supply can source 700mA.
- Indicator output signals can source 24mA.

Outline Drawing



Notes:

1. Package Material: Aluminum and Copper
2. Plating: Nickel
3. All dimensions are in millimeters [inches].
4. Tolerances ± 0.25 [0.010] 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.



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
RFLUPA0206GD	Standard	2GHz-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.