

## 100W Broadband High Power Amplifier Module 20MHz -1000MHz



### Product Description

RFLUPA0001GK is a broadband high power amplifier module with a frequency range of 20 to 1000MHz.

The power output of this amplifier is 50dBm typical. The typical small signal gain is 50dB with a gain flatness of  $\pm 1.0$ dB. This power amplifier works with a +28VDC power supply.

The working temperature of this product is between - 40°C and 70°C.

### Features

- High Power Amplifier
- Small Signal Gain 50dB Typical
- Output Saturation Power 50dBm 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<sub>A</sub>=+25°C),VCC=+12VDC

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	20		100	100		1000	MHz
Gain	49	50	53	49	50	54	dB
Gain Flatness		$\pm 1.0$			$\pm 1.5$		dB
Gain Variation Over Temperature (-40°C~+70°C)		$\pm 2.0$			$\pm 2.0$		dB
Input VSWR		1.5	2.0		1.5	2.0	: 1
Saturated Output Power (Psat)	48.5	50		48	50		dBm
IM3		25			25		dBc
Isolation S12		-55			-55		dB
Supply Current (Vcc=+28V)		2.1	13.5		2.1	13.5	A
Efficiency @ P1dB		45			40		%
Weight	Net	1.66 Max.					lbs.
	Including Heat Sink	8.4 Max.					
Impedance	50					Ohms	
Input / Output Connectors	SMA- Female						
DC Interface Connector	D-Sub9-Pin ( Male)						
Package	Epoxy Sealed (Standard)						
	Hermetically Sealed (Optional)						

**Absolute Maximum Ratings**

Parameter	Rating
Operating Voltage	+32V
*RF Input Power (RFIN)	+5dBm

**Bias Up Procedure**

- 1.Connect Ground Pin
- 2.Connect input and output
- 3.Connect +28V biasing

**Bias Down Procedure**

- 1.Turn off +28V biasing
- 2.Remove RF connection
- 3.Remove Ground.

**Environmental Specifications and Test Standards**

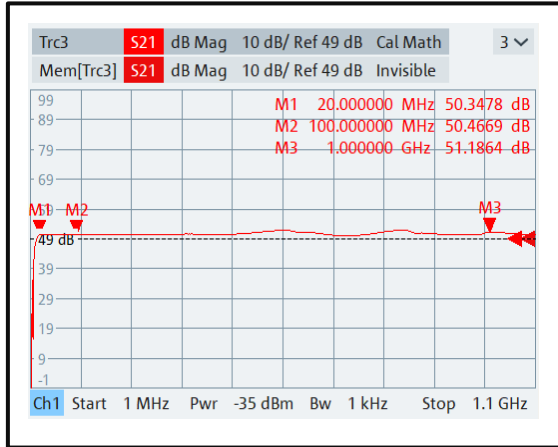
Parameter	Description
Operational Temperature	-40°C to +70°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for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

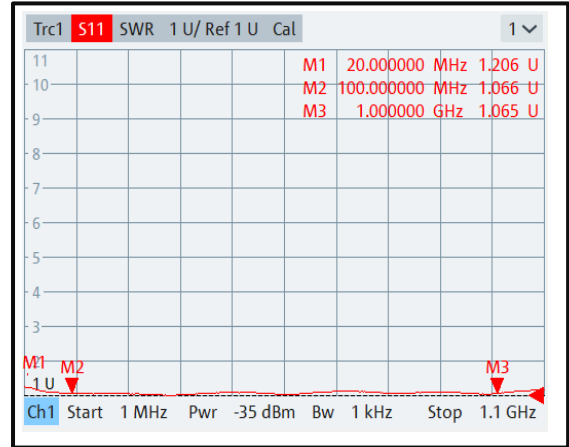
\*\*For vibration testing details please see additional information section.

Typical Performance Plots

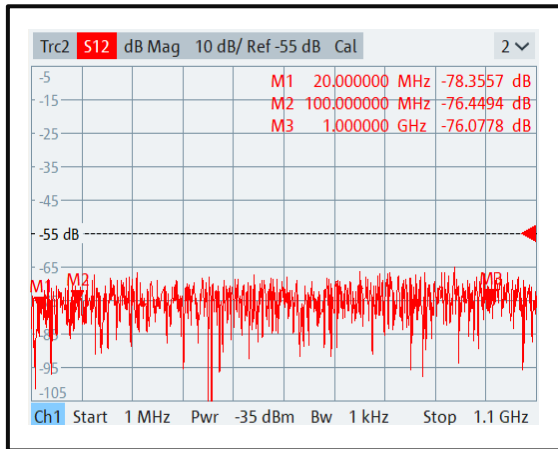
Gain@+25°C



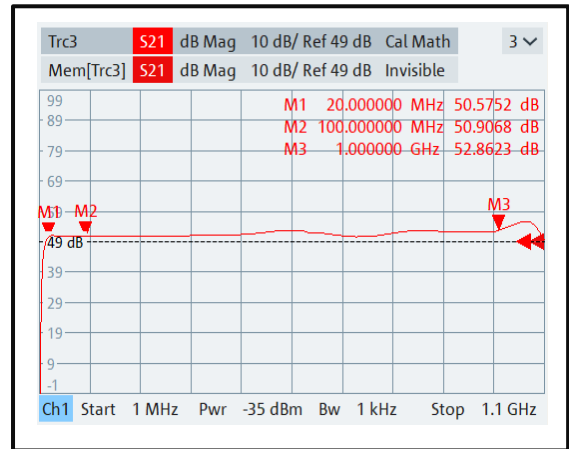
Input VSWR @+25°C



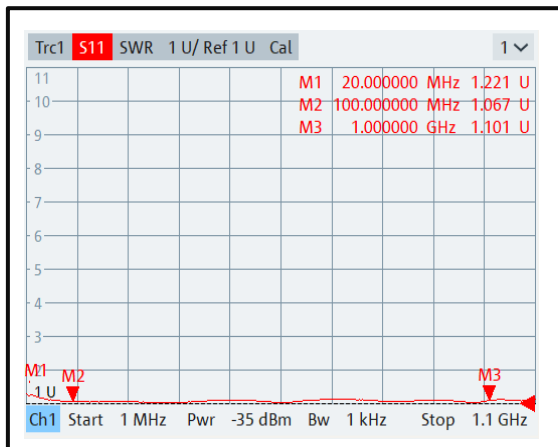
Isolation@+25°C



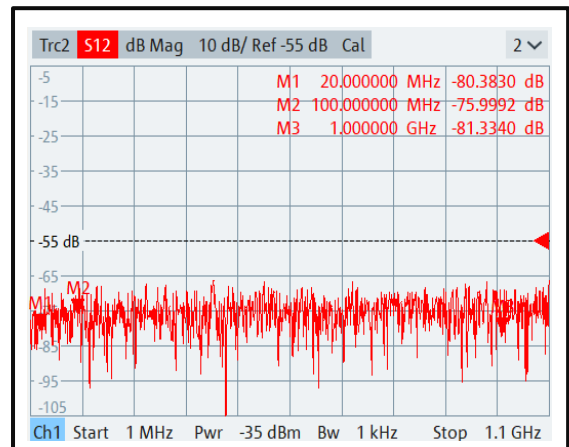
Gain@-40°C



Input VSWR @-40°C



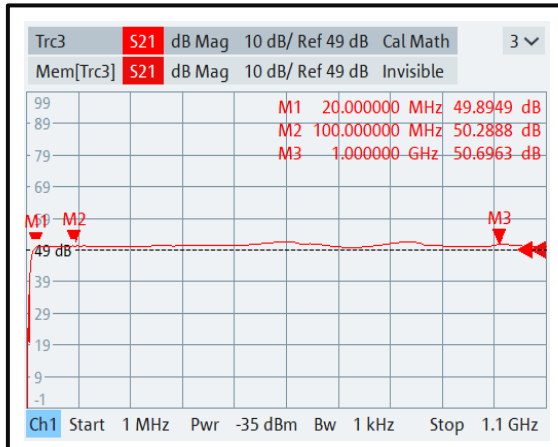
Isolation@-40°C



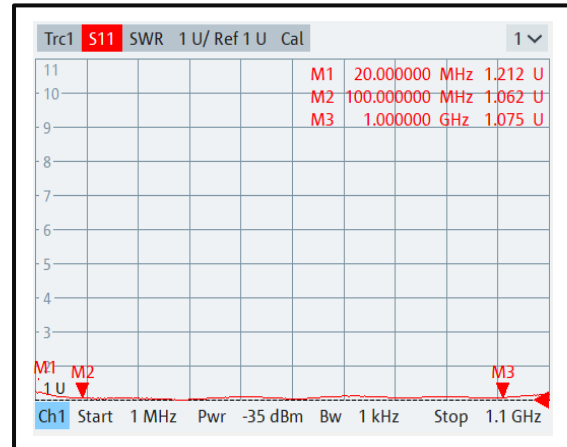
Note: Small signal VNA measurements include attenuators to protect equipment

**Typical Performance Plots**

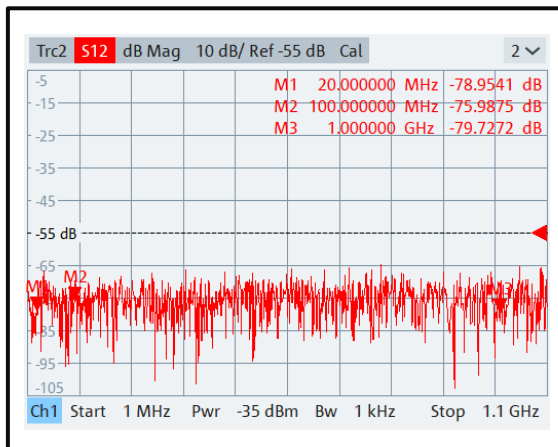
**Gain@+70°C**



**Input VSWR @+70°C**



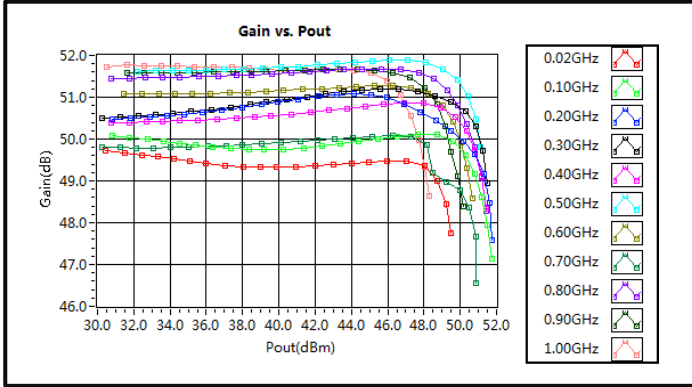
**Isolation@+70°C**



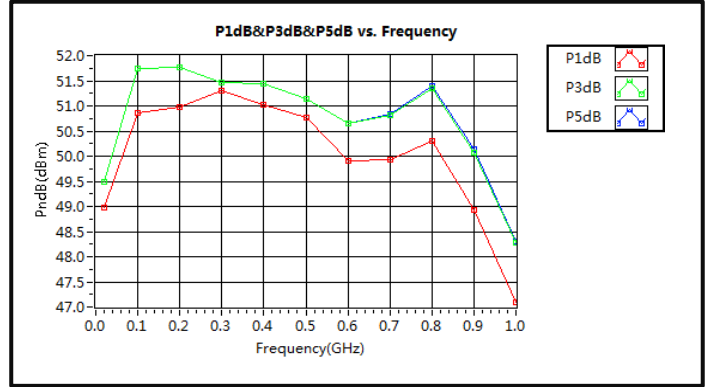
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

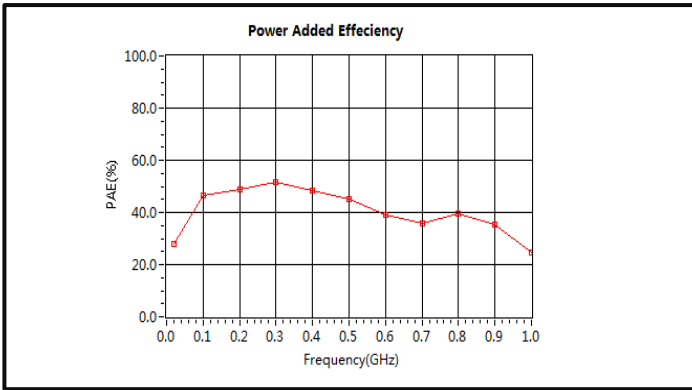
Gain vs. Output Power CW



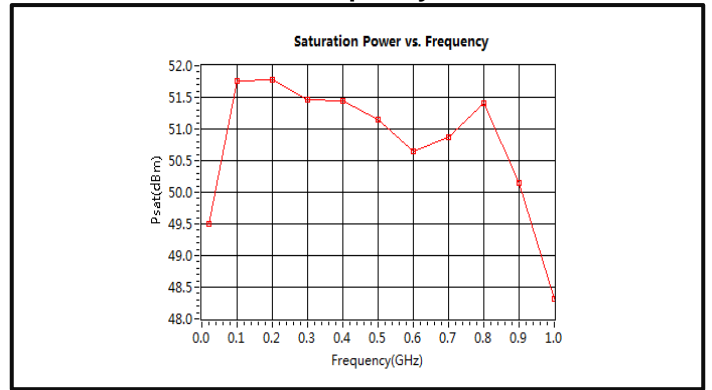
PndB vs. Frequency CW



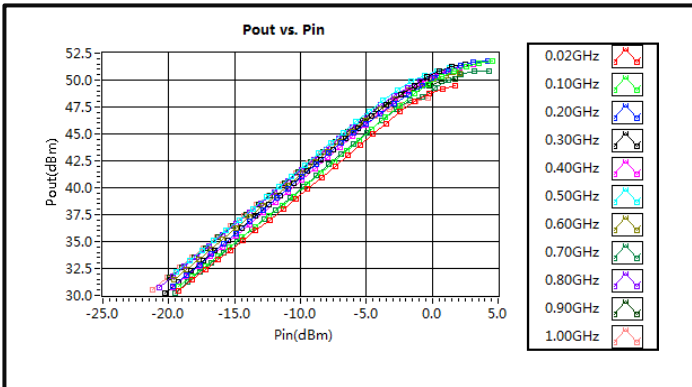
Power Added Efficiency CW



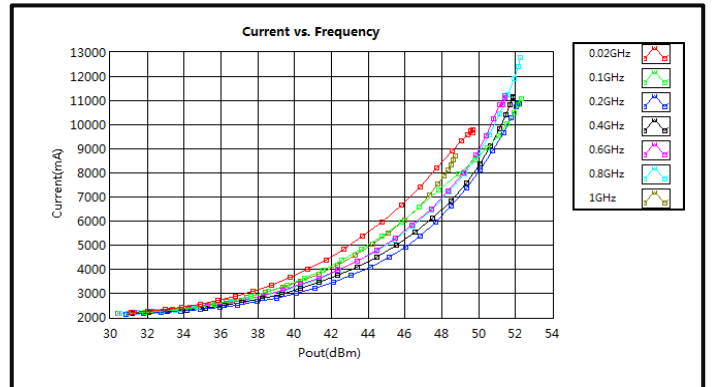
Saturation Power vs. Frequency CW



Pout vs. Pin

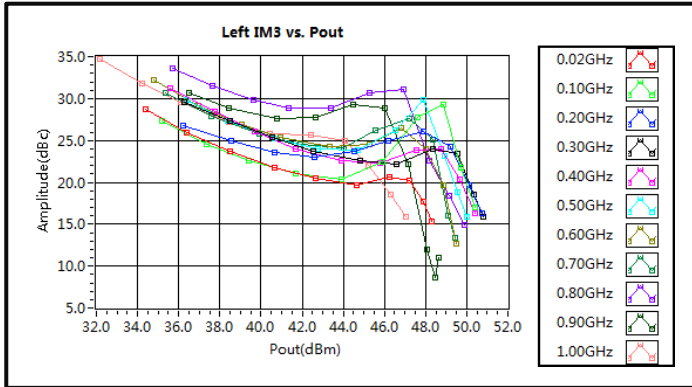


Current vs. Pout

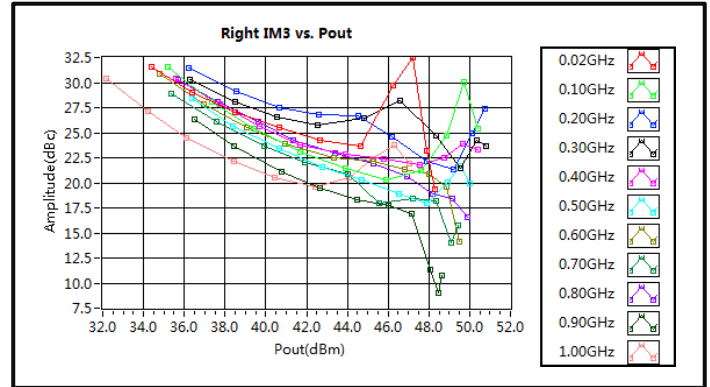


Typical Performance Plots

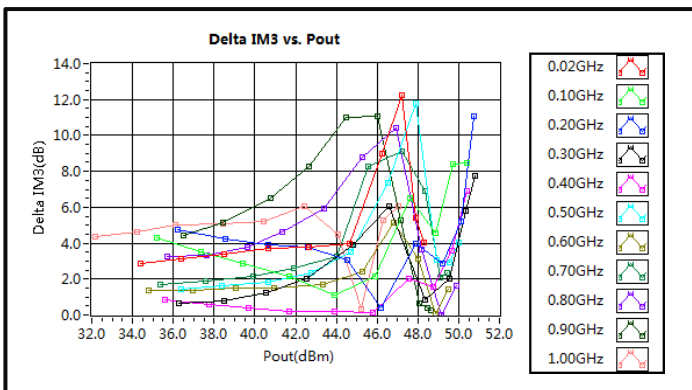
Left IM3 vs. Pout



Right IM3 vs. Pout



Delta IM3 vs. Pout

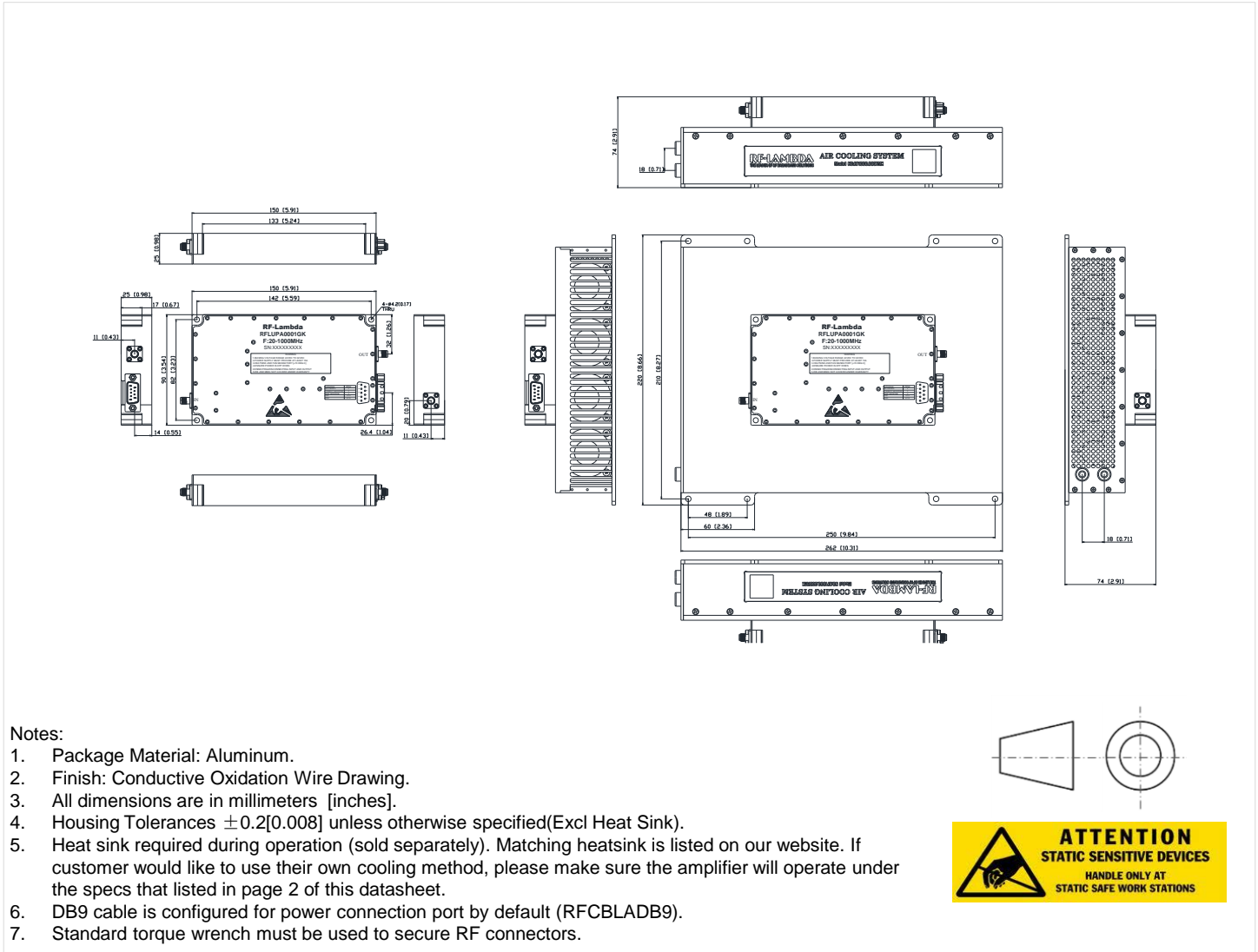


Note: IM3 test performed with 1MHz tone spacing

**DC Interface Connector**

Pin #	Description	Specifications
4,5,9	VDD	+28VDC
6,7,8	GND	Ground
1	SHUTDOWN	Amplifier Disable: TTL Logic High (3.3V) (Internally Pulled-Low)
2	CURRENT MONITOR	Analog voltage relative to IDD @ 100mV per Ampere
3	TEMP MONITOR	Analog voltage relative to Module's Temperature (500mV+10 mV/°C)

**Outline Drawing**



**Packing List**

ID	Description	QTY
1	Fig a. DB9 cable (RFCBLADB9)	1



**Fig a.**



**Ordering Information**

Part Number	Modification	Description
RFLUPA0001GK	Standard	20MHz-1000MHz 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.