Wide Band Solid State Power Amplifier
0.7GHz-2.7GHz

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

Features

- Solid State Power Amplifier
- Small Signal Gain 57dB Typical
- Output Saturation Power 53dBm Typical
- Supply Voltage +36 VDC
- 50 Ohm Matched

Product Description

RFLUPA0727GB is a wide band power amplifier with a frequency range of 0.7 to 2.7GHz.

The power output of this amplifier is 53dBm typical. The typical small signal gain is 57dB with a gain flatness of ±2dB. This power amplifier works with typically +36VDC power supply.

The power amplifier input connector is SMA-female and output connector is N-female.

The operating temperature of this product is -40 to +60ºC.

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	Units
Frequency Range		0.7		2.7	GHz
Small Signal Gain		55	57		dB
Gain Flatness			±2.0	±3.0	dB
Gain Variation Over Temperature (-40ºC to +60ºC)			±2.5		dB
Input Return Loss			15		dB
Output 1dB Compression Point (P1dB)			50		dBm
Saturated Output Power (Psat)		51	53		dBm
3rd Order Intermodulation Product(IM3)			-35		dBc
Supply Current (Vcc=+36V)			3.8	21	A
Isolation S12			-55		dB
Power Added Efficiency (PAE)			25		%
Turn On/Off Speed (Drain Disable)	ON		1000		us
	OFF		1000		
Turn On/Off Speed (Gate Disable)	ON		1000		us
	OFF		1000		
Weight	Net		7.39 Max.		lbs.
	Including Heat Sink		19.2 Max.		lbs.
Impedance			50		Ohms
Input / Output Connectors			SMA-Female(Input) – N-Female(Output)		
Package			Epoxy Sealed (Standard)		
			Hermetically Sealed (Optional)		

Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	+38VDC
*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 VSWR.)
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

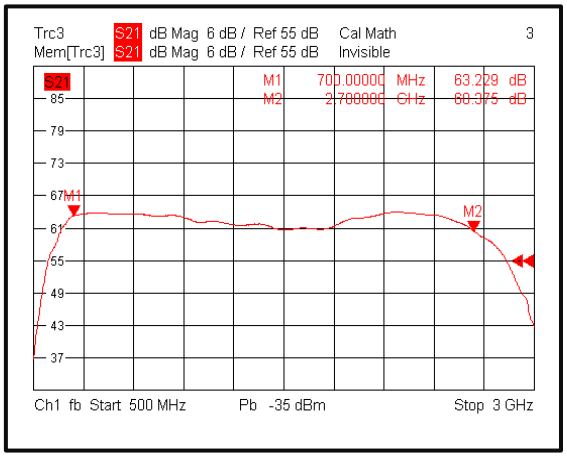
Environmental Specifications and Test Standards

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)

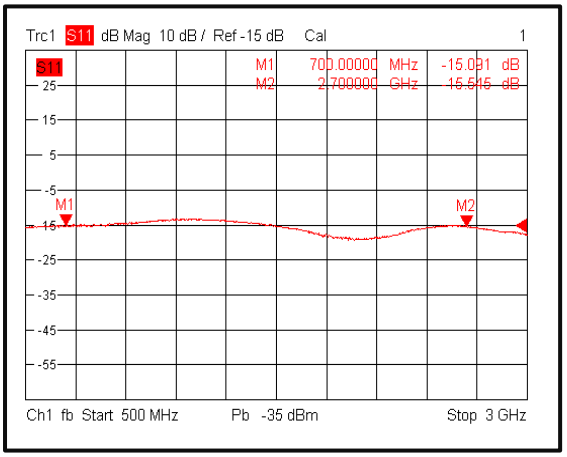
*Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.
**For vibration testing details please see additional information section.

Typical Performance Plots

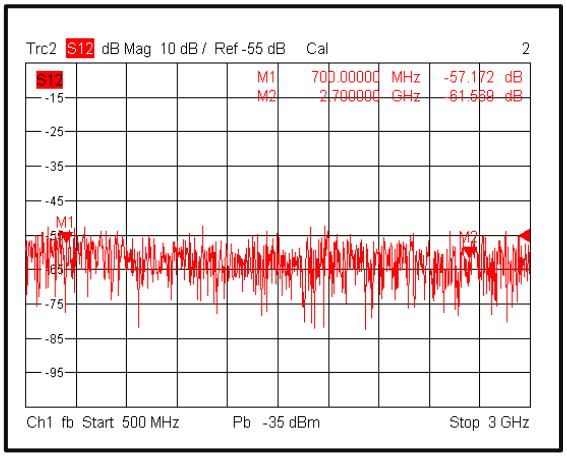
Gain@+25℃



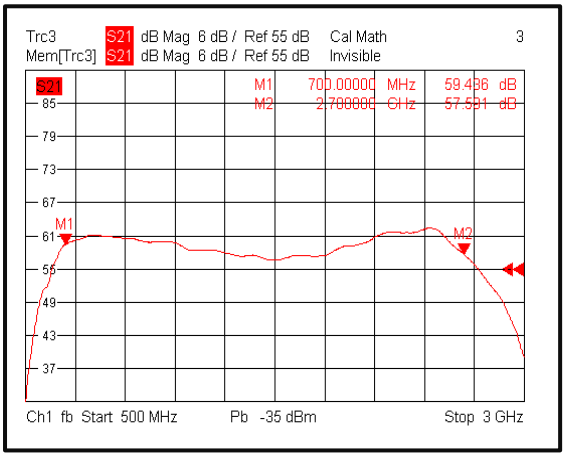
Input Return Loss@+25℃



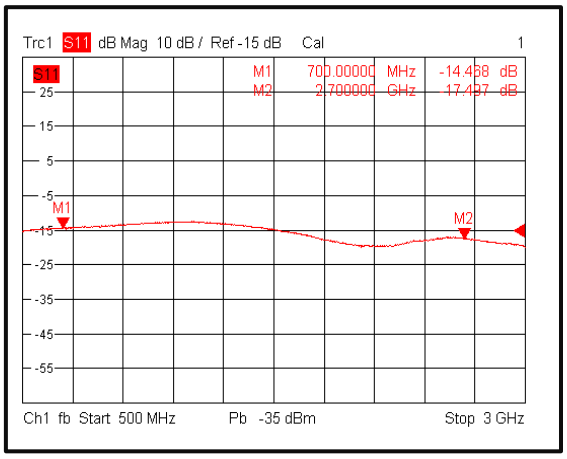
Isolation@+25℃



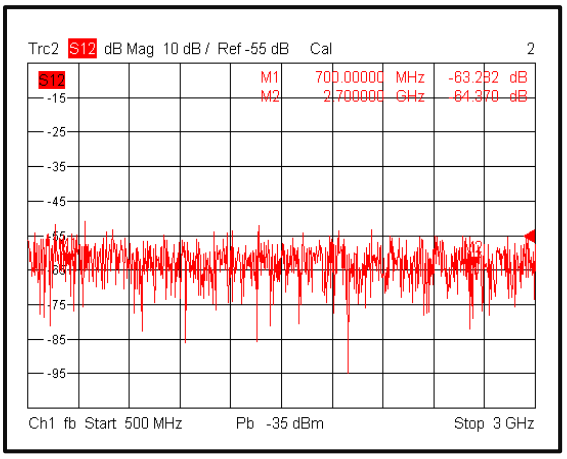
Gain@-40℃



Input Return Loss@-40℃



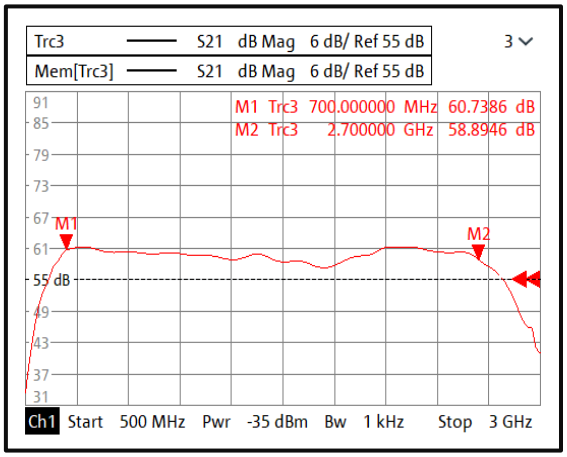
Isolation@-40℃



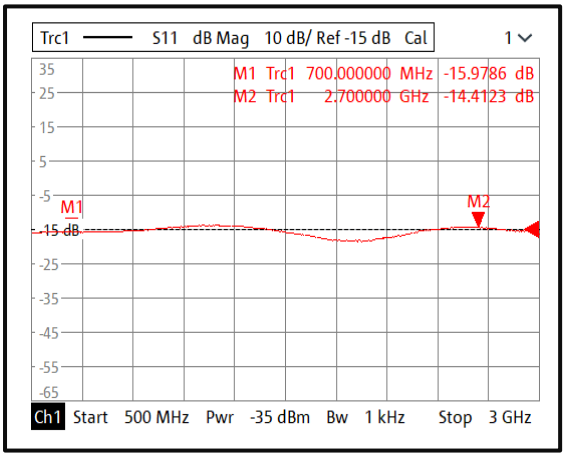
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

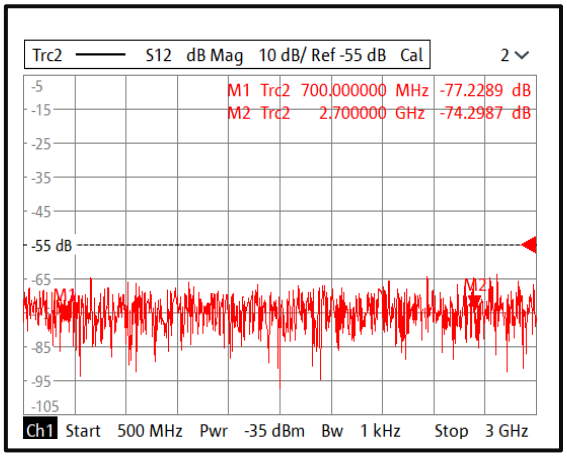
Gain @+60℃



Input Return Loss@+60℃



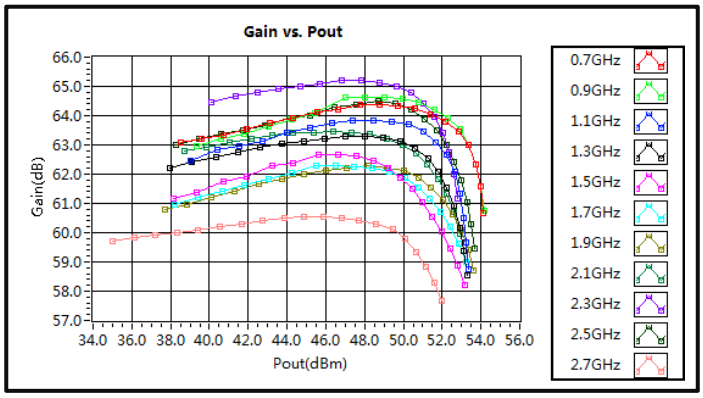
Isolation@+60℃



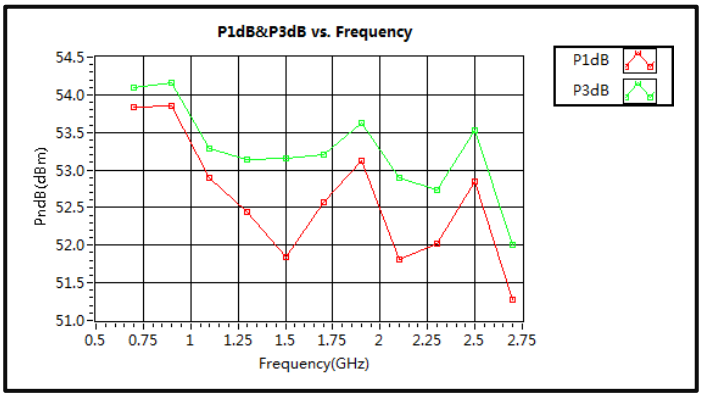
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

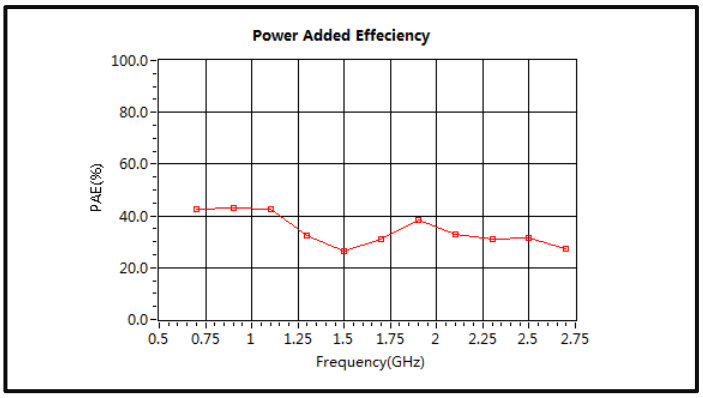
Gain vs. Output Power CW



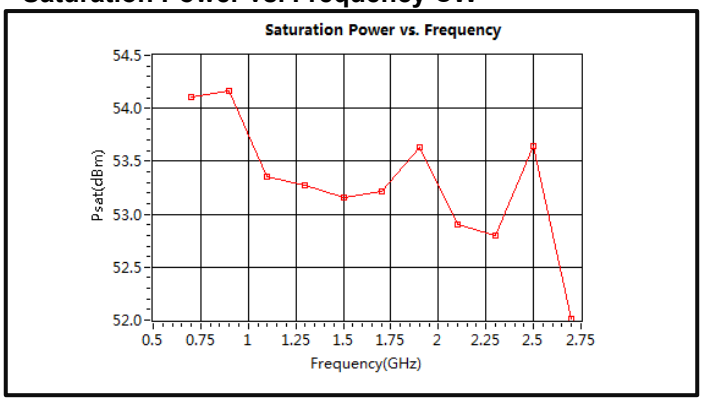
PndB vs. Frequency CW



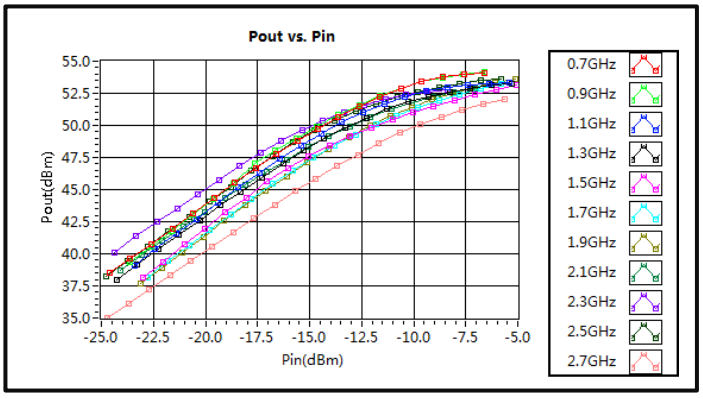
Power Added Efficiency CW



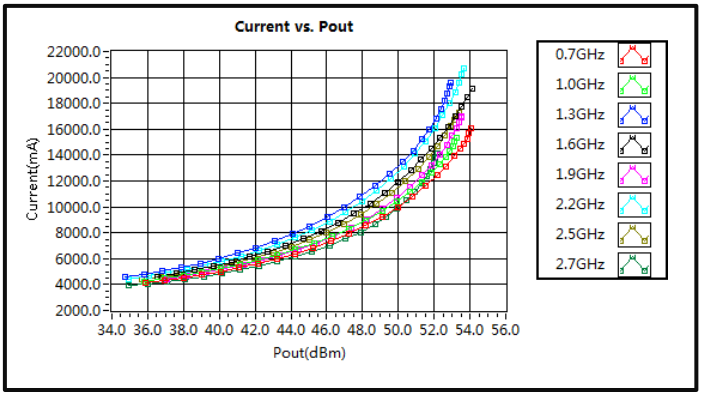
Saturation Power vs. Frequency CW



Pout vs. Pin

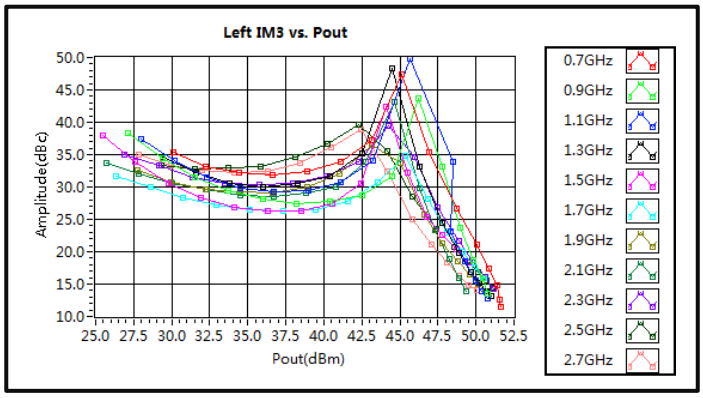


Current vs. Pout

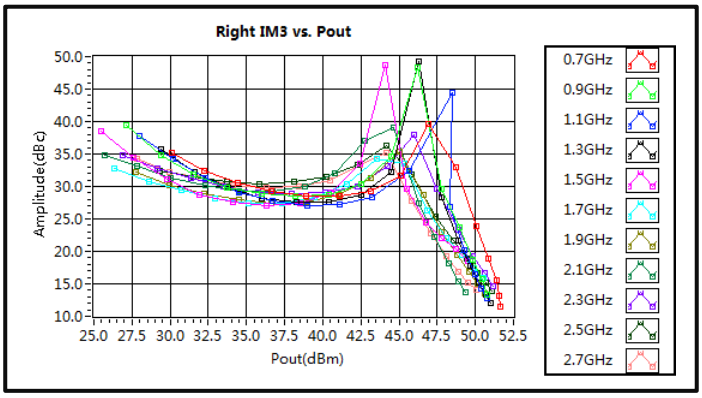


Typical Performance Plots

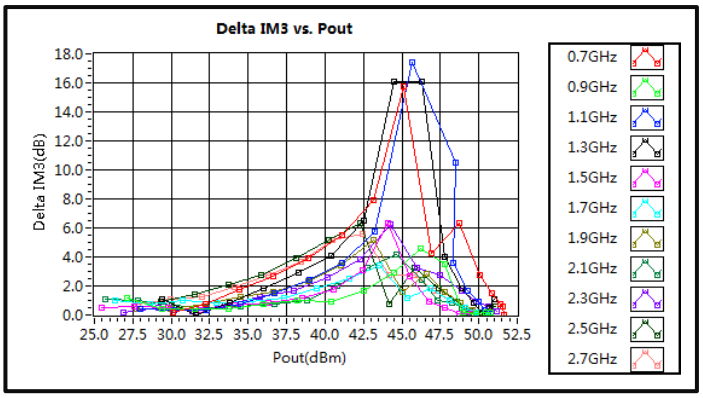
Left IM3 vs. Pout



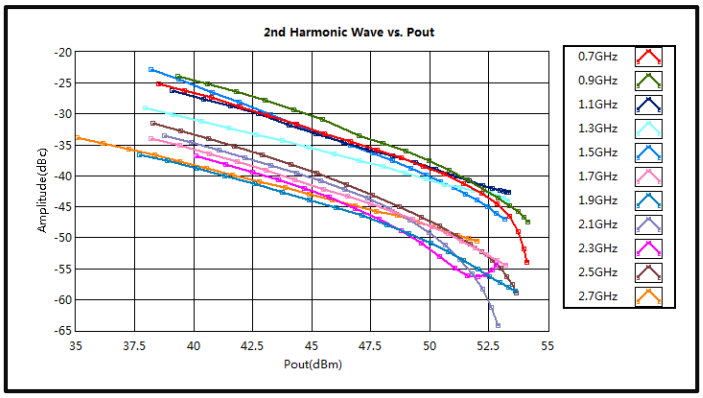
Right IM3 vs. Pout



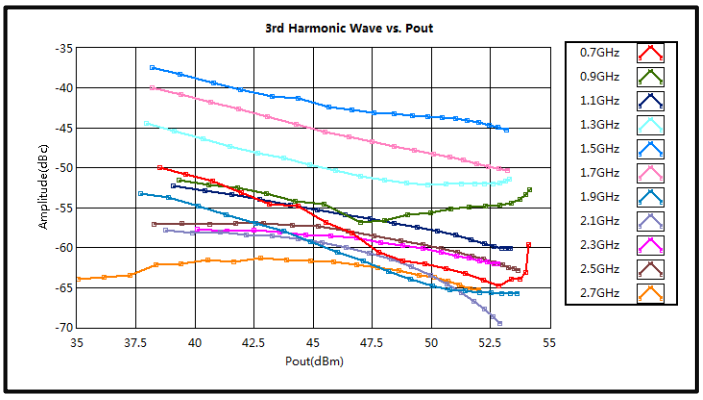
Delta IM3 vs. Pout



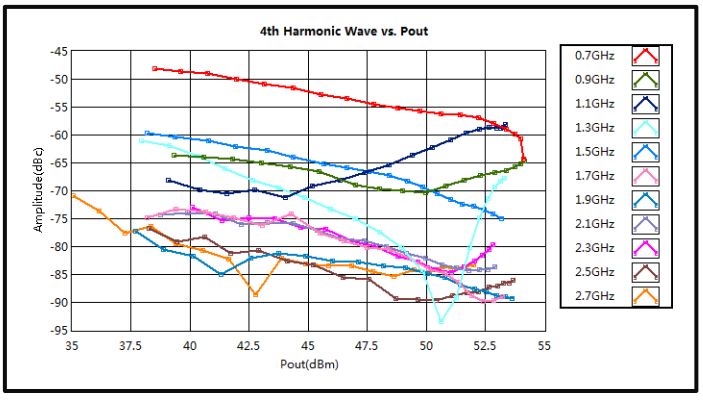
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



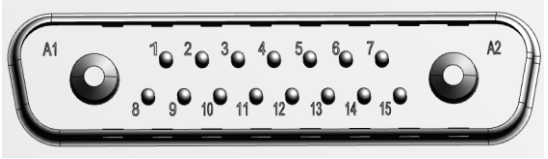
4th Harmonic Wave Output Power



Note: IM3 test performed with 1MHz tone spacing

Interface Connector

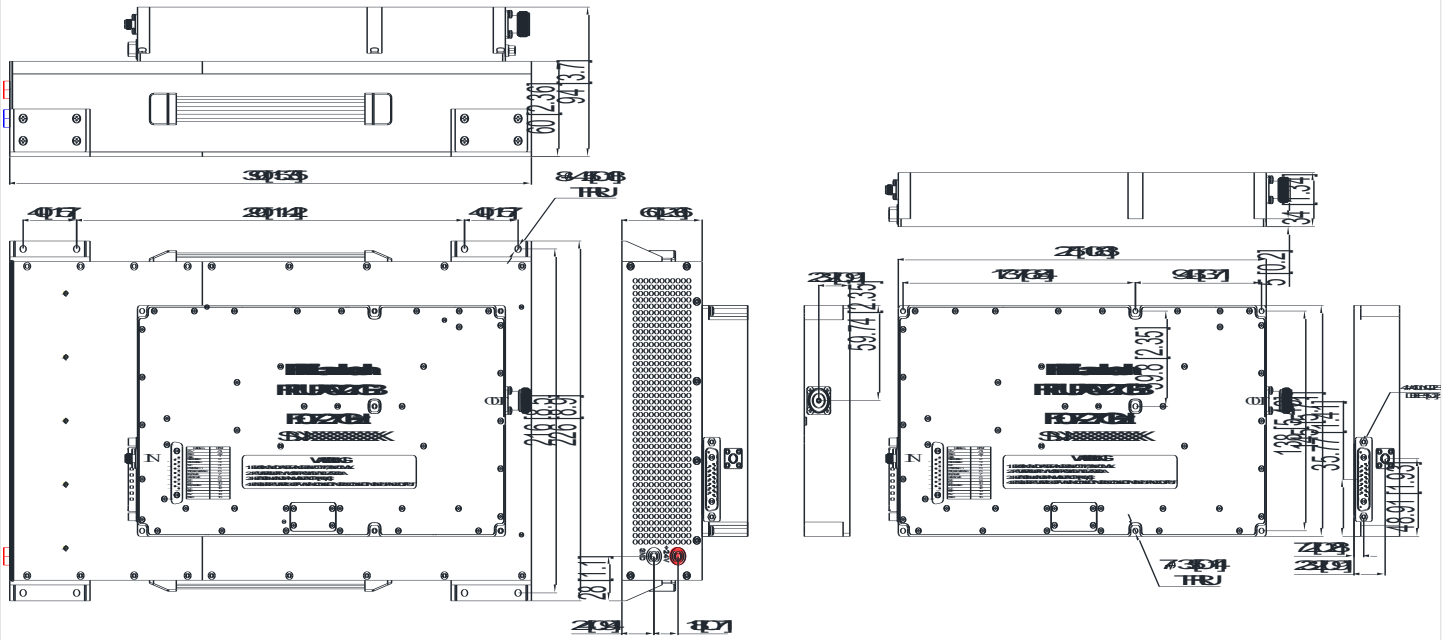
Male D-Sub is on the housing
The mating female part number: RFCBLADB17



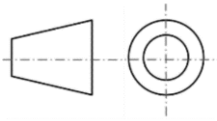
Pin #	Name	Function	Initial State	Description	Applied
A1	VDC	Power Supply	+36V	+36V DC is supply Voltage	Yes
A2	GND	Ground	GND	Ground	Yes
1	Reset	Control	HIGH	Resets PA when logic LOW is applied for five more seconds and released	Yes
2	Gate Disable	Control	LOW	Appling logic HIGH disables gate of amplifiers	Yes
3	Drain Disable	Control	LOW	Applying logic HIGH disables drain of amplifiers	Yes
4	RF Input Switch	Control	LOW	Applying logic HIGH turns OFF RF front-end switch to terminator	No
5	PA Off Alarm	Indicator	LOW	Pin will be latched to logic HIGH when any of the protection limit is reached	Yes
6	RF Input Over Drive	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	Yes
7	Temp Over	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
8	Current Over	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached	Yes
9	VSWR	Indicator	LOW	Pin will be latched to logic HIGH when output reflection is over limit	No
10	ID Imbalance	Indicator	LOW	Pin will be latched to logic HIGH when an imbalance in the drain current of the combining branches occurs	No
11	Temp monitor	Indicator	Voltage	Analog voltage relative to module's temperature	Yes
12	Current monitor	Indicator	Voltage	Analog voltage relative to module's current	No
13	NC	NC	NC	NA	NA
14	+5V	Power Supply	+5V	+5V DC is provided for reference *	Yes
15	GND	GND	GND	GND	Yes

Notes:
- The alarm state means the internal power is turned off, and the current of 36V is less than 100mA.
- If the amplifier is in protect state, the amplifier can only work normally again by pulling low the Reset pin, or to turn off the +36V power to reset the amplifier.
- The monitor signals are optional and can be left floating.
- HIGH/LOW voltages are standard TTL signals 0 to 0.8V = LOW. 2.8V to 5V = HIGH

Outline Drawing



Notes:
1. Package Material: Aluminum.
2. Finish: Nickel Plated.
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ±2.0 [0.08] 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. DB17 cable is configured for power connection port by default (RFCBLADB17).
7. Heat Sink required during operation (Sold Separately).
8. Standard torque wrench must be used to secure RF connectors.



Packing List

ID	Description	QTY
1	Fig a. D-Sub-17-Male cable (RFCBLADB17)	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
RFLUPA0727GB	Input Connector SMA-Female and Output Connector N-Female	0.7GHz-2.7GHz 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 VSWR 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