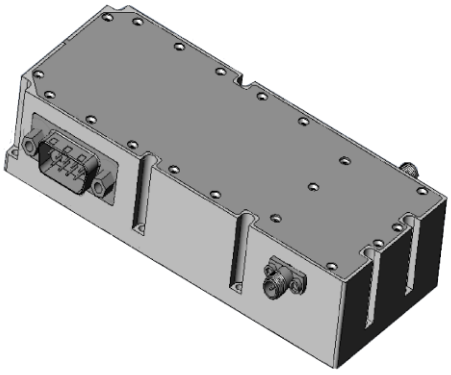
Ka Band 2W Power Amplifier
28GHz~42GHz



RoHS Compliant

Features

- Wideband Solid State Power Amplifier
- Psat: + 34dBm
- Gain: 33dB
- Supply Voltage: +36V

Typical Applications

- Wireless Infrastructure
- RF Microwave and Vsat
- Military & Aerospace Applications

Electrical Specifications, T_A = +25°C, Vcc = +36V

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	28 – 35			35 – 42			GHz
Gain		32			35		dB
Gain Flatness		±10			±10		dB
Gain Variation Over Temperature (-45°C ~ +85°C)		±3			±3		dB
Input Return Loss		15			10		dB
Output Return Loss		10			10		dB
Saturated Output Power (Psat)		34			34		dBm
Supply Current (+36 VDC)		300	1500		300	1500	mA
Isolation S12		65			65		dB
Input Max Power(no damage)	Psat – Gain			Psat – Gain			dBm
Weight	≈ 650						g
Impedance	50						Ohms
Input / Output Connectors	2.92-Female						
Finish	Nickel Plated						
Material	Aluminum / Copper						
Package Sealing	Epoxy Sealed (Standard)						
	Hermetically Sealed (Optional)						

* P1dB, P3dB and Psat power test signal: 200µs pulse width with 10% duty cycle.
* For average CW power testing or increased duty cycle, a 5dB back off from Psat is required unless water/oil cooling system is applied.

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Absolute Maximum Ratings	
Supply Voltage	+40Vdc
RF Input Power (RFIN) Pin_max = Psat - Gainsat	Psat – Gain
Storage Temperature (°C)	-50 to +125

Note: 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.

Biasing Up Procedure	
Step 1	Connect ground
Step 2	Connect input and output with 50 Ohm source/load. (in band VSWR<1.9:1 or >10dB return loss)
Step 3	Connect +Vdc
Power OFF Procedure	
Step 1	Turn off +Vdc
Step 2	Remove RF connection
Step 3	Remove ground

Environmental Specifications and Test Standards

Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45°C~+85°C (Case Temperature)
Storage Temperature		-50°C~+125°C
Thermal Shock		1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & 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	MIL-STD-883 (For Hermetically Sealed Units)

Ordering Information	
Part No.	Description
RFLUPA28G42GA	28GHz~42GHz 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.

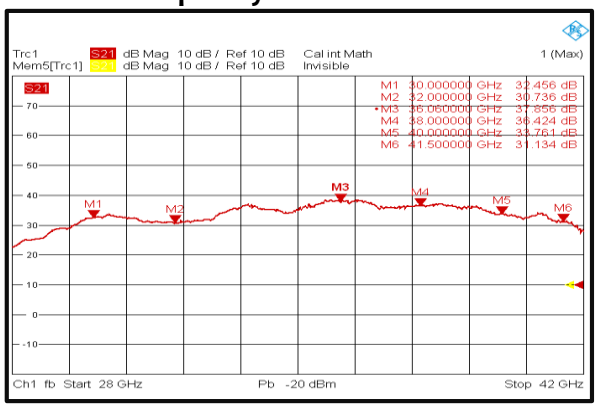
Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

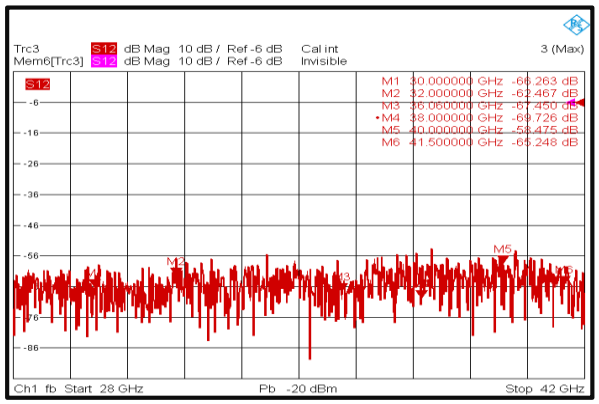
What is not covered with warranty?

Each of RF-Lambda amplifiers will go through power and temperature stress testing.
Due to fragile of the die, IC or MMIC, those are not covered by warranty. Any damage to those will NOT be free to repair.

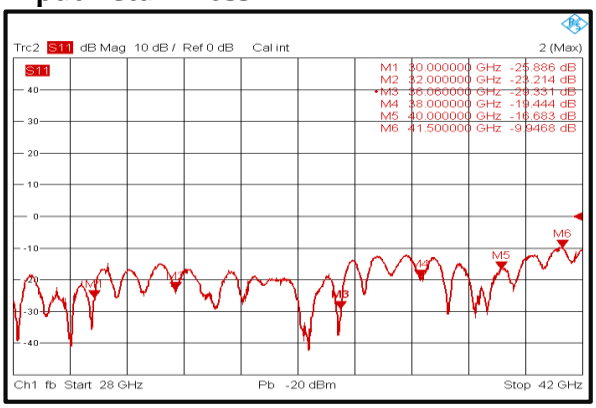
Gain vs. Frequency



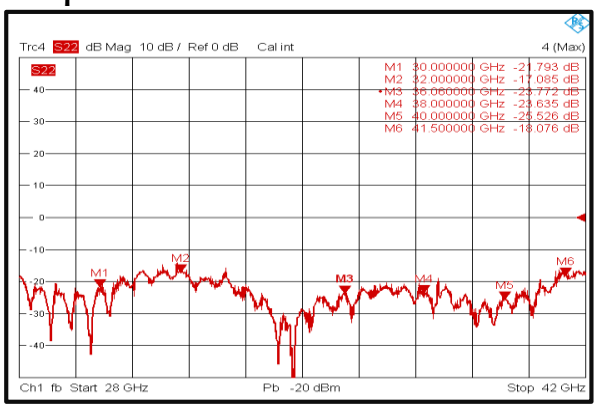
Isolation



Input Return Loss



Output Return Loss



Note: Input / Output return loss measurements include attenuators to protect equipment

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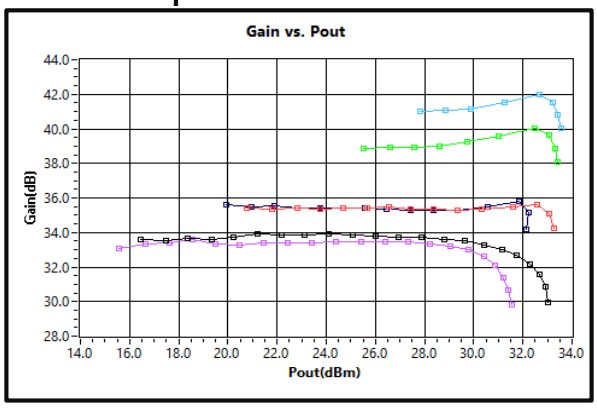
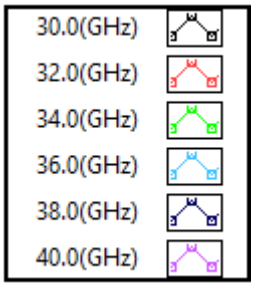
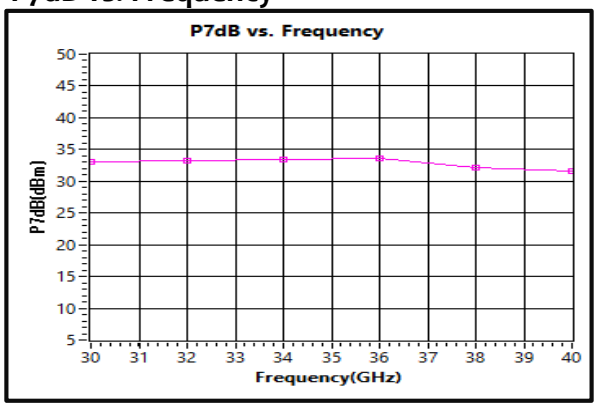
Gain vs. Output Power

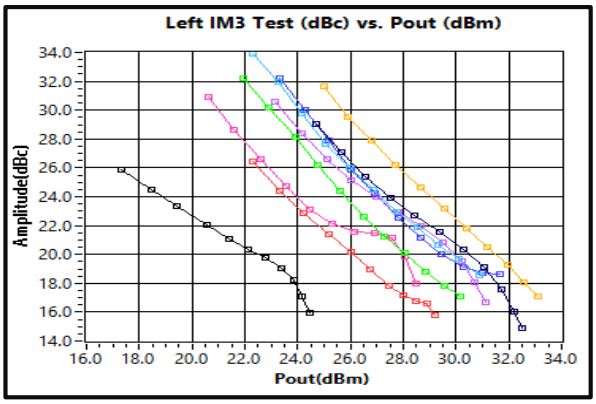




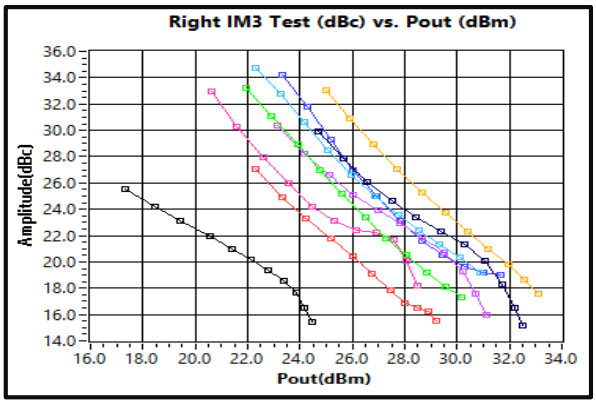
P7dB vs. Frequency



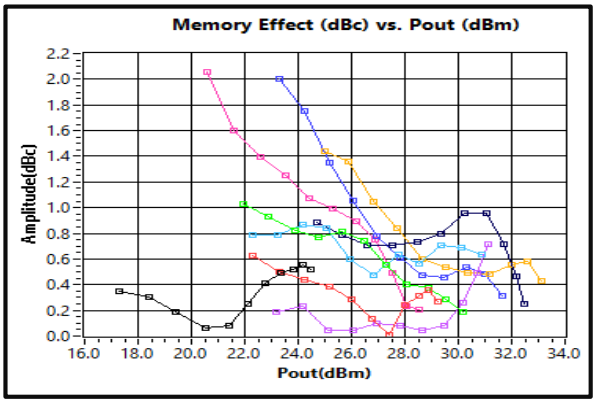
Left IM3 (dBc) vs. Pout (dBm)

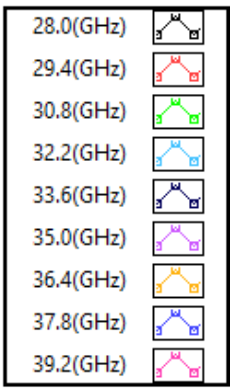


Right IM3 (dBc) vs. Pout (dBm)

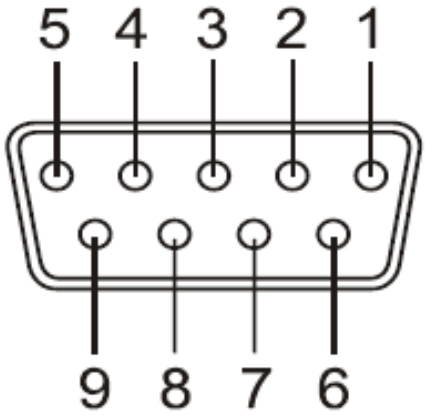


Memory Effect (dBc) vs. Pout (dBm)





D-Sub 9 Pin

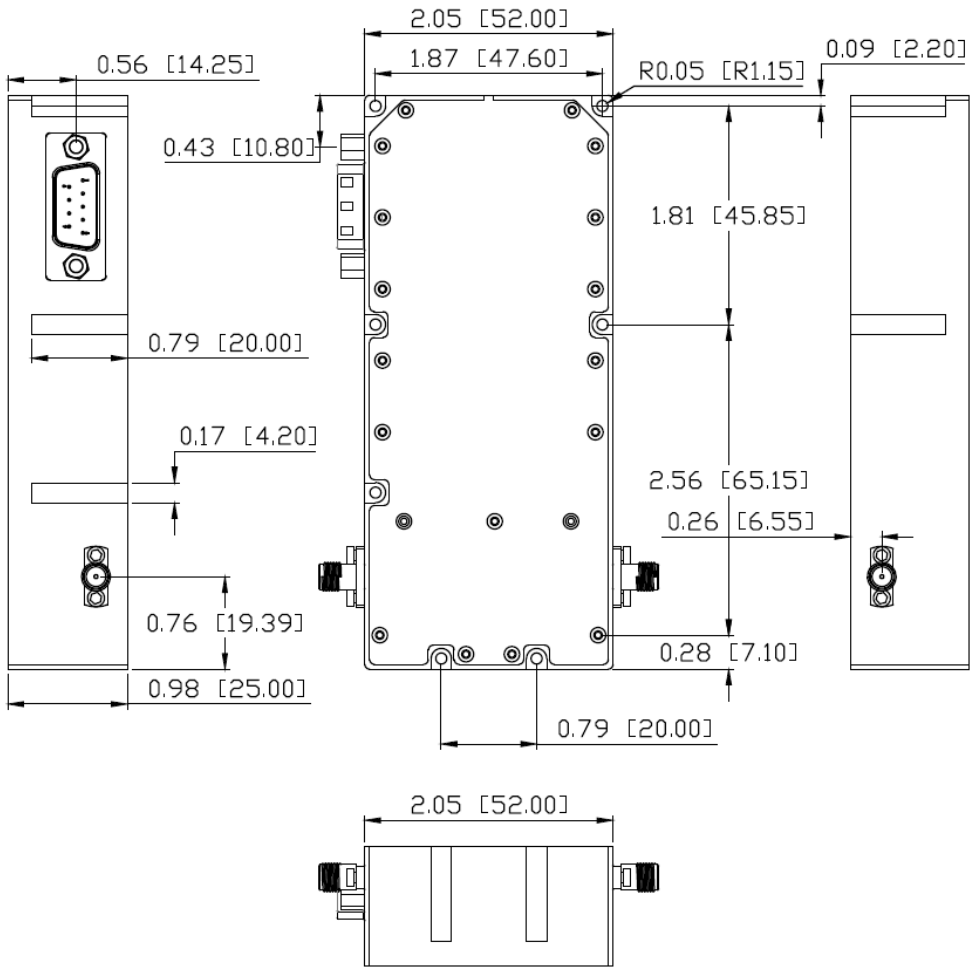


	Name	Function	Initial State	Description	Applied
Pin 1	NC	---	---	---	---
Pin 2	ID Over	Indicator	LOW	High TTL signal will indicate if the last stage of the amplifier is drawing too much current	Yes
Pin 3	ID Signal	Indicator	---	Analog voltage that represents the current being drawn from the last stage of the amplifier	Yes
Pin 4	VDC	---	---	VDC (must be able to support 5A) Both VDC pins must be tied together	Yes
Pin 5	VDC	---	---	VDC (must be able to support 5A) Both VDC pins must be tied together	Yes
Pin 6	RF Off	Control	LOW	Applying a TTL High signal to this pin will disable the RF signal	Yes
Pin 7	TEMP Signal	Indicator	---	Analog voltage that represents the case temperature of the amplifier	Yes
Pin 8	GND	---	---	GND (must be able to support 5A) Both GND pins must be tied together	Yes
Pin 9	GND	---	---	GND (must be able to support 5A) Both GND pins must be tied together	Yes

HIGH/LOW voltages are standard TTL signals:
0.0V-0.8V = LOW
2V-5V = HIGH

Outline Drawing:

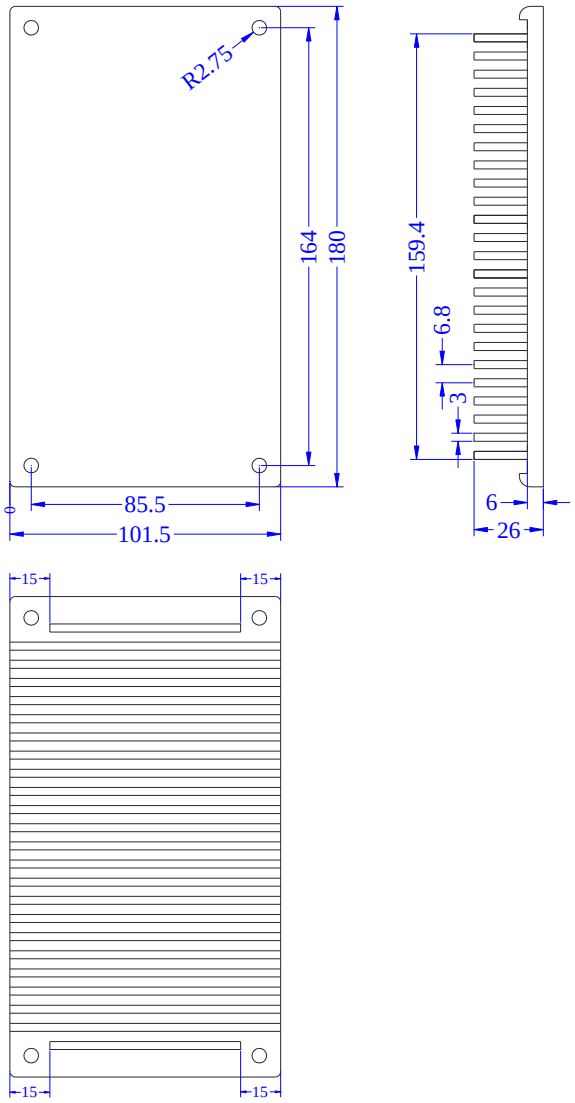
Dimensions in inches (mm)



Heat Sink and cooling fan required during operation

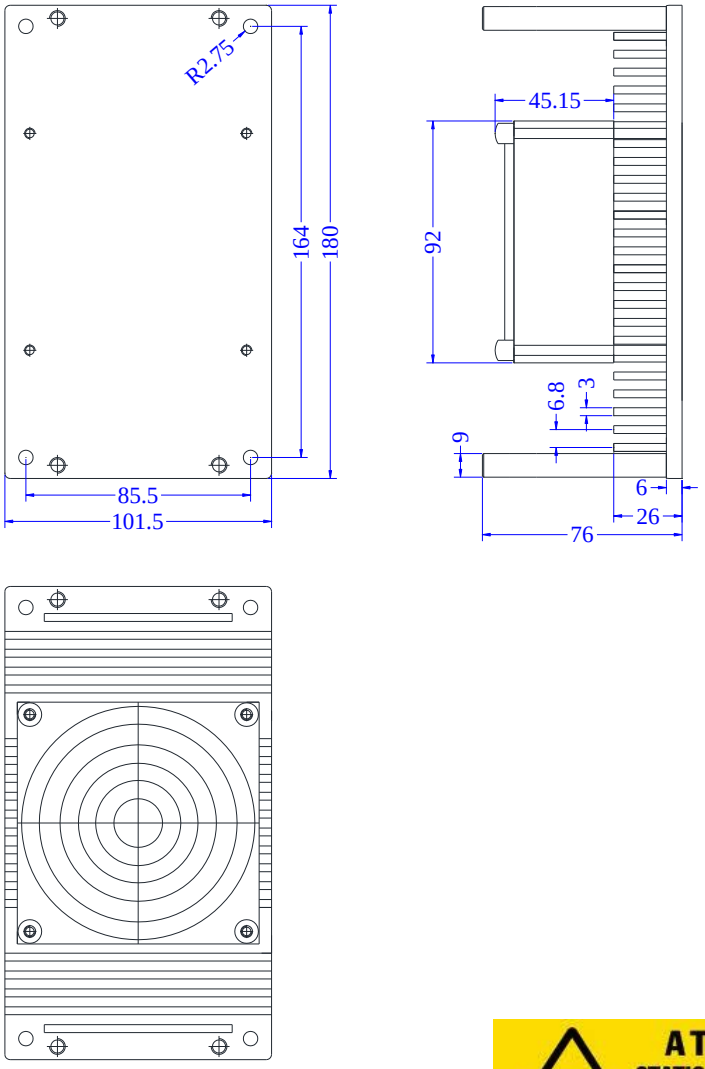
Outline Drawing Heatsink:

All Dimensions in mm



Outline Drawing Heatsink Including Air Cooling:

All Dimensions in mm



Heat Sink and cooling fan required during operation

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