

Solid State Power Amplifier 12GHz~17GHz



Features

- Solid State Power Amplifier
- Gain: +44dB Typical
- Output Power: +43 dBm Typical
- Supply Voltage: +36V

Typical Applications

- Wireless Infrastructure
- Test and Measurement
- Military and Aerospace

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{dd} = +36\text{V}$

Parameter	Min	Typ	Max	Units
Frequency Range	12 - 17			GHz
Gain		55		dB
Gain Variation Over Temperature		±3		dB
Input Return Loss		-15		dB
Output Return Loss		-20		dB
Saturated Power (Psat)		43		dBm
Supply Current (Vdd=+48V)		0.6	3	A
Power Supply		+36	+55	V
Isolation S12		-25		dB
Input Max	Psat - Gain			dBm
Weight	1285			g
Impedance	50			Ohms
Input / Output Connectors	SMA-Female Input			
Finish	Nickel Plated			
Material	Aluminum / Copper			

* P1dB, P3dB and Psat power testing 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.

Absolute Maximum Ratings	
Supply Voltage	+55 VDC
RF Input Power (RFIN) Pin_max = Psat - Gainsat	Psat - Gain

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

Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-45°C~+55°C (Case Temperature less than +85°C)
Storage Temperature	-50°C~+125°C
Thermal Shock	-45°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)

Note: The operating temperature for the unit is specified at the package base. It is the user's responsibility to ensure the part is in an environment capable of maintaining the temperature within the specified limits

Ordering Information	
Part No.	Description
RFLUPA12G17GA	12GHz~17GHz 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.

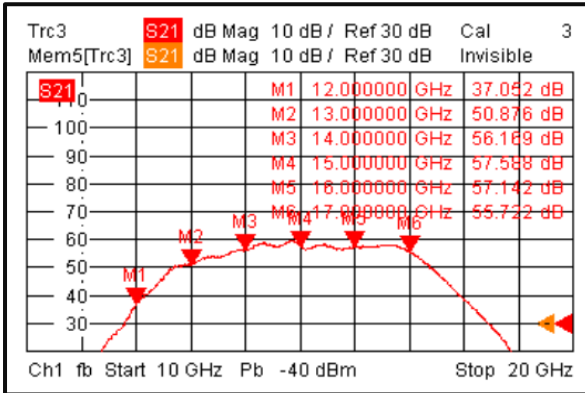
Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

What is not covered with warranty?

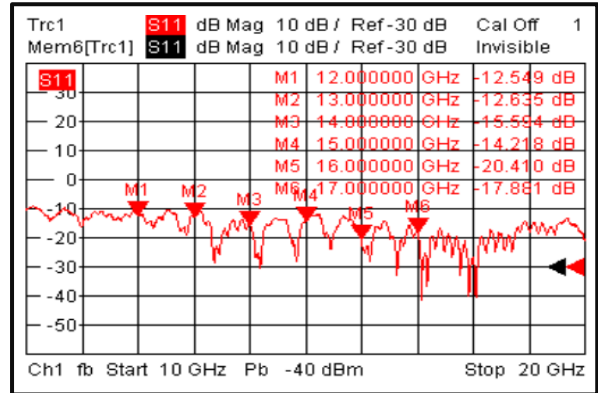
Each RF - Lambda amplifier will go through power and temperature stress testing. Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

Typical Performance Plots

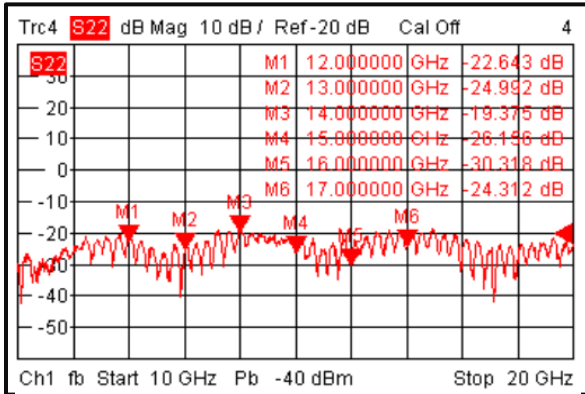
Gain vs. Frequency



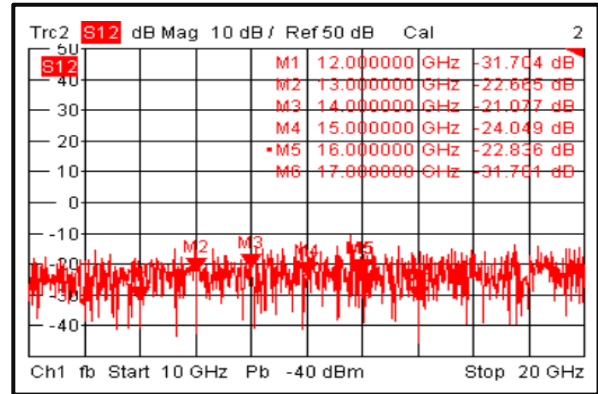
Input Return Loss



Output Return Loss



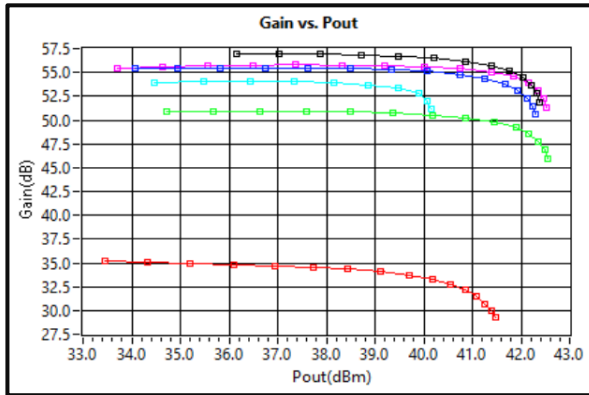
Isolation



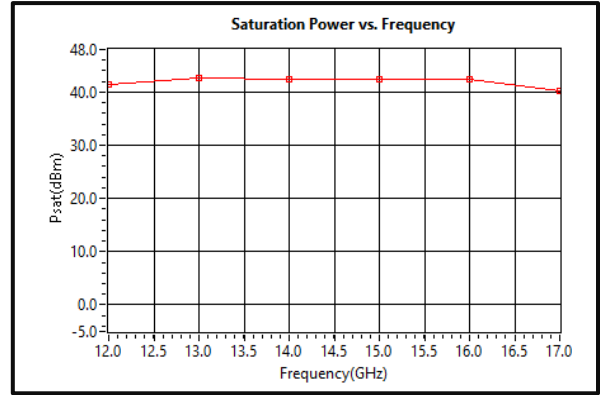
Note: Input/output return loss measurements include attenuators to protect equipment

Solid State Power Amplifier 12-17GHz

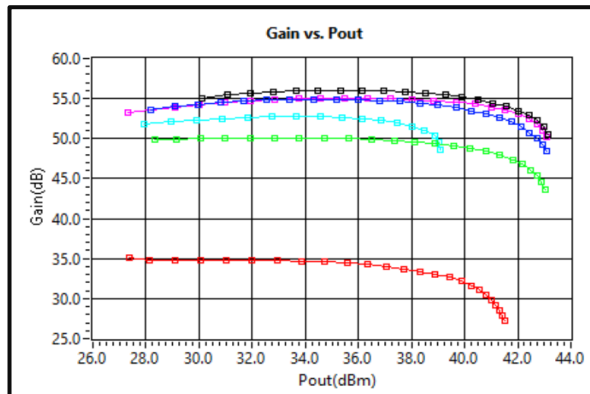
Gain vs. Output Power (Pulse signal)



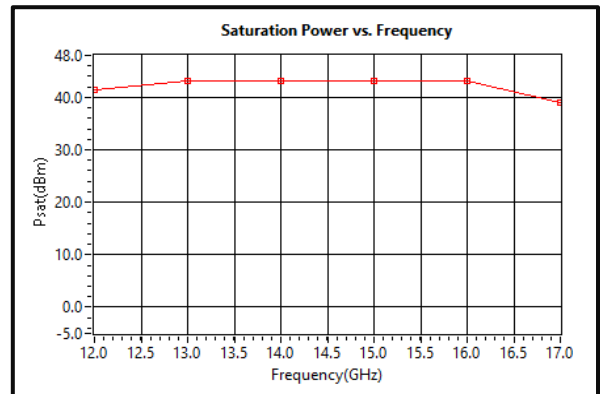
PSat vs. Frequency (Pulse signal)



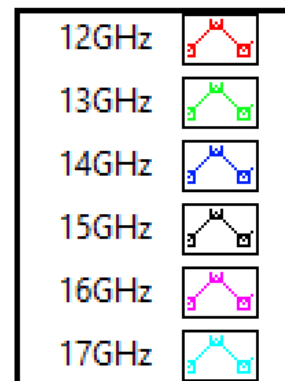
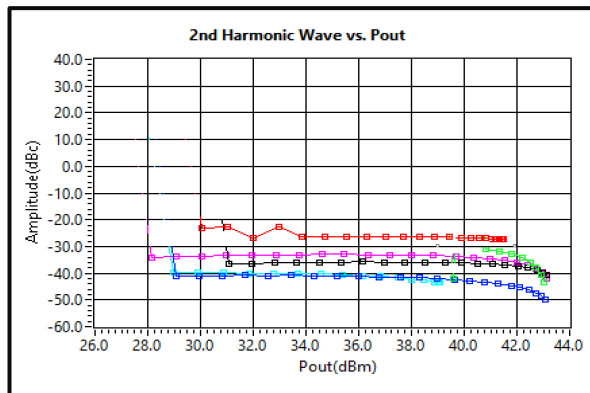
Gain vs. Output Power (CW signal)



Psat vs. Frequency (CW Signal)



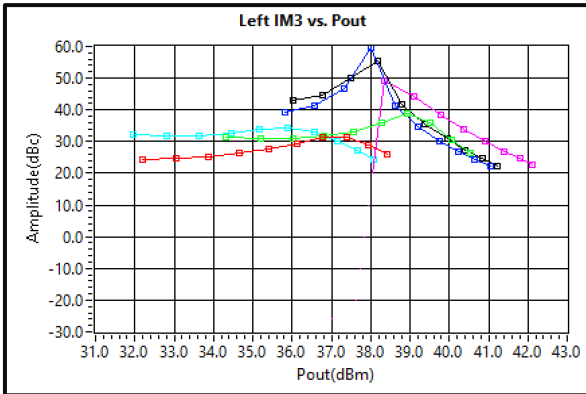
2nd Harmonic Wave vs Output Power



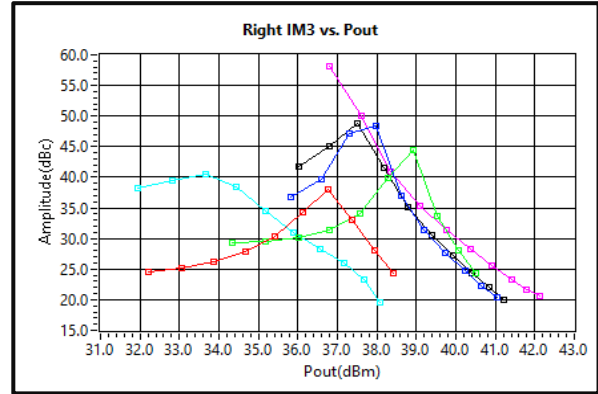
Solid State Power Amplifier 12-17GHz

10% Duty Cycle 200us Pulse Width

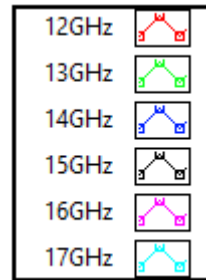
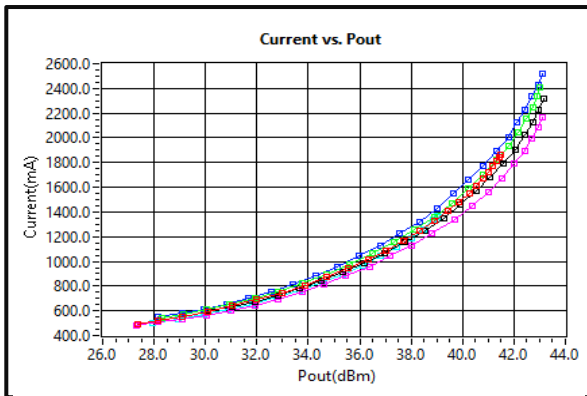
Left IM3 (dBc) vs. Pout



Right IM3 (dBc) vs. Pout



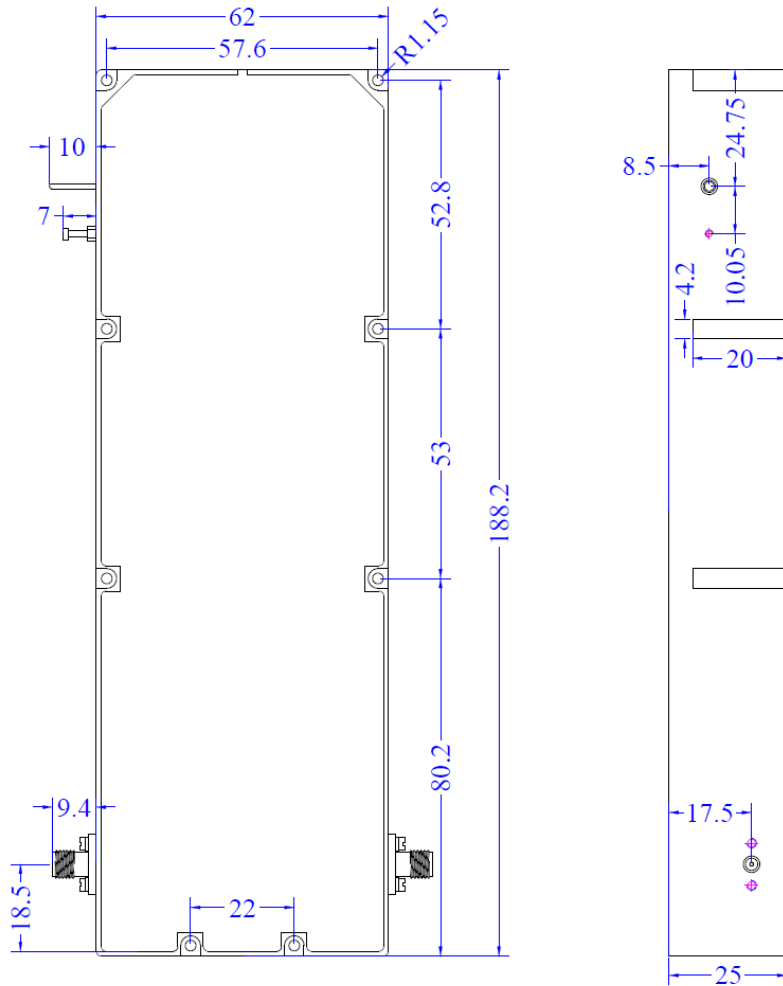
Current vs. Pout



Solid State Power Amplifier 12-17GHz

Outline Drawing:

All Dimensions in mm [inches]



Heat Sink required during operation (Sold Separately)



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.

Solid State Power Amplifier 12-17GHz