

## Solid State Power Amplifier 16-21 GHz



### Features

- Wideband Solid State Power Amplifier
- Gain: 30dB Typical
- Psat: +41.5dBm Typical
- Supply Voltage: +28V

### Typical Applications

- Military & Defense Applications
- Wireless Infrastructure
- Test and Measurement

Electrical Specifications,  $T_A = +25^\circ\text{C}$ ,  $V_{CC} = +28\text{V}$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	16 – 21			GHz
Gain	30			dB
Gain Flatness		$\pm 1$		dB
Gain Variation Over Temperature (-45 ~ +85)		$\pm 3$		dB
Input Return Loss		-15		dB
Output Return Loss		-12		dB
Output 1dB Compression Point (P1dB)		32		dBm
Saturated Output Power (Psat)		41.5		dBm
Supply Current (+28 VDC)		300		mA
Isolation S12		-50		dB
Input Max Power (No damage)	Psat – Gain			dBm
Weight	40			g
Impedance	50			Ohms
Input / Output Connectors	SMA-Female			
Finish	Gold Plated			
Material	Aluminum / Copper			
Package Sealing	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

\* P1dB, P3dB and Psat power test signal: 200 $\mu$ s 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	+29 VDC
RF Input Power	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 input and output with 50 Ohm source/load. (in band VSWR<1.9:1 or >10dB return loss)
Step 2	Connect Ground Pin
Step 3	Connect VDC
<b>Power OFF Procedure</b>	
Step 1	Turn Off VDC
Step 2	Remove RF Connection
Step 3	Remove Ground

**Environmental Specifications and Test Standards**

Parameter	Description
Operational Temperature	-40°C~+55°C (Case Temperature Less Than 85°C)
Storage Temperature	-50°C~+125°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)

**Ordering Information**

Part No.	Description
RP16G21GSPA	16GHz~21GHz 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.

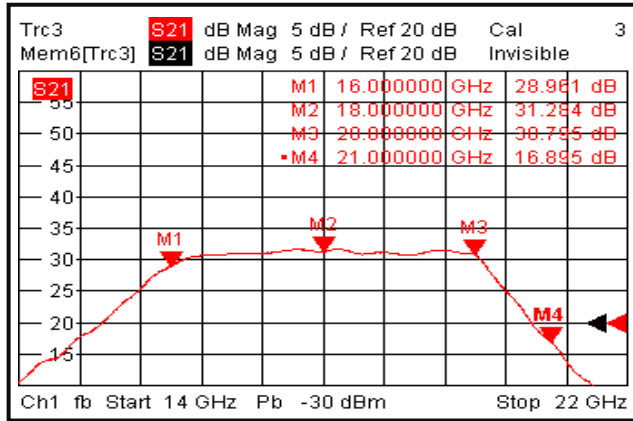
What is not covered with warranty?

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.

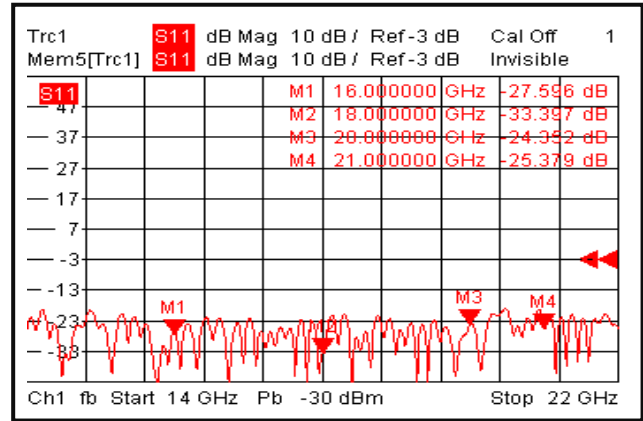
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**Typical Performance Plots**

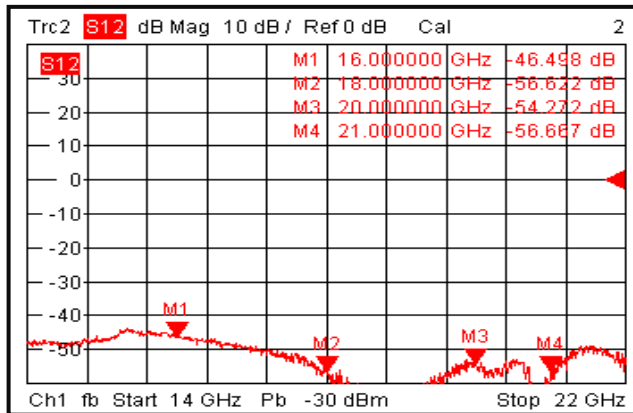
**Gain**



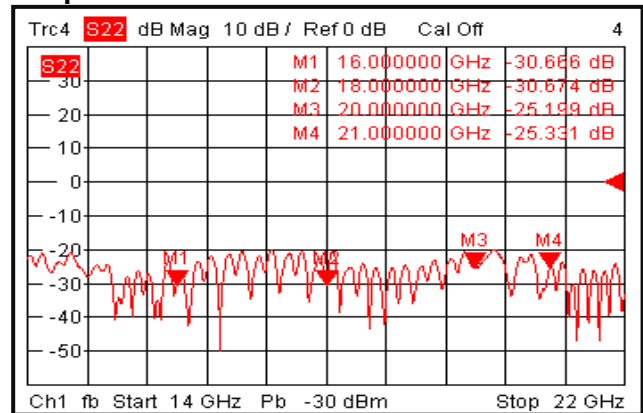
**Input Return Loss**



**Isolation**



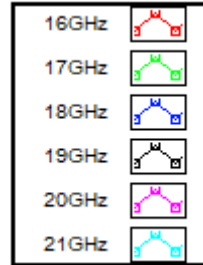
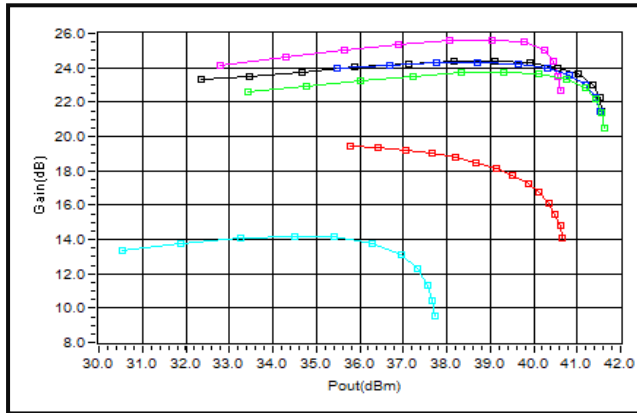
**Output Return Loss**



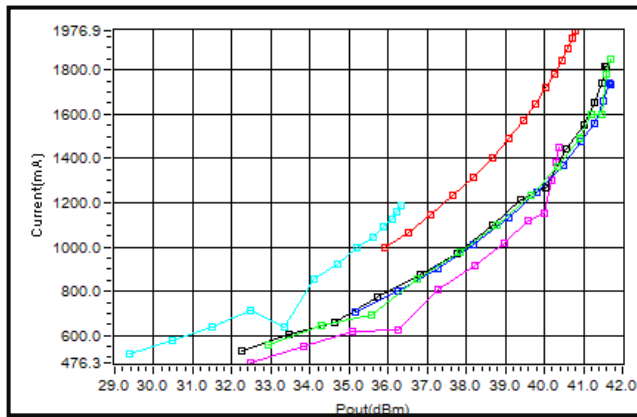
Note: Input/output return loss measurements include attenuators to protect equipment

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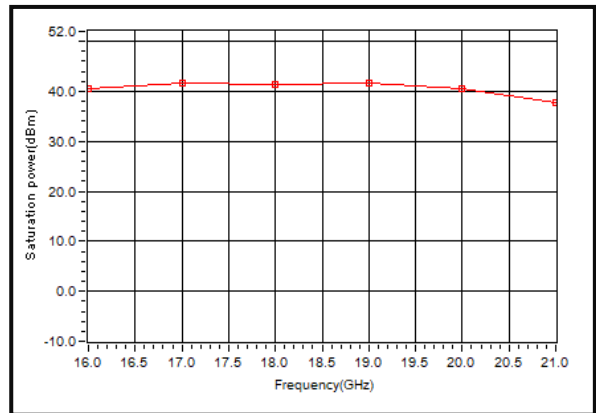
**Gain vs. Output Power**



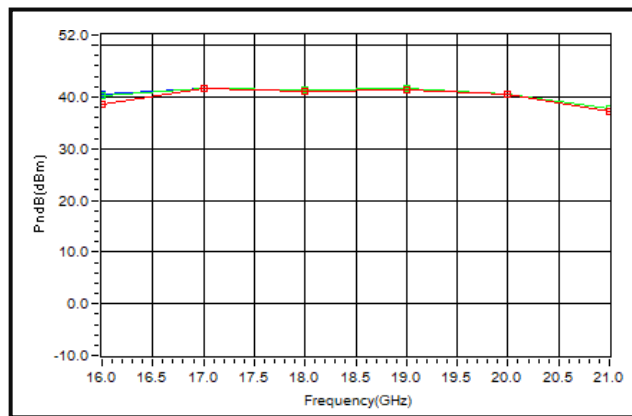
**Current vs. Pout**



**P7dB vs. Frequency**



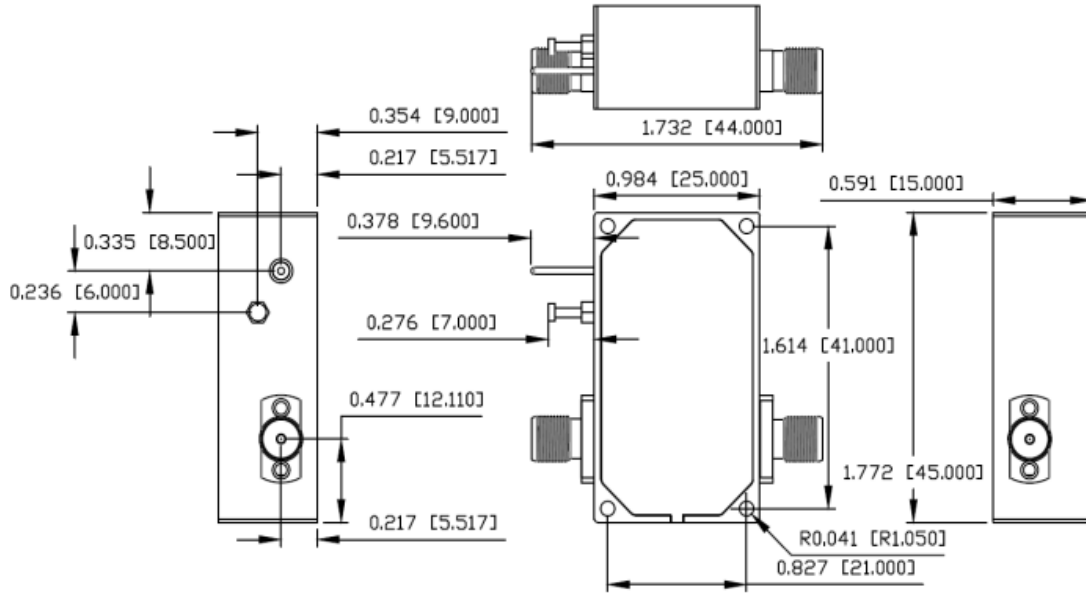
**P1dB vs. Frequency**



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**Outline Drawing:**

All Dimensions in inches [mm]



Heat Sink required during operation (Sold Separately)  
Standard torque wrench must be used to secure RF connectors.



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**Important Notice**

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