

## Wide Band Power Amplifier 6GHz-18GHz



### Product Description

R06G18GSPG is a wideband power amplifier with a frequency range of 6 to 18GHz.

The power output of this amplifier is 24dBm typical. The typical small signal gain is 17.5dB with a gain flatness of  $\pm 1.0$ dB. This power amplifier works with a +12VDC power supply.

The working temperature of this product is between - 40 °C and + 85 °C.

### Features

- Wideband Power Amplifier
- Small Signal Gain 17.5dB Typical
- Output Saturation Power 26dBm Typical
- Supply Voltage +12VDC
- 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	6		8	8		18	GHz
Gain	15	17		15	17.5		dB
Gain Flatness		$\pm 0.75$			$\pm 1.2$		dB
Gain Variation Over Temperature (-40°C~+85°C)		$\pm 1.0$			$\pm 1.0$		dB
Input VSWR		1.5	1.8		1.5	1.8	:1
Output VSWR		2.4	2.6		2.4	2.6	:1
Output 1dB Compression Point (P1dB)	20	23		22	24		dBm
*Saturated Output Power (Psat)		25			26		dBm
Supply Current (Vcc=+12V)		330	400		330	400	mA
Isolation S12		-60			-50		dB
Weight	Net		0.21 Max.				lbs.
	Including Heat Sink		0.33 Max.				
Impedance			50				Ohms
Input / Output Connectors			SMA-Female(Input)-SMA-Female(Output)				
Package			Epoxy Sealed (Standard)				
			Hermetically Sealed (Optional)				

**Absolute Maximum Ratings**

Parameter	Rating
Operating Voltage	+15VDC
*RF Input Power (RFIN)	+15dBm

**Bias Up Procedure**

- 1.Connect Ground Pin
- 2.Connect input and output
- 3.Connect +12V biasing

**Bias Down Procedure**

- 1.Turn off +12V biasing
- 2.Remove RF connection
- 3.Remove Ground.

**Environmental Specifications and Test Standards**

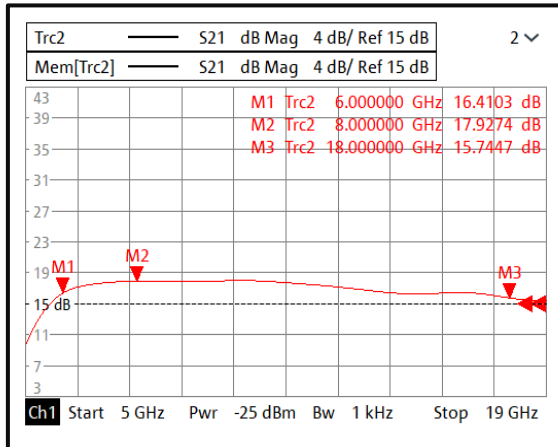
Parameter	Description
Operational Temperature	-40°C to +85°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for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

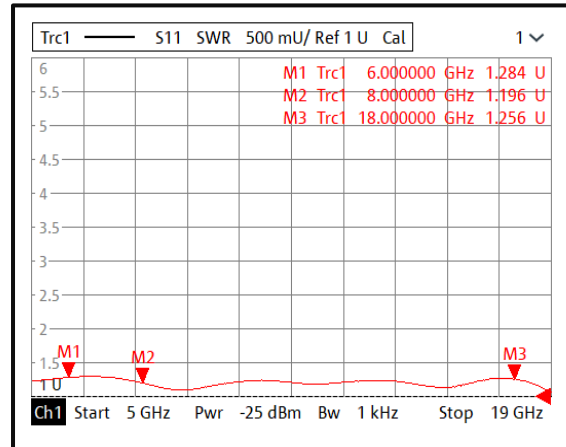
\*\*For vibration testing details please see additional information section.

Typical Performance Plots

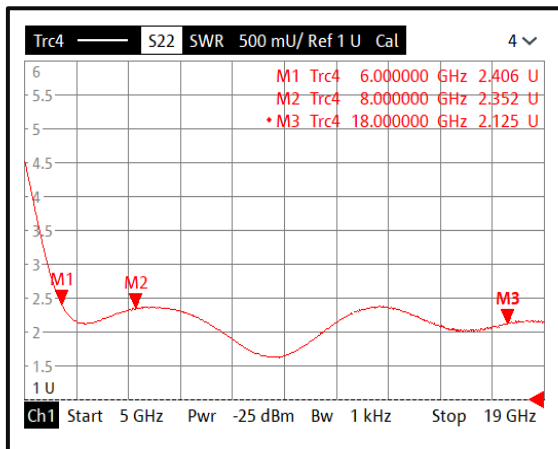
Gain @ +25°C



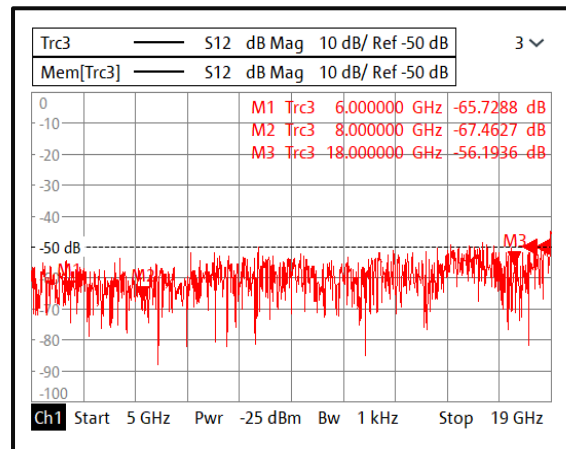
Input VSWR@+25°C



Output VSWR@+25°C



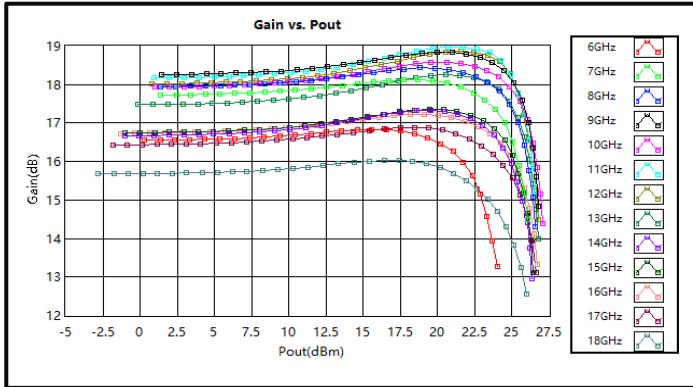
Isolation @ +25°C



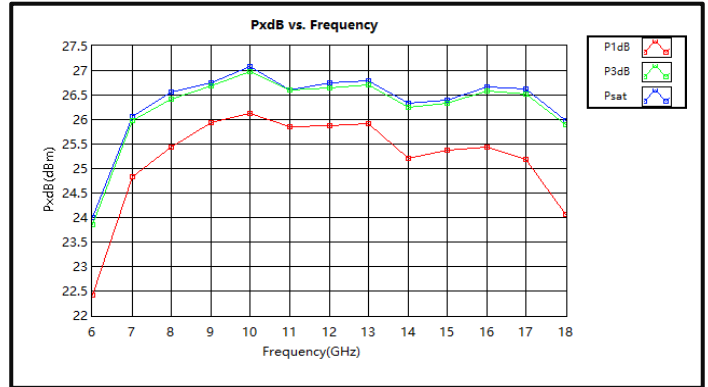
Note: Small signal VNA measurements include attenuators to protect equipment

Typical Performance Plots

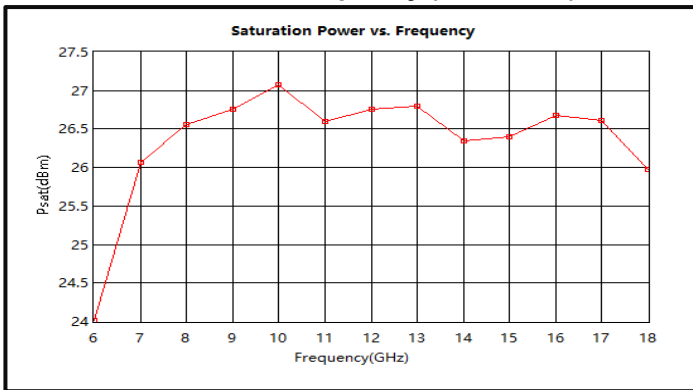
Gain vs. Output Power (CW Power)



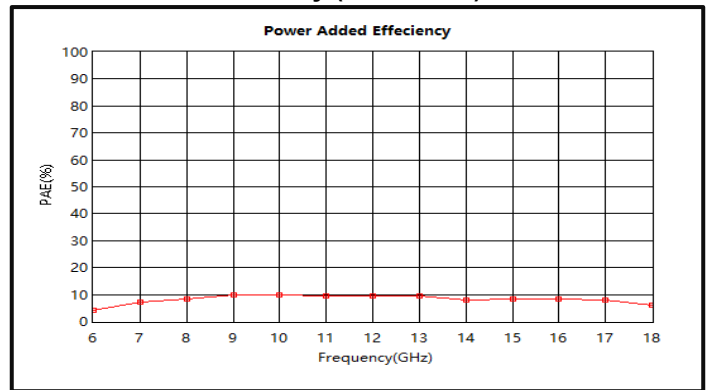
PndB vs. Frequency (CW Power)



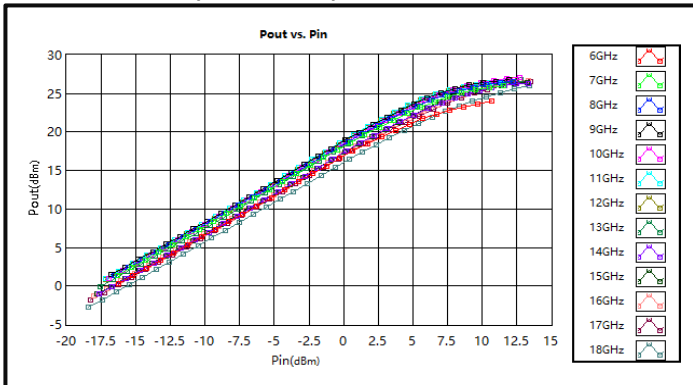
Saturation Power vs. Frequency (CW Power)



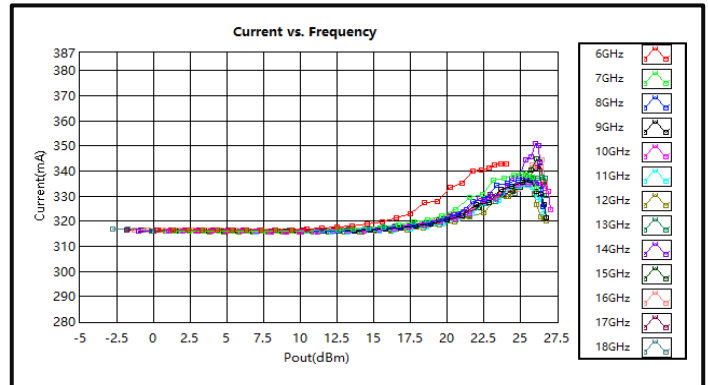
Power Added Efficiency (CW Power)



Pout vs. Pin (CW Power)

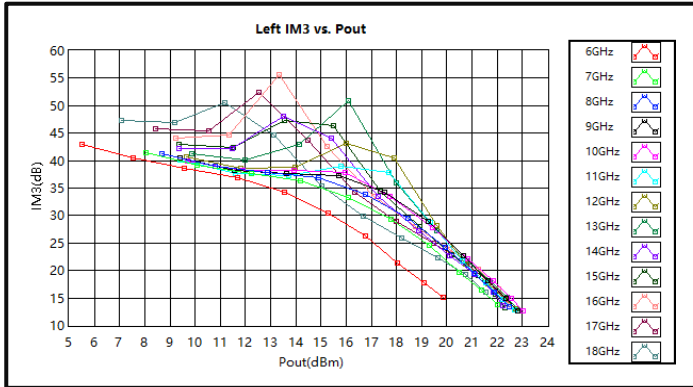


Current vs. Pout (CW Power)

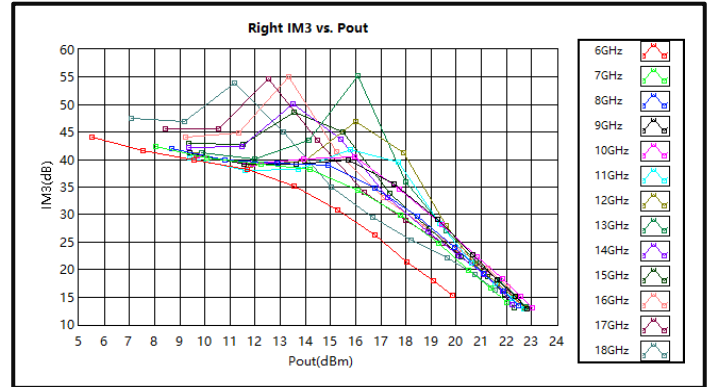


Typical Performance Plots

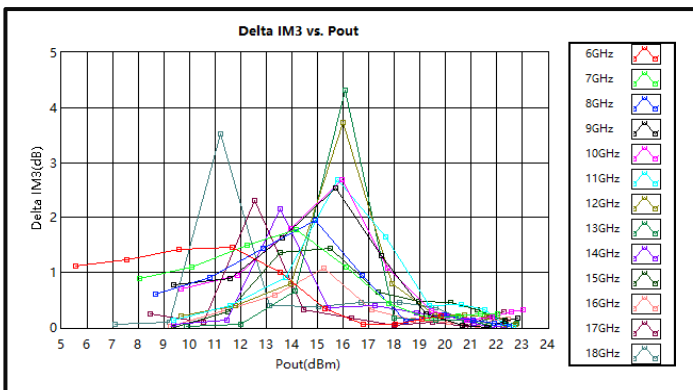
Left IM3 vs. Pout



Right IM3 vs. Pout

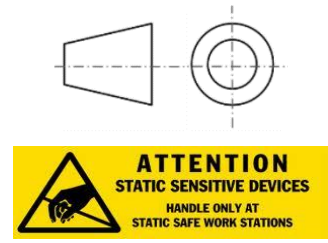
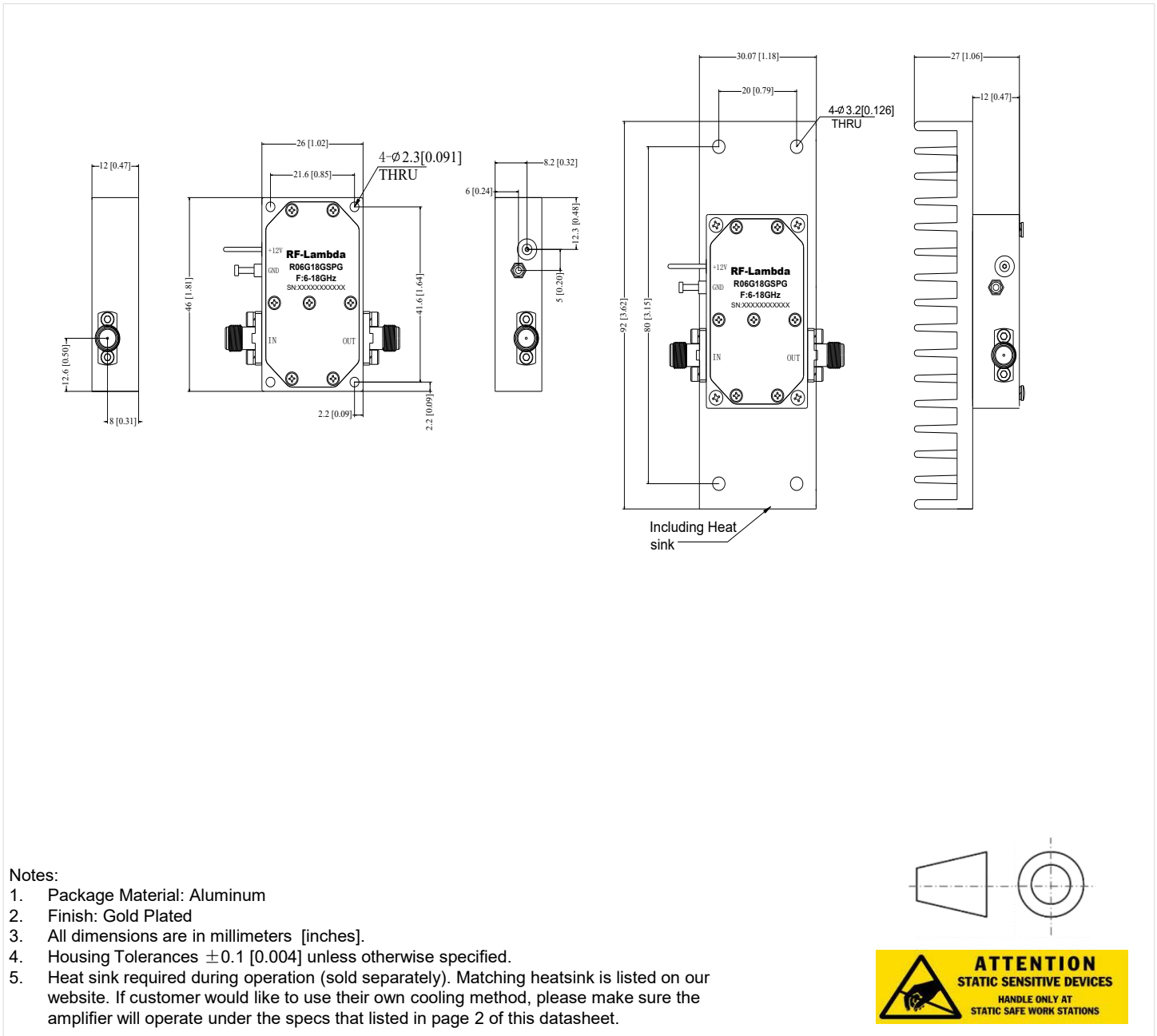


Delta IM3 vs. Pout



Note: IM3 test performed with 1MHz tone spacing

**Outline Drawing**



**Additional Information**

Documentation	Webpage
ESD Policy	<a href="https://rflambda.com/pdf/rflambda_esd_control.pdf">https://rflambda.com/pdf/rflambda_esd_control.pdf</a>
Heatsink Lookup Specifications	<a href="https://rflambda.com/search_heatsink.jsp">https://rflambda.com/search_heatsink.jsp</a>
Connector Torque Specifications	<a href="https://www.rflambda.com/pdf/Torque_Specifications.pdf">https://www.rflambda.com/pdf/Torque_Specifications.pdf</a>
Random Vibration Test Standard	<a href="https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf">https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf</a>

**Ordering Information**

Part Number	Modification	Description
R06G18GSPG	Standard	6GHz-18GHz 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**

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