

Ultra Wide Band Low Noise Amplifier 100MHz~65GHz



Features

- Wideband Solid State Power Amplifier
- Gain: 9dB Typical
- P3dB: +20dBm Typical
- Noise Figure: 5dB Typical
- Supply Voltages: +4.5V & -4V

Typical Applications

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

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_g = -4\text{V}$, $V_{dd} = +4.5\text{V}$

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.1 – 39			40 – 49			50 –59			60 –65			GHz
Gain		9			8			7			5.5		dB
Gain Flatness		±3			±3			±3			±3		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3			±3			±3		dB
Input Return Loss		10			10			10			10		dB
Output Return Loss		15			15			10			10		dB
Output Power for 3 dB Compression (P3dB)		17			12			11			8.5		dBm
Output Power for 1 dB Compression (P1dB)		13			8			7.5			7		dBm
Supply Current Positive (Vdd=4.5V)		90	150		90	150		90	150		90	150	mA
Supply Current Negative (Vg=-4V)			10			10			10			10	mA
Isolation S12		30			25			25			20		dB
Input Max Power (No damage)	Psat – Gain			Psat – Gain			Psat – Gain			Psat – Gain			dBm
Weight	20												g
Impedance	50												Ohms
Input / Output Connectors	1.85mm-Female												
Finish	Gold Plated												
Material	Aluminum / Copper												

* 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.

Absolute Maximum Ratings	
Positive Supply Voltage	+5 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 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 and Turn on Vg
Step 4	Connect and Turn on Vdd
Power OFF Procedure	
Step 1	Turn off Vdd
Step 2	Turn off Vg
Step 3	Remove RF Connection
Step 4	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~+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)

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
RooM65GSC	0.1GHz~65GHz 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.

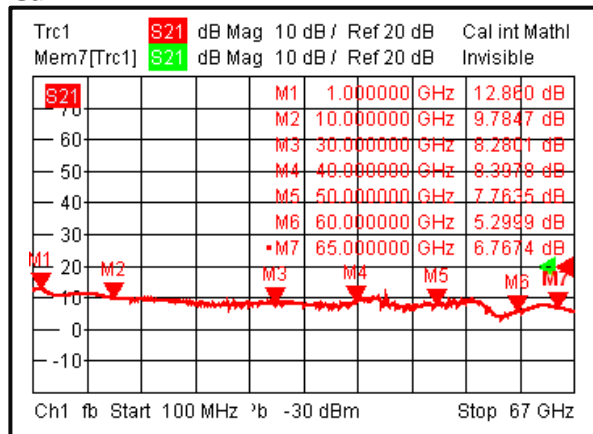
Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

What is not covered with warranty?

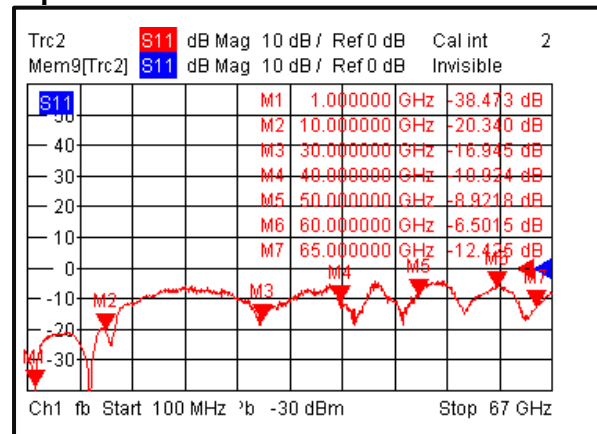
Each RF - Lambda amplifier will go through power and temperature stress testing.

Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

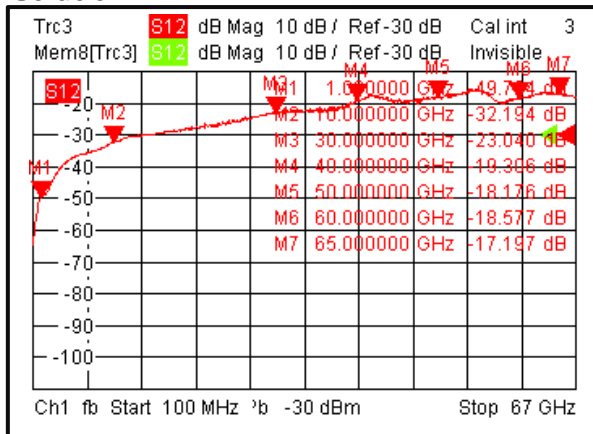
Gain



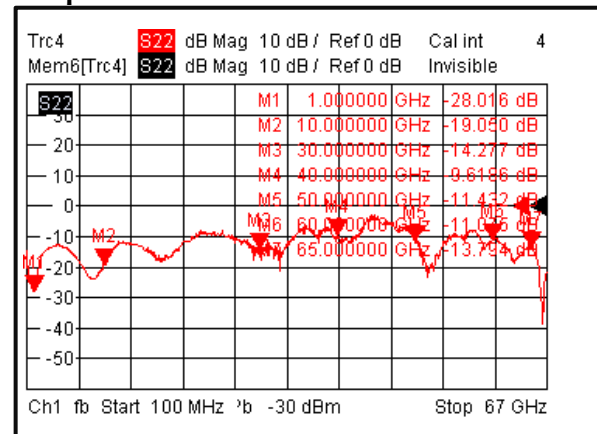
Input Return Loss



Isolation

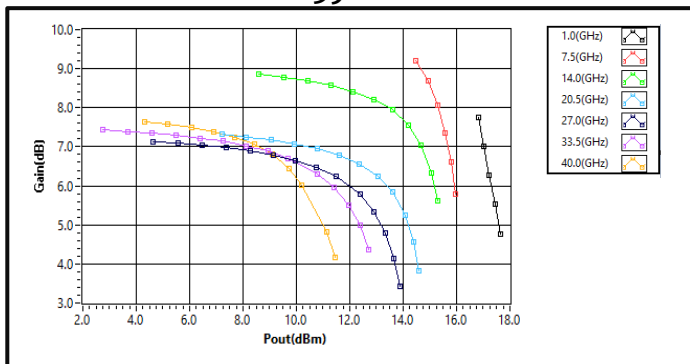


Output Return Loss

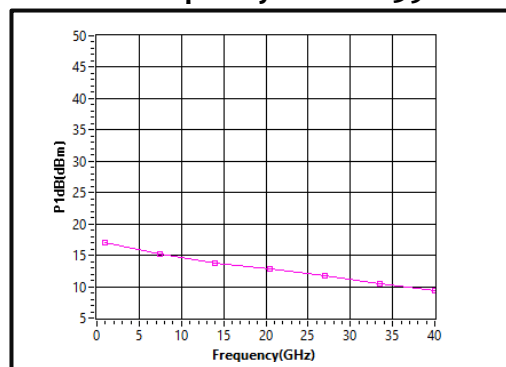


Note: Input/output return loss measurements include attenuators to protect equipment

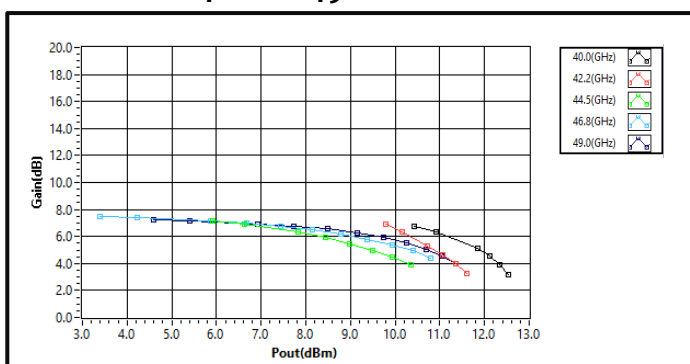
Gain vs. Pout 0.1GHz - 39 GHz



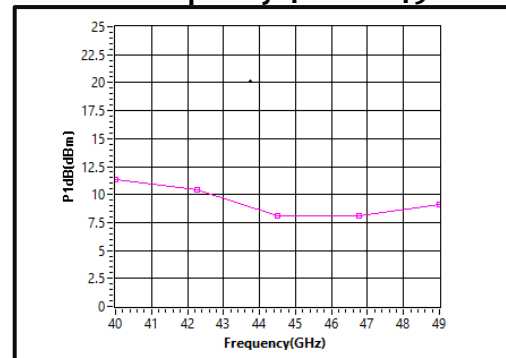
P1dB vs. Frequency 0.1GHz - 39 GHz



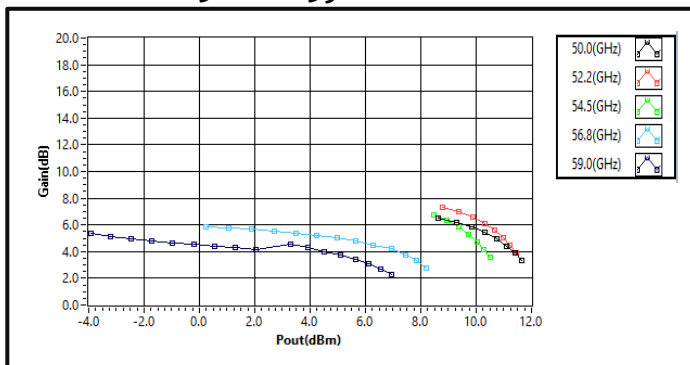
Gain vs. Pout 40GHz - 49 GHz



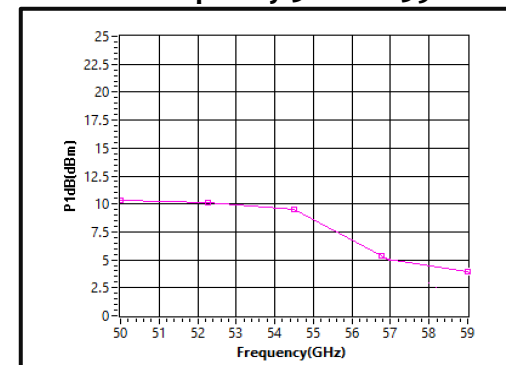
P1dB vs. Frequency 40GHz - 49 GHz



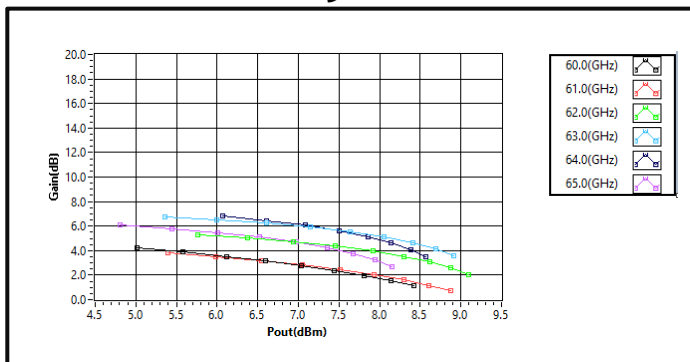
Gain vs. Pout 50GHz - 59 GHz



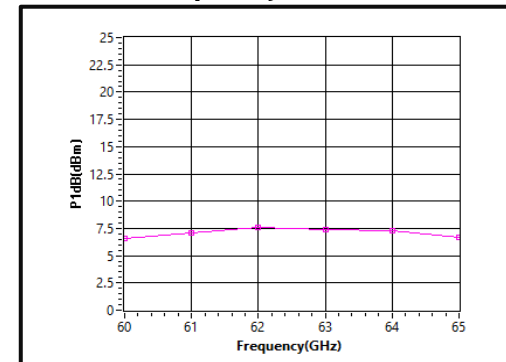
P1dB vs. Frequency 50GHz - 59 GHz



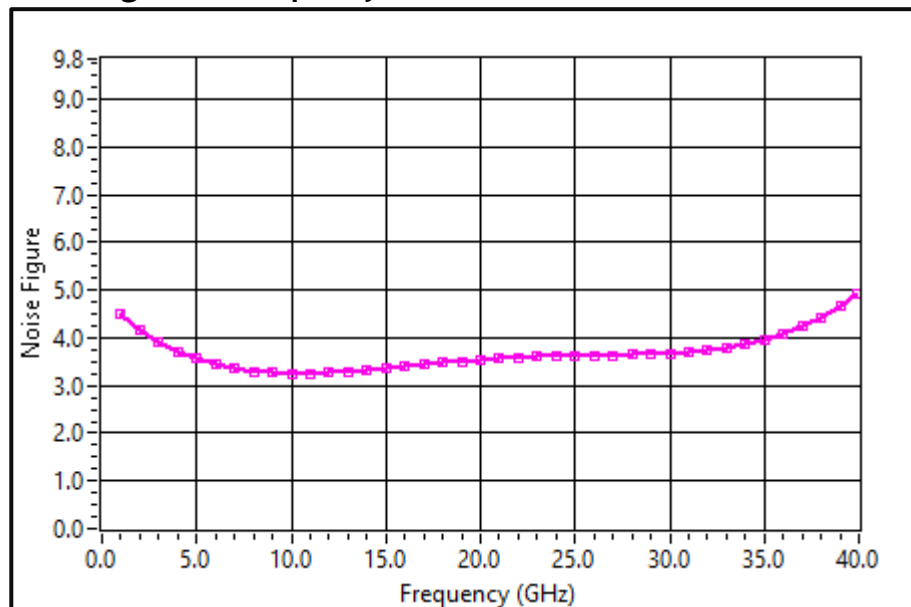
Gain vs. Pout 60GHz - 65GHz



P1dB vs. Frequency 60GHz - 65GHz

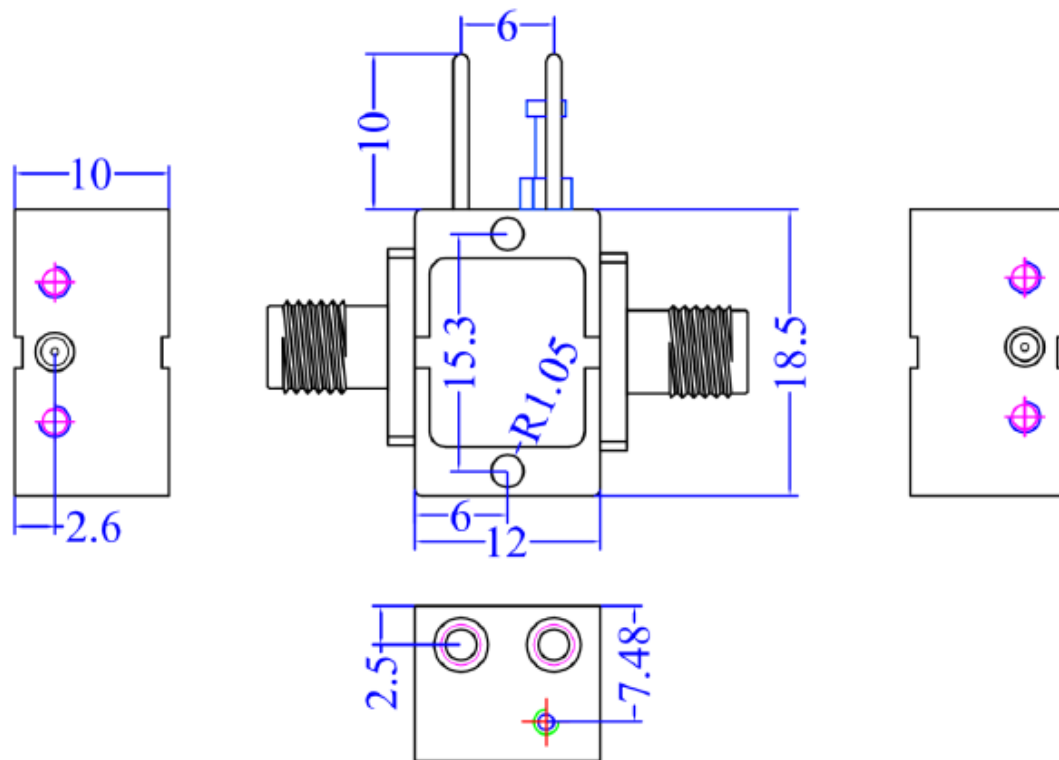


Noise Figure vs. Frequency



Outline Drawing:

All Dimensions in mm



Notes:

Standard torque wrench must be used to secure RF connectors.
Heat Sink and cooling fan required during operation



Important Notice

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