



### Ultra Wide Band Low Noise Amplifier 20GHz~45GHz



#### Features

- Noise Figure: 8.0dB Typical
- P1dB Output Power: +23dBm Typical
- Supply Voltage: +4.8V

#### Typical Applications

- Wireless Infrastructure
- RF Microwave & VSAT
- Military & Aerospace
- Test Instrument

Electrical Specifications,  $T_A=25\text{ }^\circ\text{C}$ ,  $V_g=-5\text{V}$ ,  $V_d=+4.8\text{V}$

Parameter	Typ	Typ	Units
Frequency Range	20 ~ 35	35 ~ 45	GHz
Gain	22	20	dB
Gain Variation Over Temperature	0.5	0.5	dB
Noise Figure	8.0	8.0	dB
Input VSWR	1.3	1.9	: 1
Output VSWR	1.9	1.9	: 1
Output 1dB Compression Point (P1dB)	22	22	dBm
Output 3dB Compression Point (P3dB)	23	23	dBm
Output Third Order Intercept (IP3)	26	27	dBm
Supply Current ( $V_{cc} = +4.8\text{V}$ )	300	300	mA
Bias Voltage	4.8	4.8	V
Isolation S12	55	55	dB
Maximum Input Power	P1dB - Gain		dBm
Weight	60		g
Impedance	50		Ohms
Input / Output Connectors	2.9mm – Female		
Finish	Gold Plated		
Material	Aluminum / Copper		

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Absolute Maximum Ratings	
Supply Voltage	+5.0 VDC
Maximum Input Power	P1dB - Gain

Note: Maximum RF input power is defined to protect the amplifier from damage. Input power may be increased at the users own risk to achieve the full power of the amplifier. Please reference gain and power curves and monitor the temperature.

Biasing Up Procedure	
Step 1	Connect input and output to 50 Ohm source and load with in band return loss better than 10dB.
Step 2	Connect Ground Pin
Step 3	Connect -5V bias voltage
Step4	Connect +4.8V bias voltage
Power OFF Procedure	
Step 1	Turn off +4.8V bias voltage
Step 2	Turn off -5V bias voltage
Step 3	Remove RF connections
Step4	Remove ground connection

### Environmental Specifications and Test Standards

Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45°C~+85°C (Case temperature 85C Max)
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 Number	Description
RLNA16G45GB	Ultra Wide Band Low Noise Amplifier 20- 45GHz

### 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?

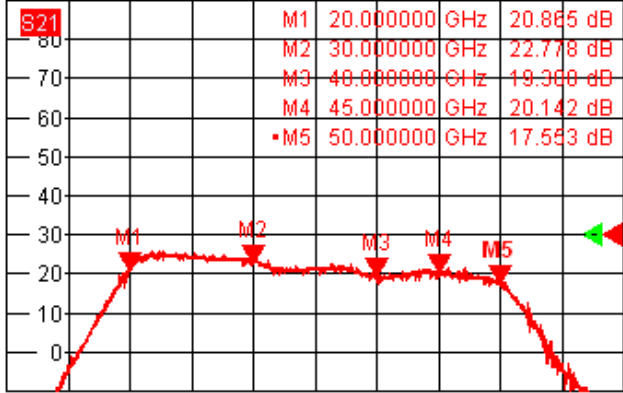
Each RF - Lambda amplifier will go through power and temperature stress testing.

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



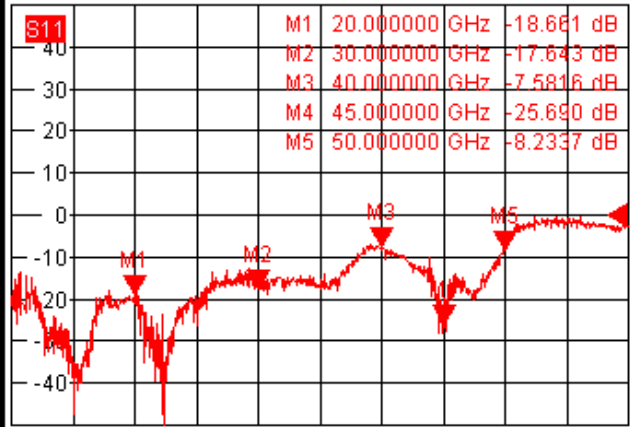
### Wideband S-Parameters

Trc1 **S21** dB Mag 10 dB / Ref 30 dB Cal int Math1  
 Mem7(Trc1) **S21** dB Mag 10 dB / Ref 30 dB Invisible



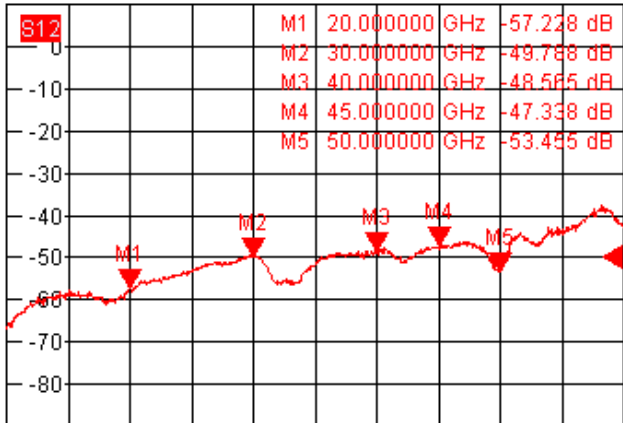
Ch1 fb Start 10 GHz Pb -20 dBm Stop 60 GHz

Trc2 **S11** dB Mag 10 dB / Ref 0 dB Cal int 2



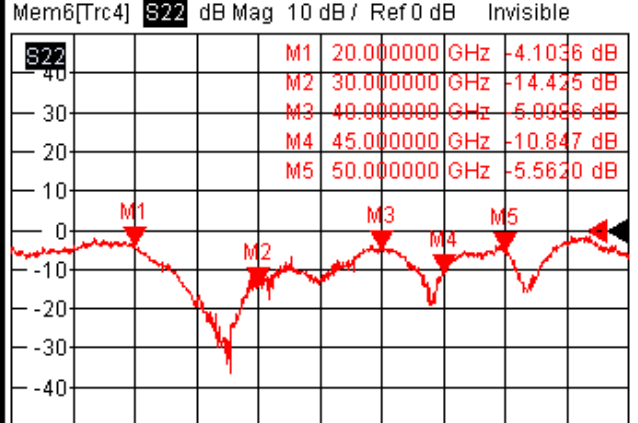
Ch1 fb Start 10 GHz Pb -20 dBm Stop 60 GHz

Trc3 **S12** dB Mag 10 dB / Ref -50 dB Cal int 3



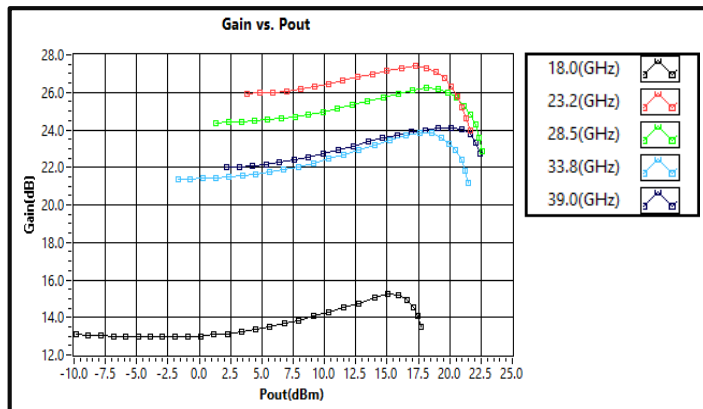
Ch1 fb Start 10 GHz Pb -20 dBm Stop 60 GHz

Trc4 **S22** dB Mag 10 dB / Ref 0 dB Cal int 4

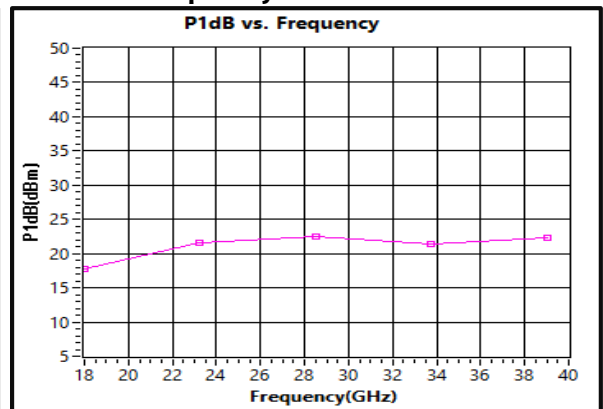


Ch1 fb Start 10 GHz Pb -20 dBm Stop 60 GHz

### Gain vs. Pout

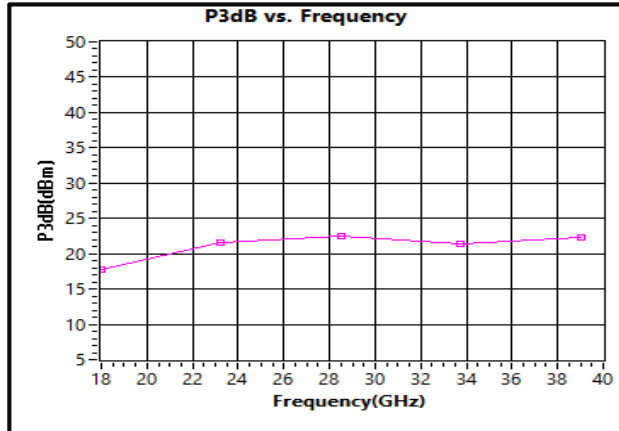


### P1dB vs. Frequency

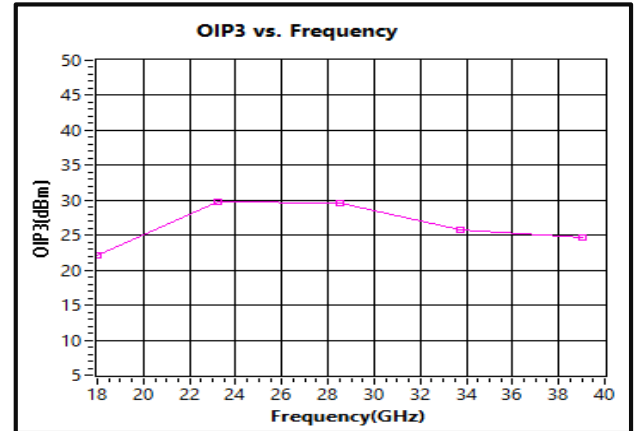




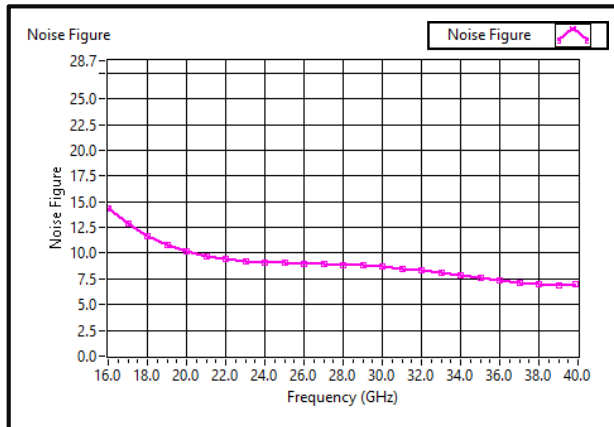
### P3dB vs. Frequency



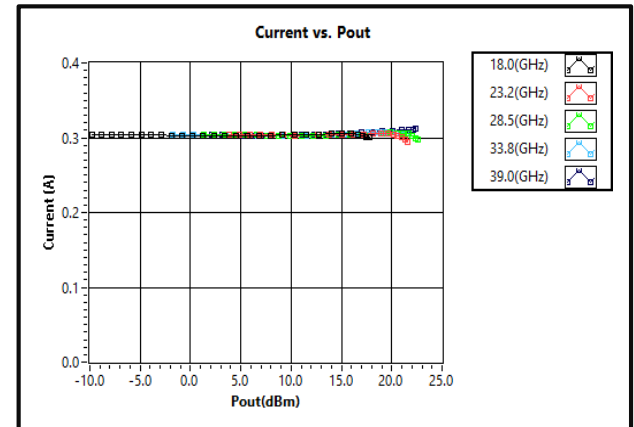
### OIP3 vs. Frequency



### Noise Figure vs. Frequency



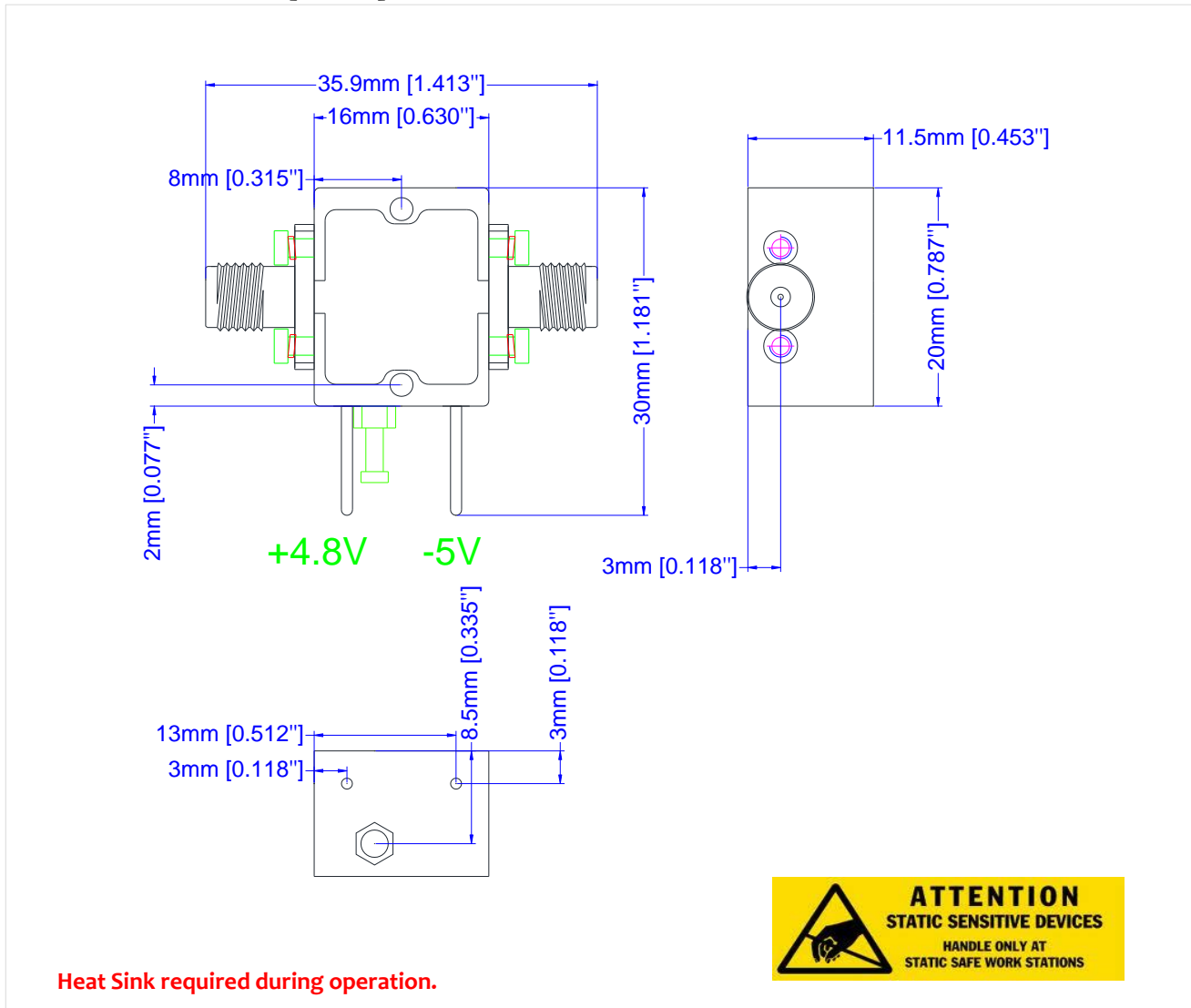
### Current vs. Pout





### Outline Drawing:

All Dimensions in mm [inches]



### Important Notice

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