

## FEATURES

- **Wideband:** 1.0 to 12 GHz
- **NF (ext match):** 1.2 dB @ 2.0 GHz  
1.6 dB @ 6.0 GHz  
1.8 dB @ 12.0 GHz
- **P-1dB:** 16 dBm
- **OIP3:** 27 dBm
- **Gain:** 17 dB
- **Bias Condition:** VDD = 5 V  
IDD = 55 mA
- **50-Ohm On-chip Matching**
- **Unconditionally Stable:** .5 GHz to 20 GHz
- **Narrow-Band Optimization with External Tuning**
- **Gain Control Option Available with 2nd Gate Control Voltage**

## APPLICATIONS

- **Microwave Point-to-Point Radios**
- **Satellite and Telemetry Communications**
- **Test Instrumentation**
- **EW Receiver Systems**
- **Wide-band Communication Systems**
- **Commercial Wireless Systems**

## DESCRIPTION

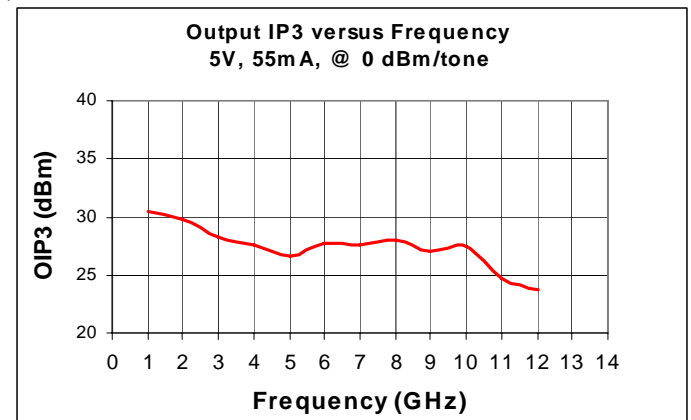
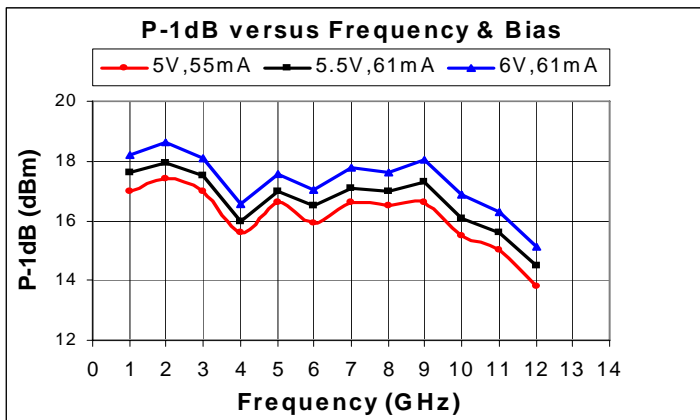
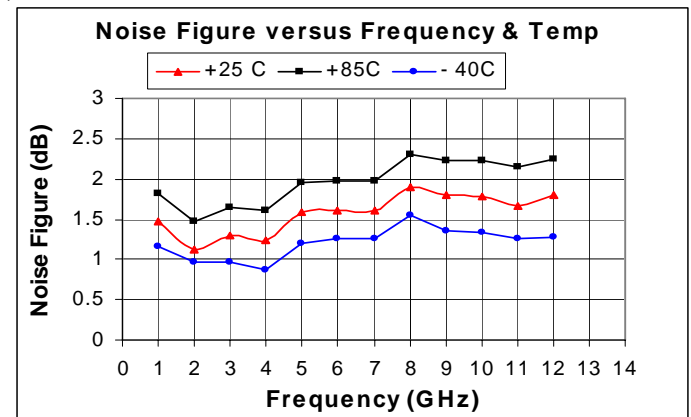
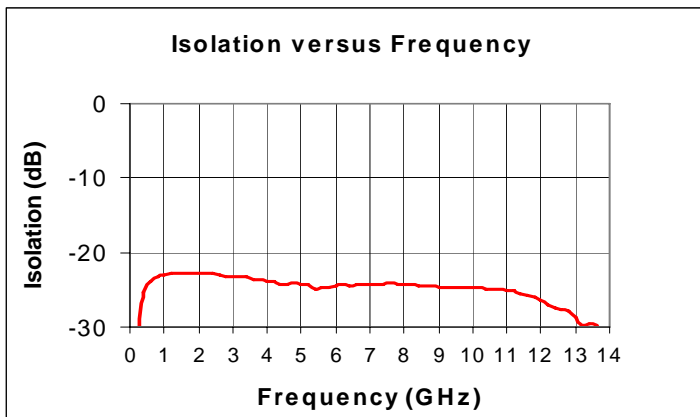
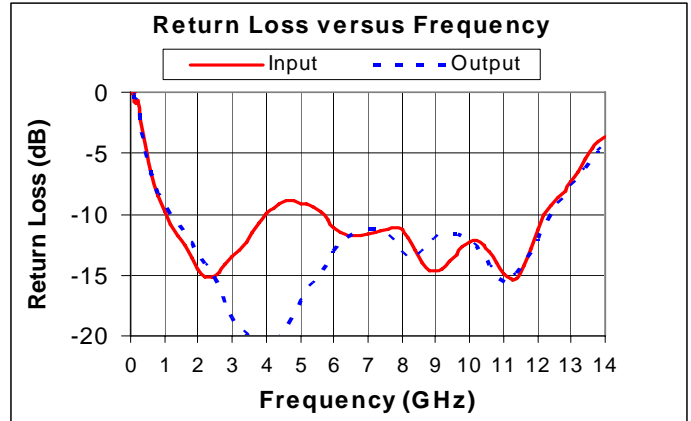
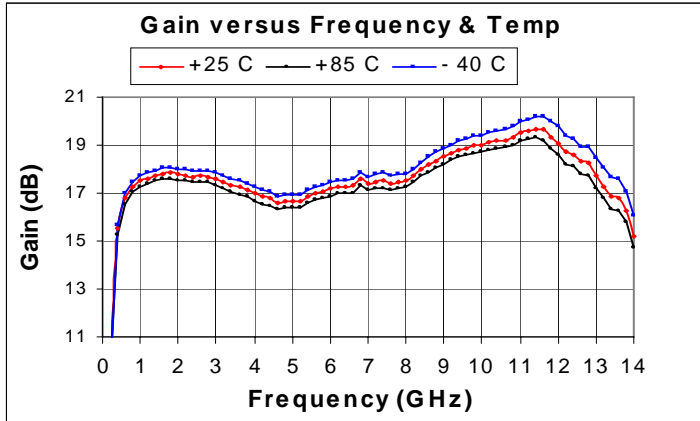
The MLA-01122B is a fully-matched broadband Low-Noise MMIC amplifier utilizing high-reliability low-noise GaAs PHEMT technology. This MMIC is suited for Satellite Communications, Microwave radios, Instrumentation, Wideband Systems and also many commercial wireless applications where low-noise figure with high-gain is desirable. It has excellent gain (17 dB) and Noise Figure (1.6 dB, mid-band) over a broad frequency range. Typical P-1dB is 16.5 dBm and OIP3 is +27dBm @ 6 GHz. It has on-chip bias circuit, choke and DC blocking to provide bias stability and ease of use. The 2<sup>nd</sup> Gate voltage input can be used for gain control if necessary. For packaged options, contact factory for further details.

## ELECTRICAL SPECIFICATIONS: VDD=+5.0V, VG1=+0.15V, VG2=+2V, IDD=55 mA, Ta=25 C, ZO=50 ohm <sup>(1)</sup>

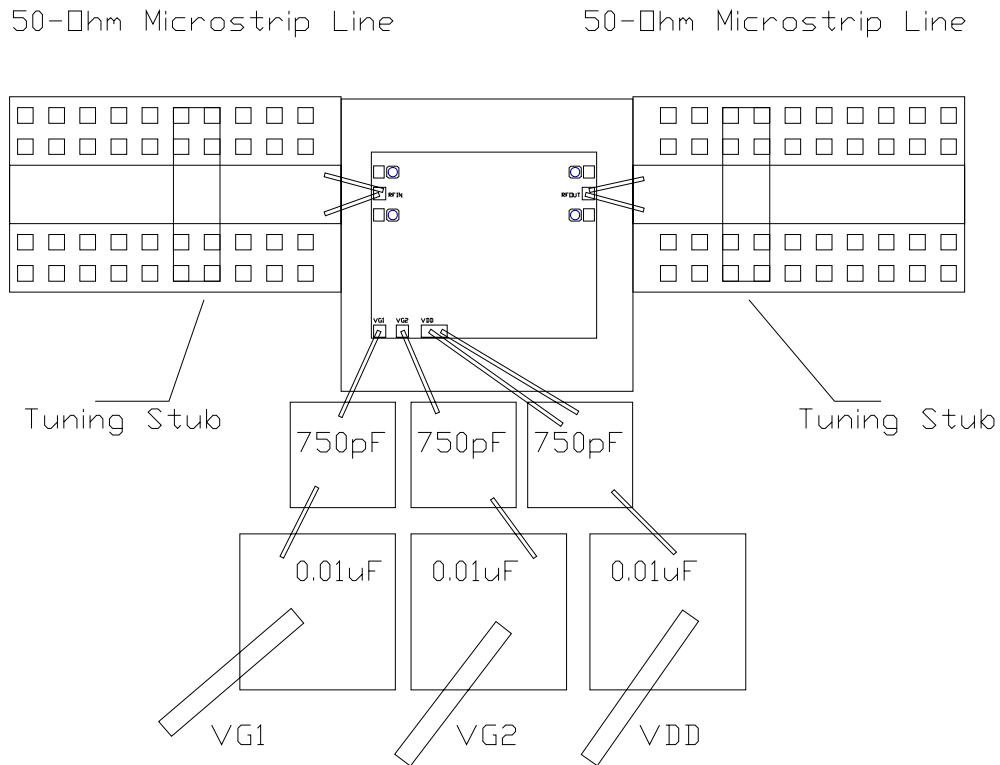
PARAMETER	TEST CONDITIONS	TYPICAL DATA	UNITS
Frequency Range		1-12	GHz
Gain	1 - 8 GHz	17	dB
	10 - 12 GHz	19	
Gain Flatness	1 - 8 GHz	0.6	+/-dB
	1 - 12 GHz	1.5	
Input Return Loss	2 GHz	15	dB
	5 GHz	9.5	
	10 GHz	12	
Output Return Loss		12	dB
Output P1dB	2 GHz	17	dBm
	6 GHz	16.5	
	10 GHz	15.5	
	12 GHz	14.0	
Output IP3 @ 0 dBm/tone, 1 MHz separation	2 GHz	30	dBm
	6 GHz	27	
	12 GHz	25	
Noise Figure	2 GHz	1.2	dB
	6 GHz	1.6	
	12 GHz	1.8	
Operating Bias Conditions: VDD IDD	VG1=+0.15V, VG2=+2V	+5	V
		55	mA
Stability Factor K	0.5 to 20 GHz	> 1	

(1) All data is measured on 50 Ohm carrier with VG2 bias derived from VDD bias using resistive voltage divider and external tuning stubs shown in assembly diagram.

**TYPICAL RF PERFORMANCE:**  $V_{DD}=+5.0V$ ,  $V_{G1}=+0.15V$ ,  $V_{G2}=+2V$ ,  $I_{DD}=55\text{ mA}$ ,  $T_a=25\text{ C}$ ,  $Z_0=50\text{ ohm}$  <sup>(1)</sup>



**ASSEMBLY DIAGRAM: For use with on-chip match option**



**Notes:**

- 1) 1<sup>st</sup> Close-in Bypass cap values must be at least 100pF and placed < 25mil from chip edge. The location of large bypass cap 0.01uF is not critical but recommended close to die. VG1 & VG2 large bypass cap 0.01uF may be removed to save space.
- 2) VG2 voltage may be derived from VDD supply using resistive voltage divider
- 3) RF IN/OUT Bonds must be 2 wires of length < 20 mil & 0.7 mil diameter for best RF performance.
- 4) Tuning stubs (10 x 40 mil) on the 50 ohm line will improve wide-band I/O return loss especially at frequencies > 8 GHz . Location may be tuned for best RF performance . All data shown includes the tuning stubs. Input Return Loss can be further optimized for narrower frequency band.

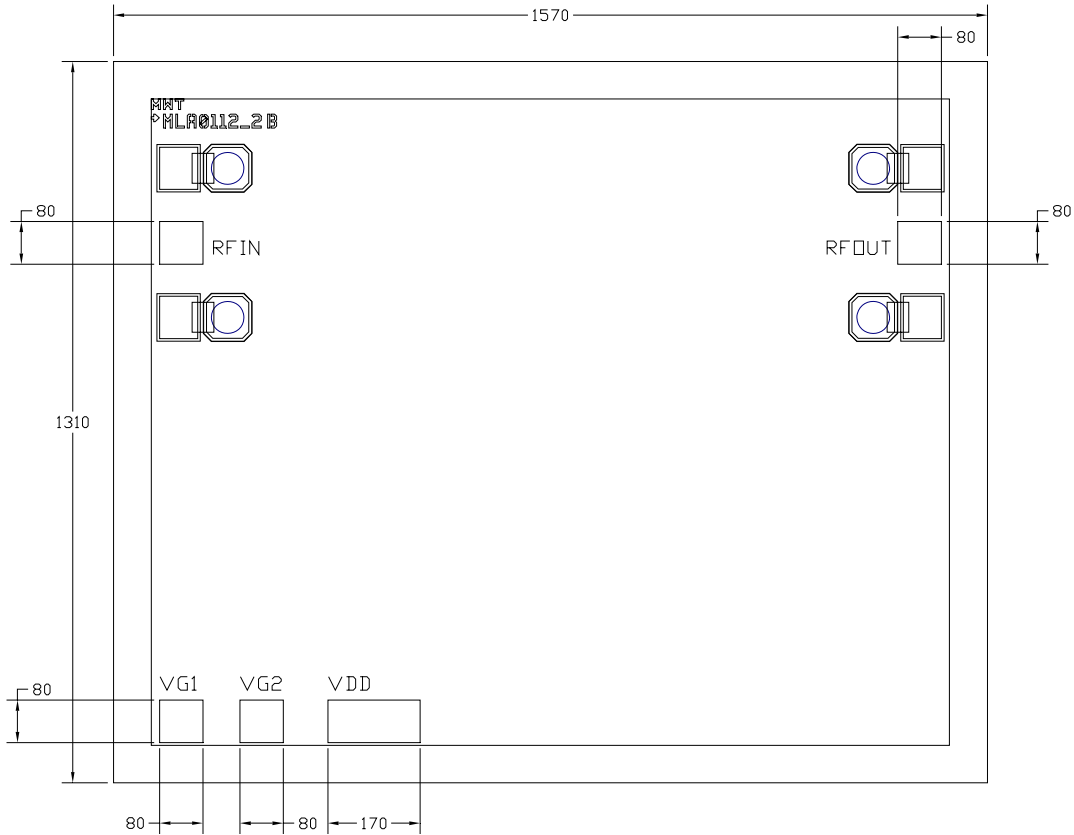
**ABSOLUTE MAXIMUM RATINGS**

SYMBOL	PARAMETERS	UNITS	MAX
VDD	Drain Voltage	V	7
IDD	Drain Current	mA	75
Pdiss	DC Power Dissipation	W	0.4
P <sub>in</sub> max	RF Input Power	dBm	13
T <sub>oper</sub>	Operating Case/Lead Temp Range	°C	-40 to +85
T <sub>ch</sub>	Channel Temperature	°C	150
T <sub>stg</sub>	Storage Temperature	°C	-60 to 150

Exceeding any on of these limits may cause permanent damage.

**MECHANICAL INFORMATION**

**Outline Drawing**



**Notes:**

- 1) Die Size: 1.57 x 1.31 x 0.1 mm
- 2) RFIN, RFOUT, VG1, VG2 Bond Pad Size is: 80 x 80 micron.
- 3) Backside of chip is metalized and provides DC & RF Ground.
- 4) Bond Pad & Backside metallization: Gold

**Functional Diagram**

