

FEATURES

- **Wide Band:** 0.2 to 2 GHz
- **NF (ext match):** 0.9 dB @ 0.2 GHz
0.95 dB @ 1.6 GHz
1.1 dB @ 2 GHz
- **P-1dB:** 16 dBm
- **OIP3:** 33 dBm
- **High Gain:** 16 dB
- **Bias Condition:** VDD = 3V
IDD = 70mA
- **50-Ohm On-chip Matching**
- **Unconditionally Stable from 50 MHz to 7 GHz**
- **Narrow-Band Optimization with External Tuning**
- **Frequency Extension to 50 MHz with External Choke**

APPLICATIONS

- **Wide-band Communication Systems**
- **Commercial Wireless Systems**
- **Iridium Satellite Communications**
- **Test Instrumentation**
- **Surveillance Systems**

DESCRIPTION

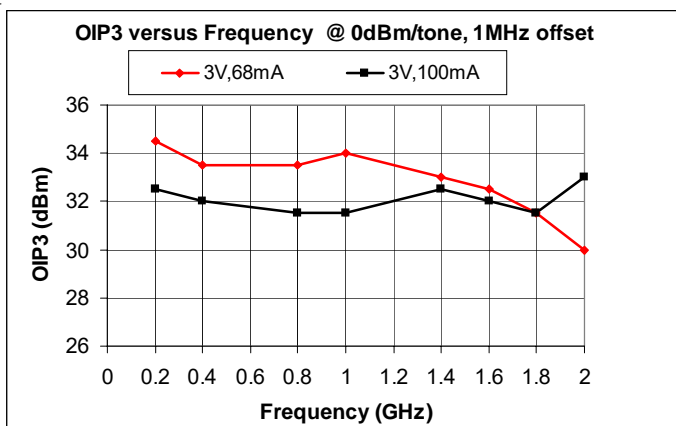
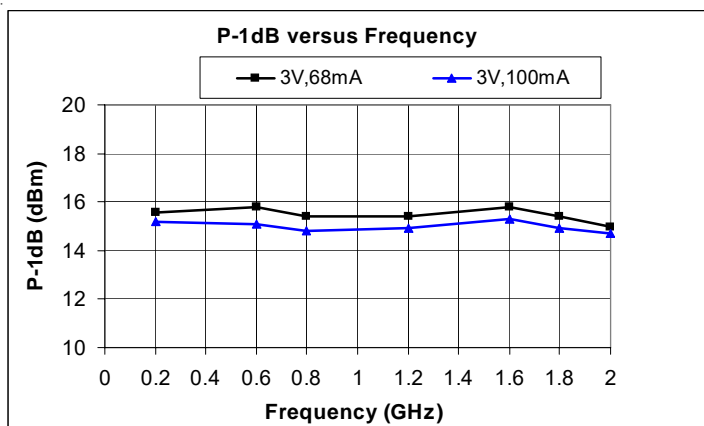
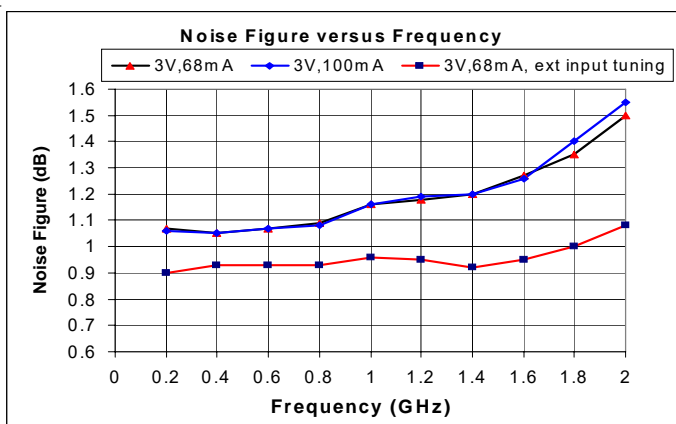
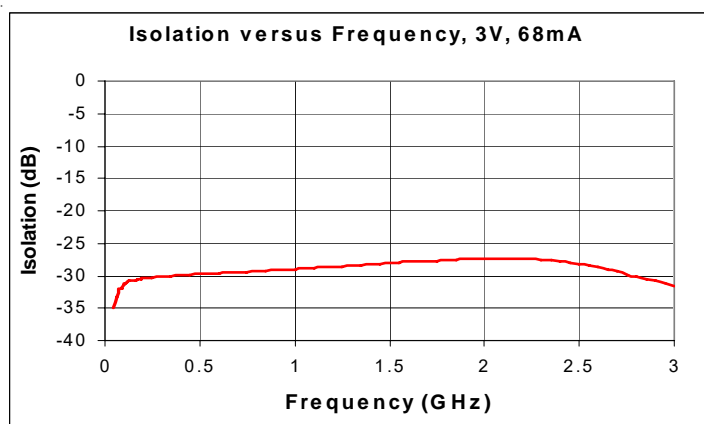
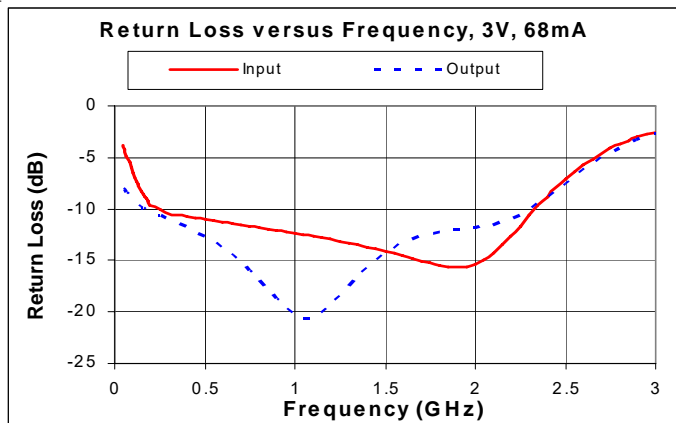
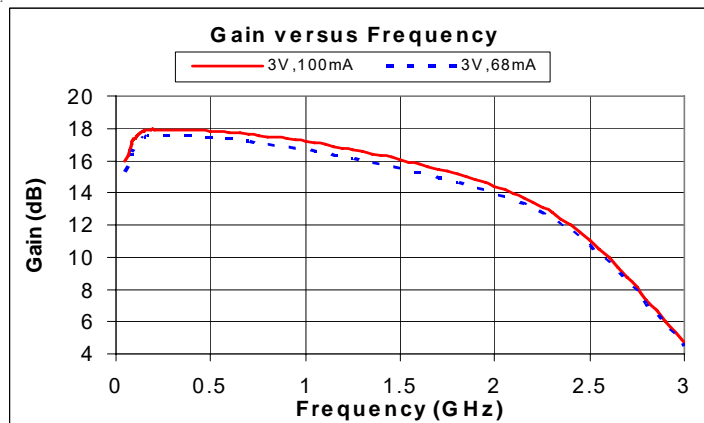
The MLA-0522A is a fully-matched single-stage broadband Low-Noise MMIC amplifier utilizing high-reliability low-noise GaAs PHEMT technology. This MMIC is ideally suited for Iridium Satellite Communications, Instrumentation, Wideband Systems and also many commercial wireless applications where low-noise figure and high-dynamic range is desirable. It has excellent gain 16 dB and Noise Figure 1.25 dB @ 1.6 GHz which is ideally suited for Iridium Satellite Band applications. Typical P-1dB is 16 dBm and OIP3 is 33 dBm @ 1.6 GHz. It has 50-ohm on-chip matching with flexibility to bypass on-chip match & optimize performance using external match. The bias current is adjustable with gate voltage down to 30 mA with good performance. Packaged options are available. Contact factory for further details.

ELECTRICAL SPECIFICATIONS: VDD=+3.0V, VG=0V, IDD=70mA, Ta=25 C, ZO=50 ohm ⁽¹⁾

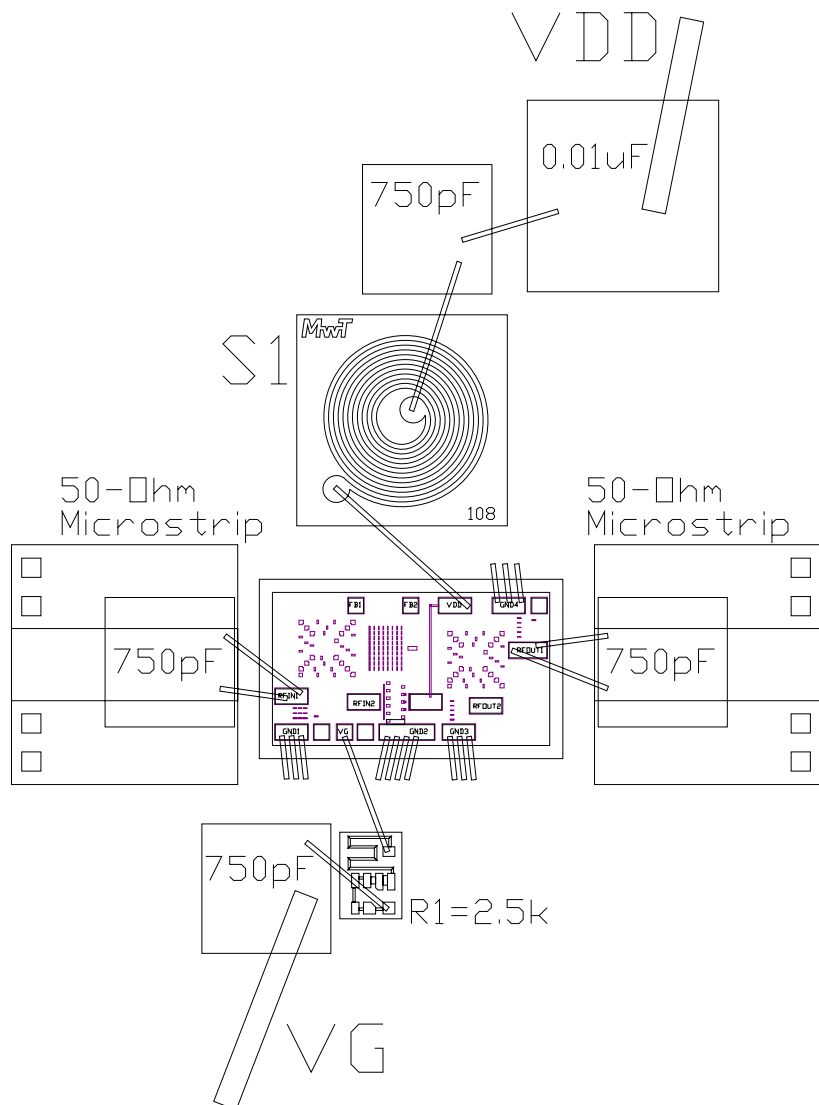
PARAMETER	TEST CONDITIONS	TYPICAL DATA	UNITS
Frequency Range		0.2-2	GHz
Gain	0.2 - 1 GHz 1.6 GHz	17 16	dB
Gain Flatness	0.2 - 1 GHz 1 - 2 GHz	0.5 1.3	+/-dB
Input Return Loss	0.5 GHz 1 GHz 1.6 GHz 2 GHz	11 12 14 15	dB
Output Return Loss	0.5 GHz 1 GHz 1.6 GHz 2 GHz	12 20 13 12	dB
Output P 1dB	0.2 - 1.8 GHz 2 GHz	16 15	dB m
Output IP 3 @ 0 dBm /tone, 1 MHz separation	0.2 GHz 1.6 GHz 2 GHz	34 33 31	dB m
Noise Figure	On-chip match	0.2 GHz 1.6 GHz 2 GHz	1.1 1.3 1.5
		0.2 GHz 1.6 GHz 2 GHz	0.9 1.0 1.1
	Ext input match	0.2 GHz 1.6 GHz 2 GHz	0.9 1.0 1.1
Operating Bias Conditions: VDD IDD	VG = 0V	+3 70	V mA
Stability Factor K	50 MHz to 7 GHz	> 1	

(1) All data is measured on 50 Ohm carrier with external Bias Choke, Bypass and DC blocking caps. See evaluation assembly diagram.

TYPICAL RF PERFORMANCE: $V_{DD}=+3.0V$, $V_G=0V$, $I_{DD}=70mA$, $T_a=25^\circ C$, $Z_O=50\ \Omega$ ⁽¹⁾



ASSEMBLY DIAGRAM: For use with on-chip match option



Notes:

- 1) R1=2.5k ohm series resistor is recommended on VG bias line for DC bias isolation.
- 2) VDD bias choke S1 is 6.5 turn MIC spiral on 10 mil thick alumina substrate. W=1mil, S=1mil, and Outside diameter = 35mil.
- 3) Please contact factory sales for additional information on external components and matching for improved performance.

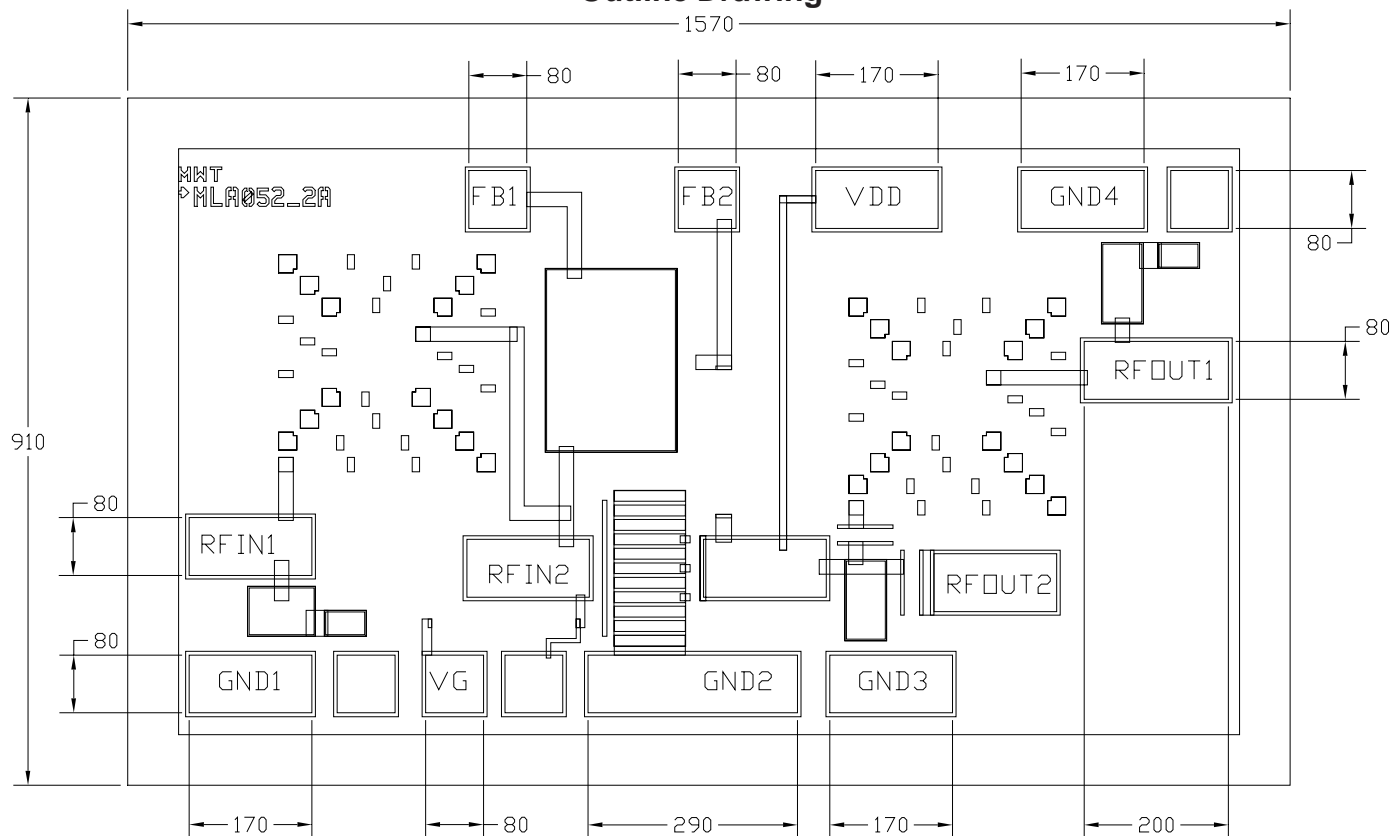
ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETERS	UNITS	MAX
VDD	Drain Voltage	V	6
IDD	Drain Current	mA	150
Pdiss	DC Power Dissipation	W	0.6
P _{in} max	RF Input Power	dBm	+17
T _{oper}	Operating Case/Lead Temp Range	°C	-40 to +85
T _{ch}	Channel Temperature	°C	150
T _{stg}	Storage Temperature	°C	-60 to 150

Exceeding any of these limits may cause permanent damage.

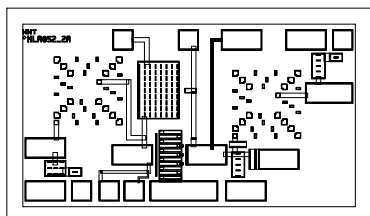
MECHANICAL INFORMATION

Outline Drawing



Notes:

- 1) Die Size: 1.57 x 0.91 x 0.1 mm
- 2) Bond Pad Sizes are shown in the above Chip Layout
- 3) Bond Pad & Backside metallization: Gold
- 4) All Pads labeled GND1 to GND4 must be bonded to backside GND paddle for DC & RF Grounding with 2 to 3 short 1mil dia wires on each pad.
- 5) FB1 & FB2 pads may be used to add external larger feedback capacitor in parallel to extend low-frequency range. Additionally low-frequency performance can be extended down to 50 MHz by using a larger external drain bias choke (> 150 nH)
- 6) RFIN2 pad may be used to bypass on-chip input inductor & cap to connect external match for reduced noise figure.
- 7) External Bias choke & Bypass caps on VDD and DC blocking caps on RFIN1/RFOUT1 are required.
- 8) Please contact factory sales for additional information on external tuning for improved performance.



Functional Diagram

