

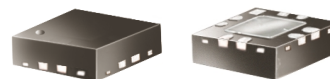
High Directivity

# Monolithic Amplifier

0.5-2.5 GHz

## Product Features

- 2.8V & 5V operation
- Micro-miniature size .120"X.120"
- Internal DC blocking at RF input and output
- High directivity, 20 dB typ.
- Low noise figure
- Output power, up to +17.9 dBm typ.
- Excellent repeatability
- Low cost
- Aqueous washable



## MNA-2

CASE STYLE: DQ849  
PRICE: \$1.90 ea. QTY. (30)

## Typical Applications

- Buffer amplifier
- Cellular
- PCN
- Communications satellite
- Defense

## General Description

MNA-2 is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in a 3x3 mm MCLP plastic package. MNA-2 is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 50,000 years at 2.8V; 8,000 years at 5V.

Function	Pin Number	Description	
RF IN	2	RF input pin	
RF-OUT	5	RF output pin	
DC	7, with 1000 pF bypass to ground; connect pin 8 via 33 ohms to pin 7 externally	Bias pins	
GND	3,4 and paddle in center of bottom	Connections to ground	
OPTIONAL	1,6	No internal connection; recommended use: per PCB Layout PL-078	



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

REV. K  
M108520  
MNA-2  
080305  
Page 1 of 4

Electrical Specifications at 25°C

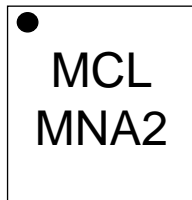
Parameter	Min.	Typ.		Max.	Units	
Frequency Range	0.5			2.5	GHz	
at DC Volts	2.8	5.0	2.8	5.0	V	
Gain					dB	
	f=0.5 GHz	10.6	9.6			
	f=1.0 GHz	12.8	11.5			
	f=1.5 GHz	12.8	11.2			
	f=2.0 GHz	12.3	10.7			
	f=2.5 GHz	11.9	10.2			
Input Return Loss	f=0.75-2.5 GHz		14	14	dB	
Output Return Loss	f=0.75-2.5 GHz		12.5	12.5	dB	
Output Power @ 1 dB compression	f=0.5 GHz f=2.5GHz		17.7 17.9	12.9 12.4	dBm	
Output IP3	f=1 GHz f=2 GHz		26.5 28.0	23.2 24.2	dBm	
Noise Figure	f=1 GHz		5.4		dB	
Directivity (Isolation - Gain)	f=0.5-2.5 GHz		20			
DC Current			76	60	95	mA
Thermal Resistance, junction-to-case			78		°C/W	

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
DC Voltage	7V at pin 7 10V at pins 2 & 5
Power Dissipation	500mW
Input Power	10dBm

Note: Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.

Product Marking



Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Performance data, graphs, s-parameter data set (.zip file)

Case Style: DQ849

Plastic package, exposed paddle, lead finish: tin/lead

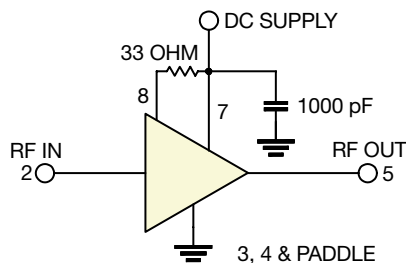
Tape & Reel: F66

Suggested Layout for PCB Design: PL-078

Evaluation Board: TB-186+

Environmental Ratings: ENV08T1

Recommended Application Circuit



**Monolithic MMIC Amplifier**

**ESD Rating**

Human Body Model (HBM): Class 1A (250v to < 500v) in accordance with ANSI/ESD STM 5.1 - 2001

Charged Device Model (CDM): Class III (500 to 1000v) in accordance with JESD22-C101A

**MSL Rating**

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020C

No.	Test Required	Condition	Standard	Quantity
1	Visual Inspection	Low Power Microscope Magnification 40x	MIP-IN-0003 (MCT spec)	10 units
2	Electrical Test	Room Temperature	SCD (MCL spec)	10 units
3	SAM Analysis	Less than 10% growth in term of delamination	J-Std-020C (Jedec Standard)	10 units
4	Moisture Sensitivity Level 1	Bake at 125°C for 24 hours Soak at 85°C/85%RH for 168 hours Reflow 3 cycles at 260°C peak	J-Std-020C (Jedec Standard)	10 units

**MSL Test Flow Chart**

