

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 +19 dBm typ.
- Excellent repeatability
- Low cost
- Aqueous washable

Typical Applications

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

General Description

MNA-4+ 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-4+ is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 40,000 years at 2.8V; 9,000 years at 5V.



MNA-4+

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

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

| 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



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

REV. L
M108294
MNA-4+
080305
Page 1 of 4

Electrical Specifications at 25°C

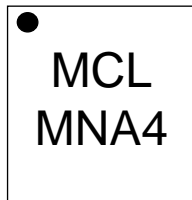
| Parameter | Min. | Typ. | | Max. | Units |
|--------------------------------------|-----------------------|--------------|--------------|------|-------|
| Frequency Range | 0.5 | | | 2.5 | GHz |
| at DC Volts | 2.8 | 5.0 | 2.8 | 5.0 | V |
| Gain | 14.0 | f=0.5 GHz | 15.6 | 14.3 | dB |
| | | f=1.0 GHz | 16.6 | 14.6 | |
| | | f=1.5 GHz | 16.4 | 14.5 | |
| | | f=2.0 GHz | 15.8 | 14.1 | |
| | | f=2.5 GHz | 13.3 | 11.7 | |
| Input Return Loss | f=0.75-2.5 GHz | 14 | 14 | | dB |
| Output Return Loss | f=0.75-2.5 GHz | 11.5 | 11.5 | | dB |
| Output Power @ 1 dB compression | f=0.5 GHz f=2.5GHz | 19.0 17.0 | 13.7 13.7 | | dBm |
| Output IP3 | f=1 GHz f=2 GHz | 28.4 29.0 | 23.9 24.9 | | dBm |
| Noise Figure | f=1 GHz | 4.8 | | | dB |
| Directivity (Isolation - Gain) | f=0.5-2.5 GHz | 20 | | | |
| DC Current | | 75 | 67 | 90 | 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

MNA-4+: Plastic package, exposed paddle, lead finish: tin/silver/nickel

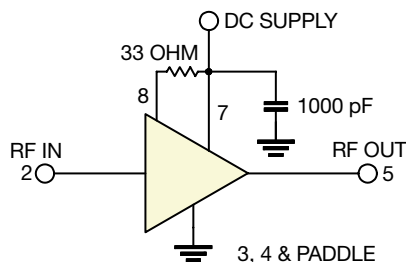
Tape & Reel: F66

Suggested Layout for PCB Design: PL-078

Evaluation Board: TB-186+

Environmental Ratings: ENV08T1

Recommended Application Circuit



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) | 45 units |
| 2 | Electrical Test | Room Temperature | SCD (MCL spec) | 45 units |
| 3 | SAM Analysis | Less than 10% growth in term of delamination | J-Std-020C (Jedec Standard) | 45 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) | 45 units |

MSL Test Flow Chart

