

Surface Mount

Monolithic Amplifier

DC-1 GHz

Features

- InGaP HBT IF and RF amplifier
- Frequency range, DC to 1 GHz
- High gain, 25.1 dB typ. at 0.1 GHz
- Internally Matched to 50 Ohms
- +19.2 dBm typ. output power at 0.1 GHz
- High IP3, +38 dBm at 0.1 GHz
- Low noise figure, 2.7 dB typ.
- Unconditionally stable
- Low thermal resistance
- Transient protected
- Aqueous washable
- Protected by US patent, 6,943,629

Applications

- Cellular
- Broadband
- Communication receivers & transmitters

General Description

Gali₇₄₊ (RoHS compliant) is a wideband amplifier offering high dynamic range. Lead finish is SnAgNi. It has repeatable performance from lot to lot, and is enclosed in a SOT-89 package. It uses patented Transient Protected Darlington configuration and is fabricated using InGaP HBT technology. Expected MTBF is 500 years at 85°C case temperature. Gali₇₄₊ is designed to be rugged for ESD and supply switch-on transients.



Gali₇₄₊

CASE STYLE: DF782
PRICE: \$2.35 ea. QTY. (20)

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

simplified schematic and pin description



| Function | Pin Number | Description |
|------------------|------------|--|
| RF IN | 1 | RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation. |
| RF-OUT and DC-IN | 3 | RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit". |
| GND | 2,4 | Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance. |

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ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs
& shopping online see web site

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at minicircuits.com

IF/RF MICROWAVE COMPONENTS

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp.

REV. D
M120653
Gali-74+
ED-10887/6
MM/RS/CP/AM
130516
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Electrical Specifications at 25°C and 80mA, unless noted

| Parameter | | Min. | Typ. | Max. | Units |
|---|----------------|------|------|------|-------|
| Frequency Range* | | DC | | 1 | GHz |
| Gain | f=0.1 GHz | | 25.1 | | dB |
| | f=1 GHz | 20 | 21.8 | | |
| | f=2 GHz | | 18.0 | | |
| | f=3 GHz | | 15.3 | | |
| | f=4 GHz | | 13.4 | | |
| Input Return Loss | f= DC to 1 GHz | | 21 | | dB |
| Output Return Loss | f= DC to 1 GHz | | 12.5 | | dB |
| Output Power @ 1 dB compression | f=0.1 GHz | 18 | 19.2 | | dBm |
| | f=0.5 GHz | | 19 | | |
| | f=1.0 GHz | | 18.3 | | |
| Output IP3 | f=0.1 GHz | | 38 | | dBm |
| | f=0.5 GHz | | 37 | | |
| | f=1.0 GHz | | 33 | | |
| Noise Figure | | | 2.7 | | dB |
| Recommended Device Operating Current | | | 80 | | mA |
| Device Operating Voltage | | 4.3 | 4.8 | 5.3 | V |
| Device Voltage Variation vs. Temperature at 80 mA | | | -3.1 | | mV/°C |
| Device Voltage Variation vs. Current at 25°C | | | 2.8 | | mV/mA |
| Thermal Resistance, junction-to-case ¹ | | | 120 | | °C/W |

*Guaranteed specification DC-1 GHz. Low frequency cut off determined by external coupling capacitors.

Absolute Maximum Ratings

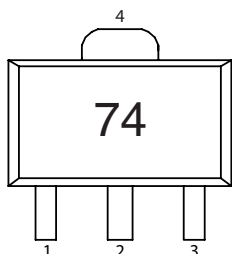
| Parameter | Ratings |
|------------------------|----------------|
| Operating Temperature* | -45°C to 85°C |
| Storage Temperature | -65°C to 150°C |
| Operating Current | 130mA |
| Input Power | 10dBm |

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

¹Case is defined as ground leads.

*Based on typical case temperature rise 6°C above ambient.

Product Marking



Markings in addition to model number designation may appear for internal quality control purposes.

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: DF782

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

Tape & Reel: F55

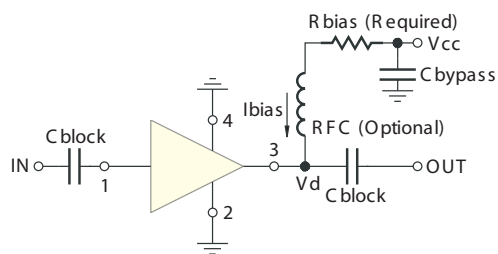
7" reels with 20, 50, 100, 200, 500, 1K devices.

Suggested Layout for PCB Design: PL-019

Evaluation Board: TB-409-74+

Environmental Ratings: ENV08T2

Recommended Application Circuit



Test Board includes case, connectors, and components (in bold) soldered to PCB

| R BIAS | |
|--------|---|
| Vcc | "1%" Res. Values (ohms) for Optimum Biasing |
| 7 | 28.7 |
| 8 | 41.2 |
| 9 | 53.6 |
| 10 | 66.5 |
| 11 | 78.7 |
| 12 | 90.9 |
| 13 | 102 |
| 14 | 115 |
| 15 | 127 |

ESD Rating

Human Body Model (HBM): Class 1C (1000v to < 2000v) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M2 (100v to < 200v) in accordance with ANSI/ESD STM 5.2 - 1999

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDECJ-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

