

Surface Mount

Monolithic Amplifier

DC-8 GHz

Product Features

- InGaP HBT microwave amplifier
- Miniature SOT-89 package
- Frequency range, DC to 8 GHz
- Output power, 12.2 dBm typ.
- Excellent package for heat dissipation, exposed metal bottom
- Low thermal resistance for high reliability
- Aqueous washable
- Protected by US Patent 6,943,629

Typical Applications

- Cellular
- PCS
- Communication receivers & transmitters

General Description

Gali₁+ (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 20,000 years at 85°C case temperature. Gali₁+ is designed to be rugged for ESD and supply switch-on transients.



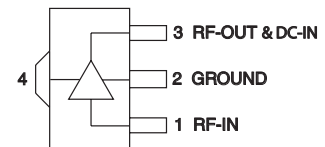
Gali₁+

CASE STYLE: DF782
PRICE: \$0.99 ea. QTY. (25)

+ 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.

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.

Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

minicircuits.com

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

IF/RF MICROWAVE COMPONENTS

REV. R
M120653
Gali1+
081209
Page 1 of 4

Electrical Specifications at 25°C and 40mA, unless noted

Parameter		Min.	Typ.	Max.	Units
Frequency Range*		DC		8	GHz
Gain	f=0.1 GHz	9.0	12.7		GHz
	f=1 GHz		12.5		
	f=2 GHz		11.8		
	f=3 GHz		11.3		
	f=4 GHz		10.5		
	f=6 GHz		10.5		
	f=8 GHz		11.0		
Input Return Loss	f= DC to 3 GHz		17.5		dB
	f= 3 to 8 GHz		11.5		
Output Return Loss	f= DC to 3 GHz		15.5		dB
	f= 3 to 8 GHz		11		
Output Power @ 1 dB compression	f=2 GHz	10.5	12.2		dBm
Output IP3	f=2 GHz		27		dBm
Noise Figure	f=2 GHz		4.5		dB
Recommended Device Operating Current			40		mA
Device Operating Voltage		3.0	3.4	4.1	V
Device Voltage Variation vs. Temperature at 40 mA			-2.8		mV/°C
Device Voltage Variation vs. Current at 25°C			9.4		mV/mA
Thermal Resistance, junction-to-case ¹			108		°C/W

*Guaranteed specification DC-8 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	55mA
Input Power	15dBm

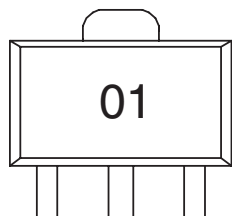
Note: Permanent damage may occur if any of these limits are exceeded.

These ratings are not intended for continuous normal operation.

¹Case is defined as ground leads.

*Based on typical case temperature rise 2°C above ambient.

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: DF782

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

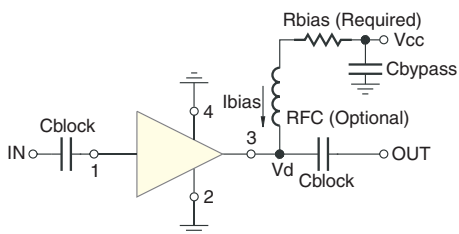
Tape & Reel: F55

Suggested Layout for PCB Design: PL-019

Evaluation Board: TB-409-1+

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	90.9
8	113
9	137
10	162
11	187
12	215
13	237
14	261
15	287
16	309
17	332
18	357
19	383
20	412

ESD Rating

Human Body Model (HBM): Class 1B (500 v to < 1000 v) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (< 100 v) 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

