Surface Mount

Monolithic Amplifier DC-8 GHz

Features
- InGaP HBT microwave amplifier
- Miniature SOT-89 package
- Frequency range, DC to 8 GHz
- Internally Matched to 50 Ohms
- Output power, 12.6 dBm typ.
- Excellent package for heat dissipation, exposed metal bottom
- Aqueous washable
- Protected by US Patent 6,943,629

Gali-21+

CASE STYLE: DF782
PRICE: $0.99 ea. QTY. (30)

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

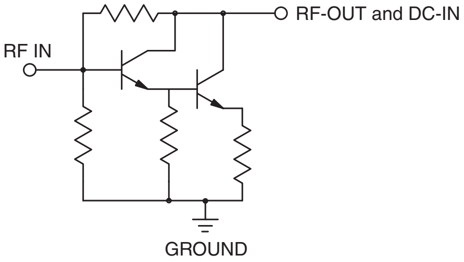
The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

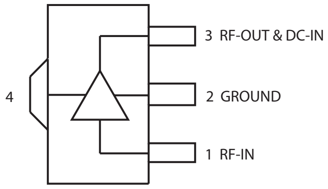
Applications
- Cellular
- PCS
- Communication receivers & transmitters

General Description

Gali-21+ (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 15,000 years at 85°C case temperature. Gali-21+ is designed to be rugged for ESD and supply switch-on transients.

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.

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

Parameter		Min.	Typ.	Max.	Units
Frequency Range*		DC		8	GHz
Gain	f=0.1 GHz		14.3		dB
	f=1 GHz		13.9		
	f=2 GHz	11.5	13.1		
	f=3 GHz		12.4		
	f=4 GHz		11.5		
	f=6 GHz		11.9		
	f=8 GHz		9.0		
Input Return Loss	f= DC to 3 GHz		26.5		dB
	f= 3 to 8 GHz		14		
Output Return Loss	f= DC to 3 GHz		17.5		dB
	f= 3 to 8 GHz		7.5		
Output Power @ 1 dB compression	f=2 GHz	10.5	12.6		dBm
Output IP3	f=2 GHz		27		dBm
Noise Figure	f=2 GHz		4.0		dB
Recommended Device Operating Current			40		mA
Device Operating Voltage		3.0	3.5	4.1	V
Device Voltage Variation vs. Temperature at 40 mA			-2.4		mV/°C
Device Voltage Variation vs. Current at 25°C			8.8		mV/mA
Thermal Resistance, junction-to-case[1]			128		°C/W

*Guaranteed specification DC-8 GHz. Low frequency cut off determined by external coupling capacitors.

Absolute Maximum Ratings

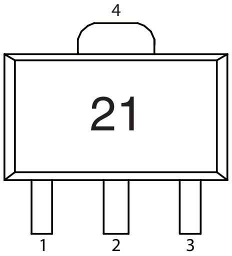
Parameter	Ratings
Operating Temperature*	-45°C to 85°C
Storage Temperature	-65°C to 150°C
Operating Current	55mA
Input Power	15dBm

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

[1] Case is defined as ground leads.

*Based on typical case temperature rise 2°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

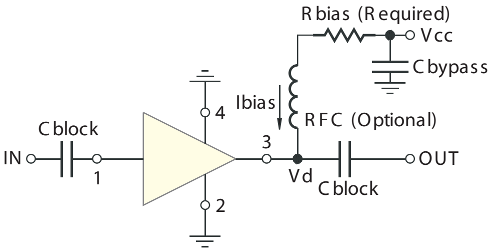
Tape & Reel: F55

Suggested Layout for PCB Design: PL-019

Evaluation Board: TB-409-21+

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	88.7
8	113
9	137
10	162
11	187
12	210
13	237
14	261
15	287
16	261
17	240
18	365
19	392
20	412

ESD Rating

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

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