

The task

A general purpose gain block

Gali 59+

Surface Mount Monolithic Amplifier

DC-5 GHz

Features

- Miniature SOT-89 Package
- Frequency range, DC to 5 GHz
- Internally Matched to 50 Ohms
- Output power, 17.6 dBm typ.



Generic photo used for illustration purposes only

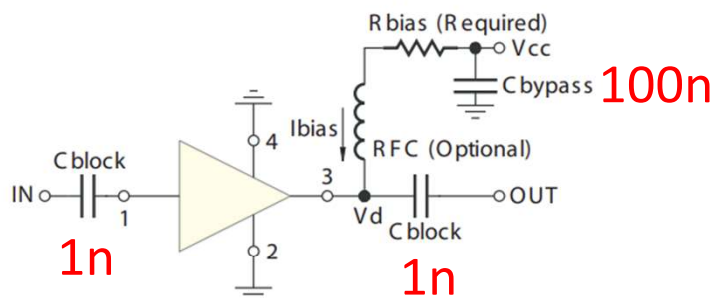
Gali 59+

CASE STYLE: DF782

+RoHS Compliant

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

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	36.5
8	51.1
9	64.9
10	80.6
11	97.6
12	113
13	127
14	143
15	158
16	174
17	191
18	205
19	221
20	237

8V supply to limit dissipation
in the bias resistor -> **51 Ω**

Current 65mA -> power **220 mW**

RFC – **470nH** (SRF ~ 70cm)

Plus connectors

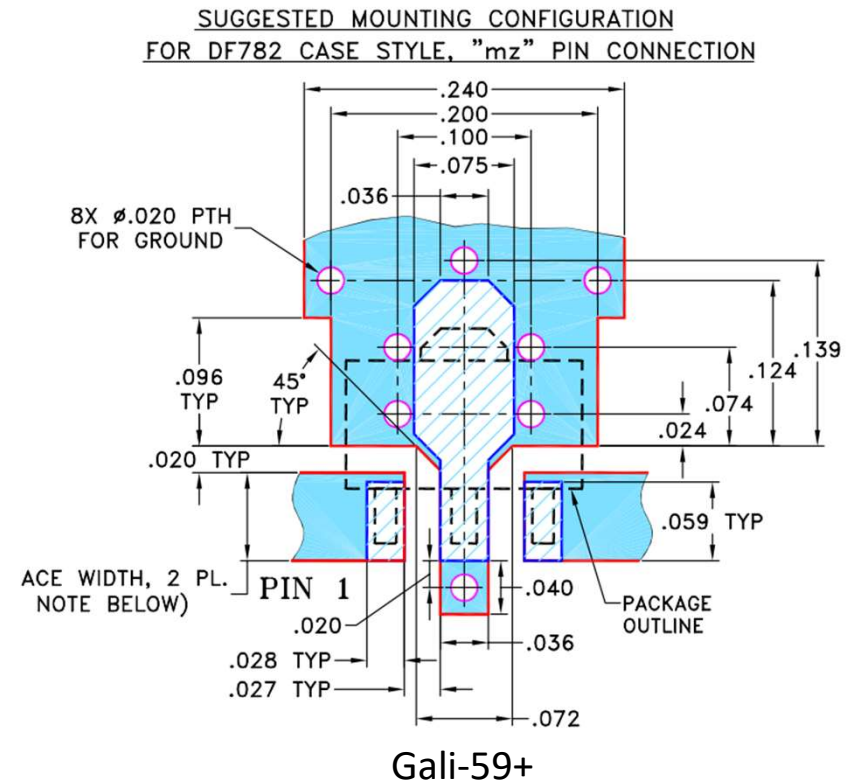
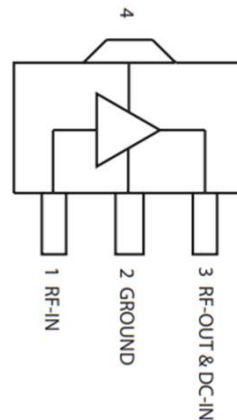
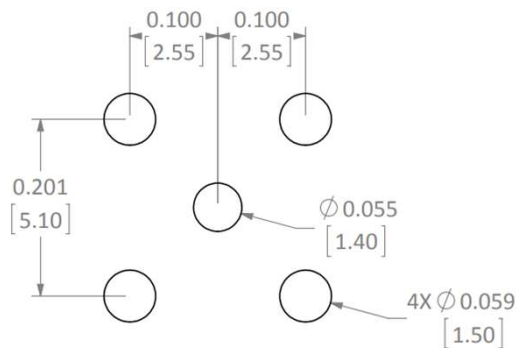
Parts – found in catalogues

Parts	Package	QTY	Mouser Part Number
Gali 59+	DF782	1	139-GALI-59
100n Capacitor	SMD 0805	1	81-GCM21BL81H104KA7L
1n Capacitors	SMD 0805	2	81-GRM2195C2A102JA1J
470nH	SMD 1008	1	81-LQW2UASR47J00L
140 Ohm, 1 W	SMD 2512	1	603-RC2512FK-07140RL
Power (molex 2 pin)	KK-254	1	538-171856-3002
SMA	SMA	2	712-CONSMA001-G

Work out what parts and what package you need first
Find from a supplier – ensure in stock...



SMA



There is a tool for calculating track sizes

Calculator Tools

General system design
Regulators
Power, current and isolation
Electrical Spacing
Via Size
Track Width
Fusing Current
Cable Size
High speed
Wavelength
RF Attenuators
Transmission Lines
Memo
E-Series
Color Code
Board Classes
Galvanic Corrosion

Transmission Line Type

- ☒ Microstrip Line
- ☐ Coplanar wave guide
- ☐ Coplanar wave guide w/ ground plane
- ☐ Rectangular Waveguide
- ☐ Coaxial Line
- ☐ Coupled Microstrip Line
- ☐ Stripline
- ☐ Twisted Pair

Substrate Parameters

ϵ_r : 4.3

$\tan \delta$: 0.02

ρ : 1.72e-08

H: 1.57 mm

H(top): 10 mm

T: 0.035 mm

Roughness: 0.05 mm

$\mu(\text{substrate})$: 1

$\mu(\text{conductor})$: 1

Component Parameters

Frequency: 432 MHz

Physical Parameters

W: 3 mm

L: 95 mm

Analyze Synthesize

Electrical Parameters

Z0: 50.5397 Ω

Ang_l: 87.9854 deg

Results

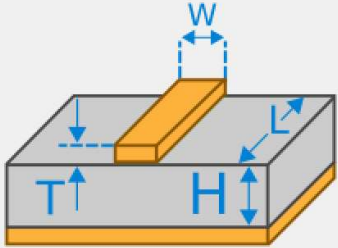
Effective ϵ_r : 3.18745

Conductor losses: 0.037883 dB

Dielectric losses: 0.119116 dB

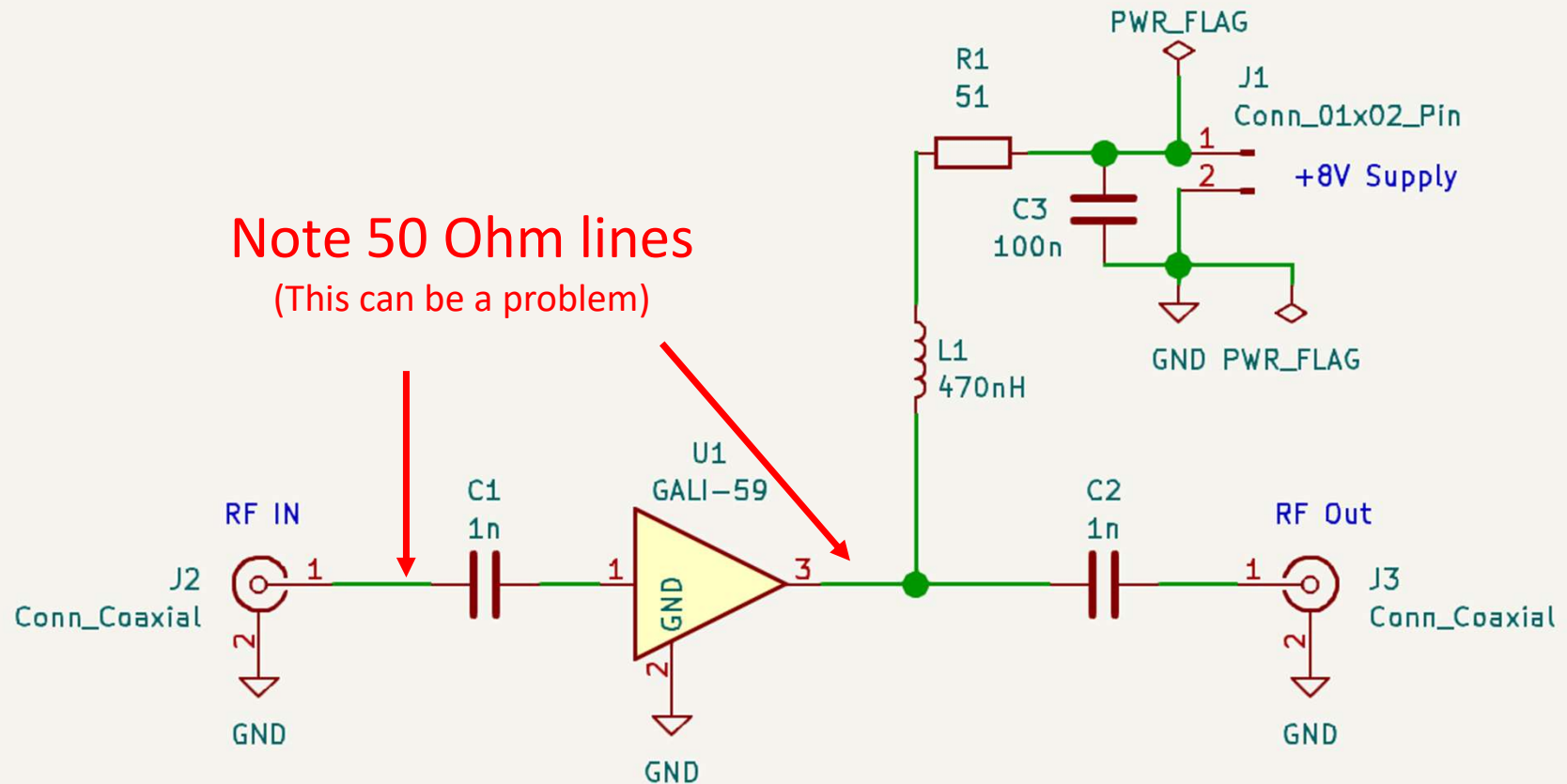
Skin depth: 3.17572 μm

Reset to Defaults



For 50 ohms on 1.6mm FR4 it is about 3mm, for 0.8mm PCB it is about 1.5mm

This is the schematic we are aiming for



The PCB might look like this:

