SAC3940

GaAs MMIC Distributed Amplifier
0.01～50GHz

Rev 1.0

Features

- Frequency：0.01~50GHz
- Gain：8dB
- NF: 7dB@30GHz
- Output P_{-1}dB：13dBm@40GHz
- Supply Voltage: +8V@130mA
- Die Size：3.54mmx1mm×0.1mm

Typical Applications

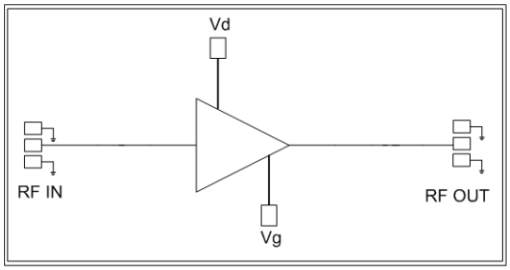
- RF/ Microwave radio
- Military and Space
- Test and Measurement
- Fiber Optics

General Description

SAC3940 is a GaAs MMIC traveling wave structured amplifier die which operates between 100MHz to 50GHz. The amplifier can provide 8dB gain, 13dBm Output P_{-1}dB from a 130mA supply current at +8V.

The chip offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25℃, V_d=+8V, I_D=130mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		0.01~50		GHz
Gain	—	8	—	dB
Gain Flatness	—	±1.5	±2	dB
Reverse Isolation	—	-40	-15	dB
Input VSWR	-8	-12	—	dB
Output VSWR	-8	-12	—	dB
Noise Figure	—	7	10	dB
Output P_{-1}dB	11	13	—	dBm
Supply Current (I_D)	—	130	180	mA

Absolute Maximum Ratings

Maximum Input Power	+12dBm	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Working Voltage	+10V		

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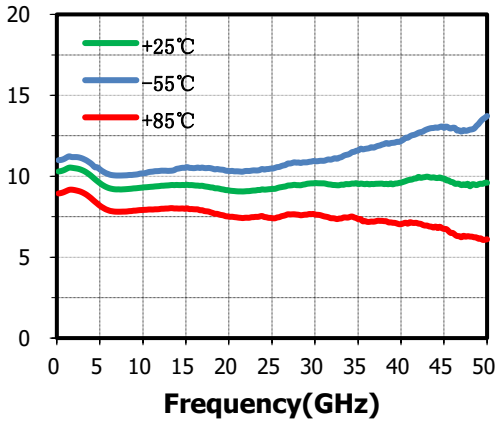
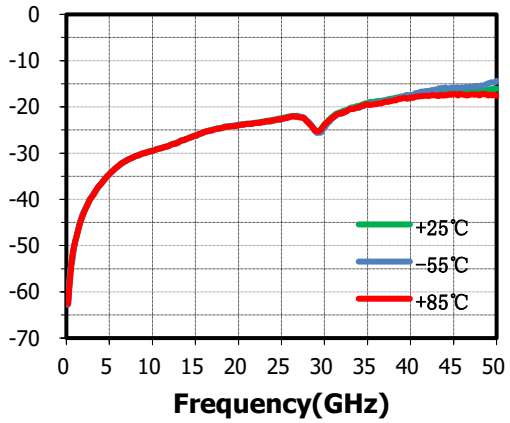
Typical Performance Curve

VD=+8V，I_{DQ}=130mA，On probe

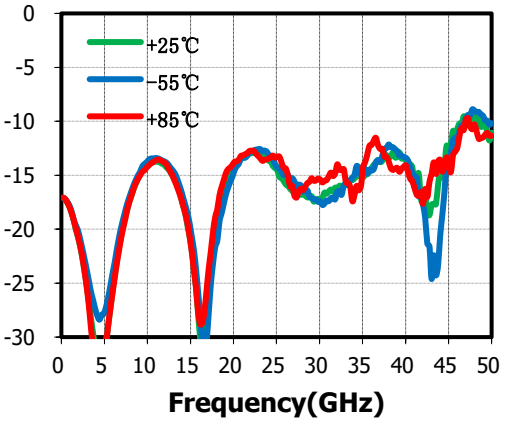
Small Signal Gain(dB) vs.Temperature



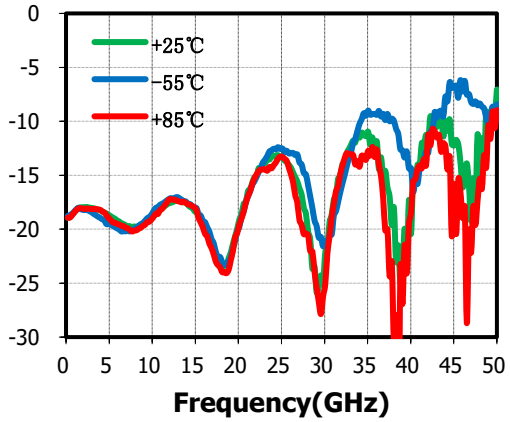
Isolation(dB) vs.Temperature



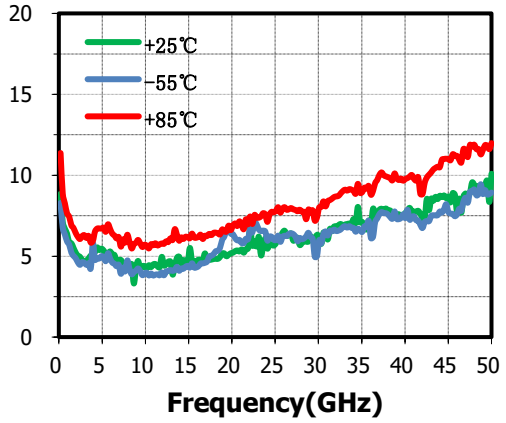
Input Return Loss(dB) vs.Temperature



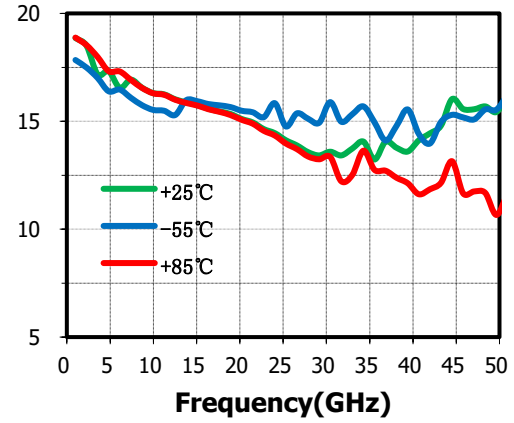
Output Return Loss(dB) vs.Temperature



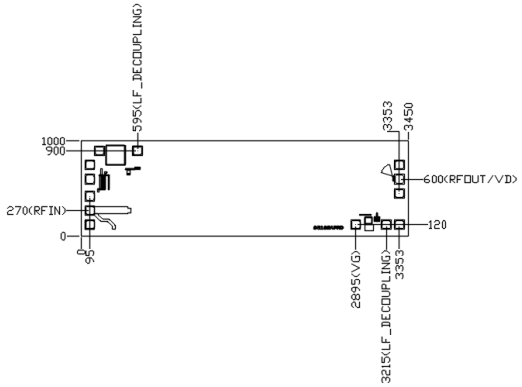
Noise Figure(dB) vs.Temperature



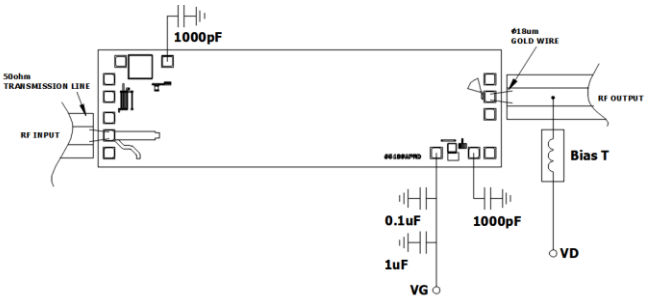
Output P-1dB(dBm) vs.Temperature



Outline
(All dimensions in um)



Assembly Diagram



Attention:

1. The GaAs MMIC device is susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.
2. The MMIC should be stored in dry Nitrogen gas environment and be handled in clean room.
3. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. The distance between RF pads and the substrate is no more than 50um. Please use diameter of 25um double Au wires with its length between 150 to 200um.
4. The backside of SAC3940 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy or Au/Sn soldering with its temperature not surpassing 300 degrees centigrade and the time of period being smaller than 30 seconds.

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