SAC3948

GaAs MMIC Driver Amplifier
1.1~1.6GHz

Rev 1.0

Features

- Frequency：1.1~1.6GHz
- Gain：18dB
- Output P_{-3}dB:28dBm Typ.
- Power Supply：+5V,350mA
- Die size:2mmx2.5mmx0.1mm

Typical Applications

- Cellular Infrastructure

General Description

SAC3948 is a GaAs MMIC driver amplifier. SAC3948 provides 18 dB of gain, and 28dBm of output power for 3 dB compression a +5V supply.

Electrical Performance (T_A=25℃, V_D=+5V, I_{DQ}=350mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		1.1~1.6		GHz
Small Signal Gain	15	18	—	dB
Small Signal Gain Flatness	—	±1	±1.75	dB
VSWRi	—	1.5	2.0	:1
VSWRo	—	1.5	2.0	:1
Isolation	—	-33	—	dB
Output P_{-3}dB	27	28	—	dBm
Output IP_3	—	33	—	dBm
Supply Current (I_D)	—	360	600	mA
Thermal Resistance		18		℃/W

Absolute Maximum Ratings

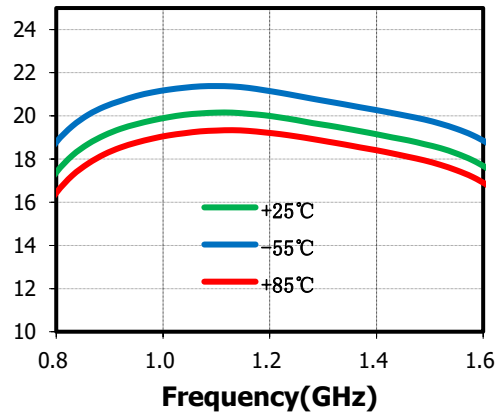
Maximum Input Power	+18dBm, CW 60s	Operating Temperature	-55℃~+85℃
Channel temperature	+150℃	Storage Temperature	-55℃~+150℃
VD	+5. 5V		

SuperApex, LLC
1580 S. Milwaukee Ave., Ste. 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

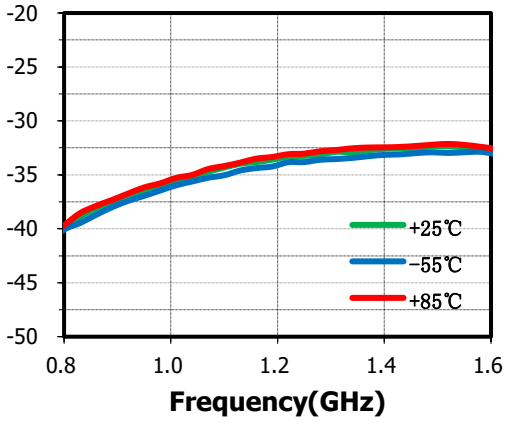
Typical Performance Curve

The following data are obtained by SAC3948 evaluation board, VD = + 5V, I_{DQ} = 0.35A, CW, T_A = + 25℃

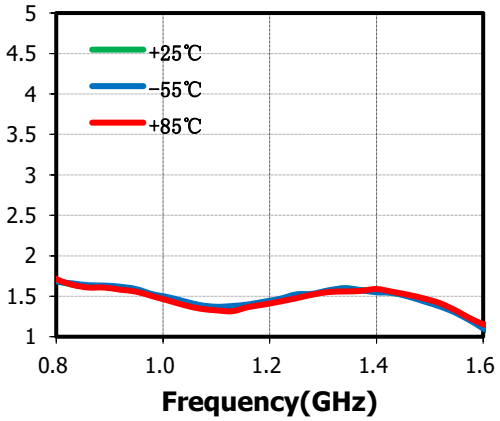
Small Signal Gain(dB) vs.Temperature



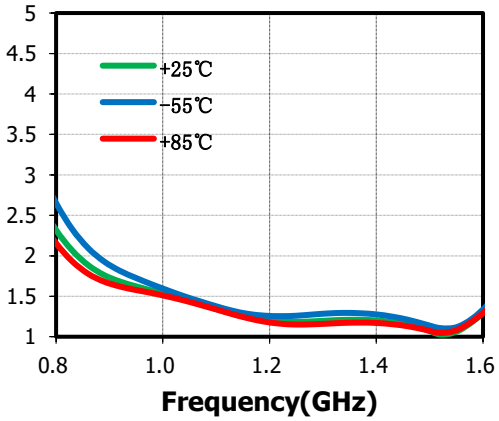
Reverse Isolation(dB) vs.Temperature



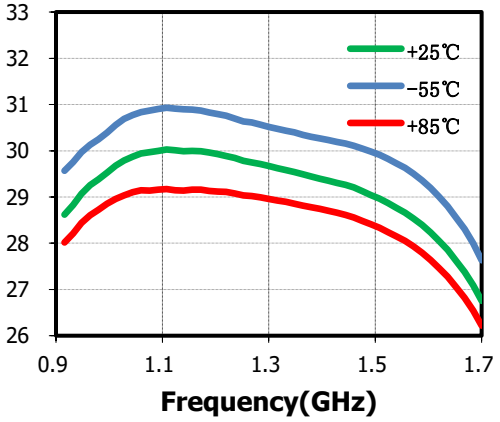
Input VSWR(:1) vs.Temperature



Output VSWR(:1) vs.Temperature



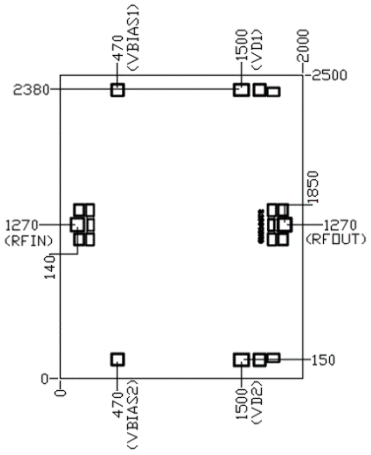
Output P-3dB(dBm) vs.Temperature



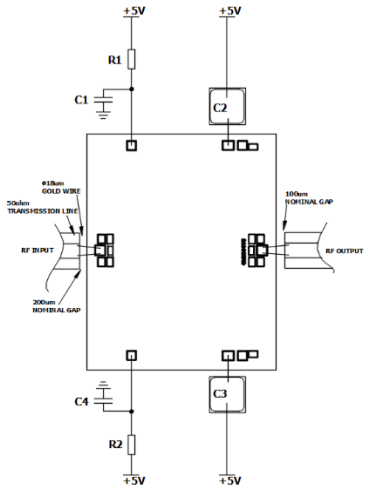
SuperApex, LLC
1580 S. Milwaukee Ave., Ste. 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

Die Outline

(All dimensions in μm)



Assembly Diagram



Pad size: RFIN、RFOUT、VBIAS1、VBIAS2: 100umx100um
VD1、VD2:100umx180um

BOM

Reference Des.	Value	Part Number	Manuf.
C1、C4	47uF	GRM21BR61A476ME15L	Murata
C2、C3	100pF	GCM0335C1H101JA16D	Murata
R1、R2*	510Ω	-	-

** Adjust R1 value between 300 Ω to 1000 Ω to achieve I_{DQ}= 0.35 A typical.

Notes

1. SAC3948 is biased with a positive voltage supply.
2. The back of chip is RF ground;
3. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 1 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized;
4. Bypass SLCs should be placed as close as possible to the chip;
5. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test;
6. The maximum spike voltage at drains (VDxx) should not exceed 5.5V.

Revision History

Revision	Date	Comment
1.0	Jul 10, 2022	First Release

SuperApex, LLC
1580 S. Milwaukee Ave., Ste. 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com