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		

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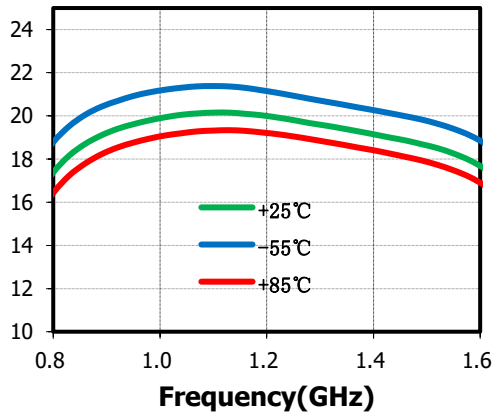
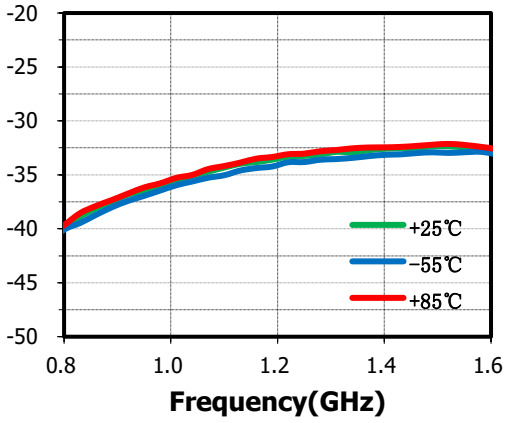
Typical Performance Curve

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

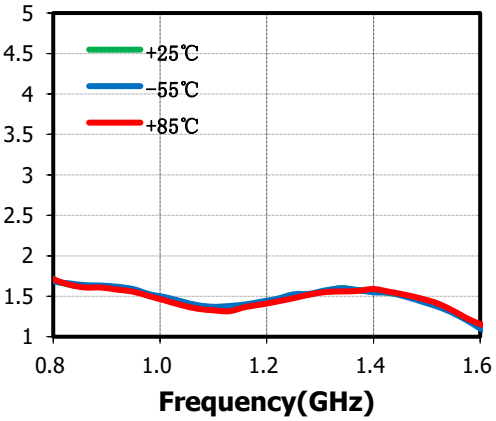
Small Signal Gain(dB) vs.Temperature



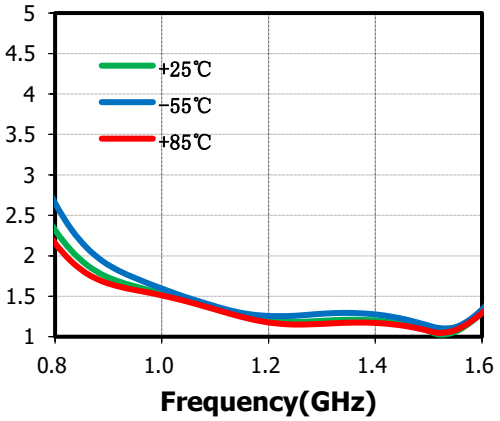
Reverse Isolation(dB) vs.Temperature



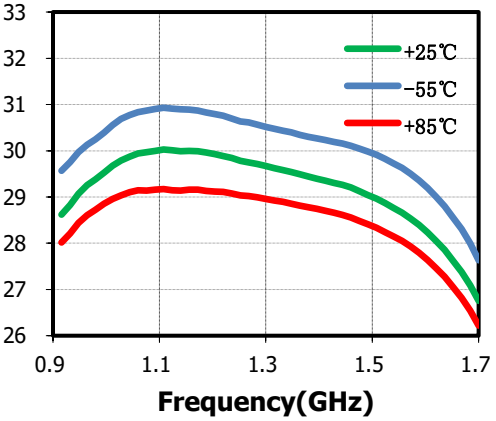
Input VSWR(:1) vs.Temperature



Output VSWR(:1) vs.Temperature



Output P-3dB(dBm) vs.Temperature



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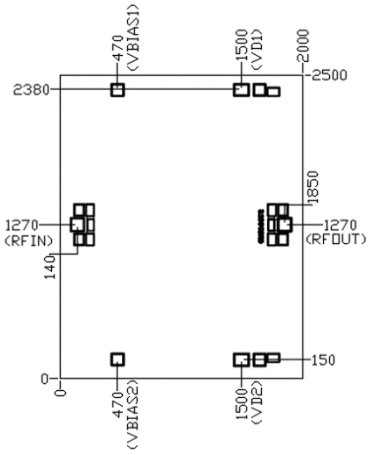
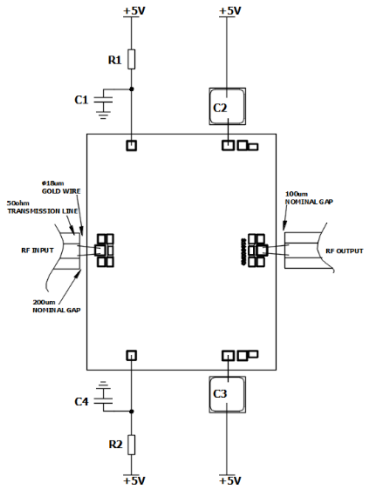
Die Outline

(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

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