

# SAC3948

GaAs MMIC Driver Amplifier  
1.1~1.6GHz

Rev 1.0

## Features

- Frequency: 1.1~1.6GHz
- Gain: 18dB
- Output P-3dB: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 ( $T_A=25^{\circ}\text{C}$ , $V_D=+5\text{V}$ , $I_{DQ}=350\text{mA}$ , $Z_0=50\Omega$ )

Parameter	Min.	Typ.	Max.	Units
Frequency Range	1.1~1.6			GHz
Small Signal Gain	15	18	—	dB
Small Signal Gain Flatness	—	$\pm 1$	$\pm 1.75$	dB
VSWRi	—	1.5	2.0	:1
VSWRo	—	1.5	2.0	:1
Isolation	—	-33	—	dB
Output P-3dB	27	28	—	dBm
Output IP <sub>3</sub>	—	33	—	dBm
Supply Current (I <sub>b</sub> )	—	360	600	mA
Thermal Resistance		18		$^{\circ}\text{C}/\text{W}$

### Absolute Maximum Ratings

Maximum Input Power	+18dBm, CW 60s	Operating Temperature	-55 $^{\circ}\text{C}$ ~+85 $^{\circ}\text{C}$
Channel temperature	+150 $^{\circ}\text{C}$	Storage Temperature	-55 $^{\circ}\text{C}$ ~+150 $^{\circ}\text{C}$
VD	+5. 5V		

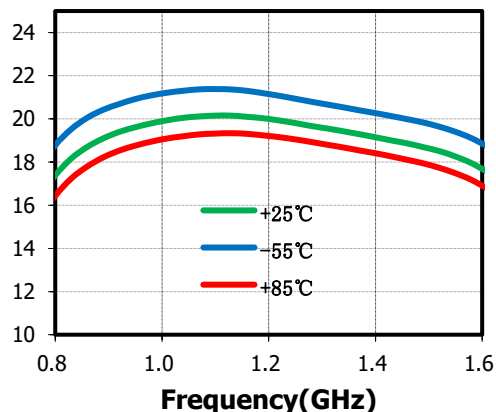
## SuperApex Corporation

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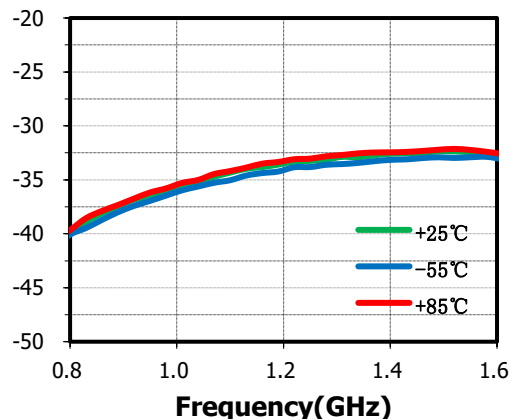
## Typical Performance Curve

The following data are obtained by SAC3948 evaluation board,  $V_D = +5V$ ,  $I_{DQ} = 0.35A$ , CW,  $T_A = +25^\circ C$

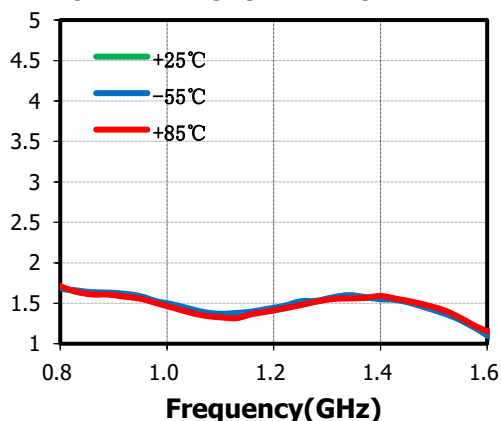
**Small Signal Gain(dB) vs. Temperature**



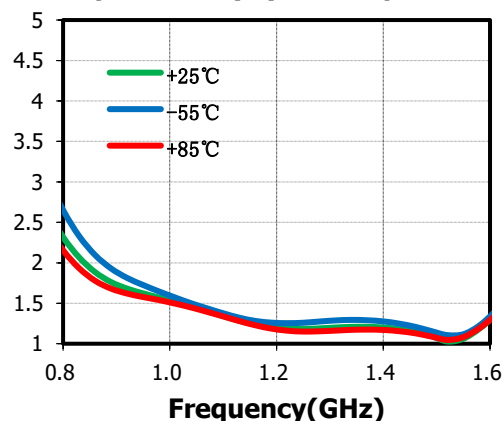
**Reverse Isolation(dB) vs. Temperature**



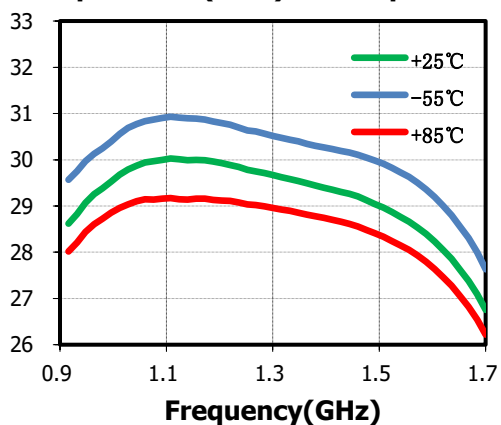
**Input VSWR(:1) vs. Temperature**



**Output VSWR(:1) vs. Temperature**



**Output P-3dB(dBm) vs. Temperature**



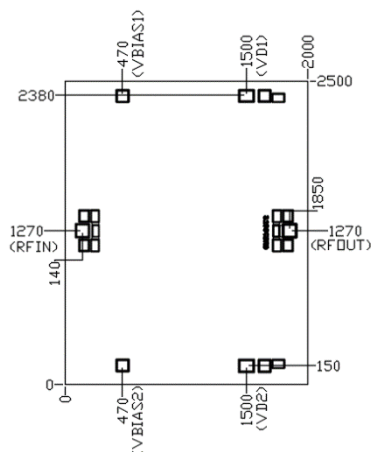
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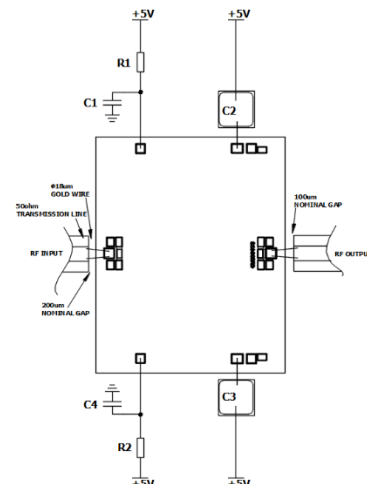
## Die Outline

(All dimensions in  $\mu\text{m}$ )



Pad size: RFIN、RFOUT、VBIAS1、VBIAS2: 100 $\mu\text{m}$ x100 $\mu\text{m}$   
VD1、VD2:100 $\mu\text{m}$ x180 $\mu\text{m}$

## Assembly Diagram



## BOM

Reference Des.	Value	Part Number	Manuf.
C1、C4	47 $\mu\text{F}$	GRM21BR61A476ME15L	Murata
C2、C3	100pF	GCM0335C1H101JA16D	Murata
R1、R2*	510 $\Omega$	-	-

\*\* Adjust R1 value between 300  $\Omega$  to 1000  $\Omega$  to achieve  $I_{\text{DQ}} = 0.35 \text{ A}$  typical.

## Notes

- SAC3948 is biased with a positive voltage supply.
- The back of chip is RF ground;
- 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;
- Bypass SLCs should be placed as close as possible to the chip;
- GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test;
- 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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