

## Features

- Frequency: 18~40GHz
- Gain:14dB
- Output P<sub>-1dB</sub>: 22dBm Typ. 20dBm Min.
- Supply Voltage: +5V/-Vg
- Output IP<sub>3</sub>: 30dBm@38GHz
- Balanced Amplifier
- Die Size: 2.3mm×1.25mm×0.1mm

## Typical Applications

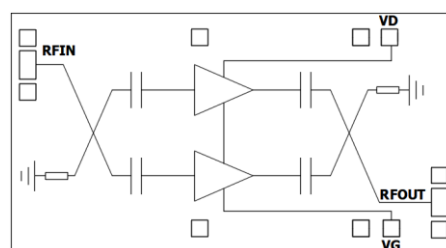
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

## General Description

SAC3931 is a balanced GaAs MMIC driver amplifier, which operates between in 18~40GHz. SAC3931 provides 14dB of gain, and 22dBm of Output P<sub>-1dB</sub> while requiring 350mA from a +5V supply voltage.

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

## Functional Diagram



## Electrical Performance

T<sub>A</sub>=25°C, V<sub>D</sub>= +5V, I<sub>D</sub>=350mA, Z<sub>0</sub>=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range	18~40			GHz
Small Signal Gain	12	14	22	dB
Small Signal Gain Flatness	—	—	±3.5*	dB
Reverse Isolation	—	-35	—	dB
Input/ Output VSWR	—	1.35	2.0	:1
Noise Figure	—	6	—	dB
Output Power for 1 dB Compression (OP <sub>-1dB</sub> )	20	22	—	dBm
Output IP <sub>3</sub>	—	30**	—	dBm
Supply Current (I <sub>D</sub> )	—	350	500	mA
Drain Voltage (V <sub>D</sub> )	5	—	6	V
Thermal Resistance	—	22	—	°C/W

\* Positive slope

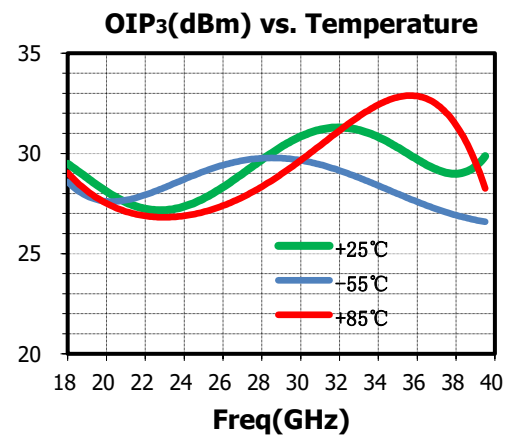
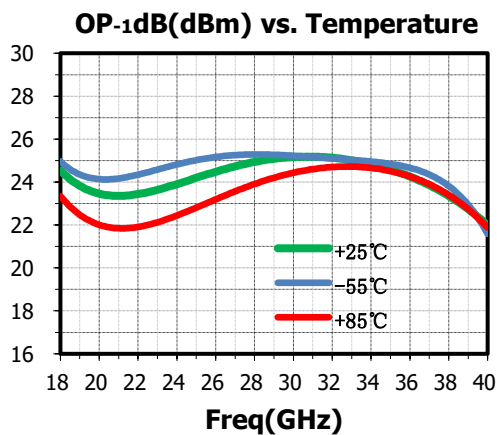
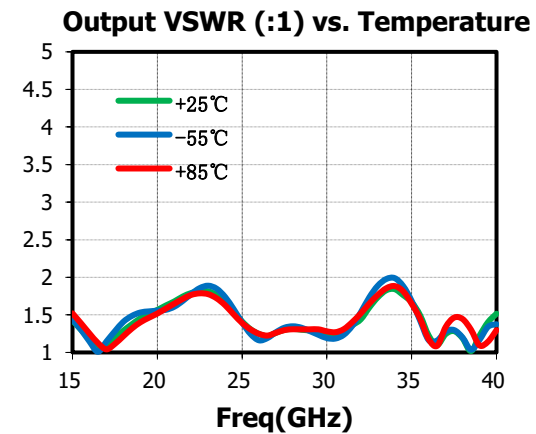
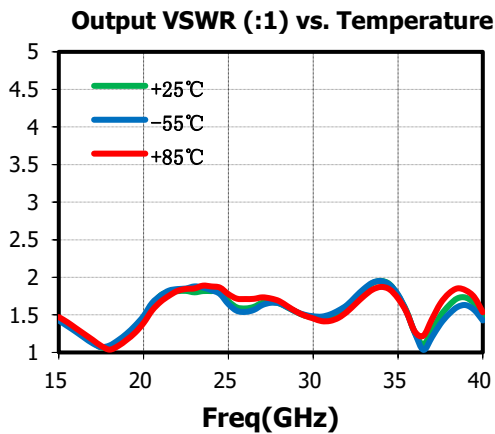
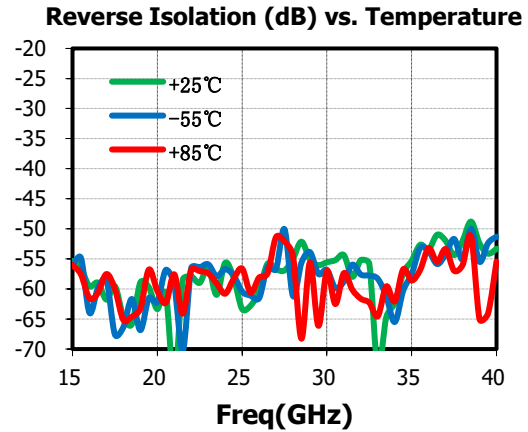
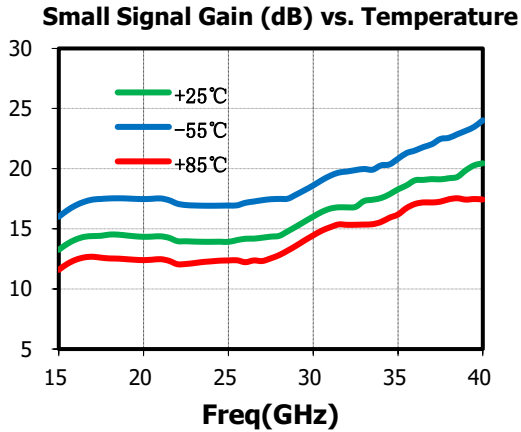
\*\*Pin/Tone=0dBm fc=30GHz, Δf=4MHz

## Absolute Maximum Ratings

Maximum Input Power	+15dBm, CW 1min	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
Maximum V <sub>D</sub>	6.5V		

## Typical Small Signal Performance Curve

$V_D=+5V$ ,  $I_{DQ}=350mA$ , the following curves are taken from SAC3931 evaluation board. No De-embedding operation has been implemented.

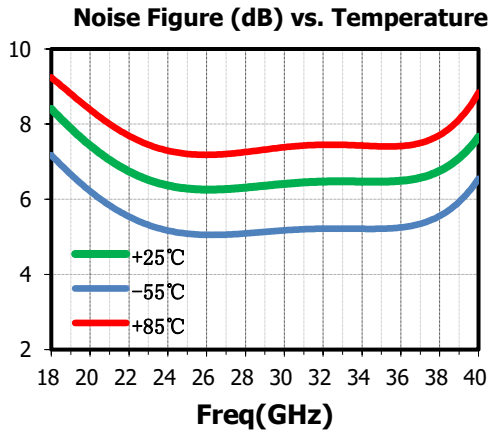


# SAC3931

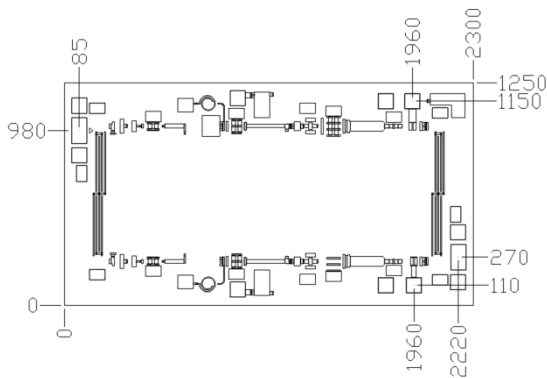


GaAs MMIC Driver Amplifier  
18~40GHz 20dBm

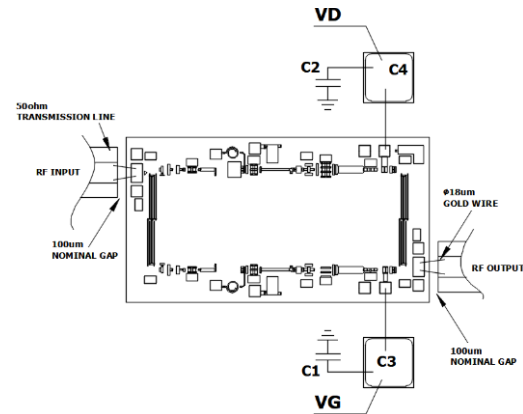
Rev1.0



## Die Outline(μm)

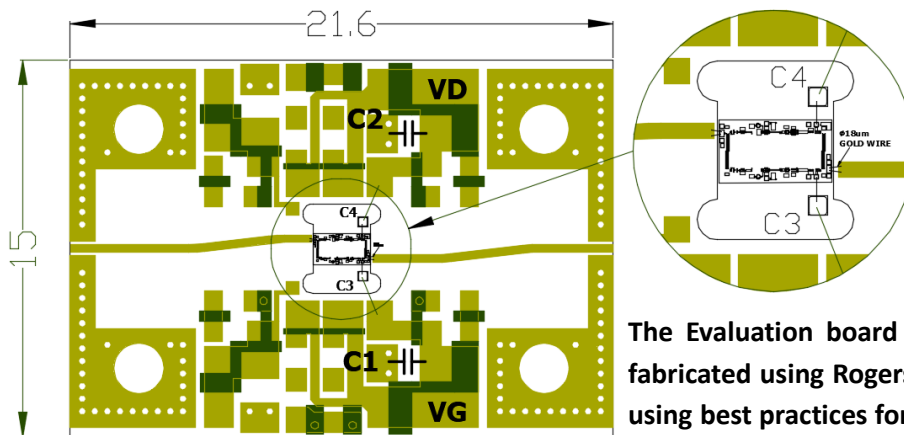


## Assembly Diagram



RFIN, RFOUT pads size:140x80  
VG/VD pads size:80x80

## SAC3931 Evaluation Board



The Evaluation board is a 2-layer board fabricated using Rogers 5880  $t=0.127$  and using best practices for high frequency RF design. The RF input and RF output traces have a  $50 \Omega$  characteristic impedance.

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# SAC3931



GaAs MMIC Driver Amplifier  
18~40GHz 20dBm

Rev1.0

## Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1、C2	2.2uF	—	ANY	0603
C3、C4	10pF	—	ANY	SLC

### Attention:

GaAs MMIC devices are susceptible to damage from electrostatic discharge. Proper precautions should be observed during handling, assembly and test.

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