

# SAC3149CR5



GaAs MMIC Power Amplifier  
8GHz~10.5GHz 37dBm

Rev 1.0

## Features

- Frequency: 8GHz~10.5GHz
- Small Signal Gain: 23dB
- Output P-1dB: 37dBm CW
- PAE: 35%@OP-1dB, f=9.35GHz
- IM3: -24dBc, 29dBm/Tone@9.35GHz
- Package Size: 18.1mm×8.7mm×2.5mm (No pins included)
- Supply Voltage: +8V/-Vg
- Package: 6-pin flange installation

## Typical Applications

- X-band multifunction radar
- Point-to-Point Radio

## General Description

SAC3149CR5 is a X-band GaAs MMIC power amplifier. SAC3149CR5 provides 23 dB of gain, and 37 dBm of output power for 1 dB compression and more than 30% PAE from a +8V supply.

## Electrical Performance

$T_A=25^{\circ}\text{C}$ ,  $V_D=+8\text{V}$ ,  $I_{DQ}=1.6\text{A}$ ,  $Z_0=50\Omega$ , CW

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8	—	10.5	GHz
Small Signal Gain	20	23	—	dB
Gain Flatness	—	±1	—	dB
Reverse Isolation	—	-65	—	dB
RF Input VSWR	—	2	—	:1
Power-Added Efficiency	—	30	—	%
Output P-1dB	—	37	—	dBm
IM <sub>3</sub> *	—	24	—	dBc
Drain Voltage (V <sub>D</sub> )	—	8	—	V
Gate Current	—	4	—	mA
Supply Current (I <sub>D</sub> )**	—	—	4	A
Thermal Resistance	—	3.8	—	°C/W

\* Pout/Tone=29dBm, fc=9.35GHz, Δf=1MHz

\*\*Adjust Vg voltage (- 1.1~-0.65V) to make I<sub>DQ</sub> about 1.6A, and typical Vg voltage is -0.85V

## Absolute Maximum Ratings

Maximum Input Power	+20dBm	Operating Temperature (Backside)	-55°C~+85°C
Channel Temperature	165°C	Storage Temperature	-55°C~+150°C
Maximum V <sub>D</sub> Supply	+8.5V	V <sub>G</sub> Range	-1.5V(Pinch-off)~-0.3V

## SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA

Tel: 1-847-505-8319, 1-847-573-9866

E-mail: sales@superapexco.com

Website: www.superapexco.com

# SAC3149CR5



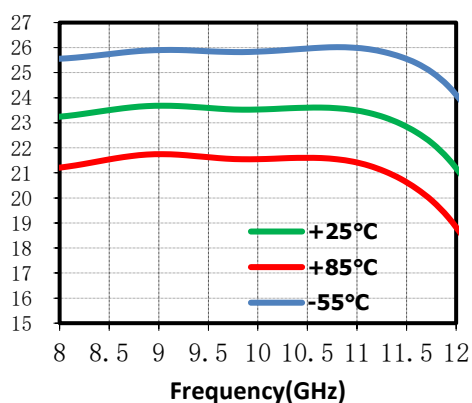
GaAs MMIC Power Amplifier  
8GHz~10.5GHz 37dBm

Rev 1.0

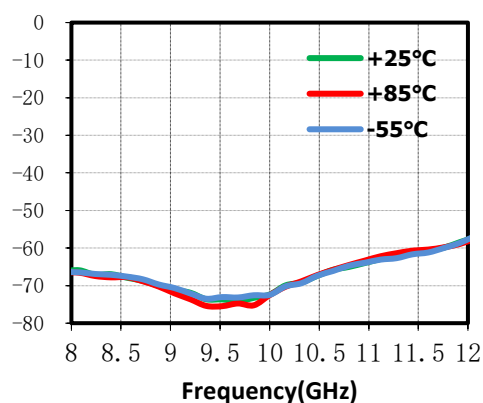
## Typical Performance Curve

$V_D=+8V, I_{DQ}=1.6A, Working\ mode\ CW, T_A=+25^{\circ}C$

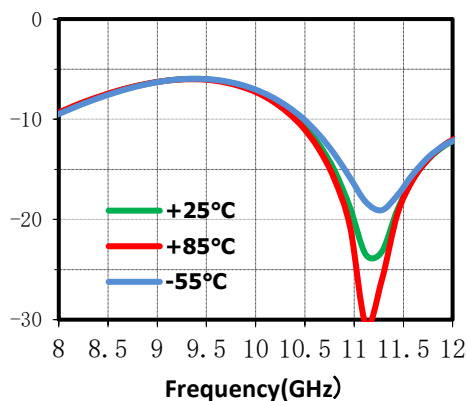
Small Signal Gain(dB) vs. Temperature



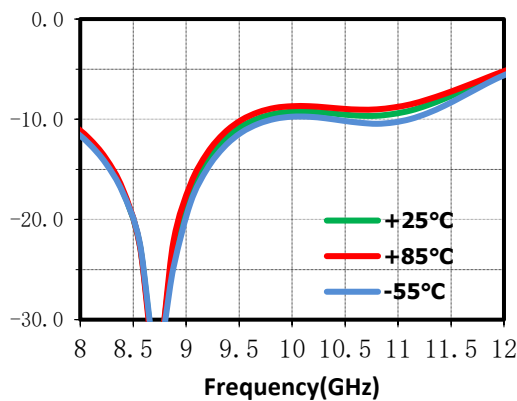
Isolation(dB) vs. Temperature



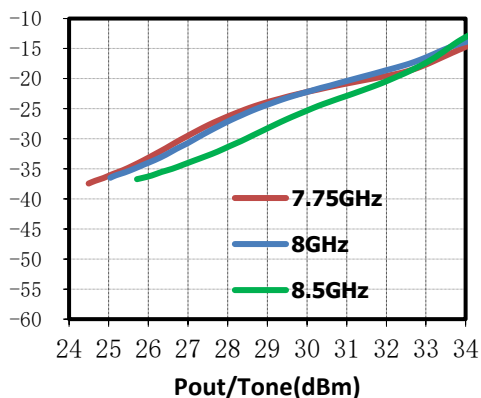
RF Input Return Loss (dB) vs. Temperature



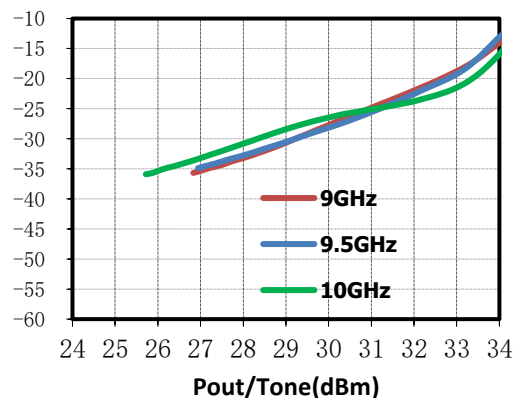
RF Output Return Loss(dB) vs. Temperature



IM3(dBc) vs. Pout/Tone



IM3(dBc) vs. Pout/Tone



### SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA

Tel: 1-847-505-8319, 1-847-573-9866

E-mail: sales@superapexco.com

Website: www.superapexco.com

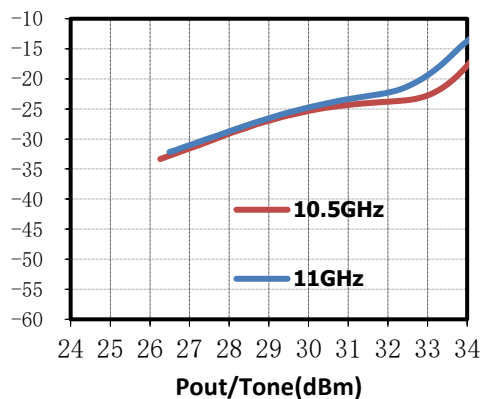
# SAC3149CR5



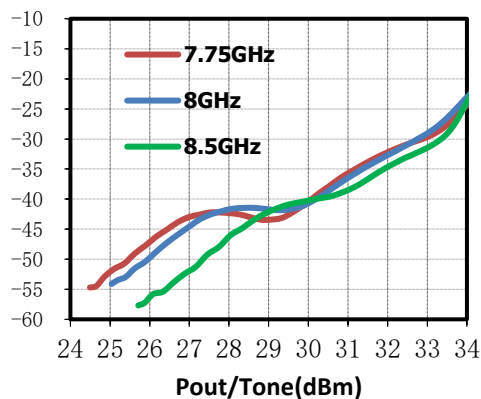
GaAs MMIC Power Amplifier  
8GHz~10.5GHz 37dBm

Rev 1.0

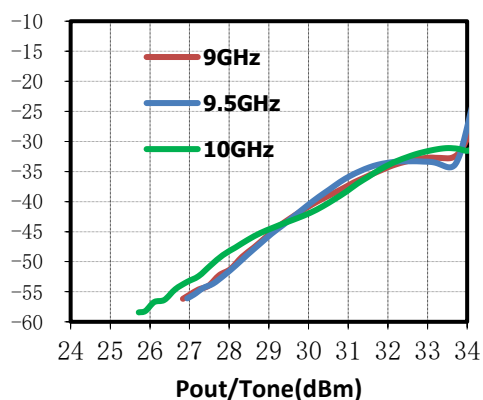
IM3(dBc)vs. Pout/Tone



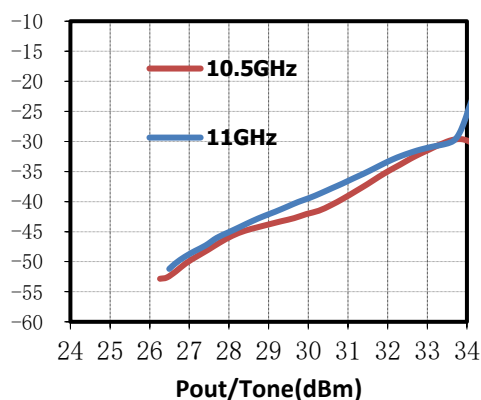
IM5(dBc)vs. Pout/Tone



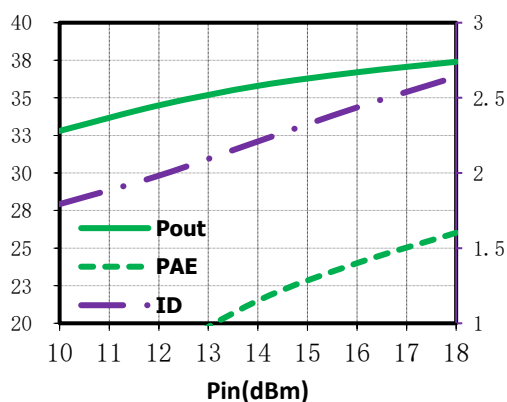
IM5(dBc)vs. Pout/Tone



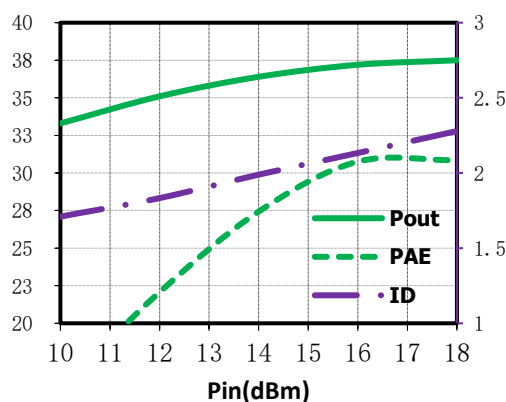
IM5(dBc)vs. Pout/Tone



Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=8GHz



Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=8.5GHz



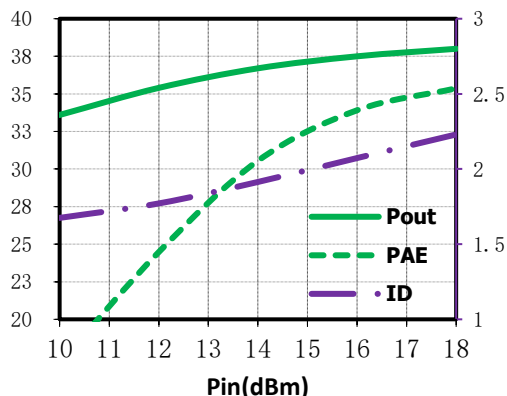
# SAC3149CR5



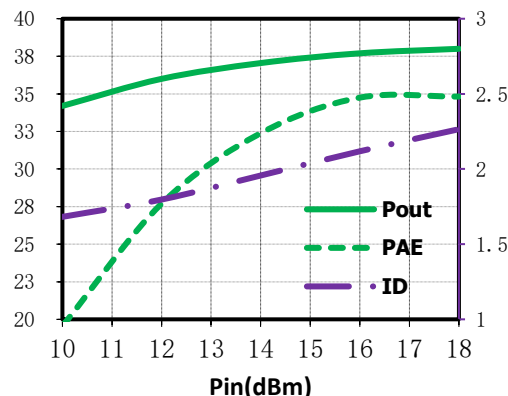
GaAs MMIC Power Amplifier  
8GHz~10.5GHz 37dBm

Rev 1.0

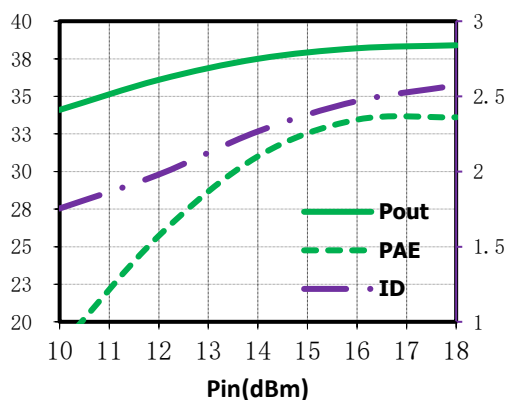
Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=9GHz



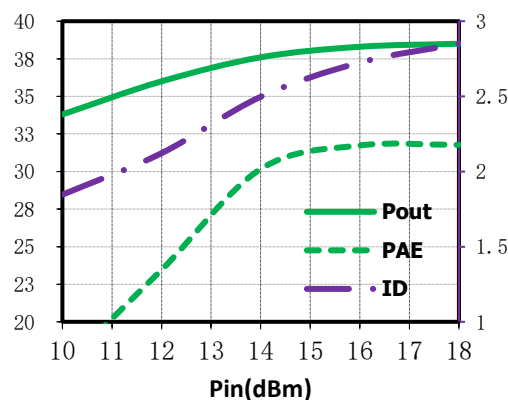
Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=9.5GHz



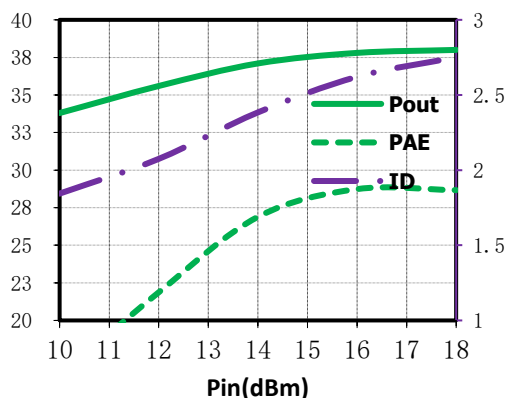
Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=10GHz



Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=10.5GHz



Pout(dBm)、PAE(%)、ID(A) vs. Pin, f=11GHz

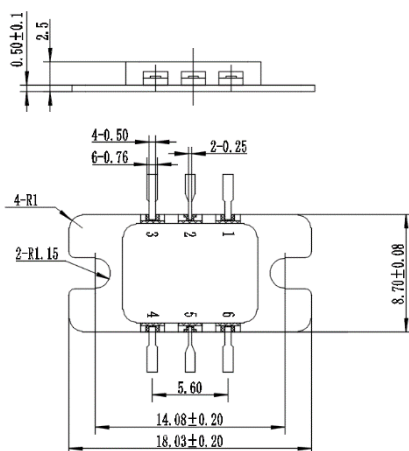


# SAC3149CR5

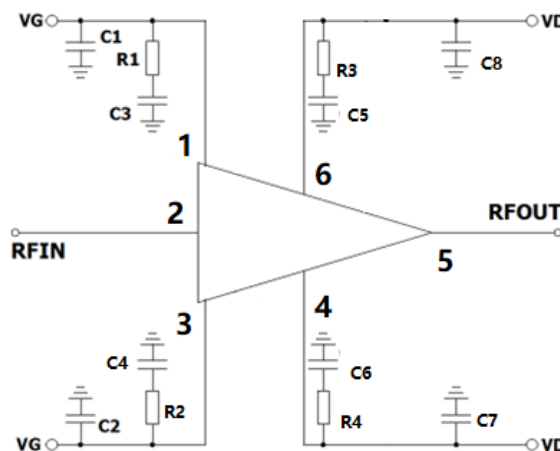
GaAs MMIC Power Amplifier  
8GHz~10.5GHz 37dBm

Rev 1.0

## Die Outline



## Application Circuit



## Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1、C2	10 $\mu$ F	—	—	0805
C3~C6	0.22 $\mu$ F	—	—	0402
C7、C8	2.2 $\mu$ F	—	—	0805
R1~R8	2.2 $\Omega$	—	—	0402

## Notes

- SAC3149CR5 needs VDx and VGx bias. Before applying the positive drain voltage, make sure that the negative grid voltage has been applied;
- The clearance between flange plate and cavity shall not exceed 0.15 mm, and the inductance of ground circuit shall be reduced as much as possible;
- The chip is sensitive to static electricity, so pay attention to anti-static during storage and use;
- The RF input and output ports of the chip do not need to add DC isolation capacitors;
- It is recommended to use M2 screws for installation. The tightening torque is not less than 9N/cm but not more than 15N/cm.

## Revision History

Revision	Date	Comment
1.0	September 7, 2022	First Release