SAC3119

GaAs MMIC Power Amplifier
5.5GHz~6GHz 36dBm

Rev1.5

Features

- Frequency: 5.5GHz~6GHz
- Gain: 22dB
- Output P_{-1}dB: 33~36dBm
- Supply Voltage: +5~8V
- Power-Added Efficiency: 40%@+5V Supply
- Die Size: 2.96mm×2.57mm×0.1mm
- Packaged: Bare Die or QFN5×5

Typical Applications

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

General Description

SAC3119 is a C-band GaAs MMIC power amplifier. SAC3119 provides 22dB of gain, and +36dBm of output power for 1 dB compression and 40% PAE from a +5V~+8V supply.

SAC3119 offers full passivation for increased reliability and moisture protection.

Electrical Performance1 (T_A=25℃, V_D=+5V, I_D=1A, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		5.5 ~ 6		GHz
Small Signal Gain	17	23	—	dB
Small Signal Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-12	—	dB
Power-Added Efficiency	—	40	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	31	33	—	dBm
Drain Voltage (V_D)	—	5	—	V
Supply Current (I_D)	—	1.1	1.7	A

Electrical Performance2 (T_A=25℃, V_D=+8V, I_D=1A, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		5.5 ~ 6		GHz
Small Signal Gain	19	21	—	dB
Small Signal Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-12	—	dB
Power-Added Efficiency	—	40	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	35.5	36	—	dBm
Drain Voltage (V_D)	—	8	—	V
Supply Current (I_D)	—	1.5	2	A

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

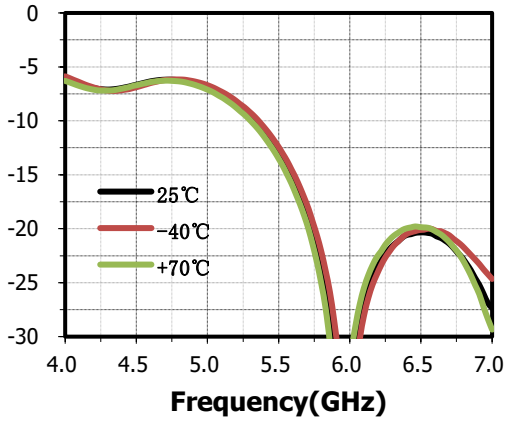
Absolute Maximum Ratings

Maximum Input Power	+20dBm	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Maximum V_D	+9V	Maximum V_G	-1.2V

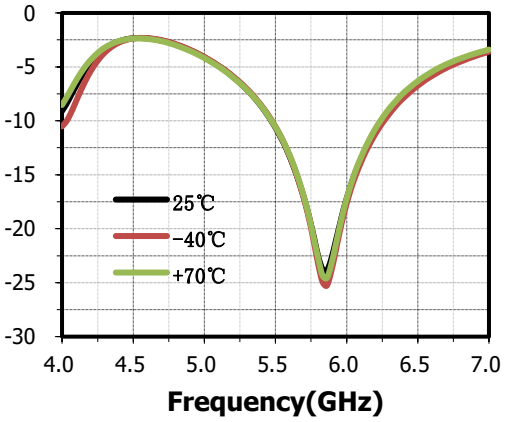
Typical Performance Curve

Data obtained from 3.5-mm connector-based test fixture,
and this data includes connecter loss and board loss(≈0.7dB)
V_D=5V, I_{DQ}=1000mA

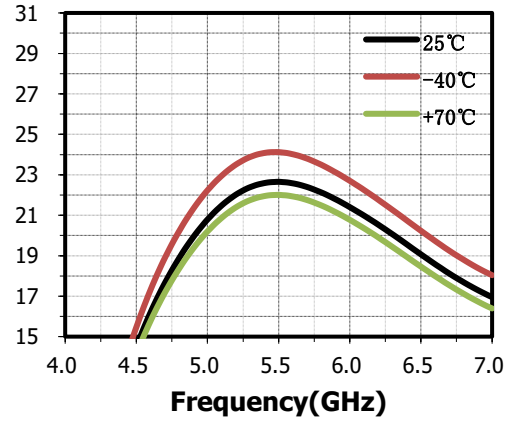
Input Return Loss(dB) vs.Temperature



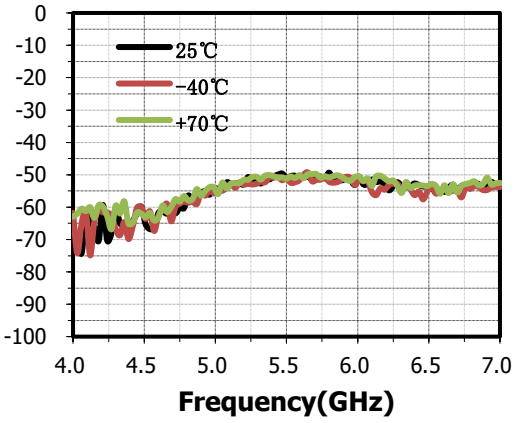
Output Return Loss(dB) vs.Temperature



Small Signal Gain(dB) vs.Temperature



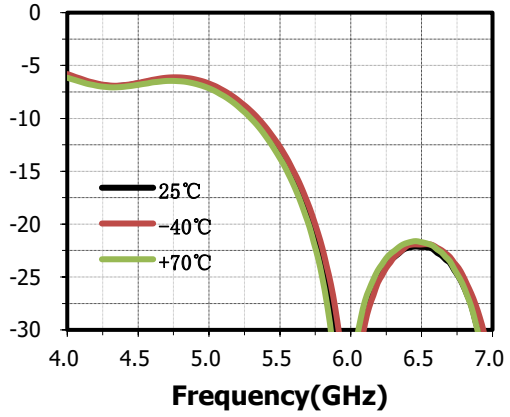
Reverse Isolation(dB) vs.Temperature



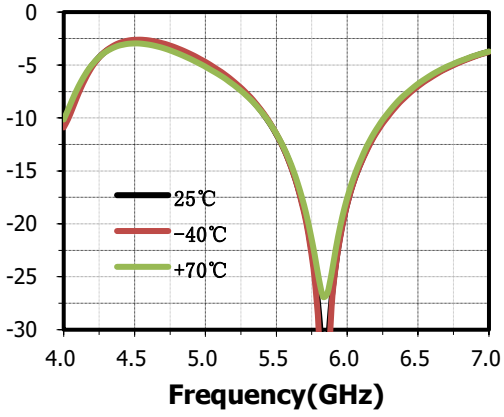
SuperApex, LLC
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

V_D=8V, I_{DQ}=1000mA

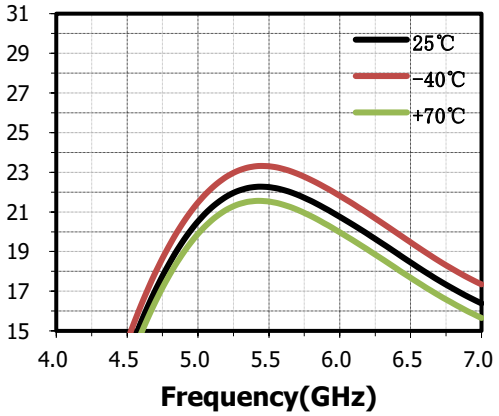
Input Return Loss(dB) vs.Temperature



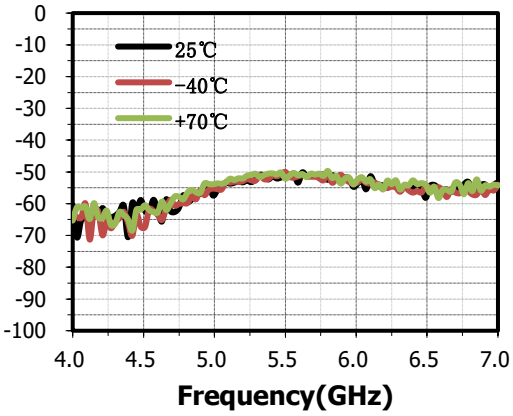
Output Return Loss(dB) vs.Temperature



Small Signal Gain(dB) vs.Temperature

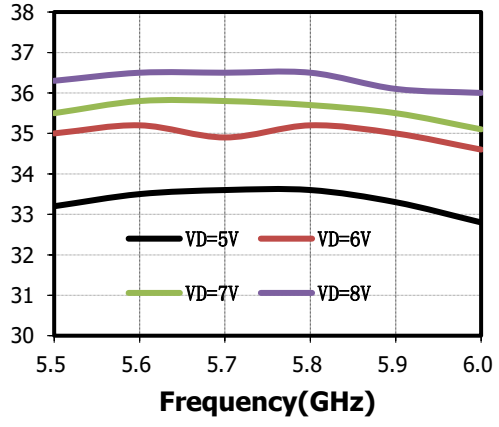


Reverse Isolation(dB) vs.Temperature

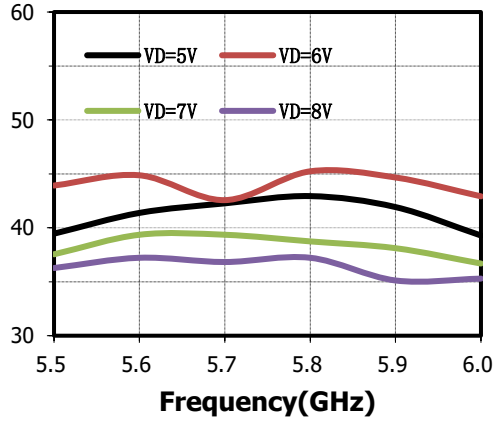


Power and PAE Performance Curve

OP-1dB(dBm) vs.V_D

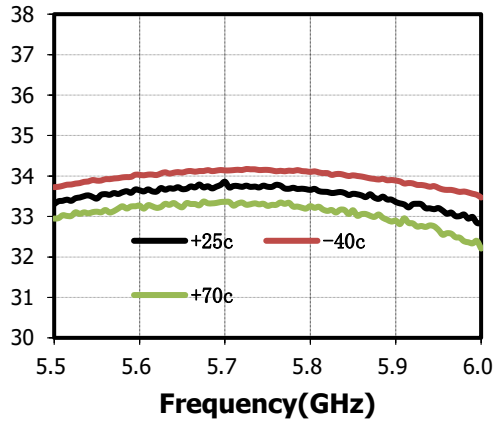


PAE(%) vs.V_D

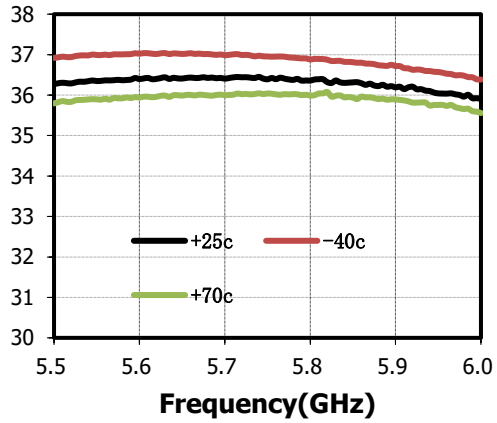


SuperApex, LLC
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

OP-1dB(dBm) vs.Temperature @VD=5V

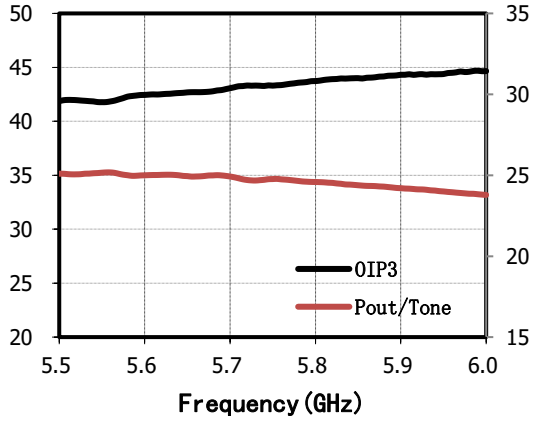


OP-1dB(dBm) vs.Temperature@VD=8V

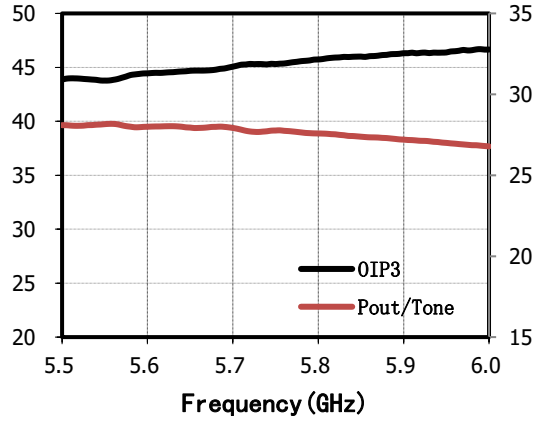


Output IP3 vs. Supply Voltage Performance Curve

OIP3(dBm) vs. POUT/Tone@VD=5V

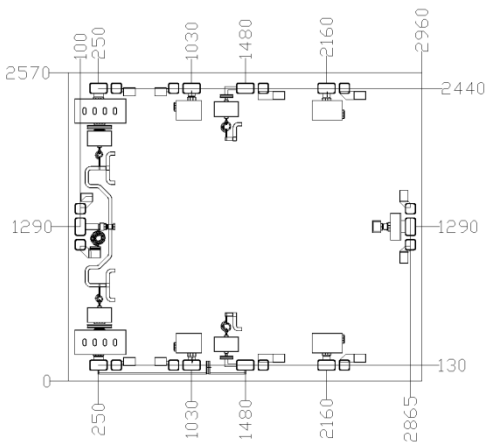


OIP3(dBm) vs. POUT/Tone@VD=8V



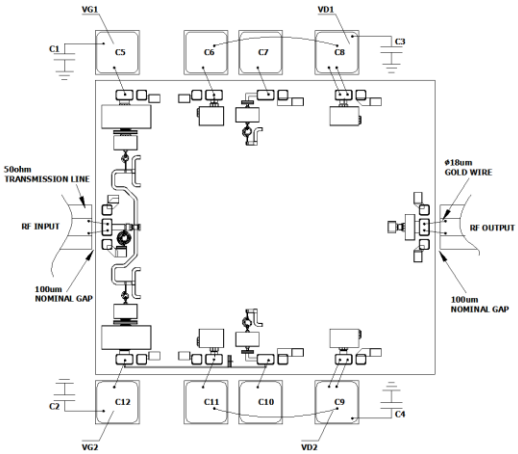
Die Outline

(All dimensions in μm)



Bonding pad size:130x80μm

Assembly Diagram



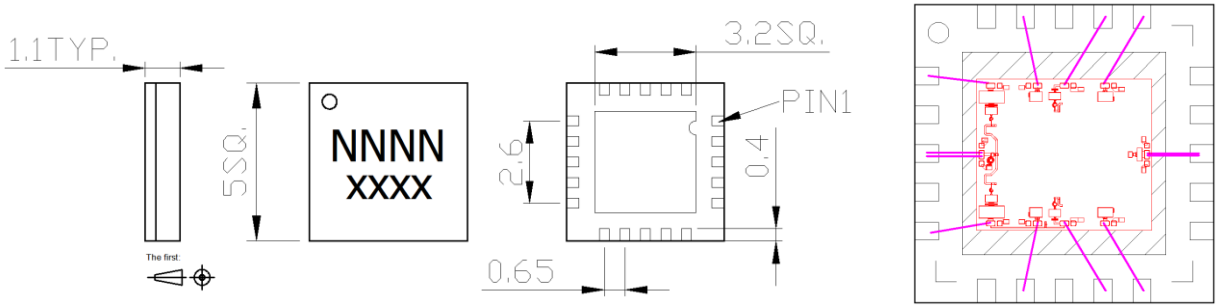
SuperApex, LLC
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1～C4	1uF	GRM155R61A105KE15D	Murata	0402
C5～C12	300pF	-	ANY	SLC

QFN5×5 Outline

(All dimensions in mm)



Pin Function

Pin No.	Func.	Pin No.	Func.	Pin No.	Func.
1	Gate Bias1	10	DrainBias2	19	DrainBias4
2	NC	11	NC	20	NC
3	RF IN	12	NC		
4	NC	13	RF OUT		
5	Gate Bias2	14	NC		
6	NC	15	NC		
7	Drain Bias1	16	DrainBias3		
8	NC	17	GateBias4		
9	Gate Bias3	18	NC		

Notes

1. SAC3119 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -0.7~-0.85 V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized. The RF input and output require a double bond wire as shown.
3. The backside of the SAC3119 die is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C1~C4 should be placed no farther than 1.5mm from the chip.