

# SAC3109Q6



GaAs MMIC Power Amplifier  
5GHz~6GHz 37dBm

Rev2.2

## Features

- Frequency: 5GHz~6GHz
- Gain: 34dB
- Output P<sub>-1dB</sub>: 35dBm@8V
- Supply Voltage: +5~8V
- Power-Added Efficiency: 40%@8V
- Packaged Size: 6mm × 6mm × 1.1mm

## Typical Applications

- Microwave radio including point to point communication
- Telecommunication
- Weather radar
- Optical communication
- Test instrumentation
- SatCom
- VSAT
- Military and Aerospace

## General Description

SAC3109Q6 is a C-band GaAs MMIC power amplifier. SAC3109Q6 provides 34 dB of gain, and +35 dBm of output power for 1dB compression and 40% PAE from a +8V supply.

## Electrical Performance (T<sub>A</sub>=25°C, V<sub>D</sub>=+8V, I<sub>D</sub>=1.1A, Z<sub>0</sub>=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	5 ~ 6			GHz
Small Signal Gain	25	34	—	dB
Small Signal Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-22	—	dB
Power-Added Efficiency	—	40	—	%
Output Power for 1 dB Compression (OP <sub>-1dB</sub> )	—	35	35.5	dBm
Drain Voltage(V <sub>D</sub> )	—	8	—	V
Supply Current(I <sub>D</sub> )	—	1.5	2.2	A

## Absolute Maximum Ratings

Maximum Input Power	+20dBm	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V <sub>D</sub>	+9V	Maximum V <sub>G</sub>	-1.2V

### 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

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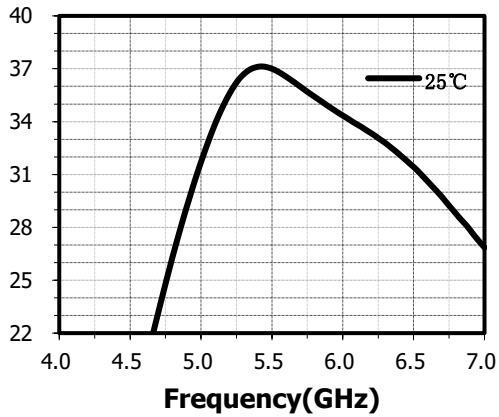
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## Typical Performance Curve

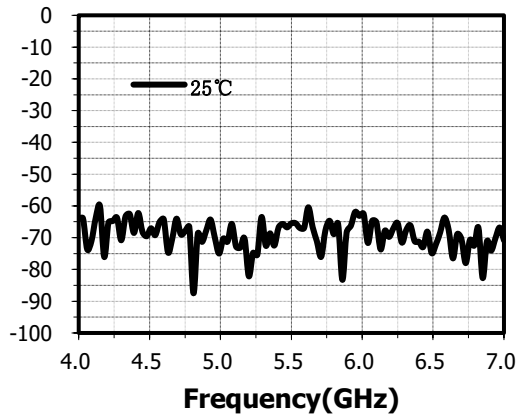
S-parameters

$V_D=8V$   $I_{DQ}=1.1A$   $T_A=25^\circ C$

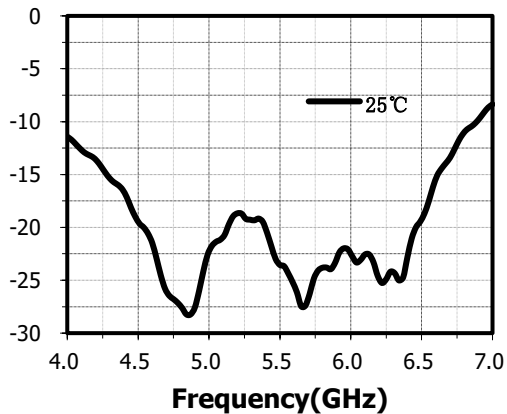
Small Signal Gain(dB) vs.Temperature



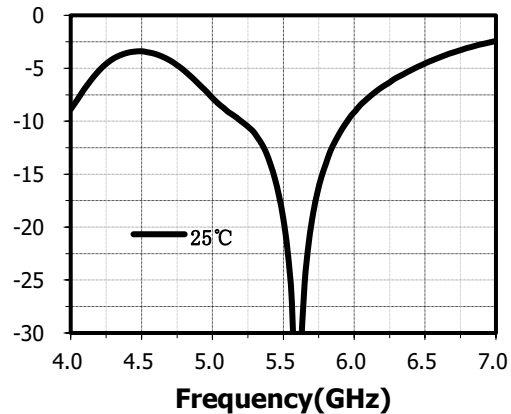
Reverse Isolation(dB) vs.Temperature



Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature



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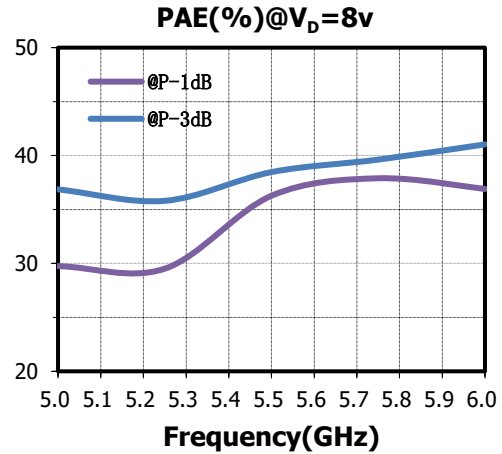
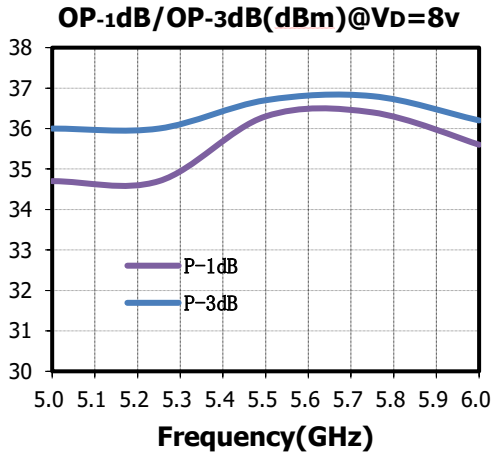
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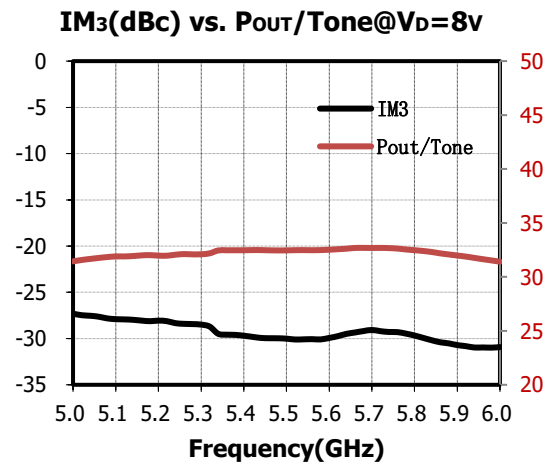
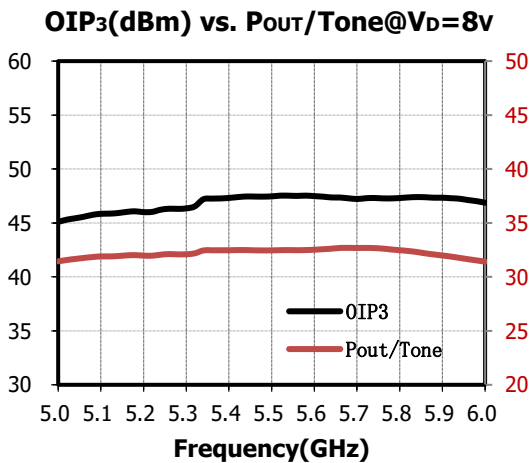
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## S-parameters $V_D=8V$ $I_{DQ}=1.1A$ $T_A=25^\circ C$



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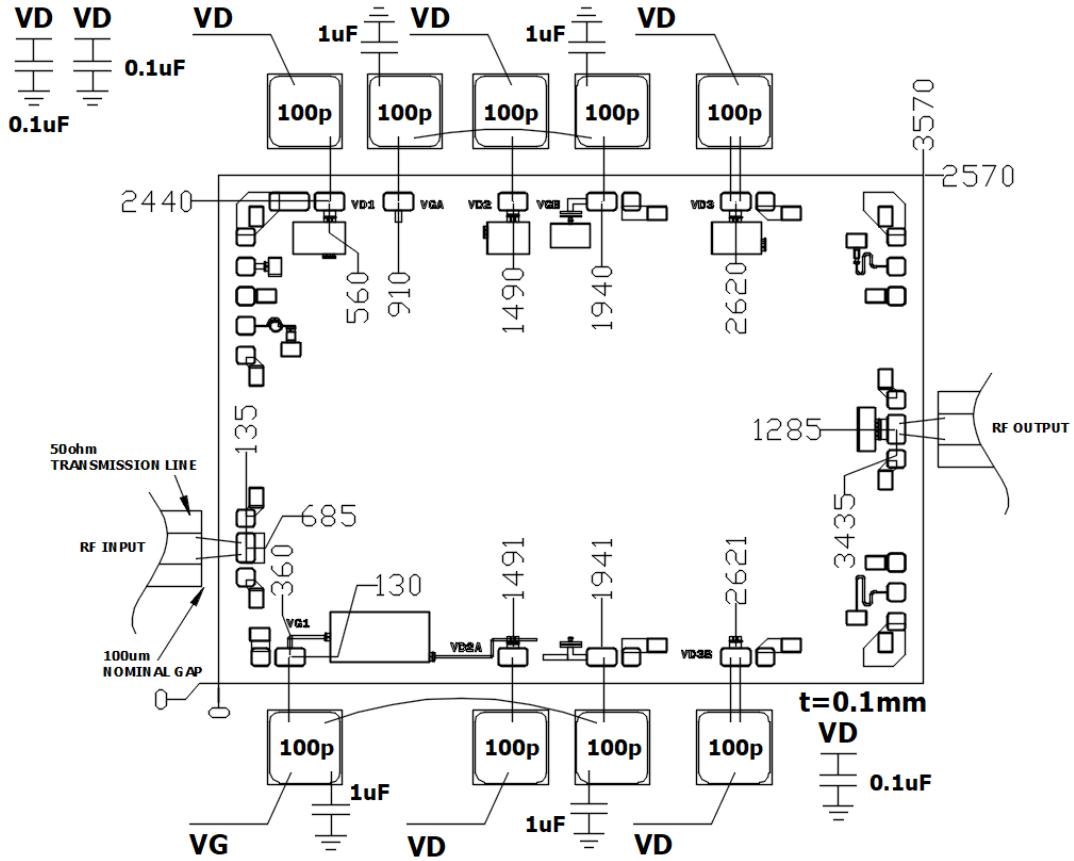
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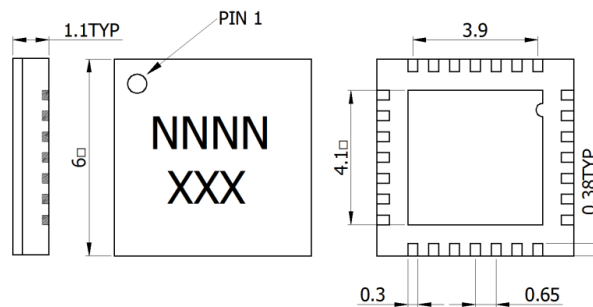
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## Bare die physical layout



## QFN 6x6 Outline Drawing

Lead-Free 6mm 28-Lead PQFN (all dimensions in mm)



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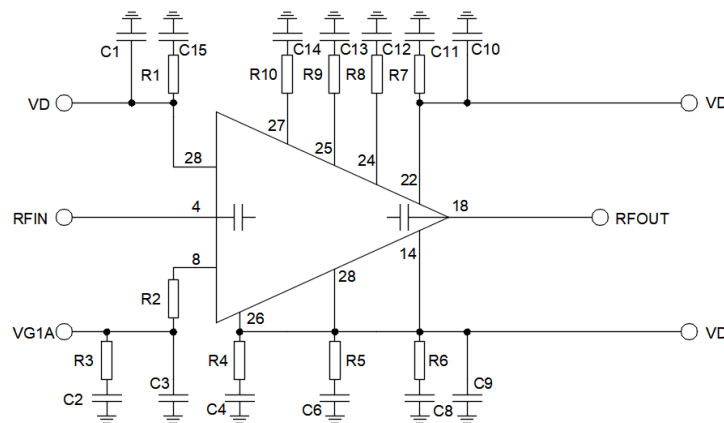
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PIN No.	Func.	PIN No.	Func.	PIN No.	Func.	PIN No.	Func.
1	Connect to GND	10	NC	19	Connect to GND	28	VD1A
2	Connect to GND	11	NC	20	Connect to GND		
3	Connect to GND	12	NC	21	Connect to GND		
4	RF IN	13	NC	22	VD3A		
5	Connect to GND	14	VD3B	23	NC		
6	Connect to GND	15	Connect to GND	24	VG Bias		
7	Connect to GND	16	Connect to GND	25	VG Bias		
8	VG1A	17	Connect to GND	26	VD2		
9	NC	18	RF OUT	27	VG Bias		

Part No.	Value	Part No.	Value	Part No.	Value
R1	2.2R	R10	2.2R	C9	10uF
R2	2.2R	C1	10uF	C10	10uF
R3	10R	C2	0.68uF	C11	0.68uF
R4	2.2R	C3	10uF	C12	0.68uF
R5	2.2R	C4	0.68uF	C13	0.68uF
R6	2.2R	C6	0.68uF	C14	0.68uF
R7	2.2R	C8	0.68uF	C15	0.68uF
R8	2.2R				
R9	2.2R				



### Attention:

1. The moisture resistant grade of products is 2A, the storage environment  $\leq 30^{\circ} \text{C}/60\% \text{RH}$ , The surrounding workshop Life is 4 weeks.
2. After un-packing, It is necessary to bake the parts for 6 hours in  $125 \pm 5$  degree environment before soldering.