

SAC3106Q6

GaAs MMIC Power Amplifier
27GHz~33GHz 31.5dBm

Rev 2.4

Features

- Frequency: 27GHz~33GHz
- Gain: 17dB
- Output P_{-1dB}: 31.5dBm
- Output I_{P3}: 36dBm
- Supply Voltage: +6V
- Power-Added Efficiency: 20%
- Size: 6mm×6mm×1.1mm

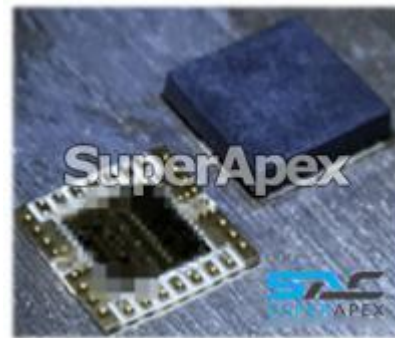
Typical Applications

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

General Description

SAC3106Q6 is a wideband GaAs MMIC power amplifier which operates between 27GHz~33GHz. SAC3106 provides 17dB of gain, 31 dBm of output power for 1 dB compression and 20% PAE from a +6V supply.

Picture



Electrical Performance (T_A=25°C, V_D=+6V, I_D=1100mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	27~33			GHz
Small Signal Gain	14	17	—	dB
Small Signal Gain Flatness	—	±2.5	—	dB
Reverse Isolation	—	-45	—	dB
Input Return Loss	—	-5	—	dB
Output Return Loss	—	-5	—	dB
Power-Added Efficiency	—	20	—	%
Output Power for 1 dB Compression (OP _{-1dB})	30.5	31.5	—	dBm
Output Third Order Intercept (OIP ₃) * 1	—	36	—	dBm
Drain Voltage (V _D)	5	—	6	V
Supply Current (I _D) 2	—	1000	1800	mA

*1. Measurement taken at P_{out} / Tone = +27 dBm

2. Fine-tuning VG from -0.5 ~ -0.8 V to make IDQ equal to 1100 mA.

Absolute Maximum Ratings

Maximum Input Power	+19dBm	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.5V	Maximum V _G	-1.2V

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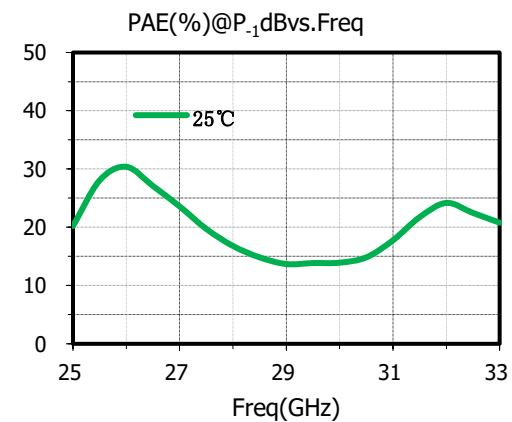
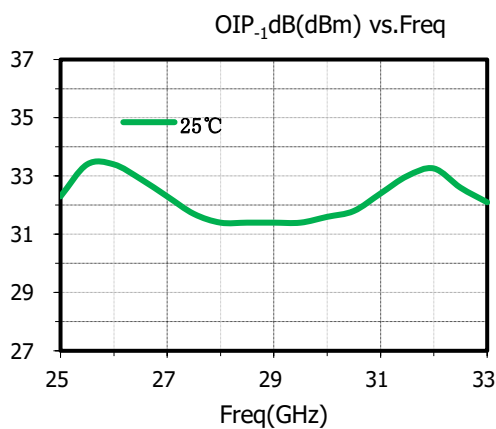
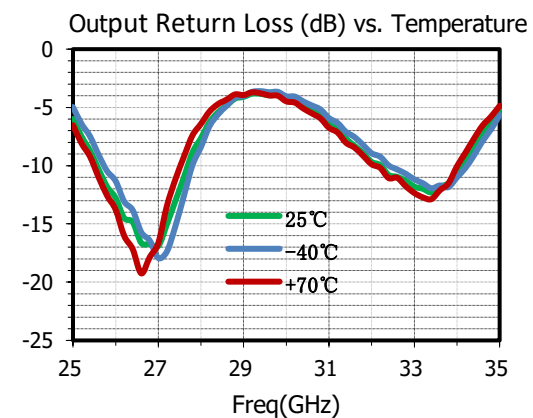
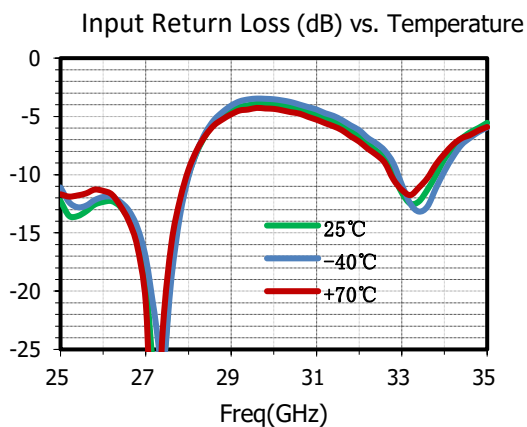
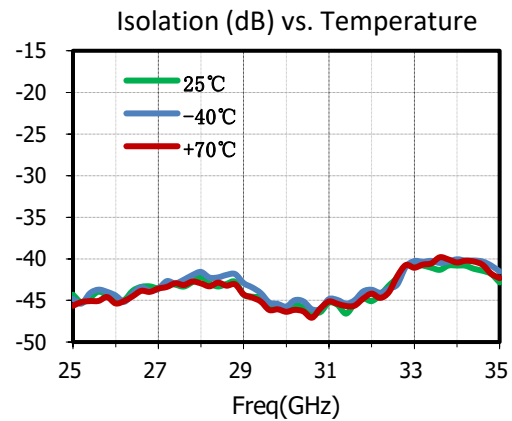
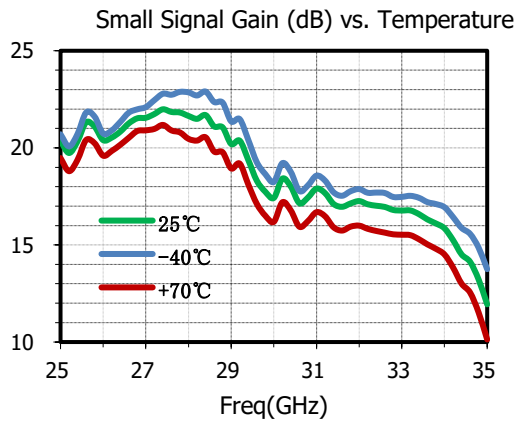
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Typical Performance Curve

S-parameter Data obtained from On-Wafer RF Probe Test Results
OP₁dB and PAE Data obtained from K connector-based test fixture

*Bias Conditions: V_D =6V, I_D =1000mA



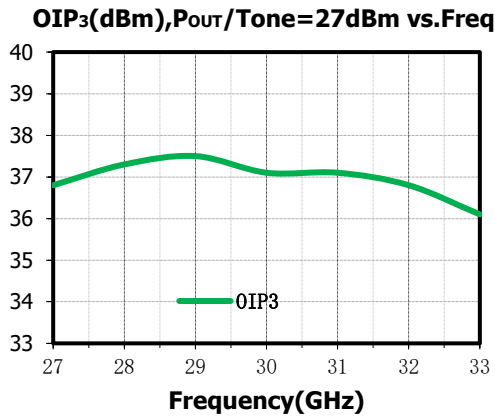
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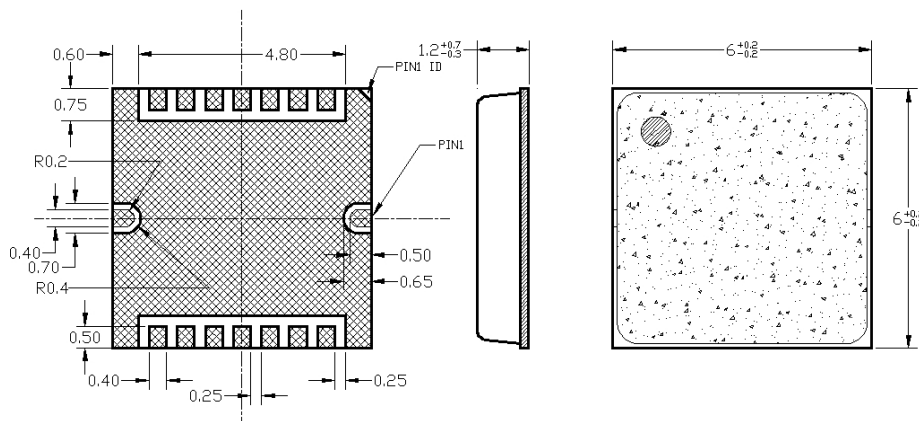
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Outline Drawing (All dimensions in mm)



Pin Descriptions

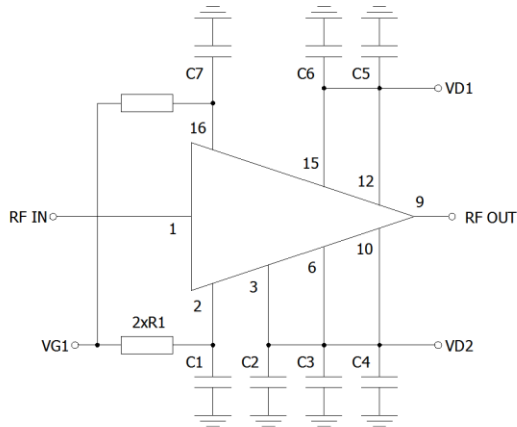
Pin No.	function	Pin No.	function
1	RF Input, Internal grounding	9	RF Output, AC coupled
2	Gate1 A	10	Drain 3
3	Drain A	11	NC
4	NC	12	Drain 2B
5	NC	13	NC
6	Drain 2 A	14	NC
7	NC	15	Drain 1B
8	NC	16	Gate 1 B

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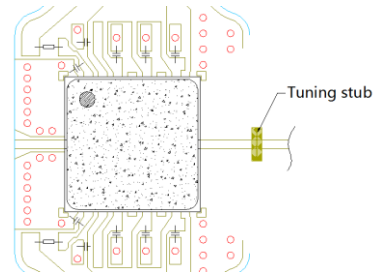
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Application Circuit

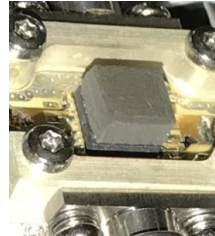


Recommended use of this chip with special attention

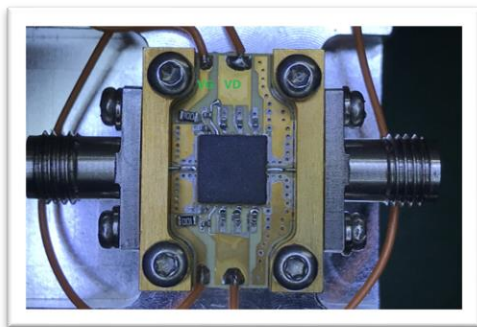
1. It is highly recommended to reserve a micro-strip line at the output of device, it will be used for fine tune of output power etc.



2. If there is resonance, try to put some absorbing material at the top of the device.

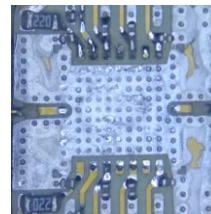


SAC3106Q6 test fixture layout



1. PCB substrate: RO4350B,
Thickness of substrate: 0.254mm
2. Contain 2 K-Connector, 2 glass insulator

3. Put all de-coupling capacitors as closer as possible to the device.
4. In order to prevent the device being destroyed by bad heat dissipation, make sure most of the ground via be filled with solder paste once device soldering work has been done.



5. Use thin PCB board to short the thermal dissipation path.

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Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1、C7	2.2uF	GRM033R61A225KE47D	Murata	0201
C2~C6	0.047uF	GRM033R61A473KE47D	Murata	0201
R1*	10Ω	—	ANY	0603

*The value of R1 is related the internal resistance of gate bias circuit, when the internal resistance of the gate bias circuit is less than 2 Ohms, set the R1 to 5.1--15 Ohms.

Attention:

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

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