SAC3156

GaAs MMIC Power Amplifier
2GHz~8.5GHz 30dBm

Rev 1.0

Features

- Frequency: 2GHz~8.5GHz
- Small Signal Gain: 18dB
- Output P-3dB: 30dBm CW
- Die Size: 3.0mm×1.25mm×0.1mm
- Supply Voltage: +7V/-Vg
- Packaged: Bare Die

Typical Applications

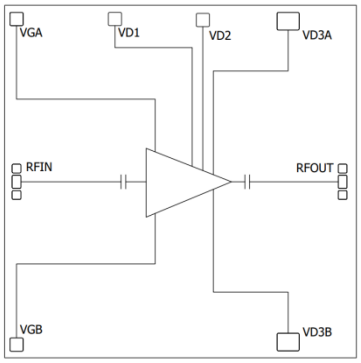
- S. C-band multifunction radar
- Point-to-Point Radios

General Description

SAC3156 is a S-band and C-band GaAs power amplifier. SAC3156 provides 18 dB of gain, and 30dBm of output power for 3 dB compression (Typ.) from a +7 supply.

The surface of SAC3156 chip is covered with dielectric layer protective layer, which has good environmental adaptability and stability. At the same time, the chip adopts on-chip metallization process to ensure good grounding. The back of the chip is metallized.

Functional Diagram



Electrical Performance

T_A=25℃, VD=+7V, I_{DQ}=0.6A, Z_0=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency	2	—	8.5	GHz
Small Signal Gain	15	18	—	dB
Small Signal Gain Flatness	—	±3	—	dB
Reverse Isolation	—	-70	—	dB
RF input port VSWR	—	1.9	2.2	:1
RF output port VSWR	—	2.0	2.5	:1
Power-Added Efficiency	—	20	—	%
Output P_{-1}dB	28	29	—	dBm
Drain Voltage (V_D)	—	—	7.5	V
Gate Current	—	20	—	μA
Supply Current (I_D)**	—	—	0.65	A
Thermal Resistance	—	17.8	—	℃/W

*Adjust the Vg voltage (- 1 ~ -0.65V) so that the I_{DQ} is about 0.65A, and the typical Vg voltage is -0.6V

Absolute Maximum Ratings

Maximum Input Power	+20dBm	Operating Temperature (Backside)	-55℃~+85℃
Channel Temperature	165℃	Storage Temperature	-55℃~+150℃
Maximum V_D Supply	+8V	V_G Range	-1.4V (Pinch Off) ~-0.5V

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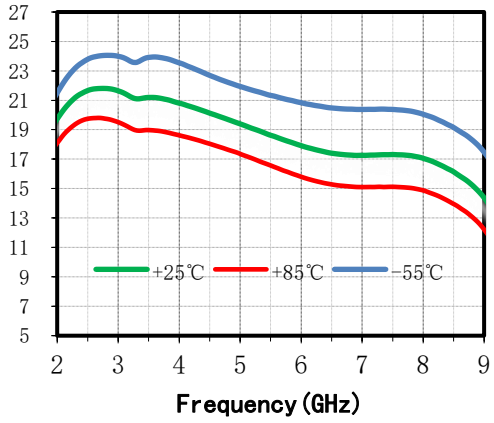
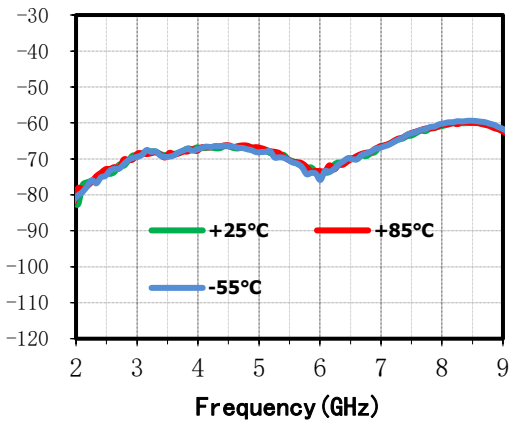
Typical Performance Curve

The following data are obtained by SAC3156 evaluation board test, V_D = + 8V, I_{DQ} = 0.56A, working mode CW, T_A = + 25℃

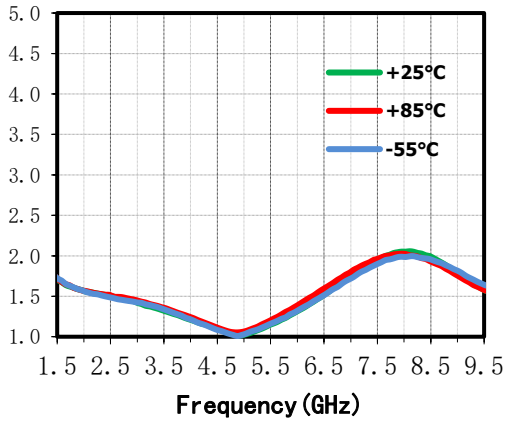
Small Signal Gain(dB) vs.Temperature



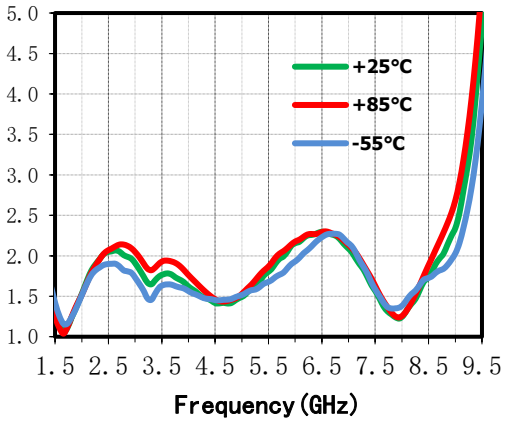
Isolation(dB) vs.Temperature



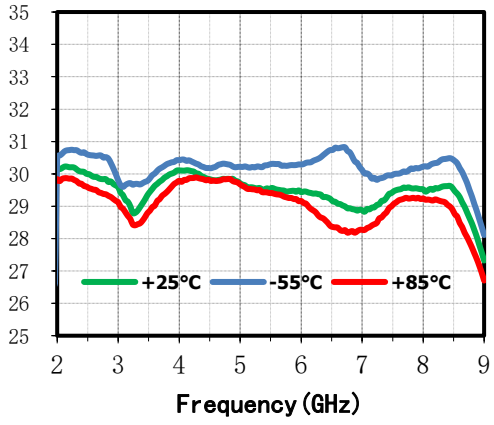
Input VSWR(:1) vs.Temperature



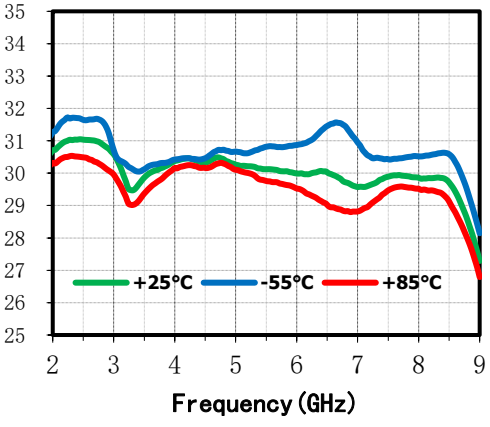
Output VSWR(:1) vs.Temperature

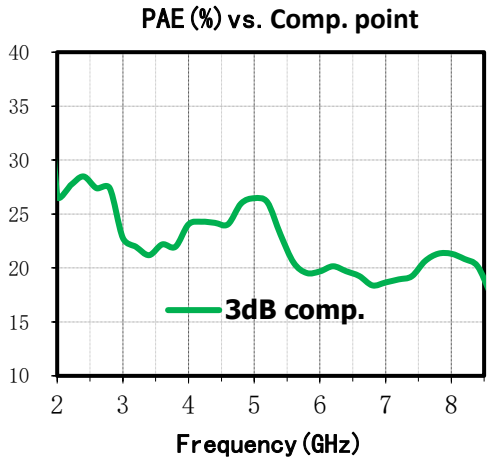


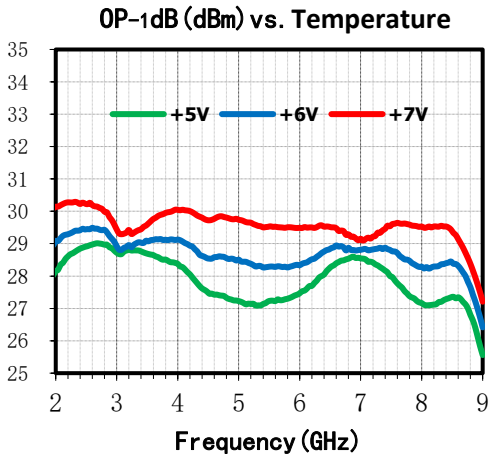
OP-1dB (dBm) vs. Temperature



OP-3dB (dBm) vs. Temperature

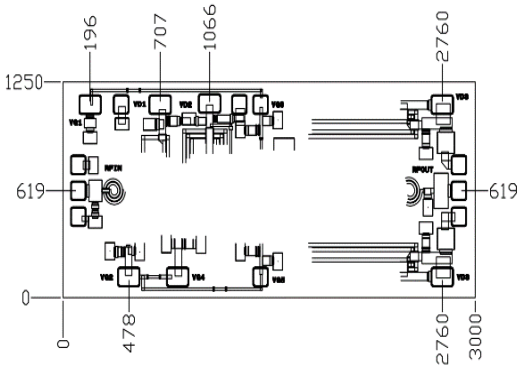




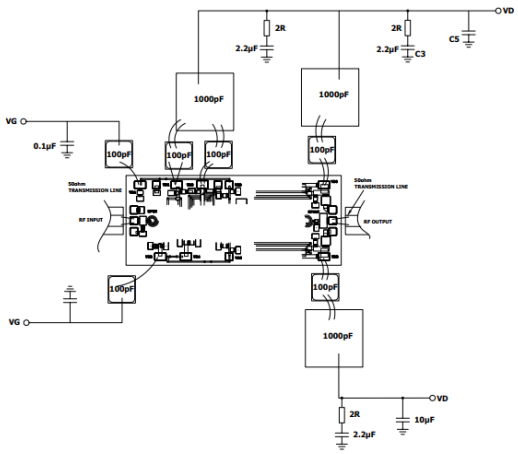


Outline Drawing

(All dimensions in μm)



Assembly Diagram



Attention:

1. SAC3156 requires drain positive voltage (VD_X) and grid negative voltage (VG_X) bias. Before applying drain positive voltage, ensure that grid negative voltage has been applied. When closing, ensure that drain positive voltage is turned off before grid negative pressure;

2. The length of RF input / output gold wire shall be shortened as much as possible. It is recommended to use gold wire with a diameter of 25μm;

3. It is recommended to use vacuum AuSn eutectic welding.

Revision History

Revision	Date	Comment
1.0	DEC 25, 2022	First Release

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