

Features

- Frequency: 2.5GHz~8.5GHz
- Small Signal Gain: 28dB
- Output P_{-1dB}: 36dBm CW
- Die Size: 5.0mm×5.0mm×0.1mm
- Supply Voltage: +8V/-V_g
- Packaged: Bare Die

General Description

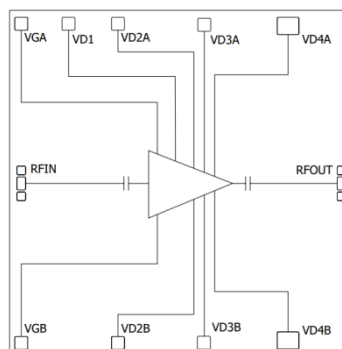
SAC3157 is a S-band and C-band GaAs power amplifier. SAC3157 provides 28 dB of gain, and 36dBm of output power for 1 dB compression (Typ.) from a +8 supply.

The surface of SAC3157 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.

Typical Applications

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

Functional Diagram



Electrical Performance

T_A=25°C, V_D=+8V, I_{DQ}=2.5A, Z₀=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency	2.5	—	8.5	GHz
Small Signal Gain	25	28	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-70	—	dB
RF input port VSWR	—	1.9	2.2	:1
RF output port VSWR	—	2.0	2.8	:1
Power-Added Efficiency	—	20	—	%
Output P _{-1dB}	35	36	—	dBm
Drain Voltage (V _D)	—	—	8.5	V
Gate Current	—	20	35	mA
Supply Current(I _D)**	—	2.5	—	A
Thermal Resistance	—	2.5	—	°C/W

*Adjust the V_g voltage (-1 ~ -0.65V) so that the I_{DQ} is about 2.5A, and the typical V_g voltage is -0.6V

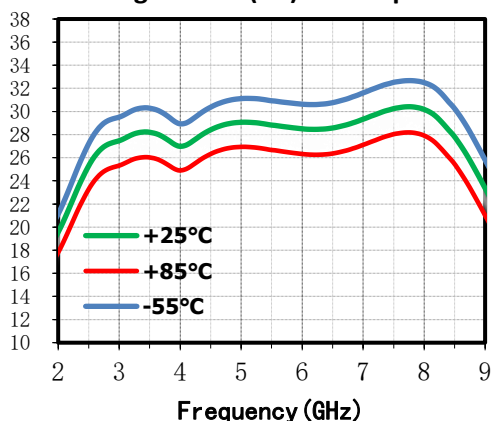
Absolute Maximum Ratings

Maximum Input Power	+27dBm	Operating Temperature (Backside)	-55°C~+85°C
Channel Temperature	165°C	Storage Temperature	-55°C~+150°C
Maximum V _D Supply	+9V	V _G Range	-1.4V (Pinch Off) ~-0.5V

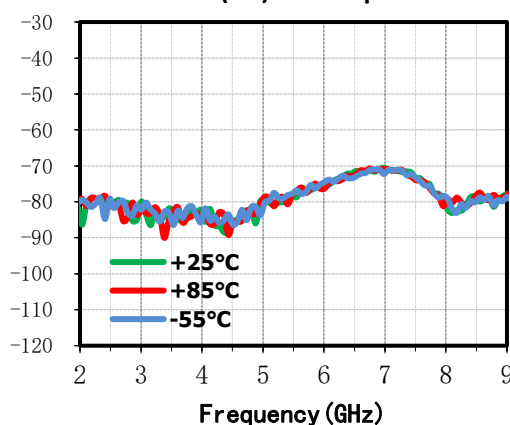
Typical Performance Curve

The following data are obtained by SAC3157 evaluation board test, $V_D = +8V$, $I_{DQ} = 2.5A$, working mode CW, $T_A = +25^\circ C$

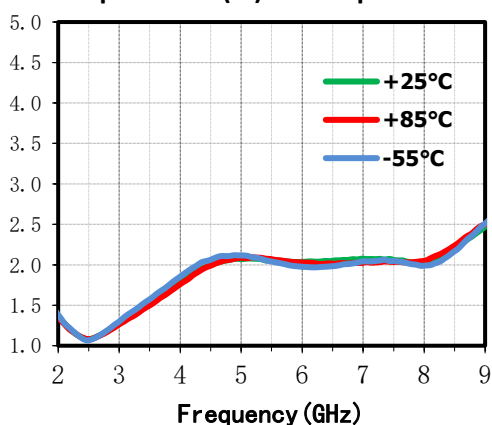
Small Signal Gain(dB) vs. Temperature



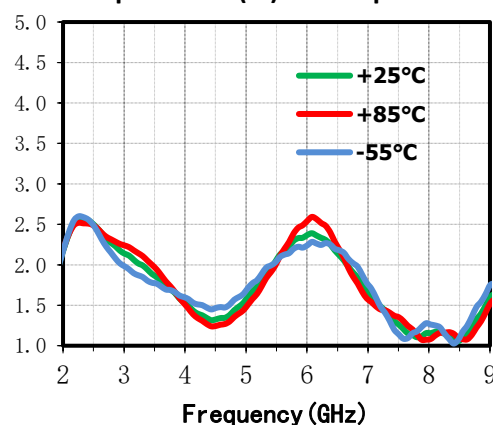
Isolation(dB) vs. Temperature



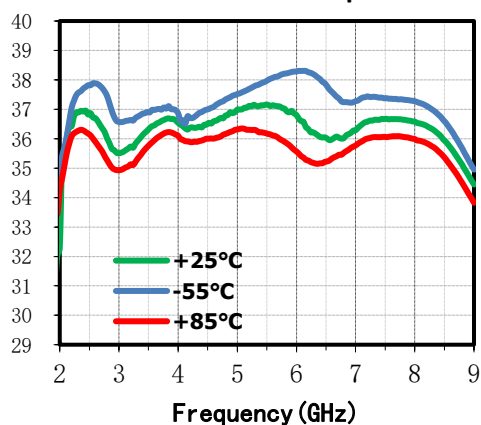
Input VSWR(:1) vs. Temperature



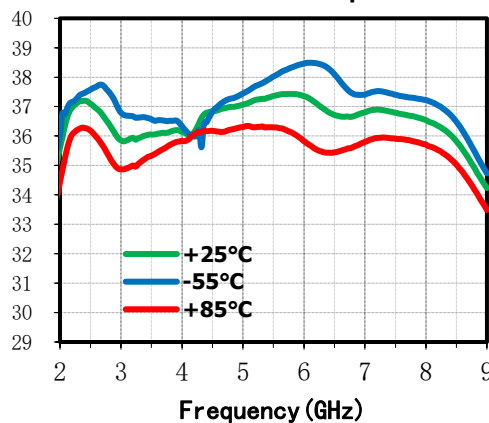
Output VSWR(:1) vs. Temperature



OP-1dB (dBm) vs. Temperature



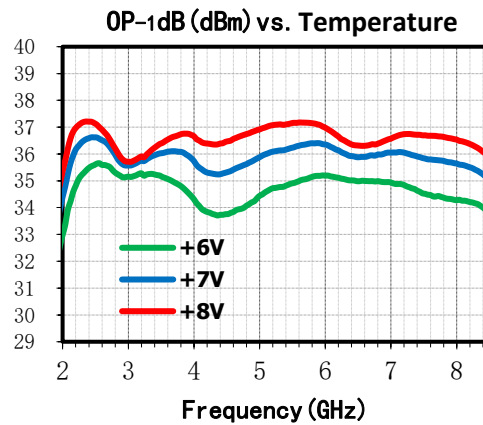
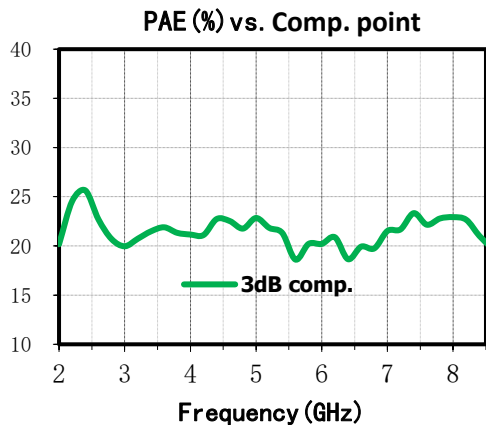
OP-3dB (dBm) vs. Temperature



SAC3157

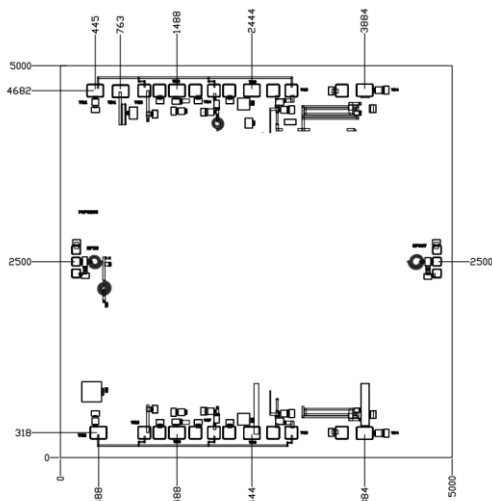
GaAs MMIC Power Amplifier
2.5GHz~8.5GHz 36dBm

Rev 1.2

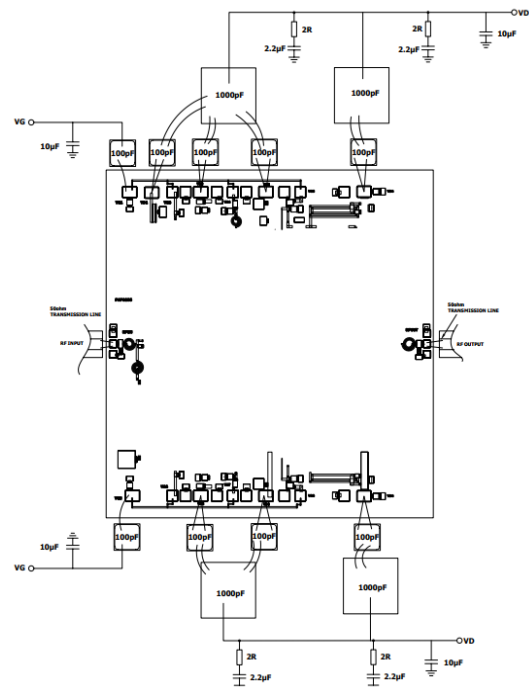


Outline Drawing

(All dimensions in μm)



Assembly Diagram



Attention:

1. SAC3157 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 $25\mu\text{m}$;
3. It is recommended to use vacuum AuSn eutectic welding.

SAC3157



GaAs MMIC Power Amplifier
2.5GHz~8.5GHz 36dBm

Rev 1.2

Revision History

Revision	Date	Comment
1.0	DEC 25, 2022	First Release
1.1	MAR 24, 2023	Fix Gate Current and Supply Current (ID)
1.2	JUN 15, 2023	Modify Chip size

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