SAC3129

GaAs MMIC Power Amplifier
37GHz～40GHz 30dBm

Rev 2.0

Features

- Frequency: 37GHz～40GHz
- Gain: 20dB
- PAE:20%@P_{-1}dB, f=38GHz
- Output P_{-1}dB: 30dBm
- Supply Voltage: +5～+6V
- Die Size: 3.25mm×2.45mm×0.1mm

Typical Applications

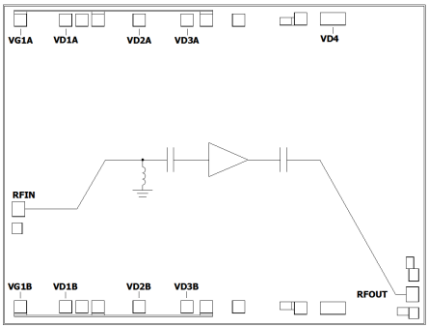
- Microwave radio
- Test instrumentation
- VSAT

General Description

The SAC3129 is a Ka-band GaAs MMIC power amplifier. The SAC3129 provides 20 dB of gain, and 30dBm of output power for 1 dB compression and 20% PAE from +6V supply.

The chip has surface passivation for protection and backside via holes and gold metallization to allow a conductive epoxy die attach process. This device is well suited for communications, Point to Point radio and VSAT applications.

Functional Diagram



Electrical Performance

T_A=25℃,V_D=+6V, I_D=1000mA,Z_0=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range	37	—	40	GHz
Small Signal Gain	16.5	20	—	dB
Small Signal Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-8	—	dB
Output Return Loss	—	-9	—	dB
Power Added Efficiency	—	20	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	30	—	—	dBm
Drain Voltage(V_D)	5	—	6	V
Supply Current(I_D)	—	1000	1600	mA

Absolute Maximum Ratings

Maximum Input Power	+16dBm	Operating Temperature	-40℃～+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃～+150℃
Maximum V_D	+6.3V	Maximum V_G	-1.2V

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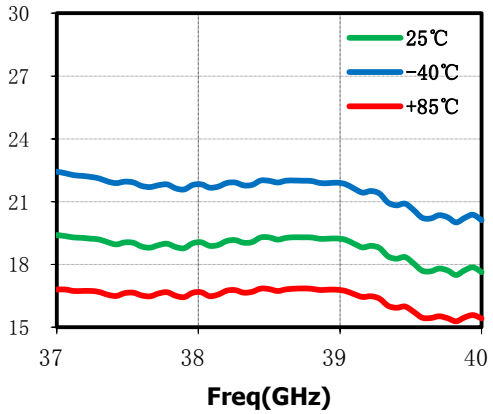
Typical Small Signal Performance Curve

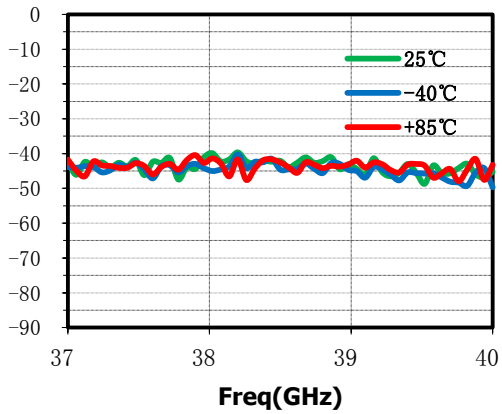
The test results are derived from measurements in a 50ohm fixture test environment. Aspects of the amplifier performance may be improved over a more narrow bandwidth by application of additional conjugate, linearity, or high PAE matching.

V_D=+6V I_D=1000mA

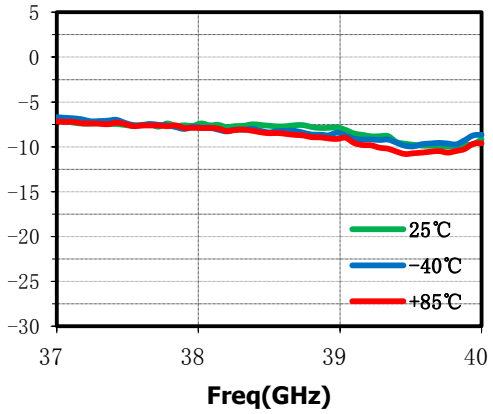
Small Signal Gain(dB)vs. Temperature



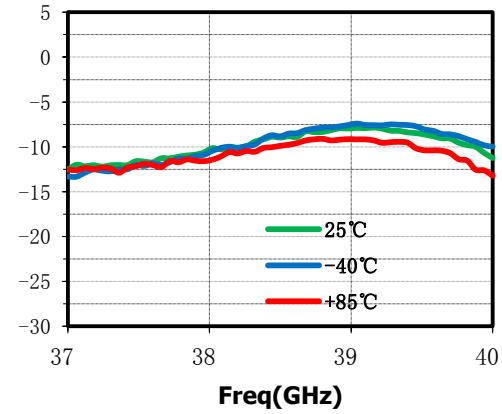
Reverse Isolation(dB)vs. Temperature



Input Return Loss(dB)vs. Temperature



Output Return Loss(dB)vs. Temperature



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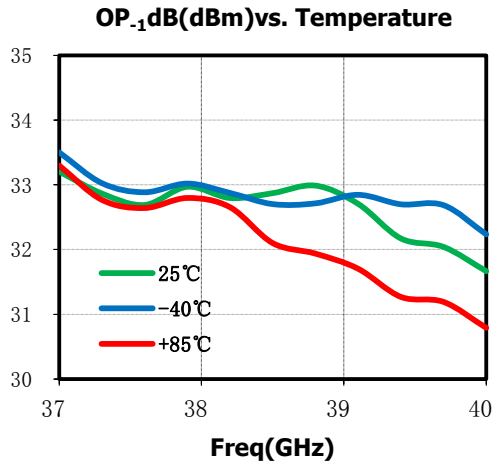
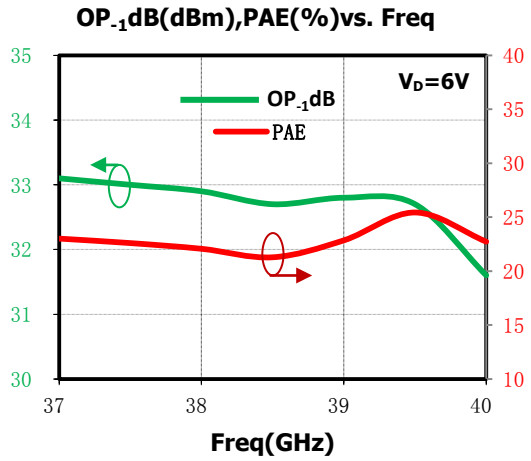
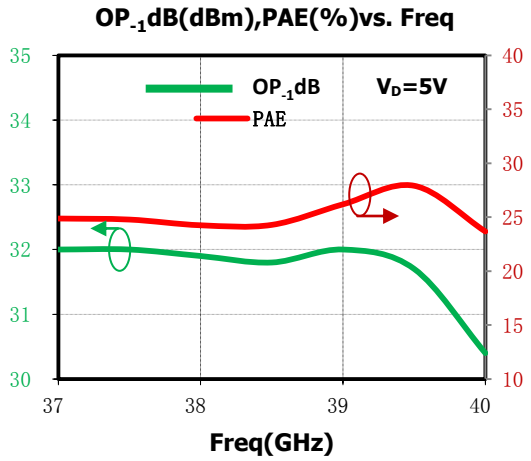
V_D=+6V I_D=1000mA







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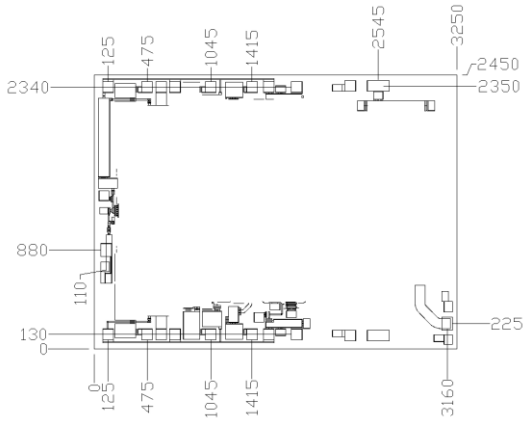
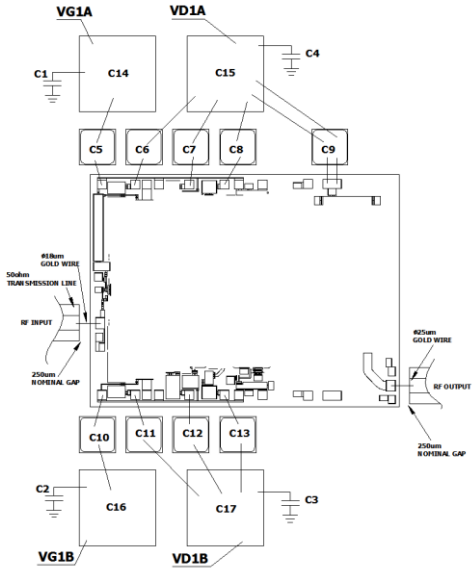
Die Outline

(all dimensions in μm)



Assembly Diagram



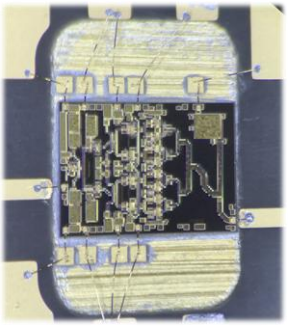
Bonding pad size:

RFIN、RFOUT：90x100μm；

VD4：180x90μm；

VD1A~VD3A、VD1B~VD3B：100x100μm

SAC3129 on Test Fixture



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1~C4	1μF	GRM155R61A105KE15D	Murata	0402
C5~C13	100pF	—	ANY	SLC
C14~C17	1000pF	—	ANY	SLC

Notes

1. The SAC3129 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -0.5～-0.75V when the drain voltage is set to 6V.
2. The back of chip is RF ground.
3. Bypass caps C1～C2 should be placed no farther than 1.8mm from the amplifier.
4. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

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