

SAC3126



GaAs MMIC Power Amplifier
18GHz~26.5GHz 32dBm

Rev1.1

Features

- Frequency: 18GHz~26.5GHz
- Gain: 23dB
- Output P_{-1dB}: 32dBm
- Supply Voltage: +6V
- Power-Added Efficiency: 22%
- Die Size: 2.35mm×3.55mm×0.1mm
- Packaged: Bare Die

Typical Applications

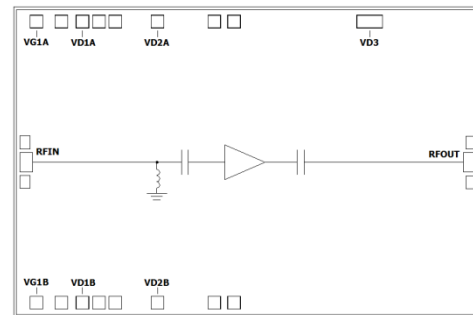
- Microwave radio including point to point communication
- Telecommunication
- Weather radar
- Optical communication
- Test instrumentation
- SatCom
- VSAT

General Description

SAC3126 is a Ka-band GaAs MMIC power amplifier. The SAC3126 provides 23 dB of gain, and 32dBm of output power for 1 dB compression and 22% PAE from a +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 radar applications.

Functional Diagram



Electrical Performance

T_A=25°C, V_D=+6V, I_D=1.1A, Z₀=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency Range	18~26.5			GHz
Small Signal Gain	20	23	—	dB
Small Signal Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-50	—	dB
Input Return Loss	—	-8	—	dB
Power-Added Efficiency	—	22	—	%
Output Power for 1 dB Compression (OP _{-1dB})	32	—	—	dBm
Drain Voltage(V _D)	6	—	6.3	V
Gate Current(I _G)	—	1	5	mA
Supply Current(I _D)	—	1.1	1.8	A
Thermal Resistance	—	8.6	—	°C/W

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

Absolute Maximum Ratings

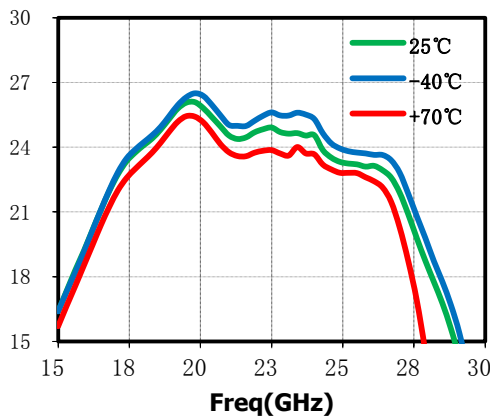
Maximum Input Power	+15dBm	Operating Temperature	-40°C~+70°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V_D	+6.5V	Maximum V_G	-1.0V

Typical Small Signal Performance Curve

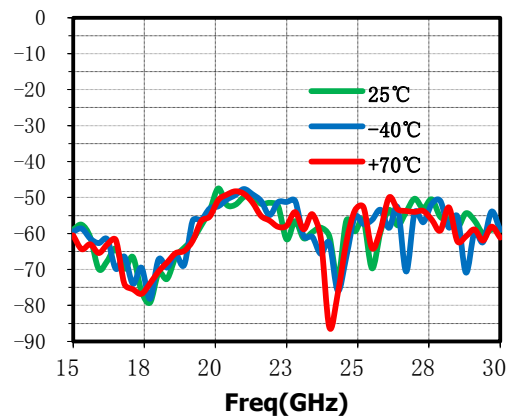
The results captured in the test-jig environment within connector plan

$V_D = +6V$ $I_D = 1.1A$ CW

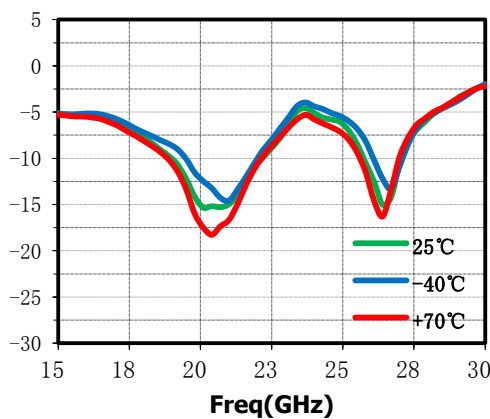
Small Signal Gain(dB) vs. Temperature



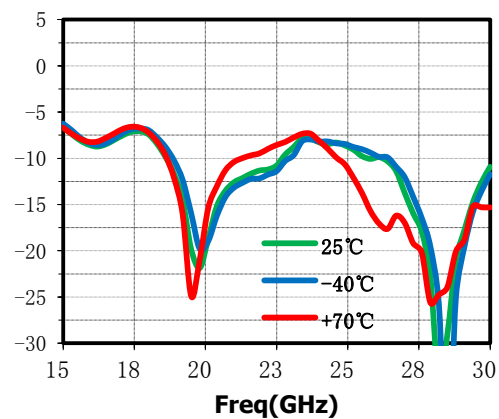
Reverse Isolation(dB) vs. Temperature



Input Return Loss(dB)



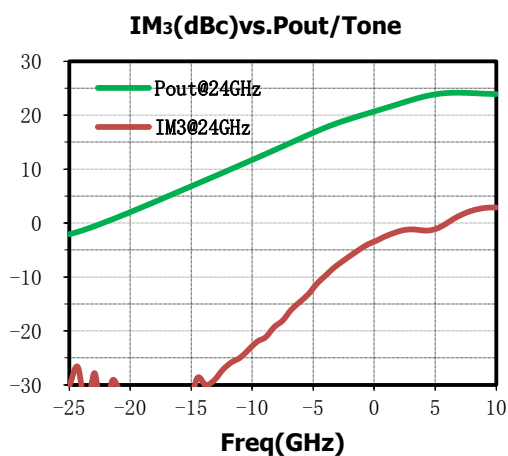
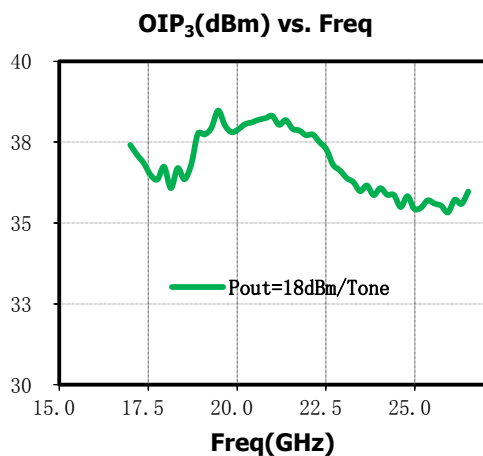
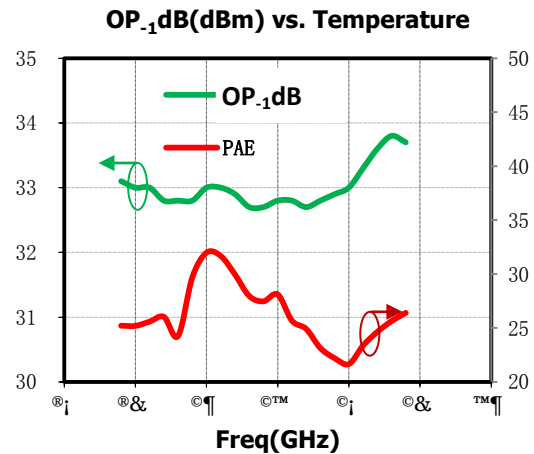
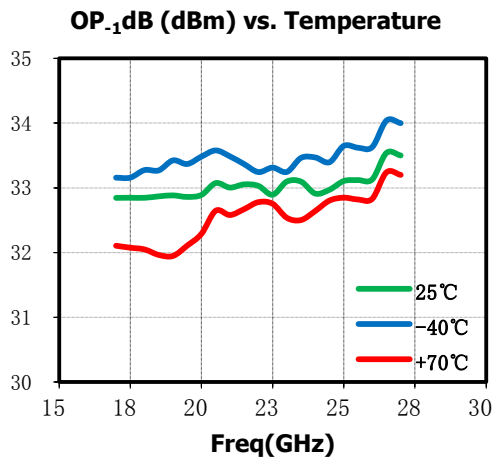
Output Return Loss(dB)



Power and PAE Performance Curve

The results captured in the test-jig environment within connector plan, then de-embedded the housing and come back in the die plan

$V_D = +6V$ $I_D = 1.1A$ CW



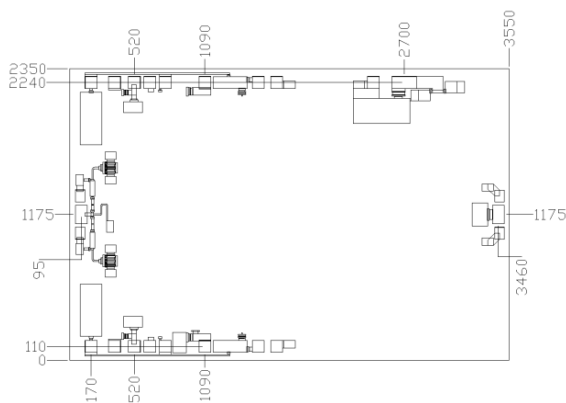
SAC3126

GaAs MMIC Power Amplifier
18GHz~26.5GHz 32dBm

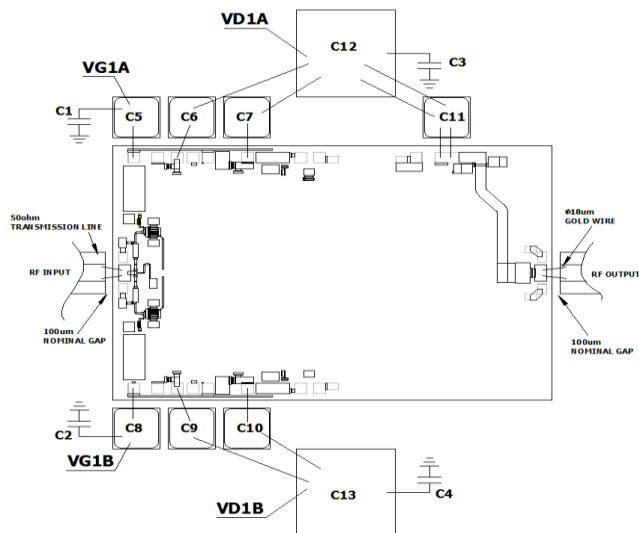
Rev1.1

Die Outline

(All dimensions in μm)



Assembly Diagram



Bonding pad size:

100x100 μm VG1A/B, VD1A ~ VD2A, VD1B ~ VD2B pads,
150x100 μm RF IN, RFOUT pads,
200x100 μm VD3 pad

Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1 ~ C4	2.2uF	GRM155R61A225KE15D	Murata	0402
C5 ~ C11	300pF	—	ANY	SLC
C12 ~ C13	1000pF	—	ANY	SLC

Notes

- SAC3126 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to $-0.7 \sim -0.85\text{V}$.
- RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized.
- Bypass caps C1~C4 should be placed no farther than 1.5mm from the amplifier.

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