

Features

- Frequency: 8GHz~14GHz
- Gain:22dB
- Output P_{-1dB}: 32dBm
- Supply Voltage: +8V
- Power-Added Efficiency: 30%
- Die Size:1.95mm×1.25mm×0.1mm
- Packaged: Bare Die

Typical Applications

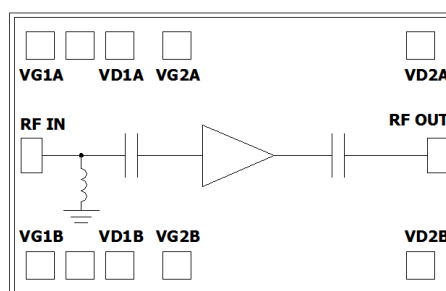
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

SAC3926 is a GaAs MMIC power amplifier. SAC3926 provides 22dB of gain, and 32dBm of output power for 1 dB compression and 30% PAE from a +8V 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=+8V, I_D=0.7A, Z₀=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8~14			GHz
Small Signal Gain	19	22	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-12	—	dB
Power-Added Efficiency	—	30	—	%
Output Power for 1 dB Compression (OP _{-1dB})	30.5	32	—	dBm
Drain Voltage (V _D)	—	8	8.5	V
Gate Current	—	2	8	mA
Supply Current (I _D)	—	1.5	1.9	A
Thermal Resistance	—	11.7	—	°C/W

Absolute Maximum Ratings

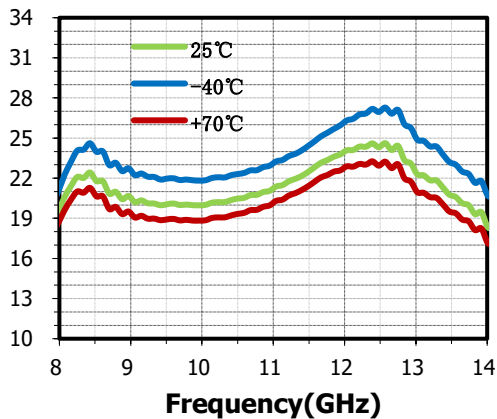
Maximum Input Power	+16dBm	Operating Temperature	-40°C~+70°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+9V	Maximum V _G	-1.2V

Typical Small Signal Performance Curve

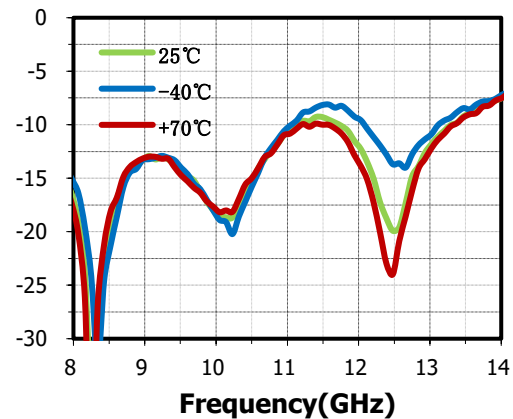
The results captured in the test-jig environment within connector plan

$V_D = +8V$ $I_D = 0.7A$

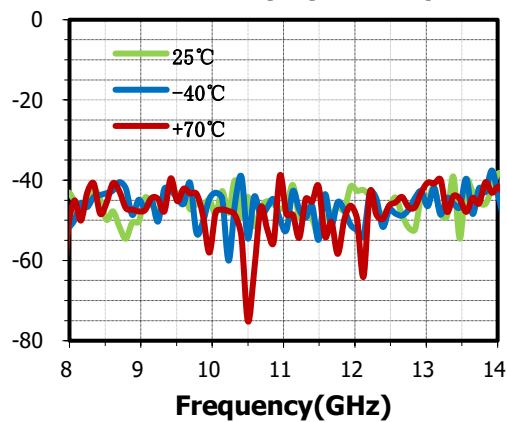
Small Signal Gain(dB) vs.Temperature



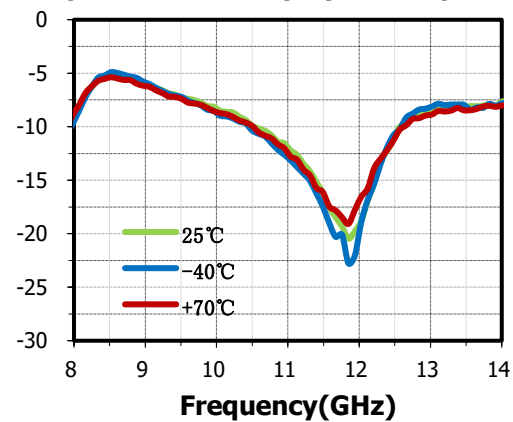
Input Return Loss(dB) vs.Temperature



Reverse Isolation(dB) vs.Temperature



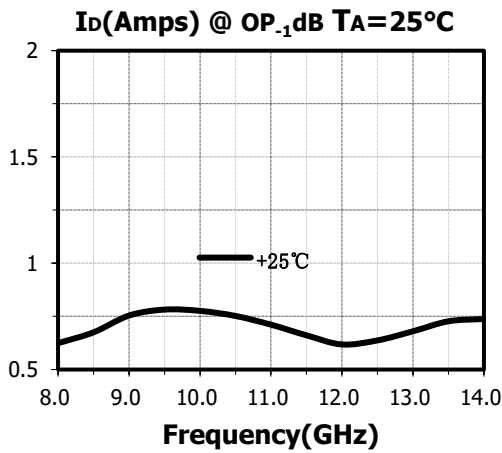
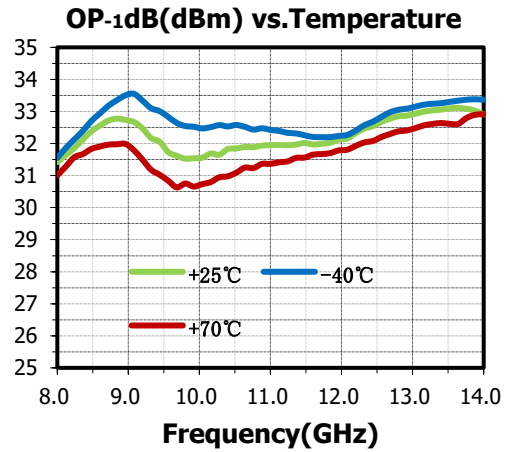
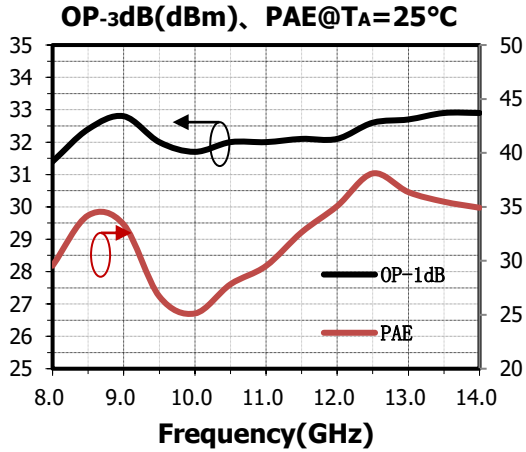
Output Return Loss(dB) vs.Temperature



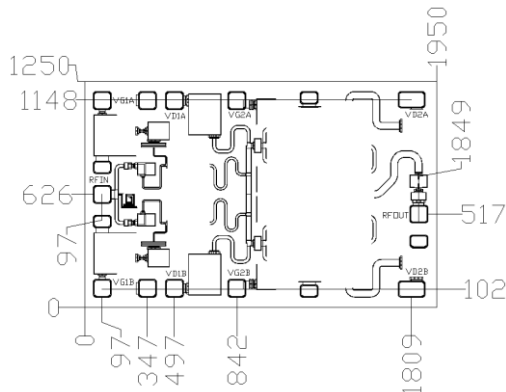
Power and PAE Performance Curve

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

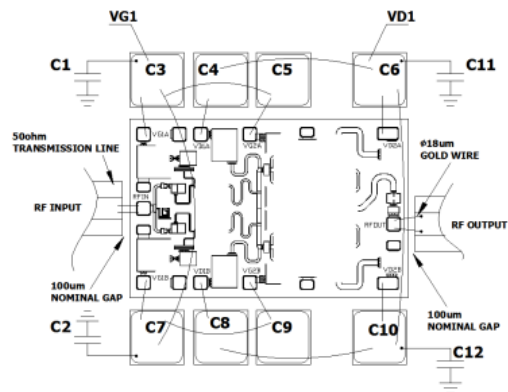
$V_D = +8V$ $I_D = 0.7A$ CW



Die Outline(μm)



Assembly Diagram



Bonding pad size: 100x100µm VGx, RF IN, RFOUT pads
150x100µm VDX pads

Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1、C2、C11、C12	10uF	CGA4J3X5R1A106K125AB	TDK	0805
C3~C10	300pF	—	ANY	SLC

Notes

1. SAC3926 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -0.7~-0.85V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 1 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized. The RF input require a single bond wire output require a double bond wire as shown.
3. The backside of SAC3926 is RF ground. Eutectic mounting is preferred, if using conductive epoxy, recommended epoxies are Die Mat DM6030HK or DM6030HK-Pt cured per the manufacturer's cure schedule. Epoxy should be applied in accordance with the manufacturers specifications and should avoid contact with the top surface of the die. An epoxy fillet should be visible around the total die periphery.
4. Bypass caps C1、C2 should be placed no farther than 1.5mm from the chip.