

Features

- Frequency: 26GHz~38GHz
- Gain: 16dB
- Balanced Amplifier
- Output P_{1dB}: 26dBm
- Supply Voltage: +5~+6V
- Power-Added Efficiency: 20%
- Die Size: 2.14mm×1.25mm×0.1mm

Typical Applications

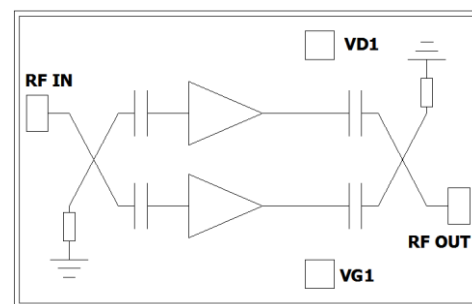
- T/R Module
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

SAC3907 is a wideband GaAs MMIC driver amplifier which operates between 26GHz ~ 38GHz. SAC3907 is a balanced amplifier which has good input and output return loss when amplifier is turned off and on.

SAC3907 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C, V_D=+6V, I_D=450mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	26~38			GHz
Small Signal Gain	—	16	—	dB
Small Signal Gain Flatness	—	2	—	dB
Reverse Isolation	—	-50	—	dB
Input Return Loss	—	-12	—	dB
Output Return Loss	—	-15	—	dB
Power-Added Efficiency	—	20	—	%
Output Power for 1 dB Compression (OP _{1dB})	—	26	—	dBm
Drain Voltage (V _D)	5	—	6	V
Supply Current (I _D)	—	400	600	mA

Absolute Maximum Ratings

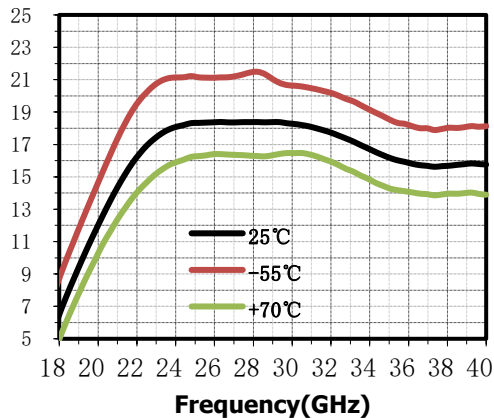
Maximum Input Power	+17dBm	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.3V	Maximum V _G	-1.2V

Typical Performance Curve

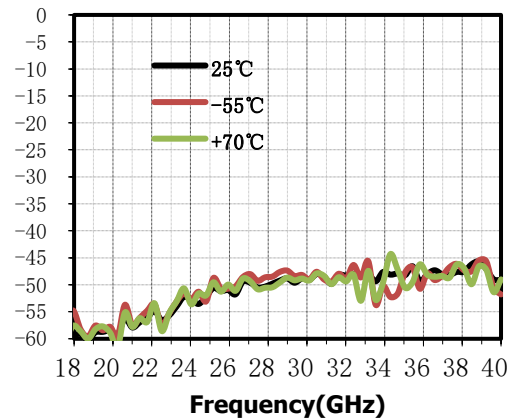
Data Based on the On-Wafer RF Probe Test Results

*Bias Conditions: $V_D = 6V$, $I_D = 450mA$

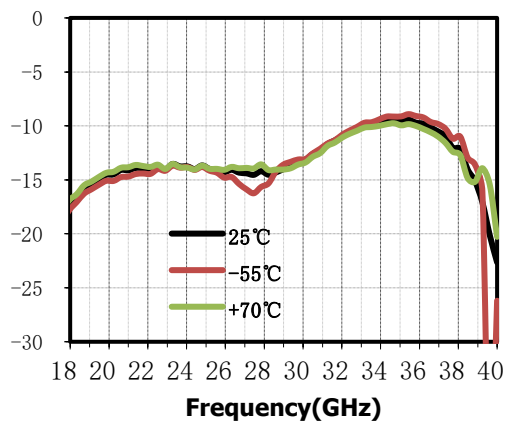
Small Signal Gain(dB) vs. Temperature



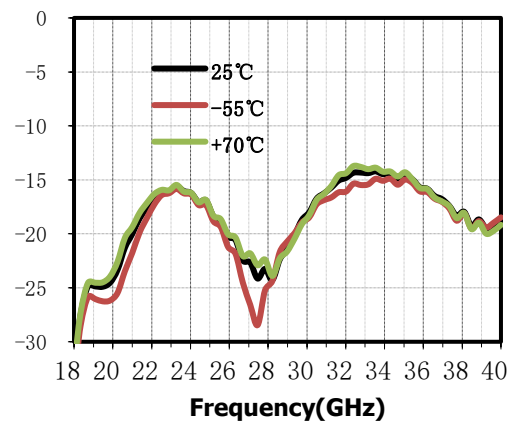
Reverse Isolation(dB) vs. Temperature



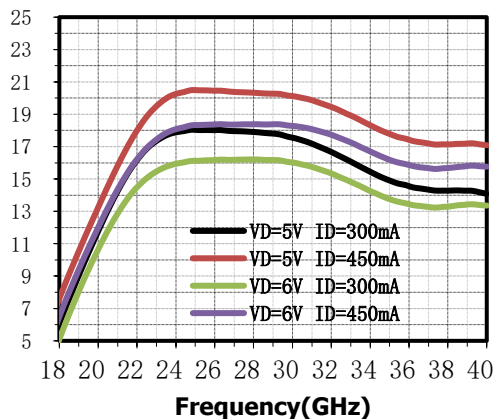
Input Return Loss(dB) vs. Temperature



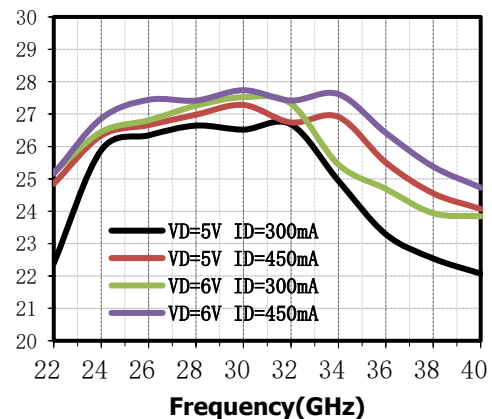
Output Return Loss(dB) vs. Temperature



Small Signal Gain(dB) vs. Bias

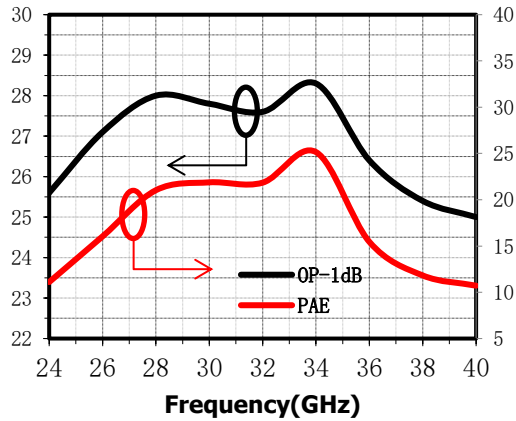


OP₁dB(dBm) vs. V_D , I_D

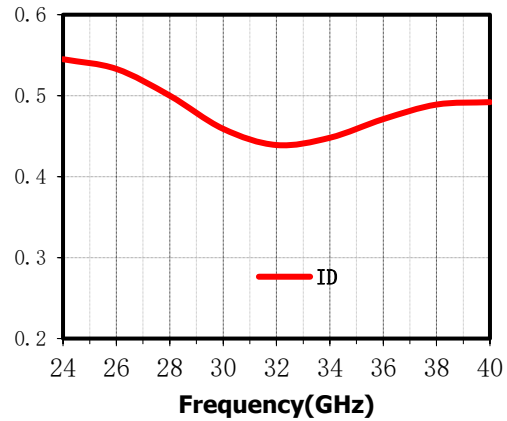


Data obtained from 3.5-mm connector-based test fixture $T_A=25^\circ\text{C}$

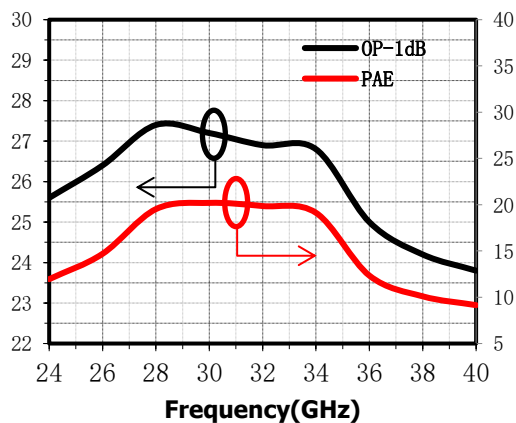
OP₁dB(dBm), PAE(%) vs.Freq @ $V_D=6\text{V}$



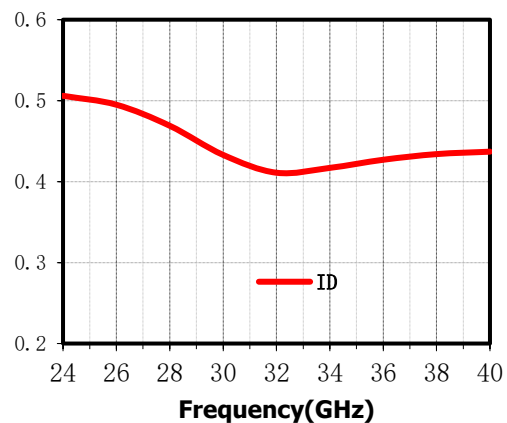
$I_D(\text{A})$ vs. Freq@OP₁dB(dBm)vs. $V_D=6\text{V}$



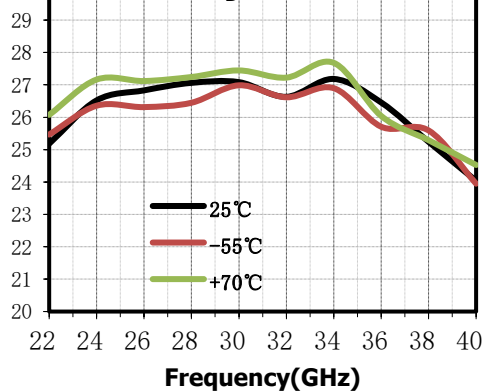
OP₁dB(dBm), PAE(%) vs.Freq @ $V_D=5\text{V}$



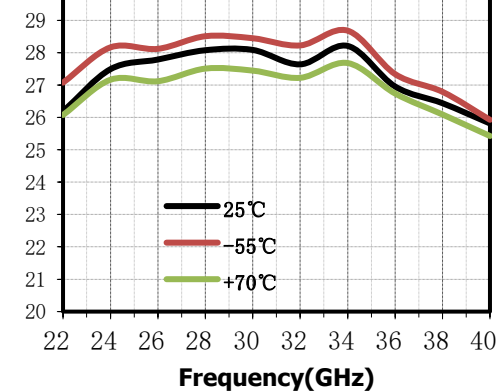
$I_D(\text{A})$ vs. Freq@OP₁dB(dBm) vs. $V_D=5\text{V}$



**OP₁dB(dBm) vs.Temperature @
 $V_D=5\text{V}$**



**OP₁dB(dBm) vs.Temperature @
 $V_D=6\text{V}$**

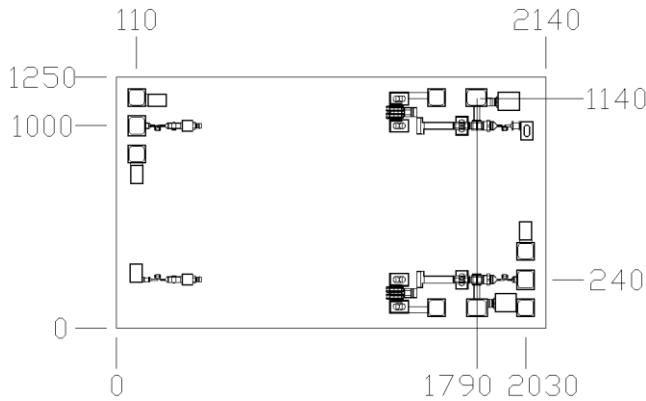


SAC3907

GaAs MMIC Driver Amplifier
26GHz~38GHz

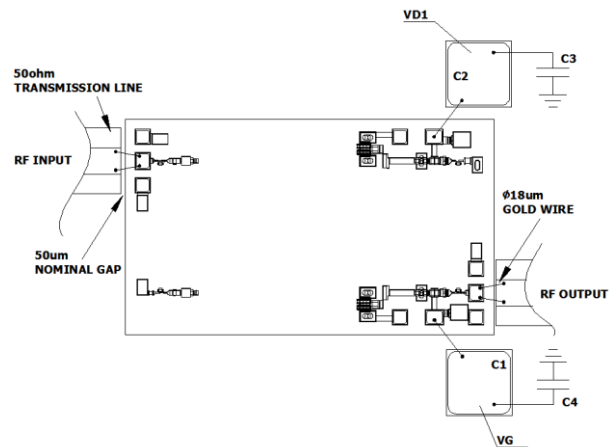
Rev 2.1

Die Outline
(All dimensions in μm)



All Bonding Pad Size: 100x100 μm

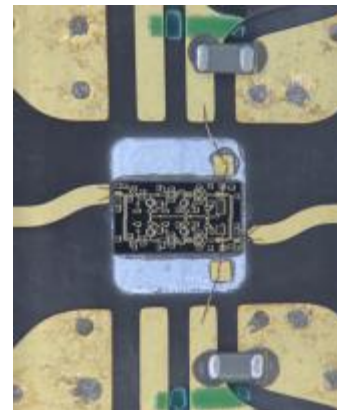
Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C3、C4	1 μF	GRM155R61A105KE15D	Murata	0402
C1、C2	300pF	—	ANY	SLC

Chip Test Fixture



Notes

1. SAC3907 is biased with a positive drain voltage supply and negative gate voltage supply.
When the drain voltage is set to 6 V, the recommended gate voltage is set to -0.4~-0.75 V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. The backside of SAC3907 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C3 and C4 should be placed no longer than 1.8mm from the amplifier.

Attention:

GaAs MMIC devices are susceptible to damage from electrostatic discharge. Proper precautions should be observed during handling, assembly and test.

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