SAC3910

GaAs MMIC Driver Amplifier
22GHz~38GHz

Rev 1.1

Features

- Frequency：22GHz~38GHz
- Gain：15dB
- Output P_{-1}dB：24dBm
- Supply Voltage：+5~+6V
- Balanced Amplifier
- Die Size：2mm×1.25mm×0.1mm

Typical Applications

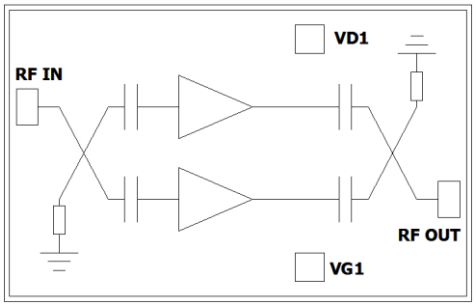
- T/R Module
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- LO Driver

General Description

SAC3910 is a wideband GaAs MMIC driver amplifier which operates between 22GHz~38GHz. SAC3910 is a balanced amplifier that has good input and output return loss when amplifier is turned off and on.

SAC3910 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25℃, V_D=+5V, I_D=250mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		22~38		GHz
Small Signal Gain	11	15	—	dB
Small Signal Gain Flatness	—	1.5	—	dB
Reverse Isolation	—	-48	—	dB
Input/Output Return Loss	—	-13	—	dB
Noise Figure	—	6.5	—	dB
Output Power for 1 dB Compression (OP_{-1}dB)	—	24	—	dBm
Drain Voltage (V_D)	5	—	6	V
Supply Current (I_D)	—	250	450	mA

Absolute Maximum Ratings

Maximum Input Power	+14dBm	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Maximum V_D	+6.5V	Maximum V_G	-1.2V

SuperApex, LLC
2801 Lakeside Drive, Suite 208, Bannockburn, IL 60015, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
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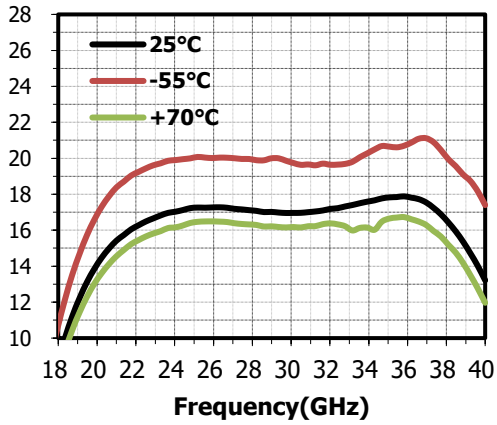
Typical Performance Curve

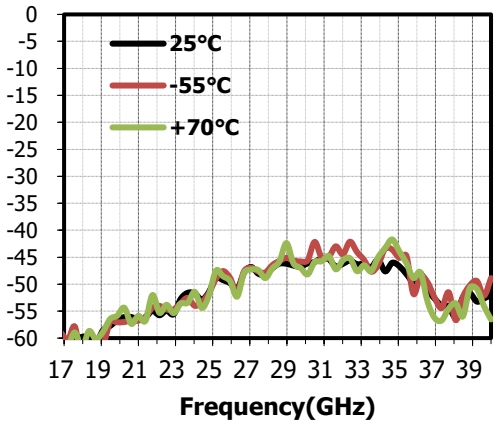
Data Based on the On-Wafer RF Probe Test Results

***Bias Conditions: V_D=5V, I_D=250mA**

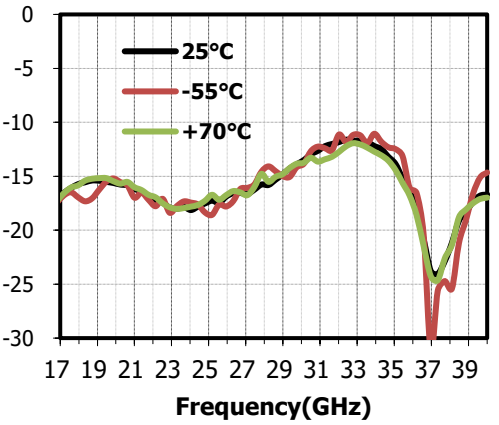
Small Signal Gain(dB) vs.Temperature



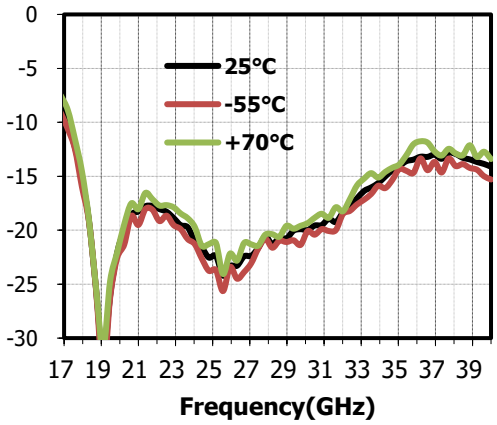
Reverse Isolation(dB) vs.Temperature



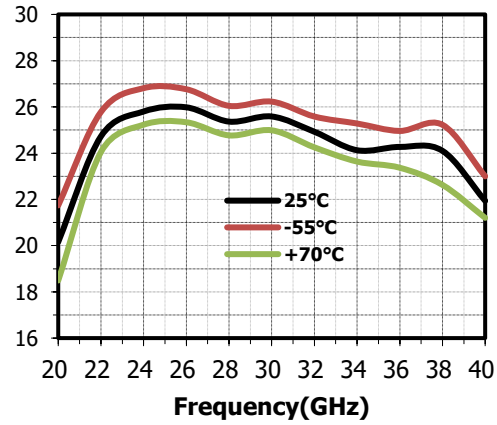
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature

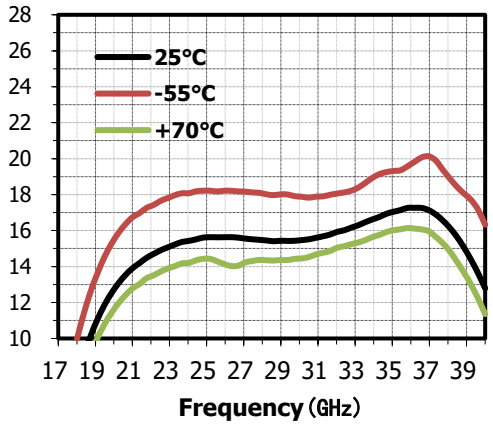


OP_{-1}dB(dBm) vs.Temperature

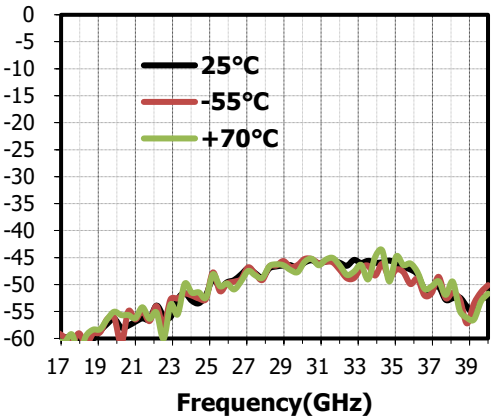


*Bias Conditions: V_D=6V, I_D=250mA

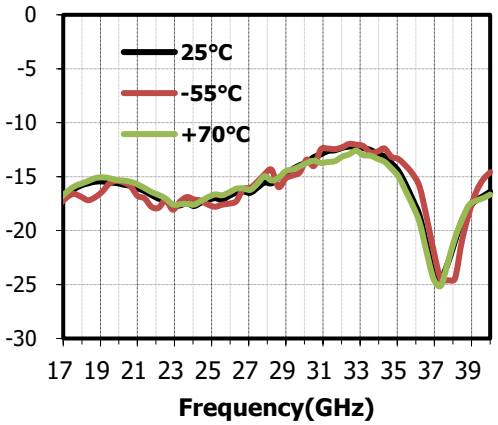
Small Signal Gain(dB) vs.Temperature



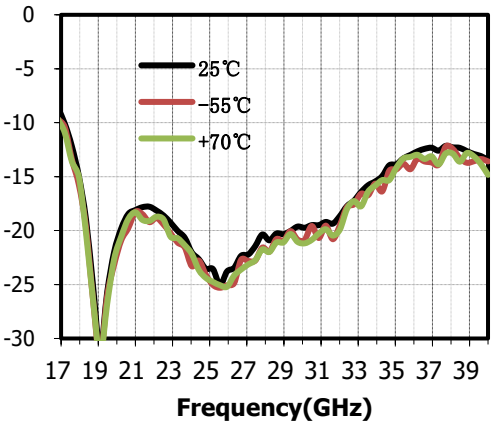
Reverse Isolation(dB) vs.Temperature



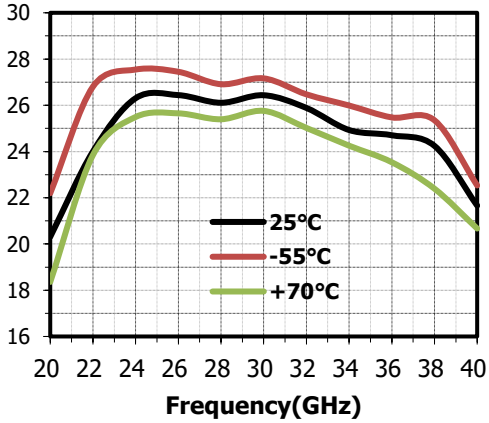
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature



OP$_{-1}$dB(dBm)vs.Temperature



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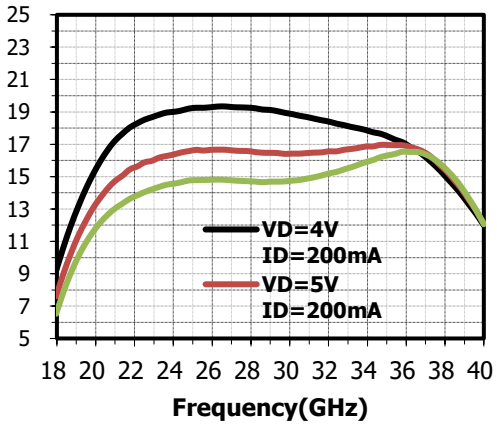
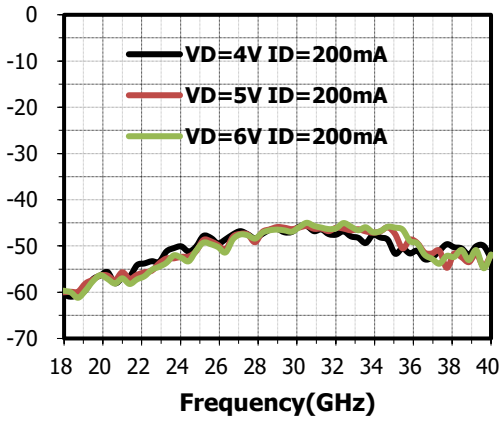
*Bias Conditions: V_D=4~6V, I_D=200mA T_A=25℃

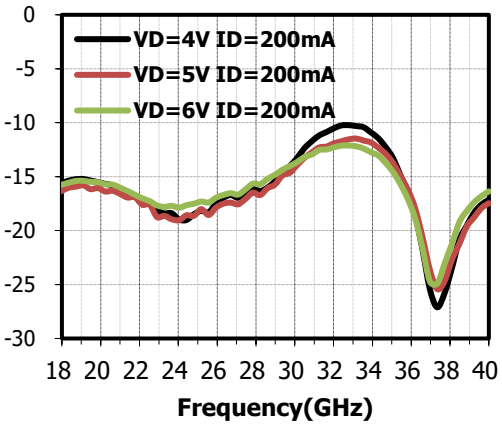
Small Signal Gain(dB) vs.Bias



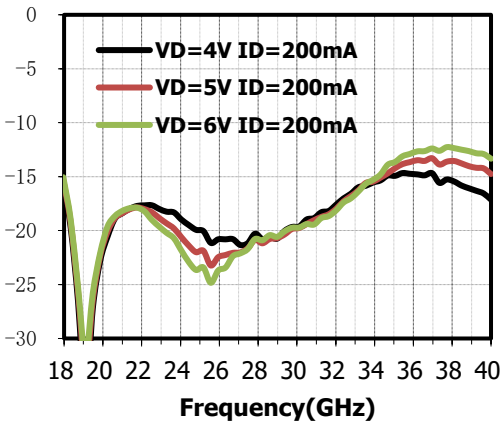
Reverse Isolation(dB) vs.Bias



Input Return Loss(dB) vs.Bias

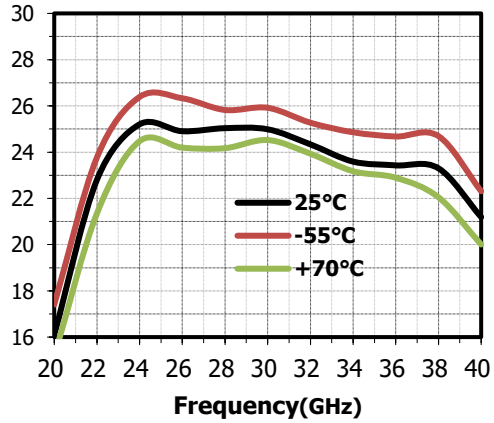


Output Return Loss(dB) vs.Bias

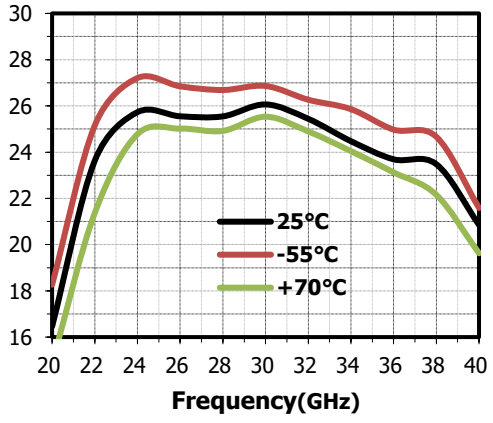


*OP_{-1}dB vs. Bias Conditions: V_D=5~6V, I_D =200mA

OP_{-1}dB(dBm) vs.Temperature@ V_D=5V



OP_{-1}dB(dBm) vs.Temperature @ V_D=6V



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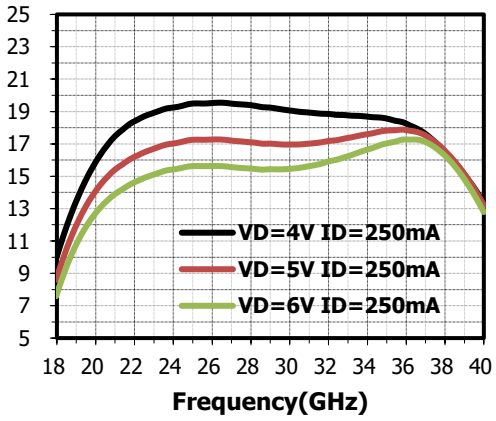
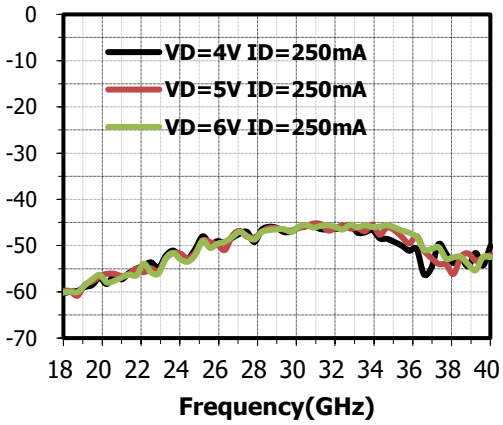
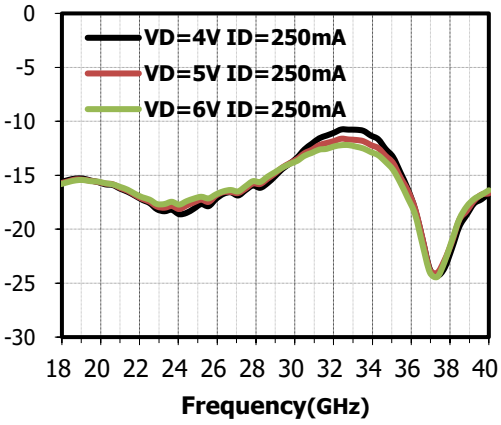
Small Signal Gain(dB) vs.Bias



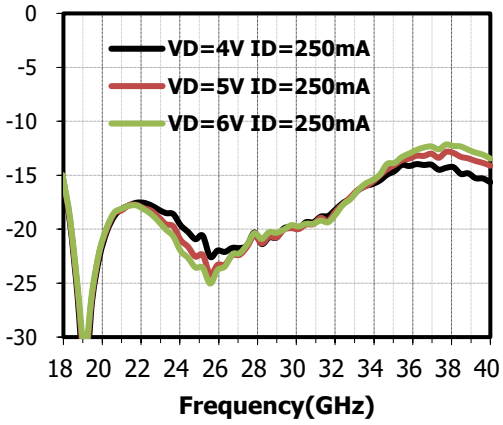
Reverse Isolation(dB) vs.Bias



Input Return Loss(dB) vs.Bias



Output Return Loss(dB) vs.Bias

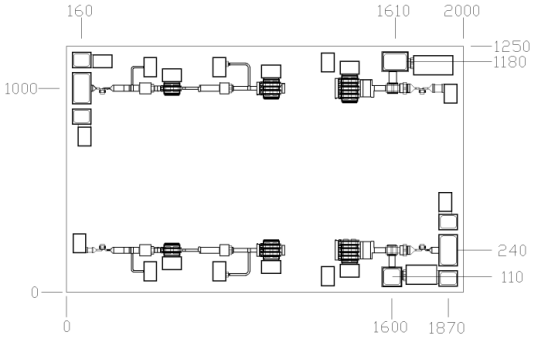


Die Outline

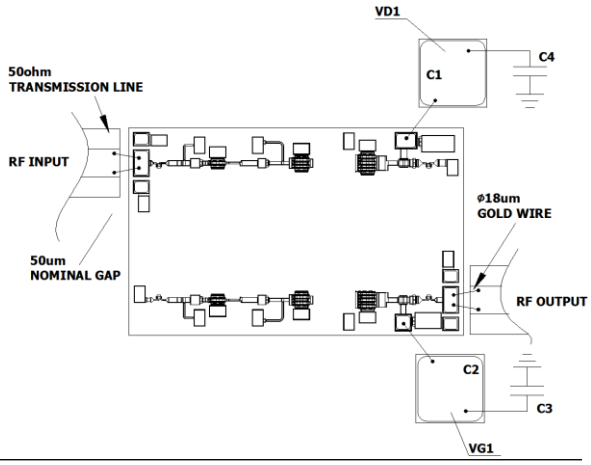
(All dimensions in um)

RF /VG Bonding pad size:100x100um

VD bonding pad size :150x100um



Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C3、C4	2.2uF	0603YD225KAT2A	AVX	0603
C1、C2	100pF	—	ANY	SLC

Notes

1. SAC3910 is biased with a positive drain voltage supply and negative gate voltage supply.
   When the drain voltage is set to 5 V, the recommended gate voltage is set to -0.5~-0.7V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. The backside of SAC3910 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 more than 1.5mm from the amplifier.

Attention:

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