SAC3911

GaAs MMIC Driver Amplifier
24GHz~40GHz

Rev 2.1

Features

- Frequency：24GHz~40GHz
- Gain：12dB
- Output P_{-1}dB：15dBm
- Supply Voltage：+4~+6V
- Balanced Amplifier
- Die Size：1.67mm×1.22mm×0.1mm

Typical Applications

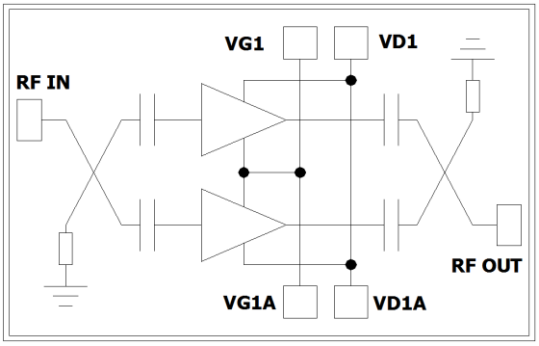
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- LO Driver

General Description

SAC3911 is a wideband GaAs MMIC driver amplifier which operates between 24GHz~40GHz. The amplifier has moderate gain and Output P_{-1}dB, making it an ideally linear gain block or driver amplifier for microwave radios.

SAC3911 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25℃,V_D=+4V,I_D=60mA,Z_0=50Ω)

Parameter		Min.	Typ.	Max.	Units
Frequency Range			24~40		GHz
Gain		9	12	—	dB
Gain Flatness		—	±1.0	—	dB
Reverse Isolation		—	-35	—	dB
Input/Output Return Loss		—	-15	—	dB
Noise Figure		—	5	—	dB
Output Power for 1 dB Compression (OP_{-1}dB)		—	15	—	dBm
Drain Voltage(V_D)		3.8	4	6	V
Supply Current(I_D)		—	60	110	mA
Typical Supply Current(I_D) vs. V_D	4V	—	60	85	mA
	5V	—	80	100	
	6V	—	80	100	

Absolute Maximum Ratings

Maximum Input Power	+12dBm	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Maximum V_D	+6.5V	Maximum V_G	-1.2V

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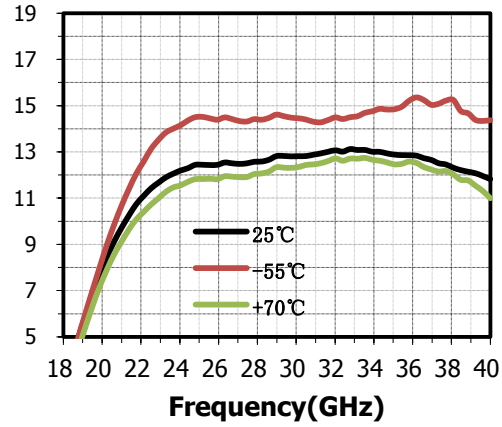
Typical Performance Curve

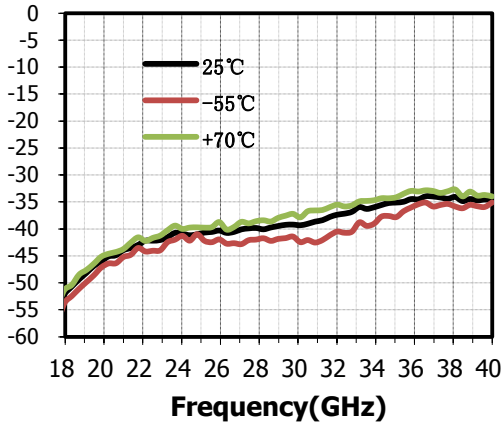
Data Based on the On-Wafer RF Probe Test Results

***Bias Conditions: V_D =4V, I_D =60mA**

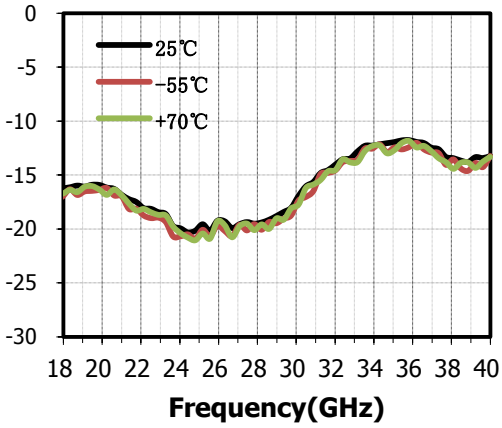
Small Signal Gain(dB) vs.Temperature



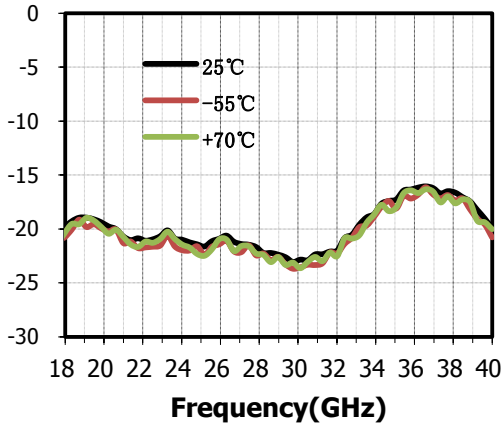
Reverse Isolation(dB) vs.Temperature



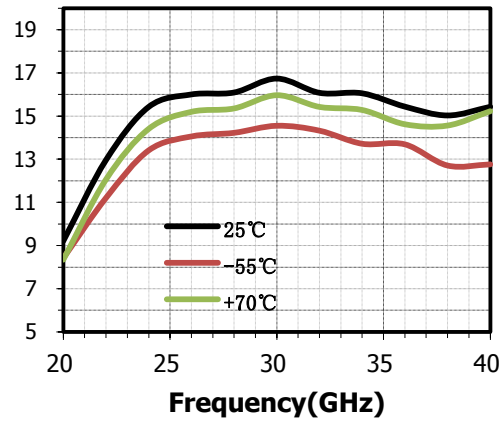
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature



OP-1dB(dBm) vs.Temperature



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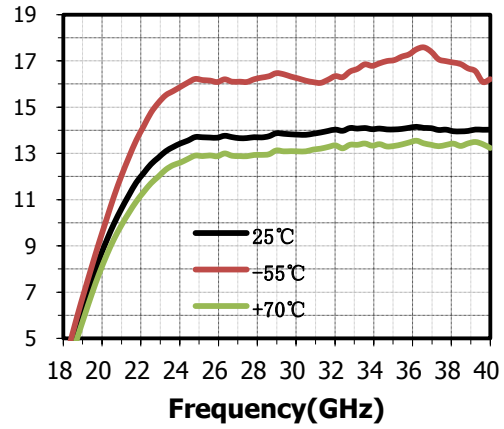
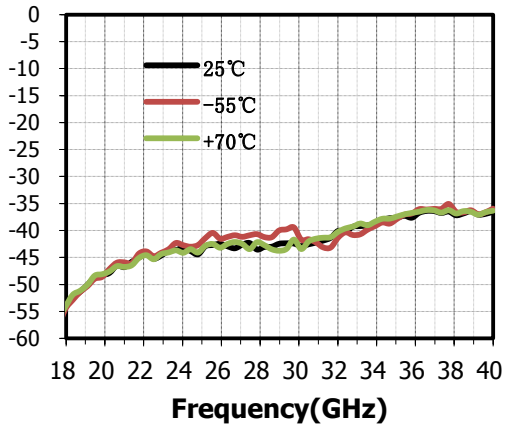
***Bias Conditions: V_D =5V, I_D =100mA**

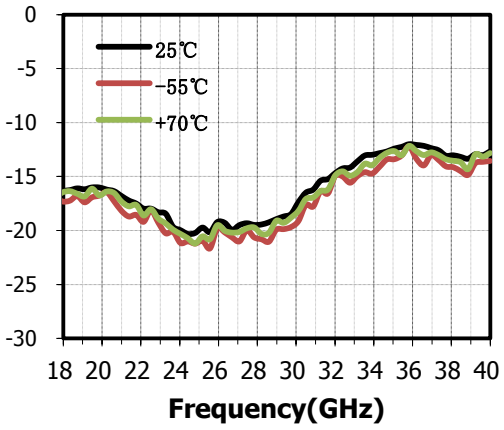
Small Signal Gain(dB) vs.Temperature



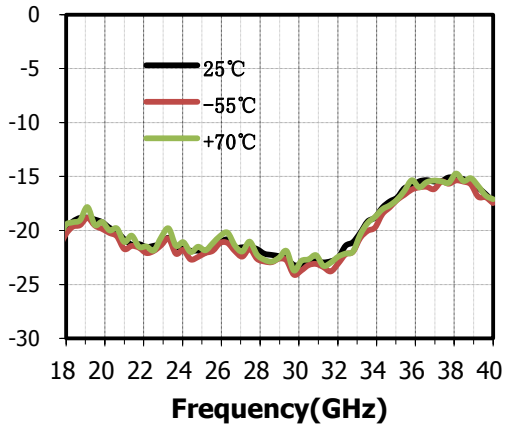
Reverse Isolation(dB) vs.Temperature



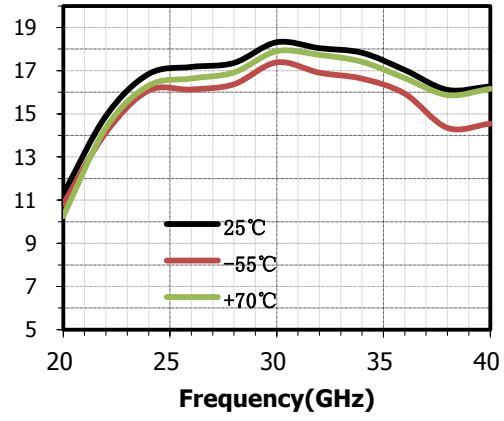
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature

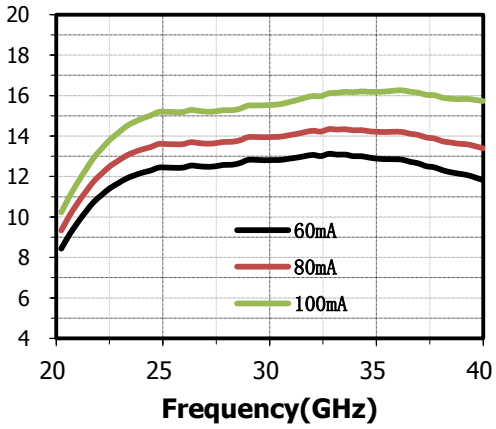


OP-1dB(dBm) vs.Temperature

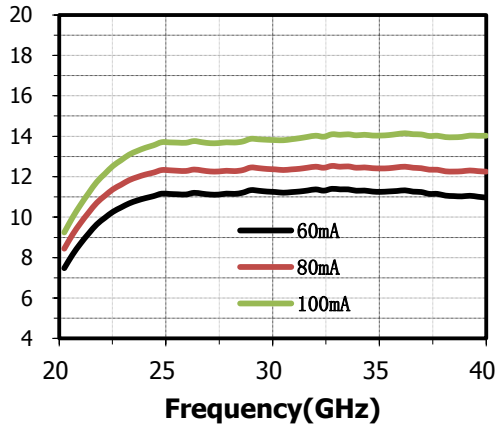


***Bias Conditions: V_D =4~6V, I_D =60~100mA T_A=25℃**

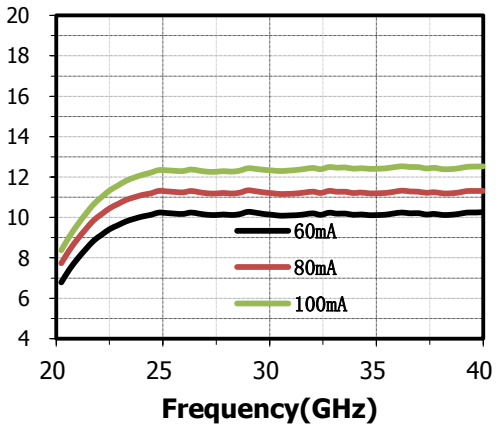
Small Signal Gain(dB) vs.ID@VD=4V



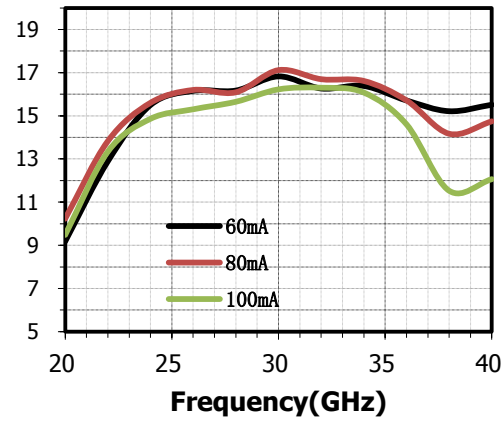
Small Signal Gain(dB) vs.ID@VD=5V



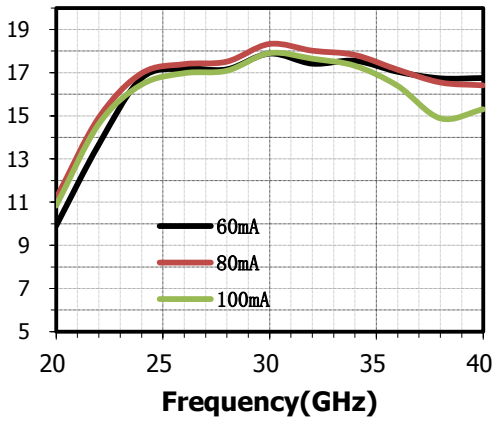
Small Signal Gain(dB) vs.ID@VD=6V



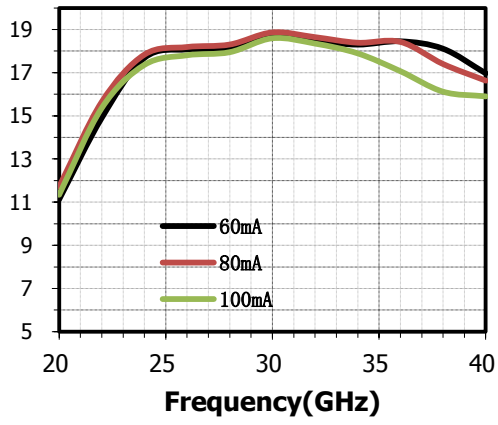
OP-1dB(dBm) vs.ID @ VD=4V



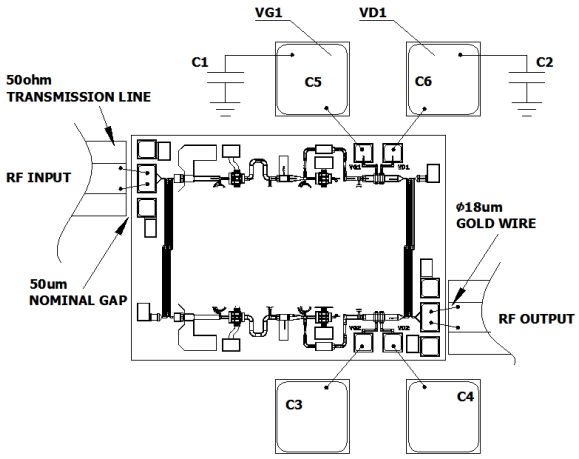
OP-1dB(dBm) vs.ID @ VD=5V



OP-1dB(dBm) vs.ID @ VD=6V



Assembly Diagram

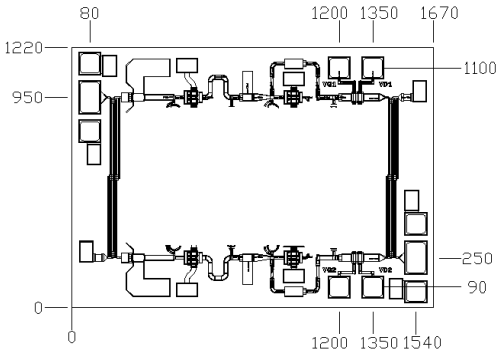


Die Outline

(all dimensions in um)

RF Bonding pad size:100x150um

VG/VD bonding pas size :100x100um



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1~C2	2.2uF	0603YD225KAT2A	AVX	0603
C3~C6	10pF	—	ANY	SLC

Notes

1. SAC3911 is biased with a positive drain voltage supply and negative gate voltage supply. When the drain voltage is set to 4 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 SAC3911 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C1 and C2 should be placed no more than 1.5mm from the amplifier.
5. Bond pads VG and VD exist on the upper and lower sides of the MMIC for assembly convenience. For best performance the unused pad should be attached with a 10pF cap to ground.

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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