SAC3916

GaAs MMIC Driver Amplifier
12GHz~18GHz

Rev 2.0

Features

- Frequency：12GHz~18GHz
- Gain：22dB
- Output P_{-1}dB：30dBm
- Output IP_3：40dBm
- Supply Voltage：+5~+6V
- Die Size：2.63mm×1.26mm×0.1mm

Typical Applications

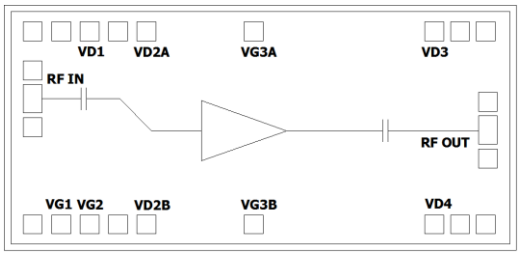
- LMDS
- SATCOM
- WLL and MMDS loops
- Test and Measurement

General Description

SAC3916 is a wideband 1W GaAs MMIC driver amplifier which operates between 12GHz~18GHz. The SAC3916 is optimized for linear operation.

SAC3916 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25℃, V_D=+5V, I_D=1000mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		12~18		GHz
Gain	18	22	—	dB
Gain Flatness	—	±2.5	—	dB
Reverse Isolation	—	-65	—	dB
Input Return Loss	—	-14	—	dB
Output Third Order Intercept (OIP_3) *	—	40	—	dBm
Output Power for 1 dB Compression (OP_{-1}dB)	—	31	—	dBm
Drain Voltage (V_D)	5	—	6	V
Supply Current (I_D)	—	1000	1700	mA

* Measurement taken at Pout / Tone = +22 dBm, fc= 16GHz, ∆f=5MHz

Absolute Maximum Ratings

Maximum Input Power	+13dBm	Operating Temperature	-55℃~+70℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Maximum V_D	+6.5V	Maximum V_G	-1.2V

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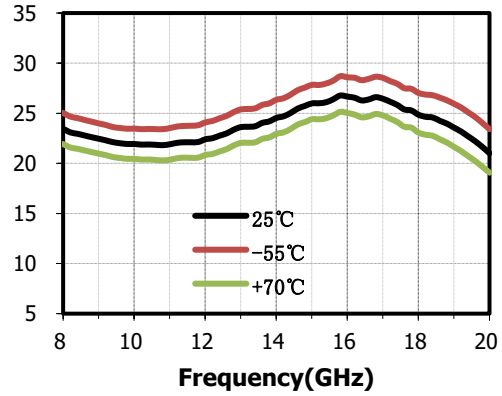
Typical Performance Curve

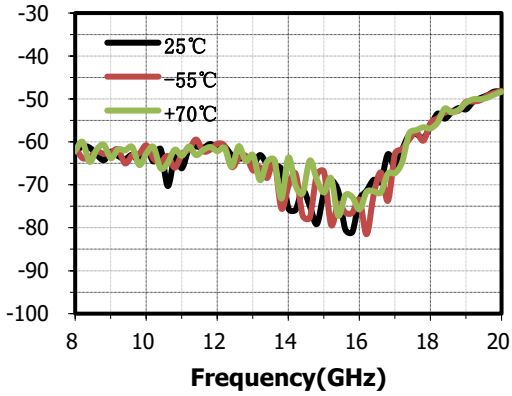
Data is obtained from 3.5-mm connector-based test fixture and this data includes connecter loss and board loss

***Bias Conditions: V_D =5V, I_D =1000mA**

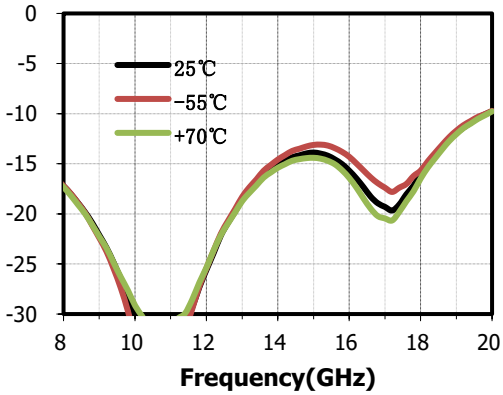
Small Signal Gain(dB) vs.Temperature



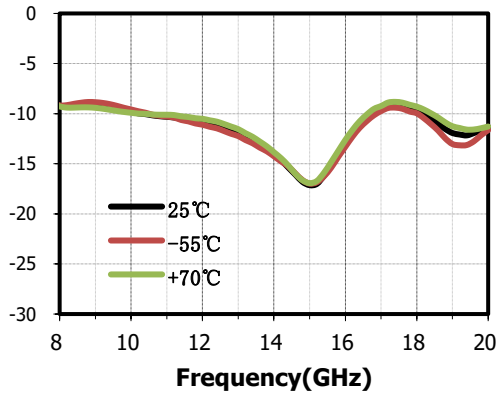
Reverse Isolation(dB) vs.Temperature



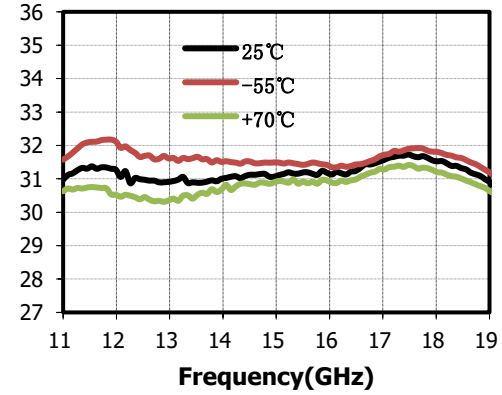
Input Return Loss(dB) vs.Temperature



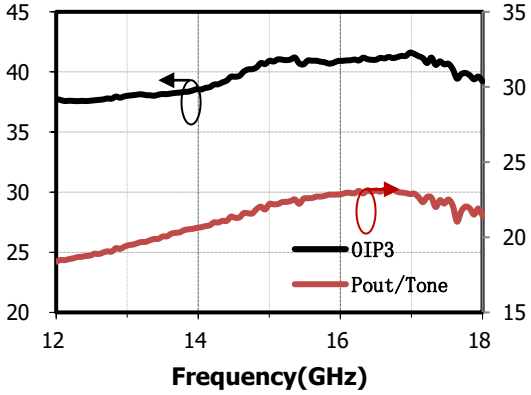
Output Return Loss(dB) vs.Temperature



OP-1dB(dBm) vs.Temperature @ V_D=5V

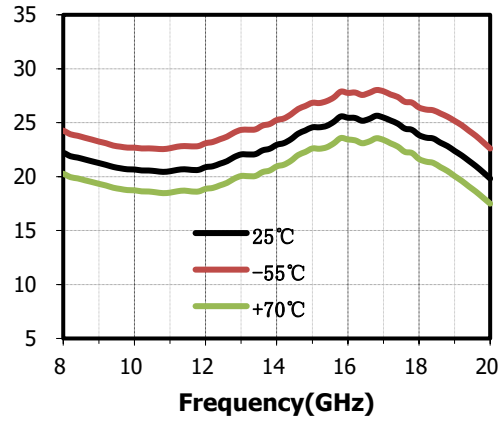


OIP3(dBm) vs. POUT/Tone@VD=5V

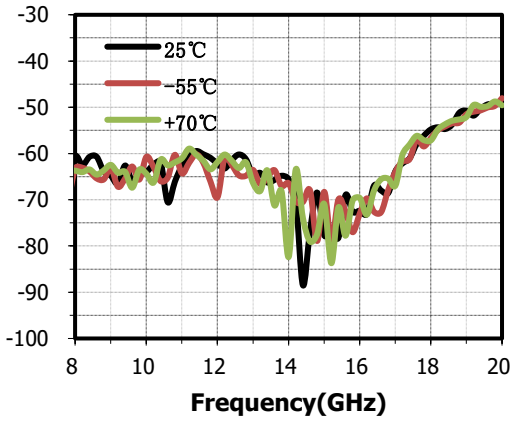


*Bias Conditions: V_D =6V, I_D =1000mA

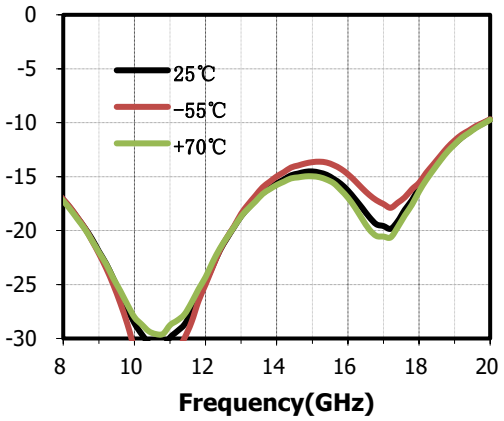
Small Signal Gain(dB) vs.Temperature



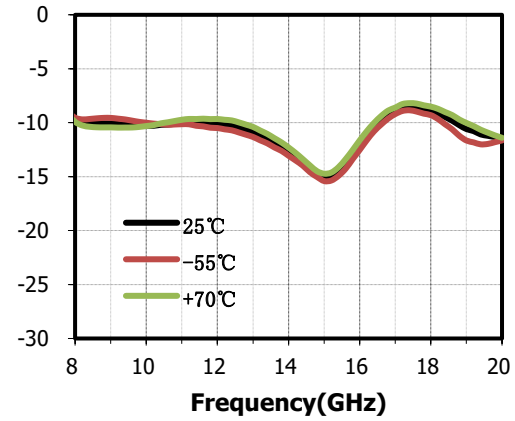
Reverse Isolation(dB) vs.Temperature



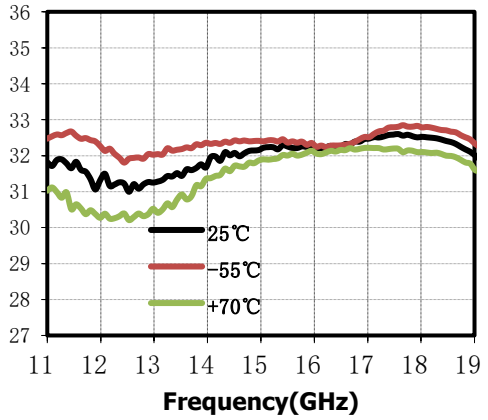
Input Return Loss(dB) vs.Temperature



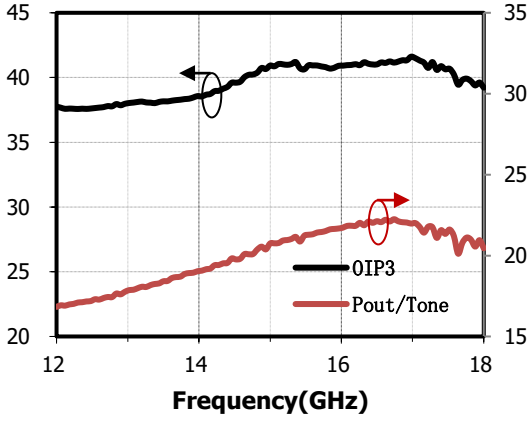
Output Return Loss(dB) vs.Temperature



OP-1dB(dBm) vs.Temperature @ V_D=6V



OIP3(dBm) vs. POUT/Tone@VD=6V



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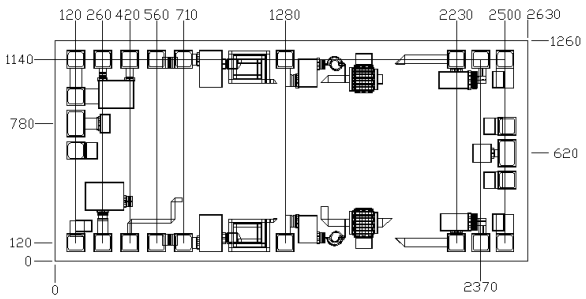
Die Outline

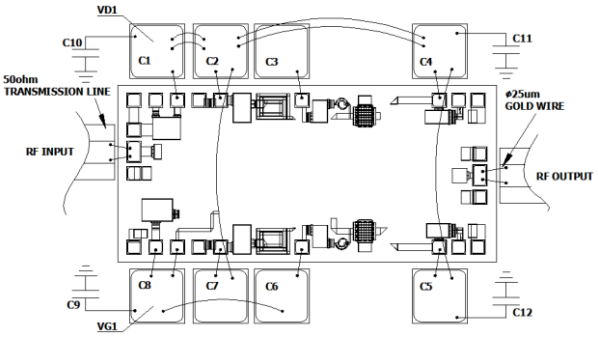
(All dimensions in um)

RF Bonding pad size:100x150um

VG/VD bonding pad size:100x100um



Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1~C8	300pF	—	ANY	SLC
C9~C12	2.2uF	0603YD225KAT2A	AVX	0603

Notes

1. SAC3916 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~-0.7 V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. The backside of SAC3916 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C9~C12 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.

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