

SAC3946



GaAs MMIC Driver Amplifier
0.01~60GHz

Rev 1.0

Features

- Frequency: 0.01~60GHz
- Gain: 12dB
- Output P₋₁dB: 15dBm
- Supply Voltage: +6V/-Vg
- Full Passivation for Enhanced Reliability
- Die Size: 3.54mm×1mm×0.1mm

Typical Applications

- Test instrumentation

General Description

SAC3946 is a broadband GaAs MMIC driver amplifier, which operates between in 0.01~60GHz. SAC3946 provides 12dB of small signal gain, and 15dBm of output P₋₁dB while requiring 130mA from a +6V supply voltage. The chip offers full passivation for increased reliability and moisture protection.

Electrical Performance (T_A=25°C, V_D= +6V, I_D=130mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	0.01~60			GHz
Small Signal Gain	—	12	—	dB
Small Signal Gain Flatness	—	±1.5	±2.5	dB
Input/ Output VSWR	—	1.6	2.5	: 1
Noise Figure	—	7	—	dB
Isolation	—	-40	-15	dB
Output P ₋₁ dB	10	15	—	dBm
Supply Current (I _D)	—	130	200	mA

Absolute Maximum Ratings

Maximum Input Power	+17dBm 30s CW	Operating Temperature	-55°C ~ +85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
V _D	+10V		

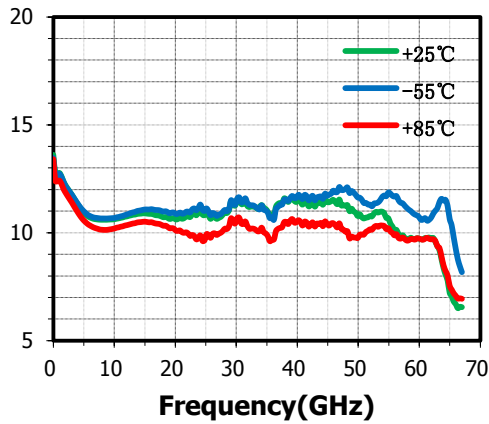
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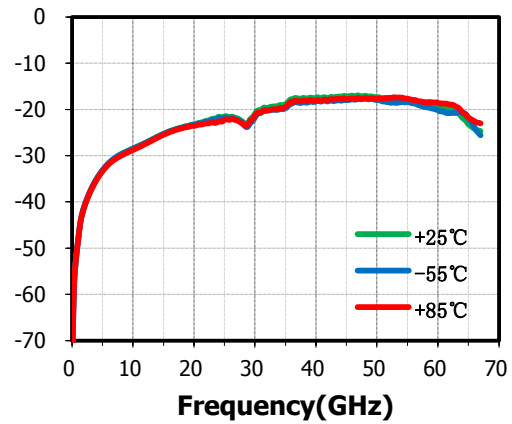
Typical Performance Curve

$V_D=+6V$, $I_{DQ}=130mA$, On fixture

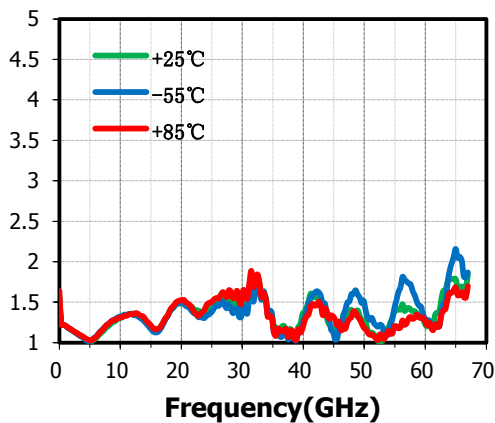
Small Signal Gain(dB) vs.Temperature



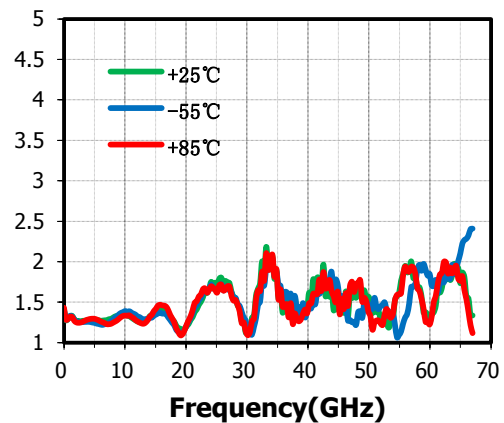
Reverse Isolation(dB) vs.Temperature



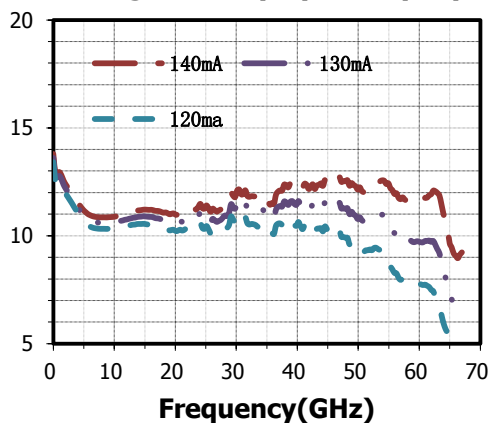
Input VSWR(:1) vs.Temperature



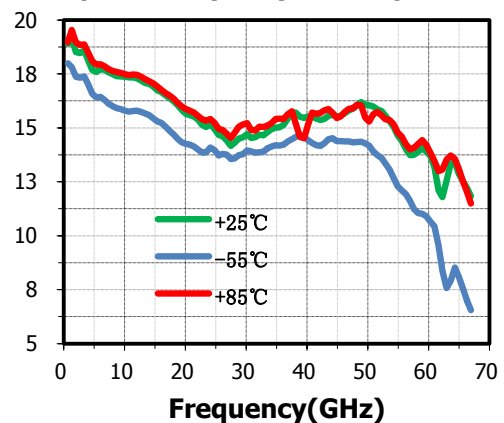
Output VSWR(:1) vs.Temperature



Small Signal Gain(dB) vs. I_{DQ} (mA)



Output P-1dB(dBm) vs.Temperature

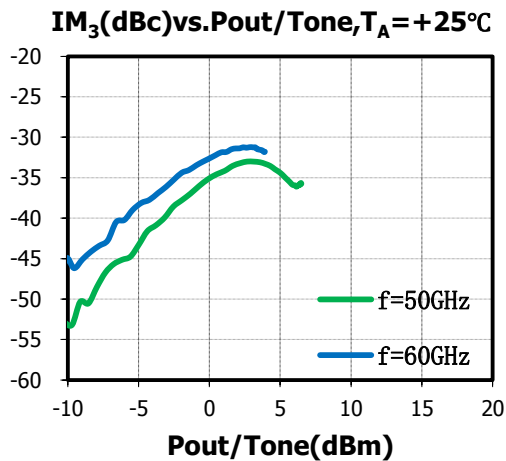
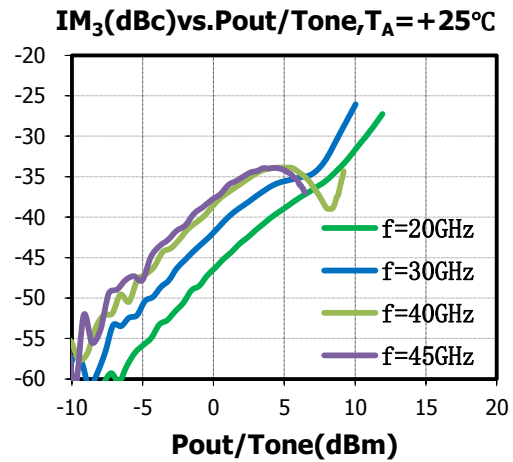
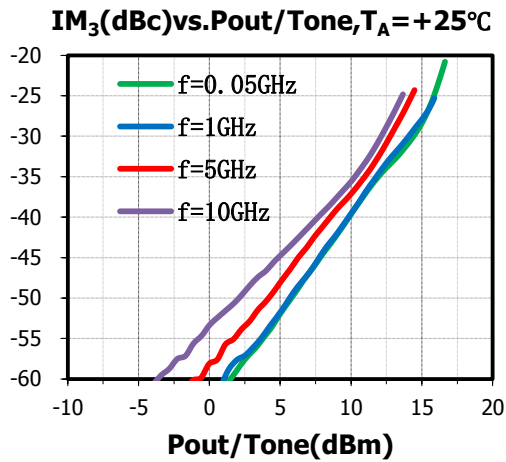


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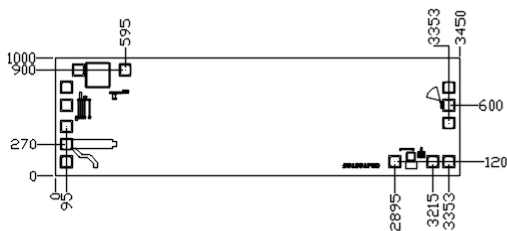


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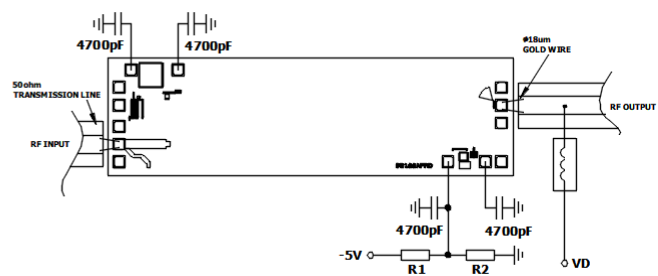
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Die Outline(μm)



Assembly Diagram



Notes

1. SAC3946 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -6 to -4V when the drain voltage is set to 6V.
2. The back of chip is RF ground.
3. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8mil

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thermosonic wedge bonding is highly recommended as the loop height will be minimized.

4. Bypass SLCs should be placed as close as possible to the chip.
5. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Revision History

Revision	Date	Comment
1.0	Jul. 10 2022	First Release