

SAC3913

GaAs MMIC Driver Amplifier
8GHz~13GHz

Rev 2.1

Features

- Frequency: 8GHz~13GHz
- Gain: 19dB
- Output P_{1dB}: 32.5dBm
- Supply Voltage: +5~+6V
- Power-Added Efficiency: 35%
- Die Size: 2.01mm×1.25mm×0.1mm

Typical Applications

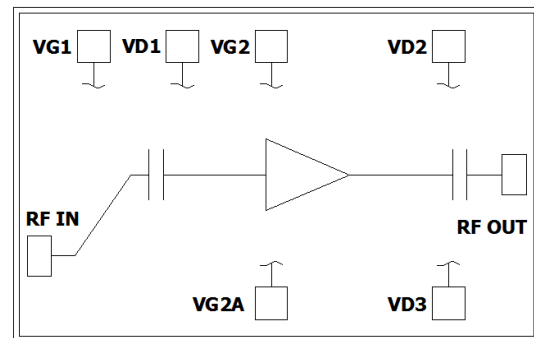
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

SAC3913 is a wideband GaAs MMIC driver amplifier which operates between 8GHz~13GHz. The amplifier has high PAE at Output P_{1dB} power, making it an ideal driver amplifier for high efficiency applications.

SAC3913 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C, V_D= +6V, I_D=650mA, Z₀=50Ω)

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

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8~13			GHz
Small Signal Gain	—	19	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-42	—	dB
Input Return Loss	—	-15	—	dB
Output Return Loss	—	-15	—	dB
Power-Added Efficiency	—	35	—	%
Output Power for 1 dB Compression (OP _{1dB})	—	32.5	—	dBm
Drain Voltage(V _D)	5	—	6	V
Supply Current(I _D)	—	650	730	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

SuperApex Corporation

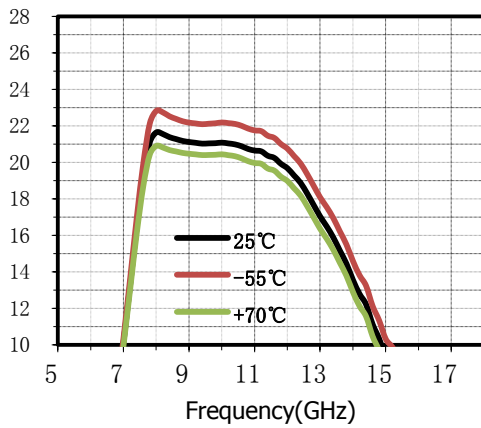
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Typical Performance Curve

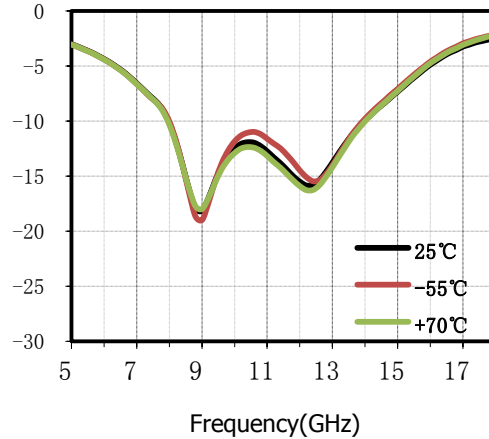
Data is obtained from 3.5-mm connector based test fixture and this data includes connector loss and board loss.

*Bias Conditions: $V_D = 6V$, $I_D = 650mA$

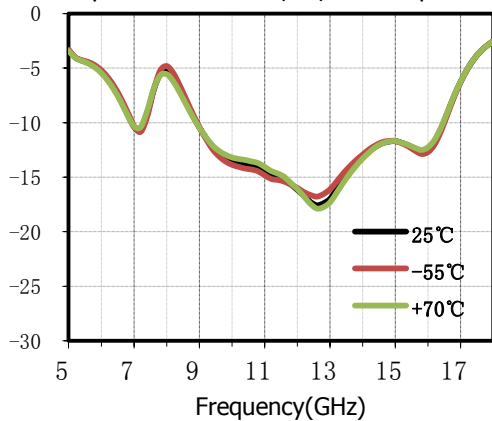
Small Signal Gain(dB) vs. Temperature



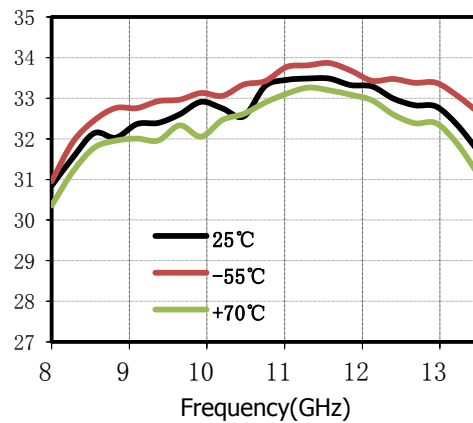
Input Return Loss(dB) vs. Temperature



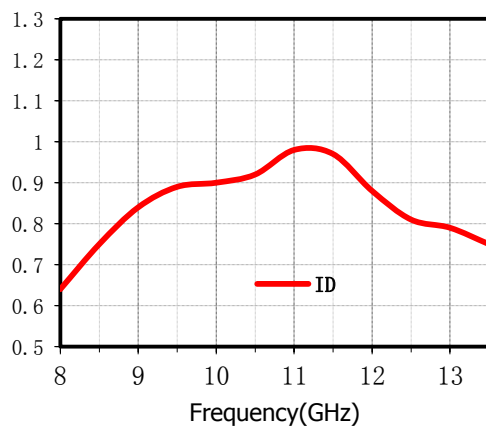
Output Return Loss(dB) vs. Temperature



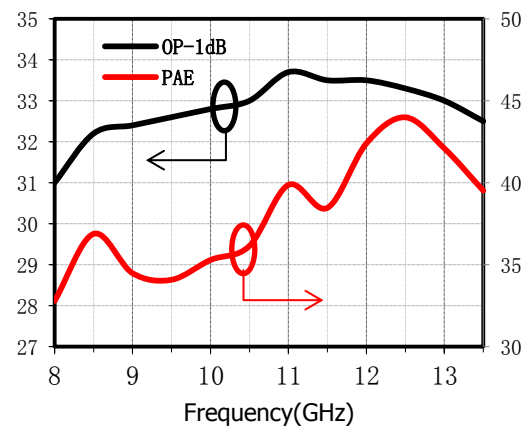
OP₁dB(dBm) vs. Temperature



OP₁dB(dBm) vs. I_D(A)



OP₁dB(dBm)、PAE(%) vs. Freq

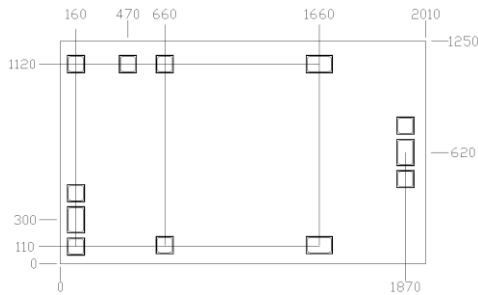


SAC3913

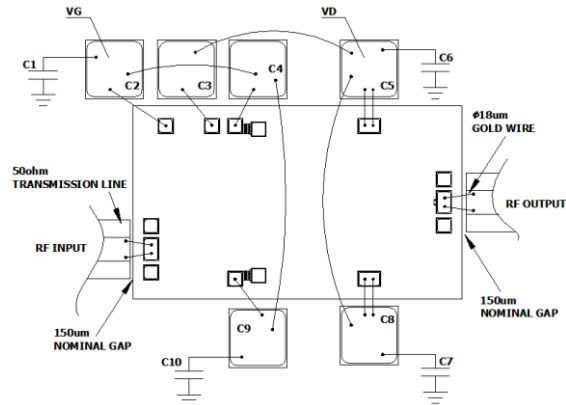
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Die Outline (all dimensions in um)

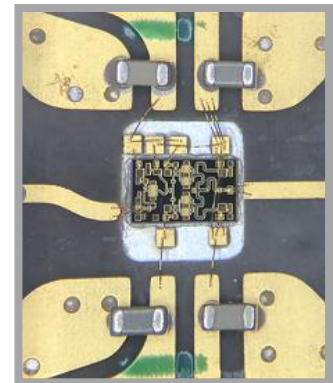


Assembly Diagram



VD2、VD3、RF Bonding pad size:100x150um
VG1、VD1、VG2、VG2A Bonding pad size:100x100um

Chip Test Fixture



Components List

Reference Des.	Value	Part Number	Manuf.	PKG
C1、C6、C7、C10	1uF	GRM155R61A105KE15D	Murata	0402
C2~C5、C8、C9	300pF	-	ANY	SLC

Notes

- SAC3913 is biased with a positive drain voltage supply and negative gate voltage supply.
When the drain voltage is set to 6V, the recommended gate voltage is -0.5~-0.75V.
- RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
- The backside of SAC3913 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
- Bypass caps C1, C6, C7 and C10 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.