

SAC3914

GaAs MMIC Driver Amplifier
14GHz~18GHz

Rev 2.1

Features

- Frequency: 14GHz~18GHz
- Gain: 19dB
- Output P_{1dB}: 31dBm
- Supply Voltage: +5V~+6V
- Power-Added Efficiency: 40%
- Die Size: 2.14mm×1.25mm×0.1mm

Typical Applications

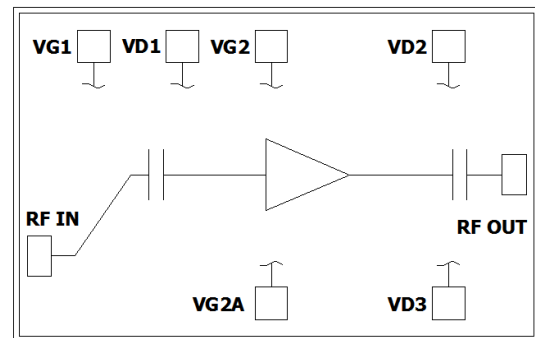
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

SAC3914 is a wideband GaAs MMIC driver amplifier which operates between 14GHz~18GHz. The amplifier has high PAE at output P_{1dB} power, making it an ideal driver amplifier for high efficiency applications.

SAC3914 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance ($T_A=25^{\circ}\text{C}$, $V_D=+6\text{V}$, $I_D=500\text{mA}$, $Z_0=50\Omega$)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	14~18			GHz
Small Signal Gain	—	19	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-10	—	dB
Power-Added Efficiency	—	40	—	%
Output Power for 1 dB Compression (OP _{1dB})	—	31	—	dBm
Drain Voltage(V _D)	5	—	6	V
Supply Current(I _D)	—	500	700	mA

Absolute Maximum Ratings

Maximum Input Power	+18dBm	Operating Temperature	-55°C~+125°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.3V	Maximum V _G	-1.2V

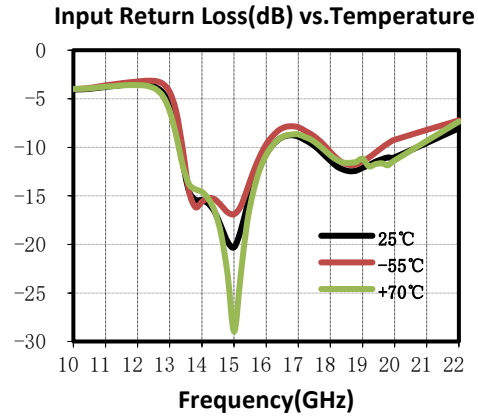
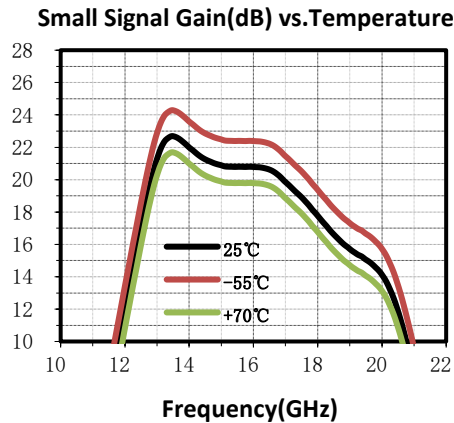
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Typical Performance Curve

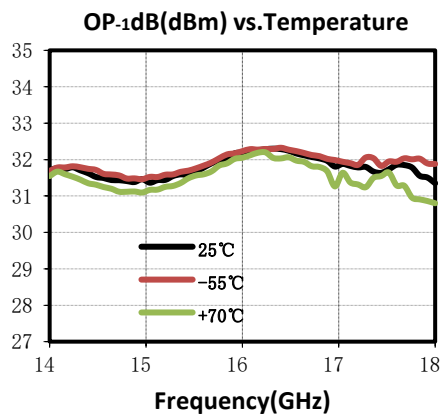
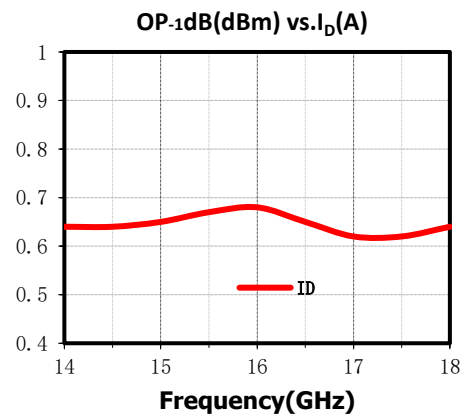
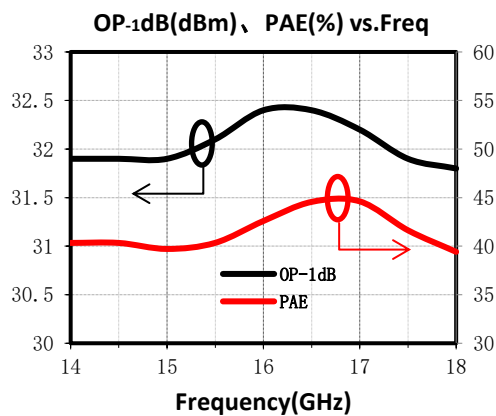
Data Based on the On-Wafer RF Probe Test Results

*Bias Conditions: $V_D = 6V$, $I_D = 500mA$



Data Based on the Connector Based Fixture Test Results

*Bias Conditions: $V_D = 6V$, $I_D = 500mA$

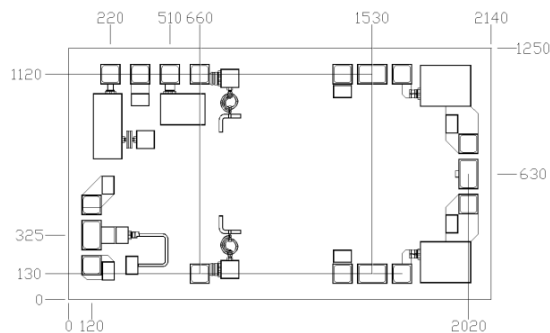


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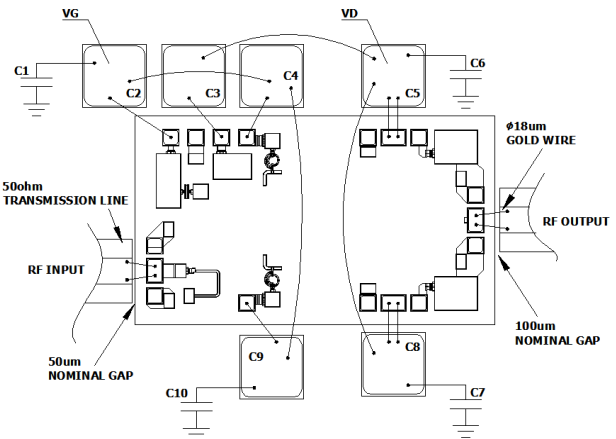
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Die Outline
(All dimensions in um)



Assembly Diagram



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

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

1. SAC3914 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.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. The backside of SAC3914 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. 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.