

Features

- Frequency: 7~9GHz
- Gain: 26dB
- Noise Figure: 0.6dB Typ. 0.7dB Max.
- Output P_{-1dB}: 17dBm@+3V
- Power Supply: +3V/80mA
- Die Size: 1.55mm×1.25mm×0.1mm

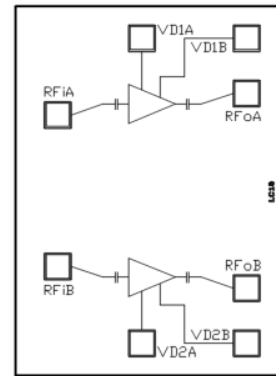
Typical Applications

- Point-to-Point Radios
- Phased Arrays

General Description

SAC3097 is a GaAs MMIC Low Noise Amplifier. SAC3097 is made of GaAs process, and the surface of the bare chip is protected by a passivation layer, which can work in the 7~9 GHz frequency band. When using 3V power supply, the small signal gain of the amplifier is 26dB, the output P_{-1dB} is 17dBm, the working current is 80mA, and the typical noise figure is 0.6dB.

Functional Diagram



Electrical Performance

T_A=25°C, V_D=+3V, I_D=80mA, Z₀=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range	7~9			GHz
Gain	23	26	—	dB
Gain Flatness	—	±1	±1.75	dB
Input VSWR/ Output VSWR	—	1.5	2	:1
Noise Figure	—	0.6	0.7	dB
Reverse Isolation	—	-55	—	dB
Output P _{-1dB}	15	17	—	dBm
Output IP ₃	—	28	—	dBm
Supply Current(I _D)	—	80	110	mA

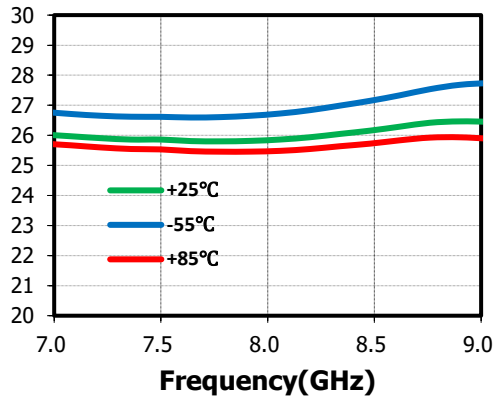
Absolute Maximum Ratings

Maximum Input Power	+18dBm, CW 20s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
Supply Voltage(V _D)	+7V		

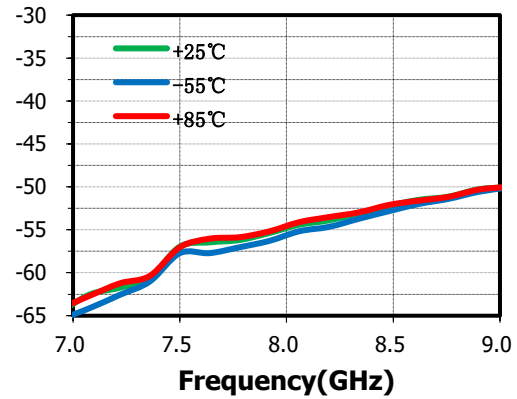
Typical Performance Curve

$V_D=+3V$, $I_{DQ}=80mA$, the following curve is measured with SAC3097 evaluation board, and the data is embedded to the gold wire bonding point.

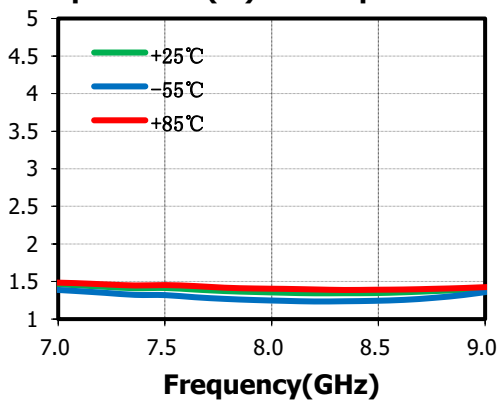
Small Signal Gain(dB) vs.Temperature



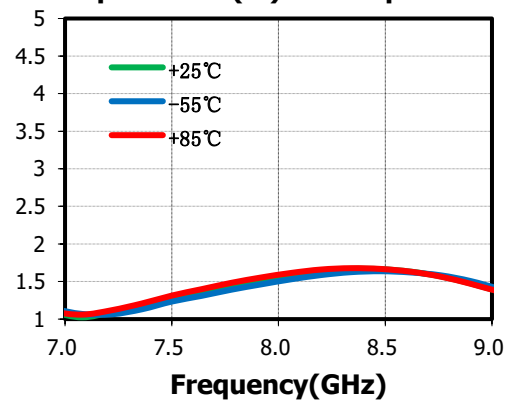
Reverse Isolation(dB) vs.Temperature



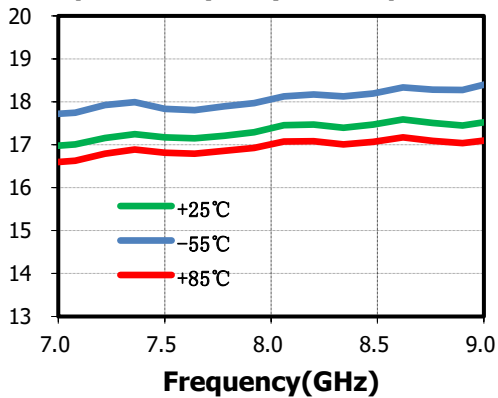
Input VSWR(:1) vs.Temperature



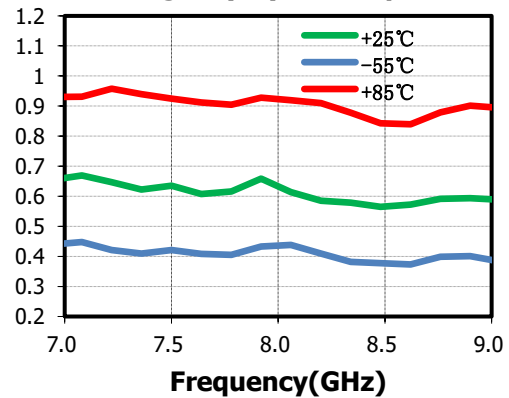
Output VSWR(:1) vs.Temperature



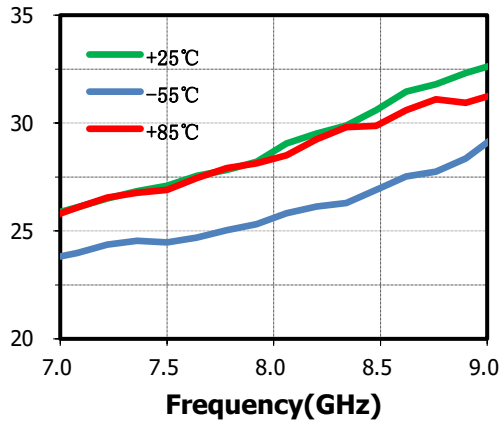
Output P-1dB(dBm) vs.Temperature



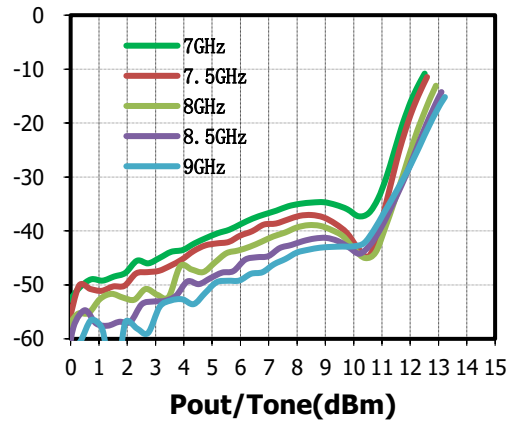
Noise Figure(dB) vs.Temperature



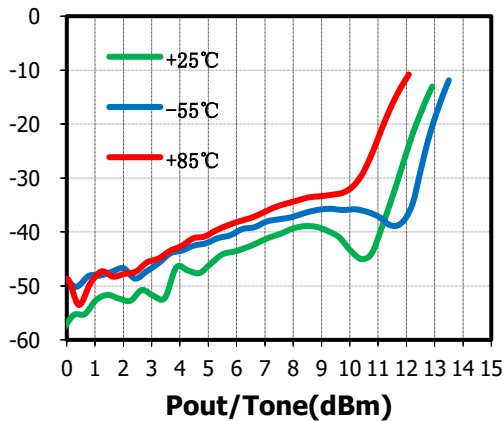
Output IP₃(dBm) vs. Temperature



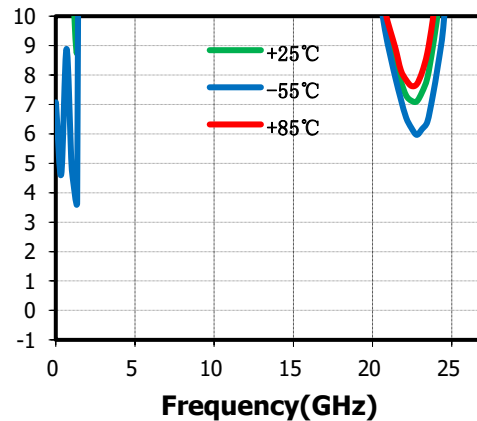
IM₃(dBc), Pout/Tone vs. Frequency



IM₃(dBc), Pout/Tone vs. Temperature

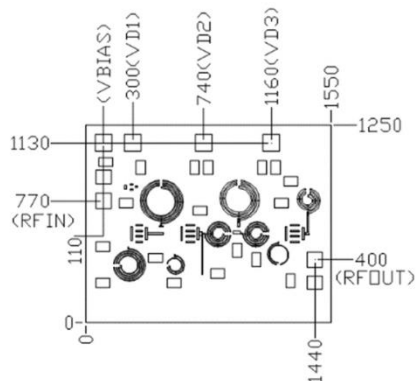


K factor(U) vs. Temperature



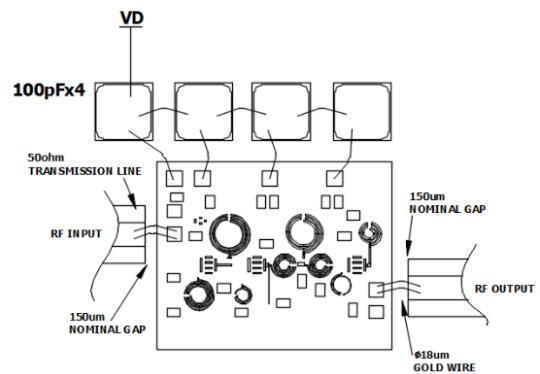
Die Outline Drawing

(All dimensions in μm)



Size of bonding pad: $100\mu\text{m}^2$, $t=100\mu\text{m}$

Die Assembly Diagram



Attention:

1. The bare chip shall be stored in a dry and nitrogen environment and used in an ultra-clean environment;
2. The bare chip is made of GaAs material, which is relatively brittle, so it cannot touch the chip surface. Be careful when using it;
3. The bare chip can be sintered with high thermal conductivity conductive adhesive or alloy (the alloy temperature cannot exceed 300 °C, and the time cannot exceed 30 seconds) to make it fully grounded;
4. The bare chip devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test;
5. The gap between the chip microwave port and the substrate shall not exceed 0.2mm Φ 18 μ m gold wire bonding, recommended gold wire length is 250~250 μ m;
6. The RF input and output ports of the chip have integrated DC isolation capacitors.

Revision History

Revision	Date	Comment
1.0	April 6, 2021	First Release