

SAC3070

GaAs MMIC Low Noise Amplifier
1~18GHz

Rev 2.1

Features

- Frequency: 1~18GHz
- Gain: 15dB
- Noise Figure: 1.1dB@1GHz
1.4dB@10GHz
2.6dB@18GHz
- Output P_{-1dB}: 12dBm@10GHz
- Power Supply: +4.75 ~ 5.5V/55mA
- Die Size: 1.25mm×1.21mm×0.1mm

Typical Applications

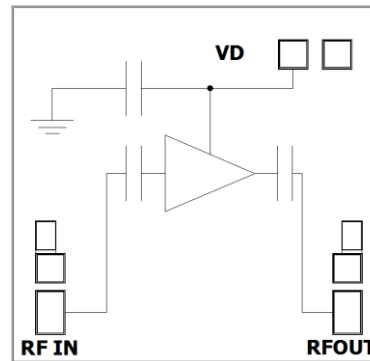
- Wide Band Receiver
- High Density MCM
- EW

General Description

SAC3070 is a GaAs MMIC low noise amplifier die which operates between 1 ~ 18GHz. The amplifier can provide 15dB gain, 12dBm Output P_{-1dB} and 1.4dB noise figure from a 55mA supply current in 10GHz.

The chip offers full passivation for increased reliability and moisture protection. This amplifier is the perfect alternative to higher cost hybrid amplifiers.

Functional Diagram



Electrical Performance (T_A=25°C, V_d=+5V, I_D=55mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units	
Frequency Range	1 ~ 18			GHz	
Gain	—	15	—	dB	
Gain Flatness	—	±2	±2.5	dB	
Reverse Isolation	—	-35	—	dB	
Input Return loss	—	-11	—	dB	
Output Return loss	—	-11	—	dB	
Noise Figure	1GHz	—	1.1	1.3	dB
	10GHz	—	1.4	1.6	
	18GHz	—	2.6	2.8	
Output P _{-1dB}	1GHz	5	7	—	dBm
	10GHz	10	12	—	
	18GHz	11	13	—	
Output IP ₃	—	23	—	dBm	
Supply Voltage(V _D)	4.75	—	5.5	V	
Supply Current(I _D)	—	55	—	mA	

Absolute Maximum Ratings

Maximum Input Power	+15dBm	Operating Temperature	-40°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C

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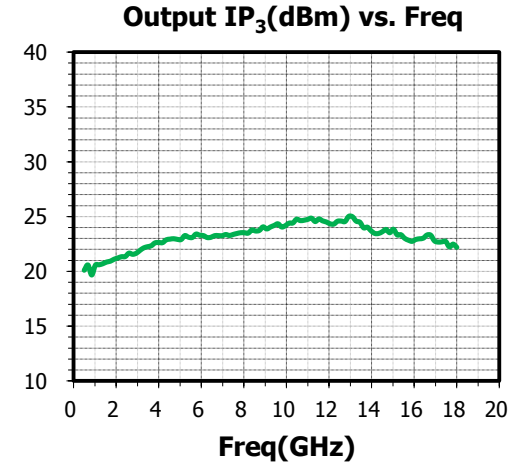
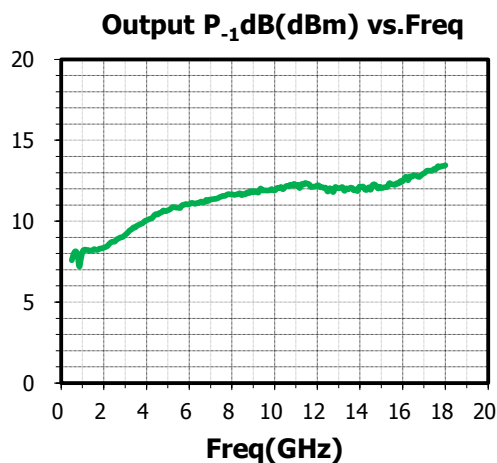
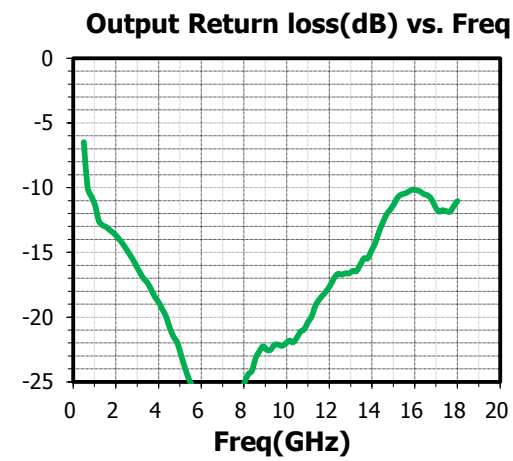
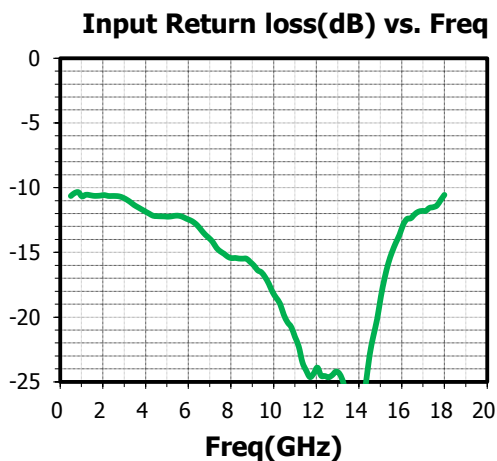
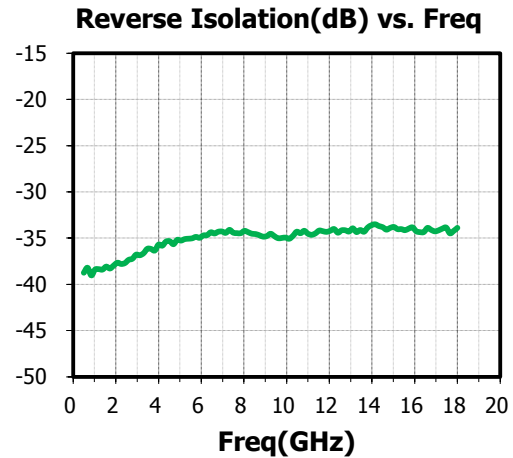
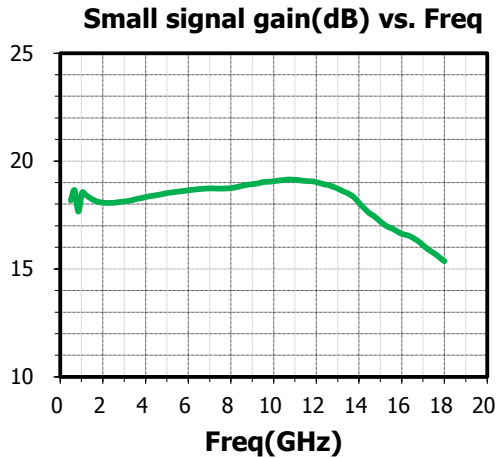


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Typical Performance Curve

$V_{D1}=5V, I_D=55mA$



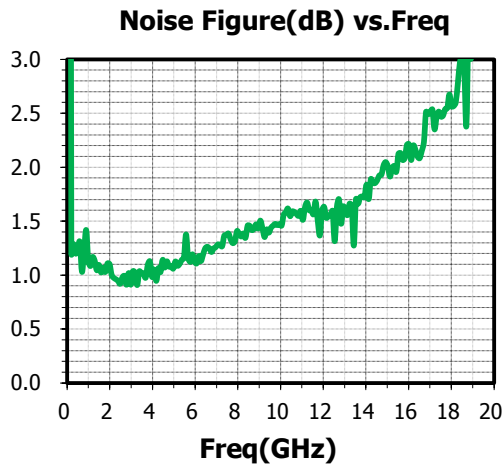
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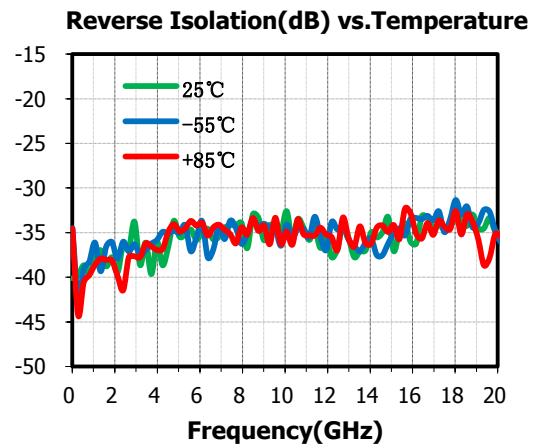
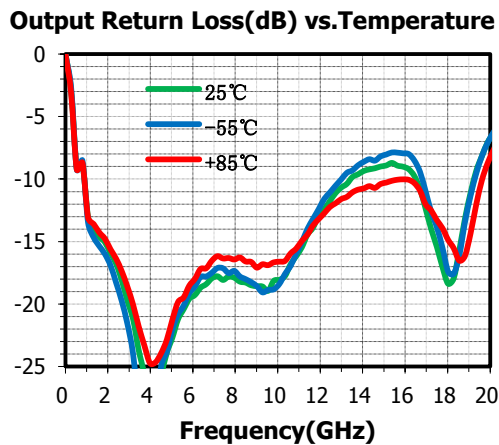
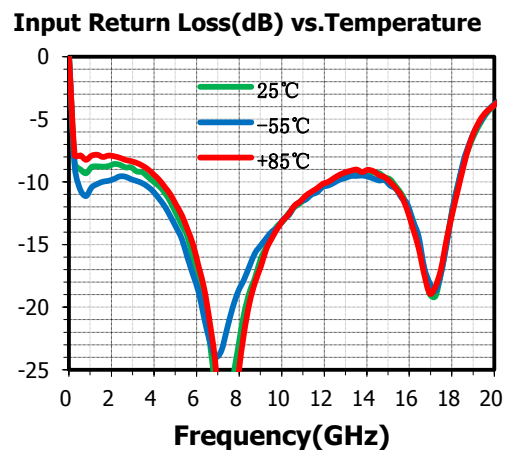
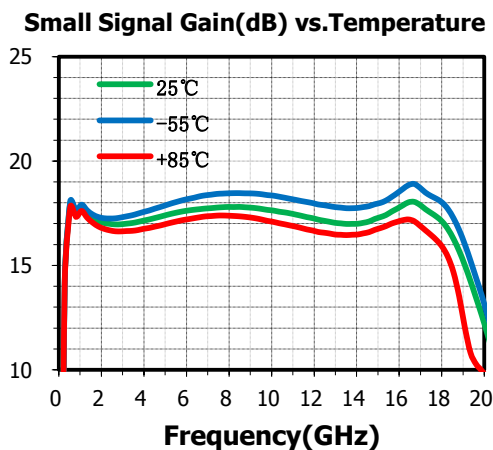
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Typical Performance Curve (Fixture test)

$V_D=4V$ $I_D=45mA$

The results captured in the test-jig environment within connector plane, then de-embedded the housing and come back in the die plane



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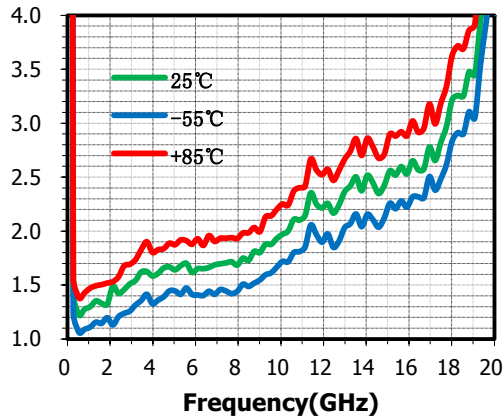
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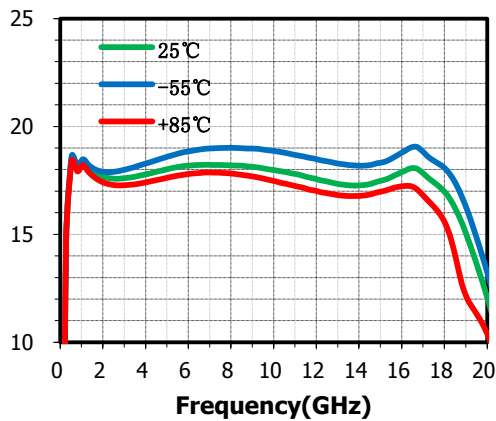
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Noise Figure(dB) vs.Temperature

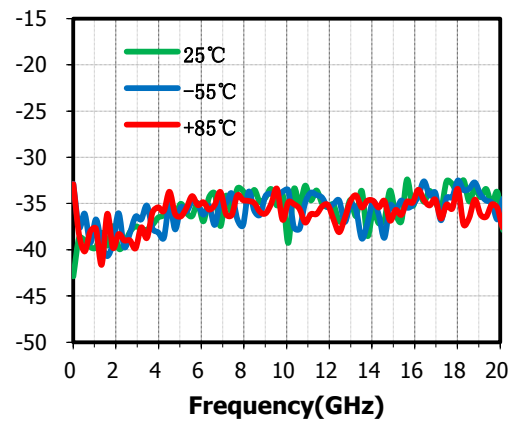


$V_D=5V$ $I_D=55mA$

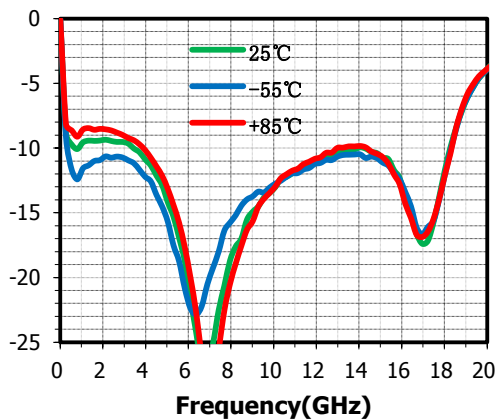
Small Signal Gain(dB) vs.Temperature



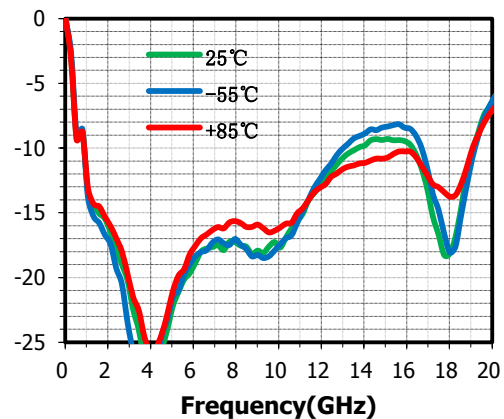
Reverse Isolation(dB) vs.Temperature



Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature



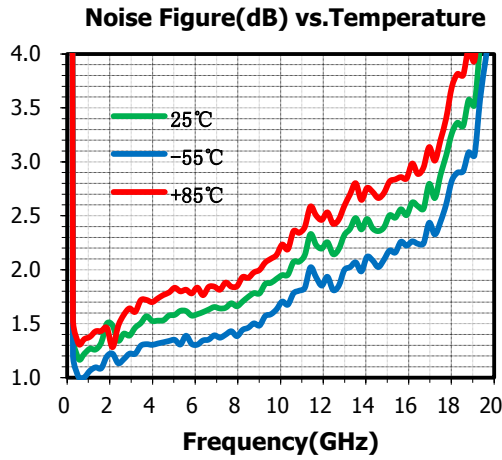
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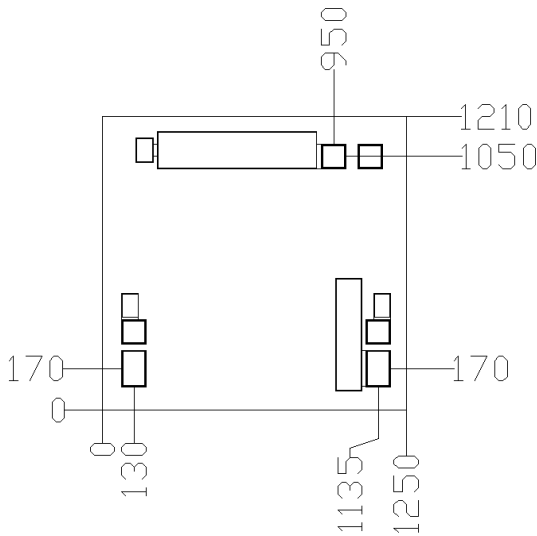
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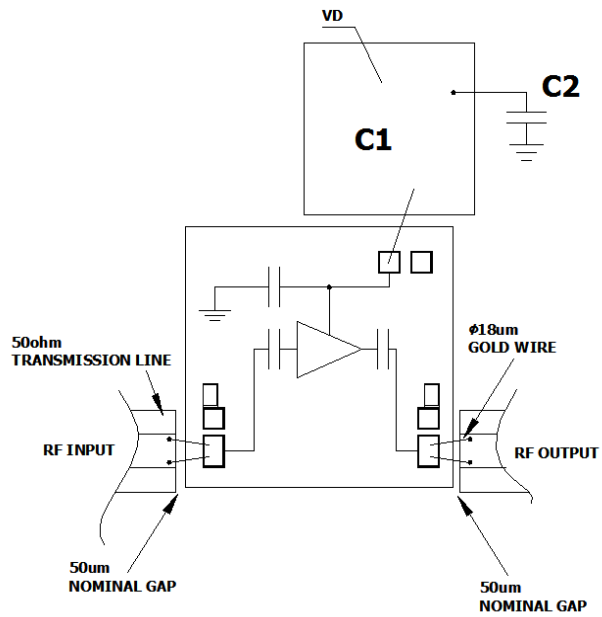
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Outline
(All dimensions in μm)



Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1	1000pF	-	-	SLC
C2	1uF	-	-	0402

Attention:

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.