

SAC3002A

GaAs MMIC Low Noise Amplifier
0.03~0.5GHz

Rev 1.0

Features

- Frequency: 0.03~0.5GHz
- Gain: 29dB
- Noise Figure: 0.4dB Typ. 0.55dB Max.
- OP₁dB: 20dBm
- Supply Voltage: +5V@80mA
- Die Size: 0.74mm×1.24mm×0.1mm

Typical Applications

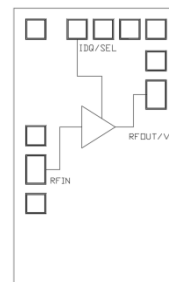
- Radar and ECM
- RF/ Microwave radio
- Military and Space
- Test and Measurement

General Description

SAC3002A is a GaAs MMIC Low Noise Amplifier die which operates between 0.03 to 0.5GHz. The amplifier can provide 29dB gain, 20dBm Output P₁dB, less than 0.55dB noise figure from a 80mA supply current.

The chip offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C, V_D= +5V, I_D=80mA, Z₀=50Ω)

Parameter	Min	Typ.	Max	Units
Frequency Range	0.03~0.5			GHz
Gain	28	29	33	dB
Gain Flatness	—	±1	±1.5	dB
Input/Output VSWR	—	1.5	2.2	:1
Noise Figure	—	0.4	0.55	dB
Reserve Isolation	—	-30	—	dB
Output Power for 1 dB Compression (OP ₁ dB)	18.5	20	—	dBm
Output Third Order Intercept (OIP ₃)	—	33	—	dBm
Supply Current(I _D)	—	80	100	mA

Absolute Maximum Ratings

Maximum Input Power	+18dBm,CW 30s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Supply Voltage	+6V		

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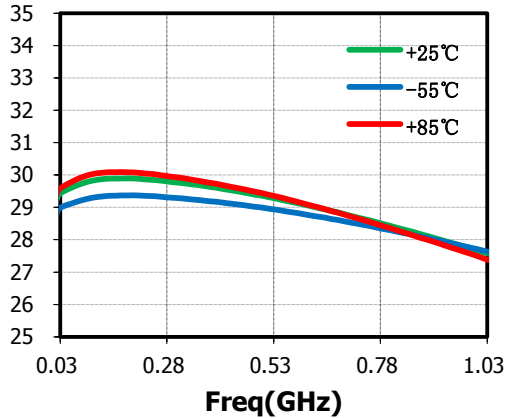
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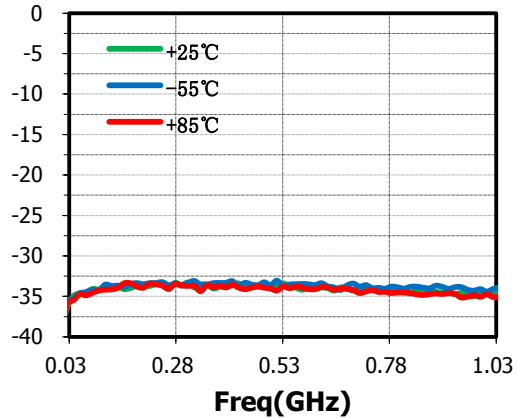
Typical Performance Curve

$V_D=+5V$, $I_{DQ}=80mA$

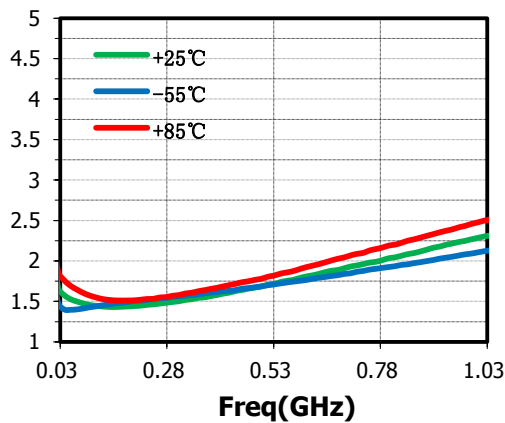
Small Signal Gain(dB) vs.Temperature



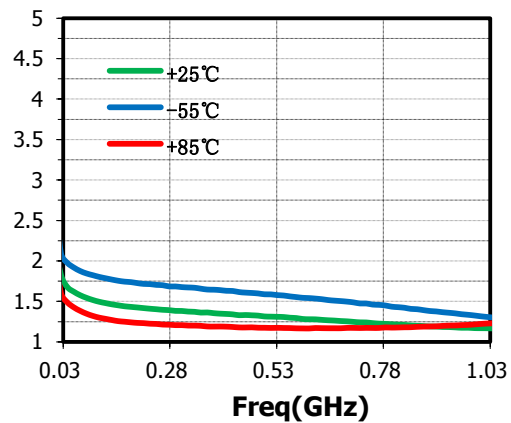
Reverse Isolation(dB) vs.Temperature



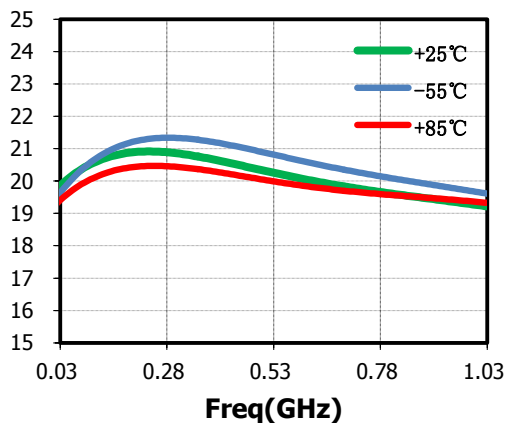
Input VSWR(:1) vs.Temperature



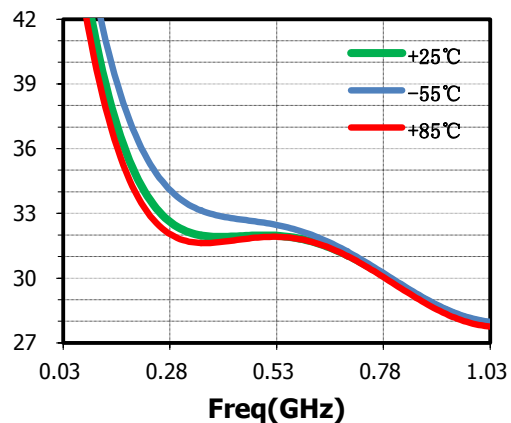
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs. Temperature



Output IP₃(dBm) vs. Temperature

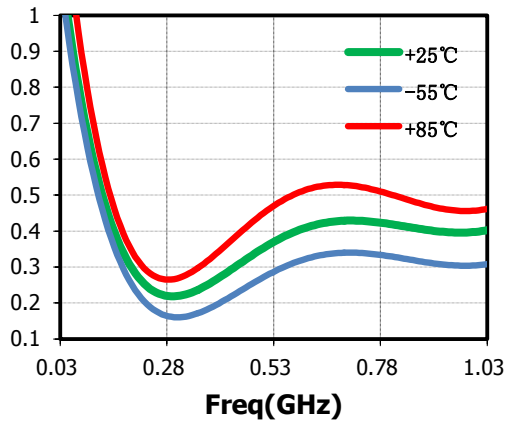


SAC3002A

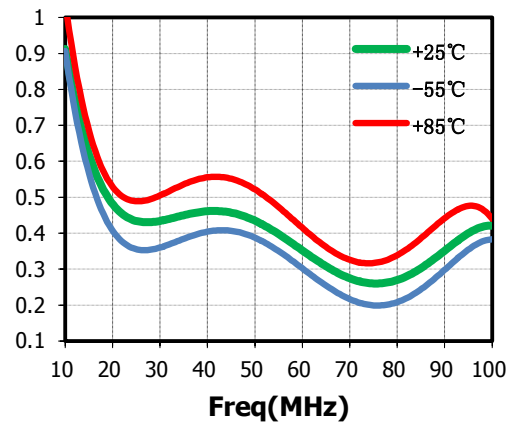
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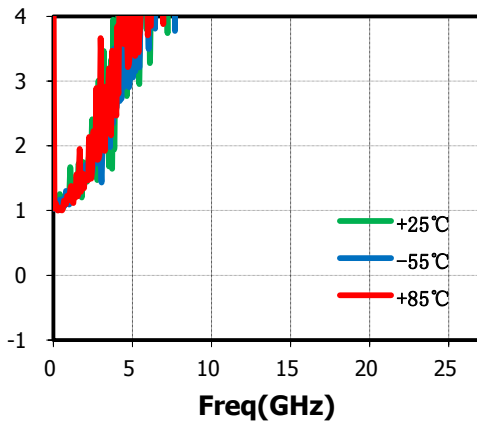
Noise Figure(dB) vs. Temperature



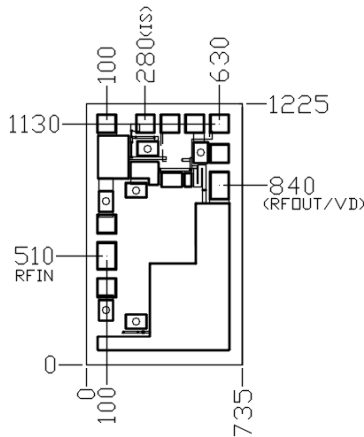
Noise Figure(dB) vs. Temperature



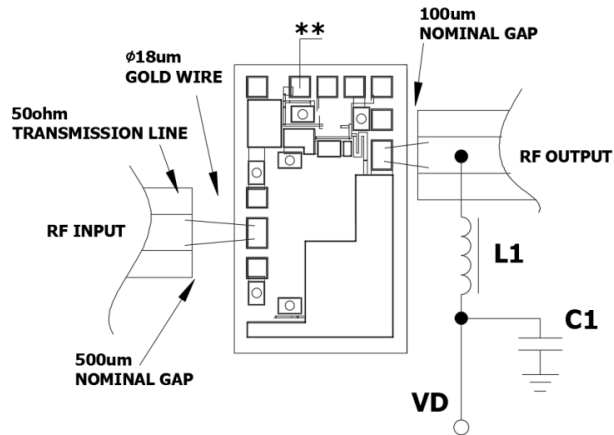
K factor vs. Temperature



Die Outline
(All dimensions in μm)



Assembly Diagram



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Remarks :

Pad size: RFIN ,RFOUT $90 \times 125 \mu\text{m}^2$, IS: $90 \times 90 \mu\text{m}^2$

RF Input and Output are DC coupled. A 0603, X5R dielectric, 0.01 μF capacitor are recommend at RF Input and Output side.

**Connect to ground

BOM

Reference Des.	Value	Part Number	Manuf.	Size
C1	2.2uF	0603YD225KAT2A	MURATA	0603
L1	-	MMZ1608S202ATD25	TDK	0603

Attention:

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