

SAC3074

GaAs MMIC Low Noise Amplifier
20~1000MHz

Rev 1.4

Features

- Frequency: 20~1000MHz
- Gain: 29dB
- Noise Figure: 0.4 dB typ. 0.55dB max.
- Single Power Supply: +5V/65mA, +4V/40mA
- Output IP₃: 37dBm@700MHz
- Integrated Temperature Compensation Circuit
- Die Size: 0.74mm×1.23mm×0.1mm

Typical Applications

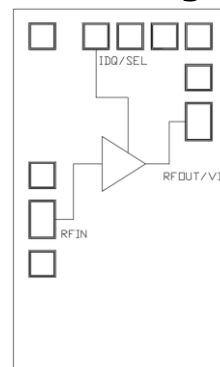
- Wide Band Receiver
- High Density MCM
- EW

General Description

SAC3074 is a GaAs MMIC low noise amplifier die which operates between 20~1000MHz. The amplifier can provide 29dB gain, 20dBm Output P_{-1dB} and 0.55dB noise figure.

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=65mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	20~1000			MHz
Gain	27	29	32	dB
Gain Flatness	—	±0.75	—	dB
Reverse Isolation	—	-30	—	dB
Input VSWR/ Output VSWR	—	2	2.7	: 1
Noise Figure	—	0.4	0.55	dB
Output P _{-1dB}	19.5	20	—	dBm
Output IP ₃	—	37*	—	dBm
Output IP ₂	—	42*	—	dBm
Supply Current(ID)	—	65	80	mA
Supply Voltage(VD)	4	—	5	V

※Pout/Tone=9dBm Fc=700MHz,Δf=1MHz

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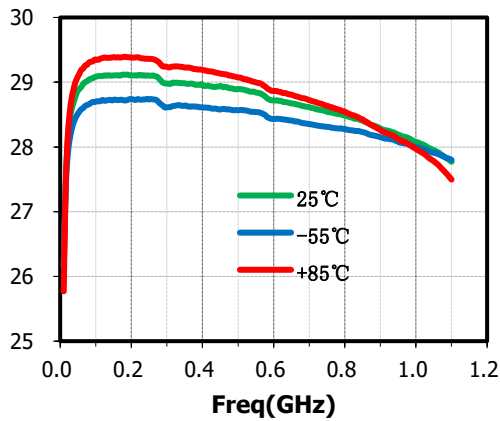
Absolute Maximum Ratings

Maximum Input Power	+20dBm, CW, 1min	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Supply Voltage	7V		

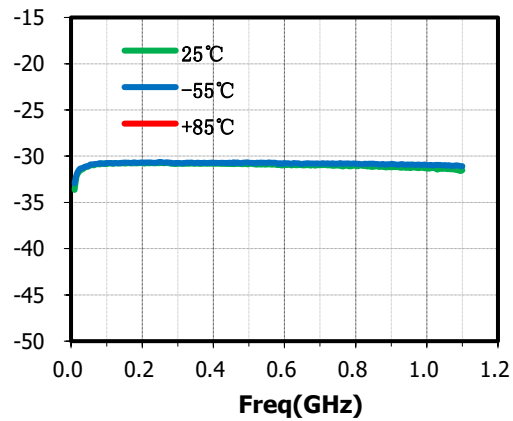
Typical Performance Curve

VD=+5V, IDQ=65mA, Bias Choke: MMZ1608S202ATD25, IDQ/SEL=Floating

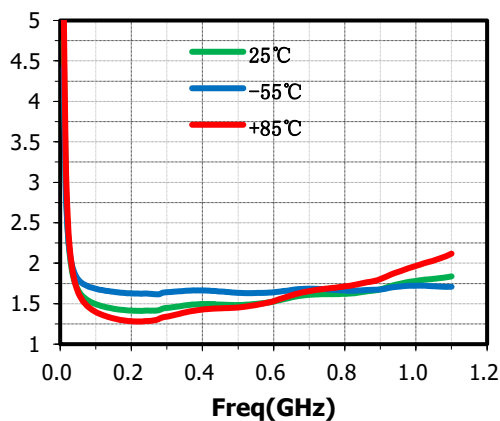
Small Signal Gain(dB) vs. Temperature



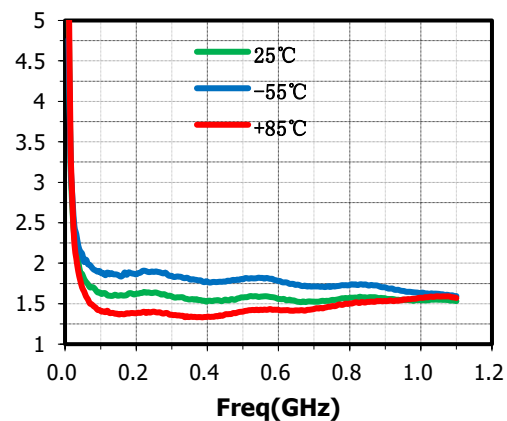
Reverse Isolation(dB) vs. Temperature



Input VSWR(:1) vs. Temperature



Output VSWR(:1) vs. Temperature

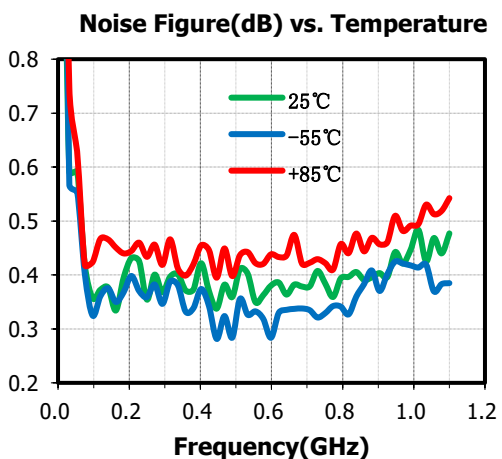
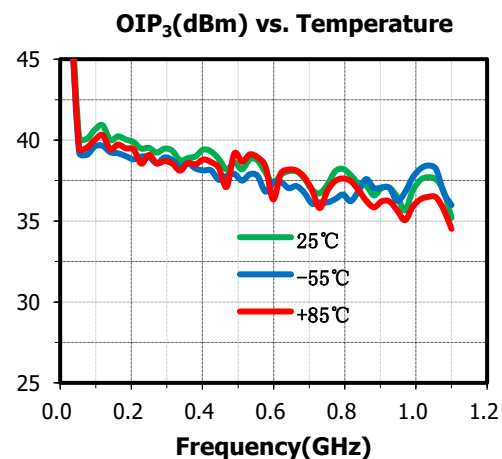
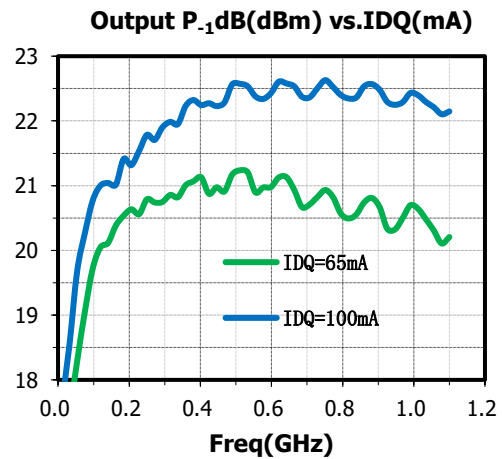
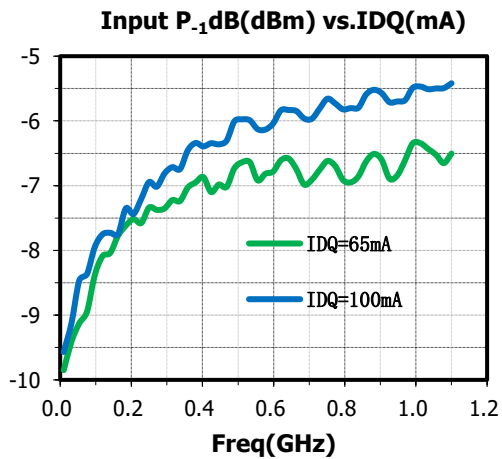
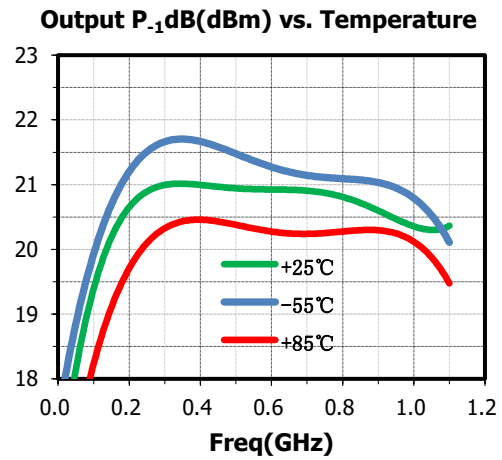
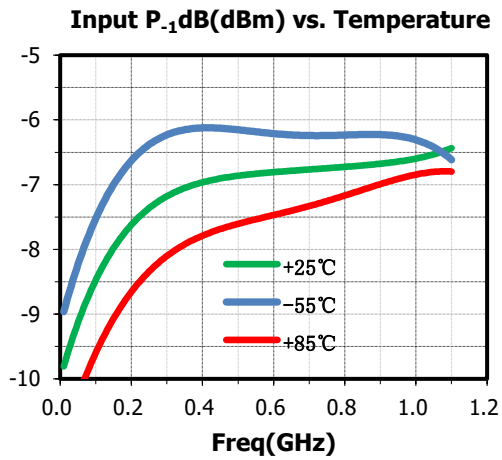


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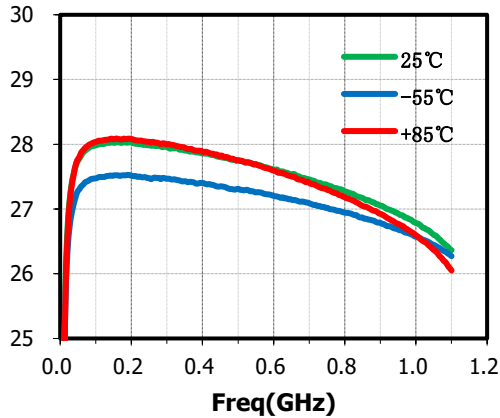


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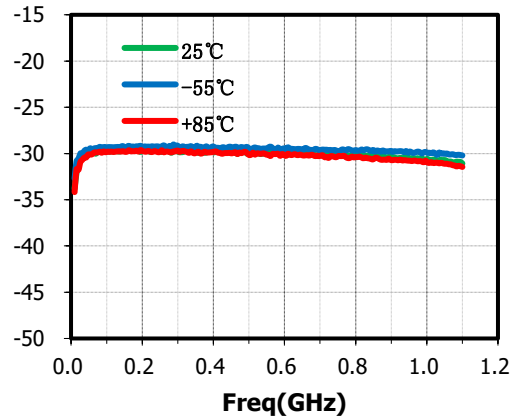
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VD=+4V, IDQ=40mA, Bias Choke: MMZ1608S202ATD25, IDQ/SEL=Connect to ground

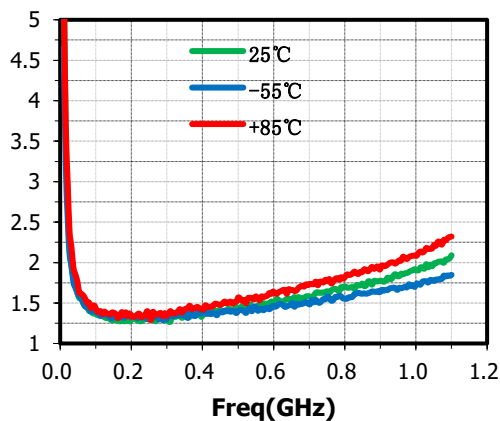
Small Signal Gain(dB) vs. Temperature



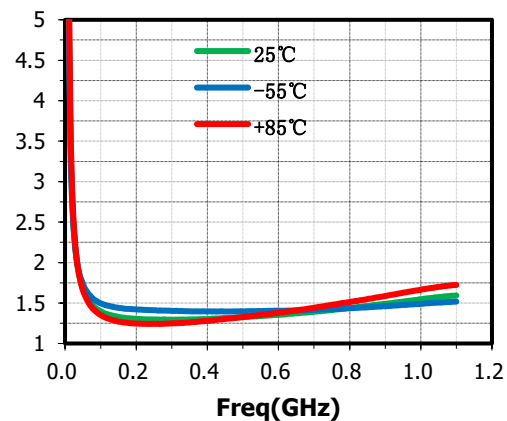
Reverse Isolation(dB) vs. Temperature



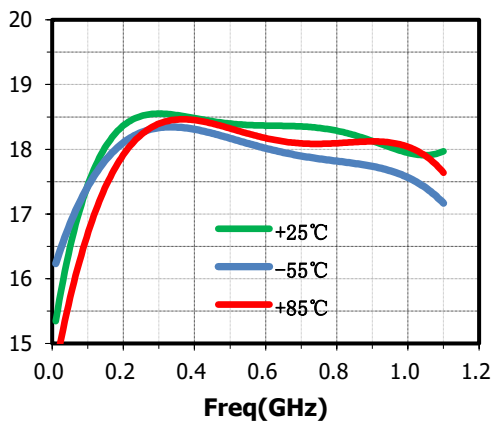
Input VSWR(:1) vs. Temperature



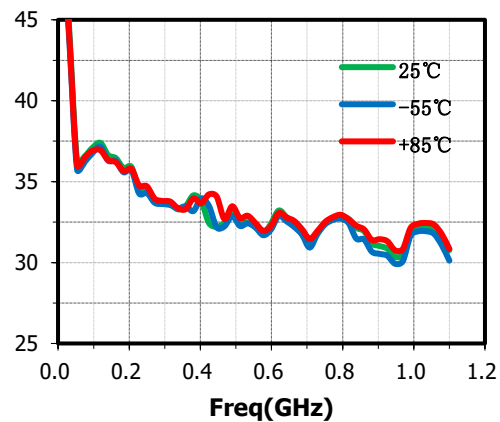
Output VSWR(:1) vs. Temperature



OP₁(dBm) vs. Temperature



OIP₃(dBm) vs. Temperature



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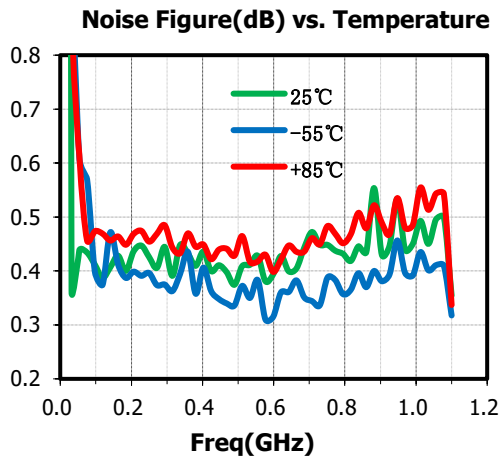
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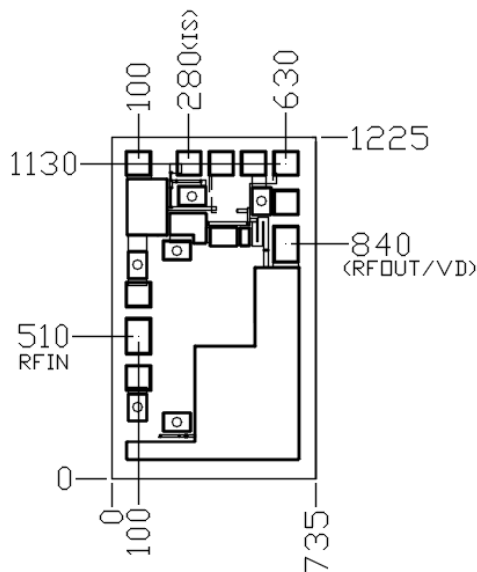
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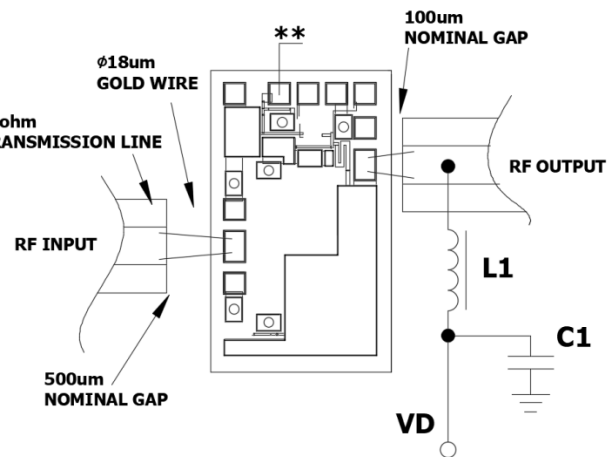
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Outline
(All dimensions in μm)



Assembly Diagram



Pads Size: RFIN ,RFOUT 90*125 μm , IS: 90x90 μm

** Connected to Ground IDQ=65mA, Floating IDQ=100mA@VD=5V

Connected to Ground IDQ=40mA@VD=4V

Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1	2.2 μ F	0603YD225KAT2A	MURATA	0603
L1	—	MMZ1608S202ATD25	TDK	0603

Attention:

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