SAC3091QP3

GaAs MMIC Low Noise Amplifier
1.5~8.5GHz

Rev 1.0

Features

- Frequency：1.5~8.5GHz
- Gain：27dB
- Noise Figure：1dB Typ. 1.2dB Max
- Output P_{-1}dB：9dBm
- Power Supply：+4V/25mA
- Package Size：3mmx3mmx0.75mm

Typical Applications

- EW
- Wideband Communication Systems

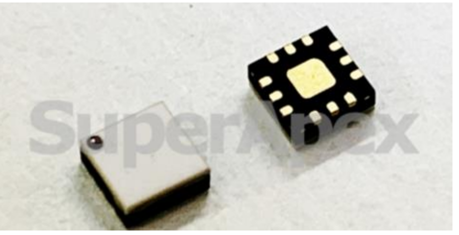
General Description

SAC3091QP3 is a GaAs MMIC Low Noise Amplifier in QFN over molding surface mount package, which operates between in 1.5~8.5GHz.

The amplifier can provide 27dB of gain, 9dBm of output P_{-1}dB and 1dB noise figure and from a 25mA supply current.

SAC3091QP3 is assembled in a 3mm x 3mm x 0.75mm QFN plastic package

Picture



Electrical Performance (T_A=25℃, V_D=+4V, I_D=25mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	1.5~8.5			GHz
Gain	25	27	32	dB
Gain Flatness	—	±1	±2	dB
Input VSWR/ Output VSWR	—	1.5	2.5	:1
Noise Figure	—	1	1.2	dB
Reverse Isolation	—	-40	—	dB
Output P_{-1}dB	6	9	—	dBm
Output IP_3	—	22	—	dBm
Supply Current(I_D)	—	25	35	mA

Absolute Maximum Ratings

Maximum Input Power	+16dBm,CW 30s	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-55℃~+150℃
Supply Voltage	+6V		

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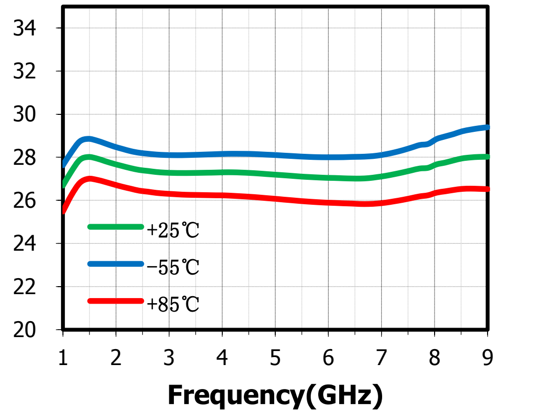
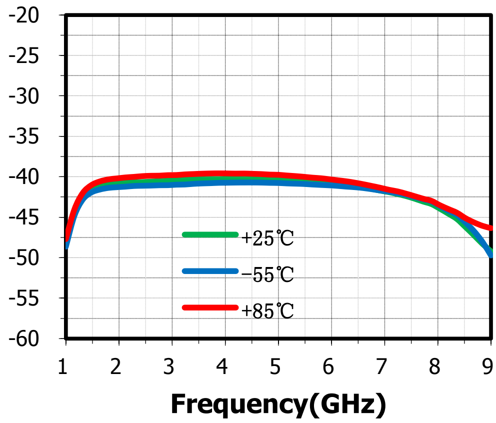
Typical Performance Curve

V_D=+4V,I_{DQ}=25mA, The following curves are taken from SAC3091QP3 evaluation board. De-embedding operation has been Implemented.

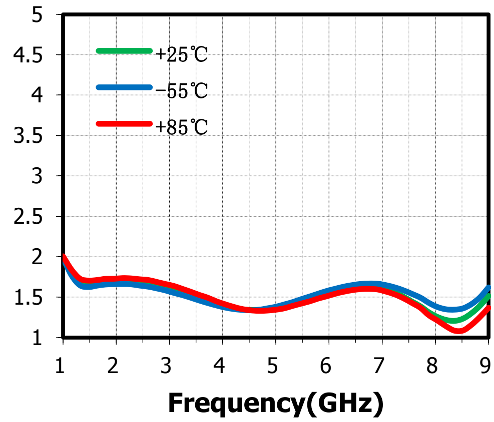
Small Signal Gain(dB) vs.Temperature



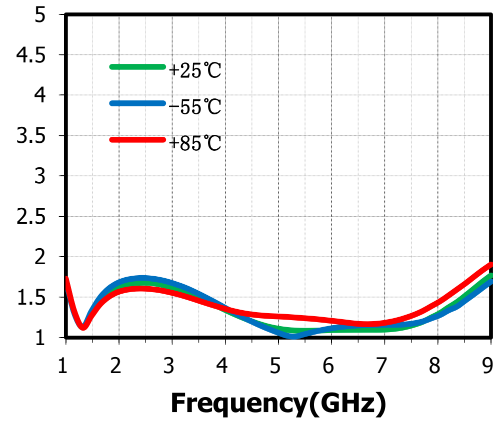
Reverse Isolation(dB) vs.Temperature



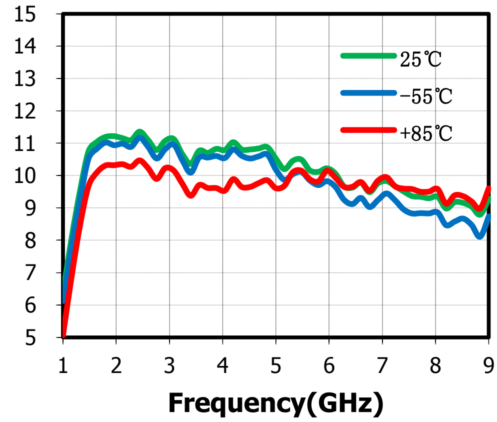
VSWRi(:1) vs.Temperature



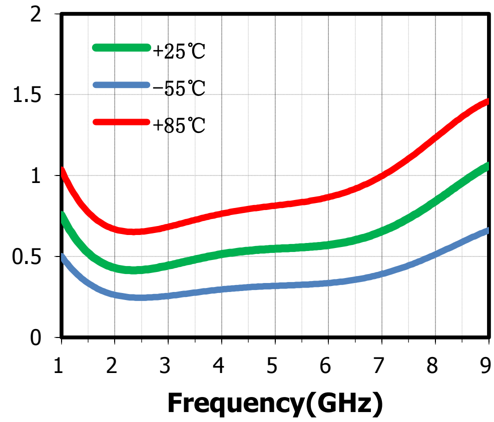
VSWRo(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Noise Figure(dB) vs.Temperature



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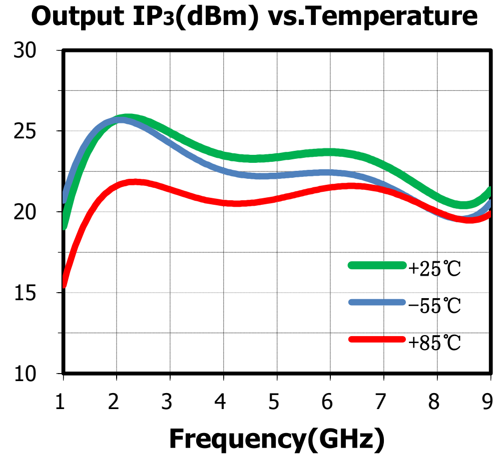
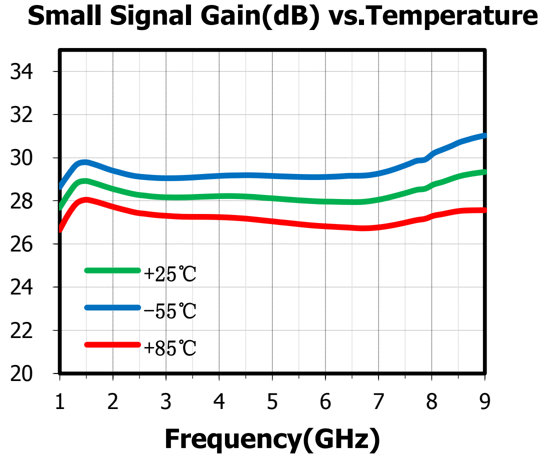
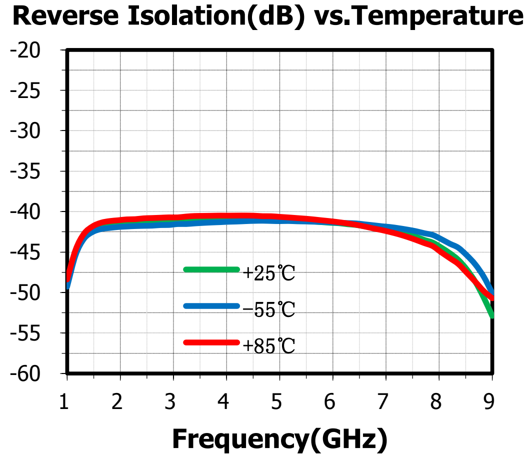
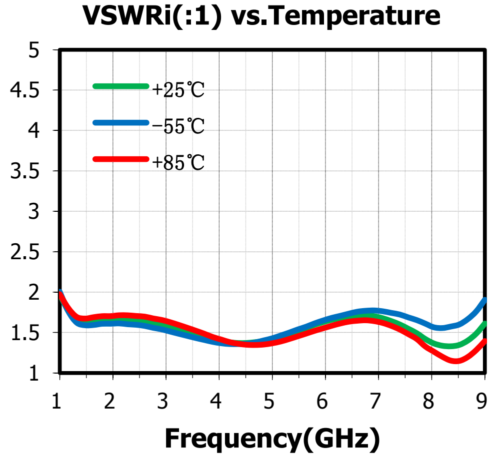
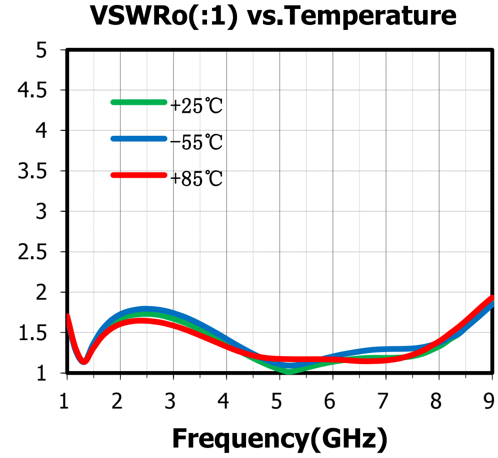


V_D=+5V,I_{DQ}=35mA, The following curves are taken from SAC3091QP3 evaluation board. De-embedding operation has been Implemented.









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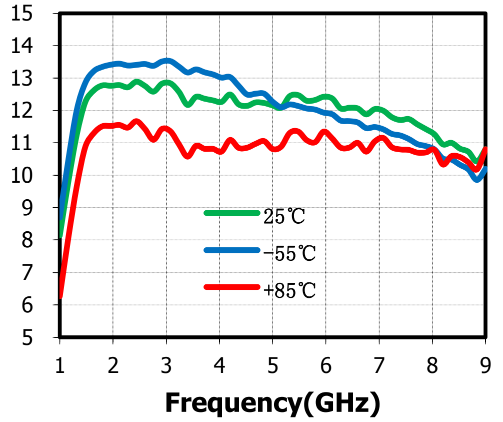
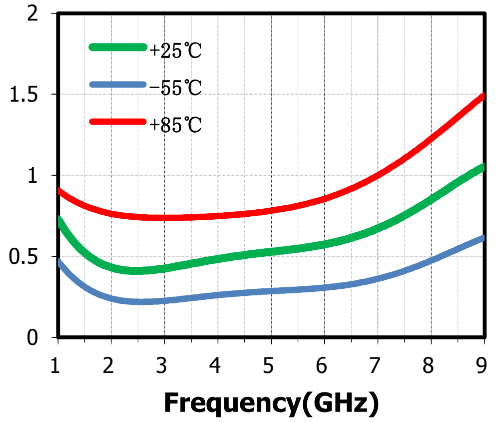
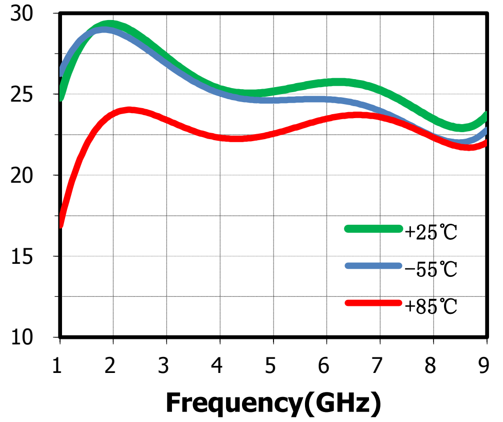
Output P-1dB(dBm) vs.Temperature



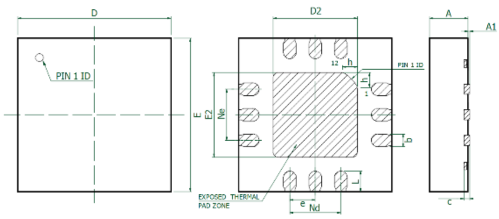
Noise Figure(dB) vs.Temperature



Output IP3(dBm) vs.Temperature

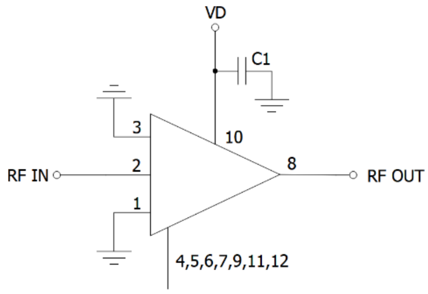


Outline Drawing
(All dimensions in mm)



DIM	MILLIMETER		
	MIN	NOM	MAX
A	0.65	0.75	0.85
A1	—	0.02	0.05
b	0.20	0.25	0.30
c	0.18	0.20	0.25
D	2.90	3.00	3.10
D2	1.55	1.65	1.75
e	0.50BSC		
Ne	1.00BSC		
Nd	1.00BSC		
E	2.90	3.00	3.10
E2	1.55	1.65	1.75
L	0.35	0.40	0.45
h	0.25	0.30	0.35

Application Circuit



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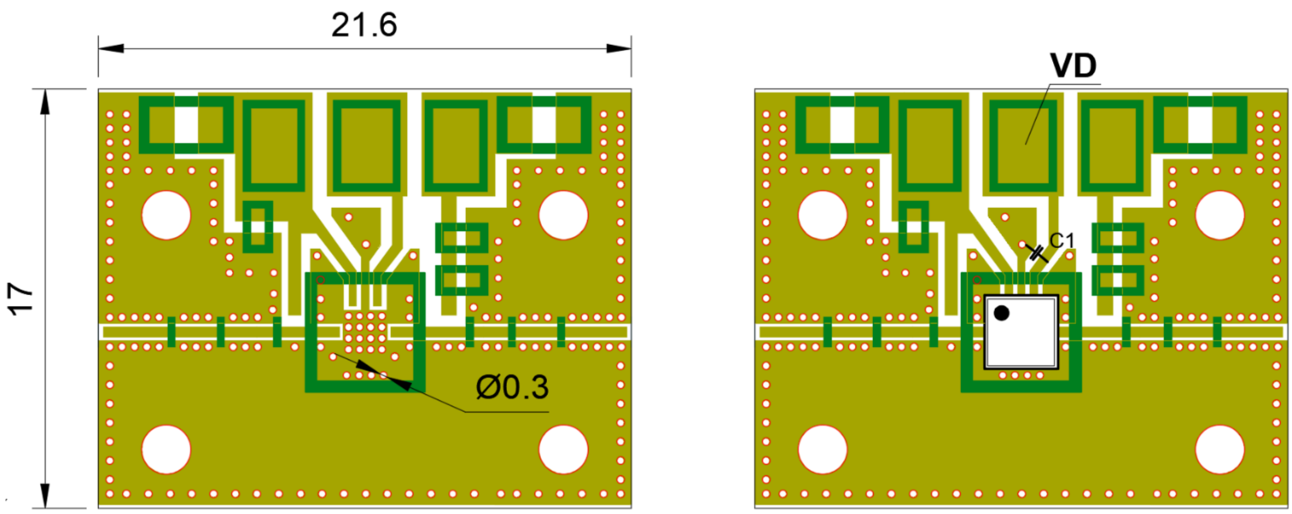
Pin Function

Pin No.	Description	Pin No.	Description
1	Connect to ground	7	Connect to ground
2	RF input, AC Coupled	8	RF output, AC Coupled
3	Connect to ground	9	Connect to ground
4	Connect to ground	10	VD
5	Connect to ground	11	NC or Connect to ground
6	Connect to ground	12	NC or Connect to ground

SAC3091QP3 Evaluation Board



The Evaluation board is a 2-layer board fabricated using Rogers 4350 t=0.254 and using best practices for high frequency RF design. The RF input and RF output traces have a 50 Ω characteristic impedance.

Components List

Reference Des.	Value	Part Number	Manuf.
C1	1000pF	GRM0336R61A102KE	Murata

Attention:

1. The moisture resistant grade of products is 2a, the storage environment ≤30° C/60% RH，The surrounding workshop life is 4 weeks.
2. After un-packing, It is necessary to bake the parts for 6 hours in 125+/-5 degree environment before soldering.