

# SAC3122Q4



GaAs MMIC Power Amplifier  
1MHz~3000MHz 30dBm

Rev 2.1

## Features

- Frequency: 1MHz~3000MHz
- Gain: 25.5dB
- Output P<sub>-1dB</sub>: 30dBm
- Supply Voltage: +10~+12V
- Package Size: 4mm×4mm×1.2mm

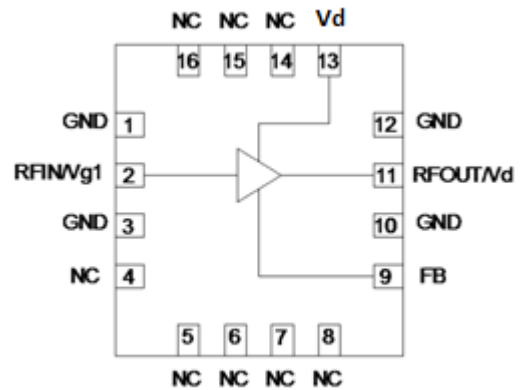
## Typical Applications

- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

## General Description

SAC3122Q4 is a wideband medium power amplifier which operates between 1MHz~3000MHz. The amplifier provides 25.5dB of gain, 30dBm P<sub>-1dB</sub> power and 40% PAE from a +10~+12V supply voltage, making it an ideal driver amplifier for high efficiency applications.

## Functional Diagram



## Electrical Performance (T<sub>A</sub>=25°C, V<sub>d</sub>=12V, Z<sub>0</sub>=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	1~3000			MHz
Small Signal Gain	—	25.5	—	dB
Small Signal Gain Flatness	—	±0.5	—	dB
Reverse Isolation	—	-28	—	dB
Input VSWR	—	2	—	:1
Output VSWR	—	2.5	—	:1
Power-Added Efficiency	—	40	—	%
Output Power for 1 dB Compression (OP <sub>-1dB</sub> )	—	31	—	dBm
Drain Voltage (V <sub>D</sub> )	10	—	12	V
Supply Current (I <sub>D</sub> )	—	240	—	mA

## Absolute Maximum Ratings

Maximum Input Power	+20dBm	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V <sub>D</sub>	+15V		

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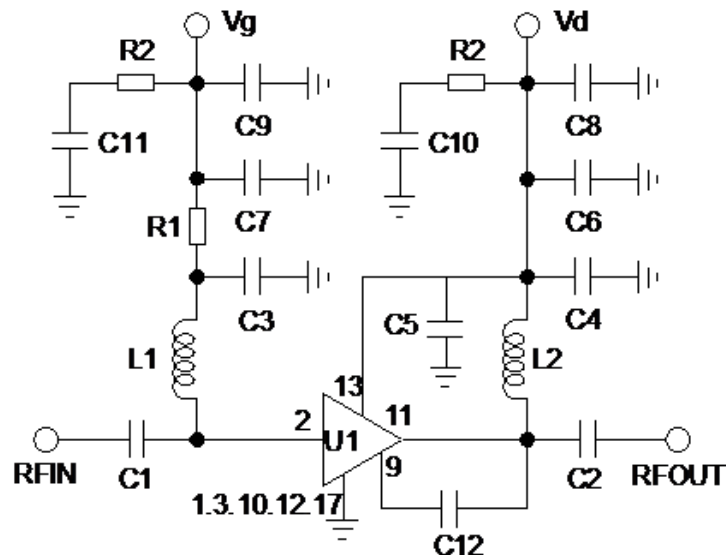
1580 S. Milwaukee Ave., Suite 405, Libertyville, IL 60048, USA  
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## Application Circuit Configuration – 1 to 1000 MHz



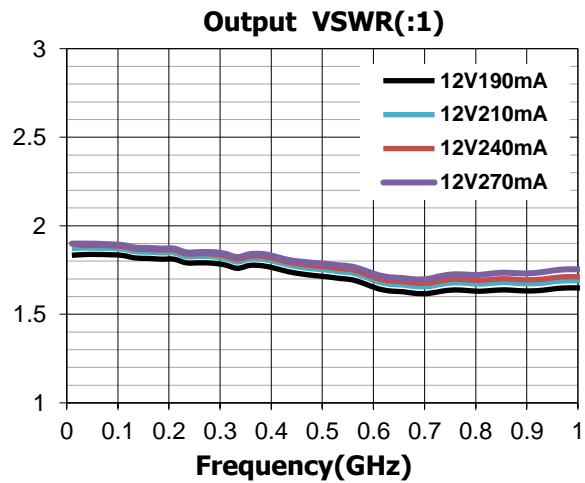
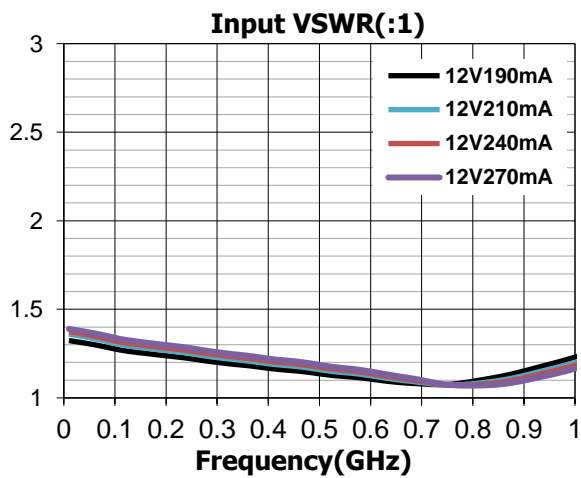
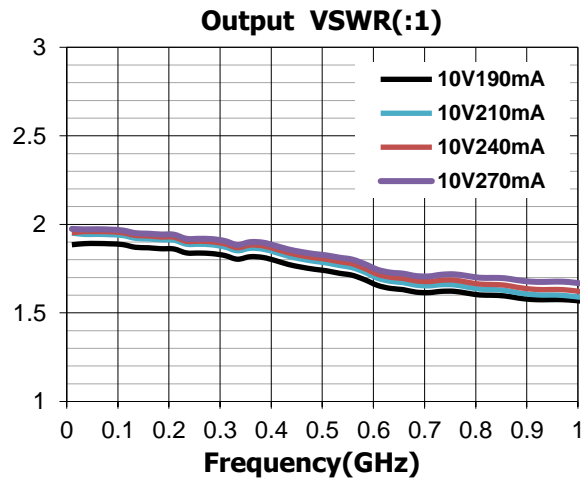
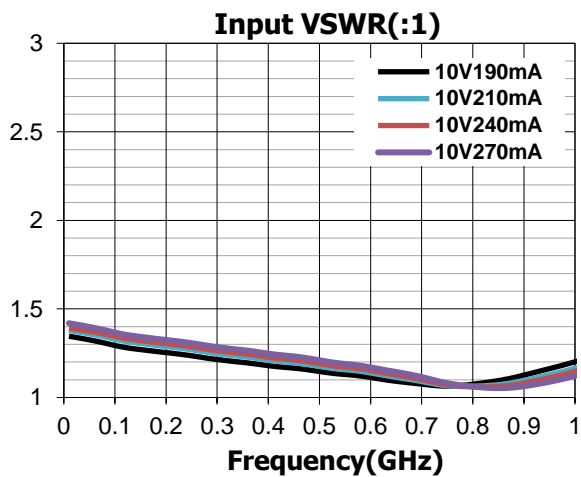
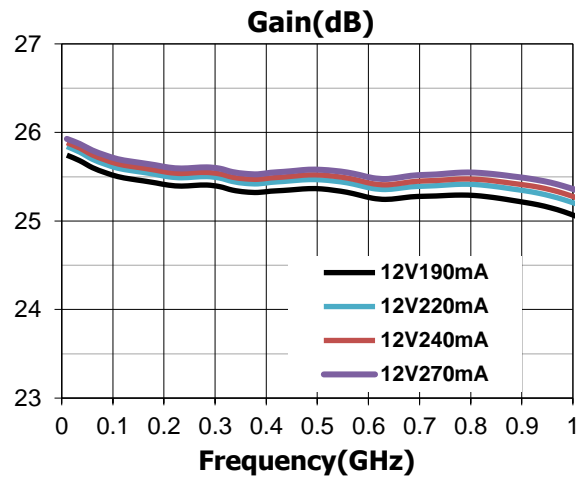
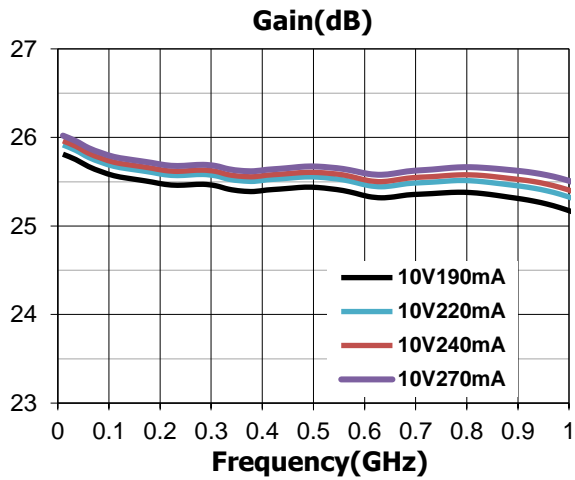
### Bill of Material - SAC3122Q4-1 to 1000 MHz

Reference Designation	Part Number	Description	Manuf.
U1	SAC3122Q4	SAC3122Q4	—
C1,C2,C3,C4,C5,C10,C11	GRM1555C1H102JA01D	0.047uF ,Cap,0402	AVX
C6,C7	08053C105K4Z2A	1uF,Cap,0805	AVX
C8,C9	1206YD226KAT2A	22uF,Cap,0805	AVX
C12	04025C472JAT2A	4700pF,Cap,0402	AVX
L1	1812LS223	Ind,22uH,1812	COILCRAFT
L2	1812LS123	Ind,12uH,1812	COILCRAFT
R1,R2,R3	CRCW080551R0FKEA	Res,0805	Vishay

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## Typical Performance Curve 1 to 1000 MHz

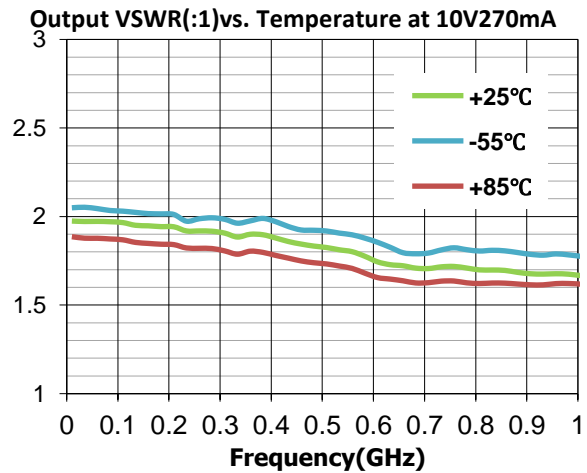
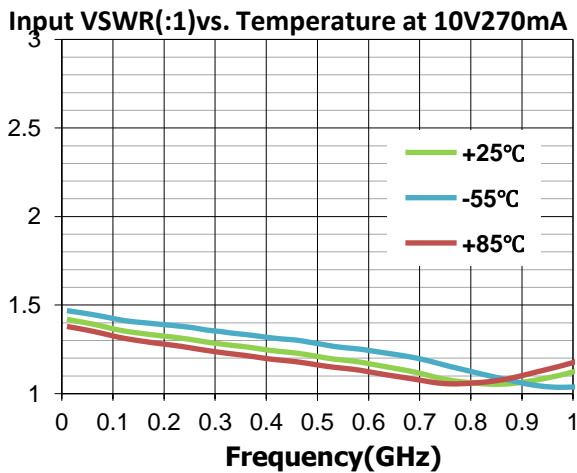
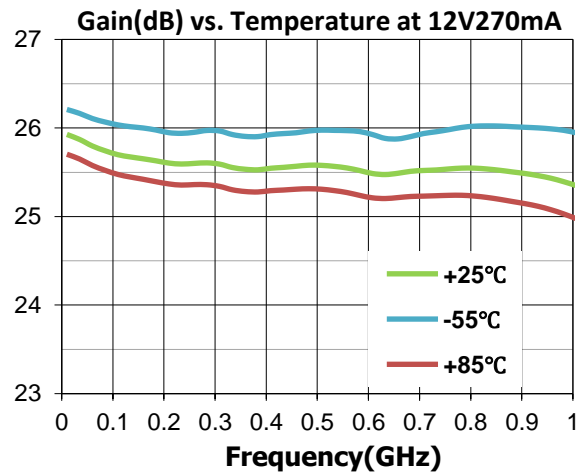
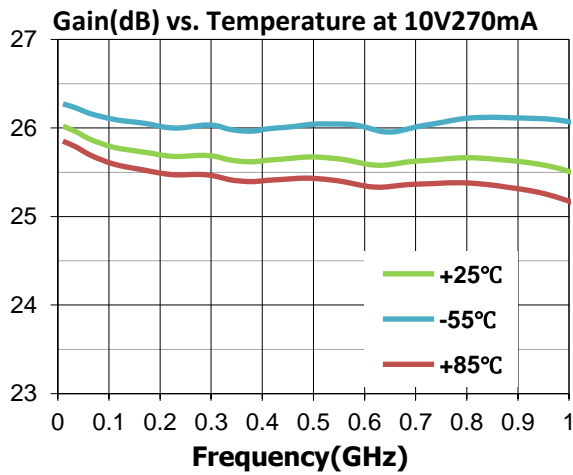
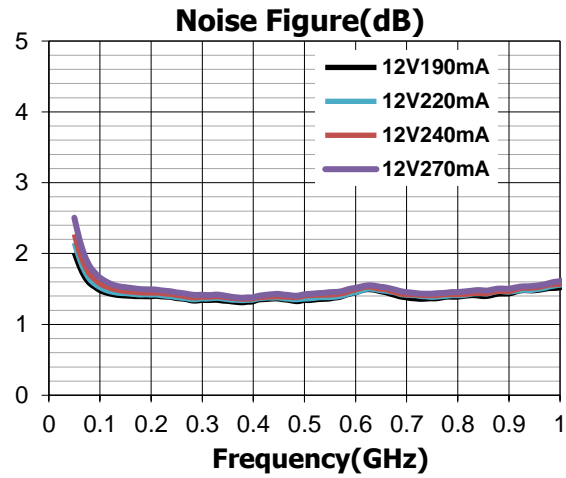
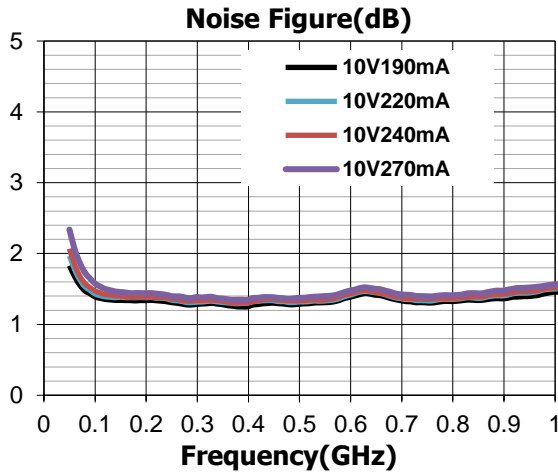


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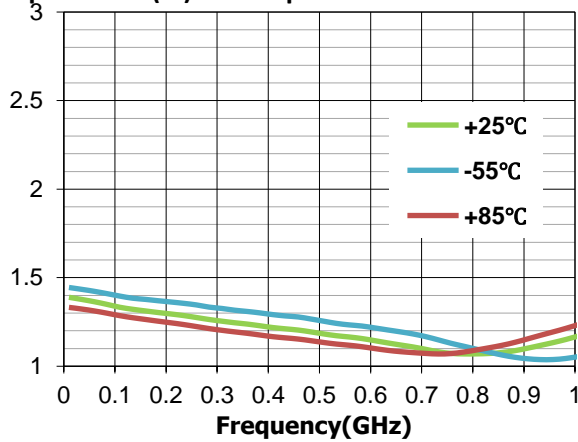
# SAC3122Q4



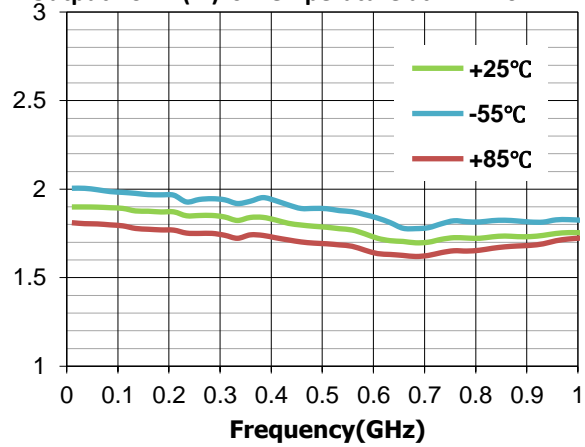
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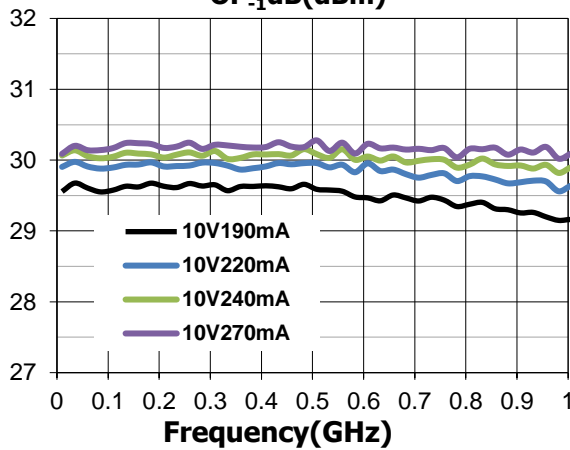
Input VSWR(:1)vs. Temperature at 12V270mA



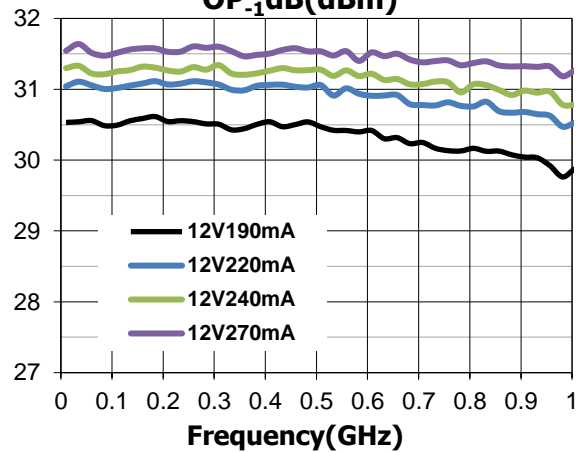
Output VSWR(:1)vs. Temperature at 12V270mA



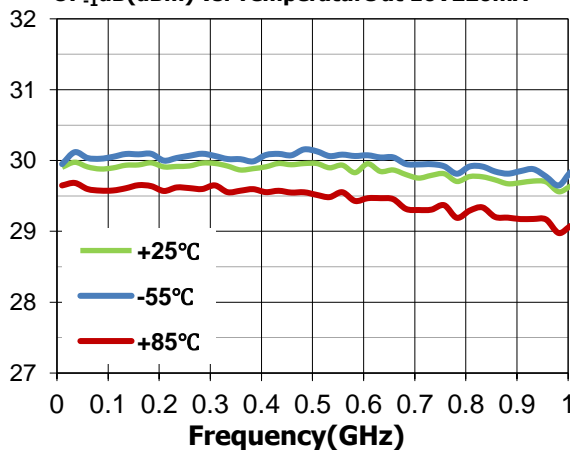
OP<sub>-1</sub>dB(dBm)



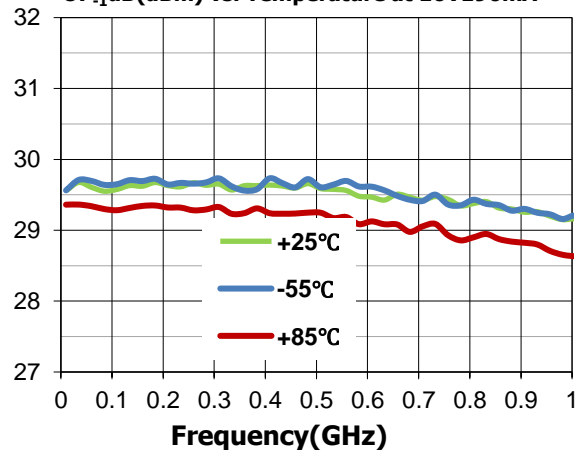
OP<sub>-1</sub>dB(dBm)



OP<sub>-1</sub>dB(dBm) vs. Temperature at 10V220mA



OP<sub>-1</sub>dB(dBm) vs. Temperature at 10V190mA

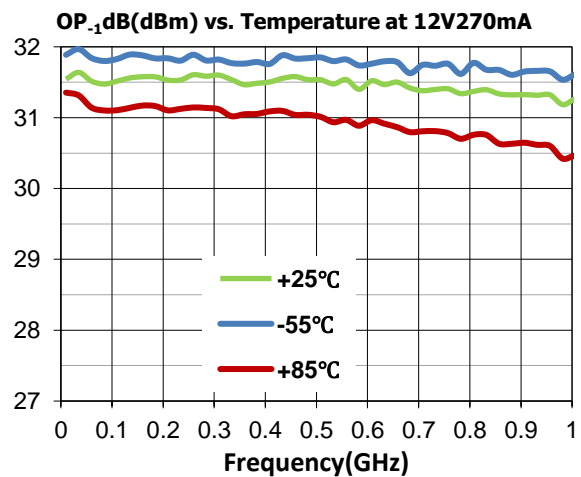
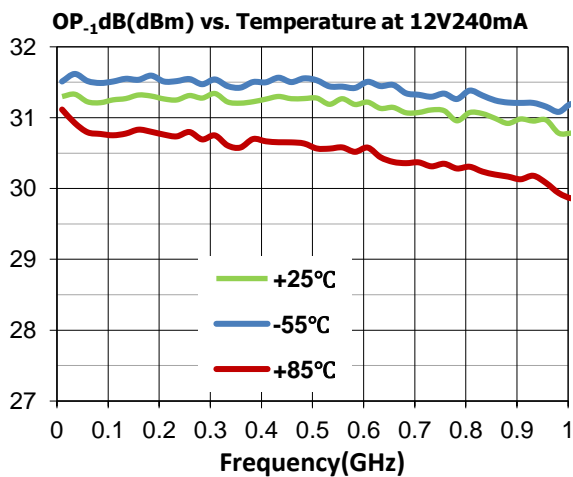
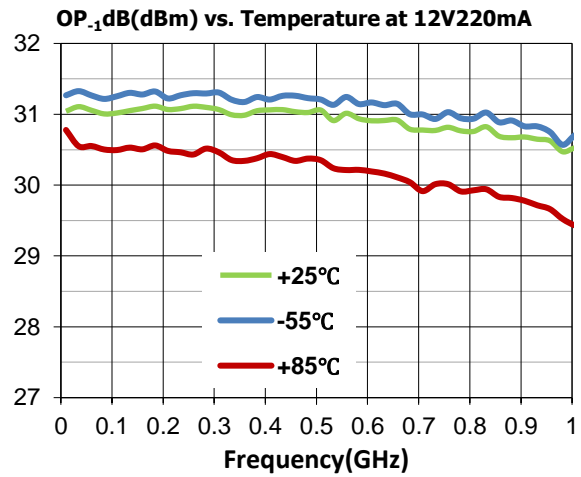
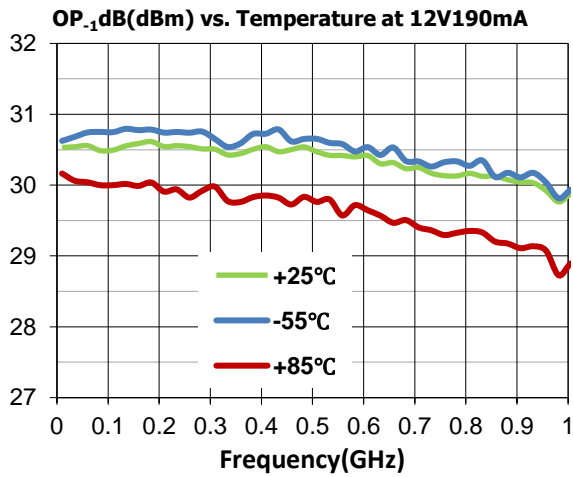
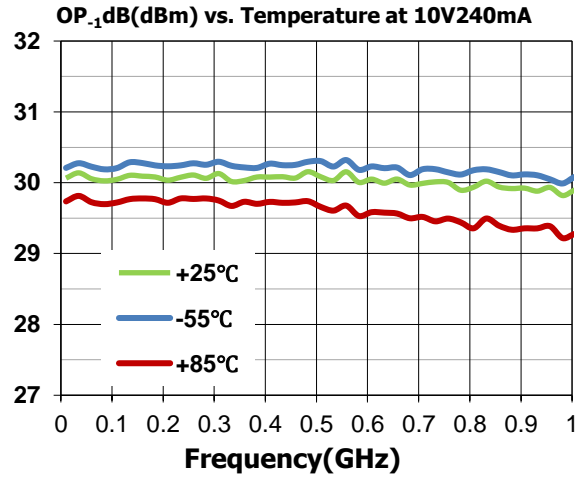
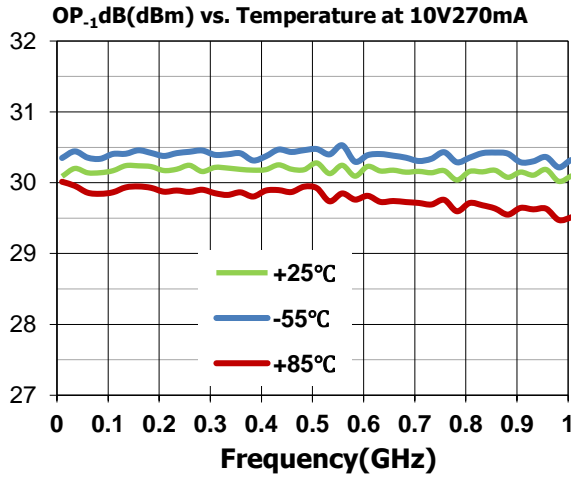


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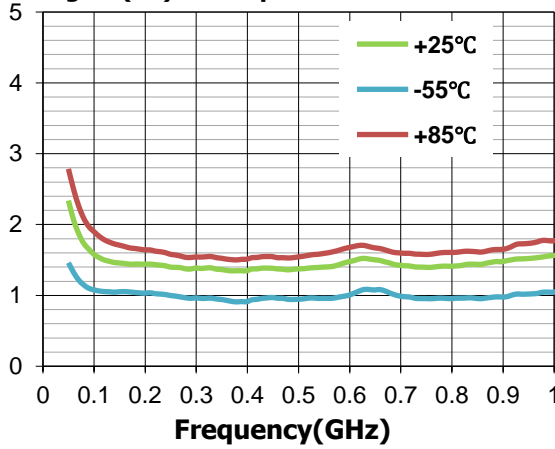
# SAC3122Q4



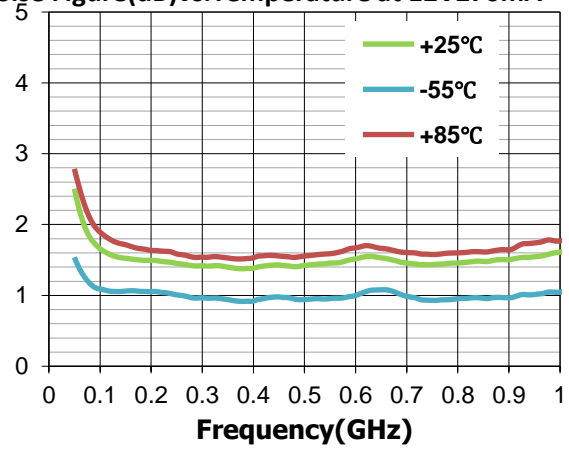
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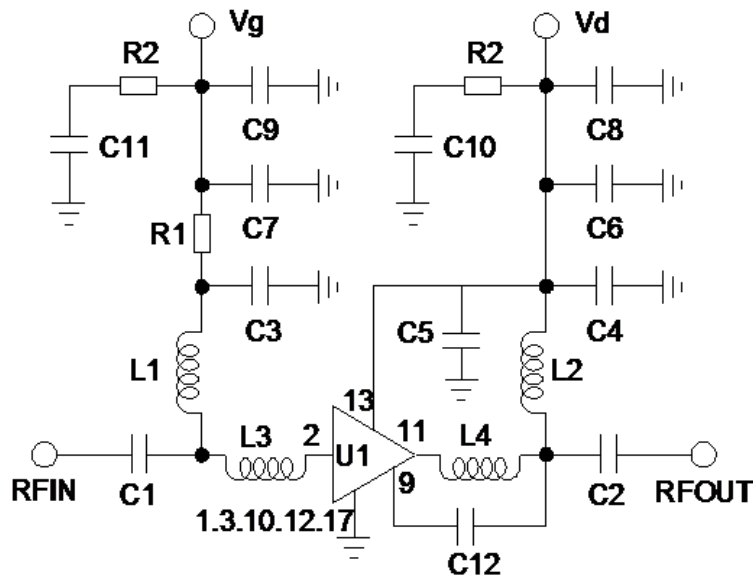
Noise Figure(dB)vs.Temperature at 10V270mA



Noise Figure(dB)vs.Temperature at 12V270mA



## Application Circuit Configuration – 100 to 3000 MHz



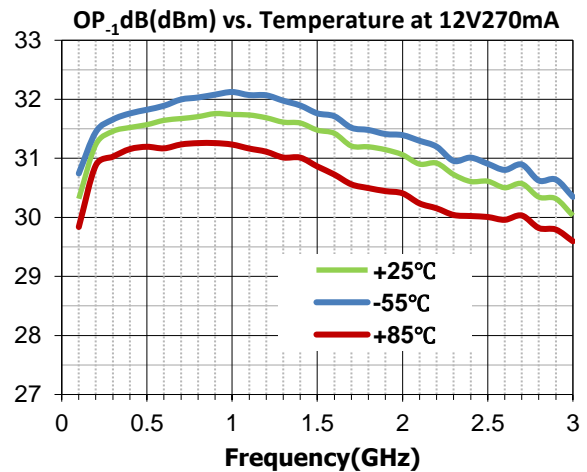
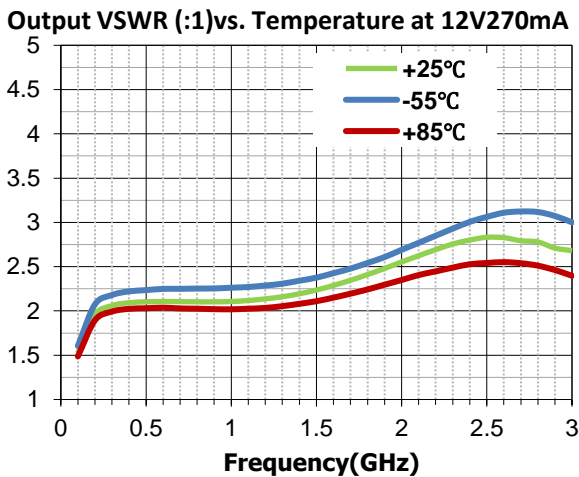
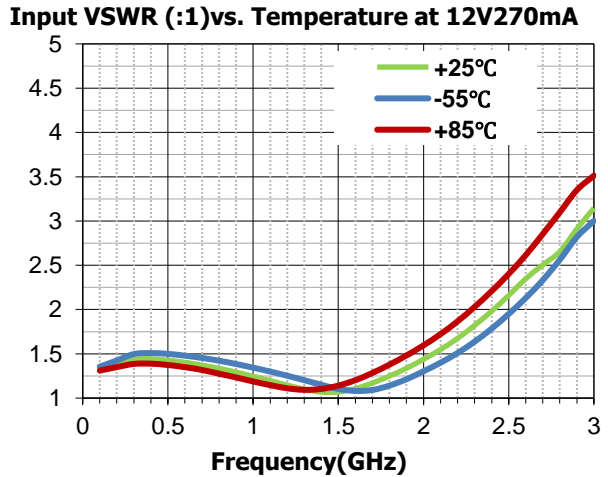
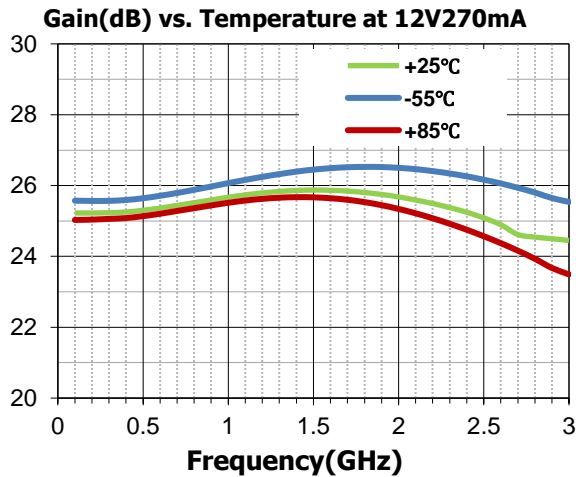
## Bill of Material - SAC3122Q4-100 to 3000 MHz

Reference Designation	Part Number	Description	Manuf.
U1	SAC3122Q4	SAC3122Q4	—
C1,C2,C3,C4,C5,C10,C11,C12	0402YC473KAT2A	1000pF ,Cap,0402	AVX
C6,C7	0805C105K4Z2A	1uF,Cap,0805	AVX
C8,C9	1206YD226KAT2A	22uF,Cap,0805	AVX
L1,L2	0805CS-101XJLC	Ind,100nH,0805	COILCRAFT
L3	0402CS-1N2XJLW	Ind,1.2nH,0402	COILCRAFT
L4	0402CS-1N8XGLU	Ind,1.8nH,0402	COILCRAFT
R1,R2,R3	CRCW080551R0FKEA	Res,0805	Vishay

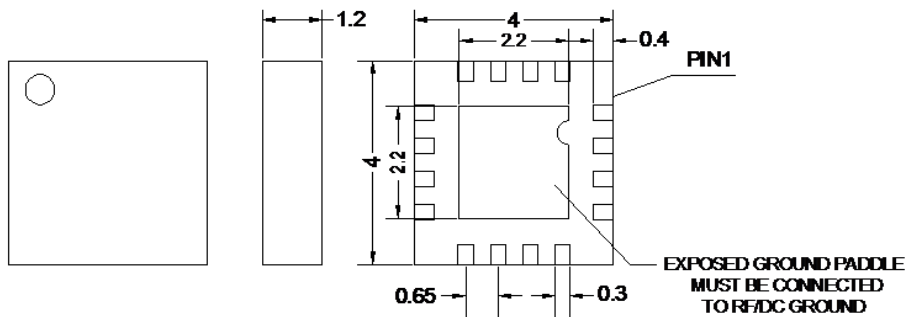
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## Typical Performance Curve 100to 3000 MHz



## Outline Drawing (All dimensions in mm)



### Attention:

1. The moisture resistant grade of products is 2A, the storage environment  $\leq 30^\circ\text{C}/60\% \text{RH}$ , The surrounding workshop Life is 4 weeks.
2. After un-packing, It is necessary to bake the parts for 6 hours in  $125\pm 5$  degree environment before soldering.