

GaAs monolithic integrated power amplifier

1MHz ~ 3000MHz 30dBm

Key indicator

- Frequency range: 1MHz~3000MHz
- Gain: 25.5dB
- Output P_{-1dB}: 30dBm
- Power supply voltage: +10~+12V
- Dimensions: 1.39mm×0.63mm×0.1mm

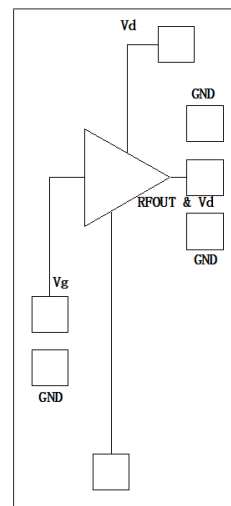
Typical application

- Point-to-point wireless communication
- Satellite communications
- Radar

Product Introduction

AY1977 is a wide band GaAs MMIC power amplifier, operating frequency 1MHz~3000MHz, small signal gain 25.5dB, output P_{-1dB} 30dBm, PAE 40%, power supply voltage +10~+12V.

Functional block diagram



Electrical properties

T_A=25°C, V_D= +12V, I_D=0.24A, Z₀=50Ω, CW

Index	Minimum	Typical value	Max	Unit
Frequency	1~3000			MHz
Small signal gain	—	25.5	—	dB
Small signal gain flatness	—	±0.5	—	dB
Reverse isolation	—	-28	—	dB
Input standing wave ratio	—	2	—	:1
Output standing wave ratio	—	2.5	—	:1
PAE	—	40	—	%
Output PdB	—	31	—	dBm
Drain voltage (V _D)	10	—	12	V
Supply current (I _D)	—	240	—	mA

V_g=-1~0V

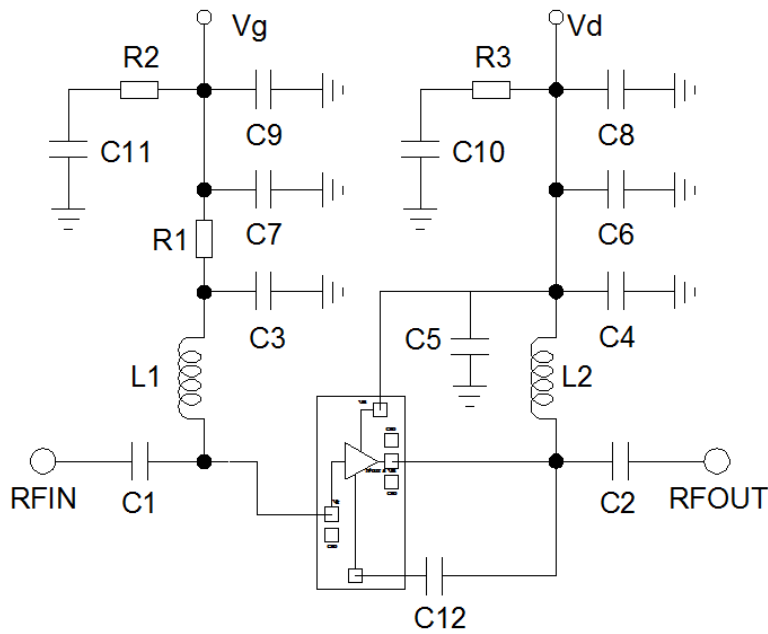
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Absolute maximum ratings

Maximum input power	+20dBm	Operating temperature	-55°C~+85°C
Channel temperature	150°C	Storage temperature	-65°C~+150°C
Max V _D	+15V		

Application circuit configuration- 1 to 1000MHz



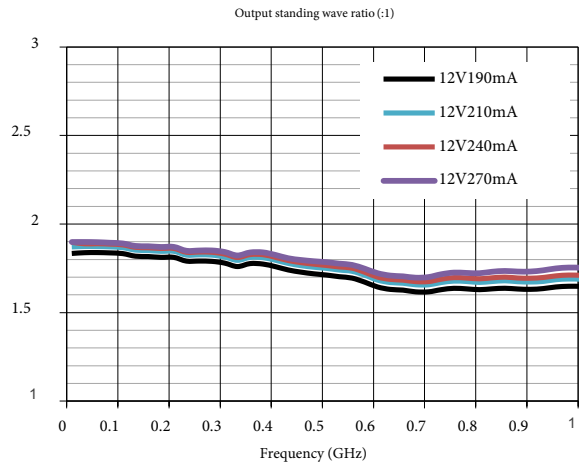
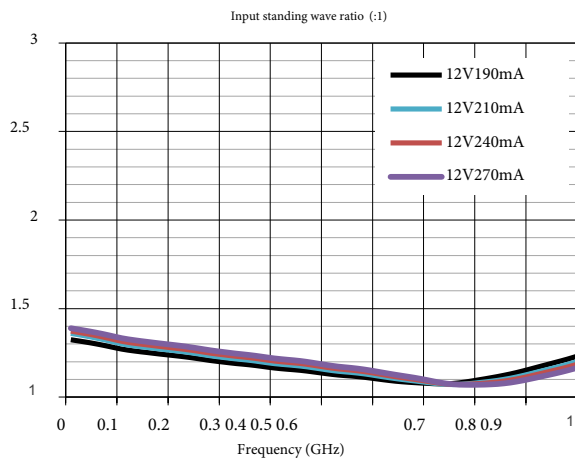
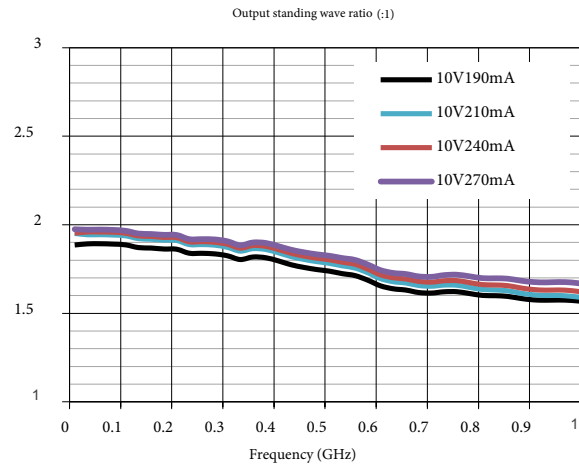
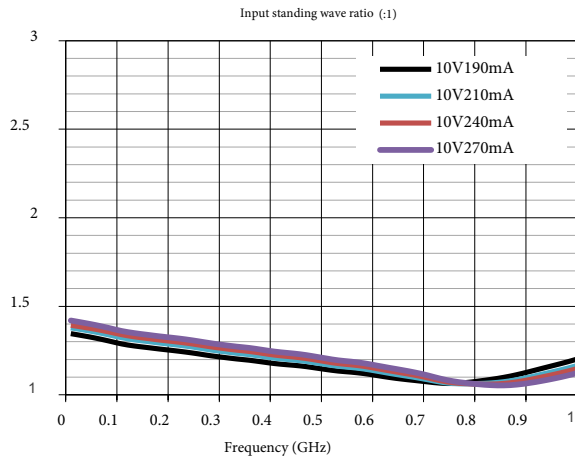
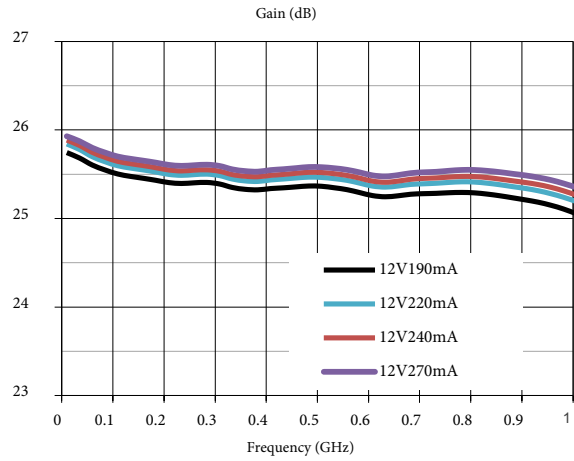
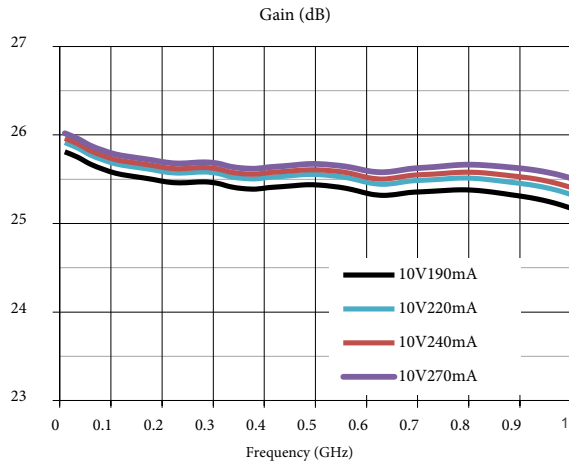
Components list – 1 to 1000MHz

Reference number	Part number	Describe	Manufacturer
U1	XT3122Q4	XT3122Q4	—
C1,C2,C3,C4,C5,C10,C11	0402YC473KAT2A	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	Thread art
L2	1812LS123	Ind,12uH,1812	Thread art
R1,R2,R3	CRCW080551R0FKEA	Res,0805	Vishay

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Typical performance test curve

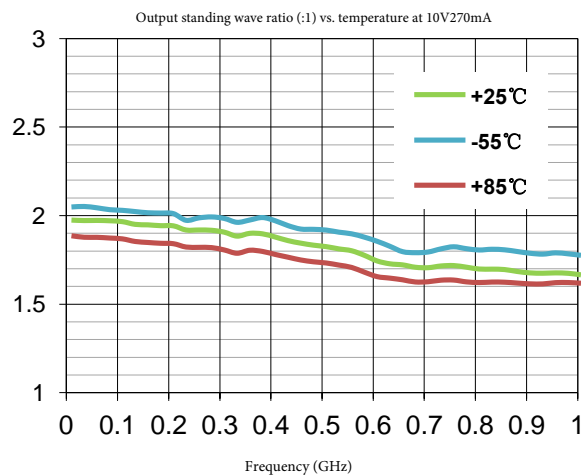
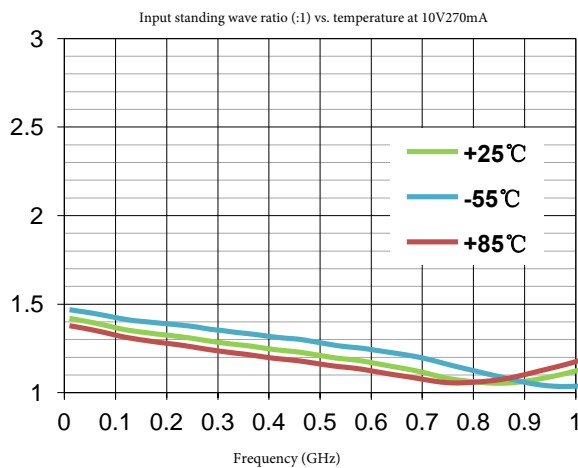
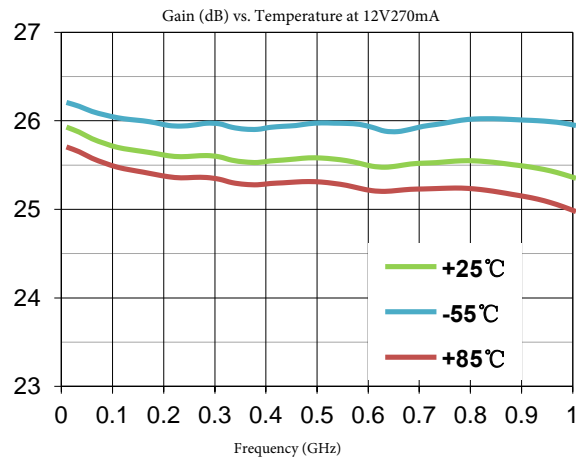
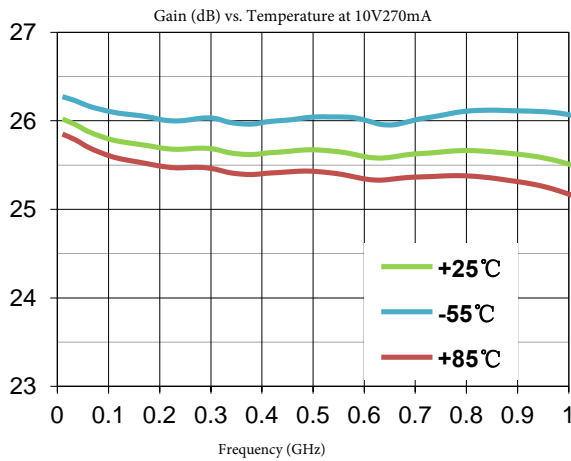
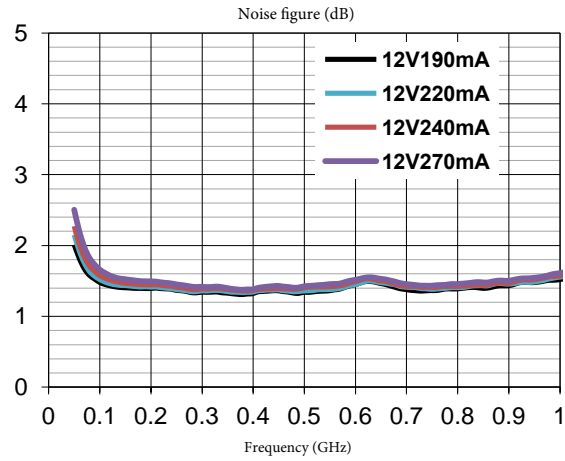
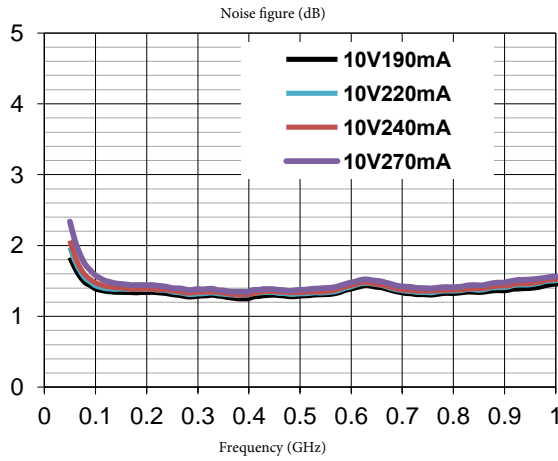
1 to 1000 MHz



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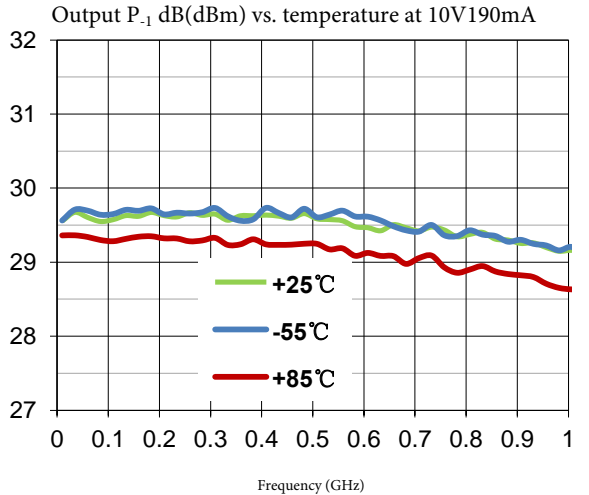
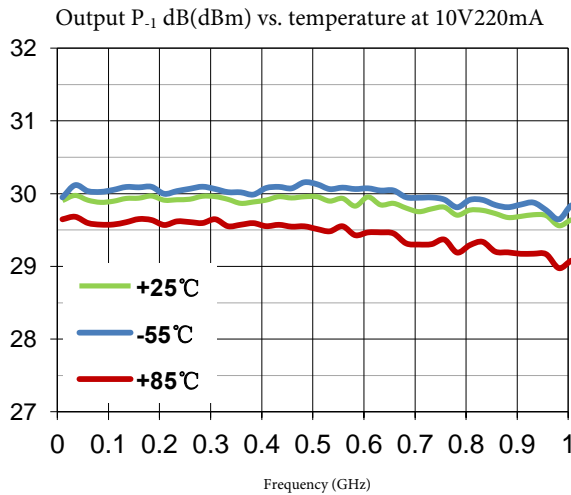
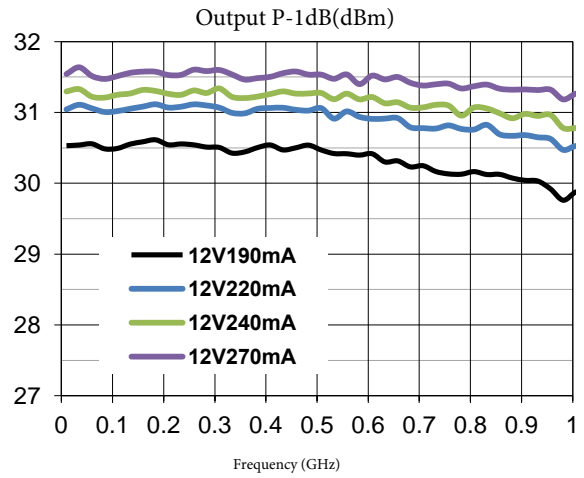
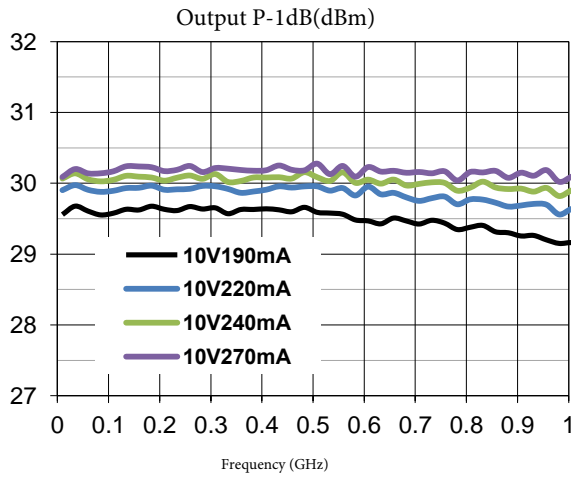
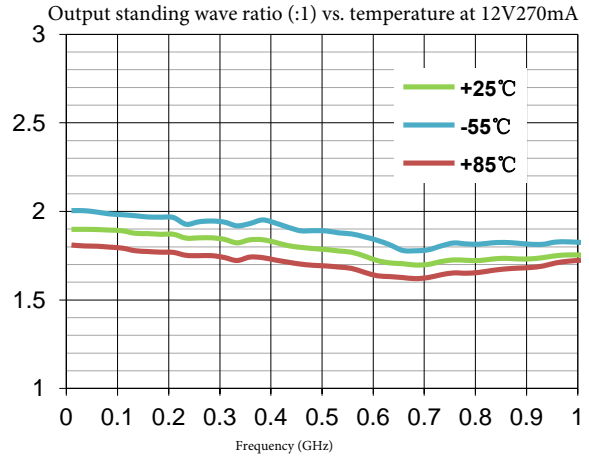
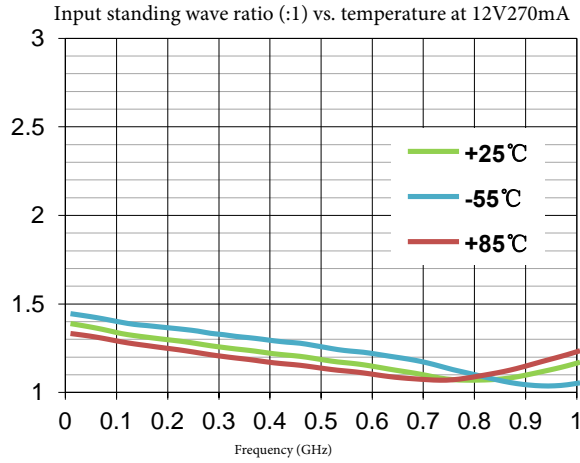
1MHz ~3000MHz

30dBm



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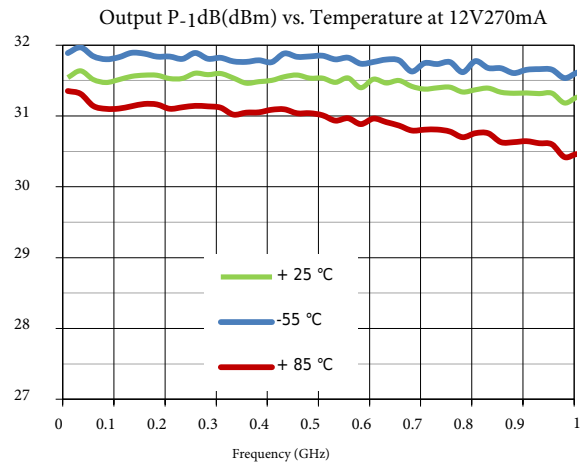
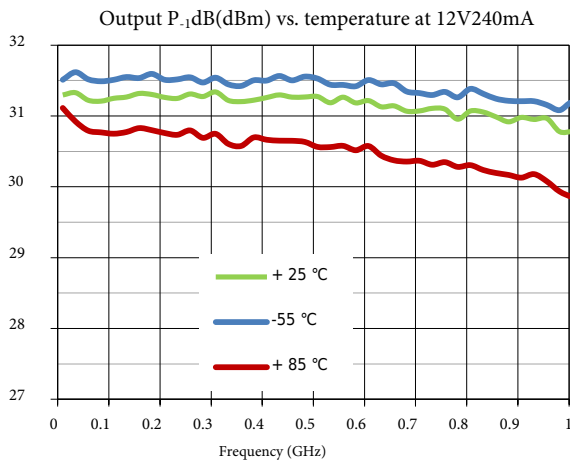
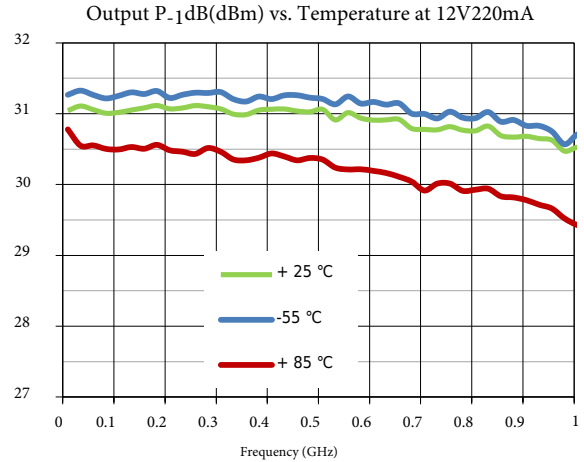
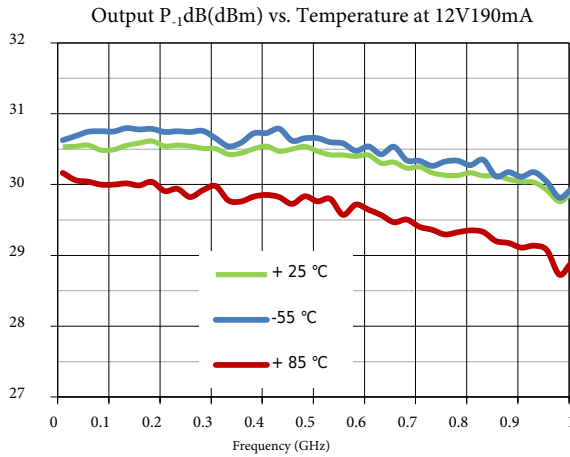
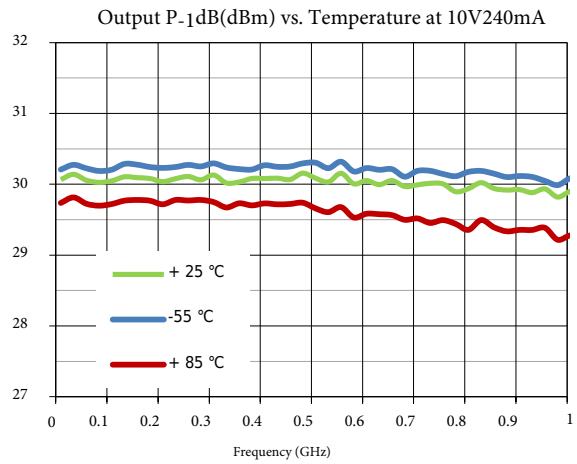
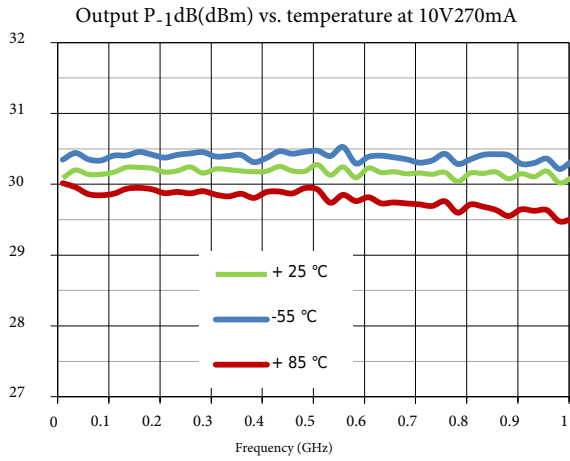
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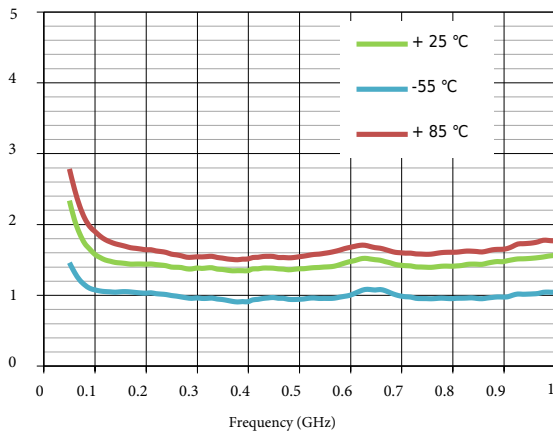


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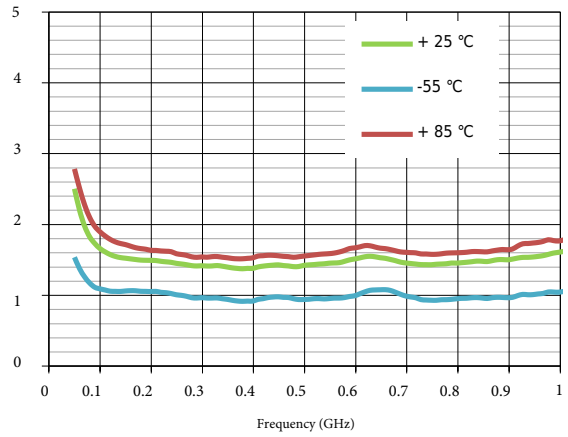
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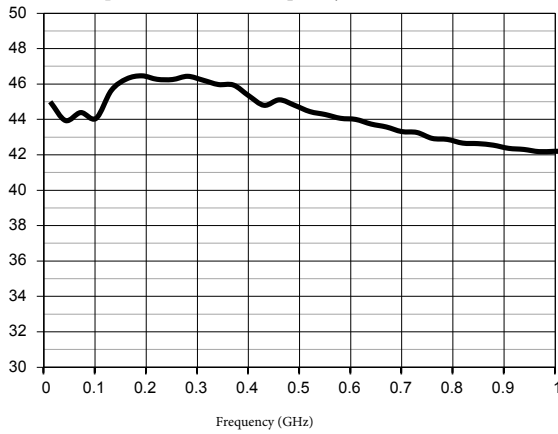
Noise figure (dB) vs. temperature at 10V270mA



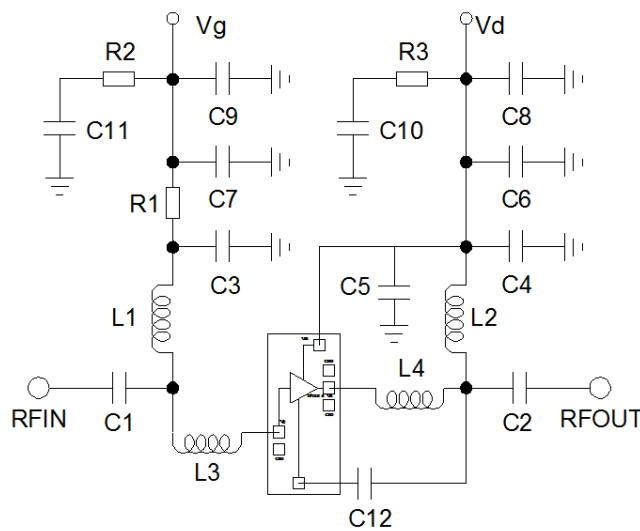
Noise figure (dB) vs. temperature at 12V270mA



Output IP₃(dBm) vs. Frequency at 12V270mA



Application circuit configuration – 100 to 3000MHz

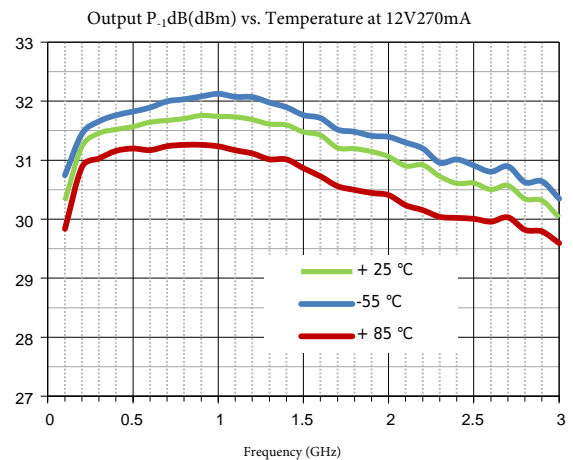
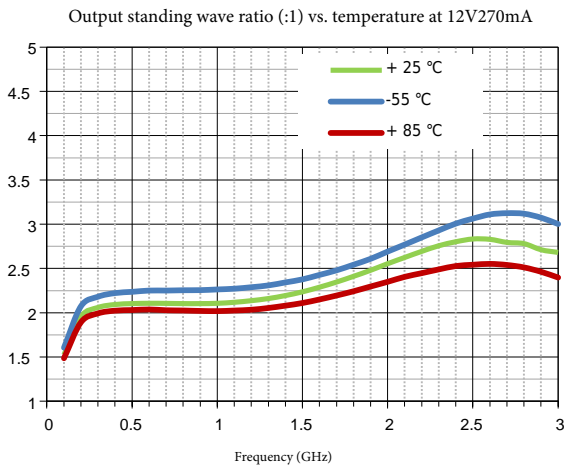
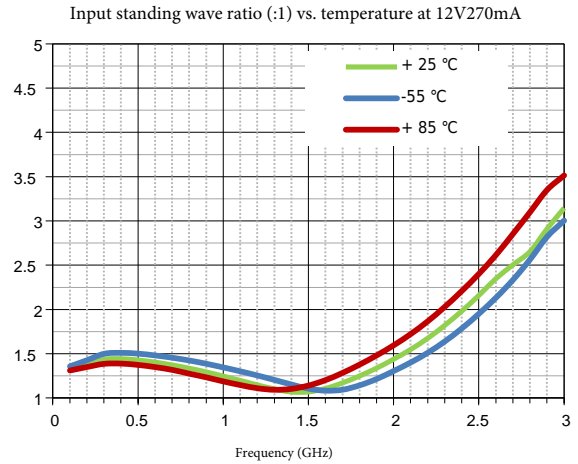
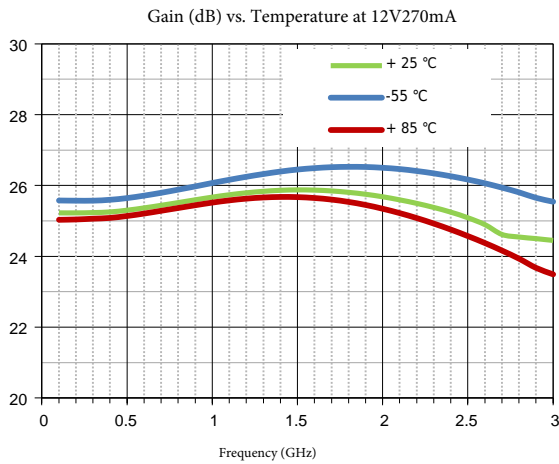


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C6,C7	08053C105K4Z2A	1uF,Cap,0805	AVX
C8,C9	1206YD226KAT2A	22uF,Cap,0805	AVX
L1,L2	0805CS-101XJLC	Ind,100nH,0805	Thread art
L3	TBD		Thread art
L4	TBD		Thread art
R1,R2,R3	CRCW080551R0FKEA	Res,0805	Vishay

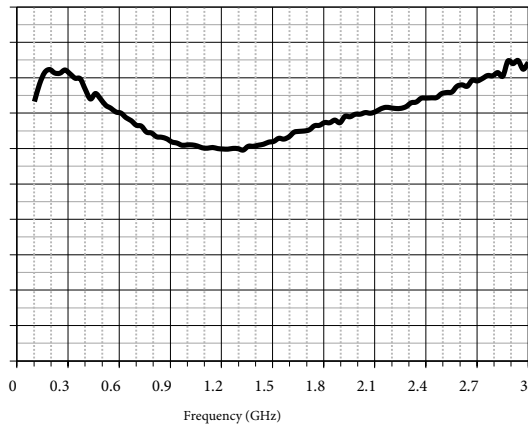
Typical performance test curve — 100 to 3000MHz



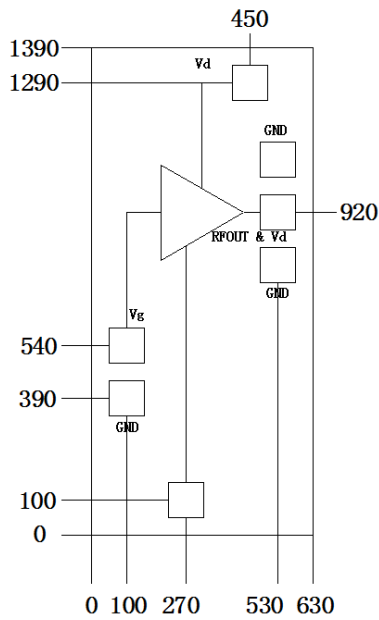
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Output IP₃(dBm) vs. Frequency at 12V270mA



Shape and port size (µm)



Precautions

Gallium arsenide MMIC devices are susceptible to electrostatic discharge damage. Precautions should be taken during transportation, assembly and testing.