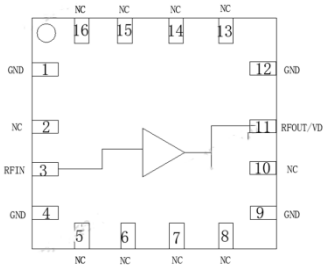
Performance Characteristics

- Wide bandwidth: 0.01GHz~3GHz
- Low noise: 1.3dB typical
- Small signal gain: 20dB
- Output P1dB: 19dBm
- Output IP3: 35dBm
- Package size:3×3mm, QFN 16L

typical application

- point-to-point communication
- Instrumentation

functional block diagram



summarize

The CWA3024SP3 is a 0.01GHz~3GHz low noise broadband amplifier fabricated in GaAs process. The amplifier is self-biased with 50Ω matched loads at input and output.

Electrical performance table (TA=+25°C VD=5V)

Parameter name	descriptive	minimum value	typical value	maximum values	minimum value	typical value	maximum values	minimum value	typical value	maximum values	unit (of measure)
operating frequency	Freq	0.01~1GHz			1~2GHz			2~3GHz			GHz
gain (electronics)	S21		20			18			16		dB
Gain Flatness	ΔG		±1			±2			±2		dB
Input Return Loss	S11		-13			-10			-18		dB
Output Return Loss	S22		-15			-15			-12		dB
inverse squareness	S12		-25			-26			-27		dB
Output 1dB compression point power	P1dB		20			19			18.5		dBm
Saturated output power	P3dB		20.5			20			20		dBm
Output IP3	Pout=0dBm/ tone, Δf=1MHz		35			34			34		dBm
coefficient of noise	NF		1			1.3			1.5		dB
Operating Current	ID	67									mA
operating voltage	VD	5									V

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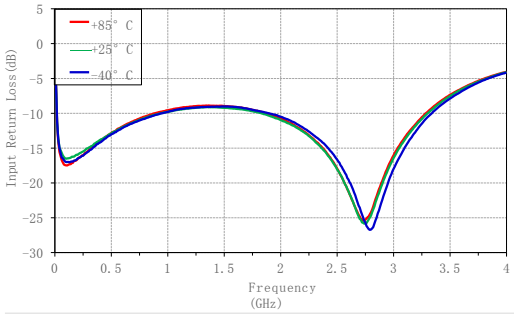
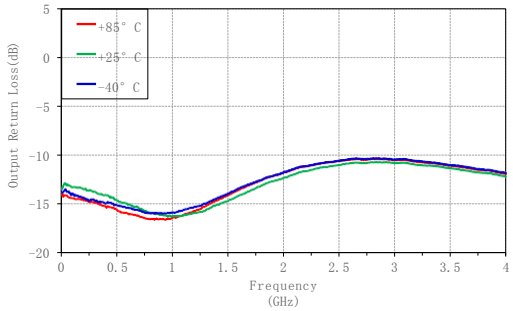
Test curve (VD=5V)

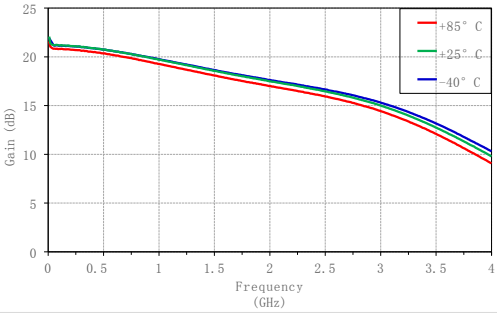
Input Return Loss VS Frequency



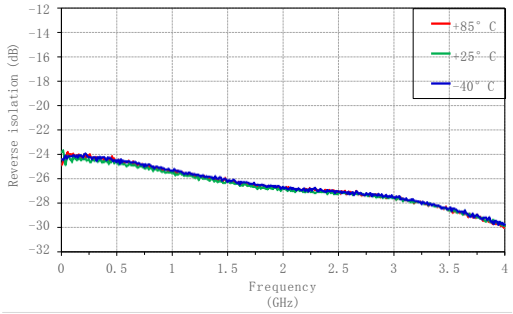
Output Return Loss VS Frequency



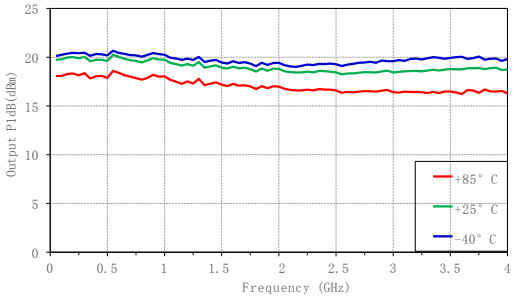
Gain VS Frequency



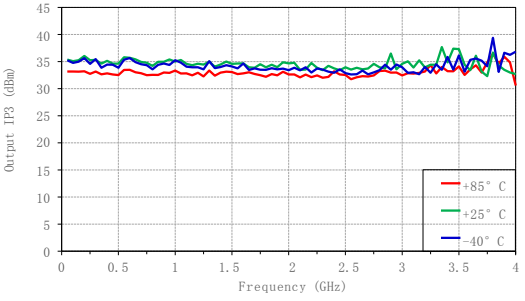
Reverse Isolation VS Frequency



Output P1dB VS Frequency



Output IP3 VS Frequency



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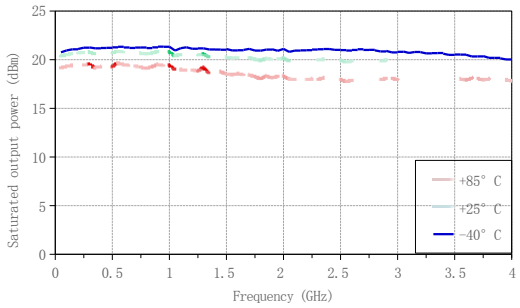
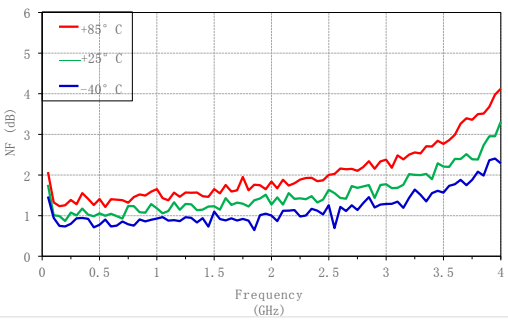
Test curve (VD=5V)

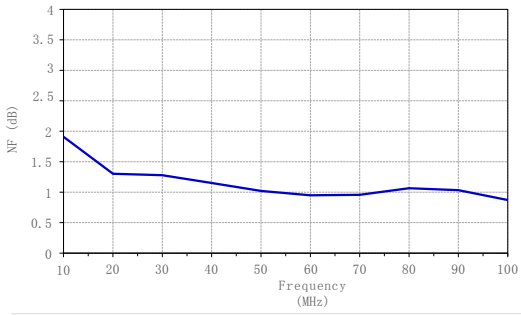
Saturated Output
Power VS Frequency



Noise Figure VS Frequency

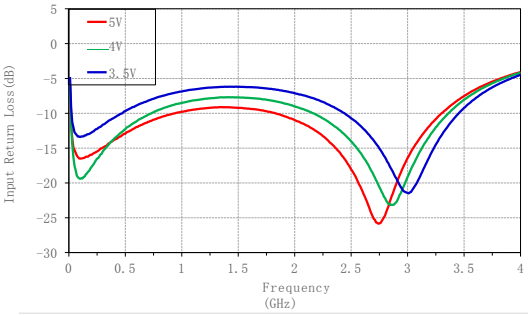


Noise Figure VS Frequency

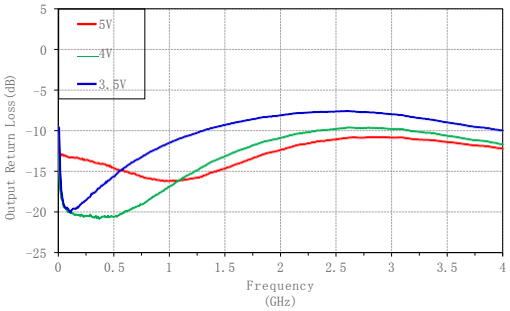


Test curve (TA=+25°C)

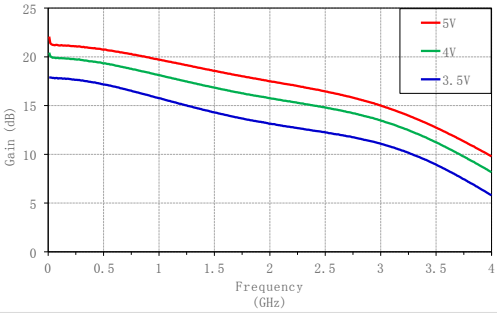
Input Return Loss VS Frequency



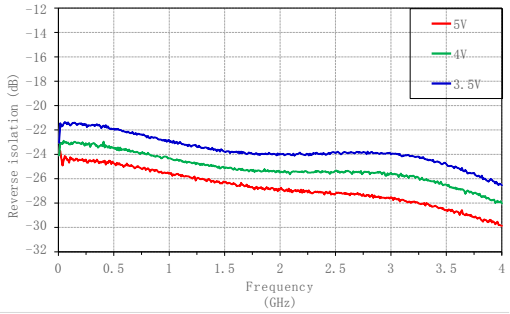
Output Return Loss VS Frequency



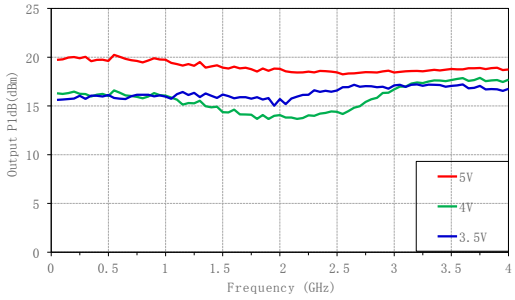
Gain VS Frequency



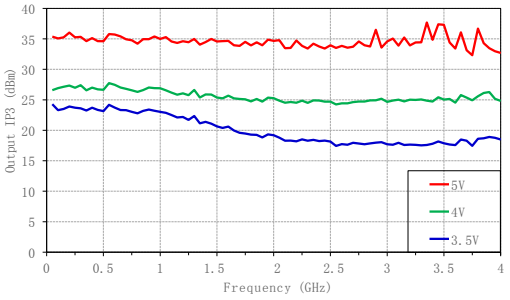
Reverse Isolation VS Frequency



Output P1dB VS Frequency



Output IP3 VS Frequency



CWA Amplifier Series

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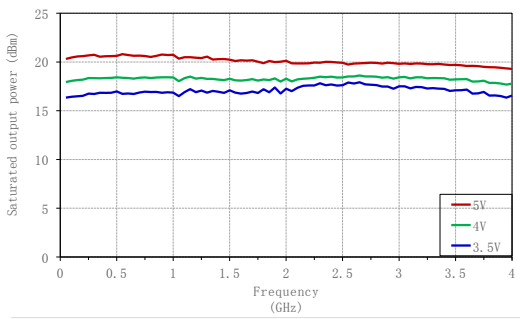
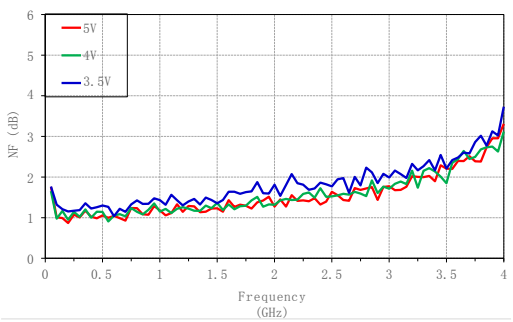
test curve

Saturated Power
VS Frequency



Noise Figure VS
Frequency



Operating parameters

operating temperature	-40℃～+85℃
Bias Voltage VD/OUT	5V

Absolute maximum rating

RF Input Power	18dBm
Storage temperature	-65℃～+150℃
operating temperature	-40℃～+85℃
Bias Voltage VD/OUT	9V
ESD-HBM	Class 1A

Package Information

model number	package material	Pad plating	MSL rating [1]	Package identification [2]	environmental requirement
CWA3024SP3	Green resin compounds	NiPdAuAg	MSL 3	S3024 XXXXX	RoHS compliant

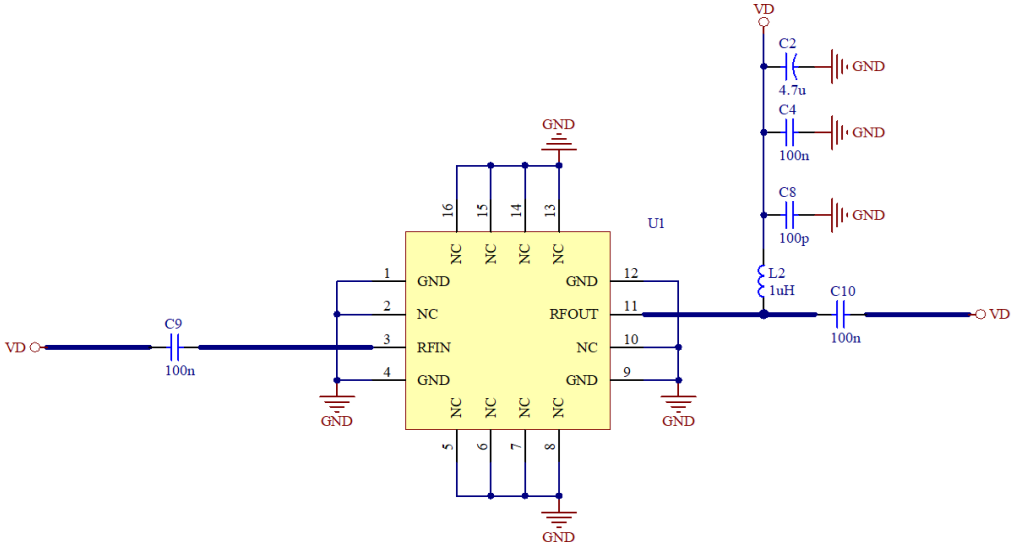
[1] Maximum reflow temperature 260° C

[2] XXXXX is the lot number

Static voltage

Static voltage	3.5V	4V	5V	6V	7V
quiescent current	13mA	28mA	67mA	100mA	116mA

Typical Application Diagram



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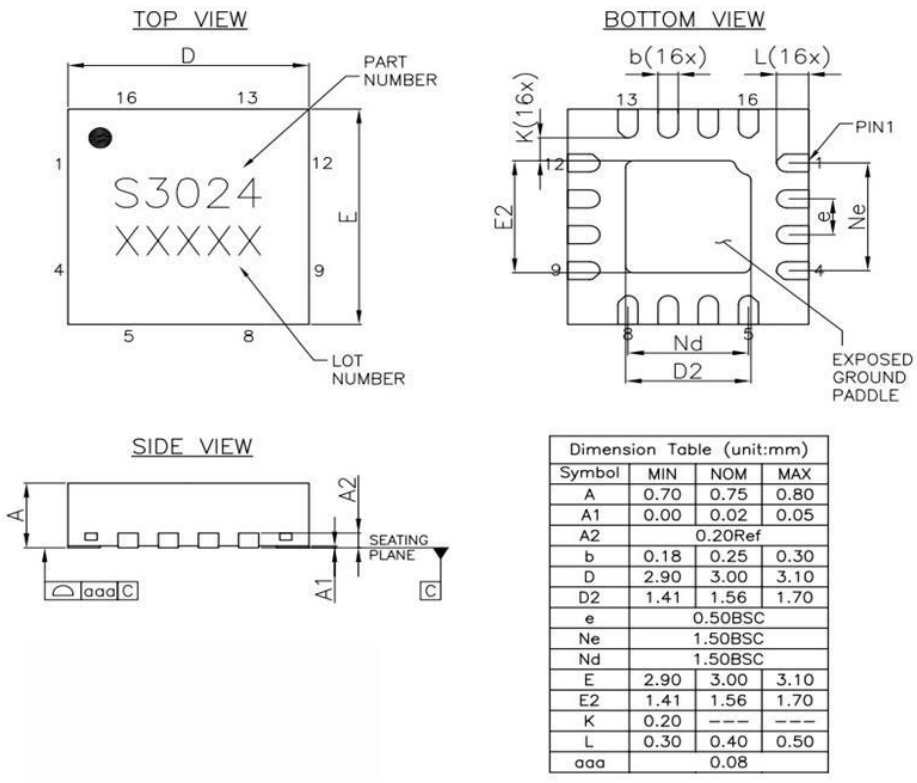
Overall dimensions

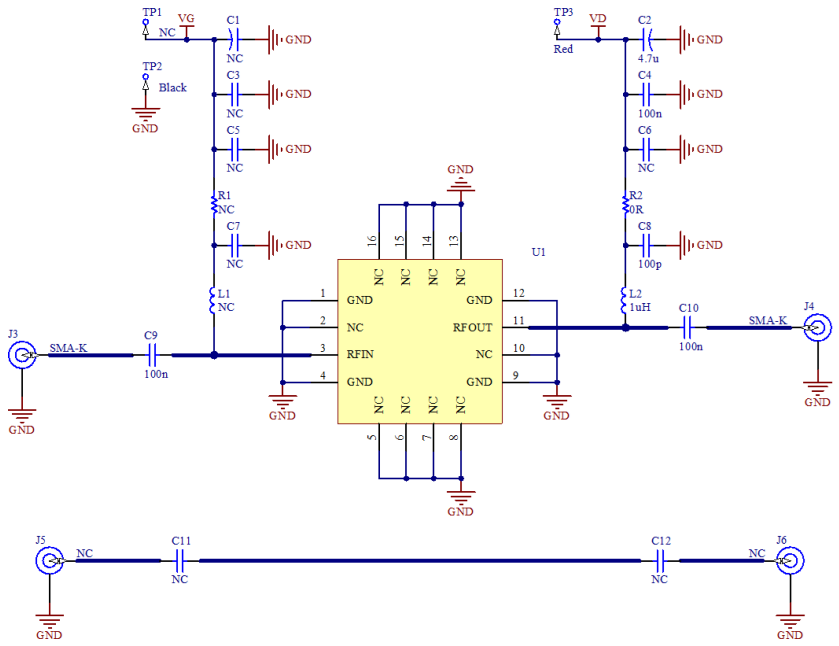


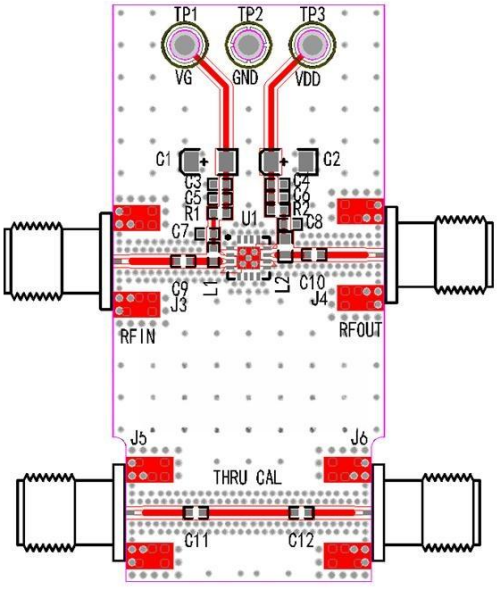
Dimension Table (unit:mm)			
Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.20Ref	
b	0.18	0.25	0.30
D	2.90	3.00	3.10
D2	1.41	1.56	1.70
e		0.50BSC	
Ne		1.50BSC	
Nd		1.50BSC	
E	2.90	3.00	3.10
E2	1.41	1.56	1.70
K	0.20	---	---
L	0.30	0.40	0.50
aaa		0.08	

Pin Definitions

Pin Number	functional symbol	Functional Description
2;5-8;10;13-16	NC	Internally unconnected
3	RFIN	RF input port, no isolation capacitors
11	RFOUT/VD	RF output port/power port, no isolation capacitors
1;4;9;12	GND	RF Ground, Exposed Ground Paddle on bottom of package is RF ground.

Evaluation Board Circuit Diagram





DeCWgnator	Description
C2	Tantalum Capacitor 1206 4.7uF
C4, C9, C10	Multilayer Ceramic Capacitors 0402 100nF
C8	Multilayer Ceramic Capacitors 0402 100pF
J3, J4	SMA-K PCB Connectors
L2	Wirewound Inductors 0603 1uH
R2	Resistor 0402 0Ω
TP2, TP3	DC Test Terminal
U1	CWA3024SP3
J3, J4 Recommended for use with NJ Aowen Model D550B12E01-023 SMA-K connectors.	
NC indicates an unused port or the device is not soldered. The NC port of the chip can be externally connected to GND.	

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