SAC4701QP4

MMIC Limiter Low Noise Amplifier
2~8GHz

Rev 1.0

Features

- Frequency: 2~8GHz
- Gain: 28dB
- Noise Figure: 1dB Typ., 1.2dB Max.
- High Power-handling capability: 2W CW
- Recovery Time: 40nS
- Output P_{-1}dB: 13dBm
- Supply Voltage: +4~5V/30~40mA
- Package Size: 4mmx4mmx1.3mm

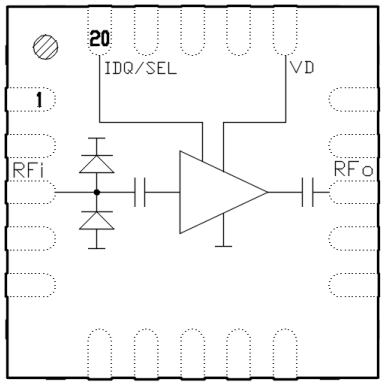
Typical Applications

- Radar
- Low Noise Amplifier

General Description

SAC4701QP4 is a PIN diode limiter low noise amplifier (Limiter-LNA) MMIC, The Limiter-LNA handles up to 33 dBm CW input power without failure. Small-signal gain and noise figure (NF) are 28dB and 1dB, respectively over the 2 to 8 GHz frequency range.

Functional Diagram



Electrical Performance

T_A=25℃, V_D=+5V, I_D=40mA, Z_0=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range		2~8		GHz
Gain	26.5	28	—	dB
Gain Flatness	—	±0.8	±1.5	dB
Input/Output VSWR	—	1.5	2.2	:1
Noise Figure	—	0.8	1.1	dB
Recovery Time*	—	40	—	nS
Reverse Isolation	—	45	—	dB
Output Power for 1 dB Compression (OP_{-1}dB)	11	13	—	dBm
Supply Current (I_D)	—	40	—	mA

* f=6000MHz, Pin=33dBm

Absolute Maximum Ratings

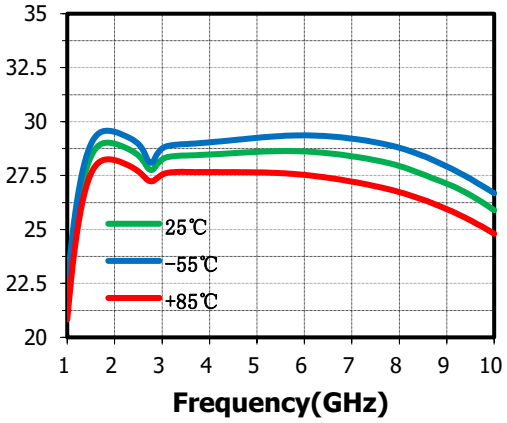
Maximum Input Power	+36dBm, CW,30s	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-55℃~+150℃
VD	+7V	RF input port reverse withstand voltage	±2V

SuperApex, LLC
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

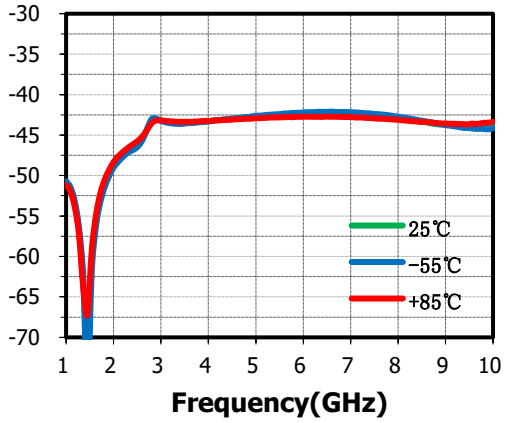
Typical Performance Curve

V_D=+5V I_{DQ}=40mA

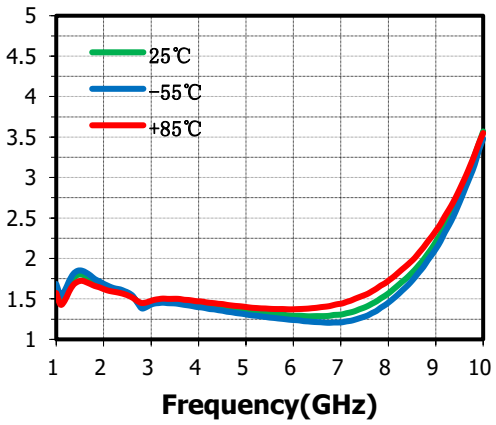
Small Signal Gain(dB) vs.Temperature



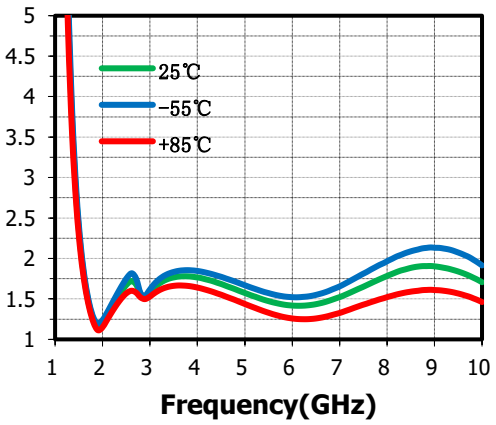
Reverse Isolation(dB) vs.Temperature



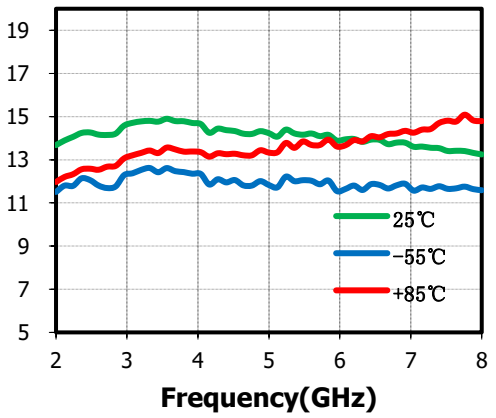
Input VSWR(:1) vs.Temperature



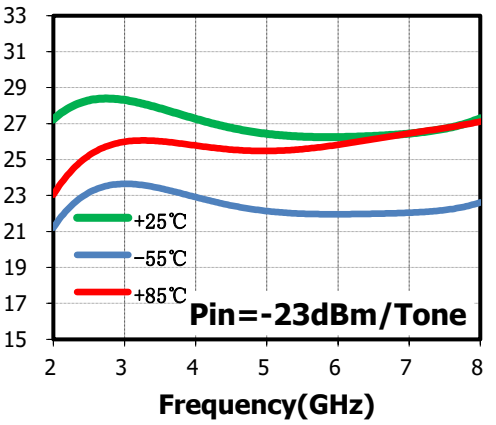
Output VSWR(:1) vs.Temperature



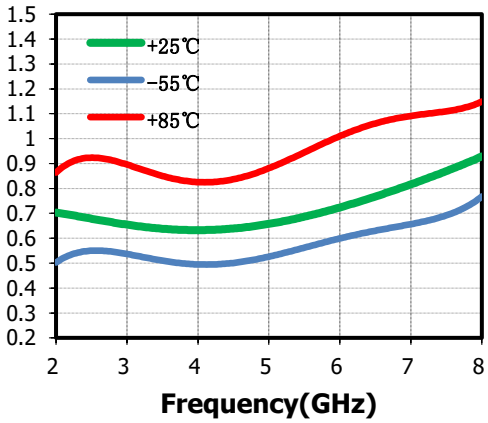
Output P-1dB(dBm) vs.Temperature



Output IP3(dBm) vs.Temperature

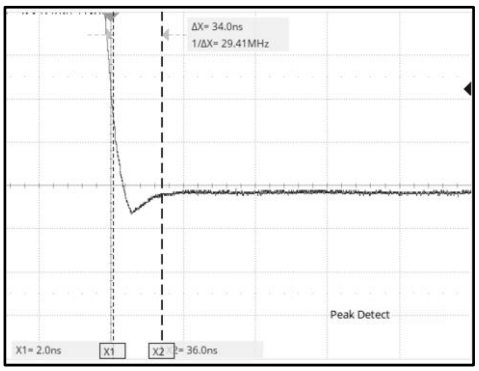


Noise Figure(dB) vs.Temperature



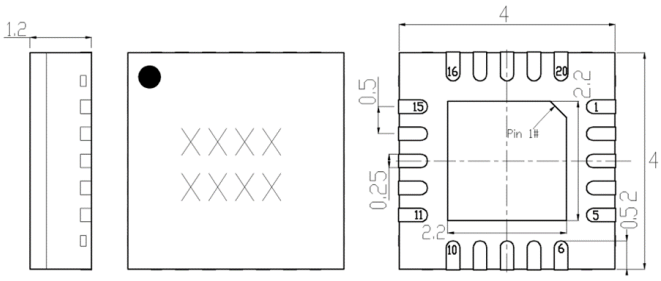
Recover Time(nS)

50nS/Div

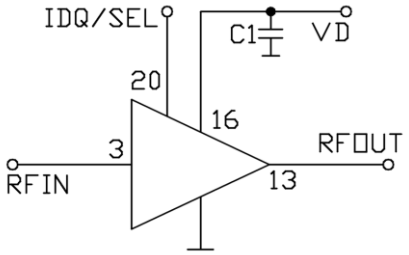


Outline Drawing

(All dimensions in mm)



Assembly Diagram



Pin Function

Pin No.	Description	Pin No.	Description
1	Connect to GND	11	Connect to GND
2	Connect to GND	12	Connect to GND
3	RFIN, DC Coupled**	13	RFOUT, AC Coupled
4	Connect to GND	14	Connect to GND
5	Connect to GND	15	Connect to GND
6	Connect to GND	16	VD
7	Connect to GND	17	Connect to GND
8	Connect to GND	18	Connect to GND
9	Connect to GND	19	Connect to GND
10	Connect to GND	20	Quiescent current selection: Connect to GND--> Lower Current(≈40mA) Floating--> Default (≈30mA)

SuperApex, LLC
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

**this pin must not source/sink more than 10mA of DC current or part non function and possible part failure will result.

Components List

Reference Des.	Value	Part Number	Size
C1	1000pF	-	0402

Attention:

1.The moisture resistant grade of products is 2A, the storage environment ≤30℃/60% RH， the surrounding workshop Life is 4 weeks;

2. Try to use thin RF boards and increase the number of groundings vias at the bottom of the device to reduce grounding inductance;

3. Remove the vacuum packaging and bake in a 125+/-5°environment for 6 hours before reflow soldering;

4. It is extremely not recommended to heat the package directly from the top.

Revision History

Revision	Date	Comment
1.0	July 25th, 2024	First Release