

SAC3901AQP3



GaAs MMIC Driver Amplifier
0.9~1.3GHz

Rev 1.0

Features

- Frequency: 0.9~1.3GHz
- Gain: 20dB
- Output P-1dB: 26dBm Typ. 25dBm Min.
- Power Supply: +5V,180mA
- Package: 3mm×3mm×0.75mm
- Die size: 1.33mm×1.25mm×0.1mm

Typical Applications

- EW
- Cellular Infrastructure

General Description

SAC3901AQP3 is a GaAs MMIC driver amplifier. SAC3901AQP3 provides 20 dB of gain, and 26dBm of output power for 1 dB compression a +5V supply.

Electrical Performance

$T_A=25^{\circ}\text{C}$, $V_D=+5\text{V}$, $I_{DQ}=180\text{mA}$, $Z_0=50\Omega$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	0.9~1.3			GHz
Small Signal Gain	17	20	—	dB
Small Signal Gain Flatness	—	±1	±1.75	dB
VSWRi	—	1.5	2.0	:1
Noise Figure	—	3.3	4.3	dB
Isolation	—	-33	—	dB
Output P-1dB	25	26	—	dBm
Output IP ₃	—	33	—	dBm
Supply Current (I _b)	—	180	285	mA
Thermal Resistance	—	33	—	°C/W

Absolute Maximum Ratings

Maximum Input Power	+12dBm	Operating Temperature	-55°C~+85°C
Channel temperature	+150°C	Storage Temperature	-55°C~+150°C
V _D	+5.25V		

SuperApex, LLC

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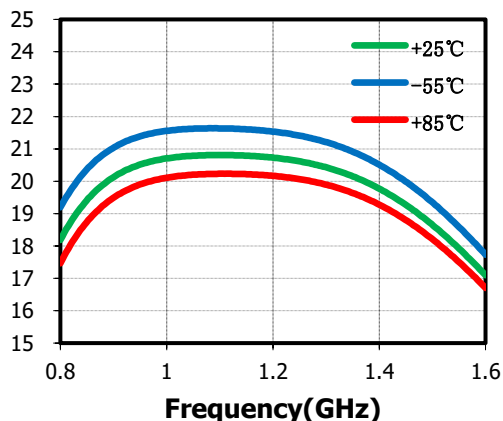
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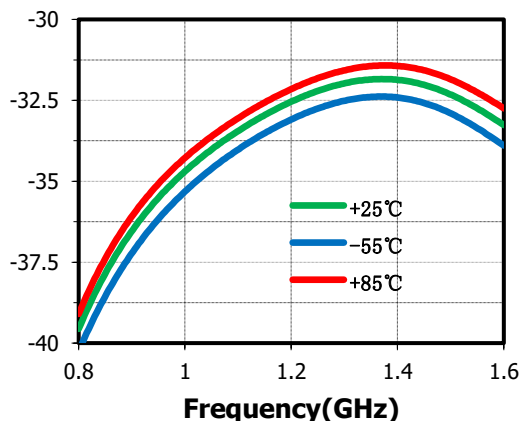
Typical Performance Curve

The following data are obtained by SAC3901AQP3 evaluation board, $V_D = +5V$, $I_{DQ} = 0.18A$, CW, $T_A = +25^\circ C$

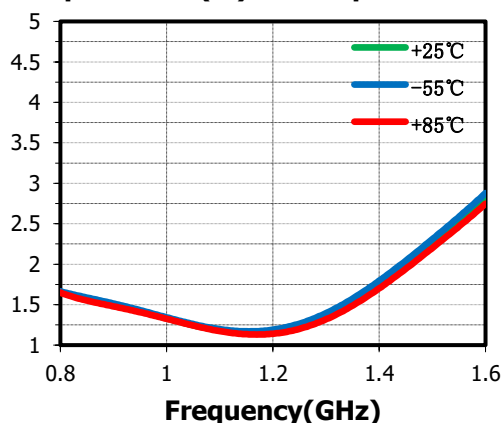
Small Signal Gain(dB) vs.Temperature



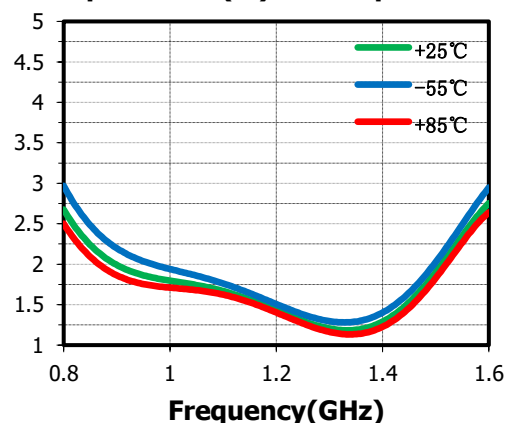
Reverse Isolation(dB) vs.Temperature



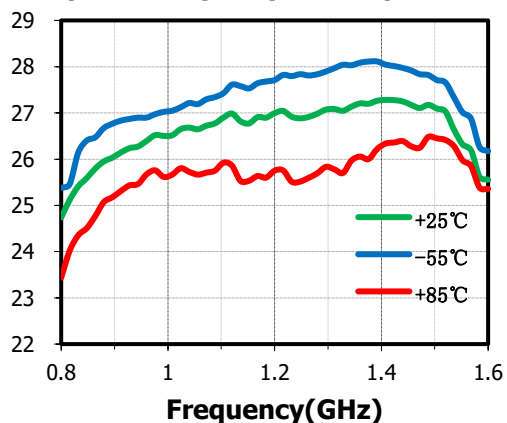
Input VSWR(:1) vs.Temperature



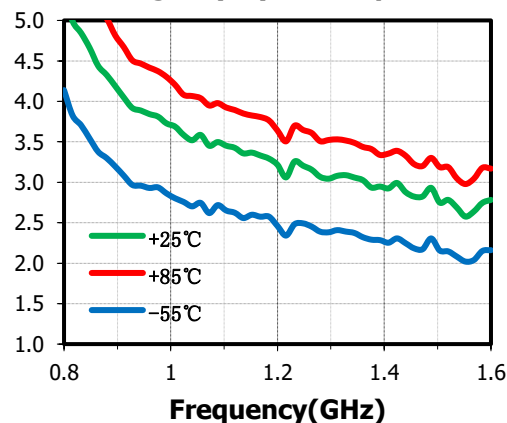
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Noise Figure(dB) vs.Temperature



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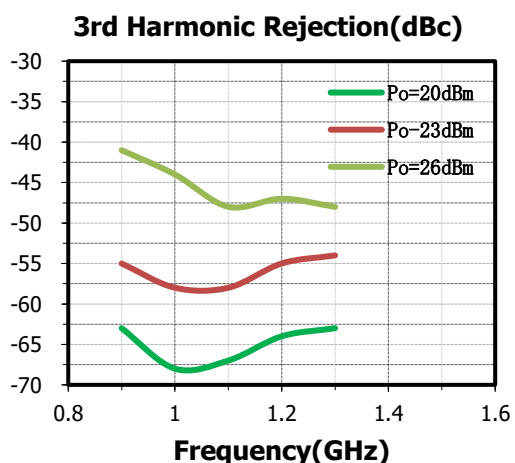
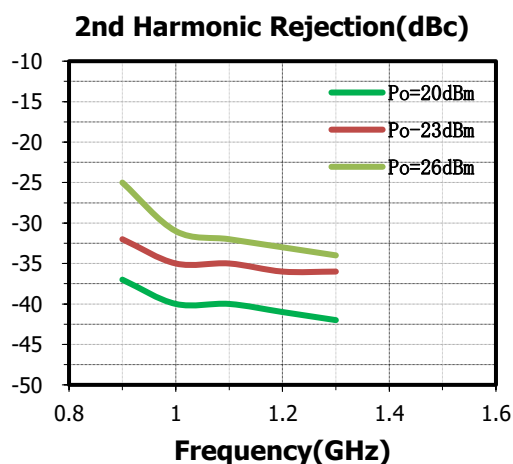
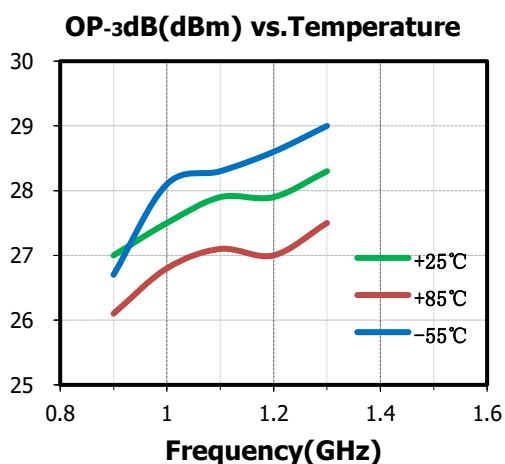
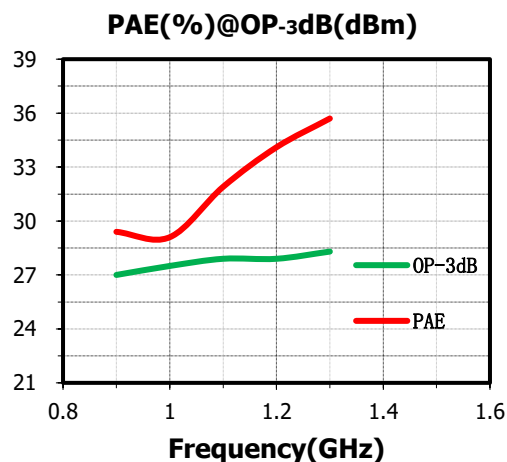
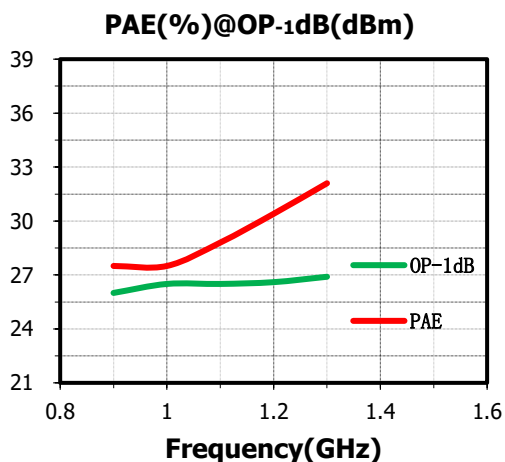
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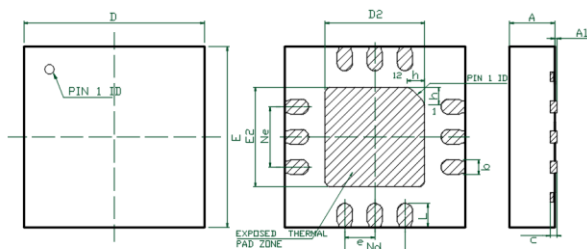
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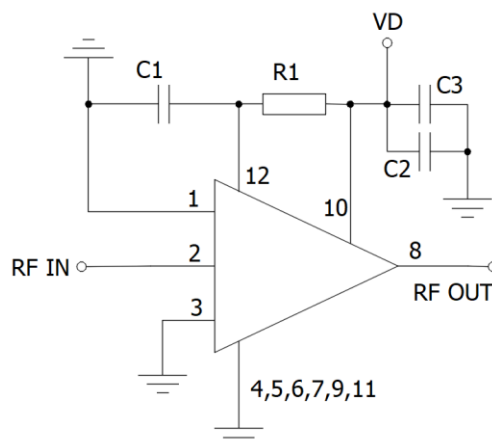
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Outline Drawing



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

Application Circuit

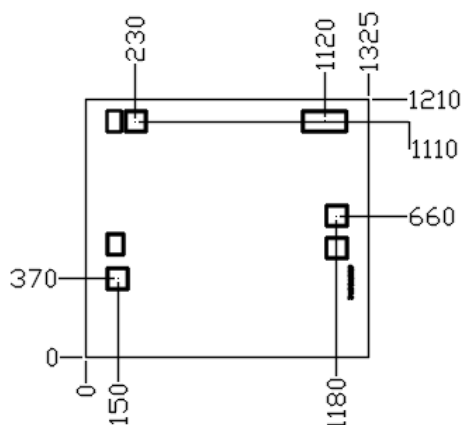


Pin Function

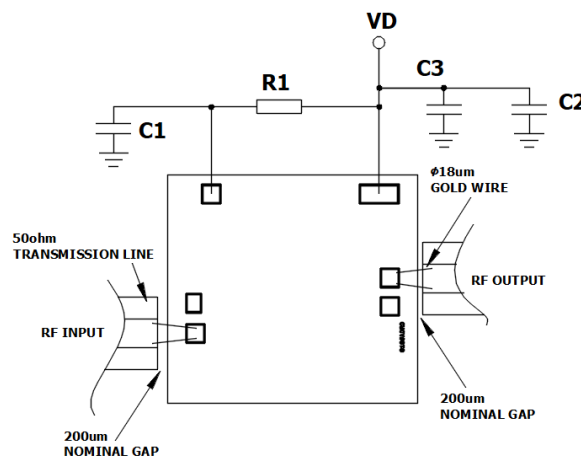
Pin No.	Description	Pin No.	Description
1	Connect to ground	7	Connect to ground
2	RF input, AC coupled	8	RF output, AC coupled
3	Connect to ground	9	Connect to ground
4	Connect to ground	10	V _D
5	Connect to ground	11	Connect to ground
6	Connect to ground	12	V _G

Die Outline

(All dimensions in μm)



Assembly



Pad size: RF IN、RF OUT、VG1: 100 μm x100 μm
VD1:100 μm x180 μm

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BOM

Reference Des.	Value	Part Number	Manuf.
C1	47uF	GRM21BR61A476ME15L	Murata
C2	1uF	GCM1887U1H103JA16D	Murata
C3	100pF	GCM0335C1H101JA16D	Murata
R1*	300 Ω	-	-

** Adjust R1 value between 200 Ω to 500 Ω to achieve IDQ= 0.18 A typical.

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 $125\pm 5^{\circ}$ environment before soldering;
3. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Revision History

Revision	Date	Comment
1.0	Aug 10, 2020	First Release

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