

SAC3241Q4

GaAs MMIC PIN Switch
2GHz~18GHz SP3T

Rev 1.0

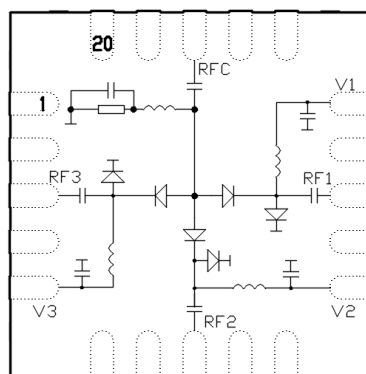
Features

- Frequency: 2~18GHz
- Insertion Loss: 1.3dB@18GHz
- Isolation: 55dB@18GHz
- Reflective switch
- Package: QFN4x4

Description

SAC3241Q4 is a wideband reflective SP3T switch housed in a QFN surface mount package, Each RF port contains DC blocking capacitors and a DC bias circuit consisting of high impedance lines and decoupling capacitor.

Functional Diagram



Electrical Performance

$T_{BASE}=25^{\circ}\text{C}$, $Z_0=50\Omega$, 15mA/-5V, CW

Parameter	Min.	Typ.	Max.	Units
Frequency	2	—	18	GHz
Insertion Loss	—	1	1.8	dB
$VSWR_{RFC}$	—	1.5	2	: 1
$VSWR_{RFX}$	—	1.5	2	: 1
Isolation	45	50	—	dB
Forward Bias Current	—	15	22	mA
Switching Speed	—	25	—	nS
Forward Bias Voltage	—	1	—	V

Absolute Maximum Ratings

Input Power	+30dBm (-V: -15V)	Operating Temperature (T_{BASE})	-55°C~+85°C
Junction Temperature	150°C	Storage Temperature	-55°C~+150°C
Forward Bias Current	25mA	Reverse Bias Voltage(-V)	-30V

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

SAC3241Q4



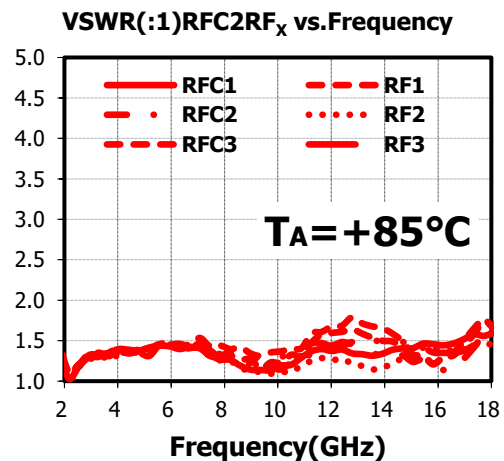
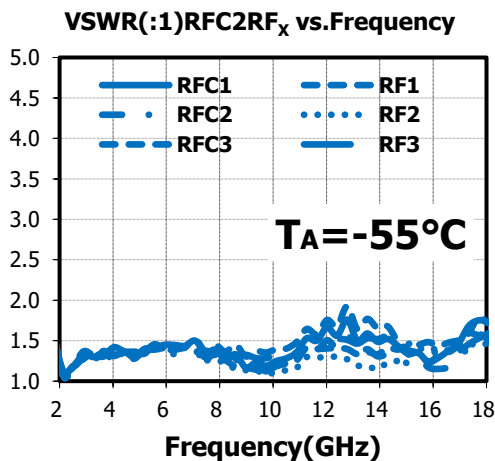
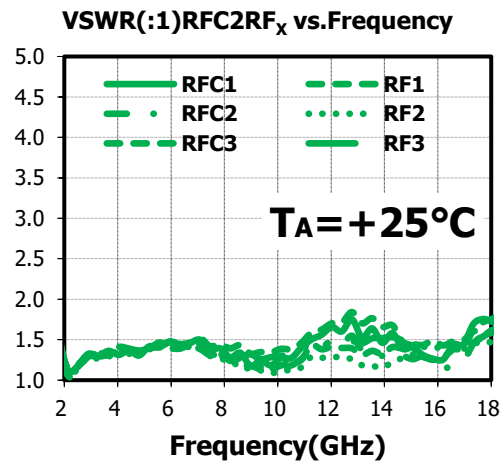
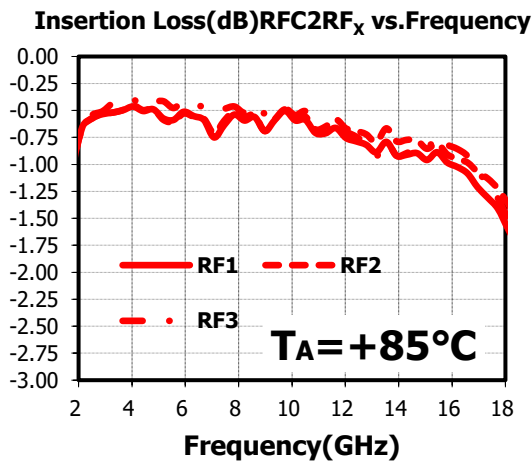
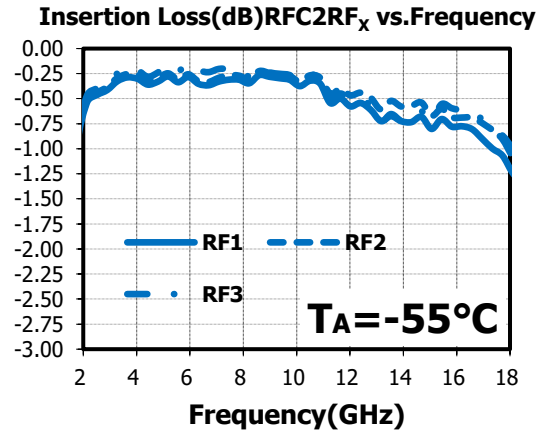
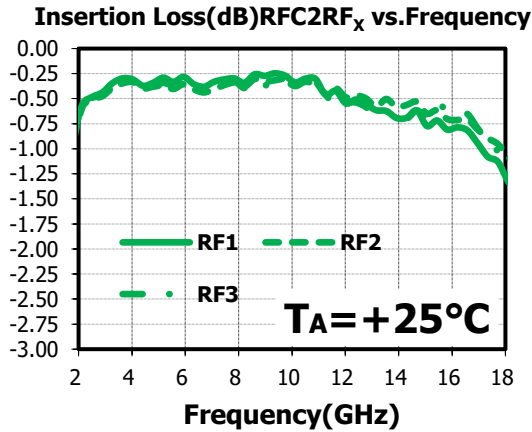
GaAs MMIC PIN Switch
2GHz~18GHz SP3T

Rev 1.0

Typical Performance Curve

The following curves are taken from SAC3241Q4 evaluation board. De-embedding operation has been Implemented.

+15mA/-5V, CW, $T_{BASE}=+25^{\circ}\text{C}$



SuperApex, LLC

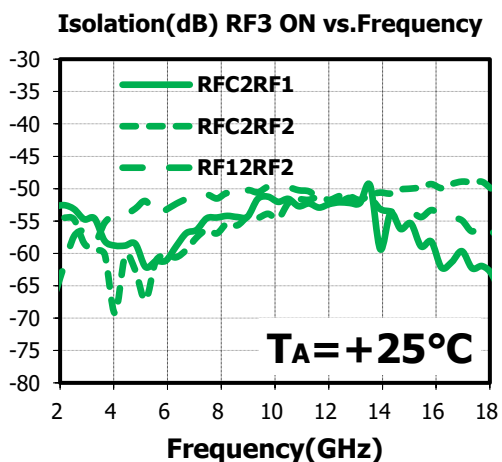
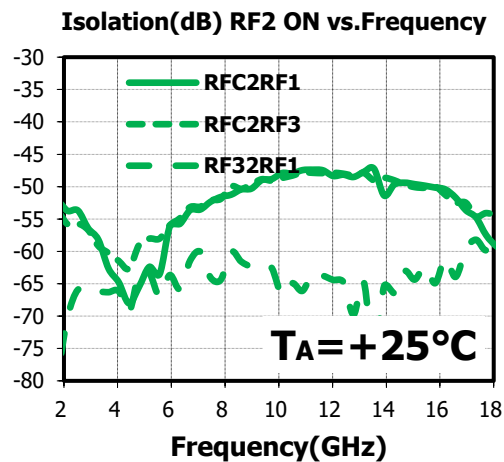
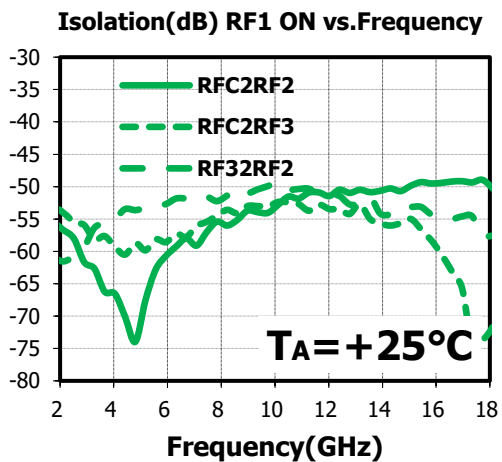
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

SAC3241Q4

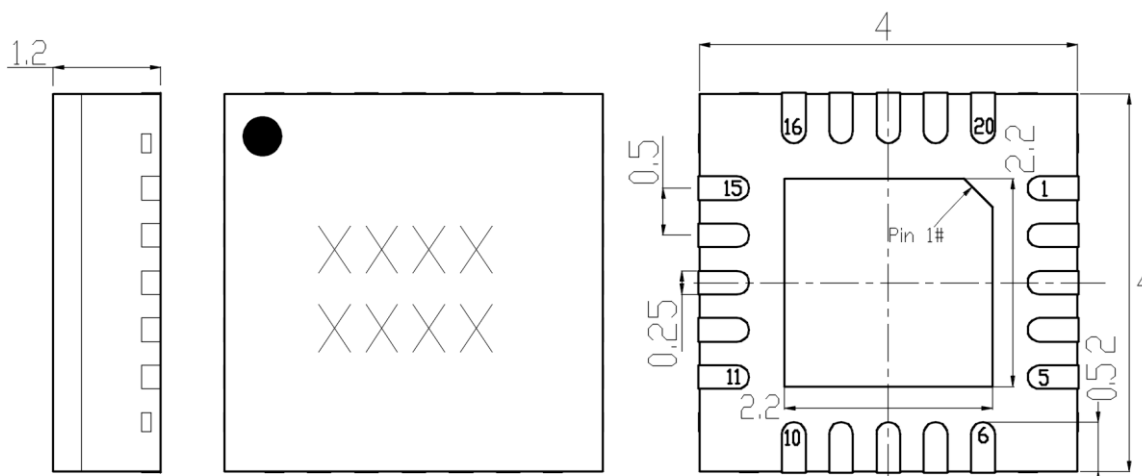


GaAs MMIC PIN Switch
2GHz~18GHz SP3T

Rev 1.0



Outline Drawing (mm)



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

SAC3241Q4

GaAs MMIC PIN Switch
2GHz~18GHz SP3T

Rev 1.0

Truth Table

Inputs			Outputs		
V1	V2	V3	RFC-RF1	RFC-RF2	RFC-RF3
-V	+V	+V	ON	OFF	OFF
+V	-V	+V	OFF	ON	OFF
+V	+V	-V	OFF	OFF	ON

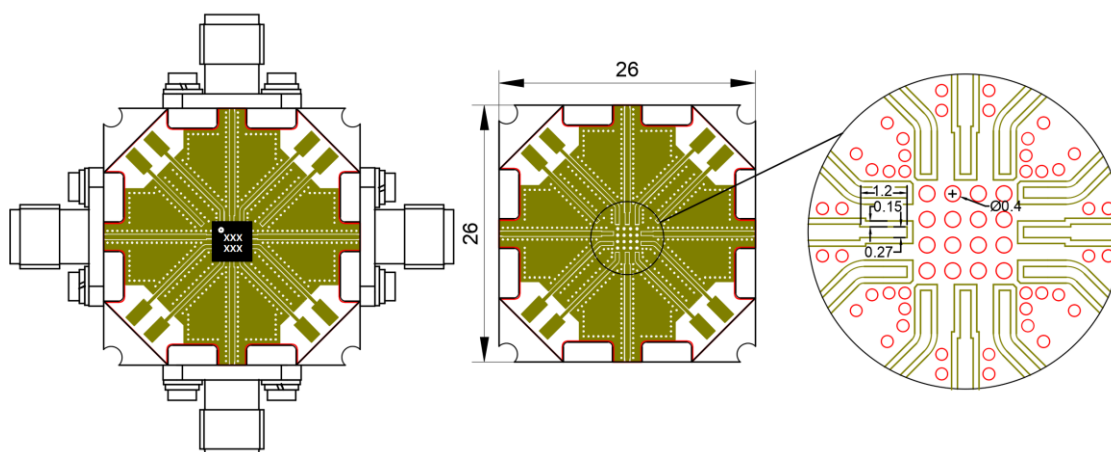
1. -V is reverse bias voltage, A -5V voltage can be used to reverse bias the PIN diode of the chip, for high power applications, a higher negative voltage can be used,

2. +V is forward bias voltage, A voltage of 3-5 V can be used to forward bias the PIN diode, forward bias current is set using external bias resistors placed at pads V1 and V2.

Pin Function

Pin No.	Description	Pin No.	Description
1	Connect to GND	11	V2
2	Connect to GND	12	Connect to GND
3	RF3	13	RF1
4	Connect to GND	14	Connect to GND
5	V3	15	V1
6	Connect to GND	16	Connect to GND
7	Connect to GND	17	Connect to GND
8	RF2	18	RFC
9	Connect to GND	19	Connect to GND
10	Connect to GND	20	Connect to GND

SAC3241Q4 Evaluation Board



The Evaluation board is a 2-layer board fabricated using Rogers 4350b $t=0.254$ and using best practices for high frequency RF design. The RF input and RF output traces have a $50\ \Omega$ characteristic impedance.

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

SAC3241Q4



GaAs MMIC PIN Switch
2GHz~18GHz SP3T

Rev 1.0

Attention:

1. The RF input and output ports have integrated DC blocking capacitors with a voltage resistance of 30V.
2. ESD tolerance level is HBM Class 1A
3. The moisture resistance level of the packaged product is Grade 2a, the storage environment is less than or equal to 30 °C/60% RH, and the service life of the surrounding workshop.
4. When using packaged products, try to use thin RF boards and increase the number of groundings vias at the bottom of the device to reduce grounding inductance.
5. Remove the vacuum packaging and bake in an environment of 125+/-5 °C for 6 hours before soldering.

Revision History

Revision	Date	Comment
1.0	2024-07-11	First Release

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