



RFSW8009

0.5-8GHz Wi-Fi/IoT SP2T Switch

Product Overview

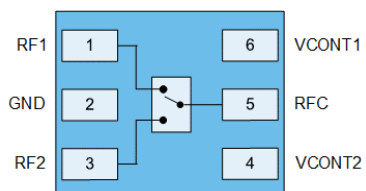
The Qorvo® RFSW8009 is a high power single-pole double-throw (SPDT) switch designed for high performance wireless applications.

This wideband switch has been designed for use from 0.5 to 8GHz, where high linearity, high isolation, low insertion loss, and small package size are required. Switching for the RFSW8009 is controlled via two control voltage inputs.



6 Pad 1.86 x 1.5 mm Laminate Package

Functional Block Diagram



Top View

Key Features

- 500 – 8000 MHz
- Low Insertion Loss
- High Isolation
- Input $P_{0.1dB} = 32$ dBm
- Fast Switching Speed <250 nS

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
RFSW8009SB	Sample bag with 5 pieces
RFSW8009SR	7" reel with 100 pieces
RFSW8009TR7	7" reel with 2,500 pieces
RFSW8009PCK-410	0.5-2.5 GHz Evaluation Board
RFSW8009PCK-411	2.5-8 GHz Evaluation Board



Absolute Maximum Ratings

Parameter	Conditions	Rating
Control Voltage	VCONT1, VCONT2	Up to +6 V
Storage Temperature		-40 to 150 °C
RF Input Power	Control Voltage = 3 V	+34 dBm
	Control Voltage = 5 V	+35 dBm

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Frequency	500		8000	MHz
Control Voltage – High	+2.7	+3	5.3	V
Control Voltage - Low	-0.2	0	+0.2	V
T _{OPERATING} *	-40		+85	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions. . * T_{OPERATING} is temperature at package ground.

Electrical Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
	Unless otherwise noted: T=+25°C				
Insertion Loss	$f = 500 \text{ to } 2000 \text{ MHz}^{(1)}$		0.40	0.65	dB
	$f = 2000 \text{ to } 2500 \text{ MHz}^{(1)}$		0.45	0.70	dB
	$f = 2500 \text{ to } 3800 \text{ MHz}^{(2)}$		0.55	0.80	dB
	$f = 3800 \text{ to } 6000 \text{ MHz}^{(2)}$		0.65	0.90	dB
	$f = 6000 \text{ to } 7200 \text{ MHz}^{(2)}$		0.70		dB
Isolation	$f = 500 \text{ to } 2000 \text{ MHz}^{(1)}$	25	28		dB
	$f = 2000 \text{ to } 2500 \text{ MHz}^{(1)}$	25	28		dB
	$f = 2500 \text{ to } 3800 \text{ MHz}^{(2)}$	25	28		dB
	$f = 3800 \text{ to } 6000 \text{ MHz}^{(2)}$	22	26		dB
	$f = 6000 \text{ to } 7200 \text{ MHz}^{(2)}$		25		dB
Return Loss	$f = 500 \text{ to } 2000 \text{ MHz}^{(1)}$	15	20		dB
	$f = 2000 \text{ to } 2500 \text{ MHz}^{(1)}$	15	20		dB
	$f = 2500 \text{ to } 6000 \text{ MHz}^{(2)}$	10	15		dB
	$f = 6000 \text{ to } 7200 \text{ MHz}^{(2)}$		15		dB
Input P ^{0.1dB}	$f = 500 \text{ to } 2500 \text{ MHz}^{(1)}$		+32		dBm
	$f = 2500 \text{ to } 6000 \text{ MHz}^{(2)}$		+32		dBm
	$f = 6000 \text{ to } 7200 \text{ MHz}^{(2)}$		+32		dBm
Input P ^{1dB}	$f = 500 \text{ to } 2500 \text{ MHz}^{(1)}$		+34		dBm
	$f = 2500 \text{ to } 7200 \text{ MHz}^{(2)}$		+34		dBm
	$f = 6000 \text{ to } 7200 \text{ MHz}^{(2)}$		+34		dBm



RFSW8009

0.5-8GHz Wi-Fi/IoT SP2T Switch

Parameter	Conditions	Min.	Typ.	Max.	Units
Input IP3	$f = 500$ to 2500 MHz		+60		dBm
2 nd Harmonics	$f = 2500$ MHz $P_{IN} = +20$ dBm		-80	-30	dBm/MHz
3 rd Harmonics	$f = 2500$ MHz $P_{IN} = +20$ dBm		-80	-42	dBm/MHz
Control Current - High	No RF input; All modes		0.1	10	μ A
Switching Time	50% of control to 90/10% of RF; All modes		50	250	nS

Notes:

1. External DC blocking capacitor value for C3, C4 & C5 per EVB Schematic = 56 pF
2. External DC blocking capacitor value for C3, C4 & C5 per EVB Schematic = 8 pF

Logic Truth Table

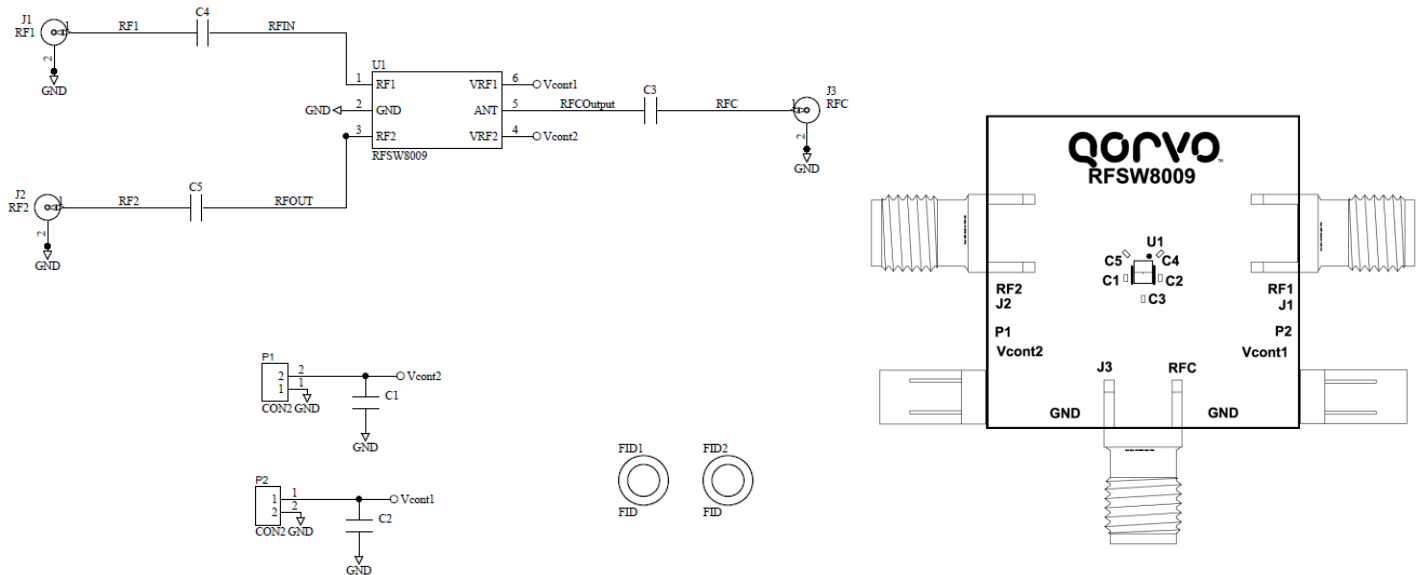
Mode	VCONT1	VCONT2
RF1-RFC	High	Low
RF2-RFC	Low	High
Not Supported	All Other States	



RFSW8009

0.5-8GHz Wi-Fi/IoT SP2T Switch

Evaluation Board Schematic and Layout – RFSW8009PCK-410



Notes:

Bill of Material

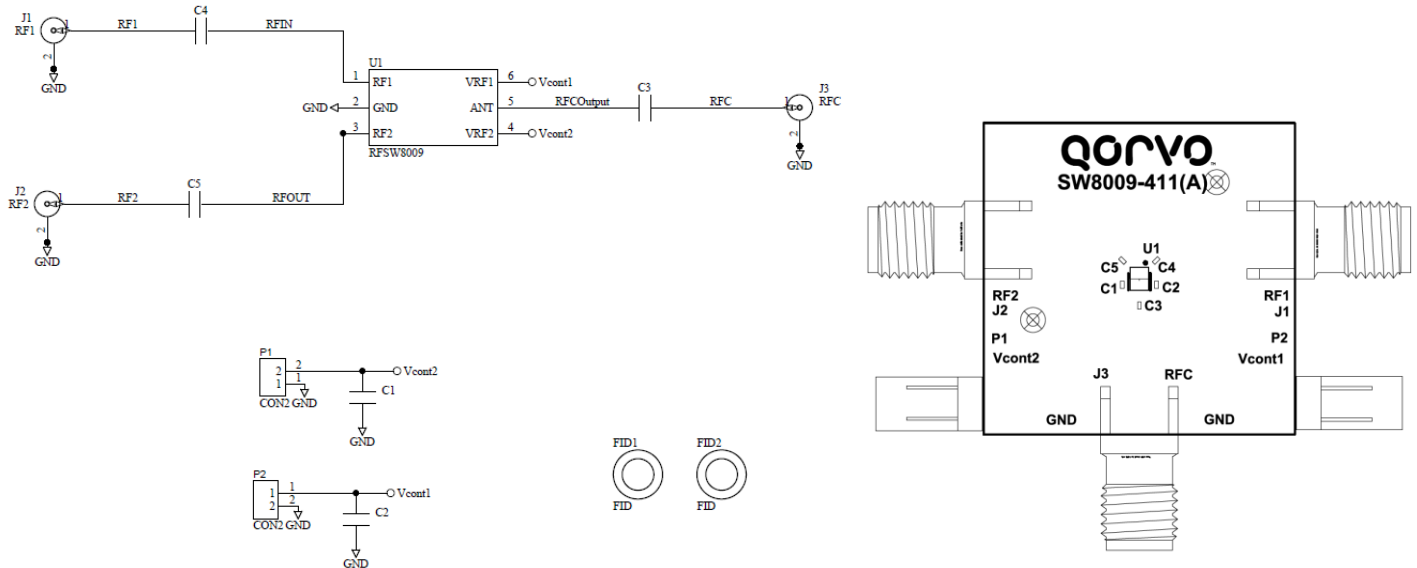
Ref. Des.	Value	Description	Manuf.	Part number
-	-	Printed Circuit Board		
U1	-	0.5-8GHz Wi-Fi/IoT SP2T Switch	Qorvo	RFSW8009
C3, C4, C5	56 pF	Capacitor, Chip, 5%, 25V, C0G, 0201	Kyocera	CM03CG560J25AH
C1, C2	1 nF	Capacitor, Chip, 10%, 25V, X7R, 0201		



RFSW8009

0.5-8GHz Wi-Fi/IoT SP2T Switch

Evaluation Board Schematic and Layout – RFSW8009PCK-411

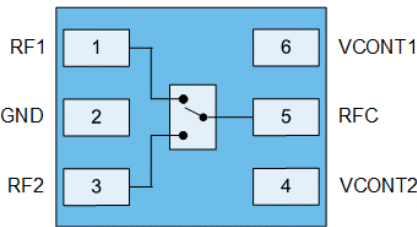


Notes:

Bill of Material

Ref. Des.	Value	Description	Manuf.	Part number
-	-	Printed Circuit Board		
U1	-	0.5-8GHz Wi-Fi/IoT SP2T Switch	Qorvo	RFSW8009
C3, C4, C5	8 pF	Capacitor, Chip, +/-0.5pF, 25V, C0G, 0201	Murata	GRM0335C1E8R0DA01D
C1, C2	1 nF	Capacitor, Chip, 10%, 25V, X7R, 0201		

Pin Configuration and Description



Top View

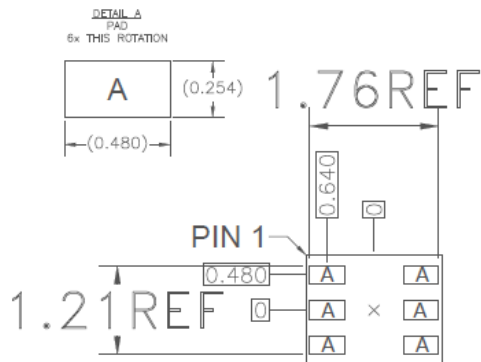
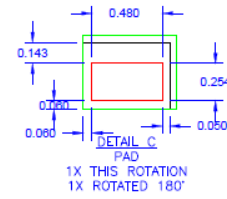
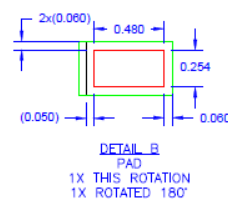
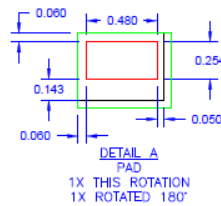
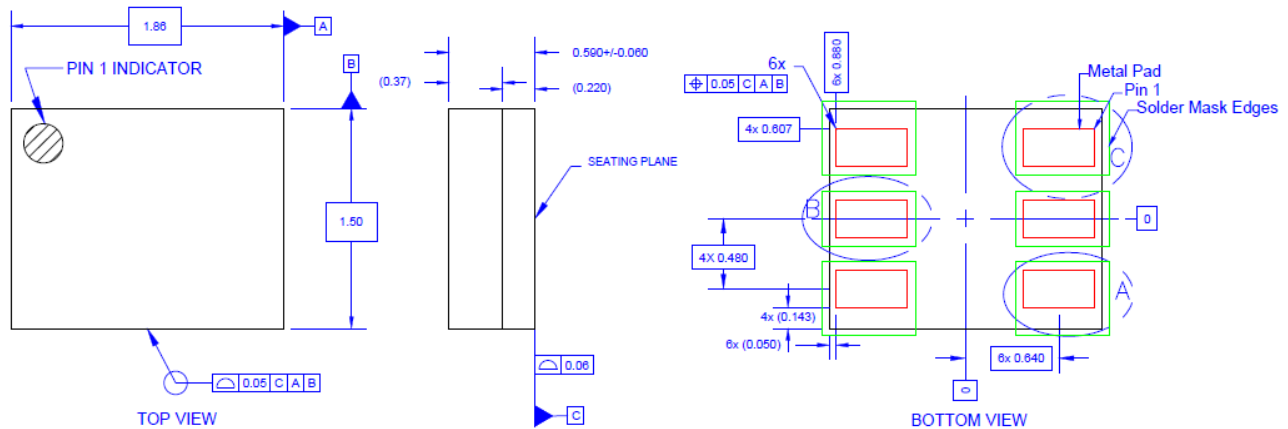
Pin Number	Label	Description
1	RF1	RF port. Internally matched to 50 Ω ⁽¹⁾
2	GND	Ground connection.
3	RF2	RF port. Internally matched to 50 Ω ⁽¹⁾
4	VCONT2	Control pin.
5	RFC	RF port. Internally matched to 50 Ω ⁽¹⁾
6	VCONT1	Control pin.

Notes:

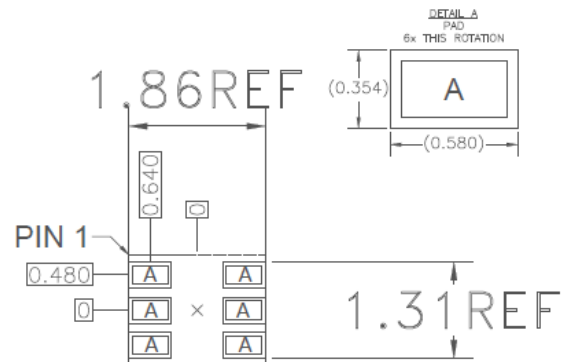
1. External DC block required.

Mechanical Information

Dimensions and PCB Mounting Pattern



**RECOMMENDED
LAND PATTERN**



**RECOMMENDED
LAND PATTERN MASK**

Notes:

3. All dimensions are in millimeters. Angles are in degrees.
4. Dimension and tolerance formats conform to ASME Y14.4M-1994.
5. The terminal #1 identifier and terminal numbering conform to JESD 95-1 SPP-012.

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1A (250V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C2A (500V)	JESD22-C101
MSL – Moisture Sensitivity Level	3	IPC/JEDEC J-STD-020



Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead Free.
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C₁₅H₁₂Br₄O₂) Free
- SVHC Free
- PFOS Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

Important Notice

The information contained in this Data Sheet and any associated documents ("Data Sheet Information") is believed to be reliable; however, Qorvo makes no warranties regarding the Data Sheet Information and assumes no responsibility or liability whatsoever for the use of said information. All Data Sheet Information is subject to change without notice. Customers should obtain and verify the latest relevant Data Sheet Information before placing orders for Qorvo® products. Data Sheet Information or the use thereof does not grant, explicitly, implicitly or otherwise any rights or licenses to any third party with respect to patents or any other intellectual property whether with regard to such Data Sheet Information itself or anything described by such information.

DATA SHEET INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Without limiting the generality of the foregoing, Qorvo® products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death. Applications described in the Data Sheet Information are for illustrative purposes only. Customers are responsible for validating that a particular product described in the Data Sheet Information is suitable for use in a particular application.

© 2020 Qorvo US, Inc. All rights reserved. This document is subject to copyright laws in various jurisdictions worldwide and may not be reproduced or distributed, in whole or in part, without the express written consent of Qorvo US, Inc. | QORVO® is a registered trademark of Qorvo US, Inc.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Qorvo:

[RFSW8009TR7](#) [RFSW8009PCK-410](#) [RFSW8009SR](#)