

### Applications

- 802.11b WLAN
- 802.11g WLAN
- 802.11a WLAN
- TX-RX Switching
- Antenna Diversity Switching
- Test and Measurement
- General Purpose Broadband Wireless

### Product Features

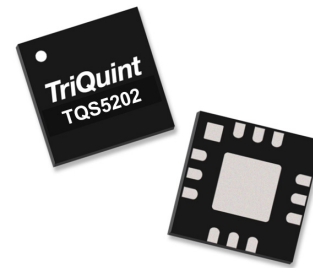
- Integrated TX-RX and Diversity Switch for Dual-band 802.11a/b/g WLAN Systems
- 0.1 to 6.0 GHz Frequency Coverage
- Low Insertion Loss
- High Isolation
- Positive Control Voltage
- No Supply Voltage Necessary
- GaAs pHEMT Technology
- Leadless 3.0 x 3.0 x 0.85 mm Pb-Free SMT Package

### General Description

The TQS5202 is a dual-band, double-pole double-throw switch configured for TX-RX and antenna diversity switching applications for the WLAN market and other general purpose transfer switch applications.

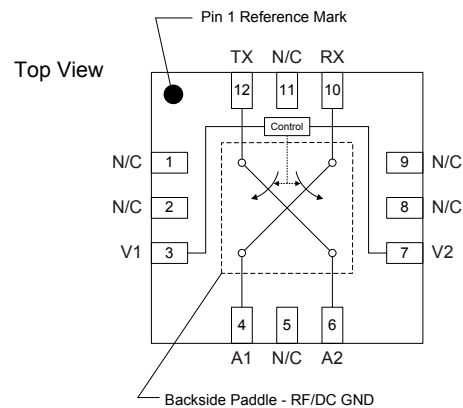
The TQS5202 exhibits industry-leading insertion loss, isolation and power handling. It requires no fixed supply voltage and operates with a positive control voltage.

The TQS5202 is manufactured using TriQuint's GaAs pHEMT process and is packaged in an industry standard 3.0 x 3.0 x 0.85 mm VQFN-12 Pb-Free package.



12-pin 3x3 mm QFN Package

### Functional Block Diagram



### Pin Configuration

Pin No.	Symbol
1, 2, 5, 8, 9, 11	N/C
3	V1
4	A1
6	A2
7	V2
10	RX
12	TX
Backside Paddle	RF/DC GND

### Ordering Information

Part No.	Description
TQS5202	SP3T Reflective Switch
TQS5202-PCB	0.1 - 6.0 GHz Evaluation Board

Standard T/R size = 2500 pieces on a 7" reel

### Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to 150°C
RF Input Power, CW, 50Ω, T = 25°C	+35 dBm
Control Voltage Range	-5.0 to +5.0 V

Operation of this device outside the parameter ranges given above may cause permanent damage.

### Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
V <sub>CTRL</sub> High State	2.5		5.0	V
Operating Temp. Range	-40		+85	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

### Electrical Specifications

Test conditions unless otherwise noted: Temp.=+25°C, 50 Ω system

Parameter	Conditions	Min	Typ	Max	Units
Operational Frequency Range		100		6000	MHz
Control Voltage	Low	0		0.2	V
	High	2.5	3.0	5.0	V
Insertion Loss	0.1 – 6 GHz			1.5	dB
	2.3 – 2.5 GHz		0.8	1.1	
	4.9 – 6.0 GHz <sup>(5)</sup>		0.95	1.35	
Isolation	0.1 – 6 GHz	20	25		dB
	2.3 – 2.5 GHz	25	33		
	4.9 – 6.0 GHz <sup>(5)</sup>	20	28		
Return Loss	0.1 – 6 GHz		12		dB
	2.3 – 2.5 GHz		15		
	4.9 – 6.0 GHz <sup>(5)</sup>		15		
Input P1dB <sup>(1)</sup>	2.3 – 2.5 GHz		+33		dBm
	4.9 – 6.0 GHz		+29		
Input P1dB <sup>(2)</sup>	2.3 – 2.5 GHz		+31		dBm
	4.9 – 6.0 GHz		+27		
Input IP3 <sup>(1)(3)</sup>	2.3 – 2.5 GHz		+50		dBm
	4.9 – 6.0 GHz		+50		
Harmonics (2f0) <sup>(4)</sup>	2.3 – 2.5 GHz		80		dBc
	4.9 – 6.0 GHz		75		
Harmonics (3f0) <sup>(4)</sup>	2.3 – 2.5 GHz		85		dBc
	4.9 – 6.0 GHz		85		
Control Voltage Bias Current	V1 or V2 or V3=5 V			50	uA

Notes:

- V<sub>CTRL</sub>=3.0 V / 0 V
- V<sub>CTRL</sub>=2.6 V / 0 V
- P<sub>IN</sub>=+20 dBm/tone, Δf=1 MHz
- P<sub>IN</sub>=+20 dBm
- Using 3pF blocking caps

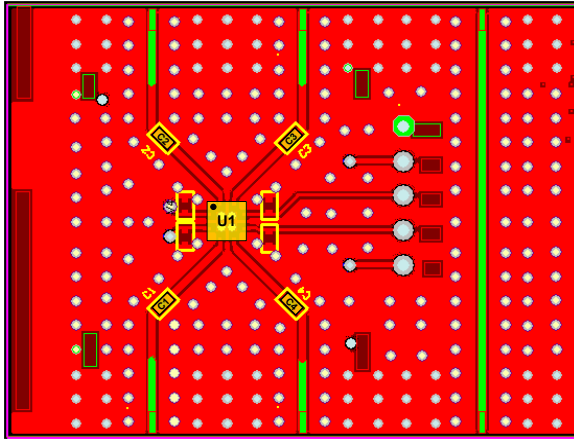
### Digital Control Voltages

State	Bias Condition
Low	≤ 0.2V
High	≥ 2.5 V

### Switch Control Truth Table

Control Voltages		Signal Path State			
V1	V2	A1-TX	A2-TX	A1-RX	A2-RX
Low	High	ON	OFF	OFF	ON
High	Low	OFF	ON	ON	OFF
All Other States		N/A	N/A	N/A	N/A

**TQS5202-PCB Evaluation Board**

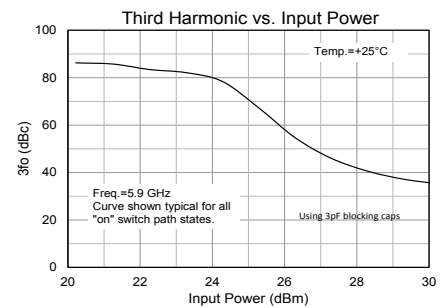
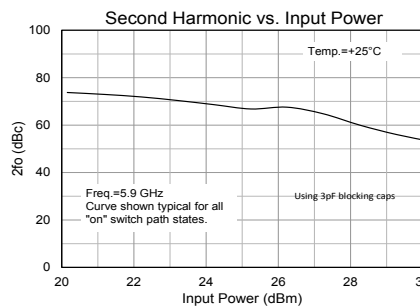
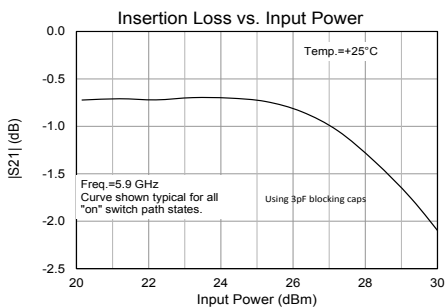
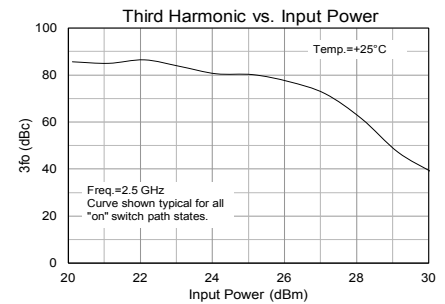
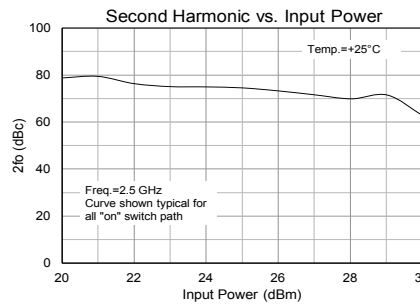
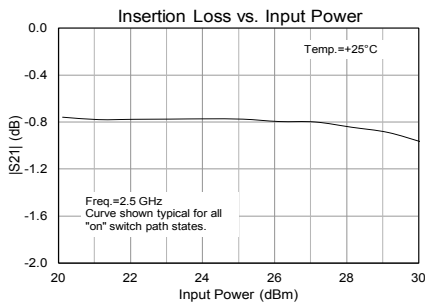
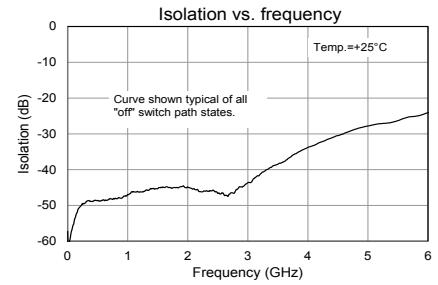
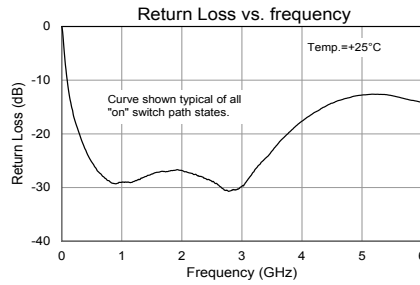
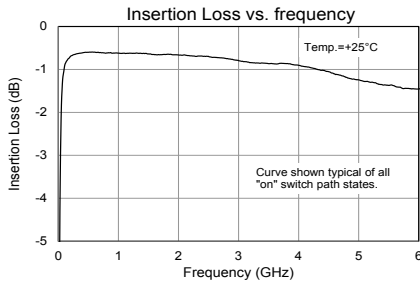


**Notes:**

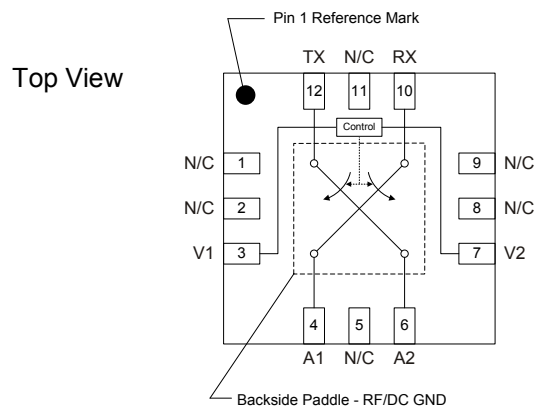
1. See Evaluation Board PCB Specifications section for material and stack-up.
2. C1,C2,C3 and C4 = 100pF.

**Performance Plots - (TQS5202-PCB)**

Test conditions unless otherwise noted:  $V_{CTRL}=3.0\text{ V} / 0.0\text{ V}$ , Temp= $+25^{\circ}\text{C}$ , 50  $\Omega$  system

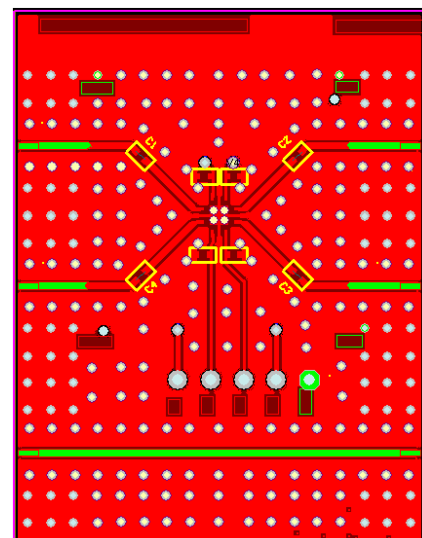
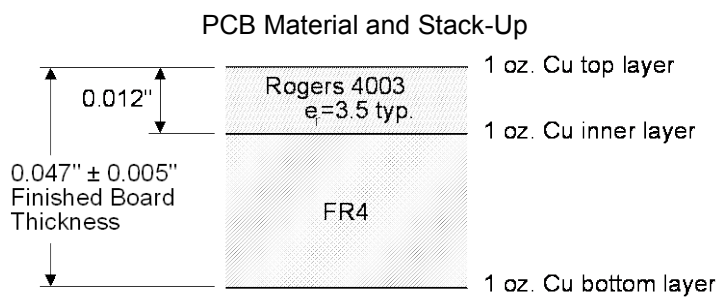


## Pin Configuration and Description



Pin No.	Symbol	Description
1, 2, 5, 8, 9, 11	N/C	No internal electrical connection. Provide grounded land pads for PCB mounting integrity.
3	V1	Switch state control voltage 1
4	A1	Antenna Port 1
6	A2	Antenna Port 2
7	V2	Switch state control voltage 2
10	RX	Receive Port
12	TX	Transmit Port
Backside Paddle	RF/DC GND	RF/DC Ground. Use recommended via pattern and ensure good solder attach for best thermal and electrical performance.

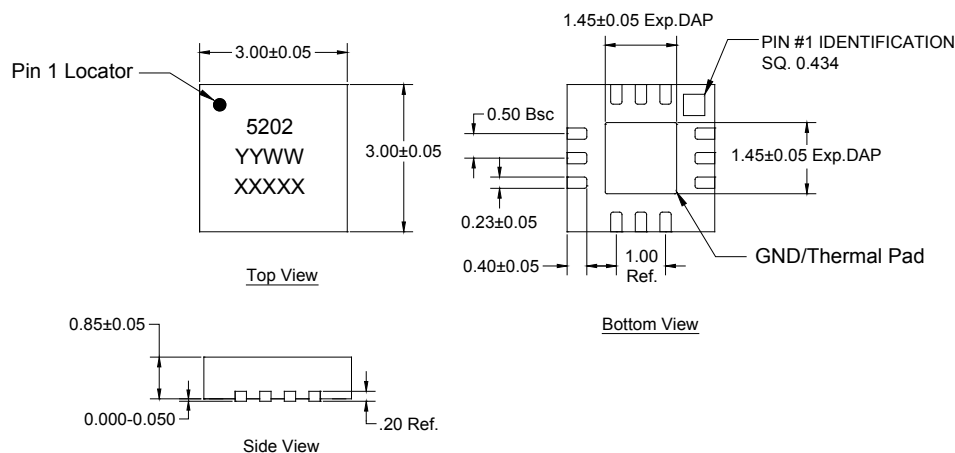
## Evaluation Board PCB Specifications



## Mechanical Information

### Package Marking and Dimensions

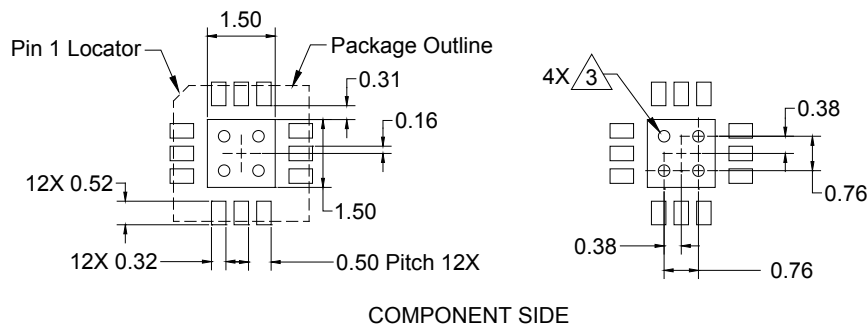
Marking: Product Code – 5202  
 Assembly Code - XXXX  
 Year/Week - YYWW



**Notes:**

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

## PCB Mounting Pattern



**Notes:**

1. All dimensions are in millimeters. Angles are in degrees.
2. Use 1 oz. copper minimum for top and bottom layer metal.
3. We recommend a 0.35mm (#80/.0135") diameter bit for drilling via holes and a final plated thru diameter of 0.25 mm (0.10").
4. Ensure good package backside paddle solder attach for reliable operation and best electrical performance.

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For technical questions and application information:

**Email:** [sjcapplications.engineering@triquint.com](mailto:sjcapplications.engineering@triquint.com)

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