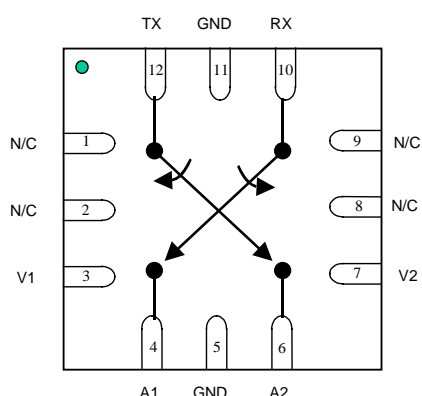


**Dual-band Diversity Switch for 802.11a/b/g Systems**

**Functional Block Diagram**



**Product Description**

The TQS5202 is a dualband double-pole double-throw switch configured for TX-RX and Antenna Diversity switching applications for the WLAN market. The device exhibits industry-leading insertion loss, isolation and power handling. It requires no fixed supply voltage and operates with a positive control voltage. The switch is manufactured using TriQuint's GaAs pHEMT process and is packaged in an industry standard 3.0mm x 3.0mm x 0.9mm VQFN-12 Pb-Free package.

**Electrical Specifications**

Parameter	Min	Typ	Max	Units
Frequency Range	2300		2500	MHz
Insertion Loss		0.8	1.1	dB
Isolation	25	33		dB
Return Loss		15		dB
Input P-1dB		33		dBm

Parameter	Min	Typ	Max	Units
Frequency Range	4900		6000	MHz
Insertion Loss		0.95	1.35	dB
Isolation	20	28		dB
Return Loss		15		dB
Input P-1dB		29		dBm

Note 1: Test Conditions:  $V_{ctrl}=3.0VDC/0VDC$  as required,  $T_c=25^{\circ}C$ ,  $P_{in} = 0dBm$

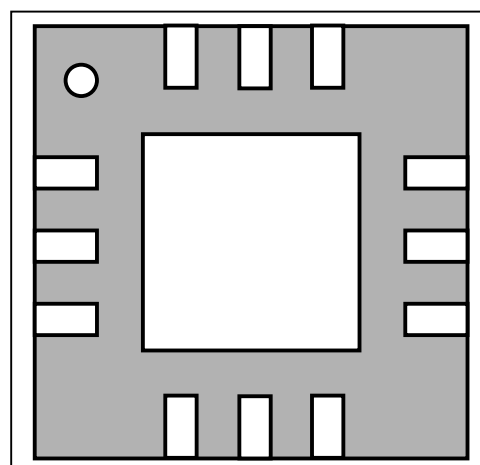
**Features**

- Integrated TX-RX and Diversity Switch for Dual-band 802.11a/b/g WLAN Systems
- 1.0 to 6.0GHz Frequency Coverage
- Low Insertion Loss
- High Isolation
- Positive Control Voltage
- No Supply Voltage Necessary
- GaAs pHEMT Technology
- Leadless 3.0 x 3.0 x 0.9 mm Pb-Free SMT Package

**Applications**

- 802.11b WLAN
- 802.11g WLAN
- 802.11a WLAN
- TX-RX Switching
- Antenna Diversity Switching

**Package Style**



## Dual-band Diversity Switch for 802.11a/b/g Systems

### Absolute Maximum Ratings

Symbol	Parameter	Absolute Maximum Value	Units
V <sub>ctrl</sub>	Control Voltage Range	-5.0 to 5.0	VDC
RF <sub>IN</sub>	RF input, 50ohm RF impedance	3.0	W
T <sub>j</sub>	Junction Temperature @ 30dBm Input, 25°C	50	°C
T <sub>c</sub>	Case Temperature, Survival	-40 to +100	°C
T <sub>STG</sub>	Storage Temperature	-40 to +150	°C
T <sub>oper</sub>	Operating Temperature Range	-40 to +85	°C

Note: The part may not survive all maximums applied simultaneously.

### DC Electrical Characteristics

Parameter	Conditions	Min.	Typ/Nom	Max.	Units
Logic Level Low	State 0	0.0		0.2	V
Logic Level High	State 1	2.5		5.0	V
Leakage Current			3	50	uA

### General Electrical Characteristics<sup>1,2,3</sup>

Parameter	Conditions	Min.	Typ/Nom	Max.	Min.	Typ/Nom	Max.	Units
RF Frequency		2400		2500	4900		6000	MHz
Insertion Loss			0.8	1.1		0.95	1.35	dB
Isolation	Either Path Adjacent to ON Path	25	33		20	28		dB
Return Loss			15			15		dB
Input P-1dB	V <sub>ctrl</sub> = 3.0V / 0V		33			29		dBm
Input P-1dB	V <sub>ctrl</sub> = 2.6V / 0V		31			27		dBm
Input IP3	P <sub>in</sub> = +20dBm, V <sub>ctrl</sub> = 3V / 0V		50			50		dBm
Harmonics (2f <sub>0</sub> )	P <sub>in</sub> = +20dBm		80			75		dBc
Harmonics (3f <sub>0</sub> )	P <sub>in</sub> = +20dBm		85			85		dBc

**Note 1:** Test Conditions: V<sub>ctrl</sub>=3.0VDC/0VDC as required, T<sub>c</sub>=25°C, P<sub>in</sub> = 0dBm unless otherwise specified.

**Note 2:** Min./Max. limits are at +25°C case temperature unless otherwise specified.

**Note 3:** TriQuint Test Board.

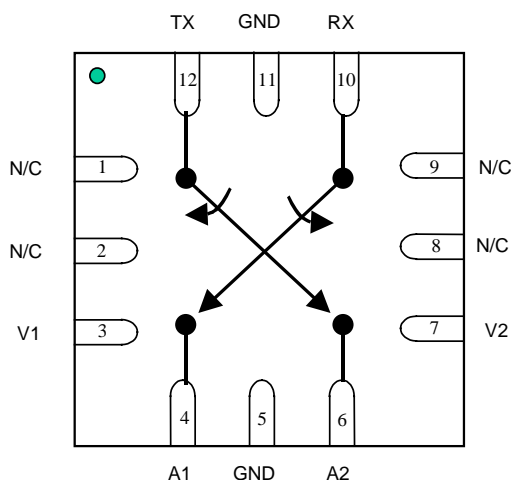
**Data Sheet: Subject to change without notice**

For additional information and latest specifications, see our website: [www.triquint.com](http://www.triquint.com)

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**Dual-band Diversity Switch for 802.11a/b/g Systems**

**Pin Out and Assignments**



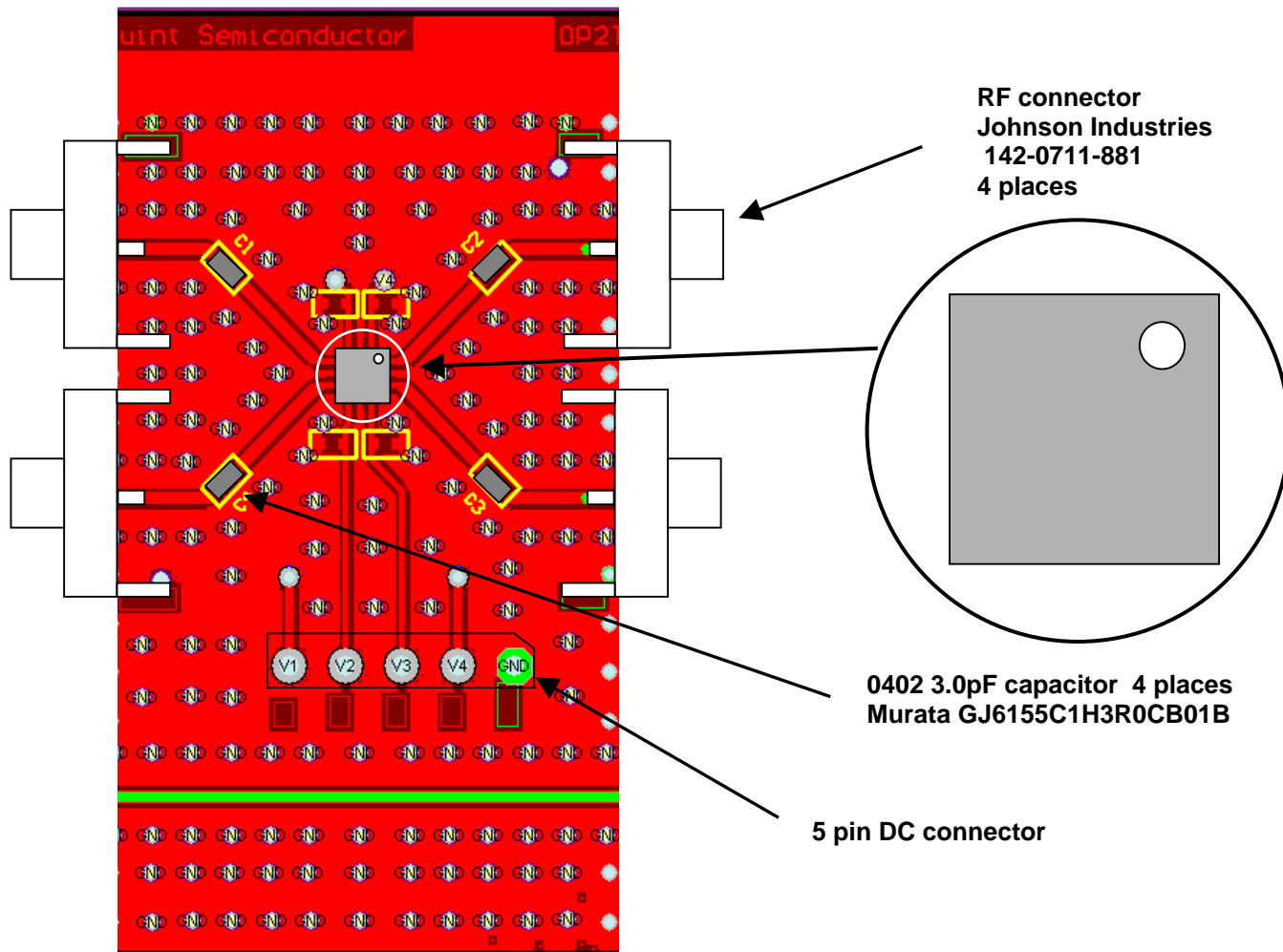
Pin	Symbol	Description
1	N/C	No Connection
2	N/C	No Connection
3	V1	Control 1
4	A1	Antenna Port 1
5	GND	Ground
6	A2	Antenna Port 2
7	V2	Control 2
8	N/C	No Connect
9	N/C	No Connect
10	RX	Receive Port
11	GND	Ground
12	TX	Transmit Port

**Truth Table**

V1	V2	A1-TX	A2-TX	A1-RX	A2-RX
0	1	ON	OFF	OFF	ON
1	0	OFF	ON	ON	OFF

**Dual-band Diversity Switch for 802.11a/b/g Systems**

*Evaluation Board – TQS5202 DPDT SW; TQS5202 DP2T V1.0 Evaluation board*

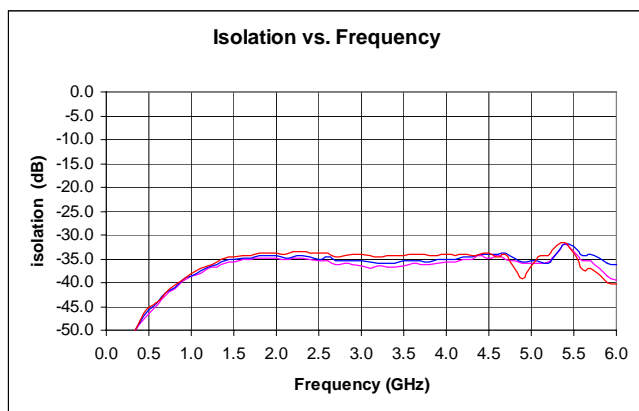
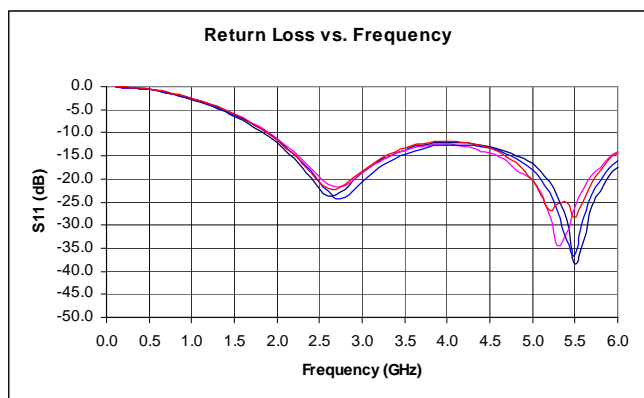
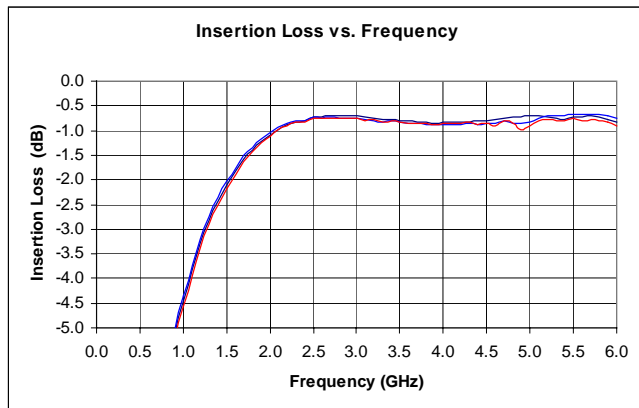


Layer/Descriptions

**Dual-band Diversity Switch for 802.11a/b/g Systems**

*TQS5202 measured performance; in TriQuint DP2T V2.0 Evaluation Board*

*Measurement conditions:  $T_a = 25^\circ\text{C}$ ;  $V_{ctrl}=3.0\text{V}/0\text{V}$ ; unless otherwise noted.*



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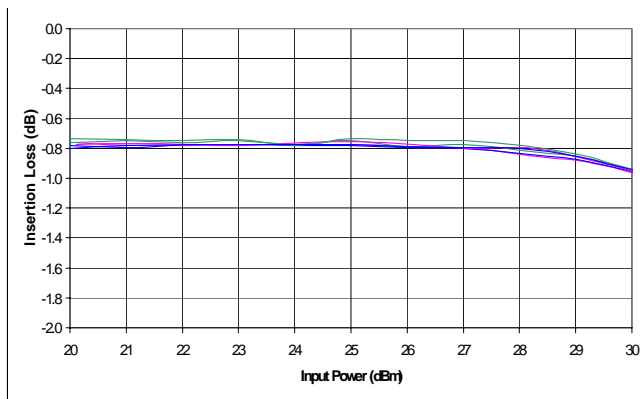
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**Dual-band Diversity Switch for 802.11a/b/g Systems**

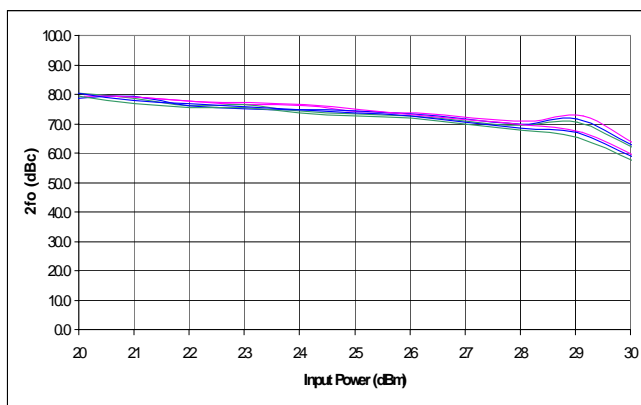
**TQS5202 measured performance; in TriQuint DP2T V2.0 Evaluation Board**

Measurement conditions:  $T_a = 25^\circ\text{C}$ ;  $V_{ctrl}=3.0\text{V}/0\text{V}$ ;  $F_o=2.5\text{GHz}$ ; unless otherwise noted.

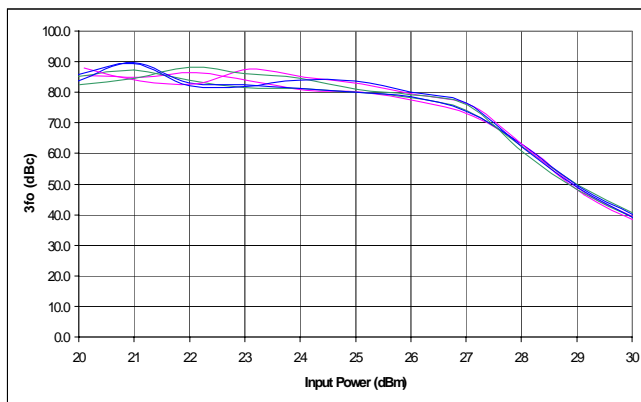
**Insertion Loss vs. I/P Power  
Fo=2.5GHz**



**2<sup>nd</sup> Harmonic vs. I/P Power  
Fo=2.5GHz**



**3<sup>rd</sup> Harmonic vs. I/P Power  
Fo=2.5GHz**



**Data Sheet: Subject to change without notice**

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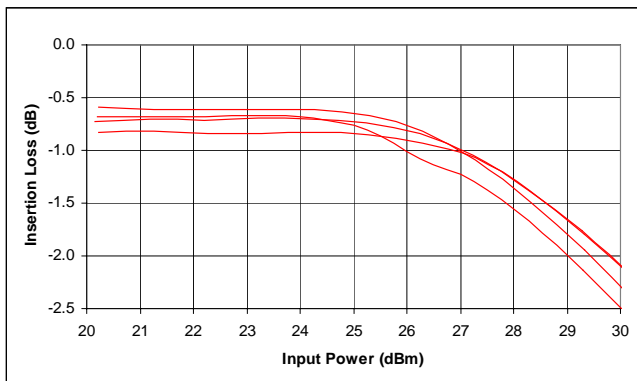
Revision 4, July, 21, 2004

**Dual-band Diversity Switch for 802.11a/b/g Systems**

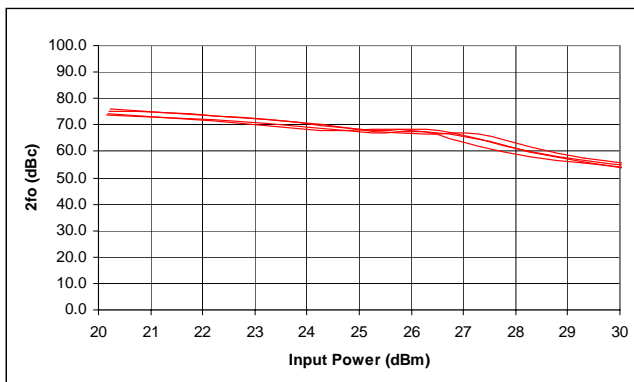
**TQS5202 measured performance; in TriQuint DP2T V2.0 Evaluation Board**

Measurement conditions:  $T_a = 25^\circ\text{C}$ ;  $V_{ctrl}=3.0\text{V}/0\text{V}$ ;  $F_o=5.9\text{GHz}$ ; unless otherwise noted.

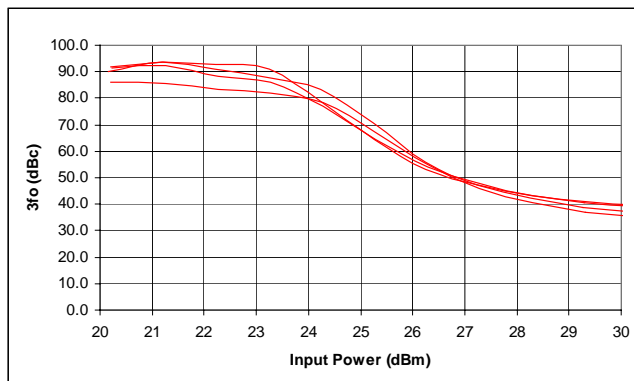
**Insertion Loss vs. I/P Power**  
 **$F_o=5.9\text{GHz}$**



**2<sup>nd</sup> Harmonic vs. I/P Power**  
 **$F_o=5.9\text{GHz}$**



**3<sup>rd</sup> Harmonic vs. I/P Power**  
 **$F_o=5.9\text{GHz}$**



**Data Sheet: Subject to change without notice**

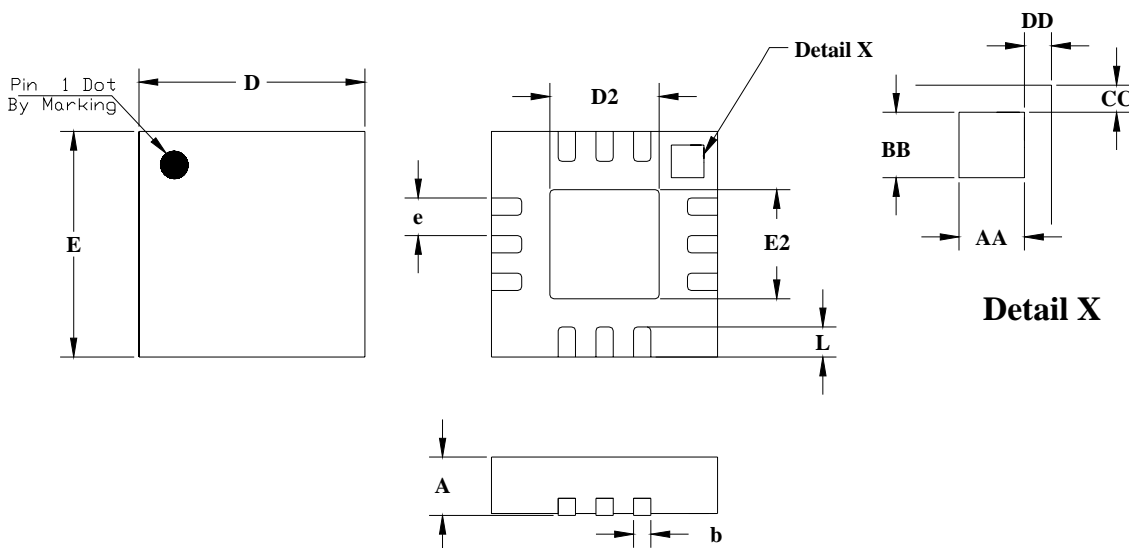
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**Dual-band Diversity Switch for 802.11a/b/g Systems**

**Application Data**

**Package Outline – VQFN 3x3 12 Lead**



JEDEC DESIGNATION	DESCRIPTION	METRIC	ENGLISH	NOTE
A	OVERALL HEIGHT	0.90 +/- .10 mm	.035 +/- .004 in	1
b	TERMINAL WIDTH	0.23 +/- .07 mm	.009 +/- .003 in	1
D	PACKAGE LENGTH	3.00 mm BSC	.118 in	1
D2	EXPOSED PAD LENGTH	1.45 +/- .10 mm	.057 +/- .004 in	1
e	TERMINAL PITCH	0.50 mm BSC	.020 in	1
E	PACKAGE WIDTH	3.00 mm BSC	.118 in	1
E2	EXPOSED PAD WIDTH	1.45 +/- .10 mm	.057 +/- .004 in	1
L	TERMINAL LENGTH	0.40 +/- .10 mm	.016 +/- .004 in	1
AA	PIN 1 ID LENGTH	0.43 mm BSC	.017 in	1
BB	PIN 1 ID WIDTH	0.43 mm BSC	.017 in	1
CC	PIN 1 ID TO EDGE	0.18 mm BSC	.007 in	1
DD	PIN 1 ID TO EDGE	0.18 mm BSC	.007 in	1

Notes:

1. PRIMARY DIMENSIONS ARE IN METRIC MILLIMETERS. THE ENGLISH EQUIVALENTS ARE CALCULATED AND SUBJECT TO ROUNDING ERROR.



**Dual-band Diversity Switch for 802.11a/b/g Systems**

**Package Marking**

Pin 1



Line 1: 5202  
Line 2: XXXX TriQuint Assembly Lot Number  
Line 3: Manufacturing year and work week

Caution: Electrostatic discharge sensitive. Observe handling Precautions!

**Part Ordering Information:**

Type	Marking	Ordering code (tape and reel)	Package
TQS5202	5202	TBD	VQFN12 3x3mm 12 Lead

**Additional Information<sup>1</sup>**

<sup>1</sup> For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: [www.triquint.com](http://www.triquint.com)

Tel: (503) 615-9000

Email: [info\\_wireless@tqs.com](mailto:info_wireless@tqs.com)

Fax: (503) 615-8902

For technical questions and additional information on specific applications:

Email: [info\\_wireless@tqs.com](mailto:info_wireless@tqs.com)

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