



# QPQ1289

## LTE Band 4 / 10 / 66 BAW Duplexer

### Product Overview

The QPQ1289 is a high performance Bulk Acoustic Wave (BAW) Duplexer designed for Small Cell applications. It is specifically designed to address bands 4, 10, and 66. For band 66, the uplink is fully covered while the downlink is partially covered with 70 MHz bandwidth.

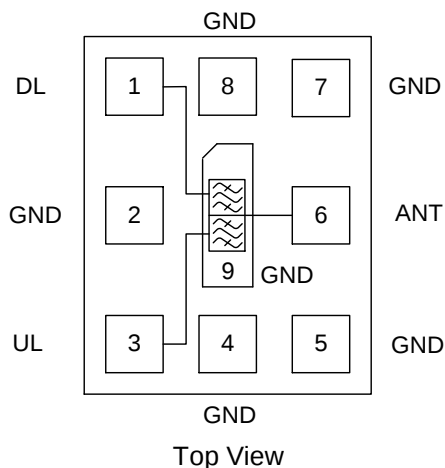
The QPQ1289 provides low insertion loss and high rejection making it an ideal choice for Small Cells. This duplexer is housed in a compact, RoHS compliant 2.00 mm x 2.50 mm x 0.91 mm surface mount package (SMP).

The QPQ1289 is part of Qorvo's extensive portfolio of RF BAW and SAW filters.



9 Pad 2.00 mm x 2.50 mm x 0.91 mm SMP

### Functional Block Diagram



### Pin Configuration - Single Ended

| Pin No.          | Label        |
|------------------|--------------|
| 1                | Downlink     |
| 2, 4, 5, 7, 8, 9 | Ground       |
| 3                | Uplink       |
| 6                | Antenna port |

### Key Features

- 70 MHz Bandwidth
- High Attenuation
- Low Loss
- Excellent Wi-Fi Rejection
- Single Input, Single Output Operation
- Small Size: 2.00 x 2.50 x 0.91 mm
- Surface Mount Device
- **RoHS** compliant (2002/95/EC), **Pb-free**



### Applications

- Extended Band 4 / 10
- Partial Band 66
- Base Station Infrastructure
- General Purpose Wireless

### Ordering Information

| Part No.   | Description                    |
|------------|--------------------------------|
| QPQ1289SB  | Sample Bag with 5 pieces       |
| QPQ1289SR  | Sample Reel with 100 pieces    |
| QPQ1289TR7 | 7" Taped Reel with 2500 pieces |
| QPQ1289EVB | Assembled Evaluation Board     |

## Absolute Maximum Ratings <sup>(1)</sup>

| Parameter                               | Rating        |
|-----------------------------------------|---------------|
| Storage Temperature                     | -40 to +125°C |
| Operating Temperature <sup>(2)</sup>    | -40 to +95 °C |
| RF in, Pulsed, DL, +25°C <sup>(3)</sup> | +39.5 dBm     |

Notes:

1. Operation of this device outside the parameter ranges given may cause permanent damage.
2. Device will function but it is not guaranteed to meet electrical specifications
3. Peak Power, 200mS pulse width, 2% Duty Cycle

## Minimum Lifetime Ratings

| Conditions                                        | Rating         |
|---------------------------------------------------|----------------|
| +29 dBm DL, +85°C, FD-LTE, 5 MHz, 16QAM, PAR=8 dB | >290,000 hours |
| +23 dBm CW, UL, +85°C                             | >270,000 hours |

## Electrical Specifications – Downlink <sup>(1)</sup>

Test conditions unless otherwise specified. Temperature Range: -40 to +95 °C

| Parameter                          | Conditions <sup>(1, 2)</sup> | Min | Typ | Max | Unit |
|------------------------------------|------------------------------|-----|-----|-----|------|
| Insertion Loss <sup>(2)</sup>      | 2110 – 2180 MHz              | -   | 2.0 | 2.9 | dB   |
|                                    | 2110 – 2170 MHz, B10DL       | -   | 2.0 | -   | dB   |
|                                    | 2110 – 2155 MHz, B4DL        | -   | 2.0 | -   | dB   |
| Input / Output Return Loss         | 2110 – 2180 MHz              | 9   | 12  | -   | dB   |
| Amplitude Variation <sup>(3)</sup> | 2110 – 2180 MHz              | -   | 0.6 | 1.0 | dB   |
| Attenuation <sup>(4)</sup>         | 10 – 1680 MHz                | 32  | 35  | -   | dB   |
|                                    | 1680 – 1800 MHz              | 42  | 45  | -   | dB   |
|                                    | 2402 – 2494 MHz              | 38  | 43  | -   | dB   |
|                                    | 2496 – 2690 MHz              | 31  | 38  | -   | dB   |

## Electrical Specifications – Uplink <sup>(1)</sup>

Test conditions unless otherwise specified. Temperature Range: -40 to +95 °C

| Parameter                          | Conditions (1, 2)      | Min | Typ | Max | Unit |
|------------------------------------|------------------------|-----|-----|-----|------|
| Insertion Loss <sup>(2)</sup>      | 1710 – 1780 MHz        | -   | 2.3 | 3.2 | dB   |
|                                    | 1710 – 1770 MHz, B10UL | -   | 2.3 | -   | dB   |
|                                    | 1710 – 1755 MHz, B4UL  | -   | 2.3 | -   | dB   |
| Input / Output Return Loss         | 1710 – 1780 MHz        | 9   | 11  | -   | dB   |
| Amplitude Variation <sup>(3)</sup> | 1710 – 1780 MHz        | -   | 0.7 | 1.5 | dB   |
| Attenuation <sup>(4)</sup>         | 10 – 870 MHz           | 40  | 45  | -   | dB   |
|                                    | 870 – 1680 MHz         | 25  | 32  | -   | dB   |
|                                    | 1850 – 2050 MHz        | 38  | 45  | -   | dB   |
|                                    | 2080 – 2225 MHz        | 32  | 35  | -   | dB   |
|                                    | 2402 – 2494 MHz        | 34  | 37  | -   | dB   |
|                                    | 2496 – 2690 MHz        | 18  | 34  | -   | dB   |

Notes:

1. All specifications are based on the QORVO schematic for the main reference design.
2. Maximum Insertion Loss within defined frequency range.
3. Amplitude Variation is defined as the difference between the lowest loss and the highest loss within 10 MHz channels.
4. Attenuation is referenced to zero dB

## Electrical Specifications – Isolation <sup>(1)</sup>

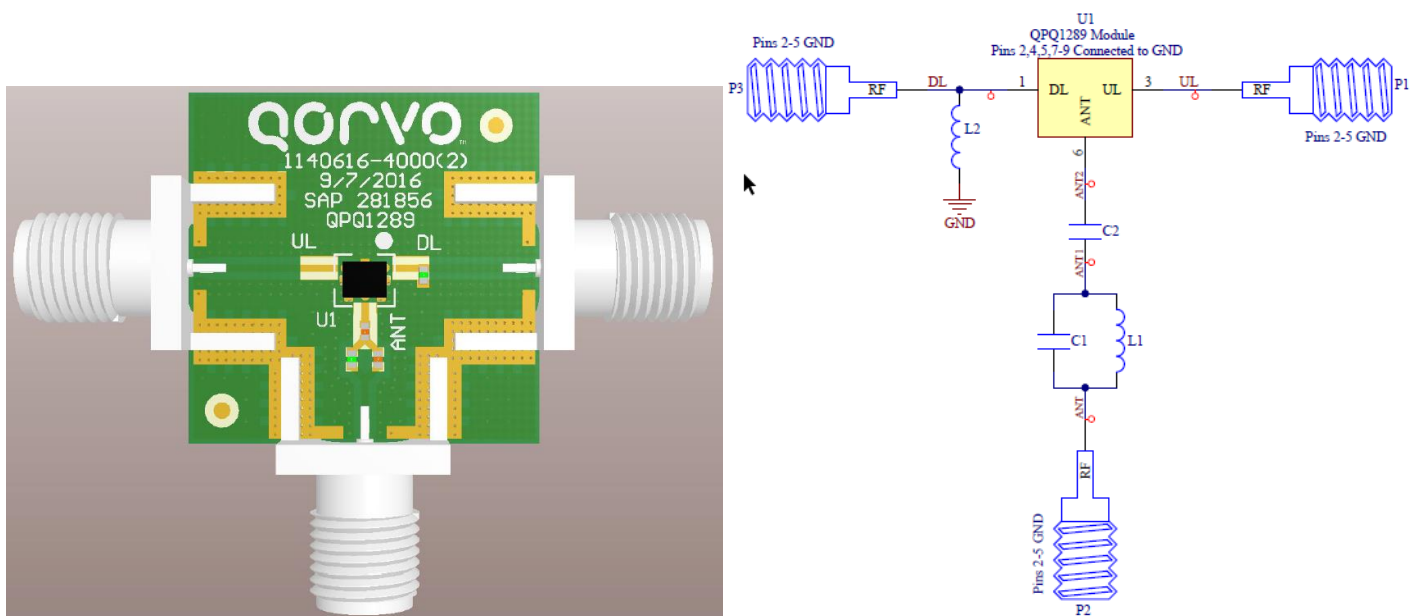
Test conditions unless otherwise specified. Temperature Range: -40 to +95 °C

| Parameter | Conditions <sup>(1, 2)</sup> | Min | Typ | Max | Unit |
|-----------|------------------------------|-----|-----|-----|------|
| Isolation | 1710 – 1780 MHz              | 42  | 45  | -   | dB   |
|           | 2110 – 2180 MHz              | 38  | 42  | -   | dB   |
|           | 1710 – 1780 MHz, B10UL       | -   | 45  | -   | dB   |
|           | 2110 – 2170 MHz, B10DL       | -   | 42  | -   | dB   |
|           | 1710 – 1755 MHz, B4UL        | -   | 46  | -   | dB   |
|           | 2110 – 2155 MHz, B4DL        | 40  | 44  | -   | dB   |

Notes:

1. All specifications are based on the QORVO schematic for the main reference design.
2. Maximum Insertion Loss within defined frequency range.
3. Amplitude Variation is defined as the difference between the lowest loss and the highest loss within 10 MHz channels.
4. Attenuation is referenced to zero dB

## Evaluation Board and Schematic – QPQ1289EVB



Notes:

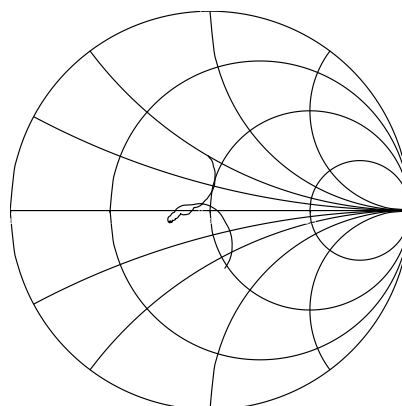
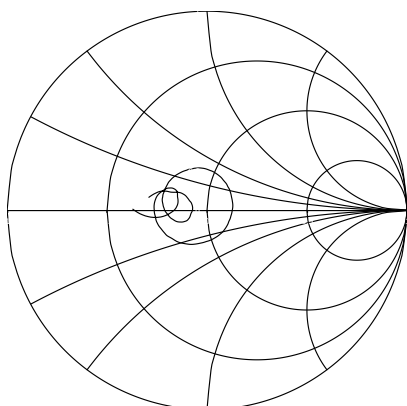
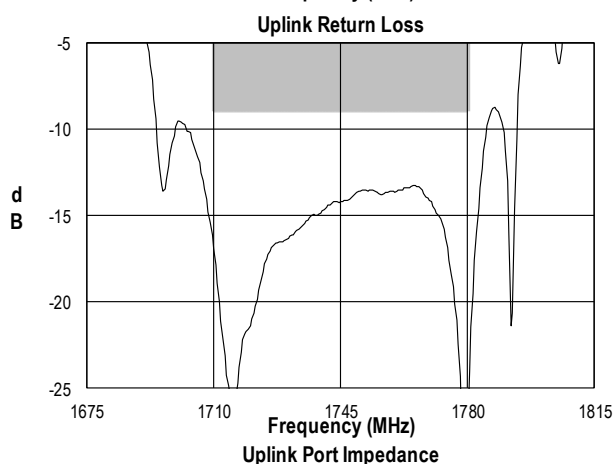
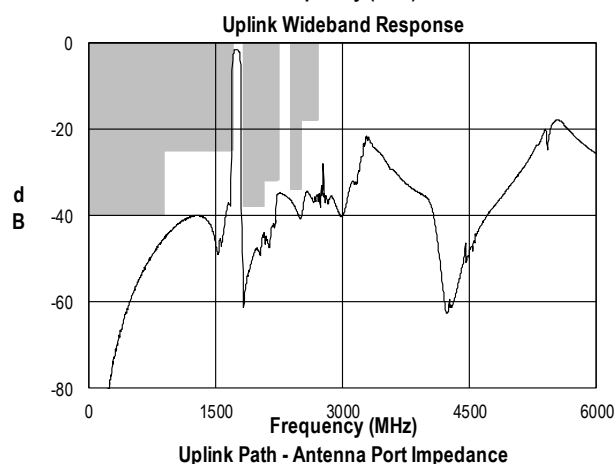
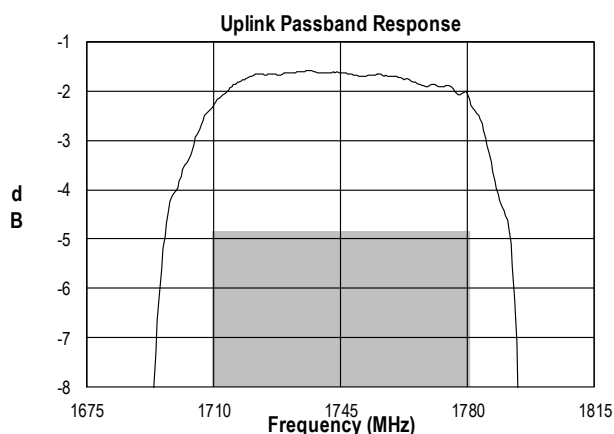
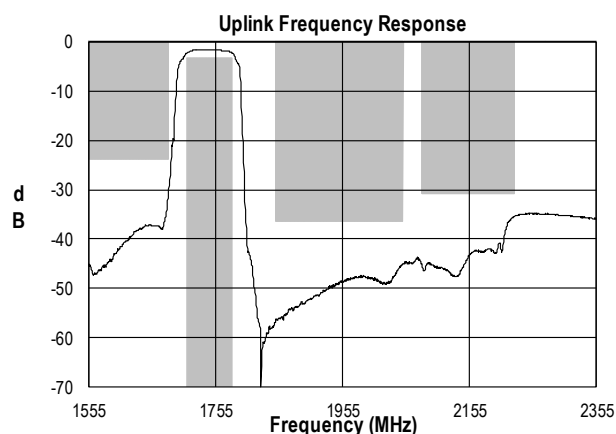
1. Distance from left side of L2 to right side of U1: 5 mils.

## Bill of Material – QPQ1289EVB

| Ref. Des. | Value  | Description                              | Manufacturer | Part Number       |
|-----------|--------|------------------------------------------|--------------|-------------------|
| U1        | N/A    | Band 66 BAW Duplexer                     | Qorvo        | QPQ1289           |
| N/A       | N/A    | Printed Circuit Board                    | Qorvo        | 1140616           |
| C2        | 3.3 pF | Cap., Chip, 0402, 5%, 50V. NPO/COG       | Murata       | GJM1555C1H3R3BB01 |
| C1        | 0.4 pF | Cap., Chip, 0402, +/-0.1pF, 50V. NPO/COG | Murata       | GJM1555C1HR40WB01 |
| L2        | 5.6 nH | Inductor, 0402, LQG                      | Murata       | LQP03TN5N6H02     |
| L1        | 1.8 nH | Inductor, 0402, LQG                      | Murata       | LQP03TN1N8B02     |
| N/A       | N/A    | SMA Edge Connector                       | Radial       | 9602-1111-018     |

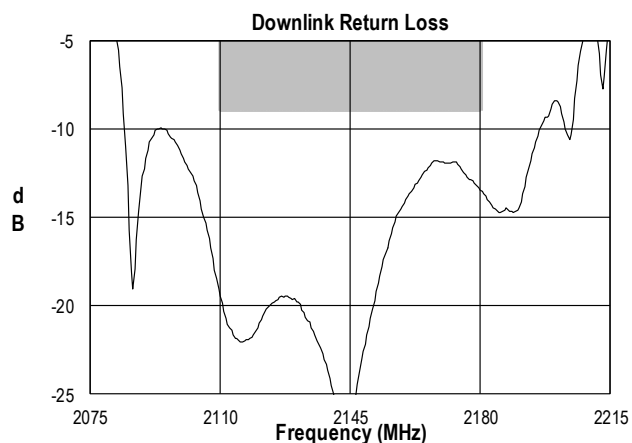
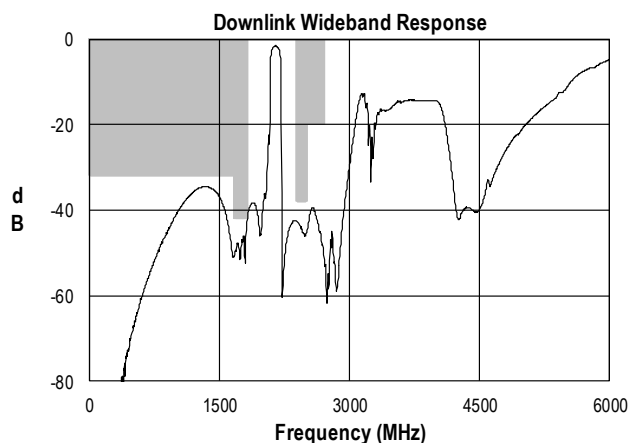
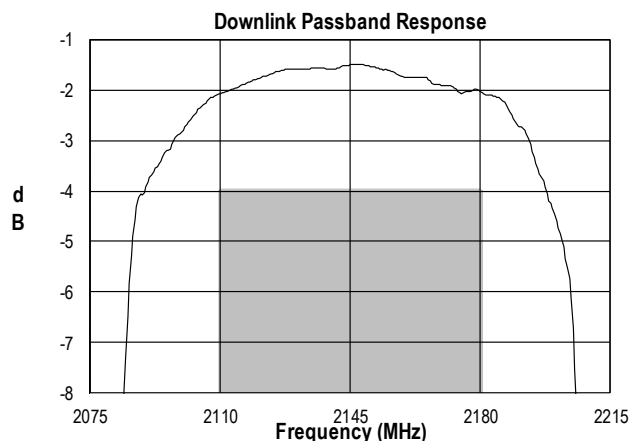
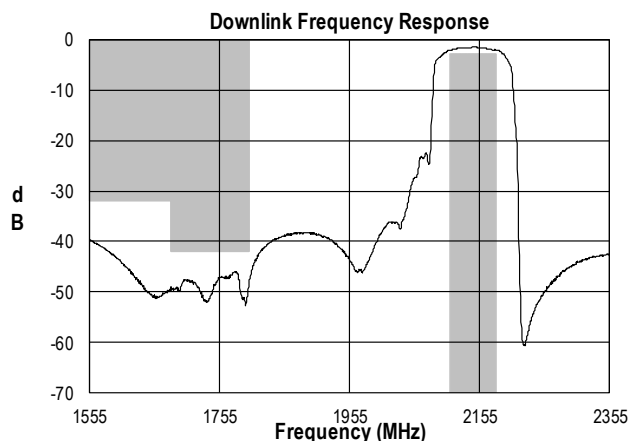
## Performance Plots Uplink

Test conditions unless otherwise noted: Temp= +25°C

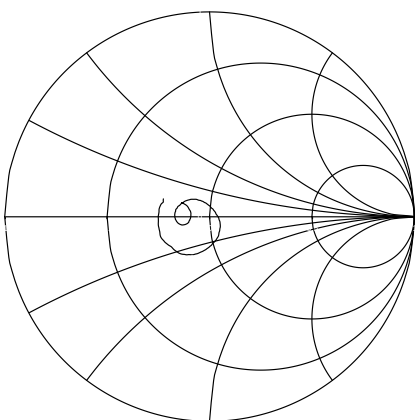


## Performance Plots Downlink

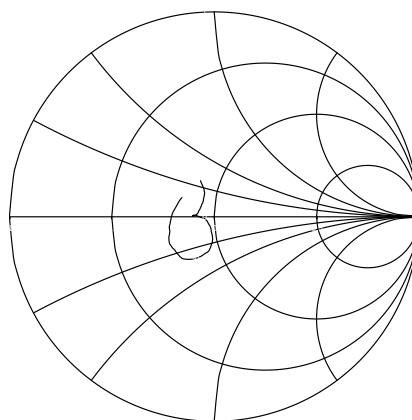
Test conditions unless otherwise noted: Temp= +25°C



Downlink Path - Antenna Port Impedance

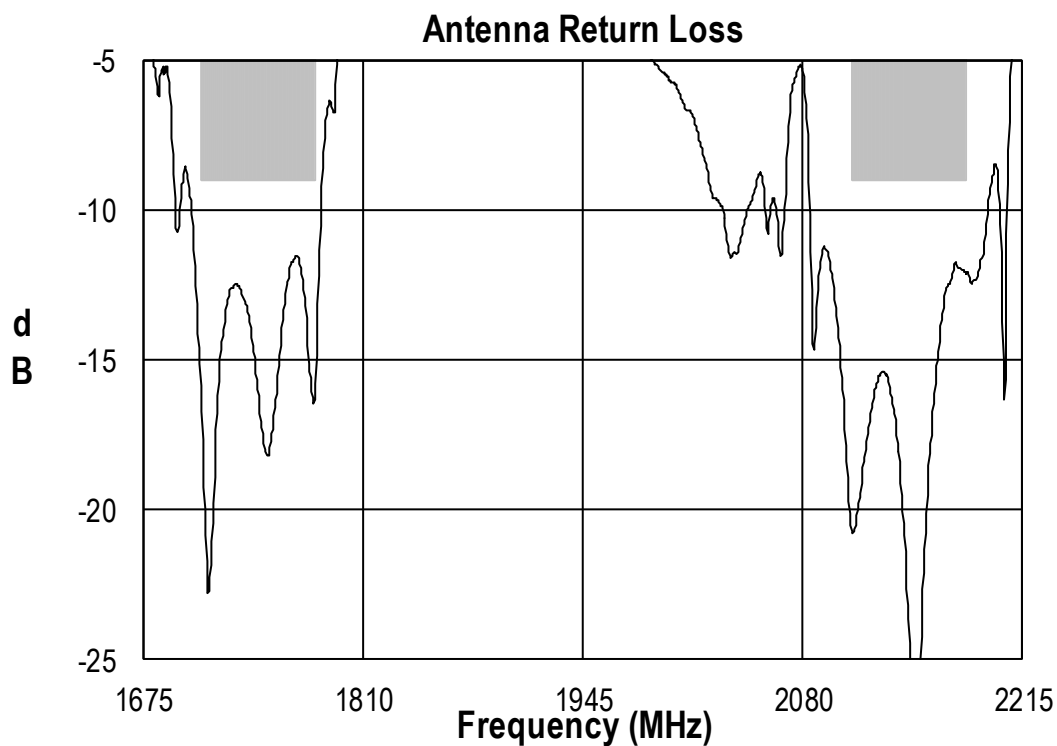
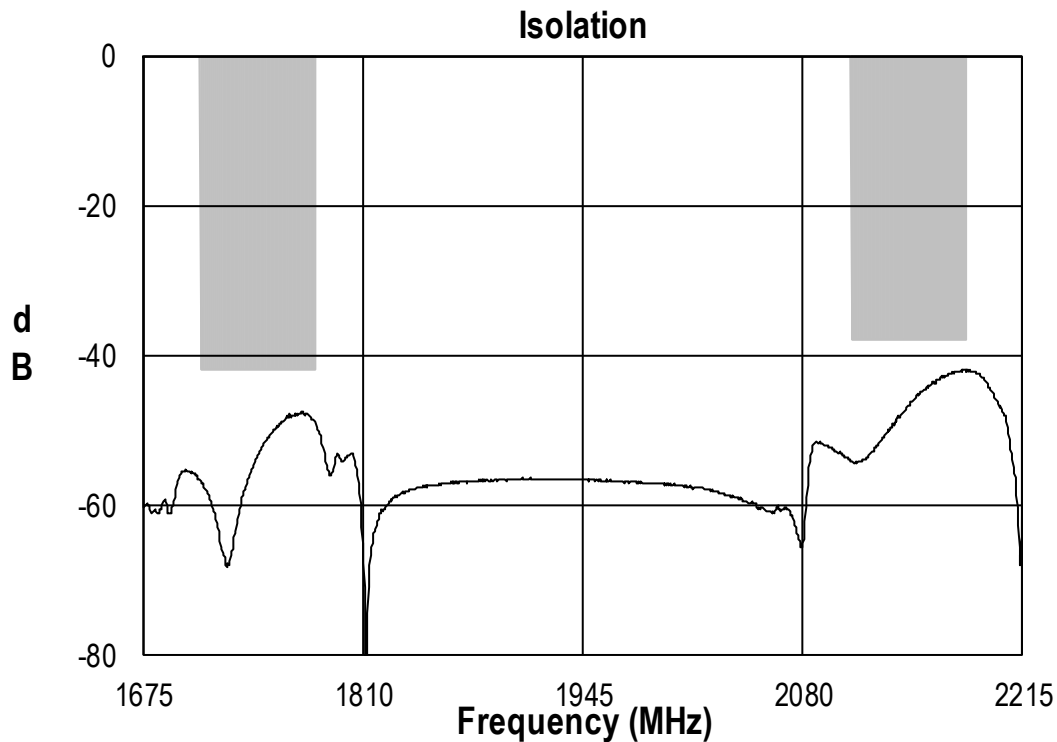


Downlink Port Impedance

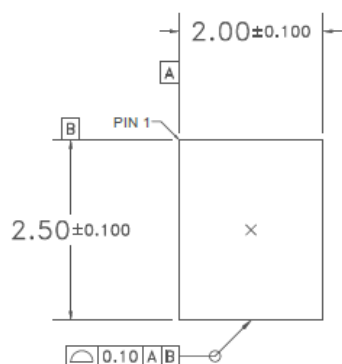


## Performance Plots Isolation

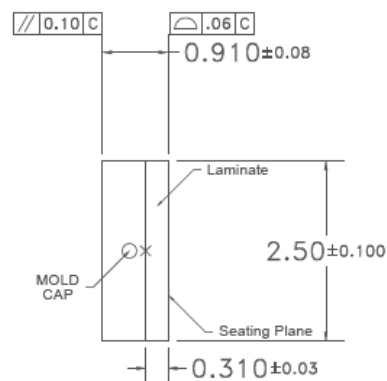
Test conditions unless otherwise noted: Temp= +25°C



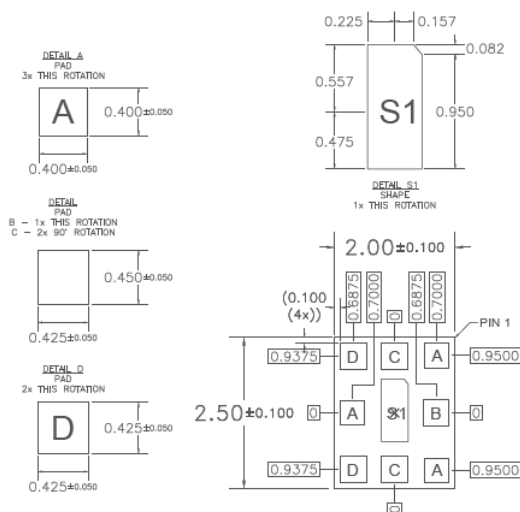
## Package Dimensions



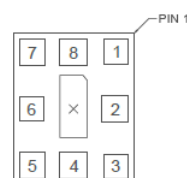
TOP  
VIEW



SIDE  
VIEW



BOTTOM  
VIEW



BOTTOM PINS  
VIEW

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.

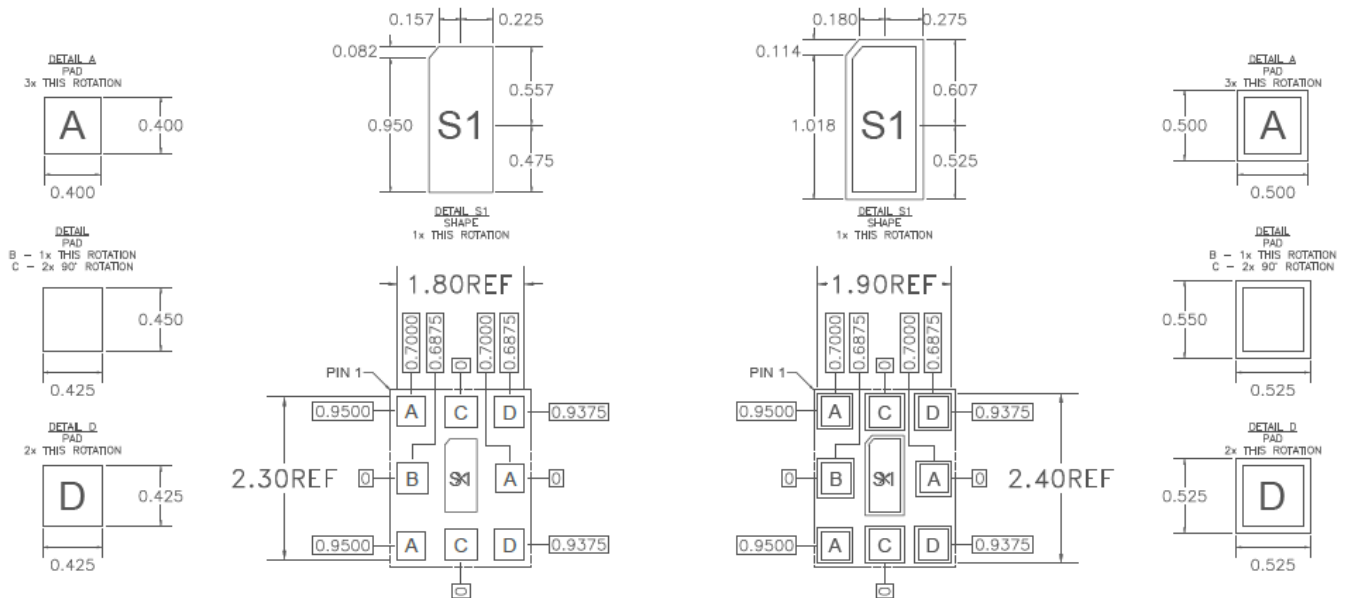
## Package Marking

### Package Marking

Qorvo Logo  
Product Identifier: 1289  
Trace Code: XXXX



## PCB Mounting Pattern

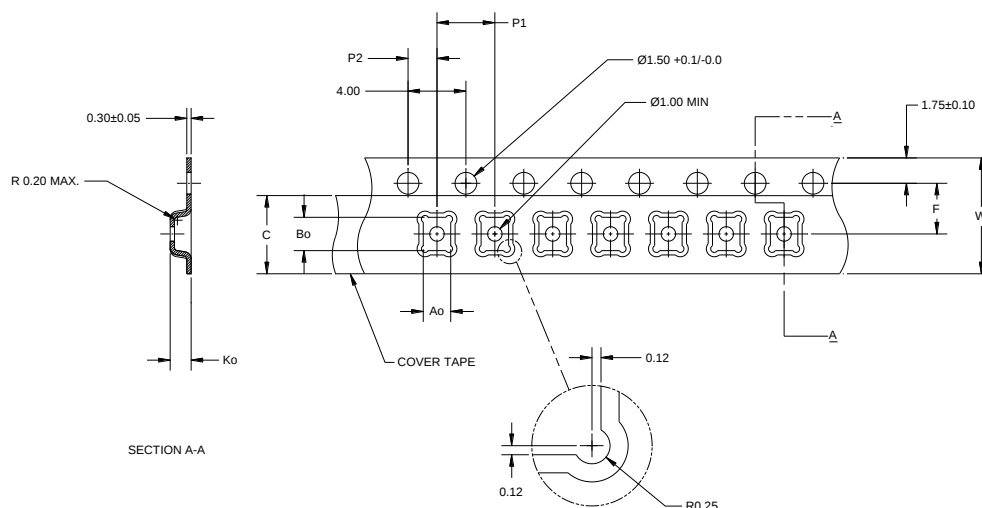


### Notes:

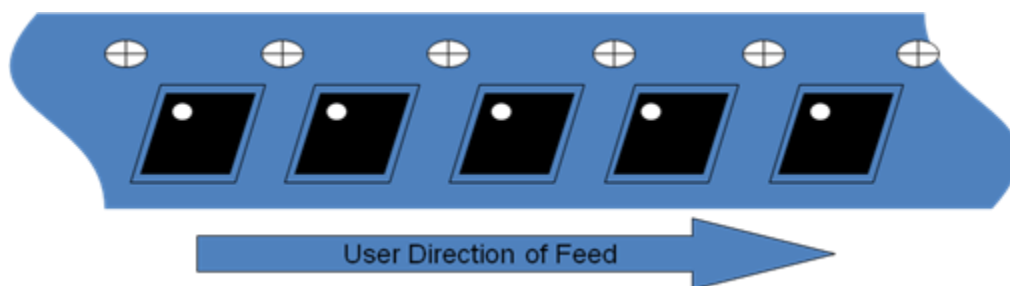
1. All dimensions are in millimeters. Angles are in degrees.
2. This drawing specifies the mounting pattern used on the Qorvo evaluation board for this product. Some modification may be necessary to suit end user assembly materials and processes.

## Tape and Reel Information – Carrier and Cover Tape Dimensions

Tape and reel specifications for this part are also available on the Qorvo website.  
Standard T/R size = 2500 pieces on a 7" reel.

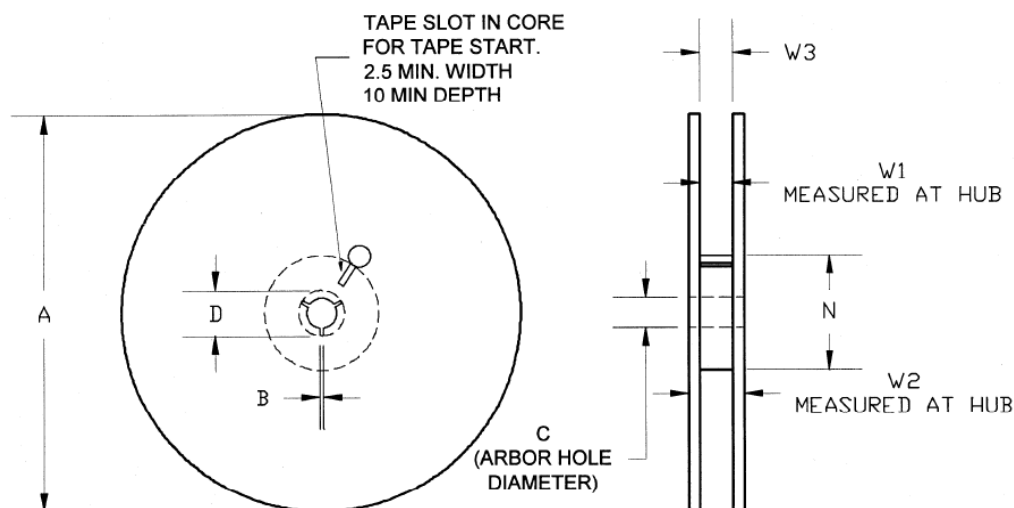


| Feature             | Measure                                  | Symbol | Size (in) | Size (mm) |
|---------------------|------------------------------------------|--------|-----------|-----------|
| Cavity              | Length                                   | A0     | 0.092     | 2.34      |
|                     | Width                                    | B0     | 0.112     | 2.85      |
|                     | Depth                                    | K0     | 0.043     | 1.10      |
|                     | Pitch                                    | P1     | 0.157     | 4.00      |
| Centerline Distance | Cavity to Perforation - Length Direction | P2     | 0.079     | 2.00      |
|                     | Cavity to Perforation - Width Direction  | F      | 0.138     | 3.50      |
| Cover Tape          | Width                                    | C      | 0.213     | 5.40      |
| Carrier Tape        | Width                                    | W      | 0.315     | 8.00      |



## Tape and Reel Information – Reel Dimensions

Tape and reel specifications for this part are also available on the Qorvo website.  
Standard T/R size = 2500 pieces on a 7" reel.



| Feature | Measure              | Symbol | Size (in) | Size (mm) |
|---------|----------------------|--------|-----------|-----------|
| Flange  | Diameter             | A      | 6.969     | 177.0     |
|         | Thickness            | W2     | 0.559     | 14.2      |
|         | Space Between Flange | W1     | 0.346     | 8.8       |
| Hub     | Outer Diameter       | N      | 2.283     | 58.0      |
|         | Arbor Hole Diameter  | C      | 0.512     | 13.0      |
|         | Key Slit Width       | B      | 0.079     | 2.0       |
|         | Key Slit Diameter    | D      | 0.787     | 20.0      |

## Handling Precautions

| Parameter                        | Rating   | Standard                 |
|----------------------------------|----------|--------------------------|
| ESD – Human Body Model (HBM)     | Class 1C | ESDA / JEDEC JS-001-2012 |
| ESD – Charged Device Model (CDM) | Class C3 | ESDA / JEDEC JS-002-2014 |
| MSL – Moisture Sensitivity Level | Level 3  | IPC/JEDEC J-STD-020      |



Caution!  
ESD-Sensitive Device

## Solderability

Compatible with both lead-free (260°C max. reflow temp.) and tin/lead (245°C max. reflow temp.) soldering processes. Solder profiles available upon request.

Contact Plating: TBD

## RoHS Compliance

This part is compliant with 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 (C<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- PFOS Free
- SVHC Free



## Contact Information

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

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

Tel: 1-844-890-8163

Email: [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

For technical questions and application information: Email: [appsupport@qorvo.com](mailto:appsupport@qorvo.com)

## Important Notice

The information contained herein is believed to be reliable; however, Qorvo makes no warranties regarding the information contained herein and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for Qorvo products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information. **THIS 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.

Copyright 2017 © Qorvo, Inc. | Qorvo is a registered trademark of Qorvo, Inc.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9