# QPQ1902

## 2437 MHz BAW Filter

## General Description

The QPQ1902 is a high-performance, high power Bulk Acoustic Wave (BAW) band-pass filter with extremely steep skirts, simultaneously exhibiting low loss in the WiFi band and high rejection in the band-edge and adjacent LTE /TD-LTE bands.

The QPQ1902 enables coexistence of WiFi and LTE signals within the same device or in close proximity to one another. Its unique power handling capability allows for implementation into high performance high power access points and small cell base stations.

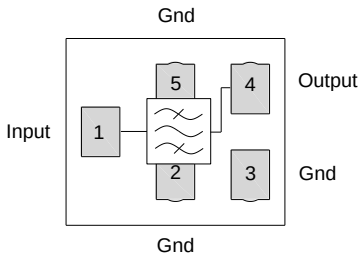
The QPQ1902 uses common module packaging techniques to achieve the industry standard 1.4 x 1.2 x 0.50 mm footprint.


1.4 X 1.2 X 0.50 mm

## Product Features

- Industry leading small size: 1.4 x 1.2 x 0.50 mm
- Performance over - 40 to + 85° C
- High Rejection at 2390 MHz, 2483.5 MHz, B38/B40/B7/B41
- Single Ended Operation
- RoHS Compliant, Pb-Free

## Functional Block Diagram




Top View

## Applications

- Usable Bandwidth of 69 MHz (CH1-11)
- High-power WLAN Access Points and Small Cells
- Band-edge filtering of WiFi signal emissions at 2390 MHz and 2483.5 MHz
- WiFi bandpass filter that enables the coexistence of 4G (LTE/TD-LTE) & WiFi signals
- ISM band applications such as Smart Meters
- Portable Hotspots and Mobile Routers

## Pin Configuration - Single Ended

| Pin No. | Label |
|---|---|
| 1 | Input |
| 4 | Output |
| 2,3,5 | Ground |

## Ordering Information

| Part No. | Description |
|---|---|
| QPQ1902 | 15,000 units/reel (standard) |
| QPQ1902-EVB | Evaluation board |

## Absolute Maximum Ratings

| Parameter | Rating |
|---|---|
| Storage Temperature [1] | −55 to +125 °C |
| Operating Temperature [2] | −20 to +85 °C |

Notes:
1. Operation of this device outside the parameter ranges given may cause permanent damage.
2. Specifications are not guaranteed over all operating conditions.

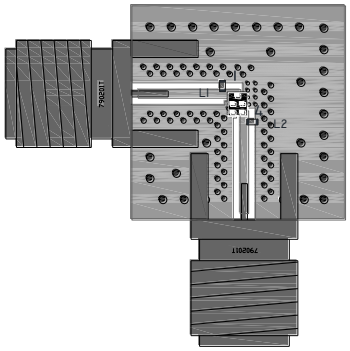
## Electrical Specifications [1]

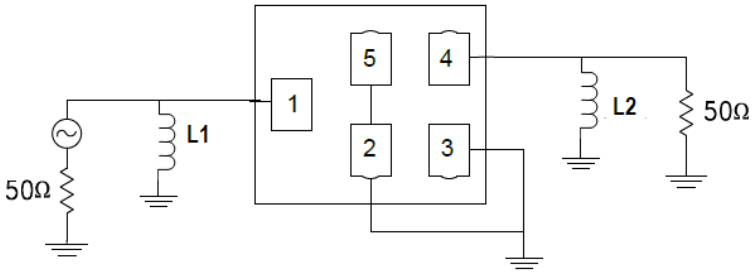
Test conditions unless otherwise noted: [2] Temp= −20 °C to +85 °C

| Parameter [3] | Conditions | Min | Typ [4] | Max | Units |
|---|---|---|---|---|---|
| Insertion Loss [5] | 2402.5 – 2421.5 MHz (WiFi Ch.1) | | 1.2 | 1.8 | dB |
| | 2407.5 – 2426.5 MHz (WiFi Ch.2) | | 1.0 | 1.3 | |
| | 2412.5 – 2461.5 MHz (WiFi Ch.3 - 9) | - | 0.8 | 1.2 | |
| | 2447.5 – 2466.5 MHz (WiFi Ch.10) | | 0.9 | 1.3 | |
| | 2452.5 – 2471.5 MHz (WiFi Ch.11) | | 1.0 | 1.6 | |
| Amplitude Variation | 2402.5 – 2421.5 MHz (WiFi Ch.1) | | 1.5 | 3.0 | dB p-p |
| | 2407.5 – 2426.5 MHz (WiFi Ch.2) | - | 0.8 | 1.4 | |
| | 2412.5 – 2461.5 MHz (WiFi Ch.3 - 9) | - | 0.5 | 1.0 | |
| | 2447.5 – 2466.5 MHz (WiFi Ch.10) | | 0.5 | 1.2 | |
| | 2452.5 – 2471.5 MHz (WiFi Ch.11) | | 1.0 | 3.0 | |
| Absolute Attenuation [6] | 100 – 2300 MHz | 20 | 23 | - | dB |
| | 2300 – 2370 MHz [6] | 20 | 20 | | |
| | 2370 – 2390 MHz [6] | 15 | 31 | | |
| | 2483.5 – 2500 MHz [6] | 15 | 24 | | |
| | 2500 – 2520 MHz [6] | 20 | 25 | | |
| | 2520 – 2570 MHz [6] | 28 | 31 | | |
| | 2570 – 2620 MHz [6] | 24 | 28 | | |
| | 2620 – 2690 MHz [6] | 22 | 27 | | |
| | 4800 – 5000 MHz | 25 | 31 | | |
| Input/Output VSWR [7] | 2402.5 – 2471.5 MHz | - | 1.5 | 2.0:1 | - |
| Source Impedance [8] | single-ended | - | 50 | - | Ω |
| Load Impedance [8] | single-ended | - | 50 | - | Ω |

Notes:
1. All specifications are based on the Qorvo schematic for the reference design shown on page 5.
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature.
3. Electrical margin has been built into design to account the variations due to temperature drift and manufacturing tolerances..
4. Only at 25 °C.
5. Data is the integrated value of the linear s-parameter over a 19 MHz range in the indicated band at the specified temperature.
6. Data is the integrated value of the linear s-parameter over 5 MHz range at the specified temperature.
7. An external impedance matching network with ±3 % tolerance will be necessary to achieve the stated specifications.
8. This is the optimum impedance in order to achieve the performance shown.

## Evaluation Board – QPQ1902-EVB





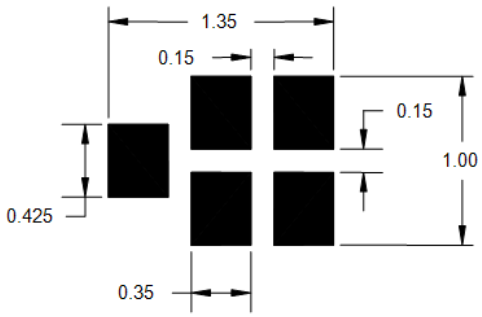

Notes:

1. Matching component values shown are for the specified Qorvo evaluation board. Value adjustment may be required in end user product circuits depending on component manufacturer and PCB material.
2. Top, middle & bottom layers: 1 oz. copper. Substrates: FR4 dielectric 031" thick. Finish plating: Nickel: 3-8 µm thick, Gold: 0.03 - 0.2 µm thick. Hole plating: Copper min .0008 µm thick.

## Bill of Material – QPQ1902-EVB

| Reference Des. | Value | Description | Manuf. | Part Number |
|---|---|---|---|---|
| U1 | - | 2437 MHz BAW Filter | Qorvo | QPQ1902 |
| L1 | 6.8nH | 0201 chip Inductor, ± 3% | Murata | LQP03TN6N8H02 |
| L2 | 6.8nH | 0201 chip Inductor, ± 3% | Murata | LQP03TN6N8H02 |
| SMA | - | SMA connector | Radiall | 9602-1111-018 |
| PCB | - | 3-layer | Qorvo | 961094-04 |

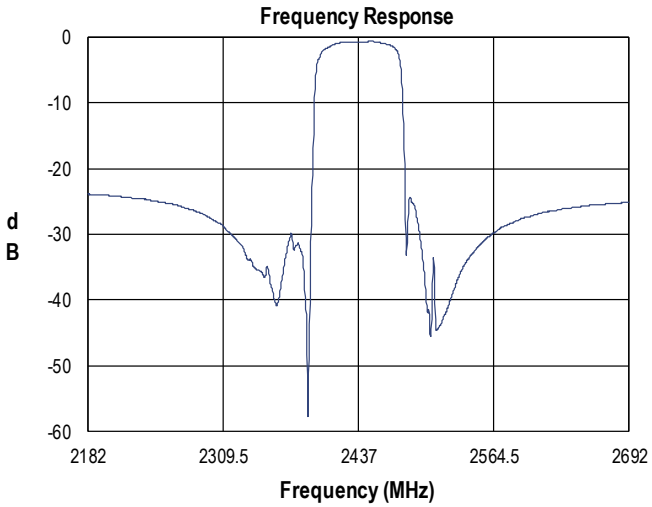
## PCB Mounting Pattern

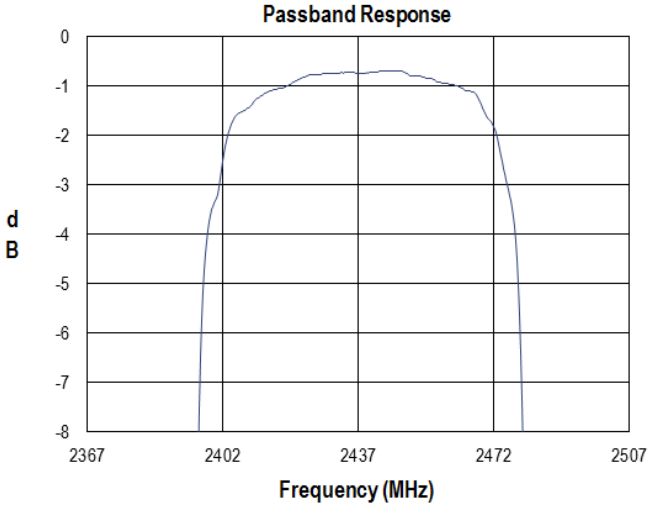


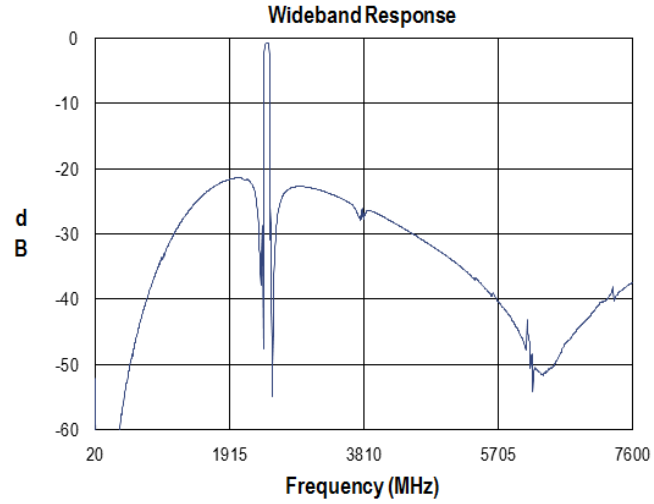

Notes:

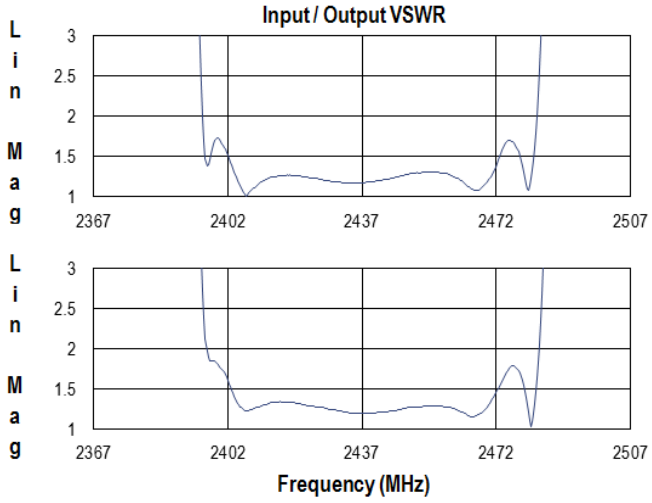
1. All dimensions are in millimeters. Angles are in degrees.
2. This drawing specifies the mounting pattern used on the Qorvo evaluation board for this product. Some modification may be necessary to suit end user assembly materials and processes.

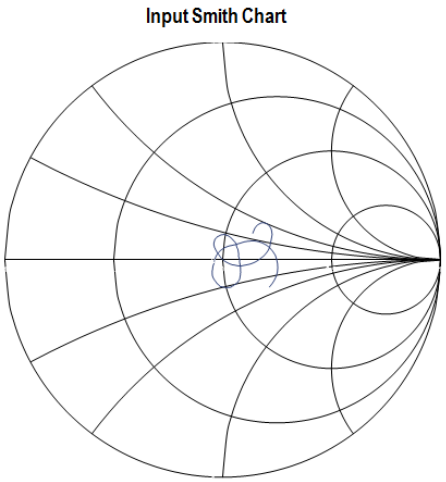
## Performance Plots

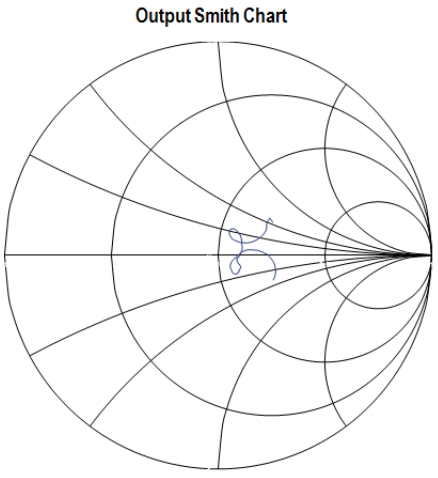


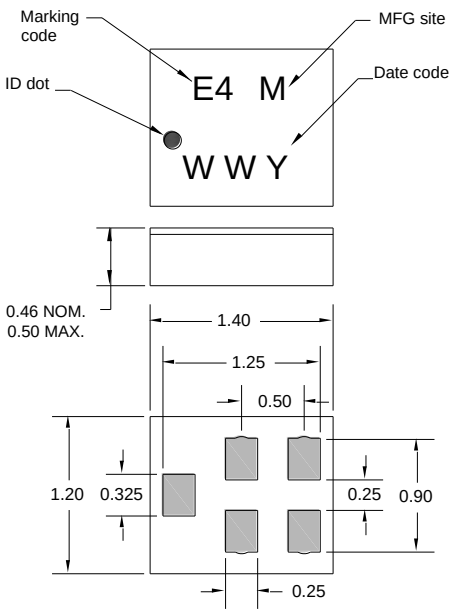



## Package Information




Package Style: CSP-5CT
Dimensions: 1.4 x 1.2 x 0.46 mm

Body: $Al_2O_3$ ceramic
Lid: *Kovar* or *Alloy 42*, *Au* over *Ni* plated
Terminations: *Au* plating 0.5 - 1.0 µm, over a 2-6 µm *Ni* plating

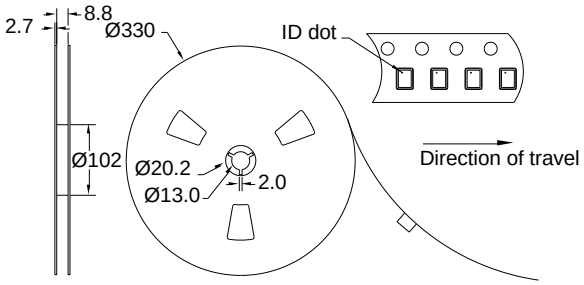
The date code consists of: WW = 2 digit week,
Y = last digit of year, M = manufacturing site code

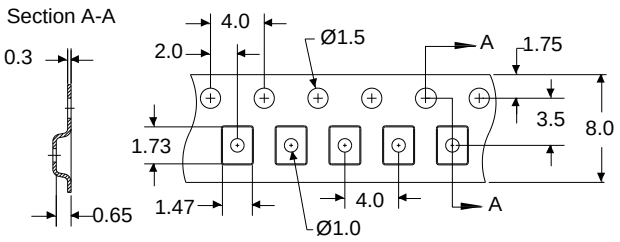
Notes:

1. All dimensions shown are typical in millimeters.
2. Unless otherwise specified all tolerances are ±0.05mm except length and width that are specified as ± 0.1mm.
3. An asterisk (*) in front of the marking code indicates prototype.

## Tape and Reel information

Standard T/R size = 15,000 units/reel. All dimensions are in millimeters



## Handling Precautions

| Parameter | Rating | Standard |
|---|---|---|
| ESD – Human Body Model (HBM) | 1B | ESDA / JEDEC JS-001 |
| ESD – Charge Device Model (CDM) | C3 | ESDA/JEDEC JS-002 |
| MSL – Moisture Sensitivity Level | N/A | JEDEC Standard IPC/JEDEC J-STD-020 |

Caution!
ESD-Sensitive Device

## Solderability

Compatible with the latest version of J-STD-020, lead free solder, 260 °C

## 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 ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free
- Qorvo Green

## Contact Information

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

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**Tel:** 1-844-890-8163
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For technical questions and application information: **Email:** appsupport@qorvo.com

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