Production Data Sheet

QPQ1904

Wi-Fi U-NII 2c-3 bandBoost Filter

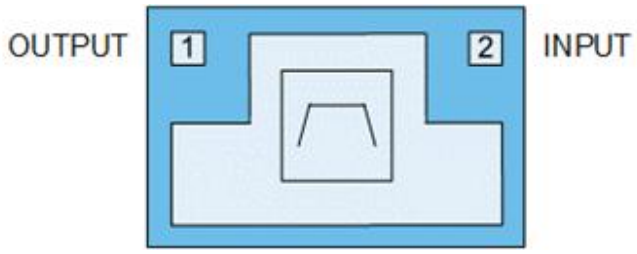
1. Product Overview and Benefits

The Qorvo® QPQ1904 is an high-performance, high power, Bulk Acoustic Wave (BAW) band-pass filter with extremely steep skirts, simultaneously exhibiting low loss in the Wi-Fi UNII2c-3 band and high near-in rejection in the UNII1-2a band.

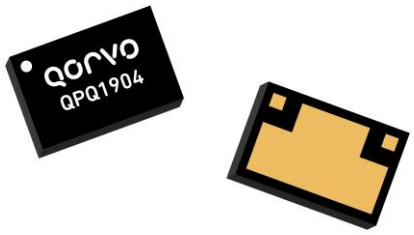
The filter module is specifically designed to enable industry leading capacity performance in Wi-Fi applications that result in higher power capability in more Wi-Fi channels than systems with no or traditional filter solutions. End users will see a better capability to deliver features that take advantage of sub-banding the 5GHz Wi-Fi spectrum in use cases such as tri-radio Wi-Fi mesh applications.

Using common module packaging techniques to achieve the industry standard footprint while negating as many external passive placements to help end users ease of integration into their circuits.

2. Functional Block Diagram



Top View



3 Pad 1.7 x 1.1 mm Laminate Package

3. Key Features

- 5490-5835 MHz
- Low Insertion Loss in Wi-Fi UNII2c-3 bands
- High Rejection in Wi-Fi UNII1-2a bands
- Extended temperature performance from -20 to +95 °C
- High power handling to +28dBm averaged Input Power
- Integrated match

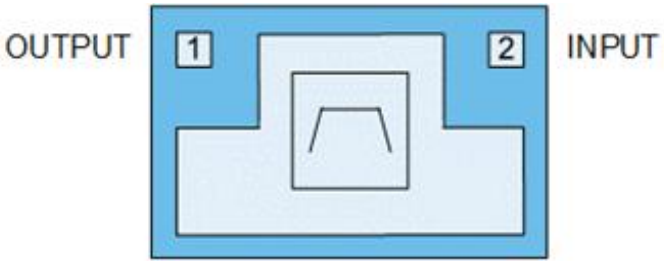
4. Applications

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

5. Ordering Information

Part Number	Description
QPQ1904SB	Sample bag with 5 pieces
QPQ1904SR	7” reel with 100 pieces
QPQ1904TR13	13” reel with 10,000 pieces
QPQ1904EVB	Assembled Evaluation Board

6. Pin Configuration and Description



Top View

Pin Number	Label	Description
1	OUTPUT	RF Output. Internally matched to 50 Ω.
2	INPUT	RF Input. Internally matched to 50 Ω.
-	GND	Ground connection (RF/DC). Use recommended via pattern to minimize inductance and thermal resistance. See PCB Mounting Pattern for suggested footprint.

7. Electrical Characteristics

7.1. Absolute Maximum Ratings

Parameter	Conditions	Rating
Operating Temperature	No damage	-40 to 125 °C
Storage Temperature		-40 to 125 °C
RF Input Power	CW, +25 °C, 200ms, Input Pin 2	+37.0 dBm

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

7.2. Minimum Lifetime Ratings

Parameter	Conditions	Rating
Power Handling	MCS0 20MHz BW, +95 °C 100% Duty Cycle, >1M hours, Input Pin 2	+28 dBm

7.3. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
$T_{AMBIENT}$	-20		+95	°C

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

7.4. Electrical Specifications

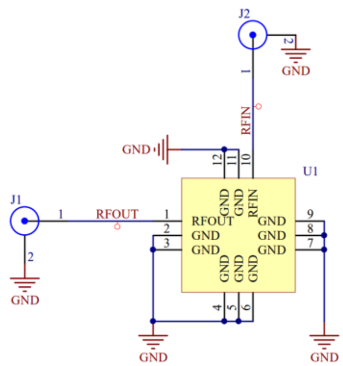
Parameter (INPUT-OUTPUT) (1) (2)	Conditions	Min.	Typ.	Max.	Units
	Unless otherwise noted: Typ. T = 25°C				
Insertion Loss(3)	*f* = 5490-5835 MHz		1.6	2.0	dB
Amplitude Variation	f = 5490-5835 MHz (20MHz BW Channel)		0.51	1.0	dB
	f = 5490-5815 MHz (40MHz BW Channel)		0.73	1.3	dB

Parameter (INPUT-OUTPUT) (1) (2)	Conditions	Min.	Typ.	Max.	Units
	Unless otherwise noted: Typ. T = 25°C				
	f = 5490-5815 MHz (80MHz BW Channel)		1.19	1.8	dB
	f = 5490-5650 MHz (160MHz BW Channel)		1.36	2.0	dB
Rejection	*f* = 30-2400 MHz	32	34		dB
	f = 2400-2500 MHz	31	34		dB
	f = 2400-3000 MHz	31	34		dB
	f = 3400-3800 MHz	29	34		dB
	f = 3800-4900 MHz	27	34		dB
	f = 5170-5330 MHz	50	59		dB
	f = 5945-6065 MHz	50	54		dB
	f = 6065-6105 MHz	45	48		dB
	f = 6105-6305 MHz	38	42		dB
	f = 6305-7125 MHz	38	42		dB
	f = 7200-7500 MHz	37	50		dB
	f = 10300-11800 MHz	30	46		dB
INPUT VSWR	f = 5490-5835 MHz			1.93	Mag
OUTPUT VSWR	f = 5490-5835 MHz			1.93	Mag
2nd Harmonics and 3rd Harmonics	PIN = +28 dBm			-50	dBm/MHz
2nd Harmonics and 3rd Harmonics	PIN = +30 dBm			-50	dBm/MHz

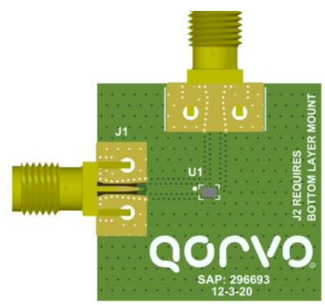
Notes:
1) All specifications are based on the QPQ1904 Applications Circuit
2) Pin 2 must be used for input. The large signal performance of this filter, such as power handling, may not be symmetric.
3) Integrated IL referenced to 0 dB. 345 MHz bandwidth.

8. Application Information

8.1. Evaluation Board Layout and BOM



Top View (Populated)

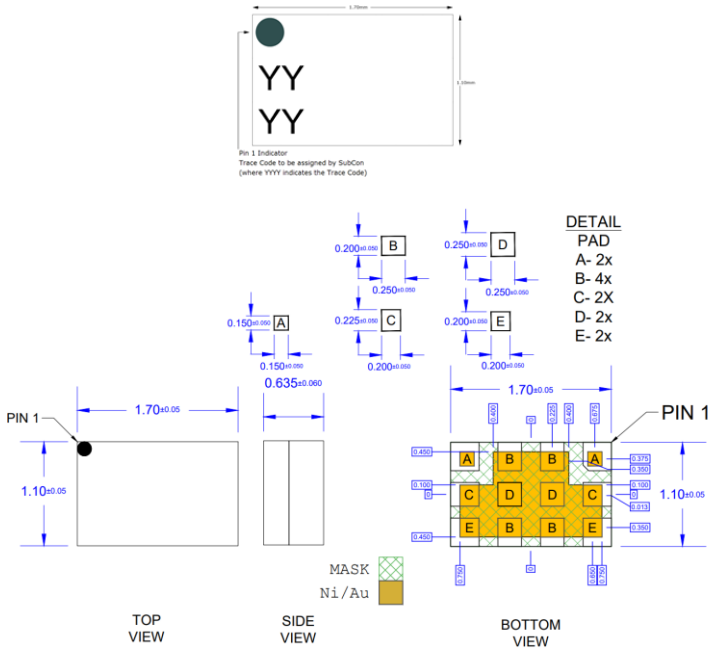


Ref. Des.	Value	Description	Manuf.	Part Number
-	-	Printed Circuit Board		
U1	-	5GHz bandBoost U-NII 2c-3 Filter	Qorvo	QPQ1904

9. Packaging and Ordering Information

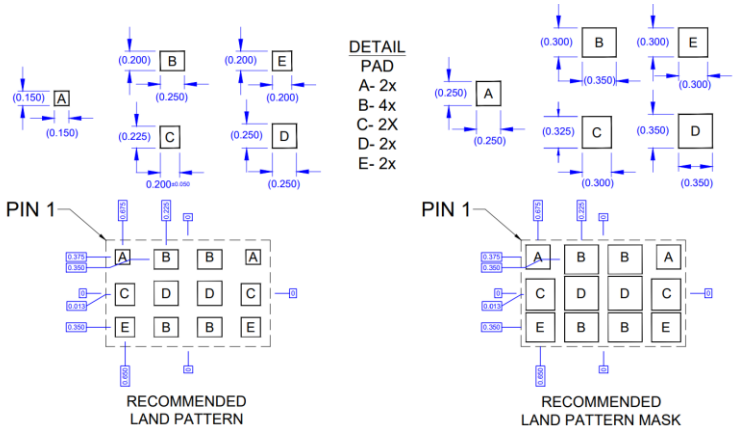
9.1. Device Marking and Package Dimensions

Marking: Trace code – YYYY & 2DID



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.

9.2. PCB Footprint Recommendations

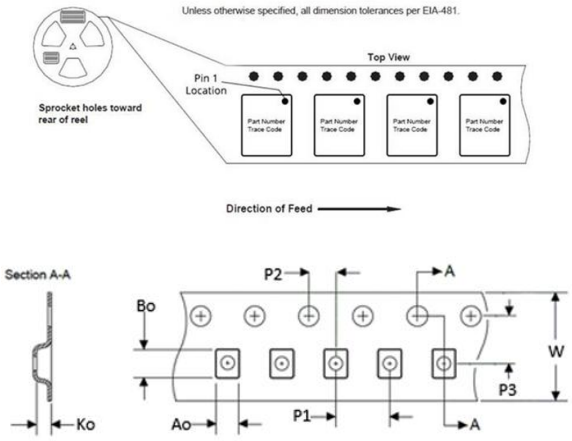


Notes:
All dimensions are in millimeters. Angles are in degrees.
Dimension and tolerance formats conform to ASME Y14.4M-1994.
The terminal #1 identifier and terminal numbering conform to JESD 95-1 SPP-012.

9.3. Tape and Reel Information

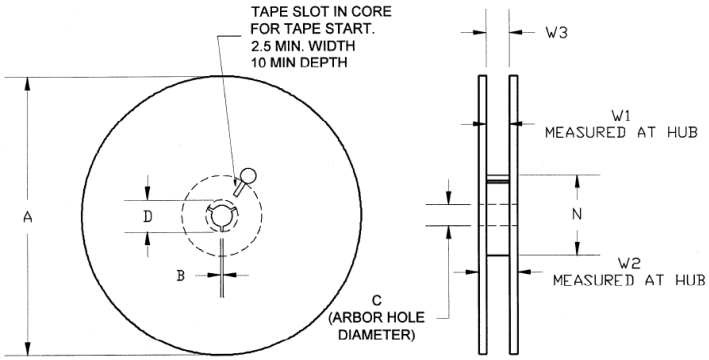
Tape and reel specifications for this part are also available on the Qorvo website.

Standard T/R size = 10,000 pieces on a 13” reel.



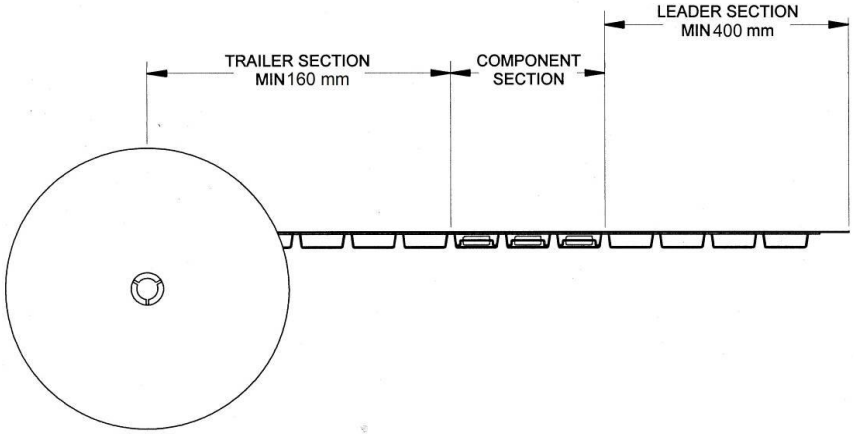
Feature	Measure	Symb	Size (in)	Size mm)
Cavity	Length	A0	0.051	1.3
	Width	B0	0.075	1.9
	Depth	K0	0.037	0.78
	Pitch	P1	0.157	4.0
Centerline Distance	Cavity to Perforation - Length Direction	P2	0.079	2.0
C2	Cavity to Perforation - Width Direction	P3	0.138	3.5
Cover Tape	Width	C	0.213	5.4
Carrier Tape	Width	W	0.315	8.0

Packaging reels are used to prevent damage to devices during shipping and storage, loaded carrier tape is typically wound onto a plastic take-up reel. The reel size is 13" diameter. The reels are made from high-impact injection-molded polystyrene (HIPS), which offers mechanical and ESD protection to packaged devices.

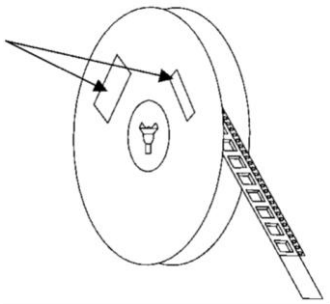


Feature	Measure	Symbol	Size (in)	Size (mm)
Flange	Diameter	A	12.992	330.0
	Thickness	W2	0.559	14.2
	Space Between Flange	W1	0.346	8.8
Hub	Outer Diameter	N	4.016	102.0
	Arbor Hole Diameter	C	0.512	13.0
	Key Slit Width	B	0.079	2.0
	Key Slit Diameter	D	0.795	20.2

Tape and reel specifications for this part are also available on the Qorvo website.



Note 2



Notes:
1. Empty part cavities at the trailing and leading ends are sealed with cover tape. See EIA 481.
2. Labels are placed on the flange opposite the sprockets in the carrier tape..

10. Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1C (1000V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1000V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

11. Solderability

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

Package lead plating: Bussed Ni/Au

12. Environmental 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
- SVHC Free
- TBBP-A (C15H12Br402) Free

Contact Information

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

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