885071

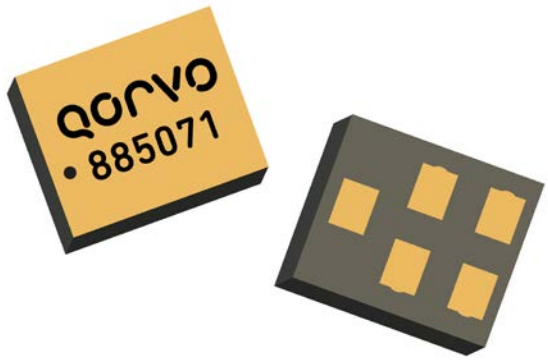
2.4 GHz WLAN/BT LTE Co-Existence Filter

General Description

The 885071 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 band-edge & near-in rejection.

The 885071 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 implantation into access points small cell base

The 885071 uses common module packaging techniques to achieve the industry standard 1.4 x 1.2 x 0.46 mm footprint. The filter exhibits excellent power Handling capabilities.

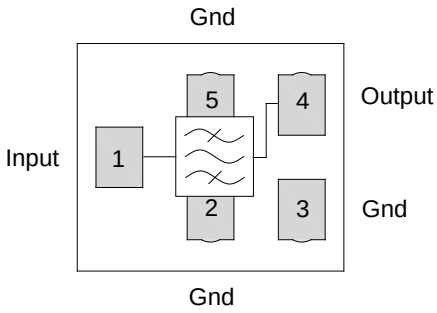


CSP-5CT package: 1.4 x 1.2 x 0.46 mm

Product Features

- Low Loss in WLAN band with extended upper corner for inclusion of Bluetooth
- High Rejection in B7/B41 bands
- Industry leading small size: 1.4 x 1.2 x 0.46 mm
- Performance over −40 to +95 ºC
- Ceramic chip-scale Package (CSP)
- Hermetically sealed
- RoHS compliant, Pb-free

Functional Block Diagram



Top View

Applications

- WiFi band pass filter that enables the coexistence of 3G/4G/LTE/TD-LTE & WiFi signals
- High-power WLAN Access Points and Small Cells
- Sideband filtering of WiFi signal emissions
- Smart Meters and 2.4 GHz ISM applications
  Set Top Box, Gateways and WiFi Routers

Pin Configuration - Single Ended

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

Ordering Information

Part No.	Description
885071	Packaged part
885071-EVB	Evaluation board

Standard T/R size = 10,000 units/reel

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature (1)	-55 to +125 °C
Operable Temperature (2)	-40 to +95 °C

1. Operation of this device outside the parameter ranges given may cause permanent damage.
2. Input Power with WLAN OFDM signal applied.

MTTF

Input Power (2)	+ 70 °C	+ 85 °C	+ 95 °C
+ 24 dBm	183 M Hours	23.5 M Hours	6.56 M hours
+ 26 dBm	67.5 M Hours	8.65 M Hours	2.41 M Hours
+ 28 dBm	24.8 M Hours	3.18 M Hours	0.89 M Hours

Electrical Specifications (1)(6)

Conditions unless otherwise noted: Device Temperature = 0°C to +70°C.

Parameter (2)	Conditions	Min	Typ (+25°C)	Max	Units
Insertion Loss (3)	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.6	1.9	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.3	1.7	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		1.5	2.0	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		1.7	2.2	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.9	2.6	
Amplitude Variation	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.0	1.3	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.0	1.2	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		0.8	1.0	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		0.8	2.3	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.7	4.3	
Input/Output VSWR	2402.5 – 2476.5 MHz (WiFi Ch.1-12)	-	1.9	2.1	-
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.8	3.0	
Impulse Response Length (4)	2401 – 2483 MHz	-	160	200	ns
Attenuation	100 – 2300 MHz	37	39	-	dB
	2300 – 2370 MHz (5)	50	53	-	dB
	2496 – 2501 MHz (+25 to +70˚C) (5)	32	55	-	dB
	2496 – 2501 MHz (0˚C to +25˚C) (5)	32	55	-	dB
	2500 – 2505 MHz (+25 to +70˚C) (5)	56	57	-	dB
	2500 – 2505 MHz (0˚C to +25˚C) (5)	48	57	-	dB
	2505 – 2570 MHz (5)	49	54	-	dB
	2570 – 2620 MHz (5)	45	49	-	dB
	2620 – 2690 MHz (5)	44	47	-	dB
	4800 – 5000 MHz	37	48	-	dB
	7200 – 7500 MHz	31	38	-	dB
2nd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	60	-	dBc
3rd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	138	-	dBc
Source/Load Impedance (7)	Single-ended	–	50	–	Ω

Notes:
1. In production, devices will be tested at room temperature to a guard-banded specification to ensure electrical compliance over temperature.
2. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances.
3. Data is the integrated value of the linear s-parameter over 19 MHz window for the indicated band at the specified temperature.
4. Duration in ns between the maxima and the point 40 dB below the maxima.
5. Data is the integrated value of the linear s-parameter over 5 MHz range at the specified temperature.
6. An external impedance matching network with ±3 % tolerance will be necessary to achieve the stated specifications.
7. This is the optimum impedance in order to achieve the performance shown.

Electrical Specifications (1)(6)

Conditions unless otherwise noted: Device Temperature = −30°C to +85°C.

Parameter (2)	Conditions	Min	Typ (+25°C)	Max	Units
Insertion Loss (3)	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.6	1.9	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.3	1.7	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		1.5	2.0	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		1.7	2.2	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.9	2.8	
Amplitude Variation	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.0	1.3	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.0	1.2	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		0.8	1.0	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		0.8	2.4	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.7	5.2	
Input/Output VSWR	2402.5 – 2476.5 MHz (WiFi Ch.1-12)	-	1.9	2.1	-
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.8	3.2	
Impulse Response Length (4)	2401 – 2483 MHz	-	160	200	ns
Attenuation	100 – 2300 MHz	37	39	-	dB
	2300 – 2370 MHz (5)	50	53	-	dB
	2496 – 2501 MHz (+25 to +85˚C) (5)	32	55	-	dB
	2496 – 2501 MHz (-30 to +25˚C) (5)	18	55	-	dB
	2500 – 2505 MHz (+25 to +85˚C) (5)	50	57	-	dB
	2500 – 2505 MHz (-30 to +25˚C) (5)	38	57	-	dB
	2505 – 2570 MHz (5)	49	54	-	dB
	2570 – 2620 MHz (5)	45	49	-	dB
	2620 – 2690 MHz (5)	44	47	-	dB
	4800 – 5000 MHz	37	48	-	dB
	7200 – 7500 MHz	31	38	-	dB
2nd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	60	-	dBc
3rd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	138	-	dBc
Source/Load Impedance (7)	Single-ended	–	50	–	Ω

Notes:

1. In production, devices will be tested at room temperature to a guard-banded specification to ensure electrical compliance over temperature.
2. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances.
3. Data is the integrated value of the linear s-parameter over 19 MHz window for the indicated band at the specified temperature.
4. Duration in ns between the maxima and the point 40 dB below the maxima.
5. Data is the integrated value of the linear s-parameter over 5 MHz range at the specified temperature.
6. An external impedance matching network with ±3 % tolerance will be necessary to achieve the stated specifications.
7. This is the optimum impedance in order to achieve the performance shown.

Electrical Specifications (1)(6)

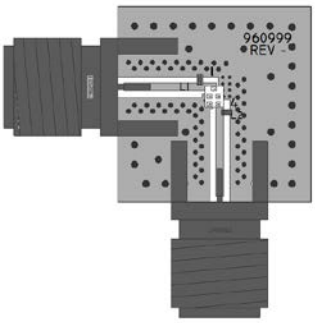
Conditions unless otherwise noted: Device Temperature = −40°C to +95°C.

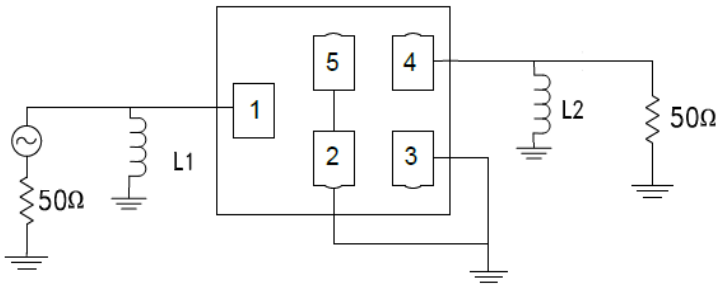
Parameter (2)	Conditions	Min	Typ (+25°C)	Max	Units
Insertion Loss (3)	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.6	1.9	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.3	1.7	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		1.5	2.1	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		1.7	2.3	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.9	2.9	
Amplitude Variation	2402.5 – 2421.5 MHz (WiFi Ch.1)	-	1.0	1.3	dB
	2407.5 – 2426.5 MHz (WiFi Ch.2)		1.0	1.2	
	2412.5 – 2471.5 MHz (WiFi Ch.3-11)		0.8	1.0	
	2457.5 – 2476.5 MHz (WiFi Ch.12)		0.8	2.5	
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.7	5.7	
Input/Output VSWR	2402.5 – 2476.5 MHz (WiFi Ch.1-12)	-	1.9	2.1	-
	2462.5 – 2481.5 MHz (WiFi Ch.13)		1.8	3.5	
Impulse Response Length (4)	2401 – 2483 MHz	-	160	200	ns
Attenuation	100 – 2300 MHz	37	39	-	dB
	2300 – 2370 MHz (5)	50	53	-	dB
	2496 – 2501 MHz (+25 to +95˚C) (5)	32	55	-	dB
	2496 – 2501 MHz (-40 to +25˚C) (5)	12	55	-	dB
	2500 – 2505 MHz (+25 to +95˚C) (5)	48	57	-	dB
	2500 – 2505 MHz (-40 to +25˚C) (5)	32	57	-	dB
	2505 – 2570 MHz (5)	49	54	-	dB
	2570 – 2620 MHz (5)	45	49	-	dB
	2620 – 2690 MHz (5)	44	47	-	dB
	4800 – 5000 MHz	37	48	-	dB
	7200 – 7500 MHz	31	38	-	dB
2nd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	60	-	dBc
3rd Harmonics	CW Tone = 2442 MHz @ 22.5 dBm	-	138	-	dBc
Source/Load Impedance (7)	Single-ended	–	50	–	Ω

Notes:

1. In production, devices will be tested at room temperature to a guard-banded specification to ensure electrical compliance over temperature.
2. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances.
3. Data is the integrated value of the linear s-parameter over 19 MHz window for the indicated band at the specified temperature.
4. Duration in ns between the maxima and the point 40 dB below the maxima.
5. Data is the integrated value of the linear s-parameter over 5 MHz range at the specified temperature.
6. An external impedance matching network with ±3 % tolerance will be necessary to achieve the stated specifications.
7. This is the optimum impedance in order to achieve the performance shown.

Evaluation Board





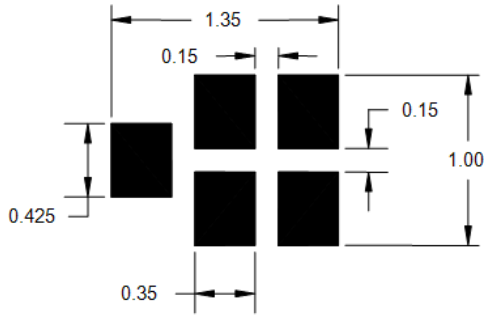
Notes:

1. Matching component values shown are for the specified TriQuint evaluation board. Value adjustment may be required in end user product circuits depending on component manufacturer and PCB material.
2. PCB: .500 x.500 x .062; Construction: ½ oz. *Cu* Top Layer; *TLY-5A* (.0075) ½ oz. *Cu* Middle Layer, *FR4*; ½ oz. *Cu* Bottom Layer. (dimensions are in inches)

Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
L1	7.5 nH	0201 chip inductors ±3%	MuRata	LQP03TN7N5H02
L2	8.2 nH	0201 chip inductors ±3%	MuRata	LQP03TN8N2H02
SMA	N/A	SMA connector	Radiall USA	9602-1111-018
PCB	N/A	3-layer	Multiple	960999

PCB Mounting Pattern

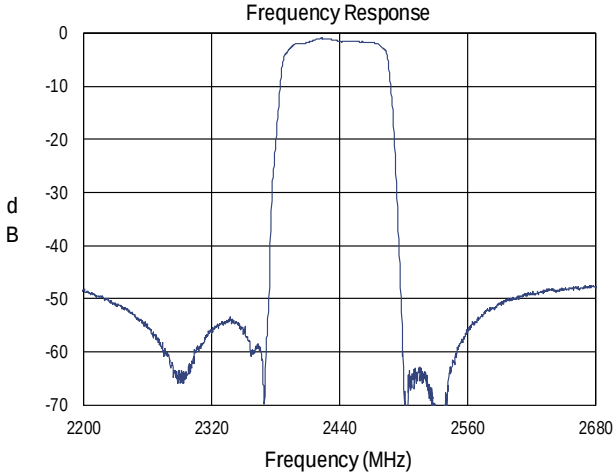


Notes:

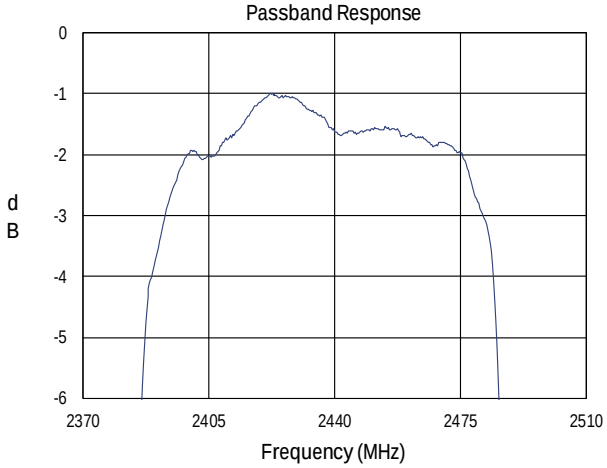
1. All dimensions are in millimeters. Angles are in degrees.
2. This drawing specifies the mounting pattern used on the TriQuint evaluation board for this product. Some modification may be necessary to suit end user assembly materials and processes.

Performance Plots

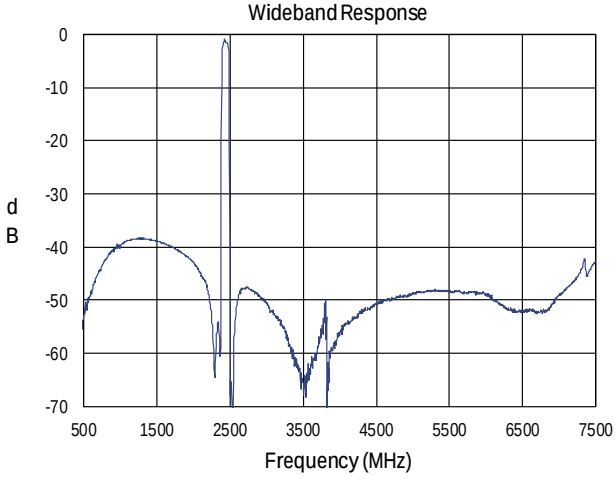
Frequency Response



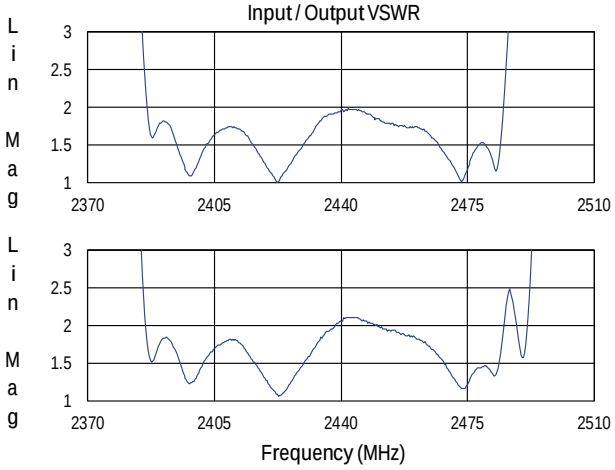
Passband Response



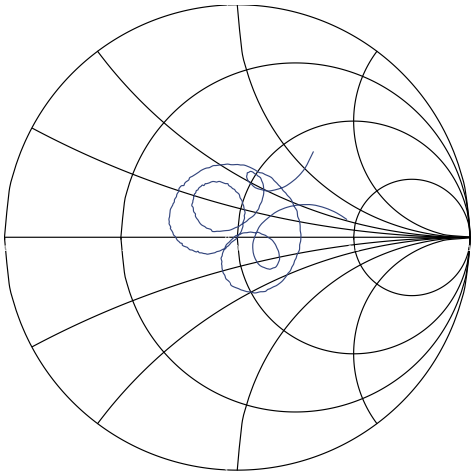
Wideband Response



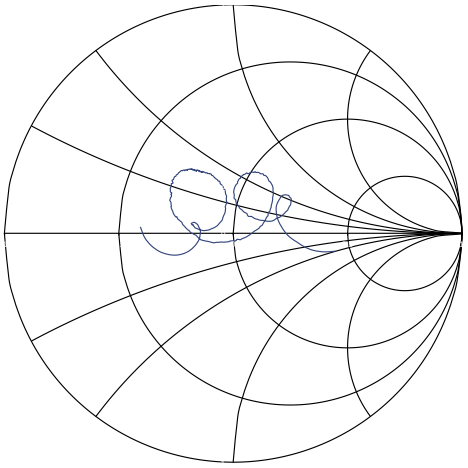
Input / Output VSWR



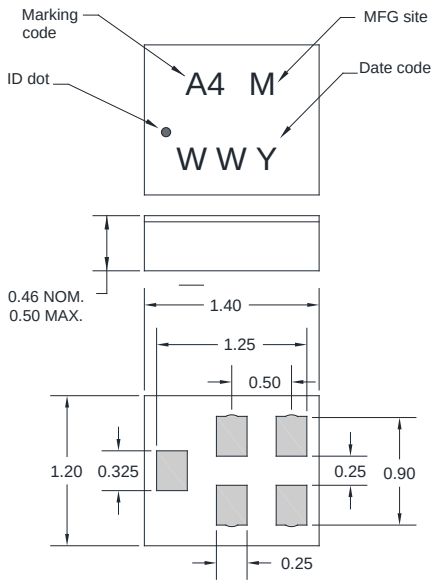
Input Smith Chart



Output Smith Chart



Package Information, Marking and Dimensions



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

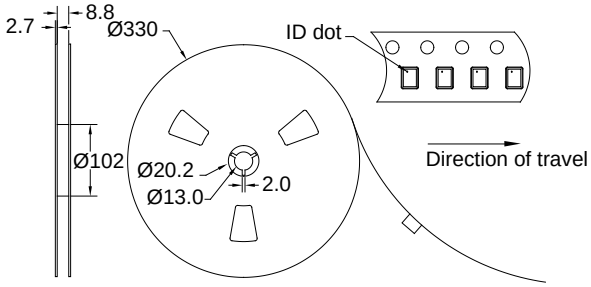
Body: Al_2O_3 ceramic
Lid: *Kovar* or *Alloy 42*, *Au* over *Ni* plated
Terminations: *Au* plating 0.5 - 1.0 µm, over a 2-6 µm *Ni* plating

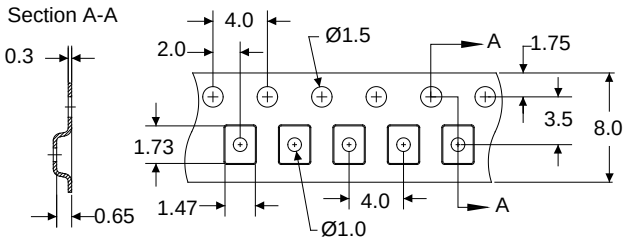
The date code consists of: WW = 2 digit week,
Y = last digit of year, M = manufacturing site code

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=10,000 units/reel.
All dimensions are in millimeters.

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1C	ESDA / JEDEC JS-001
ESD – Charge Device Model (CDM)	N/A	ESDA/JEDEC JS-002
MSL – Moisture Sensitivity Level	N/A	Hermetic package

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.

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

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

Web: www.qorvo.com
Tel: 1-844-890-8163
Email: customer.support@qorvo.com

For technical questions and application information: **Email:** flapplication.engineering@qorvo.com

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