## QPQ1060 L1 Low Loss GPS SAW Filter

#### **General Description**

QPQ1060 is a L1 GPS Band Pass Filter in a compact size for use in any GPS application. Designed for rejection of unwanted GPS signals, this SAW filter also has excellent power handling capability for low power transmitters.

Housed in a 1.4 x 1.2 mm laminate with over mold package, this device allows for a compact and cost-effective diplexer solution for GPS applications.

No matching components are required, making the PCB design and implementation easy.

Gnd

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Output

Gnd



1.4 X 1.2 X 0.84 mm

#### **Product Features**

- Usable bandwidth 31 MHz
- No matching required for operation at 50Ω
- Excellent rejection for GPS operation
- High Isolation
- High Rejection
- Laminate with Over Mold Surface Mount Package (SMP)
- Small Size: 1.4 x 1.2 x 0.84mm

Performance is typical across frequency. Please reference electrical specification table and data plots for more details.

#### **Applications**

- General purpose GPS
- Communication Systems

### Pin Configuration - Single Ended

Pin No.	Label		
1	Antenna Input <sup>(1)</sup>		
2, 3, 5	Ground		
4	L1 Output <sup>(1)</sup>		
(1) Disching conscitute are required as any parts where a DC			

<sup>(1)</sup> Blocking capacitors are required on any ports where a DC voltage may be present.

#### **Ordering Information**

Part No.	Description
QPQ1060TR7	7" Taped Reel with 2500 pieces
QPQ1060EVB	Evaluation board

## 2 3

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Input

**Functional Block Diagram** 

Gnd Top View

### QPQ1060 L1 Low Loss GPS SAW Filter

#### **Absolute Maximum Ratings**

Parameter	Rating
Storage Temperature	-40 to 125°C
Operation Temperature	-55 to 105°C
RF Input Power <sup>(1)</sup> - Test conditions: PW = 200ms; DC = 50% @ +25 °C	33 dBm

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

<sup>(1)</sup> Input Power for both Input & Output ports

#### **Minimum Lifetime Ratings**

Conditions	Rating
RF Input Power <sup>(1)</sup> ,	>10 years @ +95C
<ul><li>@ Pin 4 (L1 Port)</li></ul>	>5 years @ +105C
(4)	

<sup>(1)</sup> Input Power: CW, 25 dBm

L1 Band GPS						
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units	
Center Frequency	1559.92 - 1590.92 MHz	-	1575.42	-	MHz	
	1559.92 - 1590.92 MHz	-	1.4	2.0		
Maximum Insertion Loss	1563.42 - 1587.42 MHz	-	1.3	-	dB	
	1565.42 - 1585.42 MHz	-	1.2	-		
	1559.92 - 1590.92 MHz	-	0.4	0.7		
Amplitude Variation	1563.42 - 1587.42 MHz	-	0.3	-	dB	
	1565.42 - 1585.42 MHz	-	0.2	-	7	
	1559.92 - 1590.92 MHz	-	19	33		
Group Delay Variation	1563.42 - 1587.42 MHz	-	15	-	ns	
	1565.42 - 1585.42 MHz	-	14	-		
Absolute Attenuation	10 - 1505.42 MHz	40	42	-		
(Relative to 0 dB)	1645.42-2500 MHz	44	46	-	ав	
	1559.92 - 1590.92 MHz	10	15	-		
Input Return Loss	1563.42 - 1587.42 MHz	-	15	-	dB	
	1565.42 - 1585.42 MHz	-	15	-		
	1559.92 - 1590.92 MHz	10	14	-		
Output Return Loss	1563.42 - 1587.42 MHz	-	14	-	dB	
	1565.42 - 1585.42 MHz	-	14	-		
Nominal Impedance (5)	Single Ended	-	50	-	Ohm	

#### **Electrical Specifications** <sup>(1,2)</sup>

Notes:

- 1. All specifications are based on the Qorvo schematics for the reference designs shown on page 3.
- 2. In production, devices will be tested at room temperature to a guard banded specification to ensure electrical compliance over temperature.
- 3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacture tolerances.
- 4. Typical values are based on average measurements at room temperature on pcb. (25 °C ±5 °C)
- 5. Optimum impedance to achieve the performance shown.

## QCCVO.

### QPQ1060 L1 Low Loss GPS SAW Filter

### **Evaluation Board – QPQ1060-EVB**





Notes: Blocking capacitors are required on any RF ports where a DC voltage may be present.

### **Bill of Material – QPQ1060-EVB**

Reference Des.	Value	Description	Manuf.	Part Number
DUT	-	L1 Low Loss GPS SAW Filter	Qorvo	QPQ1060
SMA	-	SMA connector	Various	
PCB	-	Printed Circuit Board	Various	

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### QPQ1060 L1 Low Loss GPS SAW Filter

#### **Typical Performances**

Test conditions unless otherwise noted: Temp = +25 °C, 50  $\Omega$  system



#### **Package Marking and Dimensions**

#### Marking: Qorvo Logo

Part Number – 1060

Trace Code - Assigned by subcontractor



#### Notes:

- 1. All dimensions are in millimeters. Angles are in degrees.
- 2. The terminal #1 identifier and terminal numbering conform to JESD 95-1 SPP-012

#### **PCB Mounting Pattern**



#### Notes:

1. All dimensions are in millimeters. Angles are in degrees. .

### QPQ1060 L1 Low Loss GPS SAW Filter

### **Assembly Notes**

- 1. Compatible with both Lead-free solder (260°C peak reflow temperature) and tin/lead (245°C peak reflow temp.) soldering processes.
- 2. Contact plating: ENEPIG

### **Recommended Soldering Profile**



#### Handling Precautions

Parameter	Rating	Standard		
ESD-Human Body Model (HBM)	Class 3A	ESDA / JEDEC JS-001		Caution!
ESD-Charged Device Model (CDM)	Class C3	ESDA / JEDEC JS-002	JE N	ESD-Sensitive Device
MSL-Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020		

#### **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>0<sub>2</sub>) Free
- SVHC Free
- PFOS Free

#### **Contact Information**

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

Web: <u>www.qorvo.com</u>

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