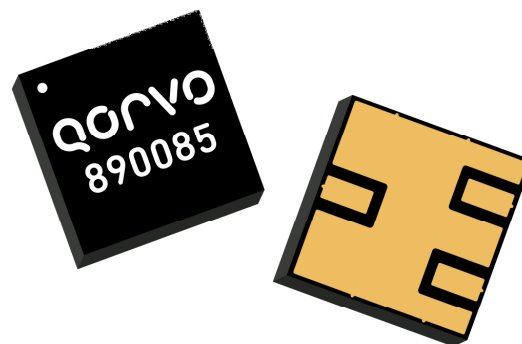



## Applications

- General purpose GPS
- Communication systems

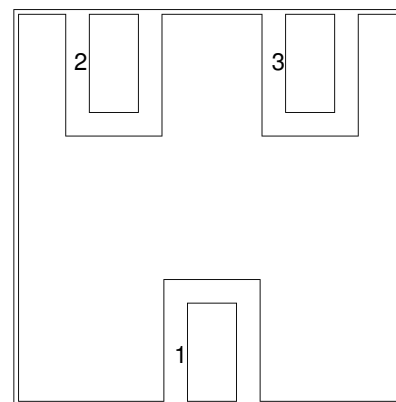


## Product Features

- Usable bandwidth 20.46 MHz for each band
- 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 : 5.0 x 5.0 x 1.1mm
- Hermetic **RoHS** compliant, **Pb**-free 

## Functional Block Diagram

Top view



## General Description

890085 is an L1/L2 GPS diplexer in a compact size for use in any GPS application. Designed for rejection of unwanted GPS signals, this SAW diplexer also has excellent power handling capability for low power transmitters.

Housed in a 5.0 x 5.0 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.

## Pin Configuration

Pin # SE	Description
1	Antenna
2	L1 Band Output
3	L2 Band Output

## Ordering Information

Part No.	Description
890085	Packaged Part
890085-EVB	Evaluation Board

## Absolute Maximum Ratings

Parameter	Rating
Operating Temperature	-55 to +85 °C
Storage Temperature	-55 to +105 °C

Notes:

1. Operation of this device outside the parameter ranges given may cause permanent damage.

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

L1 Band GPS					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Center Frequency		-	1575.42	-	MHz
Insertion Loss	1574.397 – 1576.443 MHz	-	1.5	1.9	dB
	1565.19 – 1585.65 MHz	-	1.6	2.1	
Amplitude Variation	1574.397 – 1576.443 MHz	-	.08	0.1	dB
	1565.19 – 1585.65 MHz	-	.08	0.5	
Group Delay Variation	1574.397 – 1576.443 MHz	-	.7	2.4	ns
	1565.19 – 1585.65 MHz	-	2.8	6.3	
Absolute Attenuation	824 – 960 MHz	20	32	-	dB
	1500 – 1525.42 MHz	25	31	-	dB
	1625.42 – 1650 MHz	28	31	-	dB
	1710 – 2170 MHz	20	23	-	dB
Return Loss at Port 2	1574.397 – 1576.443 MHz	10	12	-	dB
	1565.19 – 1585.65 MHz	10	12	-	
Nominal Impedance <sup>(5)</sup>	Single Ended	-	50	-	Ohm

Notes:

1. All specifications are based on the TriQuint schematics for the reference designs shown on page 4.
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 manufacturing tolerances.
4. Typical values are based on average measurements at room temperature on pcb.
5. This is the optimum impedance in order to achieve the performance shown.

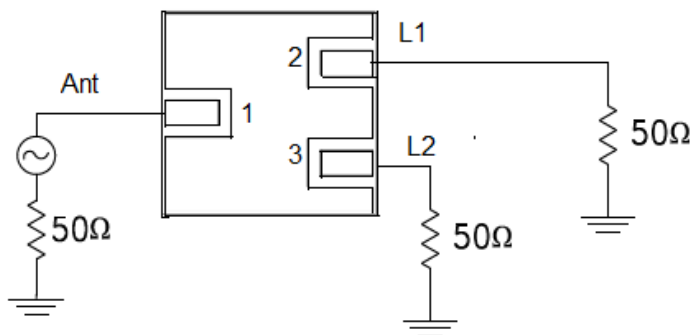
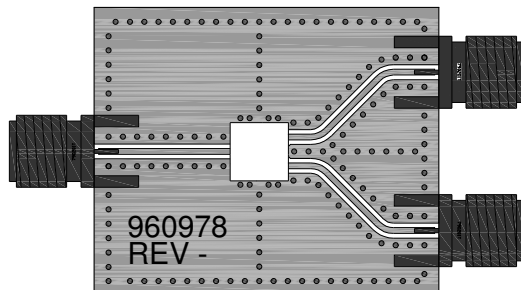
**Electrical Specifications <sup>(1)</sup>**

L2 Band GPS					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Center Frequency		-	1227.6	-	MHz
Insertion Loss	1226.577 – 1228.623 MHz	-	1.4	-	dB
	1217.37 – 1237.83 MHz	-	1.5	2.5	
Amplitude Variation	1226.577 – 1228.623 MHz	-	.1	0.2	dB
	1217.37 – 1237.83 MHz	-	.4	1.3	
Group Delay Variation	1226.577 – 1228.623 MHz	-	1.2	6	ns
	1217.37 – 1237.83 MHz	-	6	21	
Absolute Attenuation	464 – 600 MHz	29	31	-	dB
	1150 – 1177.6 MHz	20	25	-	dB
	1277.6 – 1300 MHz	26	29	-	dB
	1360 – 1820 MHz	20	23	-	dB
Return Loss at Port 3	1226.577 – 1228.623 MHz	10	17	-	dB
	1217.37 – 1237.83 MHz	9	14	-	
Nominal Impedance <sup>(5)</sup>	Single Ended	-	50	-	Ohm

L1 Band – L2 Band Specifications					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Nominal Impedance <sup>(5)</sup>	Single Ended	-	50	-	dB
Antenna Return Loss	1574.397 – 1576.443 MHz	11	13	-	
	1565.19 – 1585.65 MHz	11	13	-	
	1226.577 – 1228.623 MHz	11	15	-	
	1217.37 – 1237.83 MHz	9	15	-	
Isolation	1226.577 – 1228.623 MHz	22	29	-	dB
	1217.37 – 1237.83 MHz	25	29	-	
	1574.397 – 1576.443 MHz	27	29	-	
	1565.19 – 1585.65 MHz	27	29	-	

1. All specifications are based on the TriQuint schematics for the reference designs shown on page 4.
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 manufacturing tolerances.
4. Typical values are based on average measurements at room temperature on pcb.
5. This is the optimum impedance in order to achieve the performance shown.

Evaluation Board



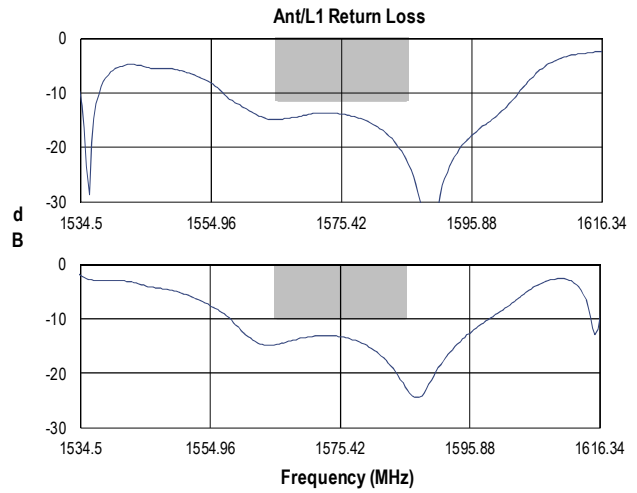
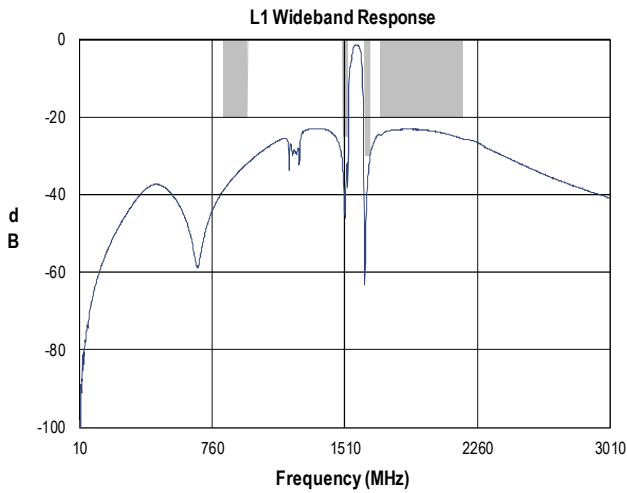
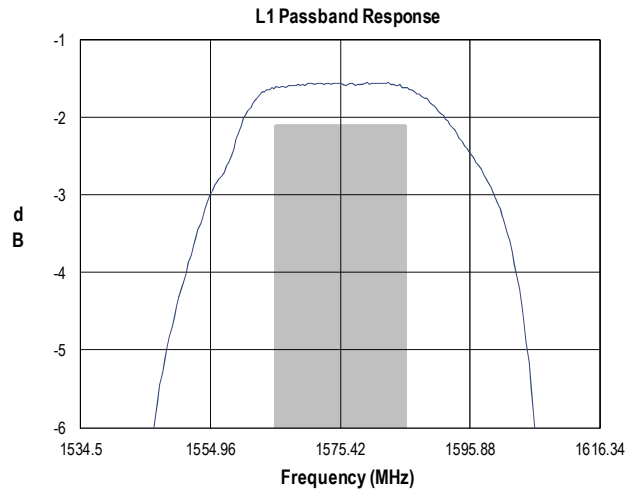
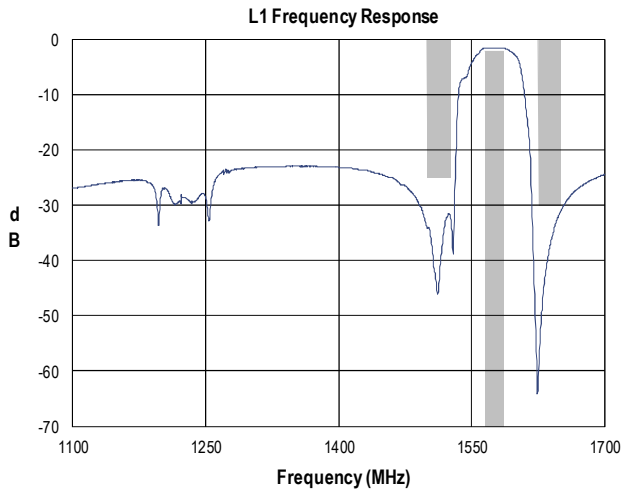
Notes:

1. No Impedance matching required. 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: 1/2 oz Cu Top Layer; TLY-5A (.0075) 1/2 oz Cu Middle Layer, FR4; 1/2 oz Cu Bottom Layer. (dimensions are in inches)

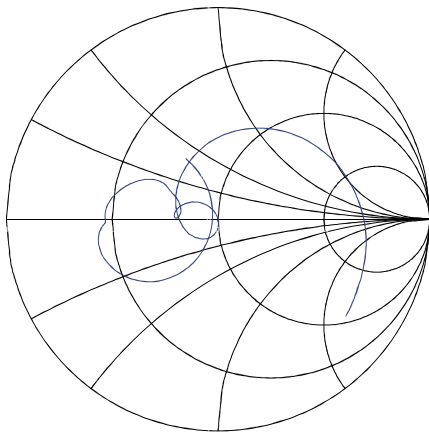
Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
SMA	N/A	SMA connector	Radiall USA	9602-1111-018
PCB	N/A	3-layer	Multiple	960978

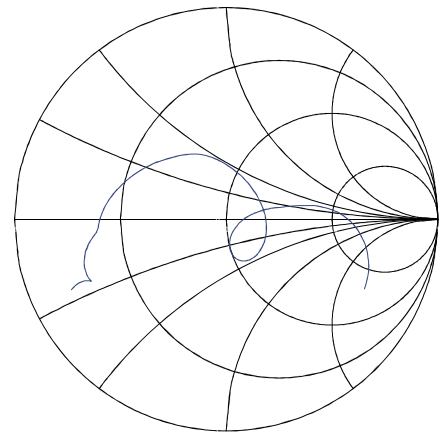
**L1 Typical Performance (at room temperature)**



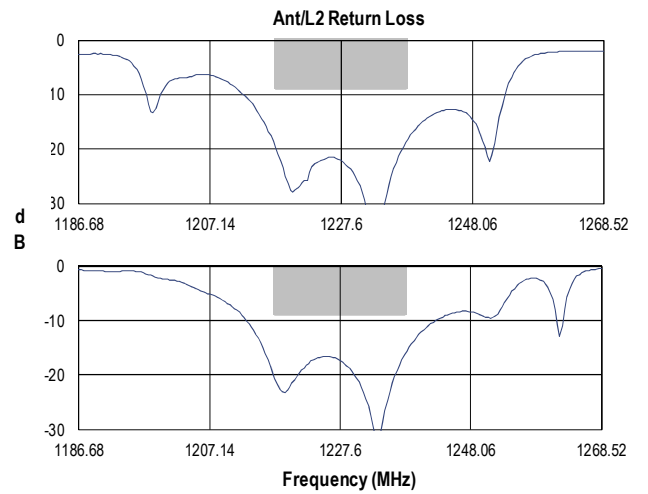
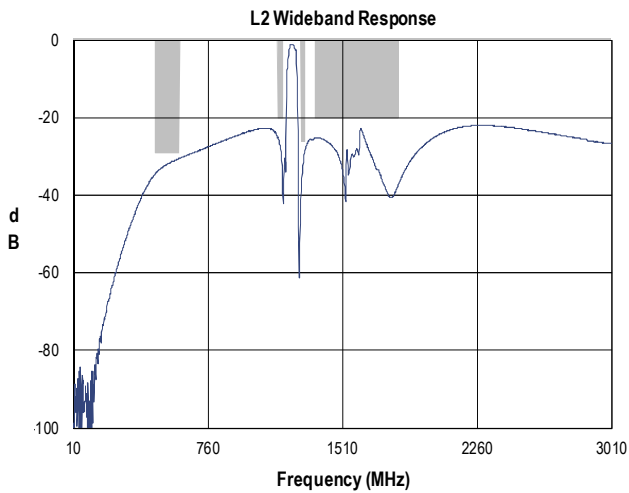
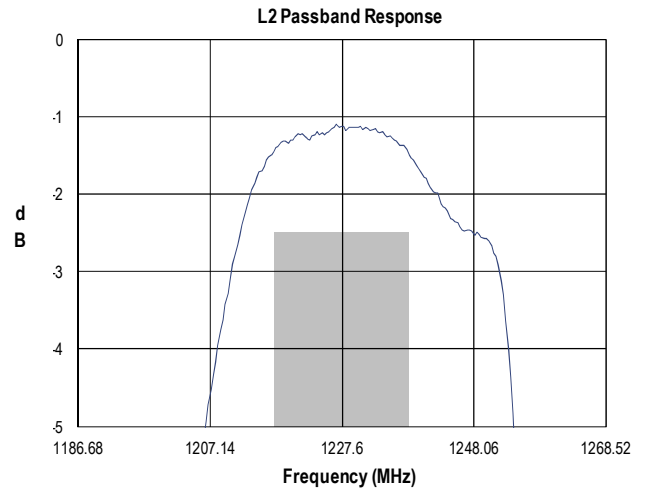
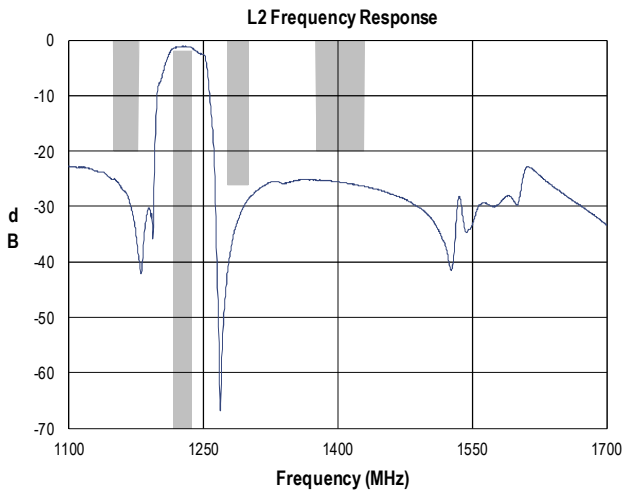
**L1 Path - Ant Port Impedance**



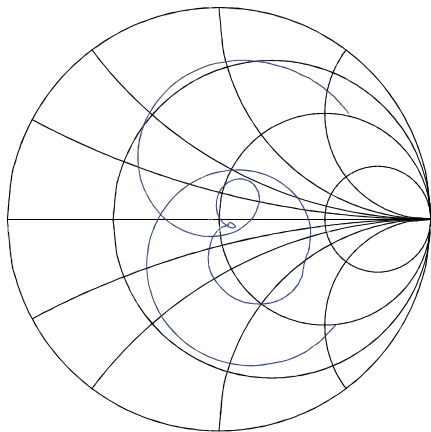
**L1 Port Impedance**



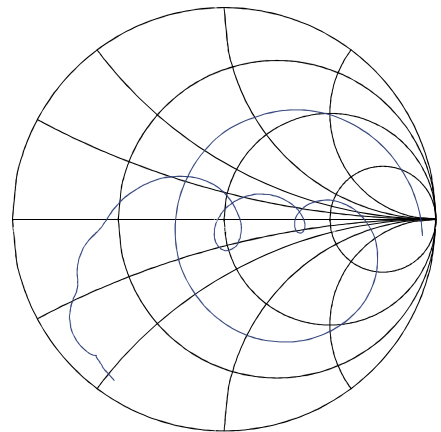
**L2 Typical Performance (at room temperature)**



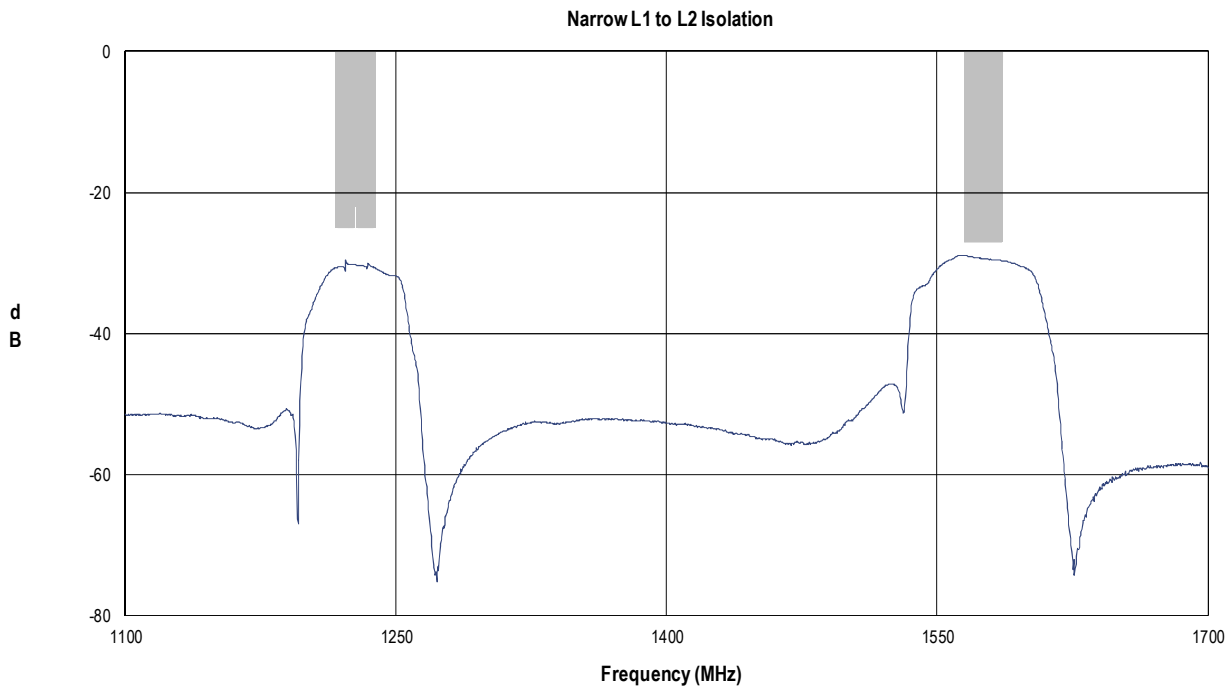
L2 Path - Ant Port Impedance



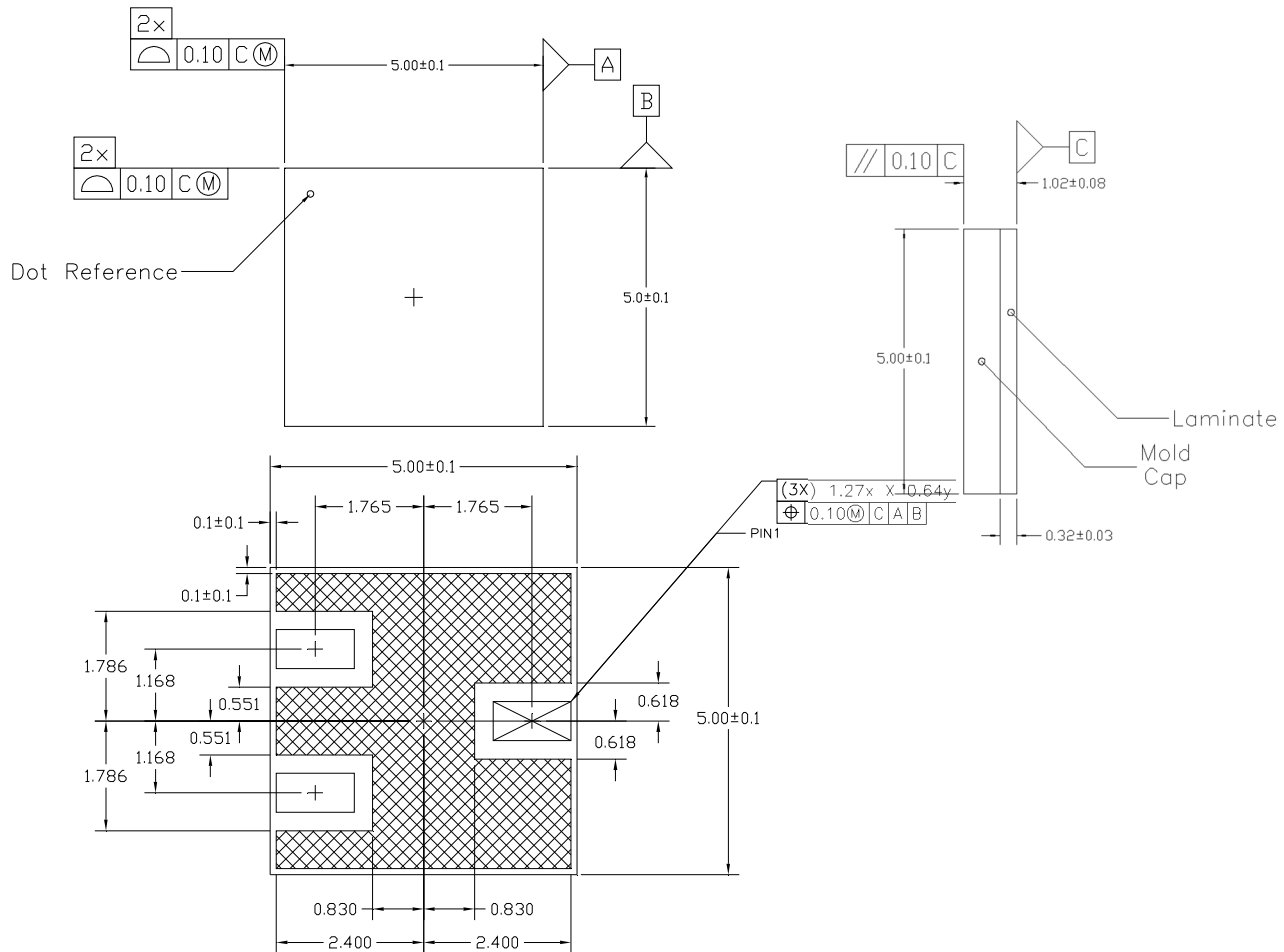
L2 Port Impedance



L1, L2 Isolation Performance



Package Information, Marking and Dimensions

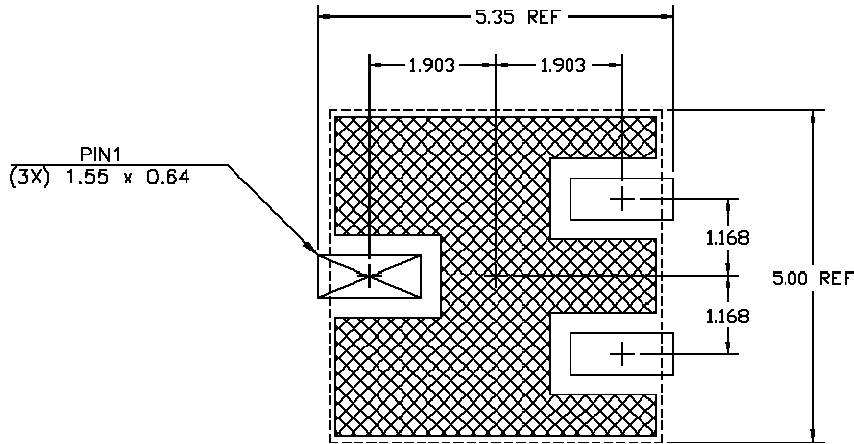


Package Style: 5X5 Module  
 Dimensions: 5 X 5 X 1.1 mm

All dimensions are in millimeters. Angles are in degrees



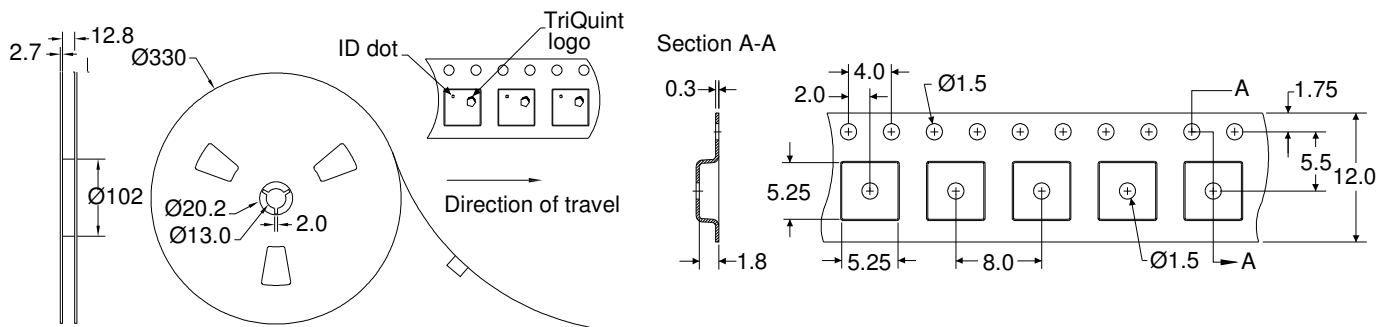
## PCB Mounting Pattern



### Notes:

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

## Tape and Reel Information



## Product Compliance Information

### ESD Sensitivity Ratings



Caution! ESD-Sensitive Device

ESD Rating: TBD

Test: Human Body Model (HBM)

Standard: ESDA / JEDEC Standard JS-001

ESD Rating: TBD

Test: Charge Device Model (CDM)

Standard: ESDAJEDEC JS-002

### MSL Rating

MSL Rating: Level 3

Test: 260°C convection reflow

Standard: JEDEC Standard IPC/JEDEC J-STD-020

### Solderability

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

Contact plating: ENIG (Electroless Nickel Immersion Gold)

Refer to [Soldering Profile](#) for recommended guidelines.

### RoHS Compliance

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

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

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## Contact Information

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

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

Tel: 877-800-8584

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

For information about the merger of RFMD and TriQuint as Qorvo:

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

For technical questions and application information: Email: [flapplication.engineering@tqs.com](mailto:flapplication.engineering@tqs.com)

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applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.