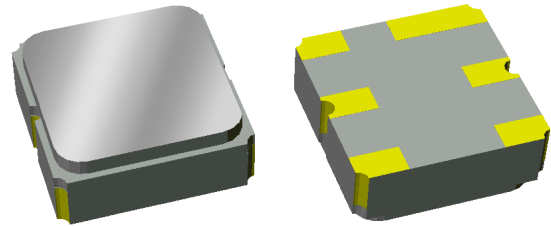



Applications

- General purpose RF filters

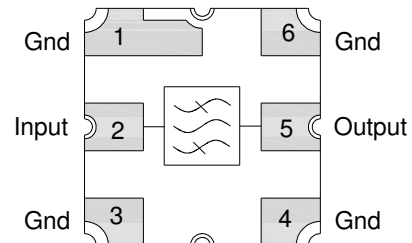


SMP-12, 3.00 x 3.00 x 1.22 mm

Product Features

- Usable bandwidth 160 MHz
- High attenuation
- Low Loss
- Excellent power handling
- Single-ended operation
- Matching required for operation at 50Ω
- Small Size: 3.00 x 3.00 x 1.22 mm
- Ceramic Surface Mount Package (SMP)
- Hermetically sealed
- **RoHS** compliant, **Pb-free** 

Functional Block Diagram



General Description

857190 is a general purpose Uplink filter for Band 1. This filter was specifically designed in a 3x3mm hermetic package for Base Station and Repeater applications and is part of our wide portfolio of RF filters in the same package.

Low loss insertion loss, coupled with high attenuation and excellent power handling, makes this filter a natural choice for our customers Uplink RF filtering needs and other general purpose applications. The 160MHz bandwidth enables the usage in a predistorter environment, where the 3rd and 5th order intermodulation results should not be distorted.

Pin Configuration – Single Ended

Pin No.	Label
2	Input
5	Output
1,3,4,6	Ground

Ordering Information

Part No.	Description
857190	Product description
857190-EVB	Evaluation board description

Standard T/R size = 5000 units/reel

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature ⁽¹⁾	-40 to +85 °C
RF Input Power ⁽²⁾	+22 dBm

1. Operation of this device outside the parameter ranges given may cause permanent damage.
2. Input Power with applied CW signal at +55 °C for 125 hours

Electrical Specifications ⁽¹⁾

Specified Temperature Range: ⁽²⁾ -40 °C to +85 °C

Parameter ⁽³⁾	Conditions	Min	Typ ⁽⁴⁾	Max	Units
Center Frequency		-	2140	-	MHz
Maximum Insertion Loss	2110 – 2170 MHz	-	2.7	3.2	dB
Amplitude Variation ⁽⁵⁾	2110 – 2170 MHz	-	0.3	0.6	dB p-p
Amplitude Variation ⁽⁵⁾	2060 – 2220 MHz	-	1.6	2.6	dB p-p
Amplitude Variation(over 5 MHz span) ⁽⁵⁾	2110 – 2170 MHz	-	0.1	0.2	dB p-p
Phase Ripple	2110 – 2170 MHz	-	1.5	5	deg. p-p
Phase Ripple(+25 °C to +85 °C)	2060 – 2220 MHz	-	15	20	deg. p-p
Phase Ripple (-40 °C to +24 °C)	2060 – 2220 MHz	-	15	30	deg. p-p
Phase Ripple(over 25 MHz span)	2110 – 2170 MHz	-	1.0	3	deg. p-p
Absolute Delay	2110 – 2170 MHz	-	3.2	5	ns
Group Delay Variation	2110 – 2170 MHz	-	1.5	5	ns p-p
Group Delay Variation	2060 – 2220 MHz	-	3.8	10	ns p-p
EVM (over any 3.84 MHz span) ⁽⁶⁾	2110 – 2170 MHz	-	0.3	1.0	%
IIP3 (Tones 5 MHz separated, power > 5dBm per tone) ⁽⁷⁾	2110 – 2170 MHz	44	50	-	dBm
Temperature Drift ⁽⁸⁾	2110 – 2170 MHz	-	0.23	0.3	dB
Absolute Attenuation ⁽⁹⁾	10 – 1802 MHz	20	22.3	-	dB
	1802 – 2000 MHz	10	24.0	-	dB
	2290 – 2429 MHz	10	21.5	-	dB
	2429 – 2465 MHz	25	31.2	-	dB
	2465 – 3707 MHz	18	21.5	-	dB
	3707 – 3768 MHz	20	31.5	-	dB
	3768 – 5179 MHz	20	28.5	-	dB
Input/Output VSWR	2110 – 2170 MHz	-	1.7	2.2:1	-
Load/Source Impedance ⁽¹⁰⁾	single-ended	-	50	-	Ohms

Notes:

1. All specifications are based on the TriQuint schematic shown on page 3
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 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
5. Amplitude Variation is defined as the difference between the lowest loss and the highest loss within defined frequency points
6. Measured with a RRC filtered QPSK modulated signal To be measured only during engineering development
7. To be measured only during engineering development
8. Temperature Drift specification is defined on Page 3 and is guaranteed by design and will not be measured in production.
9. Relative to the maximum insertion loss
10. This is the optimum impedance in order to achieve the performance shown

Temperature Drift Specification

Temperature Drift Equations:

$$\text{Temp Drift}_{\text{high}} = \left| \frac{\max(T_{\text{ambient}} - T_{\text{hot}}) - \min(T_{\text{ambient}} - T_{\text{hot}})}{2} \right|$$

$$\text{Temp Drift}_{\text{low}} = \left| \frac{\max(T_{\text{ambient}} - T_{\text{cold}}) - \min(T_{\text{ambient}} - T_{\text{cold}})}{2} \right|$$

Temperature Drift Terms Defined:

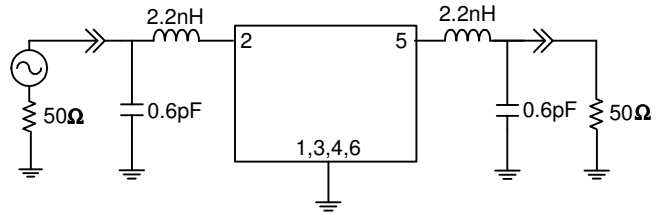
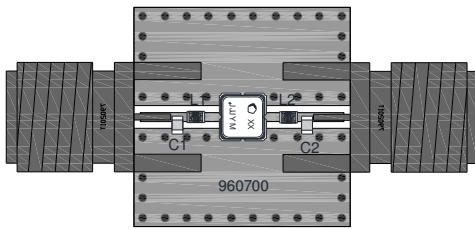
T_{ambient} - Transmission power in dB measured at +25°C.

T_{hot} - Transmission power in dB measured at +85°C.

T_{cold} - Transmission power in dB measured at -40°C.

Temperature Drift - Greater of Temp Drift_{high} vs Temp Drift_{low}

857190-EVB Evaluation Board



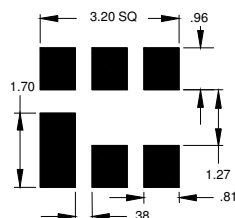
Notes:

1. Impedance matching required.
2. PCB: .500 x .500 x .063; Construction (5 layer stack-up):
1/2 oz Cu Top Layer; Dielectric: Taconic TLY-5A (.0075); 1/2 oz Cu Middle Layer, FR4; 1/2 oz Cu Bottom Layer; total thickness (0.063) (dimensions are in inches).
Contact TriQuint for Gerber files.

Bill of Material – 857190-EVB

Reference Des.	Value	Description	Manuf.	Part Number
U1	N/A	2140 MHz SAW filter	TriQuint	857190
L1, L2	2.2nH	0402 chip, series, wire wound, ±0.2nH	Murata	LQW15AN2N2C10
C1, C2	0.6pF	0402 chip, ceramic, GRM, ±10%	Murata	GRM1555C1HR60KZ01
SMA	N/A	SMA connector	Radiall USA	9602-1111-018
PCB	N/A	3-layer	multiple	960700

PCB Mounting Pattern

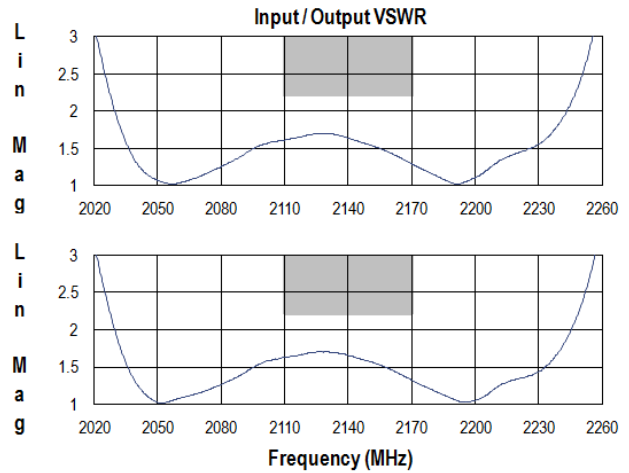
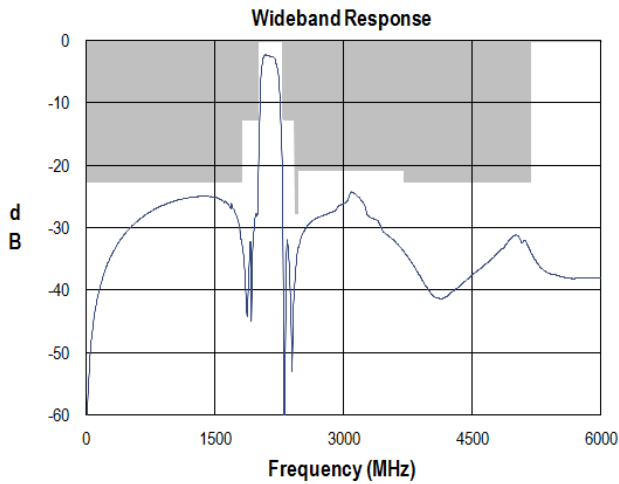
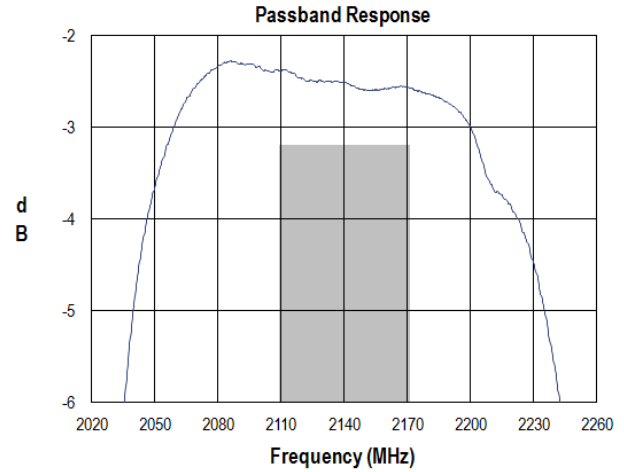
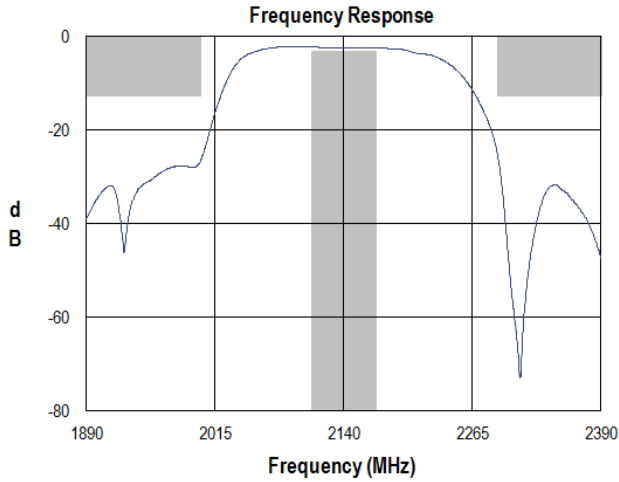


Notes:

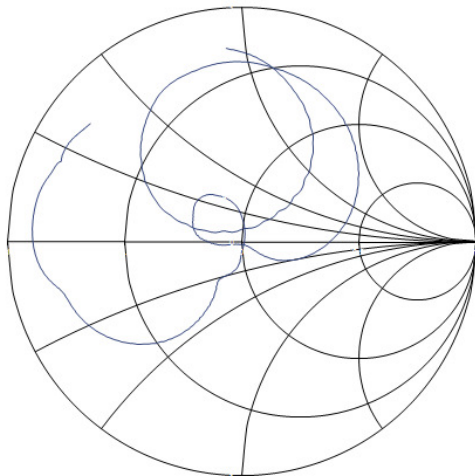
1. All dimensions are in millimeters. Angles are in degrees.
2. This drawing specifies the mounting pattern used on the TriQuint evaluation board for this product. Some modification may be necessary to suit end user assembly materials and processes.

Performance Plots - 857190-EVB

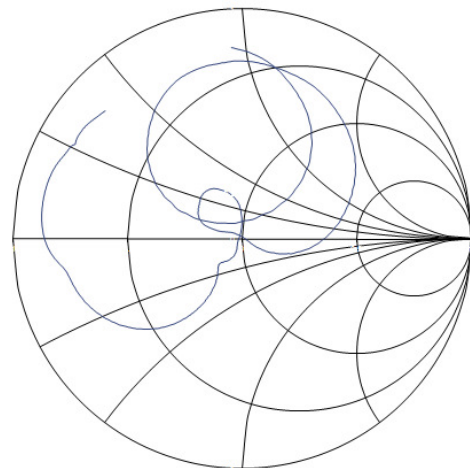
Test conditions unless otherwise noted: Temp= +25°C



Input Smith Chart



Output Smith Chart



Package Information, Marking and Dimensions

Package Style: SMP-12A
Dimensions: 3.00 x 3.00 x 1.22 mm

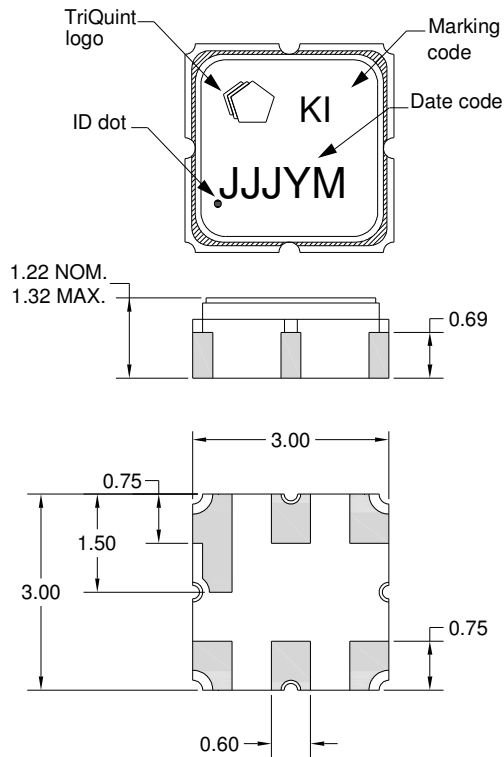
Body: Al_2O_3 ceramic
Lid: Kovar, Ni plated
Terminations: Au plating 0.5 - 1.0 μ m, over a 2-6 μ m Ni plating

All dimensions shown are nominal in millimeters
All tolerances are ± 0.15 mm except overall length and width ± 0.10 mm

The date code consists of day of the current year (Julian, 3 digits), Y = last digit of the year, and M = manufacturing site code

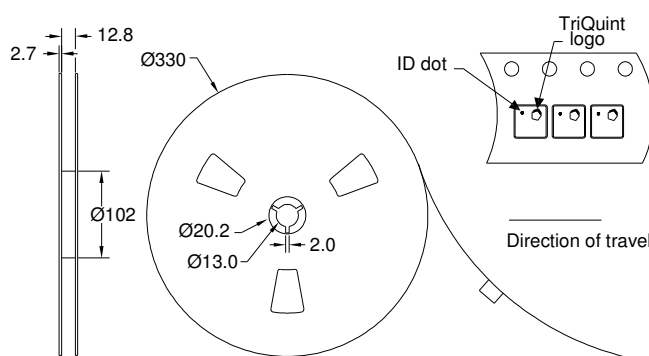
Notes:

1. All dimensions shown are typical in millimeters
2. An asterisk (*) in front of the marking code indicates prototype.

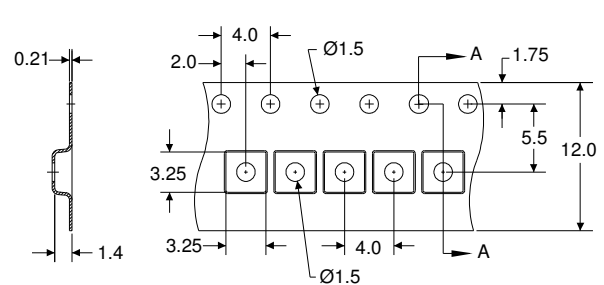


Tape and Reel information

Standard T/R size = 5000 units/reel. All dimensions are in millimeters



Section A-A



Product Compliance Information

ESD Sensitivity Ratings



Caution! ESD-Sensitive Device

ESD Rating: Class 1A
Value: Passes \leq 400 V
Test: Electrostatic Discharge Sensitivity Testing,
Human Body Model (HBM) - component level
Standard: ESDA/JEDEC JS-001-2012

ESD Rating: Class 0B
Value: Passes \leq 200 V
Test: Machine Model (MM)
Standard: JEDEC Standard JESD22-A115

MSL Rating

Not applicable. Hermetic package.

Solderability

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

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 (C₁₅H₁₂Br₄O₂) Free
- PFOS Free
- SVHC Free

Contact Information

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

Web: www.triquint.com **Tel:** 877-800-8584
Email: customer.support@qorvo.com

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

Web: www.qorvo.com

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

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