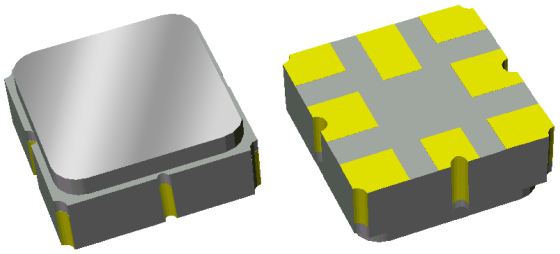
856653

1250 MHz Filter

Applications

- Broadband tuners
- DOCSIS 3.0 gateways
- DOCSIS 3.0 cable modems

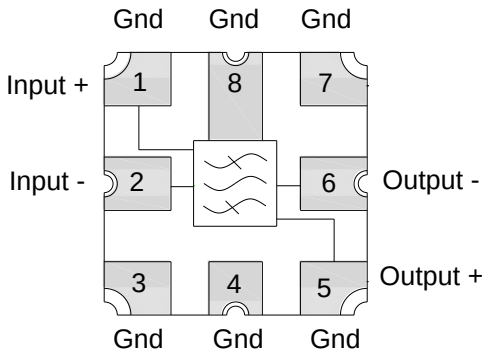


SMP-12D 3.00 x 3.00 x 1.22 mm

Product Features

- Usable bandwidth 100 MHz
- High attenuation
- Balanced operation
- Small Size: 3.00 x 3.00 x 1.22 mm
- Ceramic Surface Mount Package (SMP)
- Hermetic
- RoHS (2002/95/EC) compliant, Pb-free

Functional Block Diagram



Top View

General Description

Tuner IF filter for applications where higher bandwidths, up to 100 MHz, are needed to support DOCSIS 3.0 The design supports industry accepted reference designs and supports the high attenuation demands of CATV set-top boxes.

Pin Configuration

Pin No.	Label
1	Input +
2	Input −
5	Output +
6	Output −
3,4,7,8	Ground

Ordering Information

Part No.	Description
856653	Packaged Part
856653-EVB	Evaluation board

Standard T/R size = 5000 units/reel

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature (1)	-40 to +85 °C
Operable Temperature (1)	-40 to +85 °C

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

Electrical Specifications (1) (3)

Test conditions unless otherwise noted: (2) Temperature Range 0 to +70 °C

Parameter	Conditions	Min	Typical (4)	Max	Units
Center Frequency		-	1250	–	MHz
Maximum Insertion Loss	1200 – 1300 MHz	-	6.8	8	dB
Amplitude Variation	1200 – 1300 MHz 1200 – 1300 MHz (in any 8 MHz channel)	- -	1.1 1.1	3.0 2.0	dB p-p
Group Delay Ripple	1200 – 1300 MHz 1200 – 1300 MHz (in any 8 MHz channel)	- -	18 8	60 18	ns p-p
Attenuation (5)	800 – 1052 MHz 1052 – 1152 MHz 1350 – 1450 MHz 1450 – 2000 MHz	45 40 20 40	55 50 25 50	- - - -	dB
Input / Output Return Loss	1200 – 1300 MHz	-	9	-	dB

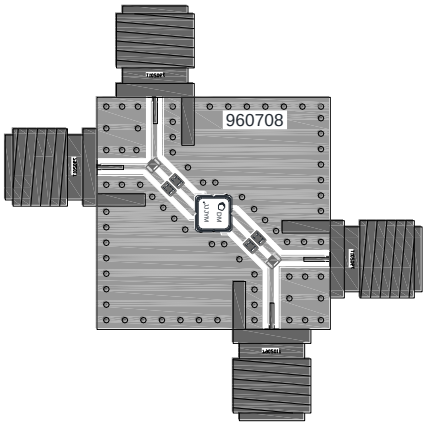
Test conditions unless otherwise noted: (2) Temperature Range -40 to +85 °C

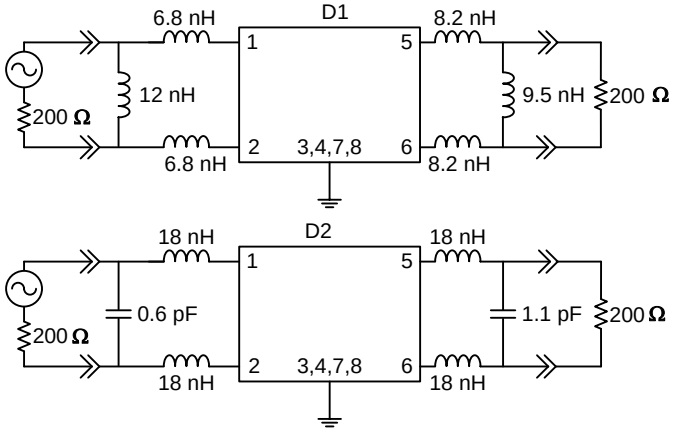
Parameter	Conditions	Min	Typical (4)	Max	Units
Maximum Insertion Loss	1200 – 1300 MHz	-	6.8	8.5	dB
Amplitude Variation	1200 – 1300 MHz 1200 – 1300 MHz (in any 8 MHz channel)	- -	1.1 1.1	3.0 2.0	dB p-p
Group Delay Ripple	1200 – 1300 MHz 1200 – 1300 MHz (in any 8 MHz channel)	- -	18 8	60 18	ns p-p
Attenuation (5)	800 – 1052 MHz 1052 – 1152 MHz 1350 – 1450 MHz 1450 – 2000 MHz	45 40 20 40	55 50 25 50	- - - -	dB
Input / Output Return Loss	1200 – 1300 MHz	-	9	-	dB
Source/Load Impedance (6)	Balanced	-	200	-	Ω

Notes:

1. All specifications are based on the TriQuint schematic for the main reference design 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. Relative to zero dB
6. This is the optimum impedance in order to achieve the performance shown

960686 Evaluation Board



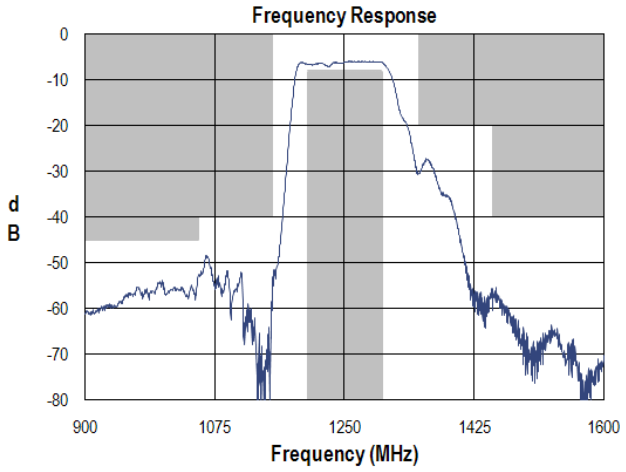


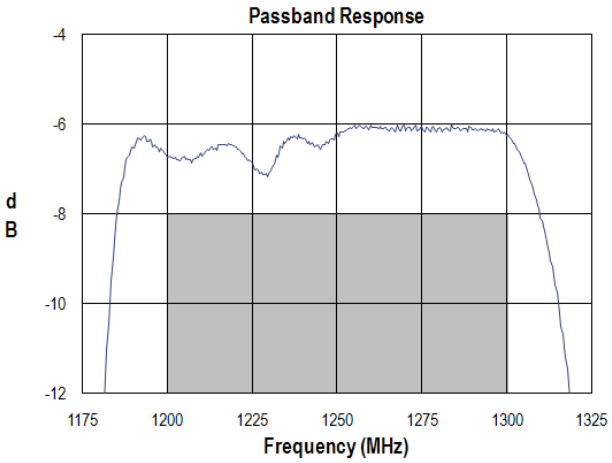
Notes:
3-layers board - top, middle & bottom layer: 1 oz copper
Substrates: .031" thick FR4 dielectric.
Finish plating: Nickel: 3-8 µm thick, Gold: .03-.2 µm thick
Hole plating: Copper min .0008 µm thick

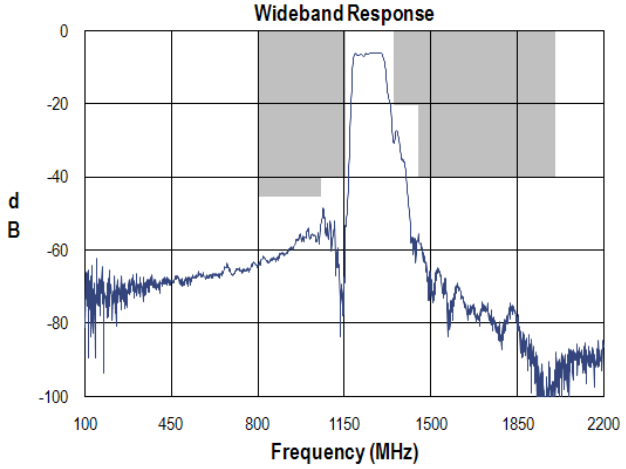
Bill of Material

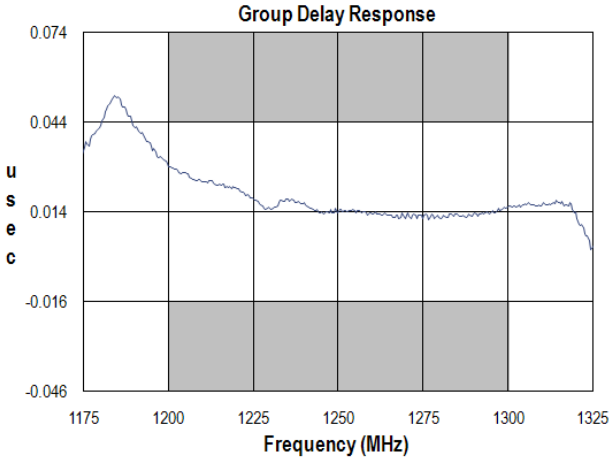
Reference Des. D1	Value	Description	Manuf.	Part Number
L1	12 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN12NH00
L2	6.8 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN6N8H00
L3	6.8 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN6N8H00
L4	8.2 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN8N2H00
L5	8.2 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN8N2H00
L6	9.5 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN9N5H00
Reference Des. D2	**Value**	**Description**	**Manuf.**	**Part Number**
L1	18 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN18NH00
L2	18 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN18NH00
L3	18 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN18NH00
L4	18 nH	Coil Wire-wound, 0402, ± 3%	Murata	LQW15AN18NH00
C1	0.6 pF	Cer. Chip Capacitor, 0402 ± 0.1 pF	Murata	GJM1555C1HR60BB01
C2	1.1 pF	Cer. Chip Capacitor, 0402 ± 0.1 pF	Murata	GJM1555C1H1R1BB01
SMA	N/A	SMA connector	Johnson Components	142-0701-801
PCB	N/A	3-layer	Multiple	960708

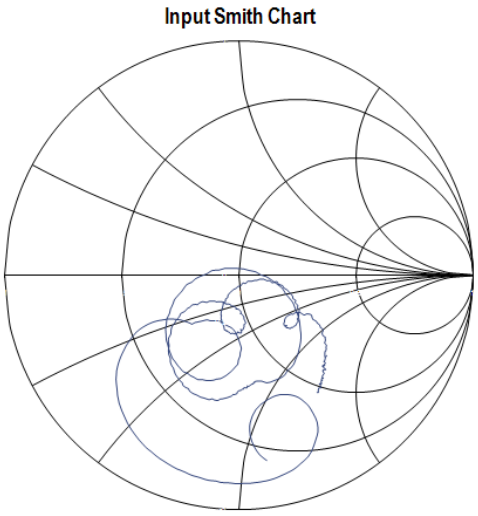
Performance Plots D1 (Test conditions unless otherwise noted: Temp.= +25 °C)

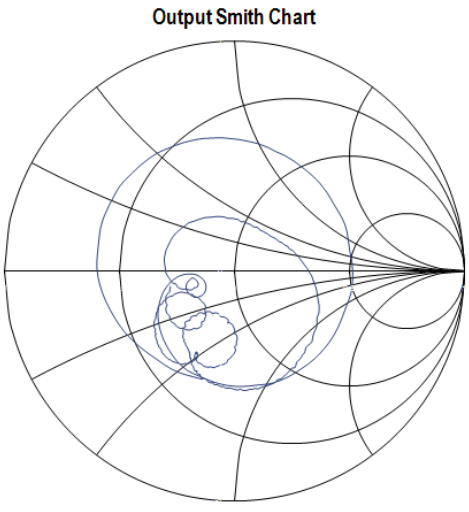




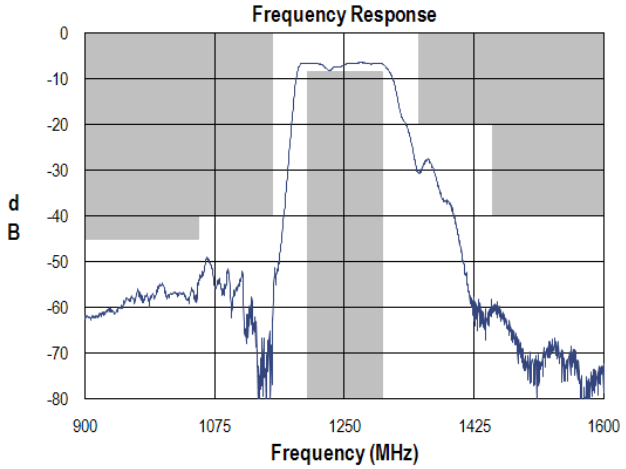


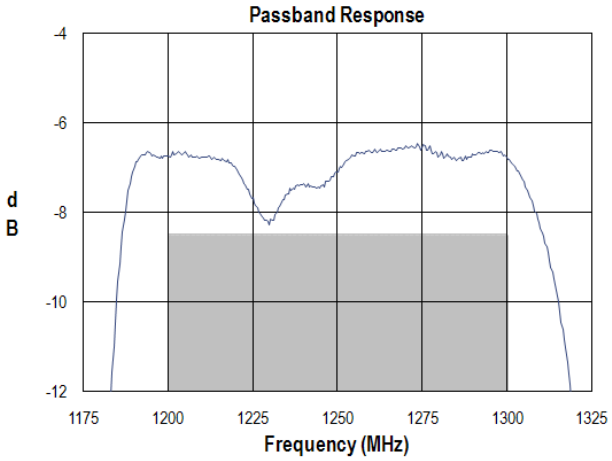


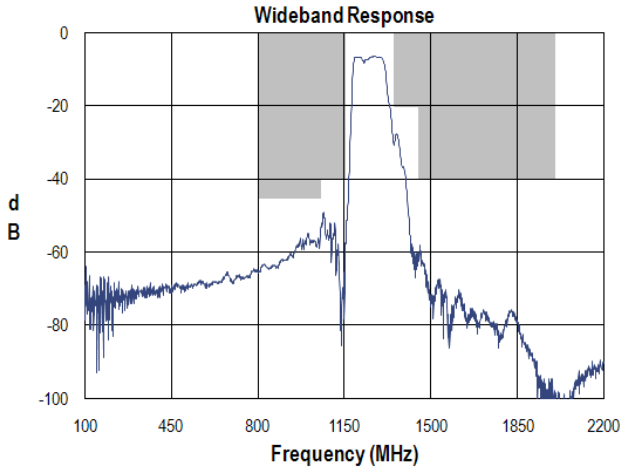


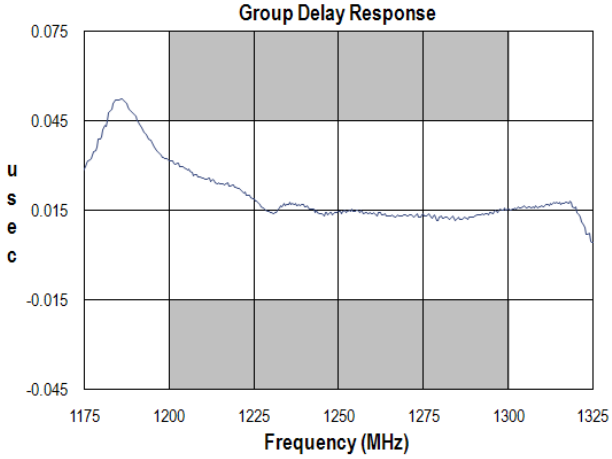


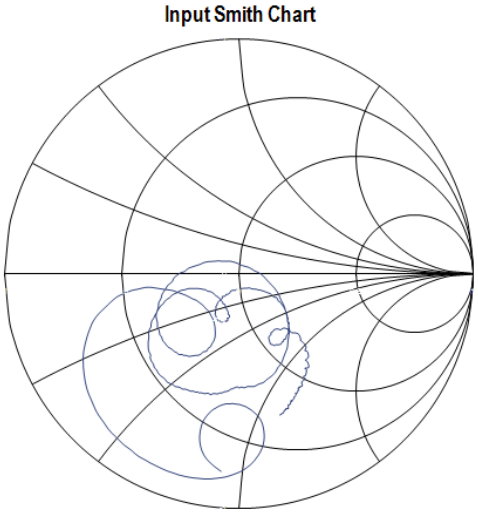
Performance Plots D2 (Test conditions unless otherwise noted: Temp.= + 25 °C)

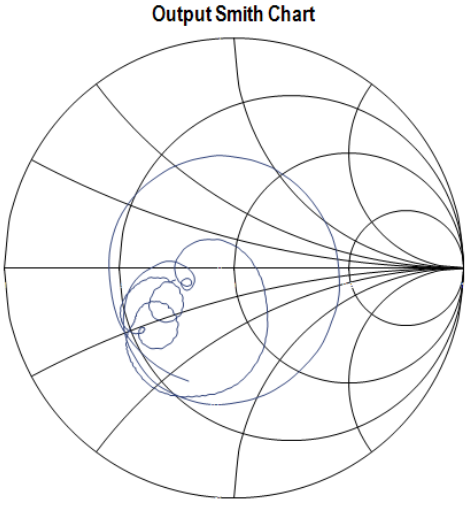




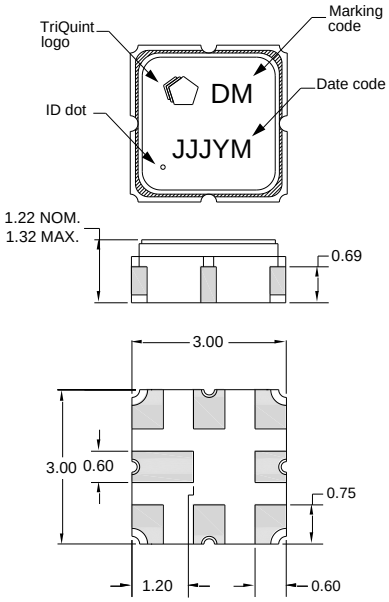








Mechanical Information



Package Style: SMP-12D

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 µm, over a 2-6 µm Ni plating

All dimensions shown are nominal in millimeters

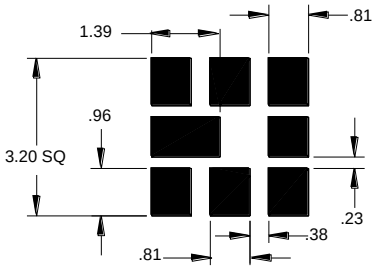
All tolerances are ± 0.15 mm except overall length and width ± 0.10 mm

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.

PCB Mounting Pattern

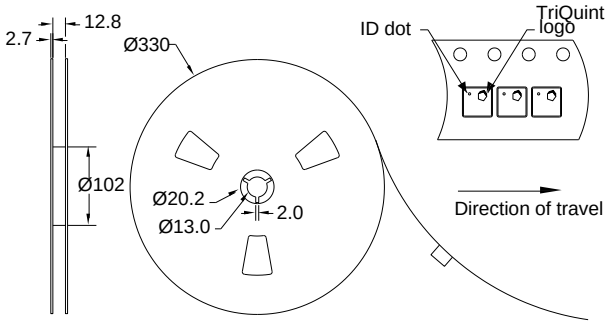


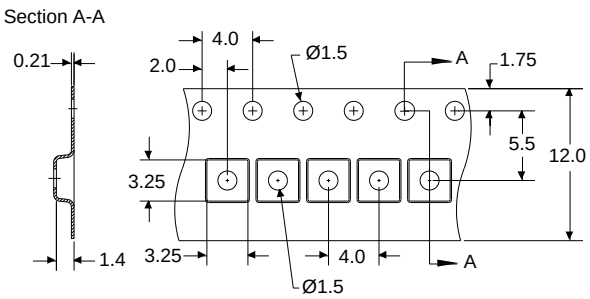
Notes:

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.

Tape and Reel information

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





Product Compliance Information

ESD Sensitivity Ratings

Caution! ESD-Sensitive Device

ESD Rating: 1A
Value: Passes ≥ 300 V min.
Test: Human Body Model (HBM)
Standard: ESDA/JEDEC JS-001-2012

ESD Rating: A
Value: Passes ≥ 150 V min.
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 ($C_{15}H_{12}Br_4O_2$) 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:** +1.407.886.8860
Email: info-sales@tqs.com **Fax:** +1.407.886.7061

For technical questions and application information:

Email: flapplication.engineering@tqs.com

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