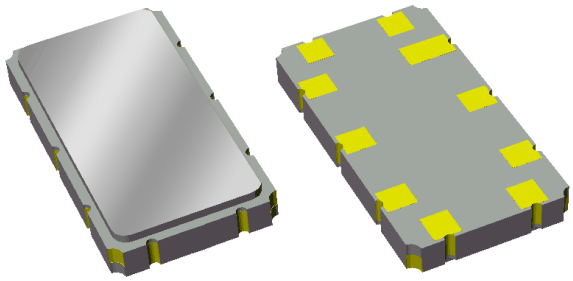
856774

140 MHz SAW Filter

Applications

- General purpose wireless
- Wireless infrastructure
- 3G, 4G, Multi-standard

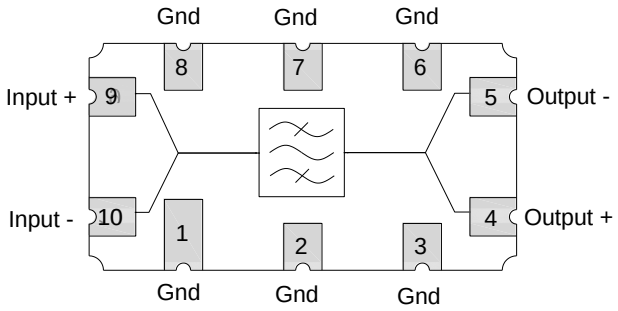


Product Features

- Usable bandwidth 56 MHz
- High attenuation
- Very Low EVM
- Balanced or single-ended operation
- Ceramic Surface Mount Package (SMP)
- Small Size: 9.1 x 4.8 x 1.24 mm
- Hermetic **RoHS** compliant, **Pb**-free

Functional Block Diagram

Top view



General Description

140 MHz IF filter specifically designed for low signal distortion in both amplitude and phase response.

Designed for versatile drive configurations, this filter can be used either single-ended or in a balanced configuration

Excellent attenuation and flat in-band performance leading to low EVM contribution, makes this filter an effective choice for many different types of wideband communications systems.

Pin Configuration Bal/Bal

Pin #	Description
9	Input +
10	Input -
4	Output +
5	Output -
1,2,3,6,7,8	Case Ground

Ordering Information

Part No.	Description
856774	packaged part
856774-EVB	evaluation board

Standard T/R size = 4000 units/reel.

Specifications

Electrical Specifications [1]

Specified Temperature Range: [2] -40 to +85 ºC

Parameter [3]	Conditions	Min	Typical [4]	Max	Units
Center Frequency		-	140	-	MHz
Minimum Insertion Loss		-	22.3	23	dB
Amplitude Variation	112 – 168 MHz	-	0.7	1.5	dB
Phase Linearity	112 – 168 MHz	-	2.7	7.0	deg p-p
Group Delay Variation	112 – 168 MHz	-	13	40	ns p-p
Average Group Delay	112 – 168 MHz	-	0.43	0.5	µs
Time Domain Spurious [5]					
	0.7 – 1.45 µs	50	54	-	dB
	1.45 – 5.0 µs	55	66	-	dB
RF Feedthrough [6]	112 – 168 MHz	50	59	-	dB
Input/output Return Loss	112 – 168 MHz	8	9.5	-	dB
Relative Attenuation [7]					
	10 – 101 MHz	40	49	-	dB
	179 – 192 MHz	35	42	-	dB
	192 – 250 MHz	40	44	-	dB
Source Impedance (balanced) [8]	-	-	50	-	Ω
Load Impedance (balanced) [8]	-	-	50	-	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 main time domain signal
6. Measured over 90 to 190 MHz
7. Relative to minimum insertion loss
8. This is the optimum impedance in order to achieve the performance shown

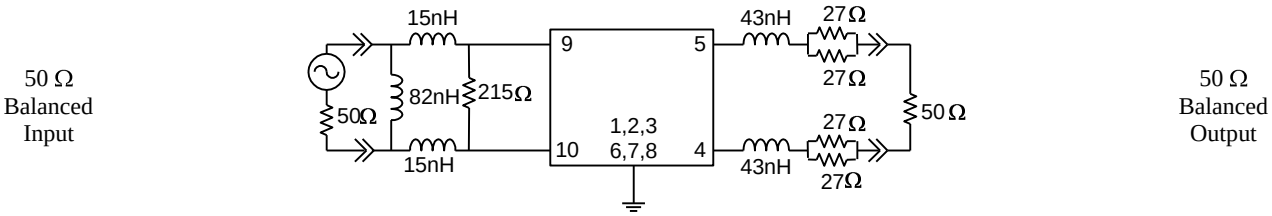
Absolute Maximum Ratings

Parameter	Rating
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +85 °C
Input Power	+10 dBm

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

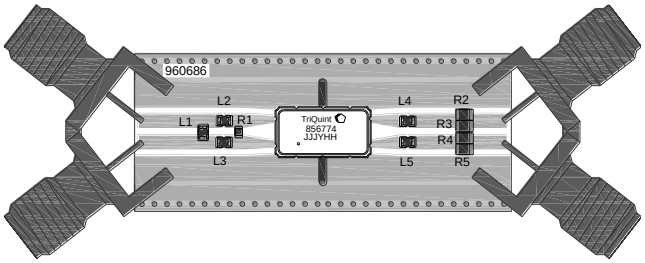
Reference Design

Schematic



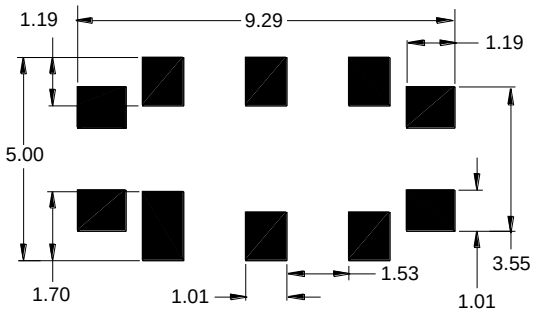
Notes:
1. Actual matching values may vary due to PCB layout and parasitics

PC Board



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

Mounting Configuration



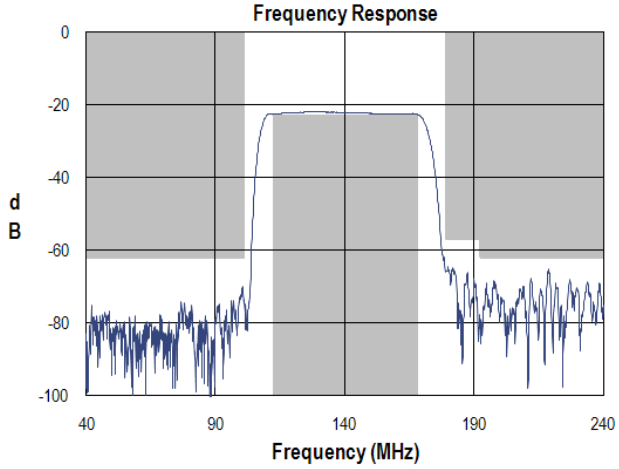
Notes:
1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

Bill of Material

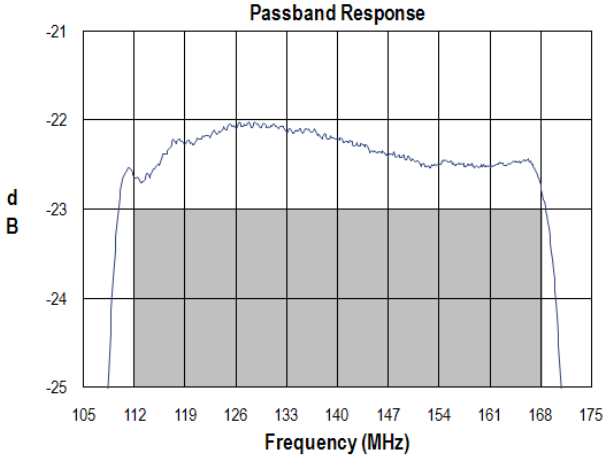
Reference Desg.	Value	Description	Manufacturer	Part Number
L1	82nH	Coil Wire-wound, 0805, 5%	Coillcraft	0805CS-820XJBC
L2	15nH	Coil Wire-wound, 0805, 5%	Coillcraft	0805CS-150XJBC
L3	15nH	Coil Wire-wound, 0805, 5%	Coillcraft	0805CS-150XJBC
L4	43nH	Coil Wire-wound, 0805, 5%	Coillcraft	0805CS-430XJBC
L5	43nH	Coil Wire-wound, 0805, 5%	Coillcraft	0805CS-430XJBC
R1	215Ω	Ceramic Chip, 0603, 5%	KOA	RN731JT-B25
R2	27Ω	Ceramic Chip, 0805, 5%	KOA	RM73BJ270
R3	27Ω	Ceramic Chip, 0805, 5%	KOA	RM73BJ270
R4	27Ω	Ceramic Chip, 0805, 5%	KOA	RM73BJ270
R5	27Ω	Ceramic Chip, 0805, 5%	KOA	RM73BJ270
SMA	N/A	SMA connector	Johnson Components	142-0701-801
PCB	N/A	3-layer	multiple	960686

Typical Performance (at room temperature)

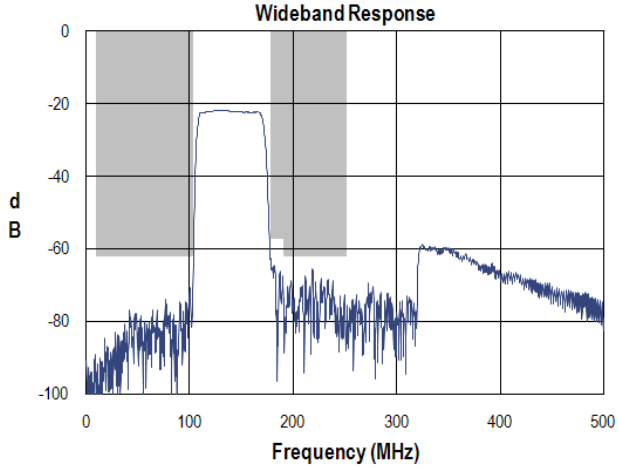
Frequency Response



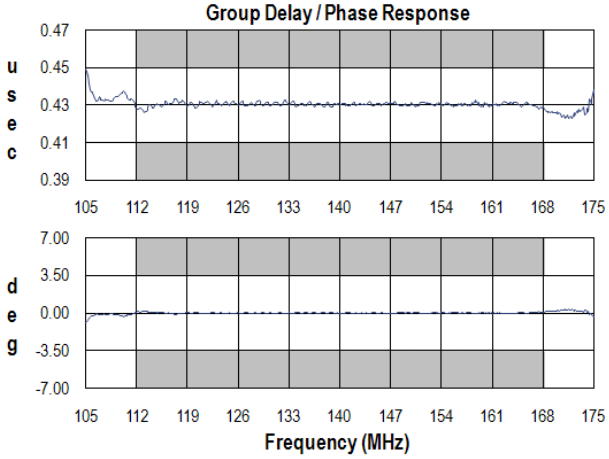
Passband Response



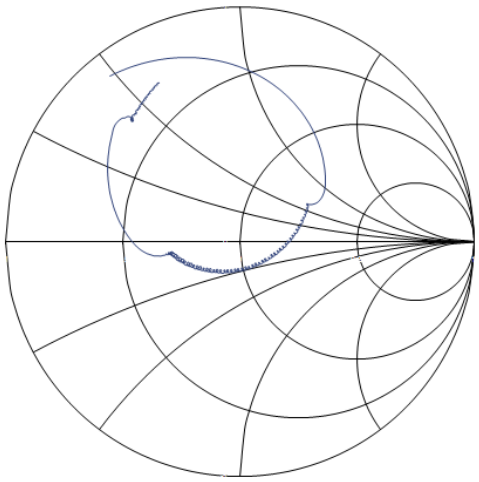
Wideband Response



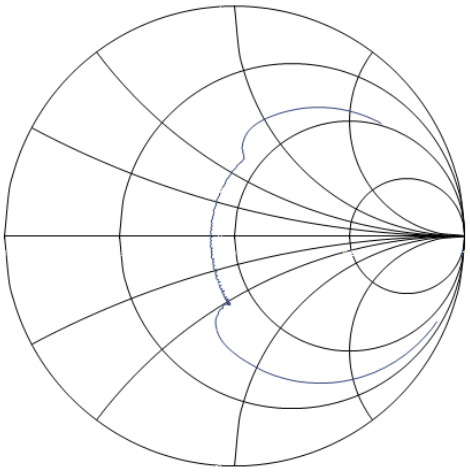
Group Delay / Phase Response



Input Smith Chart

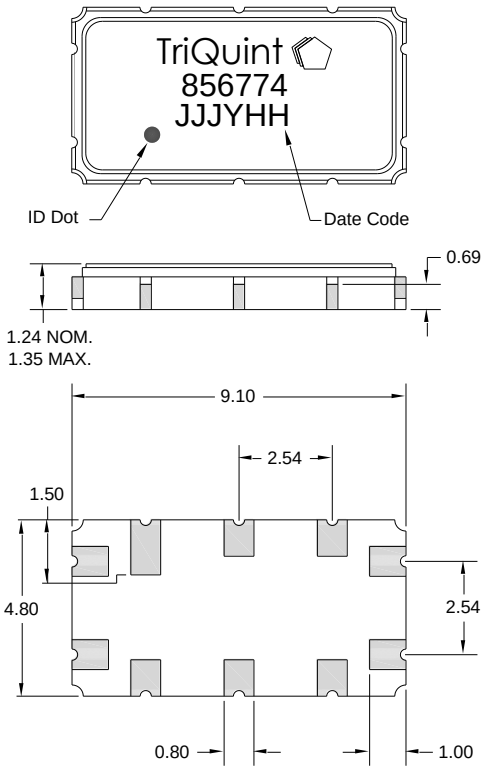


Output Smith Chart



Mechanical Information

Package Information, Dimensions and Marking



Package Style: SMP-35C
Dimensions: 9.10 x 4.80 x 1.24 mm

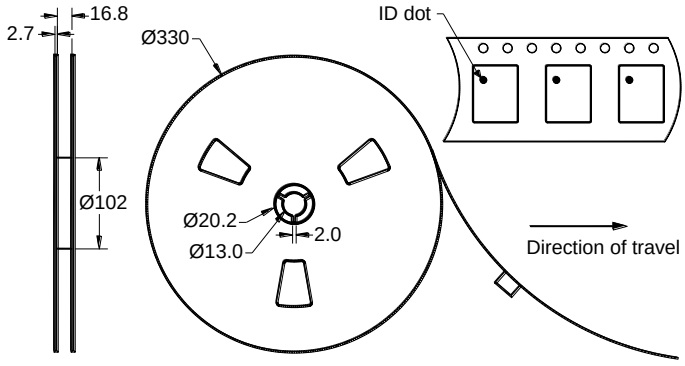
Body: Al_2O_3 ceramic
Lid: *Kovar*, *Ni* plated
Terminations: *Au* plating 0.5 - 1.0µm, over a 2-6µm *Ni* plating

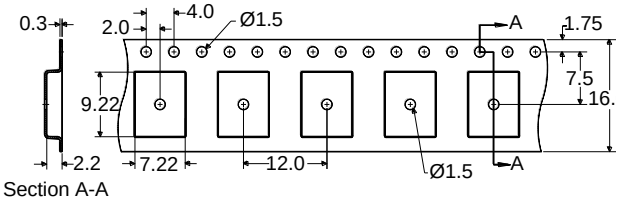
All dimensions shown are nominal in millimeters
All tolerances are ±0.15mm except overall length and width ±0.10mm

The date code consists of day of the current year (Julian, 3 digits), last digit of the year (1 digit) and hour (2 digits)

Tape and Reel Information

Standard T/R size = 4000 units/reel. All dimensions are in millimeters





Product Compliance Information

ESD Information

Caution! ESD-Sensitive Device

ESD Rating: 1A
Value: Passes ≥ 400 V min.
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

ESD Rating: B
Value: Passes ≥ 250 V min.
Test: Machine Model (MM)
Standard: JEDEC Standard JESD22-A115

MSL Rating

Devices are Hermetic, therefore MSL is not applicable.

Solderability

Compatible with the latest version of J-STD-020, lead free solder, 260°C

Refer to Soldering Profile for recommended guidelines.

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:

- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free

Contact Information

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