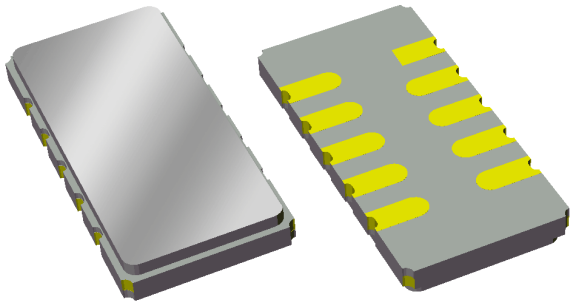
856517

153.6 MHz SAW Filter

Applications

- General Purpose
- Broadband Wireless Applications
- For IF applications

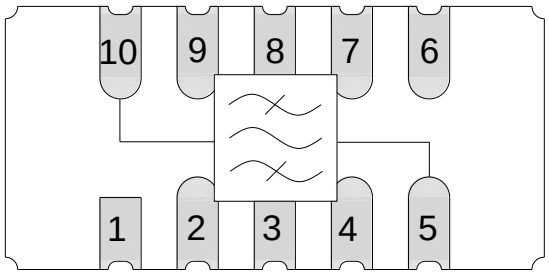


Product Features

- Usable bandwidth 32 MHz
- Low loss
- High Attenuation
- Single-ended operation
- Ceramic Surface Mount Package (SMP)
- Small Size
- Dimensions: 13.30 x 6.50 x 1.5mm
- Hermetic **RoHS** compliant, **Pb**-free

Functional Block Diagram

Top view



General Description

The 856517 is a high-performance IF SAW filter with a center frequency of 153.6 MHz and a usable bandwidth of 32 MHz. It is suitable for a wide variety of applications, including broadband wireless data transceivers.

It features low loss with excellent attenuation, and is designed to be used with a single ended input and output.

The device is RoHS compliant and Pb-free.

Pin Configuration

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

Ordering Information

Part No.	Description
856517	packaged part
856517-EVB	evaluation board

Standard T/R size = 2000 units/reel.

Specifications

Electrical Specifications [1]

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

Parameter [3]	Conditions	Min	Typical [4]	Max	Units
Center Frequency		-	153.6	-	MHz
Insertion Loss	at 153.6 MHz	-	13	15	dB
1.0 dB Lower Frequency [7]		-	136.1	136.7	MHz
1.0 dB Upper Frequency [7]		169.6	171.1	-	MHz
Amplitude Variation [5]	137.6 – 169.6 MHz	-	0.7	1.2	dB p-p
Phase Ripple (p-p)	137.6 – 169.6 MHz	-	5	12	deg p-p
Phase Ripple (RMS)	137.6 – 169.6 MHz	-	1	2.5	deg p-p
Absolute Group Delay at 153.6 MHz	137.6 – 169.6 MHz	-	0.7	0.8	µs
Group Delay Variation	137.6 – 169.6 MHz	-	50	100	ns p-p
Stopband Attenuation [7]	70 – 125 MHz	40	52	-	dB
	275 – 350 MHz	35	55	-	dB
	400 – 1000 MHz	40	45	-	dB
	1000 – 2000 MHz	30	40	-	dB
Input Return Loss [6]	137.6 – 169.6 MHz	8	10	-	dB
Output Return Loss [6]	137.6 – 169.6 MHz	9	11	-	dB
Source Impedance (single-ended) [8]	-	-	50	-	Ω
Load Impedance (single-ended) [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. Is defined as the difference between the lowest loss and the highest loss within defined frequency points
6. An external impedance matching network +/- 2% tolerance will be necessary to achieve proposed return loss
7. Relative to Insertion loss at center frequency
8. This is the optimum impedance in order to achieve the performance shown

Absolute Maximum Ratings

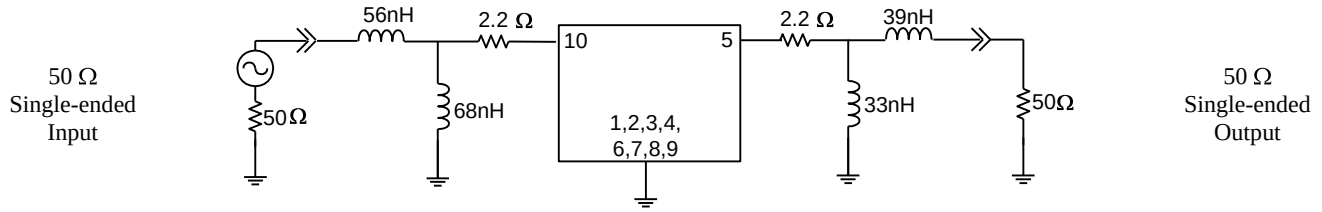
Parameter	Rating
Operating Temperature [9]	-40 to +85 °C
Storage Temperature	-40 to +85 °C

9. Device may operate over this range with degraded Electrical Specifications

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

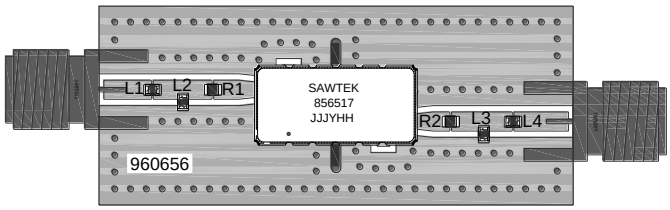
Reference Design – 50Ω SE Input, 50Ω SE Output

Schematic



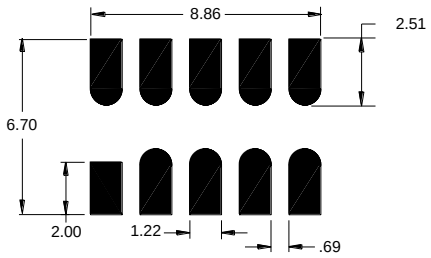
Notes:
1. Actual matching values may vary due to PCB layout and parasitics

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



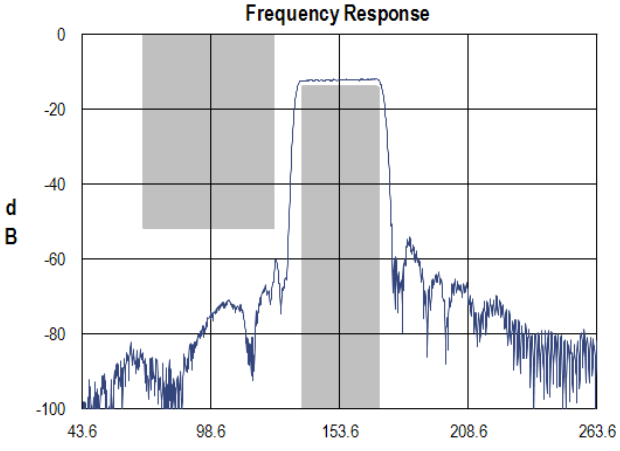
Notes:
1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

Bill of Material

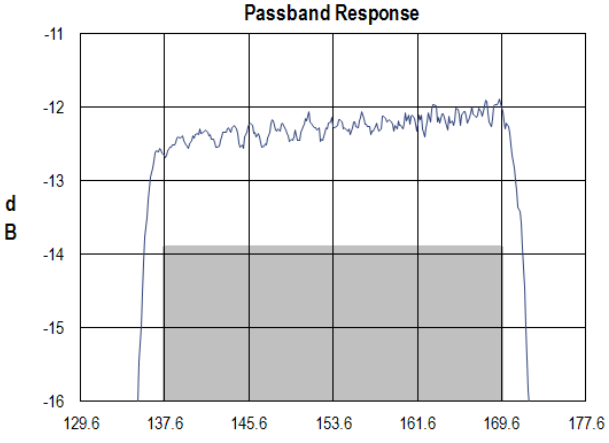
Reference Desg.	Value	Description	Manufacturer	Part Number
L1	56nH	Coil Wire-wound, 0603, 5%	CoillCraft	0603CS-560XJBC
L2	68nH	Coil Wire-wound, 0603, 5%	CoillCraft	0603CS-680XJBC
L3	33nH	Coil Wire-wound, 0603, 5%	CoillCraft	0603CS-330XJBC
L4	39nH	Coil Wire-wound, 0603, 5%	CoillCraft	0603CS-390XJBC
R1	2.2 Ohms	Chip Ceramic, 0603, 5%	Skywell	RC03J2R2G
R2	2.2 Ohms	Chip Ceramic, 0603, 5%	Skywell	RC03J2R2G
SMA	N/A	SMA connector	Radiall USA Inc.	9602-1111-018
PCB	N/A	3-layer	multiple	960740

Typical Performance (at room temperature)

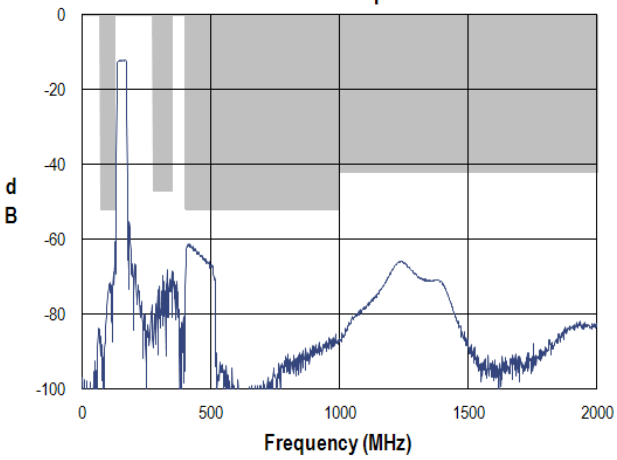
Frequency Response



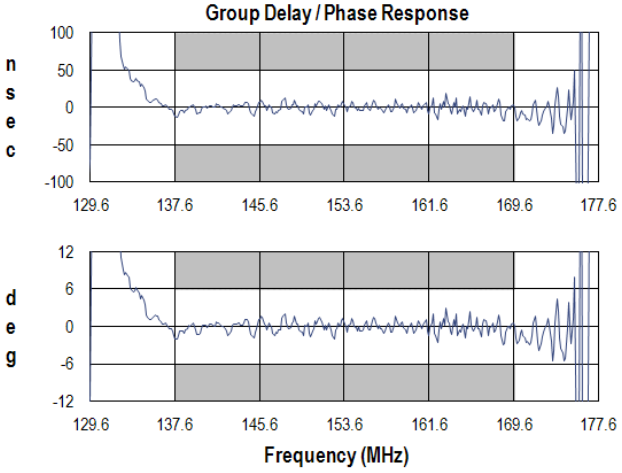
Passband Response



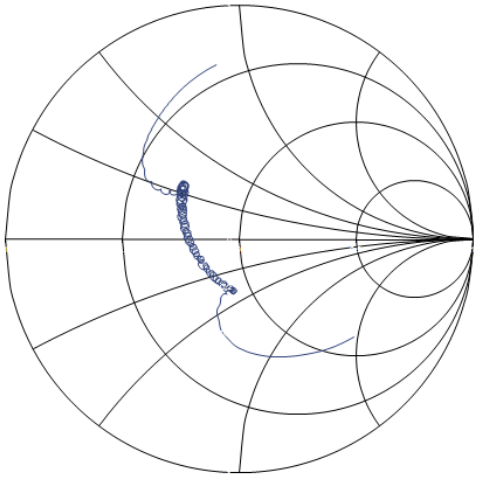
Wideband Response



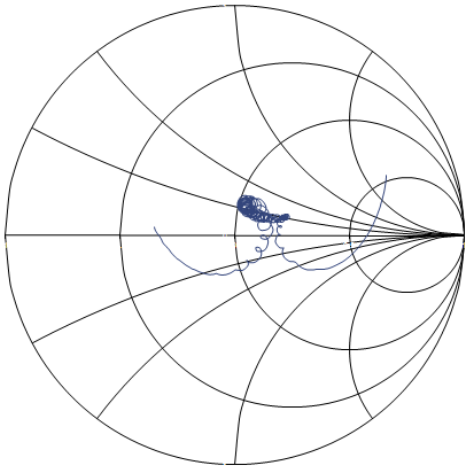
Group Delay / Phase Response



Input Smith Chart

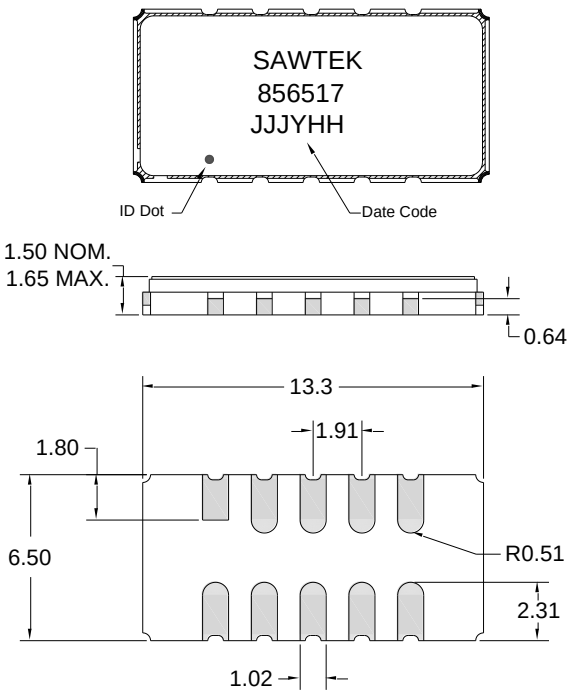


Output Smith Chart



Mechanical Information

Package Information, Dimensions and Marking



Package Style: SMP-53C
Dimensions: 13.3 x 6.50 x 1.50 mm

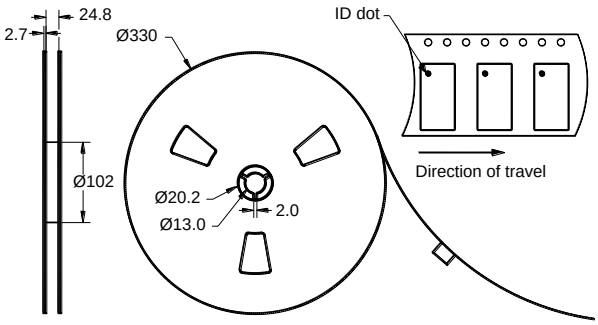
Body: Al_2O_3 ceramic
Lid: *Kovar, Ni* plated
Terminations: *Au* plating 0.5 - 1.0µm, over a 2-6µm *Ni* plating

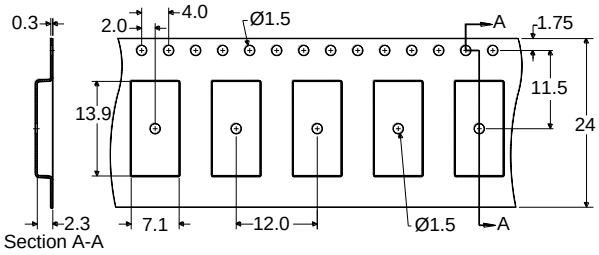
All dimensions shown are nominal in millimeters
All tolerances are ±0.15mm except overall length and width ±0.10mm

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 = 2000 units/reel. All dimensions are in millimeters





Product Compliance Information

ESD Information

Caution! ESD-Sensitive Device

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

ESD Rating: TBD
Value: Passes ≥ TBD 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 ($C_{15}H_{12}Br_40_2$) Free
- PFOS Free
- SVHC Free

Contact Information

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