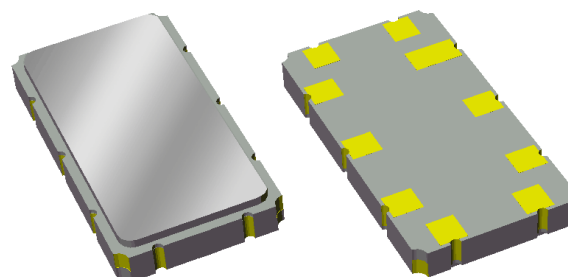


# 856496


## 208 MHz SAW Filter

### Applications

- For WCDMA applications

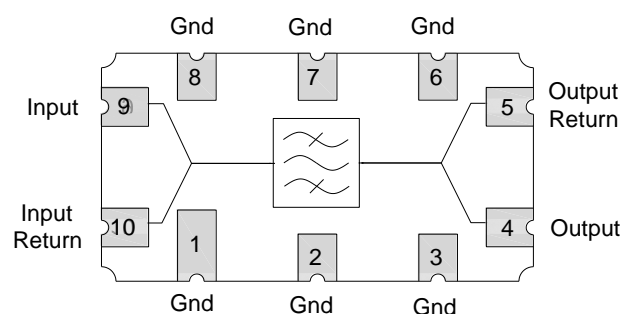


### Product Features

- Usable bandwidth 3.84 MHz
- High attenuation
- Balanced operation
- Ceramic Surface Mount Package (SMP)
- Small Size
- Hermetic **RoHS** compliant, **Pb-free** 

### Functional Block Diagram

Top view



### General Description

The 856496 is a high-performance IF SAW filter with a center frequency of 208 MHz and a 1 dB bandwidth of 3.84 MHz.

It features low loss with excellent attenuation, and is designed to be used with a balanced pin input and output. The small size of this surface mounted filter makes it an economical choice for demanding applications such as WCDMA or other similar high data rate communications standards.

This device is RoHS compliant and Pb-free.

### Pin Configuration

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

### Ordering Information

Part No.	Description
856496	packaged part
856496-EVB	evaluation board

Standard T/R size = 4000 units/reel.

## Specifications

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

Specified Temperature Range: <sup>(2)</sup> -40 to +85 °C

Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Center Frequency		-	208	-	MHz
Insertion Loss $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	-	11.5	13	dB
1 dB Bandwidth <sup>(5)</sup>	206.08 – 209.92 MHz	3.84	4.23	-	MHz
Amplitude Variation $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	-	0.8	1.0	dB p-p
Mean Group Delay $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	1.029	1.035	1.039	-
Phase Ripple $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	-	5.0	-	deg
Phase Ripple RMS $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	-	1.2	2.0	deg RMS
EVM $F_0 \pm 1.92$ MHz	206.08 – 209.92 MHz	-	3.0	6.0	%
Stop band Attenuation <sup>(5)</sup>					
148 - 180 MHz	( $F_0 - 60$ to $F_0 - 28$ MHz)	55	70	-	dB
180 - 190 MHz	( $F_0 - 28$ to $F_0 - 18$ MHz)	45	63	-	dB
190 - 203 MHz	( $F_0 - 18$ to $F_0 - 5$ MHz)	40	45	-	dB
203 - 204.7 MHz	( $F_0 - 5$ to $F_0 - 3.3$ MHz)	36	39	-	dB
204.7 - 205.2 MHz	( $F_0 - 3.3$ to $F_0 - 2.8$ MHz)	28	31	-	dB
205.2 - 205.4 MHz	( $F_0 - 2.8$ to $F_0 - 2.6$ MHz)	25	30	-	dB
205.4 - 205.485 MHz	( $F_0 - 2.6$ to $F_0 - 2.515$ MHz)	17	26	-	dB
210.515 - 210.6 MHz	( $F_0 + 2.515$ to $F_0 + 2.6$ MHz)	17	26	-	dB
210.6 - 210.8 MHz	( $F_0 + 2.6$ to $F_0 + 2.8$ MHz)	23	26	-	dB
210.8 - 211.3 MHz	( $F_0 + 2.8$ to $F_0 + 3.3$ MHz)	28	30	-	dB
211.3 - 213 MHz	( $F_0 + 3.3$ to $F_0 + 5$ MHz)	33	35	-	dB
213 - 226 MHz	( $F_0 + 5$ to $F_0 + 18$ MHz)	40	42	-	dB
226 - 236 MHz	( $F_0 + 18$ to $F_0 + 28$ MHz)	45	56	-	dB
236 - 268 MHz	( $F_0 + 28$ to $F_0 + 60$ MHz)	55	58	-	dB
Source Impedance (balanced) <sup>(6)</sup>	-	-	200	-	$\Omega$
Load Impedance (balanced) <sup>(6)</sup>	-	-	200	-	$\Omega$

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 minimum insertion loss
6. This is the optimum impedance in order to achieve the performance shown

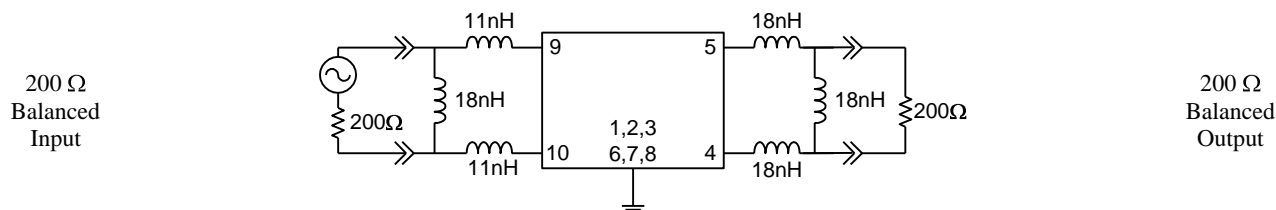
### Absolute Maximum Ratings

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

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

### Reference Design

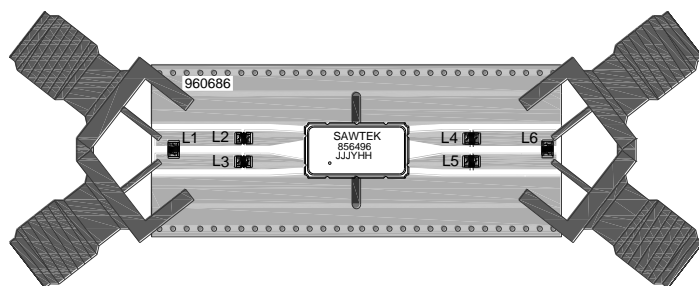
#### Schematic



Notes:

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

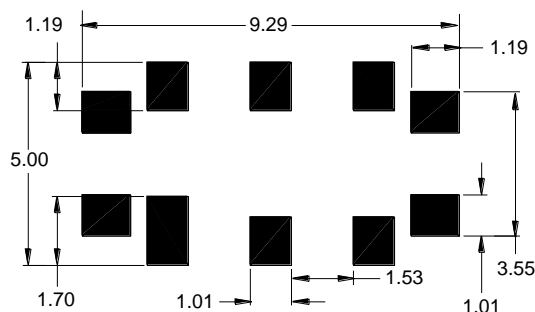
#### PC Board



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.

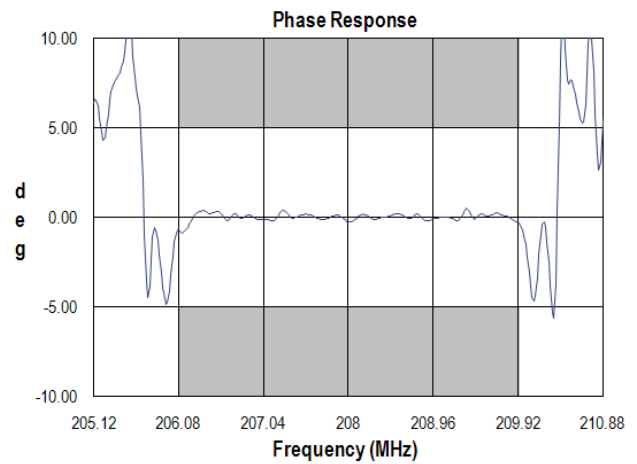
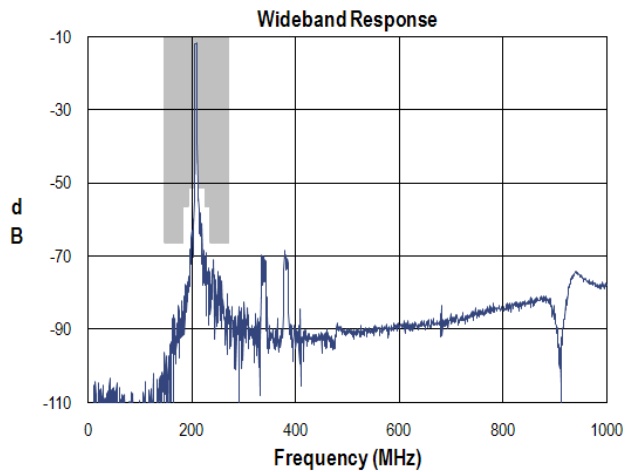
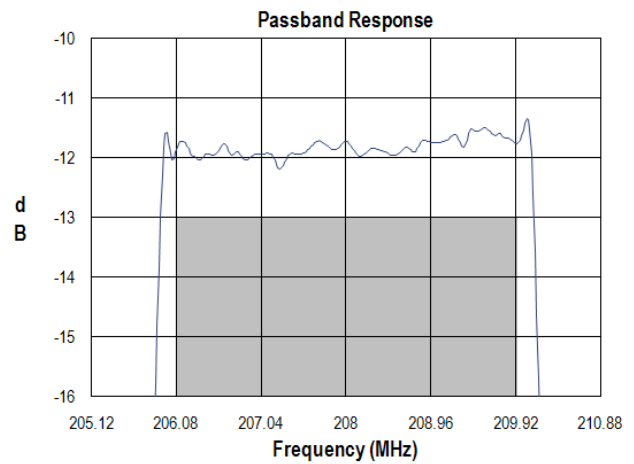
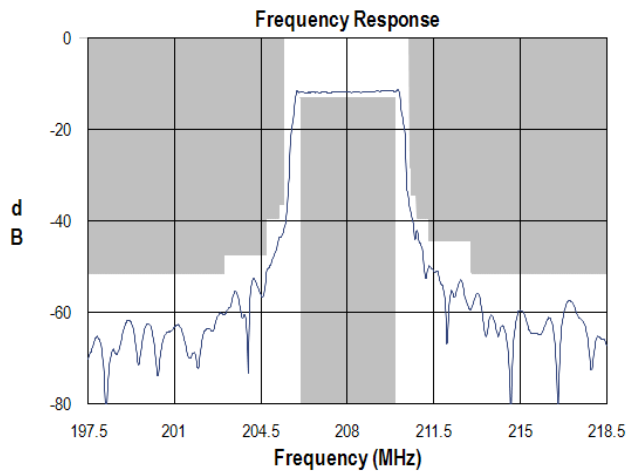
#### Bill of Material

Reference Desg.	Value	Description	Manufacturer	Part Number
L1	18nH	Coil Wire-wound, 0603, 5%	Coilcraft	0603CS-18NXJBC
L2	11nH	Coil Wire-wound, 0603,, 5%	Coilcraft	0603CS-11NXJBC
L3	11 nH	Coil Wire-wound, 0603,, 5%	Coilcraft	0603CS-11NXJBC
L4	18 nH	Coil Wire-wound, 0603,, 5%	Coilcraft	0603CS-18NXJBC
L5	18 nH	Coil Wire-wound, 0603,, 5%	Coilcraft	0603CS-18NXJBC
L6	18 nH	Coil Wire-wound, 0603,, 5%	Coilcraft	0603CS-18NXJBC
SMA	N/A	SMA connector	Johnson Components	142-0701-801
PCB	N/A	3-layer	multiple	960686

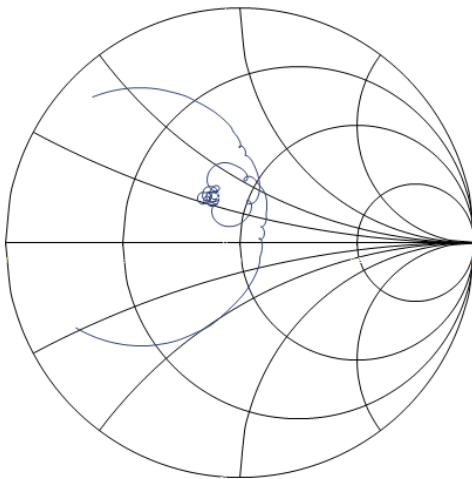
# 856496

## 208 MHz SAW Filter

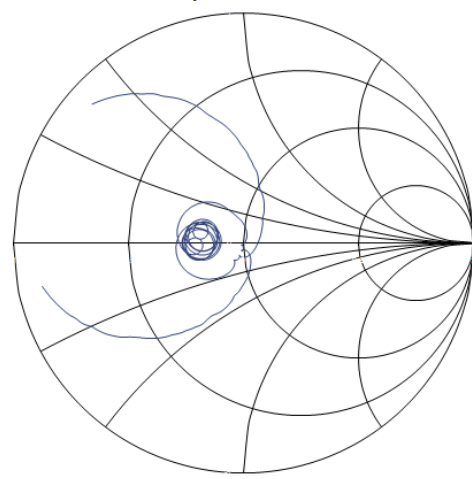
### Typical Performance (at room temperature)



Input Smith Chart

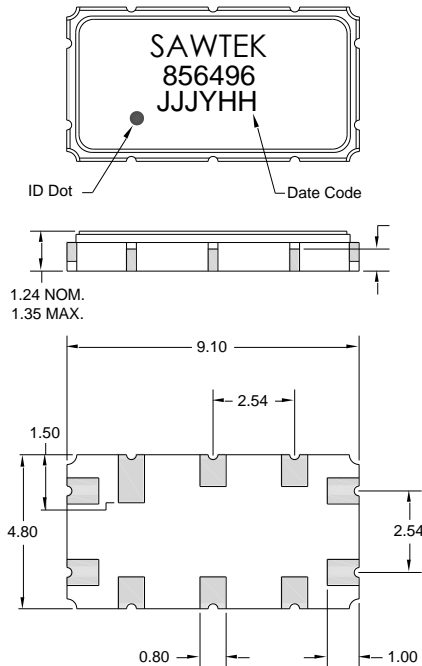


Output Smith Chart



### Mechanical Information

#### Package Information, Dimensions and Marking



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

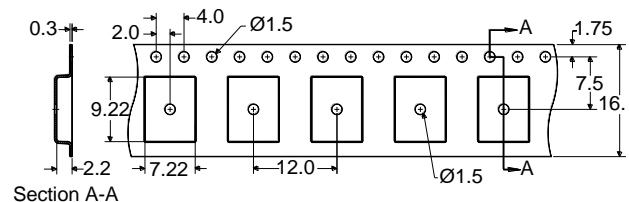
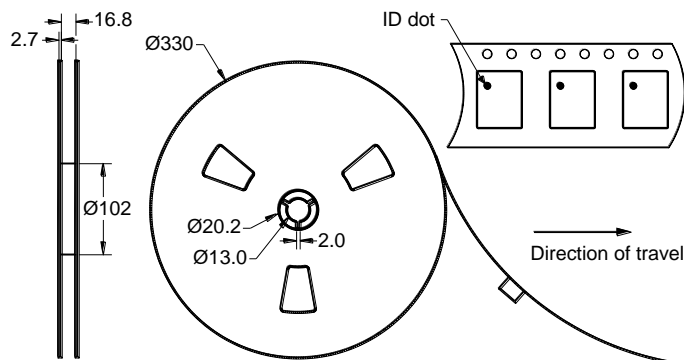
Body:  $Al_2O_3$  ceramic  
Lid: Kovar, Ni plated  
Terminations: Au plating 0.5 - 1.0 $\mu$ m, over a 2-6 $\mu$ m Ni plating

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

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: 1C

Value: Passes  $\geq 1150V$  min.  
Test: Human Body Model (HBM)  
Standard: JEDEC Standard JESD22-A114

ESD Rating: B

Value: Passes  $\geq 250V$  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

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

Web: [www.triquint.com](http://www.triquint.com)  
Email: [info-sales@tqs.com](mailto:info-sales@tqs.com)

Tel: +1.407.886.8860  
Fax: +1.407.886.7061

For technical questions and application information:

Email: [applications.engineering@tqs.com](mailto:applications.engineering@tqs.com)

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