

# Surface Acoustic Wave Components

f o r R F C o n t r o l S y s t e m s

## What are SAW components used for?

In remote control applications, SAW resonators provide stable frequencies for the RF carrier signal to transmit data over a range of 10 to 300 m or for the local oscillators of superhet receivers. The front-end filter in the receiver eliminates interference from the incoming RF signal, thus increasing selectivity and sensitivity in short-range devices.

## Benefits

- SAW resonators with tight frequency tolerances:  $\pm 75/\pm 50$  kHz
- Identical pinning for all standard frequencies in each package size
- Hermetically sealed SMD packages
- Extended operating temperature range from  $-40$  °C up to  $+125$  °C
- Improved shock and vibration strength thanks to stress-free cold seam-welding of the metal lid
- Patented passivation technologies for enhanced reliability
- 100% final examination
- All EPCOS factories are certified to automotive standard ISO/TS 16949
- Component qualification to automotive test procedure AEC-Q200
- Full level 3 PPAP available
- Unique production know-how and volume benefits from the world market leader in SAW components
- Compliant to EU RoHS Directive (2002/95/EC)
- Lead-free soldering compatible with J-STD 20C
- Helps to fulfill ETSI EN 300 220 and FCC Part 15

# Applications

## Automotive



Remote keyless entry



Tire-pressure monitoring

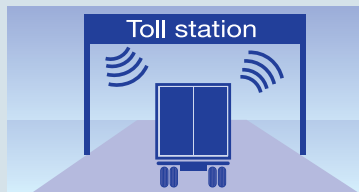


Automotive telematics / navigation

## Security and access



Fire alarm, burglar alarm

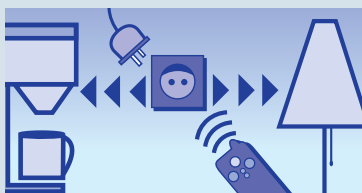


Automotive toll systems



Container tagging

## Home convenience



Wireless switches



Advanced metering infrastructure



Garage-door openers

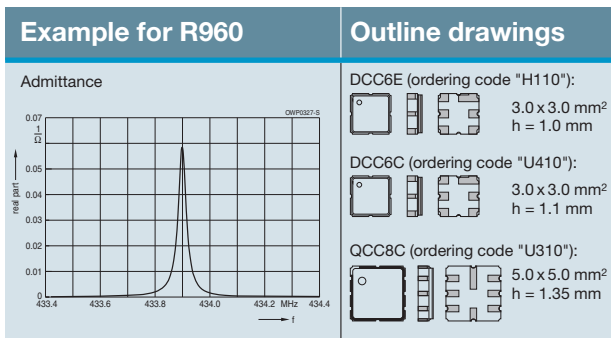


Wireless audio



Remote controls

# Resonators

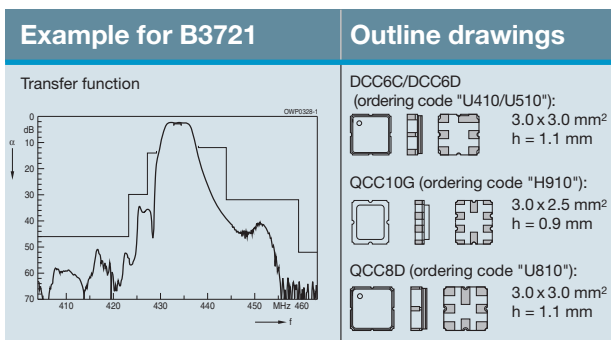


## General characteristics

- **Center frequency tolerance:** ±50 kHz; ±75 kHz
- **Insertion loss:** < 1.5 dB (typ.)
- **Substrate:** Quartz
- **Package:** DCC6E, QCC8C

Main representatives			
f <sub>c</sub> [MHz]	f <sub>c</sub> tolerance [kHz]	Ordering code	Remark
315.00	±75	B39321R0901H110	USA, China
315.00	±50	B39321R0961H110	USA, China (RKE)
315.04	±50	B39321R0963H110	USA (TPM)
433.42	±75	B39431R0904U410	Europe
433.92	±75	B39431R0920H110	Europe, China
433.92	±50	B39431R0960H110	Europe, China (RKE)
433.95	±50	B39431R0962H110	Europe (TPM)
915.00	±350	B39921R2906H110	USA 2 port
314.875/ 315.125	±50	B39311R0771U310	USA (RKE) 2 in 1
433.795/ 434.045	±50	B39431R0770U310	Europe (RKE) 2 in 1
868.35	±100	B39871R0958H110	Europe
1176.00	±300	B39122R0959H110	World

# Wideband Filters



## General characteristics

- **Usable bandwidth:** Typically 1 to 3 MHz
- **Substrate:** Lithium tantalate
- **Input/output impedance:** 50 Ω
- **Selectivity:** High ultimate rejection
- **Remarks:** Excellent for fixed frequency and channelized systems, low insertion attenuation
- **Package:** DCC6C, DCC6D, QCC8D, QCC10G

Main representatives			
f <sub>c</sub> [MHz]	Usable bandwidth [MHz]	Ordering code	Remark
312.20	0.6	B39311B3712U410	Japan
315.00	1.0	B39321B3722U410	USA, China
433.92	1.6	B39431B3721U410	Europe, China
864.00	3.0	B39861B3563U410	Europe
866.50	7.0	B39871B3717U410	Europe (RFID)
869.00	2.0	B39871B3716U410	Europe
915.00	26.0	B39921B3588U410	USA (Meter Reading)
881.50/ 942.50	25.0/ 35.0	B39941B3514H910	Telematics Dual band
1575.00	2.0	B39162B3521U410	GPS unb./unb., high selectivity
1575.00	2.4	B39162B3520U410	GPS unb./unb., low IA*
1575.00	2.4	B39162B4060U810	GPS unb./bal., low IA*
1575.00	2.4	B39162B4050U510	GPS unb./bal., high selectivity
1575.42/ 2326.25	2.046/ 12.5	B39232B3526U510	GPS/SDARS Diplexer
1601.50	17.0	B39162B3529U410	Russia (Glonass)
1842.50/ 1960.00	75.0/ 60.0	B39202B3515H910	Telematics Dual band
2450.00	97.0	B39252B4041U410	World (ISM)

\* Insertion attenuation

# Narrowband Filters

Example for B3743	Outline drawings
<p>Transfer function</p>	<p>DCC6E (ordering code "H110"):   3.0 x 3.0 mm<sup>2</sup>                      h = 1.0 mm</p> <p>QCC8B (ordering code "Z810"):   3.8 x 3.8 mm<sup>2</sup>                      h = 1.5 mm</p>

## General characteristics

- **Usable bandwidth:** Approximately 0.3 to 0.6 MHz
- **Substrate:** Quartz
- **Input/output impedance:** > 50 Ω
- **Selectivity:** Excellent nearby rejection
- **Package:** DCC6E, QCC8B

Main representatives			
f <sub>c</sub> [MHz]	Usable bandwidth [MHz]	Ordering code	Remark
315.00	0.36	B39321B3741H110	USA, China
315.00	0.36	B39321B3761Z810	USA, China
315.00	0.55	B39321B3781Z810	USA, China (multi channel)
315.00	1.1	B39321B3783Z810	USA, China (multi channel)
433.42	0.24	B39431B3735H110	Europe
433.92	0.34	B39431B3743H110	Europe, China
433.92	0.36	B39431B3760Z810	Europe, China
433.92	0.36	B39431B3732H110	Europe, China
433.92	0.55	B39431B3780Z810	Europe, China (multi channel)
433.92	1.1	B39431B3782Z810	Europe, China (multi channel)
447.725	0.29	B39451B3737H110	Korea
868.30	0.30	B39871B3734H110	Europe
868.30	0.60	B39871B3744H110	Europe

# Ultra-Narrowband Filters

Example for B3790	Outline drawings
<p>Transfer function</p>	<p>QCC8B (ordering code "Z810"):   3.8 x 3.8 mm<sup>2</sup>                      h = 1.5 mm</p> <p>QCC8C (ordering code "U310"):   5.0 x 5.0 mm<sup>2</sup>                      h = 1.35 mm</p>

## General characteristics

- **Usable bandwidth:** Approximately 0.1 to 0.3 MHz
- **Substrate:** Quartz
- **Input/output impedance:** > 50 Ω
- **Selectivity:** Very steep skirts

Main representatives			
f <sub>c</sub> [MHz]	Usable bandwidth [MHz]	Ordering code	Remark
315.00	0.10	B39321B3792Z810	USA, China
433.42	0.24	B39431B3791Z810	Europe
433.92	0.12	B39431B3790Z810	Europe, China
868.30	0.28	B39971B3574U310	Europe
868.45	0.30	B39871B3793Z810	Europe

- **Remarks:** Excellent image-frequency rejection; external coupling coil required
- **Package:** QCC8B, QCC8C

**Important information:** Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The Important Notes ([www.epcos.com/ImportantNotes](http://www.epcos.com/ImportantNotes)) and the product-specific warnings and cautions must be observed. All relevant information is available through our sales offices.