



## **SAW Components**

### **SAW Rx 2in1 filter**

Cellular + PCS / WCDMA band V + WCDMA band II

<b>Series/type:</b>	<b>B9318</b>
<b>Ordering code:</b>	<b>B39202B9318G110</b>
<b>Date:</b>	<b>March 08, 2007</b>
<b>Version:</b>	<b>2.0</b>



Data sheet



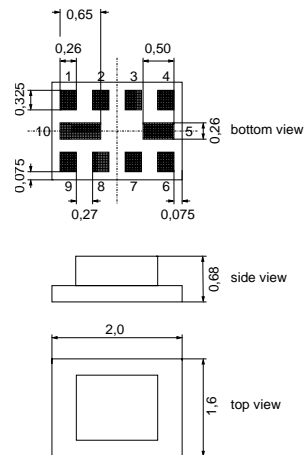
Application

- Low-loss RF filter for mobile telephone CDMA systems, receive path (Rx) of Cellular and PCS
- Also applicable for mobile phone WCDMA systems, receive path of Band V and BAND II
- Bandwidth
  - Filter 1 (Cellular): 25 MHz
  - Filter 2 (PCS): 60 MHz
- Impedance transformation from:
  - Filter 1 (Cellular): 50 Ω to 100 Ω
  - Filter 2 (PCS): 50 Ω to 100 Ω
- Unbalanced to balanced operation



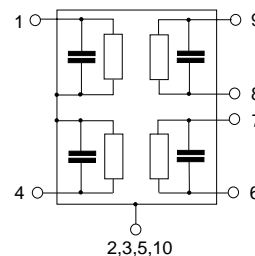
Features

- Package size 2.0 x 1.6 x 0.68 mm<sup>3</sup>
- Package code QCS10H
- RoHS compatible
- Approximate weight 0.008 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

- 1 Input [ Filter 1: Cellular]
- 4 Input [ Filter 2: PCS ]
- 6,7 Output balanced [ Filter 2: PCS ]
- 8,9 Output balanced [ Filter 1: Cellular ]
- 2,3,5,10 Case ground





**SAW Components**

**B9318**

**SAW Rx 2in1 filter**

**881.5 / 1960.0 MHz**

Data sheet



**Characteristics filter 1 (Cellular)**

Temperature range for specification:  $T = -30\text{ °C to }+85\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$  (unbalanced)  
 Terminating load impedance:  $Z_L = 100\ \Omega$  (balanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	881.5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$				
869.0 ... 894.0 MHz		—	1.7	2.4 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
869.0 ... 894.0 MHz		—	0.5	1.2	dB
<b>Amplit. ripple over any 5MHz channel</b>	$\Delta\alpha$				
869.0 ... 894.0 MHz		—	0.4	0.7	dB
<b>Group delay over any 5MHz channel</b>					
869.0 ... 894.0 MHz		—	15	40	ns
<b>Input VSWR</b>					
869.0 ... 894.0 MHz		—	1.6	2.0	
<b>Output VSWR</b>					
869.0 ... 894.0 MHz		—	1.7	2.0	
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>					
869.0 ... 894.0 MHz			-0.1/0.7	-1.0/1.0	dB
<b>Output phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b>					
869.0 ... 894.0 MHz			-3/2	-5/+5	°
<b>Attenuation</b>	$\alpha$				
0.0 ... 820.0 MHz		47	55	—	dB
820.0 ... 835.0 MHz		45	48	—	dB
835.0 ... 849.0 MHz		47	52	—	dB
914.0 ... 950.0 MHz		24	30	—	dB
950.0 ... 2000.0 MHz		45	52	—	dB
2000.0 ... 3000.0 MHz		40	47	—	dB
3000.0 ... 6000.0 MHz		40	45	—	dB

<sup>1)</sup> pcb loss of 0.1dB extracted



SAW Components

B9318

SAW Rx 2in1 filter

881.5 / 1960.0 MHz

Data sheet



### Maximum ratings

Operable temperature range	T	-30/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	100 <sup>1)</sup>	V	machine model, 10 pulses
Input power at				
WCDMA band V	P <sub>IN</sub>	10	dBm	continuous wave @ +55°C ambient
Tx band				

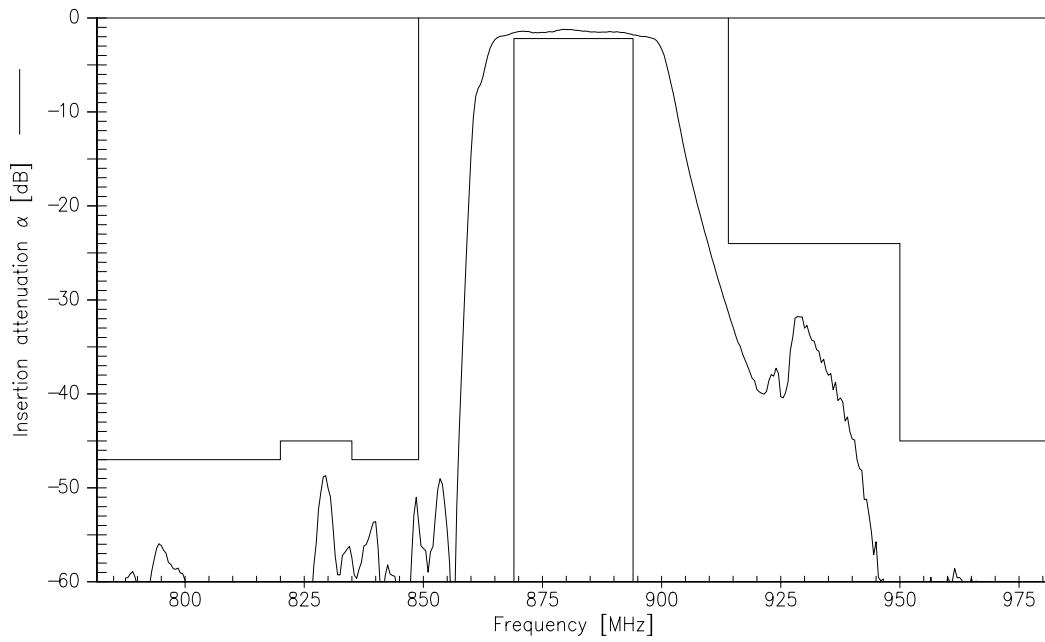
<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



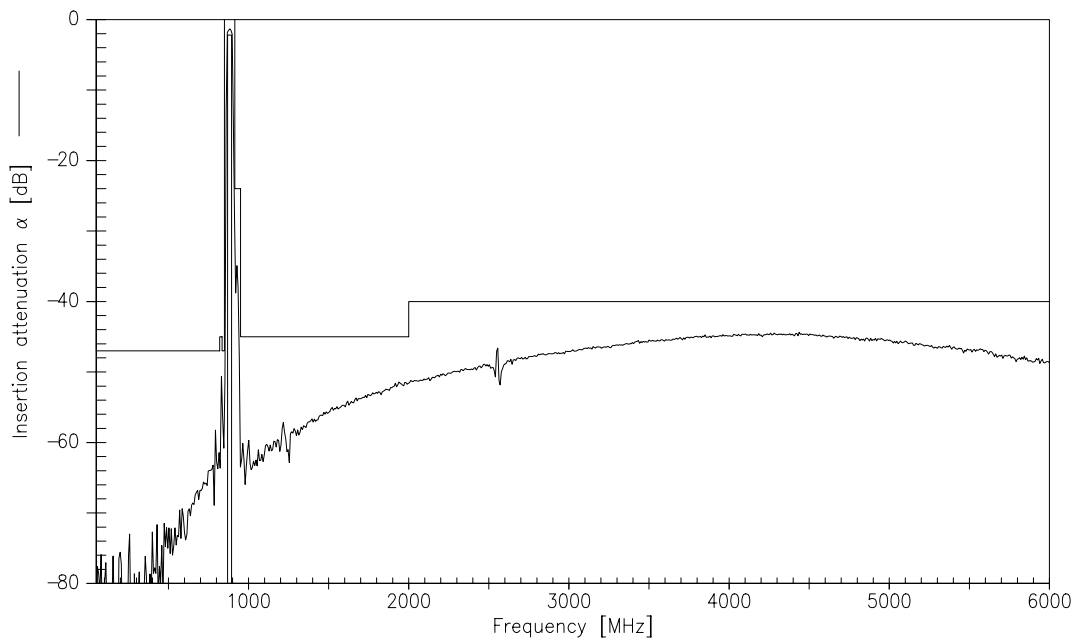
Data sheet



Transfer function filter 1 (Cellular)



Transfer function filter 1 (Cellular) - wideband



Please read *cautions and warnings* and *important notes* at the end of this document.

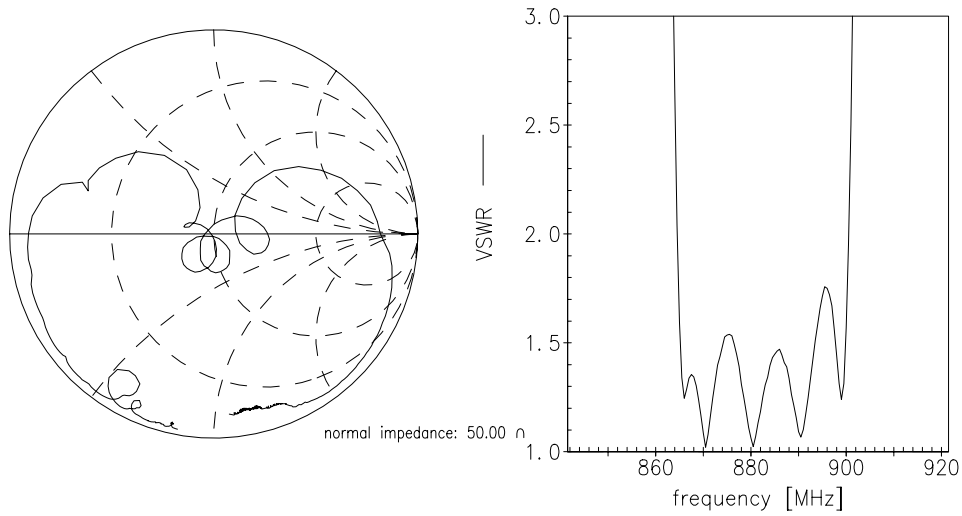


Data sheet

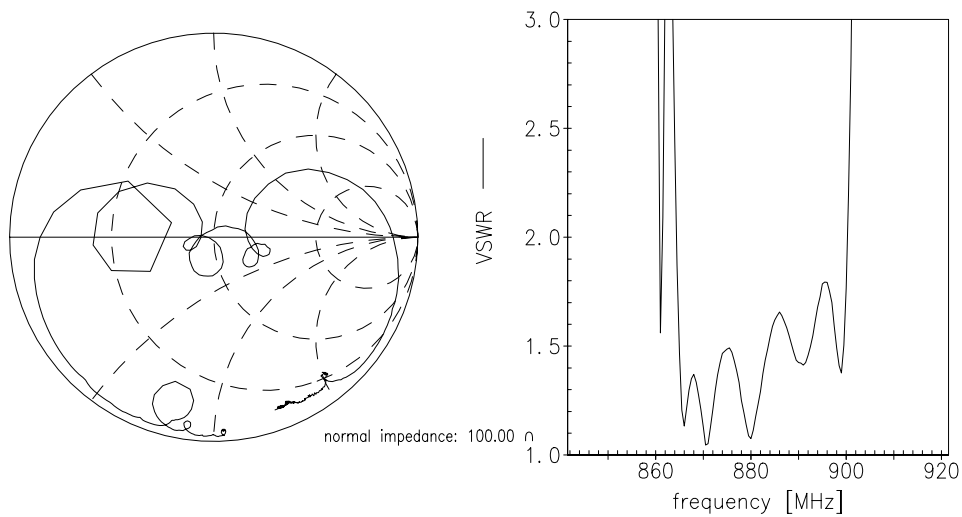


Smith charts filter 1 (Cellular)

$S_{11}$  function



$S_{22}$  function





Data sheet



Characteristics filter 1(PCS)

Temperature range for specification: T = -30 °C to +85 °C  
 Terminating source impedance: Z<sub>S</sub> = 50 Ω (unbalanced)  
 Terminating load impedance: Z<sub>L</sub> = 100 Ω || 13 nH (balanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	1960.0	—	MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>				
1930.6 ... 1989.4 MHz		—	1.8	2.6 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b>	Δα				
1930.6 ... 1989.4 MHz		—	0.8	1.6 <sup>2)</sup>	dB
<b>Amplit. ripple over any 5MHz channel</b>	Δα				
1930.6 ... 1989.4 MHz		—	0.4	0.9 <sup>3)</sup>	dB
<b>Group delay over any 5MHz channel</b>					
1930.6 ... 1989.4 MHz		—	23	30	ns
<b>Input VSWR</b>					
1930.6 ... 1989.4 MHz		—	1.5	2.1	
<b>Output VSWR</b>					
1930.6 ... 1989.4 MHz		—	1.5	2.1	
<b>Output amplitude balance ( S<sub>31</sub>/S<sub>21</sub> )</b>					
1930.6 ... 1989.4 MHz		-1.0	-0.5/0.3	1.0	dB
<b>Output phase balance (φ(S<sub>31</sub>) - φ(S<sub>21</sub>)+180°)</b>					
1930.6 ... 1989.4 MHz		-10	-4/4	10	°
<b>Attenuation</b>	α				
DC ... 1600.0 MHz		40	45	—	dB
1600.0 ... 1850.0 MHz		30	35	—	dB
1850.0 ... 1910.0 MHz		20	24	—	dB
2040.0 ... 2200.0 MHz		25	35	—	dB
2200.0 ... 2800.0 MHz		30	36	—	dB
2800.0 ... 3400.0 MHz		40	43	—	dB
3400.0 ... 6000.0 MHz		30	41	—	dB

1) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 3.2 dB pcb loss of 0.2dB extracted.

2) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 2.2 dB

3) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 1.1 dB



SAW Components

B9318

SAW Rx 2in1 filter

881.5 / 1960.0 MHz

Data sheet



### Maximum ratings

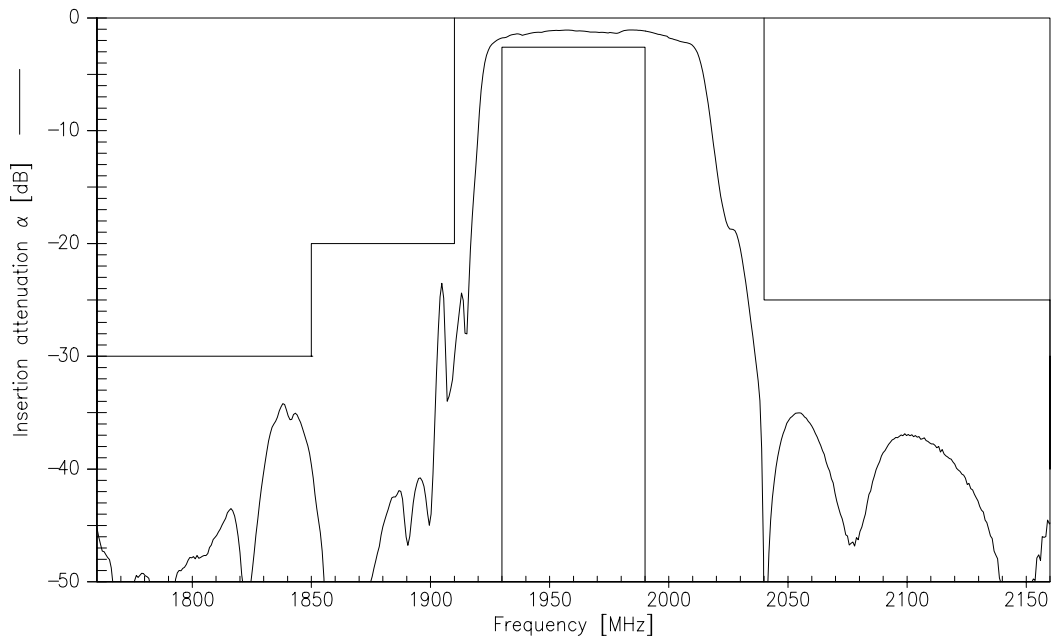
Operable temperature range	T	-30/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 10 pulses
Input power at				
WCDMA band II	P <sub>IN</sub>	10	dBm	continuous wave @ +55°C ambient
Tx band				

<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

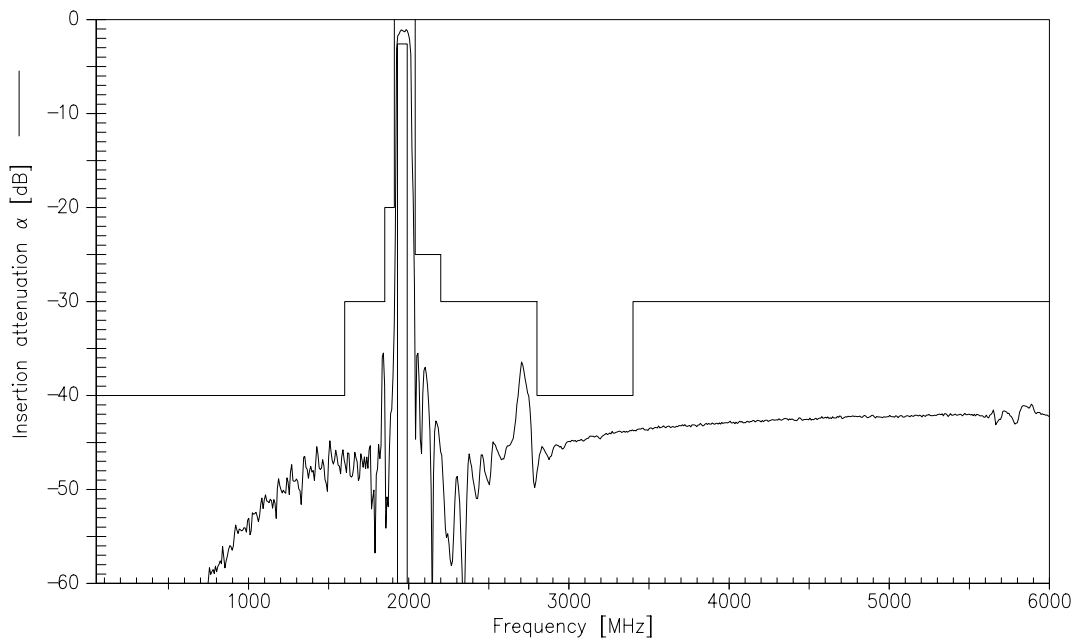




Transfer function filter 2 (PCS)



Transfer function filter 2 (PCS) - wideband



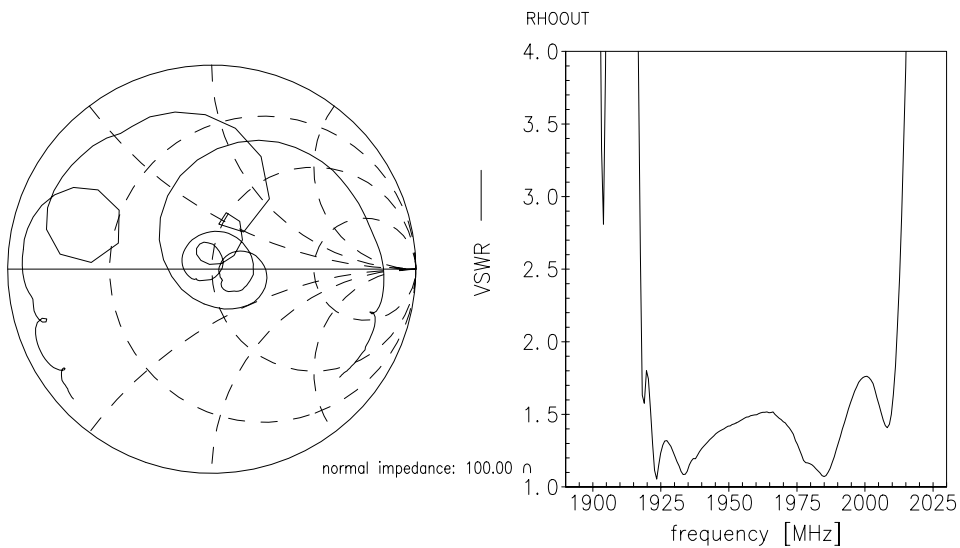
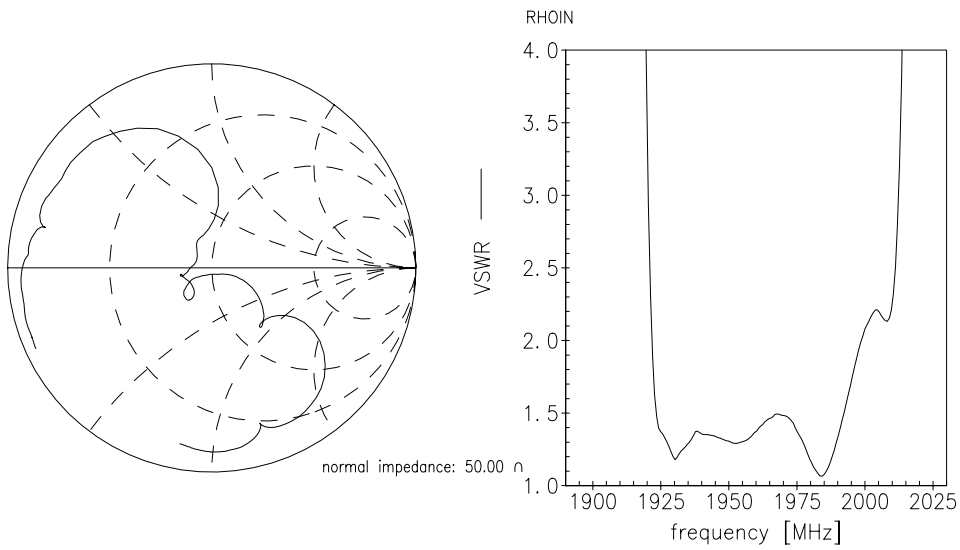


Data sheet



Smith charts filter 2 (PCS)

S<sub>11</sub> function



Please read *cautions and warnings and important notes* at the end of this document.



SAW Components

B9318

SAW Rx 2in1 filter

881.5 / 1960.0 MHz

Data sheet



## References

Type	B9318
Ordering code	B39202B9318G110
Marking and package	C61157-A7-A141
Packaging	F61074-V8152-Z000
Date codes	L_1126
S-parameters	Cellular: B9318_LB_NB.s3p, B9318_LB_WB.s3p PCS: B9318_UB_NB.s3p, B9318_UB_WB.s3p
Soldering profile	S_6001
RoHS compatible	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."

For further information please contact your local EPCOS sales office or visit our webpage at [www.epcos.com](http://www.epcos.com).

Published by EPCOS AG  
Surface Acoustic Wave Components Division  
P.O. Box 80 17 09, 81617 Munich, GERMANY

© EPCOS AG 2007. This brochure replaces the previous edition.

For questions on technology, prices and delivery please contact the Sales Offices of EPCOS AG or the international Representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our Sales Offices.

Please read *cautions and warnings and important notes* at the end of this document.



## Important notes

The following applies to all products named in this publication:

1. 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 in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of passive electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of a passive electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of a passive electronic component.
3. The warnings, cautions and product-specific notes must be observed.
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as "hazardous")**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available.
6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, CeraDiode, CSSP, PhaseCap, PhaseMod, SIFI, SIKOREL, Silver-Cap, SIMID, SIOV, SIP5D, SIP5K, TOPcap, UltraCap, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.epcos.com/trademarks](http://www.epcos.com/trademarks).