SAW Components

SAW Rx 2in1 Filter

iDEN

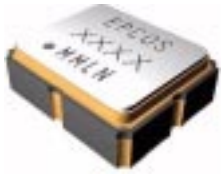
Series/Type:	**B4231**
Ordering code:	**B39941B4231H410**
Date:	Apr 10, 2006
Version:	1.1

Preliminary Data

SMD

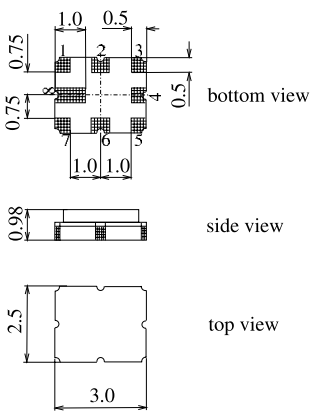
Application

- Low-loss 2in1 RF filter for iDEN
- Device with two integrated Rx filters
- Low amplitude ripple
- Usable passband Filter 1: 19.0 MHz
- Usable passband Filter 2: 6.0 MHz
- No matching network required for operation at 50 Ω
- Unbalanced to unbalanced operation for both filters



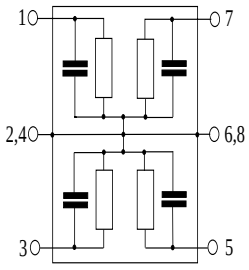
Features

- Package size 2.5 x 3.0 x 0.98 mm³
- Package code QCC8E
- Approx. weight 0.027 g
- Ceramic package for **S**urface **M**ount **T**echnology (**SMT**)
- RoHS compliant
- Ni, gold-plated terminals



Pin configuration

■	1	Input [Filter 1]
■	7	Output [Filter 1]
■	3	Input [Filter 2]
■	5	Output [Filter 2]
■	2,6	To be grounded
■	4,8	Case ground



Preliminary Data

SMD

Characteristics of Filter 1

Operating temperature range: T = -30 ... +70 °C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		B4231 [1]			DGL [2]	
		min.	typ. @ 25 °C	max.	min./ max.	
Center frequency	f_C	—	860.5	—		MHz
Maximum insertion attenuation	α_{max}					
851.0 ... 870.0 MHz		—	2.1	3.0 [3]		dB
Amplitude ripple (p-p)	$\Delta\alpha$					
851.0 ... 870.0 MHz		—	0.6	1.0		dB
Group delay ripple (p-p)	$\Delta\tau$					
851.0 ... 870.0 MHz		—	12	50		ns
Input return loss						
851.0 ... 870.0 MHz		12.0	14.0	—		dB
Output return loss						
851.0 ... 870.0 MHz		12.0	13.5	—		dB
Attenuation	α					
0.1 ... 688.0 MHz		50	58	—		dB
688.0 ... 705.0 MHz		49	57	—		dB
769.0 ... 788.0 MHz		42	51	—		dB
806.0 ... 825.0 MHz		25	45	—		dB
896.0 ... 902.0 MHz		25	38	—		dB
925.0 ... 960.0 MHz		42	51	—		dB
1013.0 ... 1036.0 MHz		45	50	—		dB
1702.0 ... 1740.0 MHz		33	40	—		dB
1740.0 ... 3500.0 MHz		30	35	—		dB
3500.0 ... 3600.0 MHz		28	32	—		dB
3600.0 ... 4000.0 MHz		20	25	—		dB

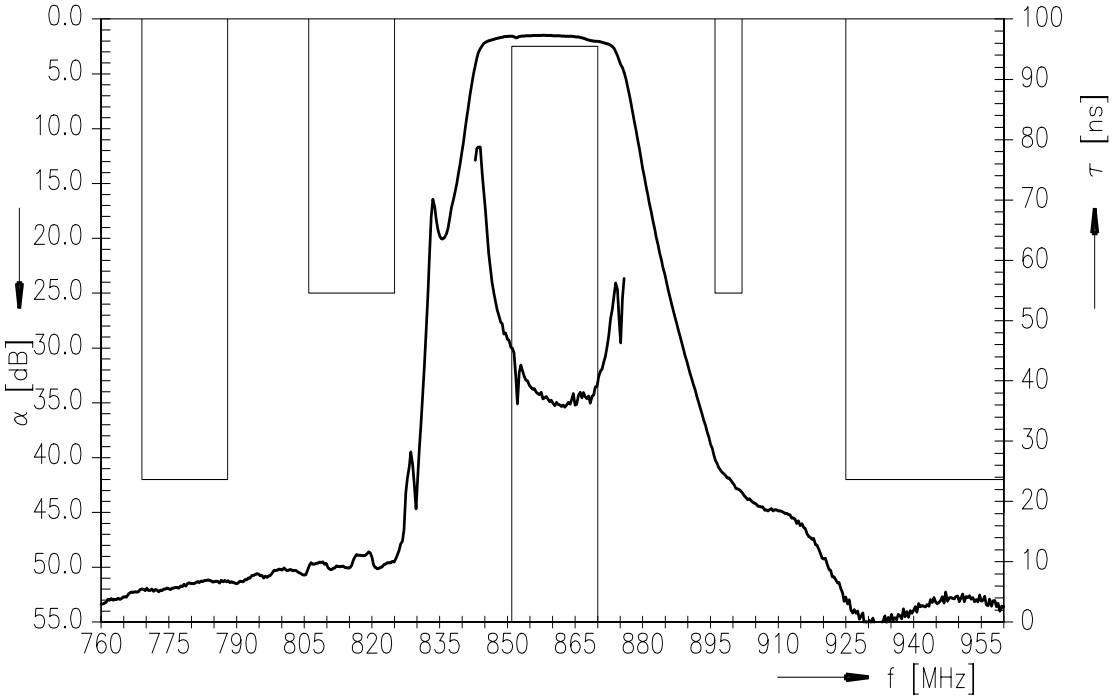
[1] Values in columns min, typ and max indicate the development status of the current version.
[2] Values in column DesignGoal (DGL) indicate the target performance.
[3] 2.5 dB max at 25 °C.

Maximum ratings of Filter 1

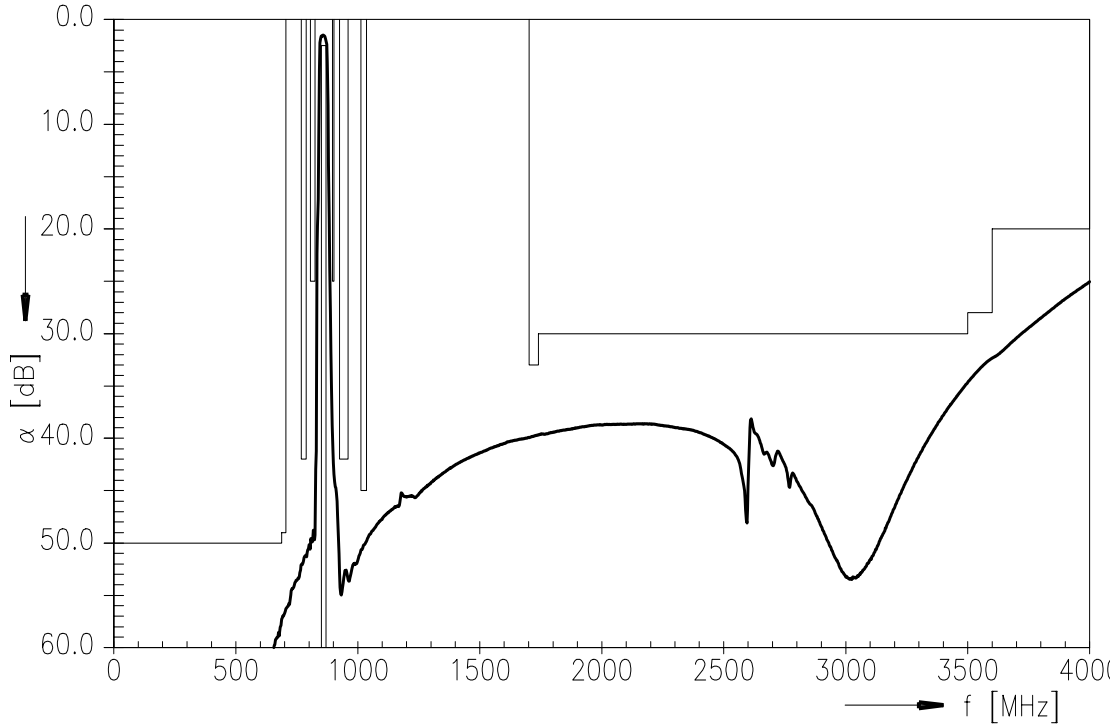
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100 [1)]	V	machine model, 10 pulses
Input Power at 851.0 ... 870.0 MHz	P_{IN}	10	dBm	continuous wave, 10000 hours, 85 ˚C

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

Transfer Function Filter 1 (narrowband)

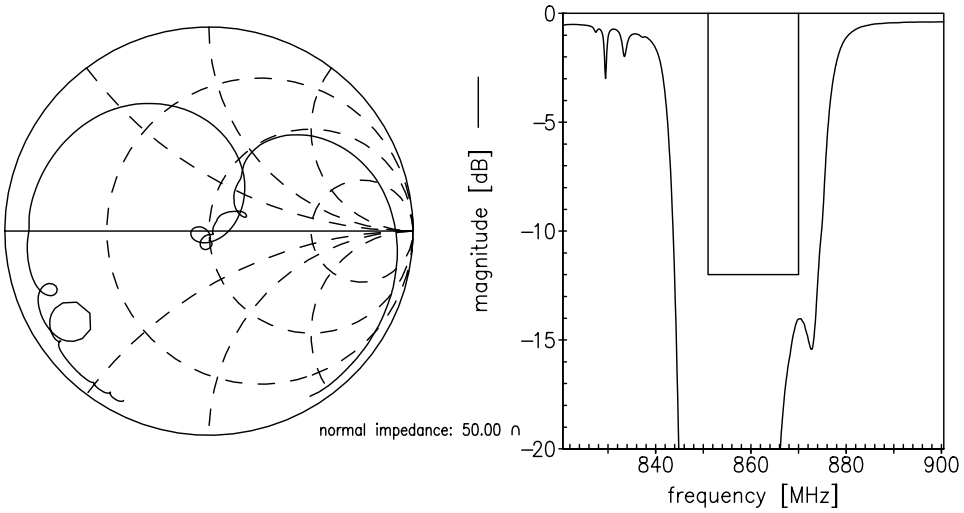


Transfer Function Filter 1 (wideband)

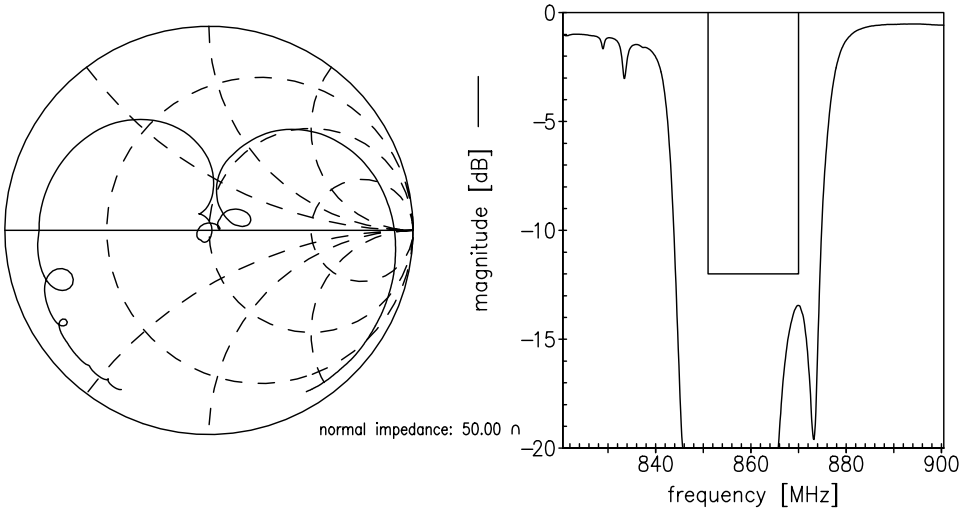


Smith Charts Filter 1

S_{11} Function



S_{22} Function



Preliminary Data

SMD

Characteristics of Filter 2

Operating temperature range: T = -30 ... +70 °C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		B4231 [1]			DGL [2]	
		min.	typ. @ 25 °C	max.	min./ max.	
Center frequency	f_C	—	938.0	—		MHz
Maximum insertion attenuation	α_{max}					
935.0 ... 941.0 MHz		—	1.8	3.0 [3]		dB
Amplitude ripple (p-p)	$\Delta\alpha$					
935.0 ... 941.0 MHz		—	0.1	1.0		dB
Group delay ripple (p-p)	$\Delta\tau$					
935.0 ... 941.0 MHz		—	2	50		ns
Input return loss						
935.0 ... 941.0 MHz		12.0	21.0	—		dB
Output return loss						
935.0 ... 941.0 MHz		12.0	21.0	—		dB
Attenuation	α					
0.1 ... 756.0 MHz		50	54	—		dB
756.0 ... 762.0 MHz		49	53	—		dB
806.0 ... 824.0 MHz		25	51	—		dB
824.0 ... 845.0 MHz		35	50	—		dB
845.0 ... 852.0 MHz		42	50	—		dB
852.0 ... 894.0 MHz		35	47	—		dB
896.0 ... 902.0 MHz		25	47	—		dB
1024.0 ... 1031.0 MHz		42	48	—		dB
1113.0 ... 1121.0 MHz		43	47	—	45	dB
1870.0 ... 1882.0 MHz		33	39	—		dB
1882.0 ... 3600.0 MHz		30	36	—		dB
3600.0 ... 4000.0 MHz		24	28	—	25	dB

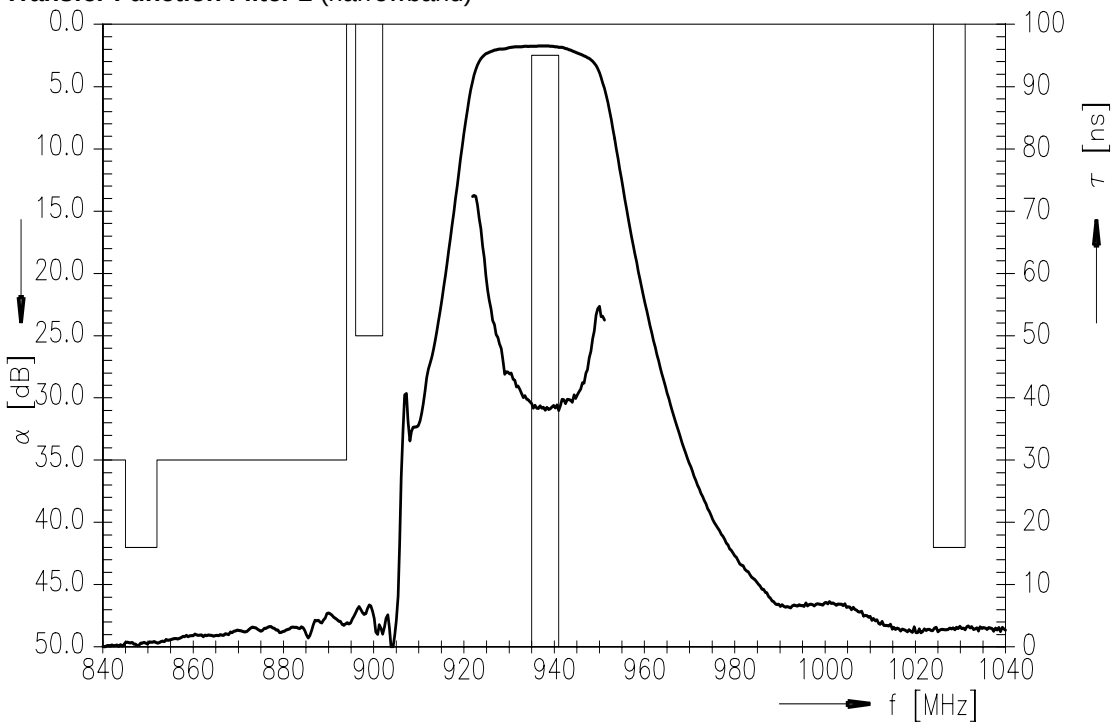
1) Values in columns min, typ and max indicate the development status of the current version.
2) Values in column DesignGoal (DGL) indicate the target performance.
3) 2.5 dB max at 25 °C.

Maximum ratings of Filter 2

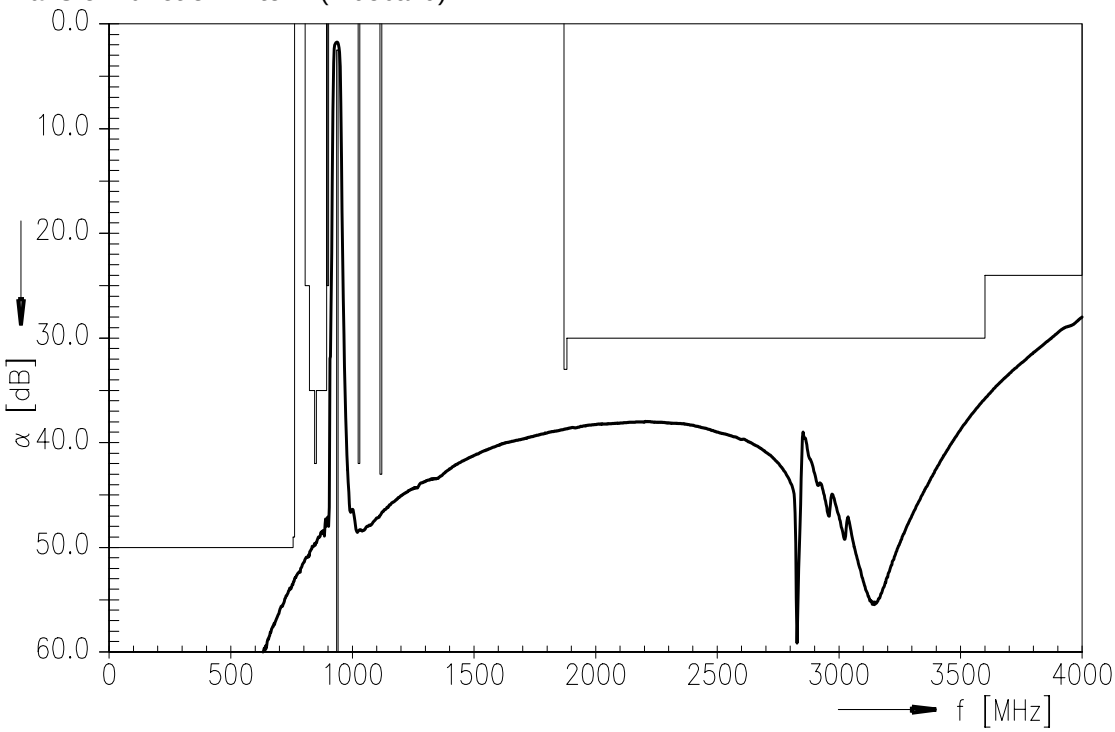
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100 [1)]	V	machine model, 10 pulses
Input Power at 935.0 ... 941.0 MHz	P_{IN}	10	dBm	continuous wave, 10000 hours, 85 ˚C

[1)] acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

Transfer Function Filter 2 (narrowband)

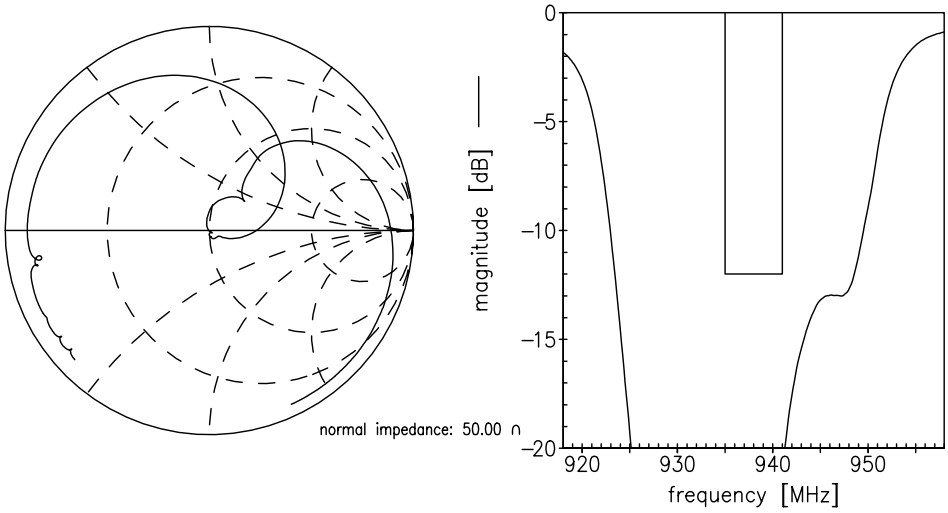


Transfer Function Filter 2 (wideband)

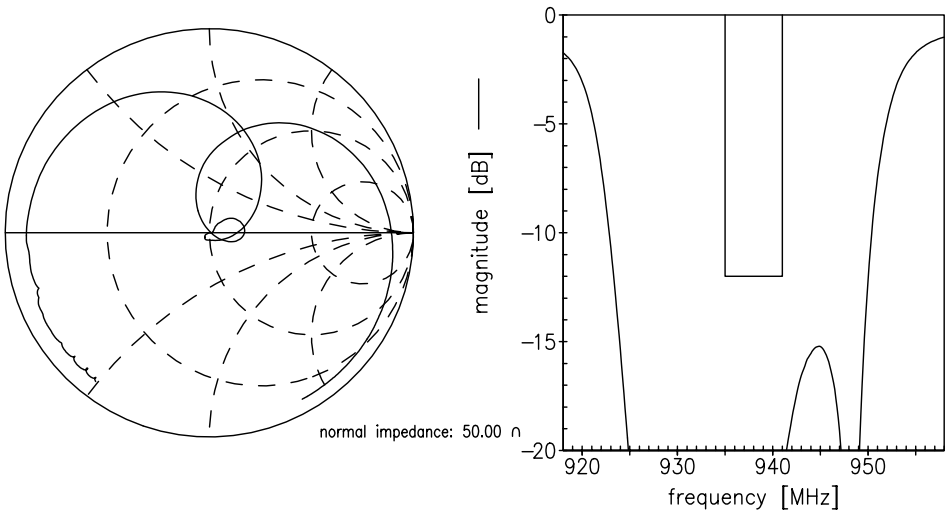


Smith Charts Filter 2

S_{11} Function



S_{22} Function



References

Type	B4231
Ordering code	B39941B4231H410
Marking and package	C61157-A7-A92
Packaging	F61074-V8174-Z000
Date codes	L_1126
S-parameters	B4231_LB_NB.s2p B4231_LB_WB.s2p B4231_UB_NB.s2p B4231_UB_WB.s2p
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 .

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

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.

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). 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, SilverCap, 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.