



SAW Components

SAW Rx 2in1 input duplex filter
GSM 850 / GSM 900

Series/type:	B9814
Ordering code:	B39941B9814P810
Date:	September 30, 2011
Version:	2.1

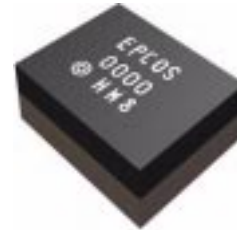
© EPCOS AG 2015. Reproduction, publication and dissemination of this publication, enclosures hereto and the information contained therein without EPCOS' prior express consent is prohibited.

EPCOS AG is a TDK Group Company.

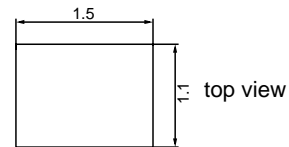
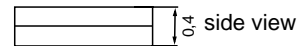
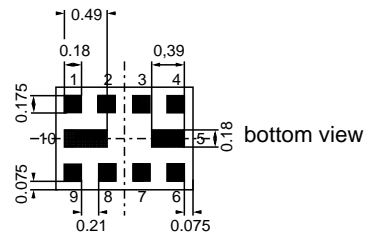
Data sheet


Application

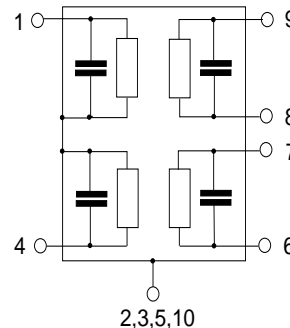
- Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 850 systems, receive path (Rx)
- Usable passband:
 Filter 1 (GSM 900): 35 MHz
 Filter 2 (GSM 850): 25 MHz
- Unbalanced to balanced operation for all filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


Features

- Package size 1.5 x 1.1 x 0.4 mm³
- RoHS compatible
- Approx. weight 0.003g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitive Level 3**


Pin configuration

- 1 Input [Diplex]
- 8,9 Output, balanced [Filter 1]
- 6,7 Output, balanced [Filter 2]
- 4 To be grounded
- 2,3,5,10 Case-ground



Data sheet


Characteristics of filter 1 (GSM 900)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 10\text{ nH (unbalanced)}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 40\text{ nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	942.5	—	MHz
Maximum insertion attenuation	α_{\max}	—	1.9 ¹⁾	3.0	dB
925.0 ... 960.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.9	2.1	dB
925.0 ... 960.0 MHz					
Input VSWR		—	1.9	2.3	
925.0 ... 960.0 MHz					
Output VSWR		—	2.0	2.3	
925.0 ... 960.0 MHz					
Common mode rejection ratio		22	27	—	dB
925.0 ... 960.0 MHz					
Attenuation	α				
10.0 ... 480.0 MHz		45	55	—	dB
480.0 ... 825.0 MHz		35	39	—	dB
825.0 ... 905.0 MHz		21	26	—	dB
905.0 ... 915.0 MHz		14	20	—	dB
980.0 ... 1050.0 MHz		21	26	—	dB
1050.0 ... 1850.0 MHz		26	32	—	dB
1850.0 ... 1920.0 MHz		38	39	—	dB
1920.0 ... 5000.0 MHz		30	38	—	dB
5000.0 ... 6000.0 MHz		30	36	—	dB

¹⁾ Typical value excluding PCB losses.

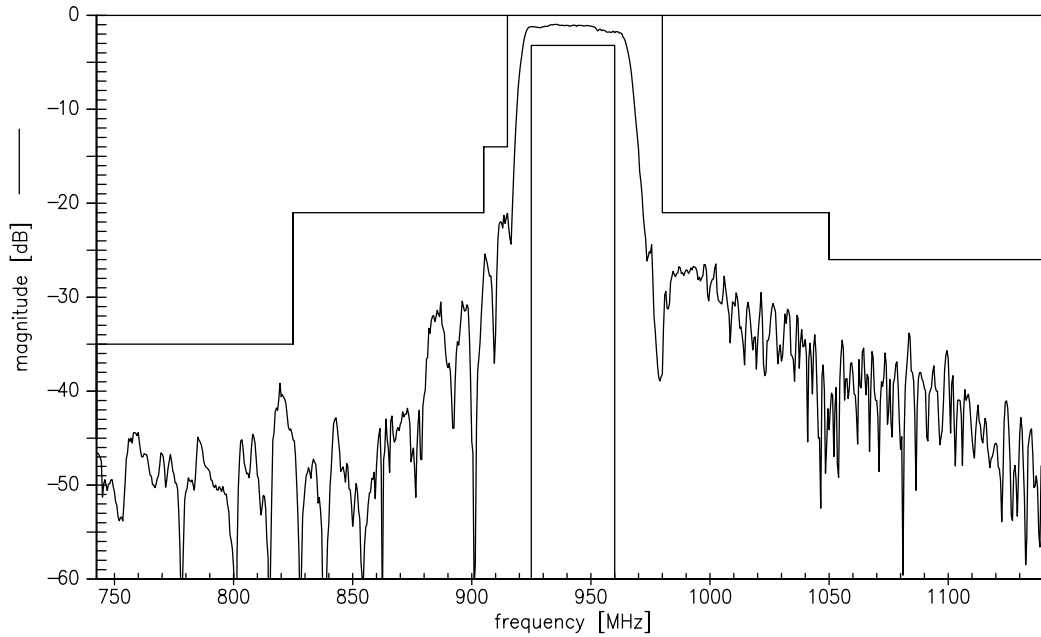

Maximum ratings of filter 1

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, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

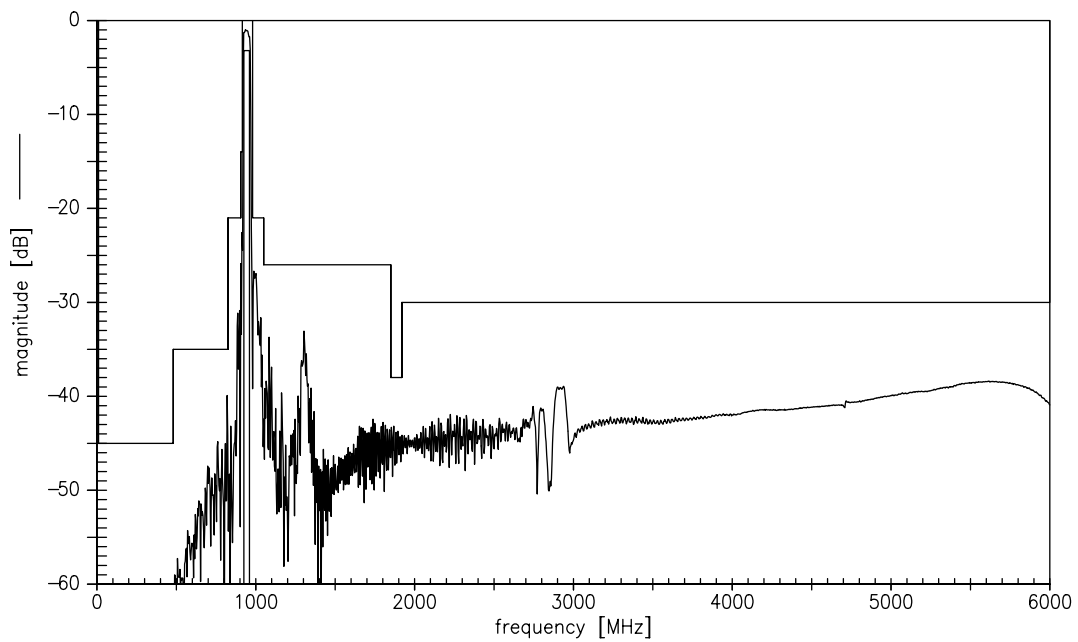
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 1



Transfer function of filter 1 - wideband

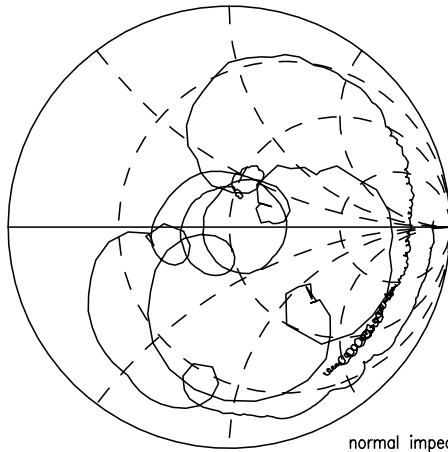


Data sheet

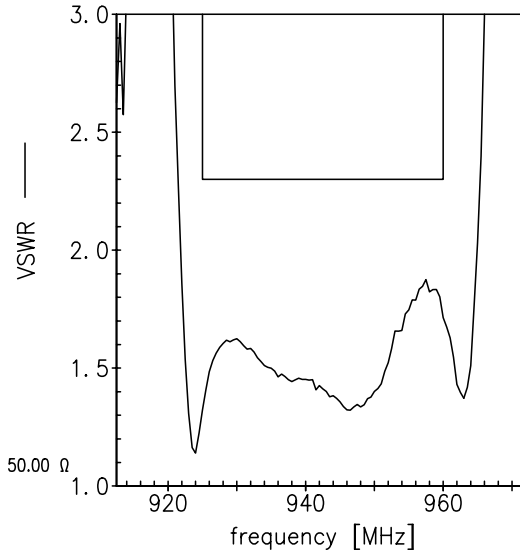


Smith Charts filter 1

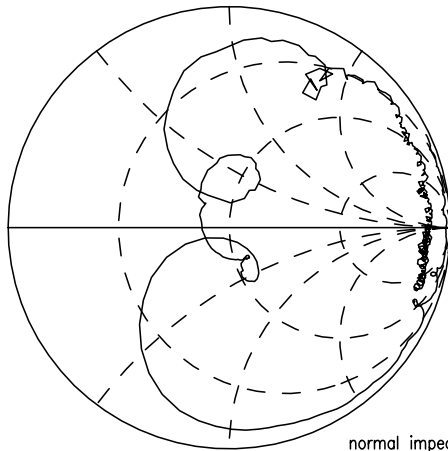
S_{11} function



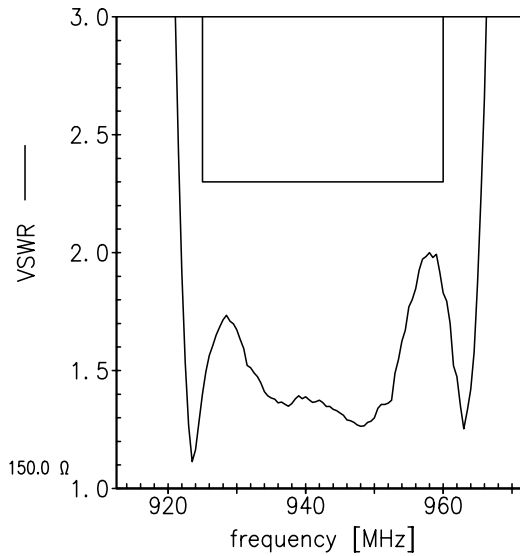
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω



Data sheet


Characteristics of filter 2 (GSM 850)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 10\text{ nH (unbalanced)}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 56\text{ nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	881.5	—	MHz
Maximum insertion attenuation 869.0 ... 894.0 MHz	α_{\max}	—	1.6 ¹⁾	2.1	dB
Amplitude ripple (p-p) 869.0 ... 894.0 MHz	$\Delta\alpha$	—	0.8	1.6	dB
Input VSWR 869.0 ... 894.0 MHz		—	1.5	2.2	
Output VSWR 869.0 ... 894.0 MHz		—	1.7	2.2	
Common mode rejection ratio 869.0 ... 894.0 MHz		19	24	—	dB
Attenuation	α				
10.0 ... 447.0 MHz		45	50	—	dB
447.0 ... 849.0 MHz		28	33	—	dB
914.0 ... 1000.0 MHz		24	28	—	dB
1000.0 ... 1850.0 MHz		28	32	—	dB
1850.0 ... 1920.0 MHz		37	46	—	dB
1920.0 ... 4000.0 MHz		33	39	—	dB
4000.0 ... 6000.0 MHz		25	32	—	dB

1) Typical value excluding PCB losses.

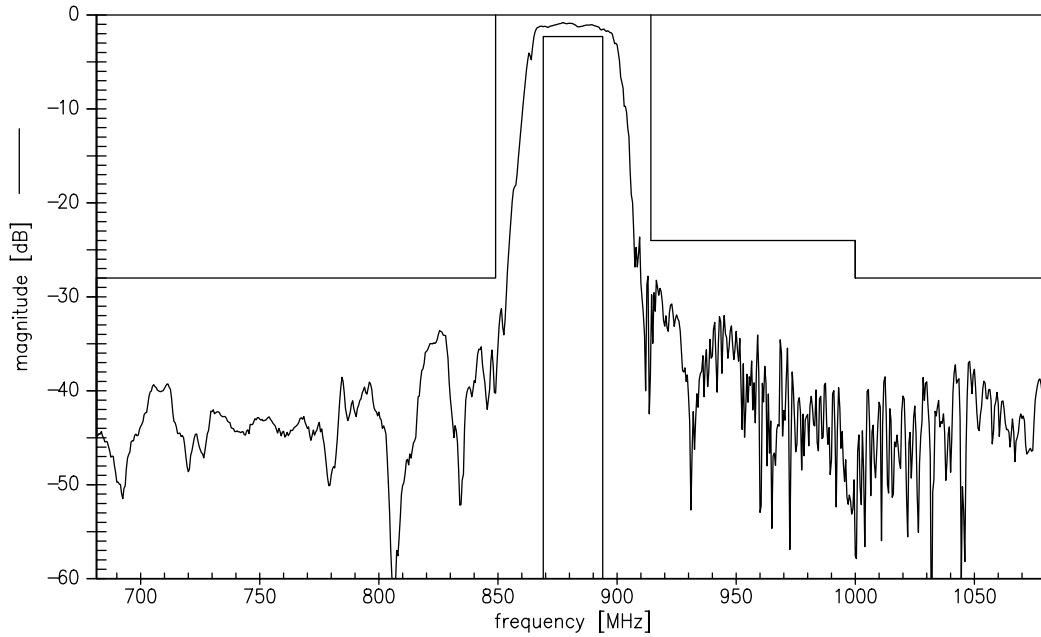

Maximum ratings of filter 2

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, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

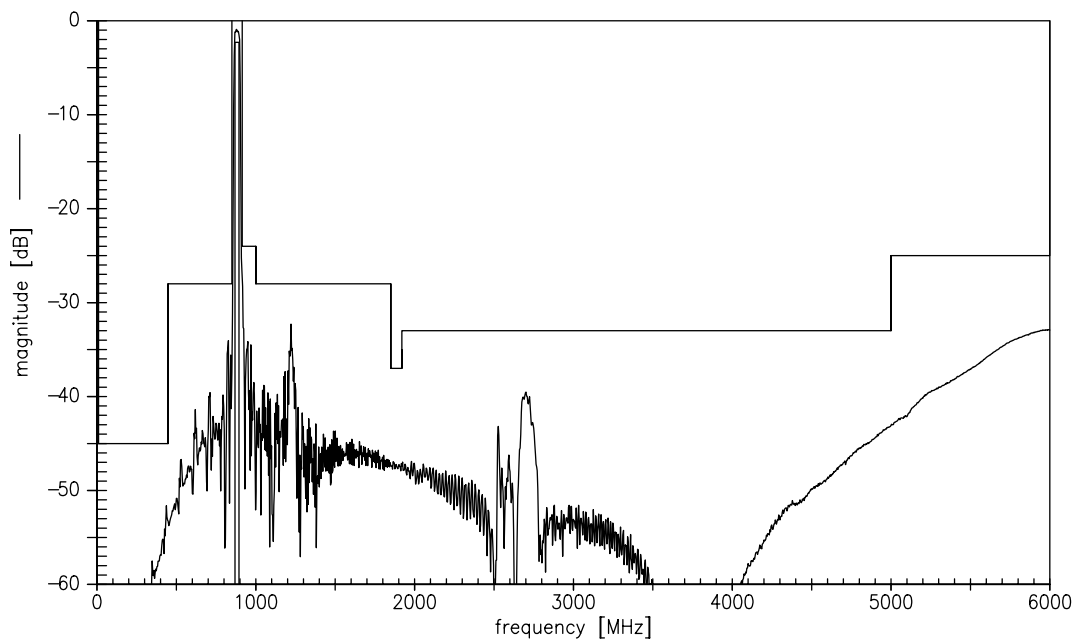
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 2



Transfer function of filter 2 - wideband

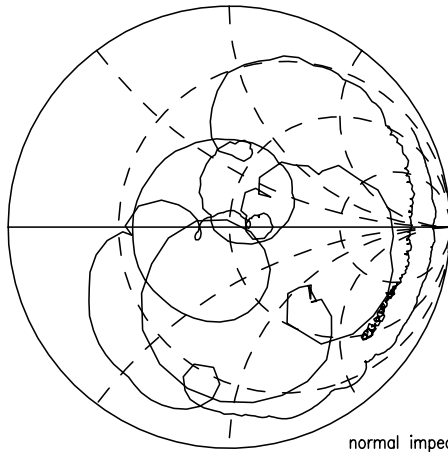


Data sheet

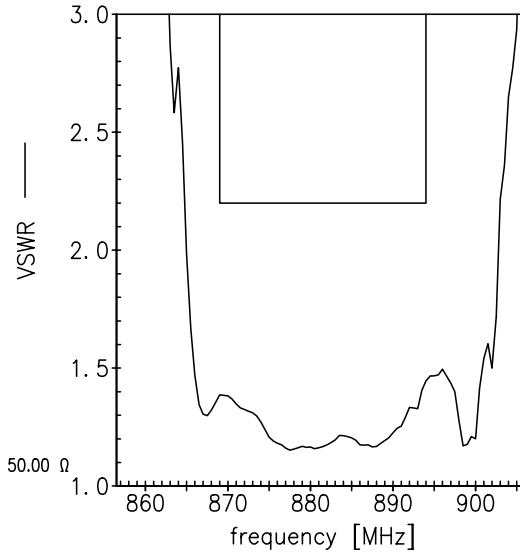


Smith Charts filter 2

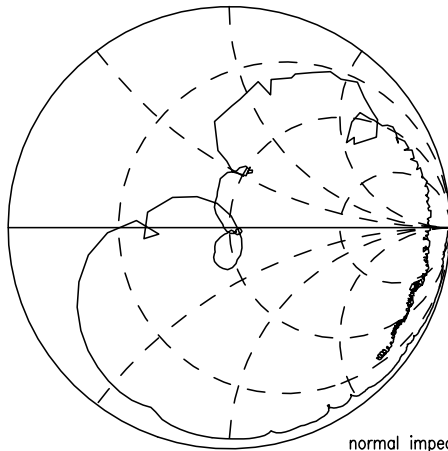
S_{11} function



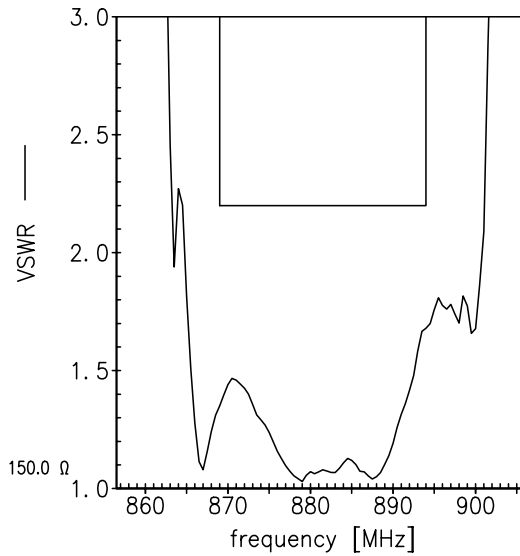
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω



SAW Components	B9814
-----------------------	--------------

SAW Rx 2in1 input diplex filter	881.5 / 942.5 MHz
--	--------------------------

Data sheet



References

Type	B9814
Ordering code	B39941B9814P810
Marking and package	C61157-Z8-C20
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9814_LB_NB.s3p, B9814_LB_WB.s3p B9814_UB_NB.s3p, B9814_UB_WB.s3p see file header for port/pin assignment table
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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
Matching coils	See http://www.tdk.co.jp/tefe02/coil.htm#aname1 http://www.tdk.co.jp/etvcl/index.htm for a large variety of matching coils.

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com.

Published by EPCOS AG
Systems, Acoustics, Waves Business Group
P.O. Box 80 17 09, 81617 Munich, GERMANY

© EPCOS AG 2011. 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.

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 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 an 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 an 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. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
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, BAOKE, Alu-X, CeraDiode, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, 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.