



SAW Components

SAW RF filter

TETRA

Series/type:	B5151
Ordering code:	B39421B5151U310
Date:	September 27, 2010
Version:	1.0



SAW Components	B5151
SAW RF filter	390.00 / 415.00 MHz

Sample data



Revision History: Changes compared to previous iteration issue

ISSUE	ORIGINATOR	DETAIL SPEC CHANGES	DATE
DGLV69S01			
0.1	Kok Meng	Initial Release	13.02.2009
LV69A			
1.0	Kok Meng	Filter shifted high by 0.8MHz Updates of attenuation spec for Filter I Relaxation of IL for Filter 2 to 3.5dB Relaxation of AR for Filter 2 to 2.2dB Relaxation of VSWR for Filter 2 to 2.2 Updates of attenuation spec for Filter 2	08.04.2009
DGLV69S02			
0.2	Kok Meng	Change in customer spec for IL and attenuation	03.06.2009
LV69B			
1.0	Kok Meng	With reference to DGLV69S02, Relaxation of IL for Filter I to 2.3dB Improvement of AR for Filter I to 0.9dB Updates of attenuation spec for Filter I Relaxation of IL for Filter 2 to 2.7dB Improvement of AR for Filter 2 to 1.3dB Relaxation of Input VSWR for Filter 2 to 2.1 Updates of attenuation spec for Filter 2	28.08.2009
B5151			
1.0	Kok Meng	Include ordering code	27.09.2010



SAW Components

B5151

SAW RF filter

390.00 / 415.00 MHz

Sample data



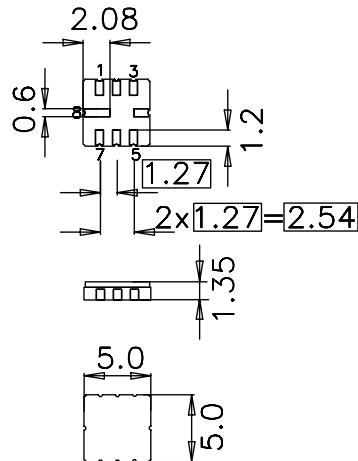
Application

- Low-loss RF filter for TETRA
- Low amplitude ripple
- Usable passband:
 - Filter 1 : 20 MHz
 - Filter 2 : 30 MHz
- Unbalanced to unbalanced operation
- No matching required for operation at 50 Ω



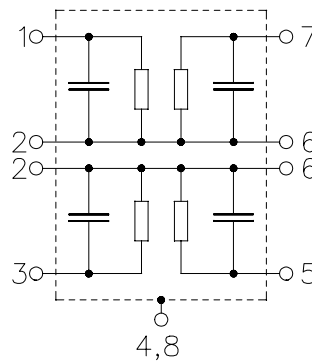
Features

- Package size 5.0 x 5.0 x 1.35 mm³
- Package code QCC8C
- RoHS compatible
- Approximate weight 0.10 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

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



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



SAW Components	B5151
SAW RF filter	390.00 / 415.00 MHz

Sample data



Characteristics of Filter 1

Temperature range for specification: $T = -30$ to $+70^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 50\ \Omega$
 Terminating load impedance: $Z_L = 50\ \Omega$

		LV69B ¹⁾			DGL ²⁾	
		min.	typ. @ 25 °C	max.	min./ max.	
Center frequency	f_C	—	390.0	—		MHz
Maximum insertion attenuation	α_{max}					
380.0 ... 400.0	MHz	—	1.8	2.3		dB
Amplitude ripple (p-p)	$\Delta\alpha$					
380.0 ... 400.0	MHz	—	0.4	0.9		dB
Input VSWR						
380.0 ... 400.0	MHz	—	1.7	2.0		
Output VSWR						
380.0 ... 400.0	MHz	—	1.7	2.0		
Attenuation	α					
10.0 ... 150.0	MHz	35	42	—		dB
150.0 ... 287.0	MHz	33	37	—		dB
287.0 ... 335.0	MHz	26	29	—		dB
335.0 ... 360.0	MHz	20	23	—		dB
418.0 ... 442.0	MHz	15	21	—		dB
442.0 ... 456.0	MHz	25	33	—		dB
456.0 ... 532.0	MHz	28	36	—		dB
532.0 ... 560.0	MHz	28	32	—		dB
560.0 ... 668.0	MHz	22	24	—		dB
668.0 ... 1000.0	MHz	22	31	—		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.

**SAW Components****B5151****SAW RF filter****390.00 / 415.00 MHz**

Sample data

**Maximum ratings of Filter 1**

Operable temperature range	T	-40 / +85	°C	
Storage temperature range	T _{stg}	-40 / +85	°C	
DC voltage	V _{DC}	0	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input Power at 380.0 ... 400.0 MHz	P _{IN}	15	dBm	continuous wave

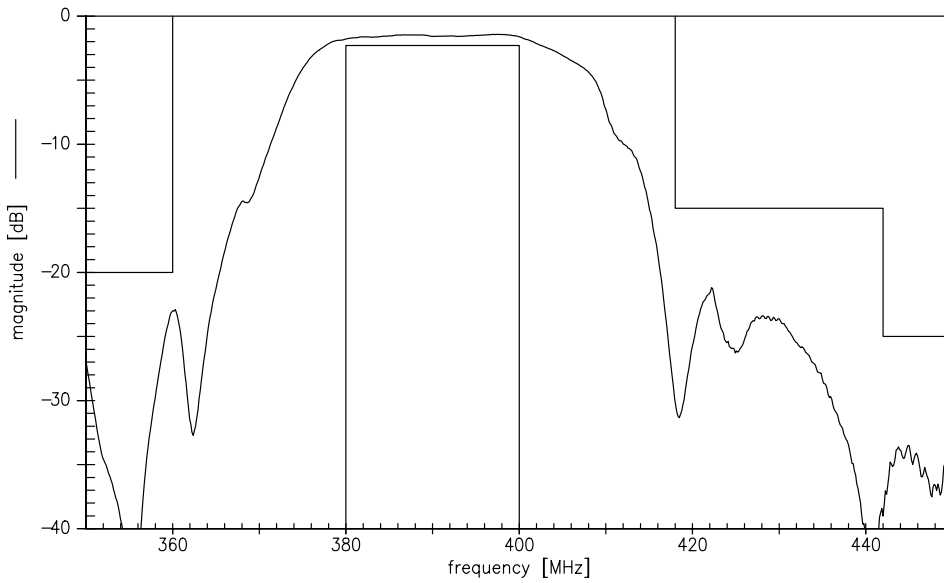
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



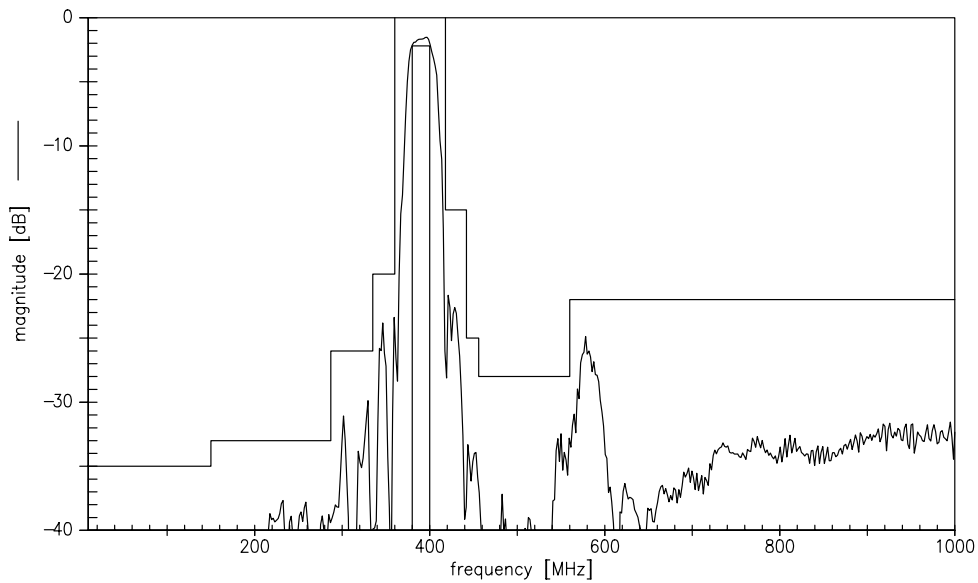
Sample data



Transfer function of Filter 1



Transfer function (wideband)



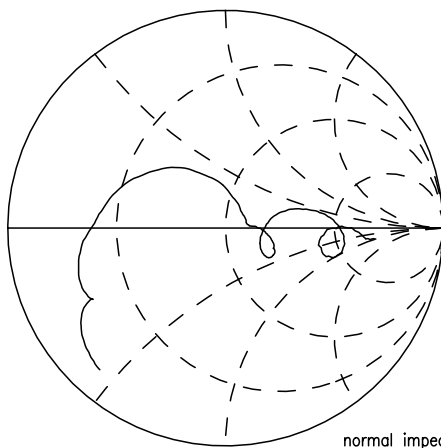


Sample data

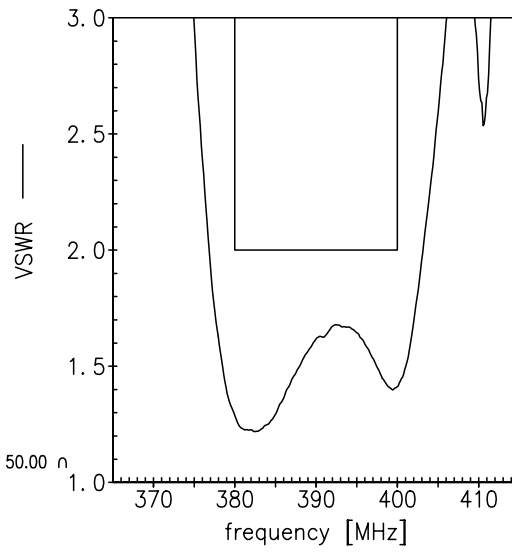


Smith charts of Filter 1

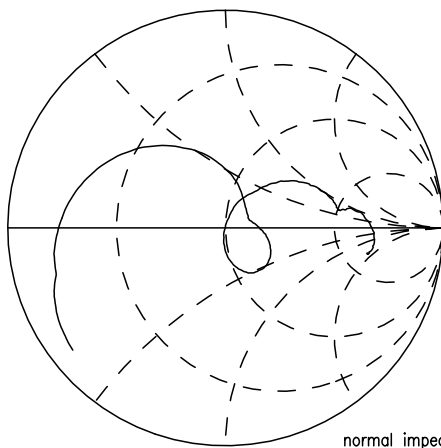
S₁₁ function



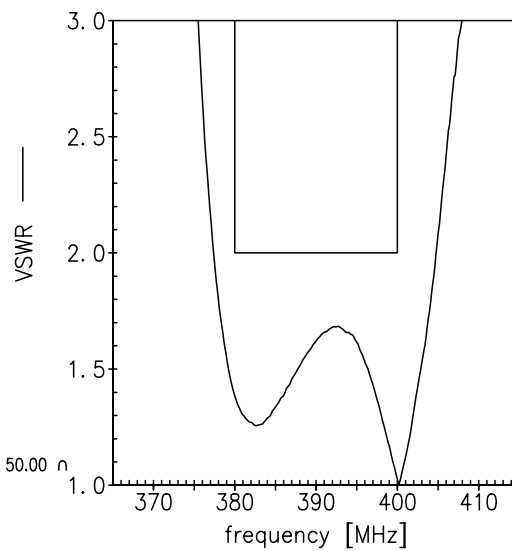
normal impedance: 50.00 Ω



S₂₂ function



normal impedance: 50.00 Ω





SAW Components	B5151
SAW RF filter	390.00 / 415.00 MHz

Sample data



Characteristics of Filter 2

Temperature range for specification: $T = -30$ to $+70^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 50\ \Omega$
 Terminating load impedance: $Z_L = 50\ \Omega$

		LV69B ¹⁾			DGL ²⁾	
		min.	typ. @ 25 °C	max.	min./ max.	
Center frequency	f_C	—	415.0	—		MHz
Maximum insertion attenuation	α_{max}					
400.0 ... 430.0 MHz		—	2.2	2.7		dB
Amplitude ripple (p-p)	$\Delta\alpha$					
400.0 ... 430.0 MHz		—	0.8	1.3		dB
Input VSWR						
400.0 ... 430.0 MHz		—	1.7	2.1		
Output VSWR						
400.0 ... 430.0 MHz		—	1.7	2.0		
Attenuation	α					
10.0 ... 345.0 MHz		25	29	—		dB
345.0 ... 390.0 MHz		9	11	—		dB
440.0 ... 470.0 MHz		4	7	—		dB
470.0 ... 480.0 MHz		25	30	—		dB
480.0 ... 561.0 MHz		27	34	—		dB
561.0 ... 593.0 MHz		28	31	—		dB
593.0 ... 950.0 MHz		21	23	—		dB
950.0 ... 2000.0 MHz		13	16	—		dB
2000.0 ... 2500.0 MHz		5	8	—		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.

**SAW Components****B5151****SAW RF filter****390.00 / 415.00 MHz**

Sample data

**Maximum ratings of Filter 2**

Operable temperature range	T	-40 / +85	°C	
Storage temperature range	T _{stg}	-40 / +85	°C	
DC voltage	V _{DC}	0	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input Power at 400.0 ... 430.0 MHz	P _{IN}	15	dBm	continuous wave

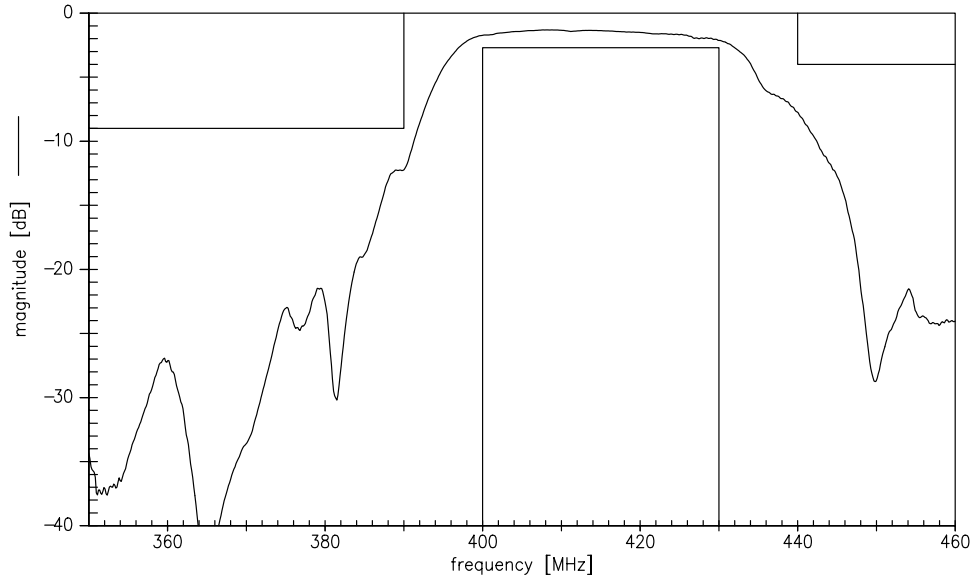
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



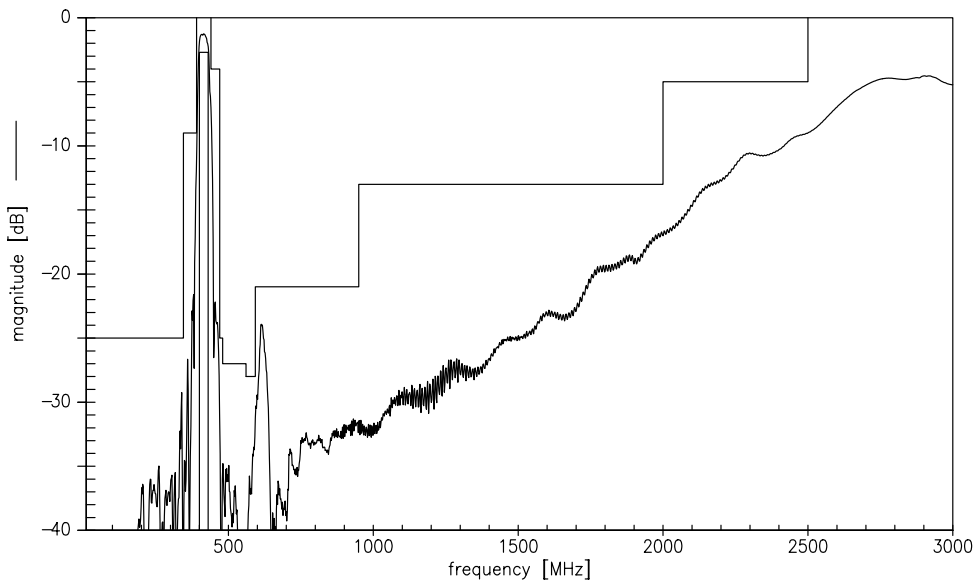
Sample data



Transfer function of Filter 2



Transfer function (wideband)



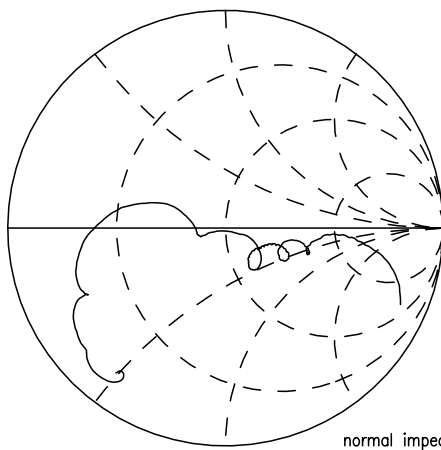


Sample data

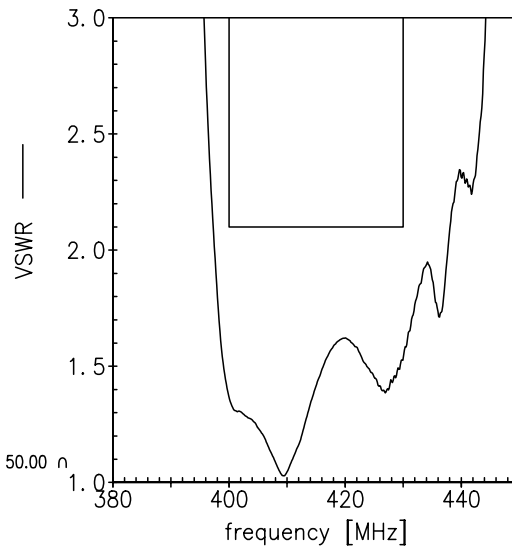


Smith charts of Filter 2

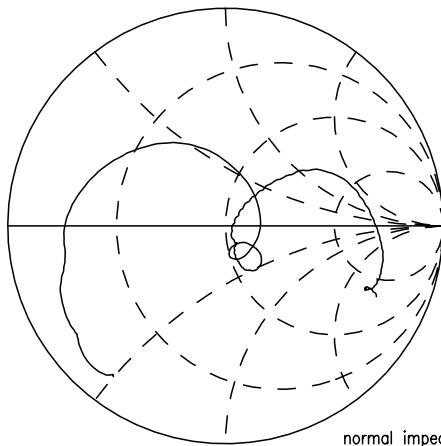
S₁₁ function



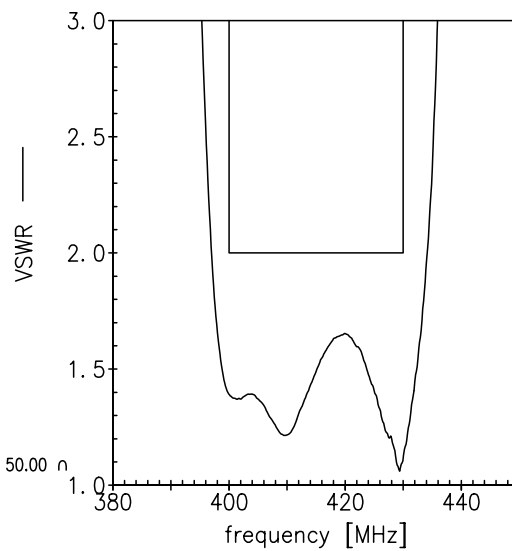
normal impedance: 50.00 Ω



S₂₂ function



normal impedance: 50.00 Ω



**SAW Components****B5151****SAW RF filter****390.00 / 415.00 MHz**

Sample data

**References**

Type	B5151
Ordering code	B39421B5151U310
Marking and package	C61157-A7-A56
Packaging	F61074-V8169-Z000
Date codes	L_1126
S-parameters	LV69B_NB.s2p LV69B_WB.s2p 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."
Matching coils	See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm

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

© EPCOS AG 2010. 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 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.