



SAW Components

SAW Tx 2in1 Filter

WCDMA band IV & V

Series/type:	B9316
Ordering code:	B39172B9316N410
Date:	Jan 11, 2007
Version:	2.1



Data Sheet



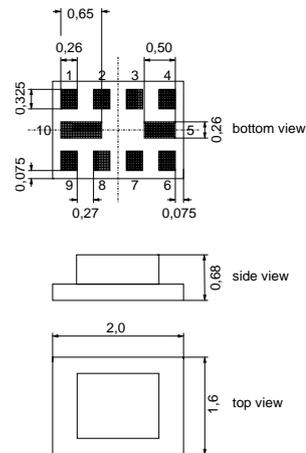
Application

- Low-loss RF filter for mobile telephone WCDMA band V / band IV systems, transmit path (Tx)
- Usable passband:
 - Filter 1 (band V): 25 MHz
 - Filter 2 (band IV): 45 MHz
- Impedance transformation from:
 - Filter 1 (band V): 100 Ω to 50 Ω
 - Filter 2 (band IV): 100 Ω to 50 Ω
- Balanced to unbalanced operation



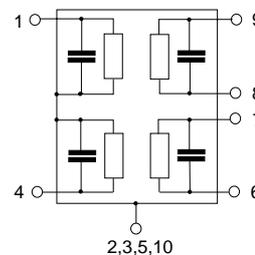
Features

- Package size 2.0 x 1.6 x 0.68 mm³
- Package code QCS10I
- RoHS compatible
- Approximate weight 0.008 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

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





Characteristics filter 1 (WCDMA band V)

Operating temperature range: T = -15 °C to +80 °C
 Terminating source impedance: Z_S = 100 Ω (balanced)
 Terminating load impedance: Z_L = 50 Ω (unbalanced)

		min.	LP77C typ. @ 25 °C	max.	
Center frequency	f _C		836.5		MHz
Maximum insertion attenuation	α _{max}				
824.0 ... 849.0 MHz			1.7	2.2 ¹⁾	dB
Amplitude ripple (p-p)	Δα				
824.0 ... 849.0 MHz			1.0	1.5	dB
Amplitude ripple at 5 MHz BW	Δα				
824.0 ... 849.0 MHz			0.7	0.9	dB
Group delay variation at 5 MHz BW					
824.0 ... 849.0 MHz			10	28	ns
Error Vector Magnitude²⁾ @f_{Carrier}					
826.4 ... 846.6 MHz			1.5	2.5	%
Input VSWR					
824.0 ... 849.0 MHz			1.7	2.0	
Output VSWR					
824.0 ... 849.0 MHz			1.7	2.0	
Input amplitude balance (S₃₁/S₂₁)					
824.0 ... 849.0 MHz		-1	-0.5/0.5	1	dB
Input phase balance (φ(S₃₁) - φ(S₂₁)+180°)					
824.0 ... 849.0 MHz		-10	-3/3	10	°
Attenuation	α				
DC ... 779.0 MHz		35.0	44.0		dB
779.0 ... 804.0 MHz		25.0	33.0		dB
869.0 ... 1570.0 MHz		33.0	36.0		dB
1570.0 ... 1580.0 MHz		43.0	48.0		dB
1580.0 ... 2547.0 MHz		35.0	40.0		dB
2547.0 ... 6000.0 MHz		25.0	35.0		dB

¹⁾ 2.8 dB for T=-30°C to 85°C

²⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.



SAW Components

B9316

SAW Tx 2in1 Filter

836.5 / 1732.5 MHz

Data Sheet



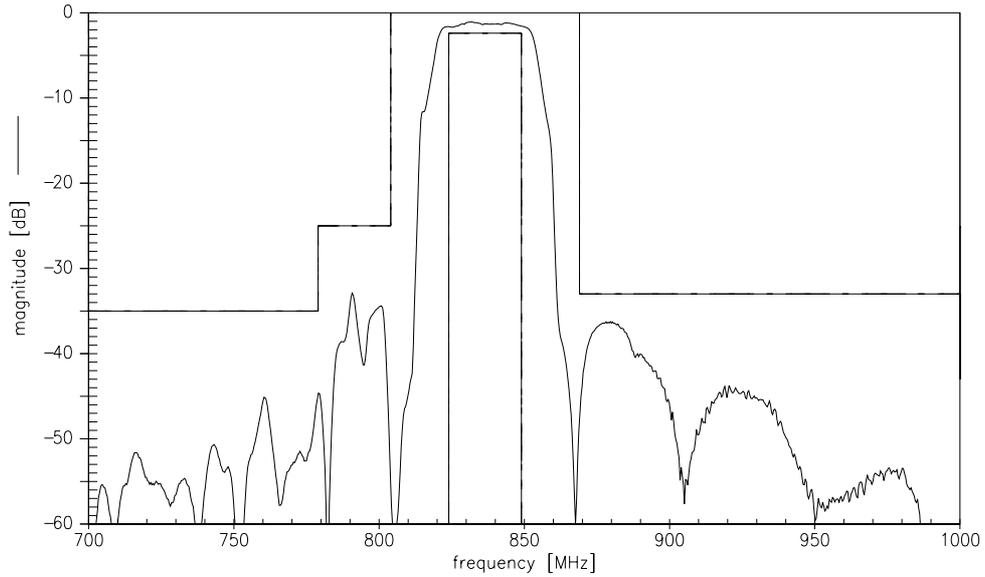
Maximum ratings

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

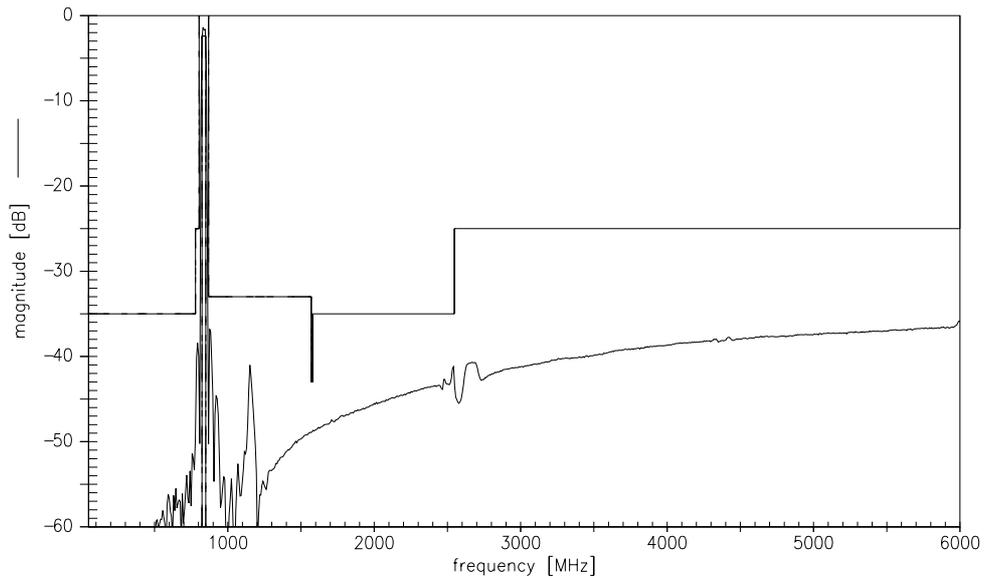
¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



Transfer function



Transfer function (wideband)

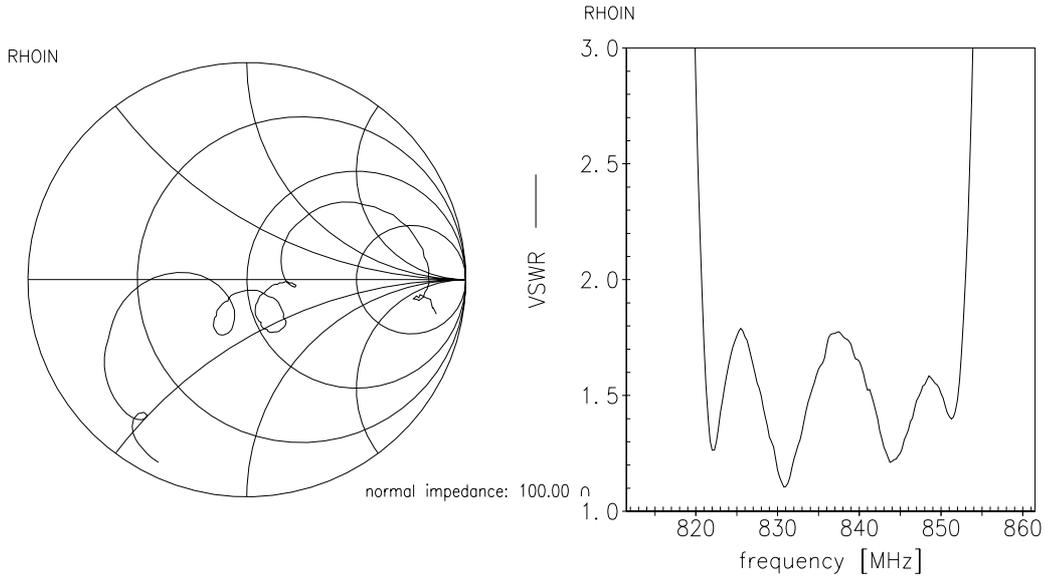




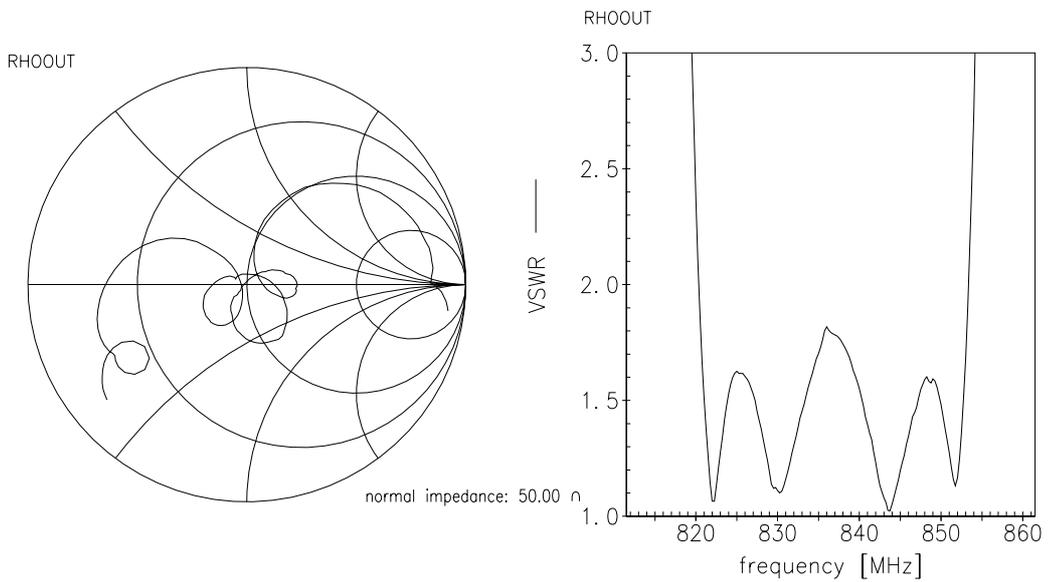
Data Sheet



S₁₁ function



S₂₂ function





Data Sheet



Characteristics filter 2 (WCDMA band IV)

Operating temperature range: T = -15 °C to +80 °C
 Terminating source impedance: Z_S = 100 Ω (balanced) || 22 nH
 Terminating load impedance: Z_L = 50 Ω (unbalanced)

		LP77C			
		min.	typ.	max.	
Center frequency	f _C		1732.5		MHz
Maximum insertion attenuation	α _{max}				
1710.0 ... 1755.0	MHz		1.5	2.2 ¹⁾	dB
Amplitude ripple (p-p)	Δα				
1710.0 ... 1755.0	MHz		0.6	1.4	dB
Amplitude ripple at 5MHz BW	Δα				
1710.0 ... 1755.0	MHz		0.4	0.9	dB
Group Delay variation at 5MHz BW	Δα				
1710.0 ... 1755.0	MHz		8	20	ns
Error Vector Magnitude²⁾ @f_{Carrier}					
1712.4 ... 1752.6	MHz		1.4	2.5	%
Input VSWR					
1710.0 ... 1755.0	MHz		1.6	2.0	
Output VSWR					
1710.0 ... 1755.0	MHz		1.5	2.0	
Input amplitude balance (S₃₁/S₂₁)					
1710.0 ... 1755.0	MHz	-1	-0.5/0.7	1	dB
Input phase balance (φ(S₃₁) - φ(S₂₁)+180°)					
1710.0 ... 1755.0	MHz	-10	-2/5	10	°
Attenuation	α				
DC ... 1310.0	MHz	24	45		dB
1310.0 ... 1355.0	MHz	20	45		dB
1570.0 ... 1580.0	MHz	33	38		dB
1670.0 ... 1675.0	MHz	30	34		dB
1775.0 ... 1830.0	MHz	9	20		dB
1830.0 ... 2110.0	MHz	20	27		dB
2110.0 ... 2155.0	MHz	33	43		dB
2250.0 ... 2500.0	MHz	30	38		dB
2500.0 ... 6000.0	MHz	20	38		dB

1) 2.8 dB for T= -30°C to 85°C

2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141



SAW Components

B9316

SAW Tx 2in1 Filter

836.5 / 1732.5 MHz

Data Sheet

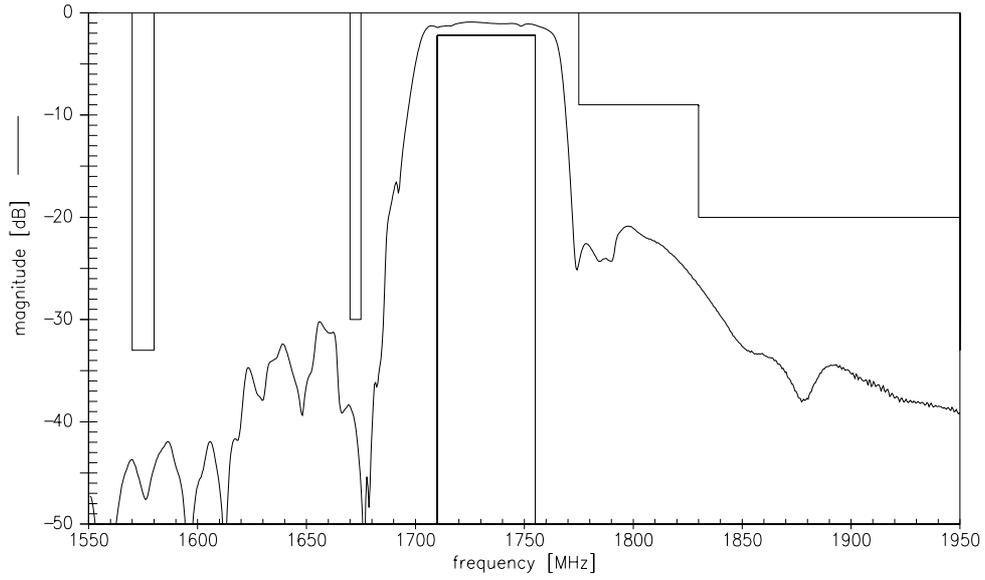


Maximum ratings

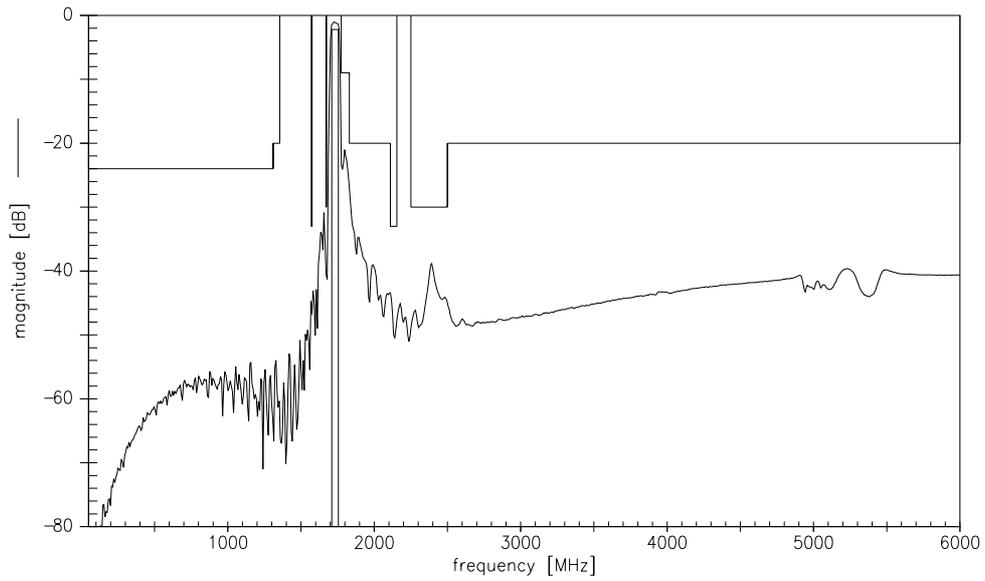
Operable temperature range	T	-30/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50	V	machine model, 10 pulses
Input power at WCDMA band V	P _{IN}	10	dBm	continuous wave @ +55°C ambient
Tx band				



Transfer function



Transfer function (wideband)

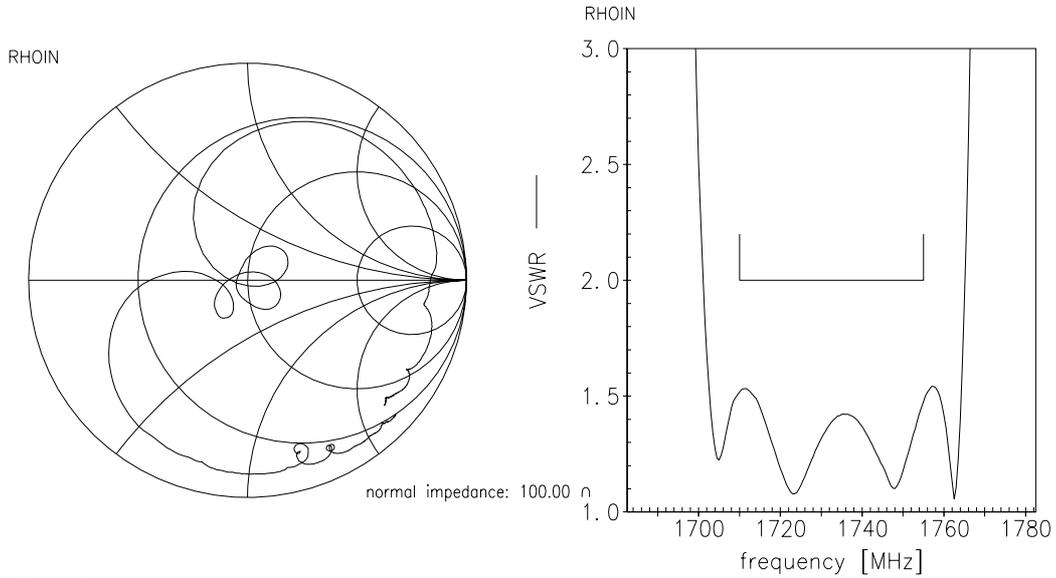




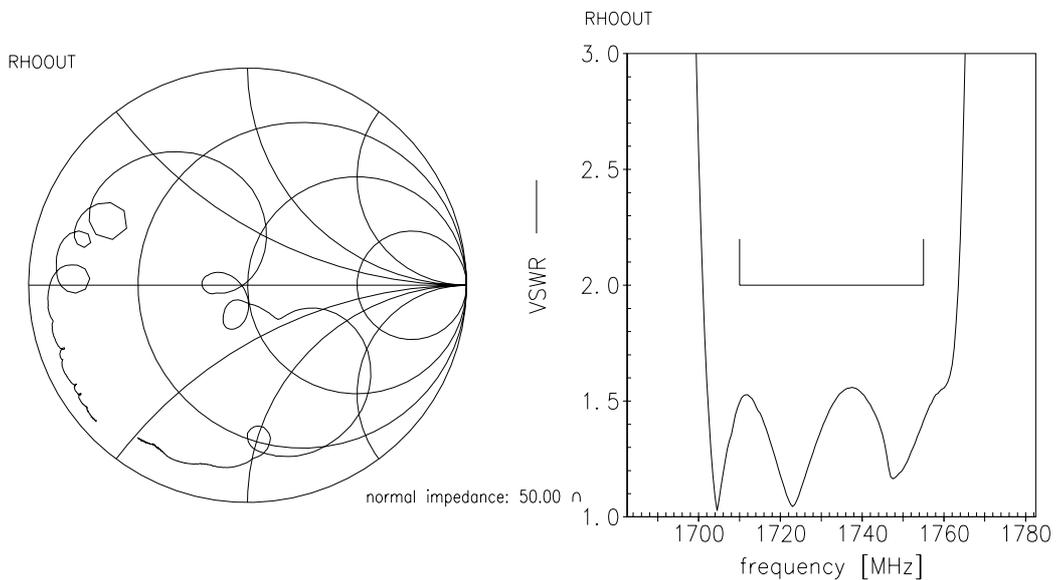
Data Sheet



S₁₁ function



S₂₂ function





SAW Components

B9316

SAW Tx 2in1 Filter

836.5 / 1732.5 MHz

Data Sheet



References

Type	B9316
Ordering code	B39172B9316N410
Marking and package	C61157-A7-A146
Packaging	F61074-V8152-Z000
Date codes	L_1126
S-parameters	B9316_LB_NB.s3p, B9316_LB_WB.s3p B9316_UB_NB.s3p, B9316_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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.

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 2006. 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). 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.