

November 02, 2009

## Notification of changes

### **New passivation material for multilayer varistors and CeraDiodes**

EPCOS has been successfully manufacturing multilayer varistors and CeraDiode® for many years as single and array components in case sizes 0201, 0402, 0603, 0805, 1003, 1206 and 1210 (single) as well as 0405, 0506, 0508, 0612 and 1012 on the basis of the chip-coating process. Here, these components are encapsulated in a glass-like passivation material.

The composition of this passivation material has now been improved. The components encapsulated with the new passivation material will represent the new standard. They differ slightly in their visual appearance from those made with the previous passivation material. The multilayer varistors and CeraDiodes in case size 0603 will be the first to be converted to the new passivation material, the other case sizes listed above will follow by the end of 2010. Their conversion will be notified in a separate PCN. The components with the new passivation material may be distinguished by the last two digits of the ordering code:

- New passivation material: B72\*T/D\*K/A/H\*V9
- Previous passivation material: B72\*T/D\*K/A/H\*V7

The multilayer varistors and CeraDiodes with the optimized passivation material V9 satisfy all the data book specifications as regards electrical and mechanical properties exactly like those manufactured with the previous passivation material V7.

Manufacture of the components with the improved passivation material is based on existing know-how and is implemented with existing and released equipment. Series production takes place according to the standard production control plans.

The multilayer varistors and CeraDiodes in case size 0603 with the optimized passivation material may be ordered immediately. From February 1, 2010 multi-layer varistors and CeraDiodes in case size 0603 will be manufactured exclusively with the new passivation material. Within a transition period from February 1, 2010 residual stocks with the previous passivation material may still be shipped. This change does not affect multilayer varistors manufactured in PLZT passivation technology, which are distinguished by the suffix V50, such as B725\*T\*K\*V50.

**Enclosures** Notification of changes (PCN)  
Data sheets

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**Customers should address inquiries directly to their EPCOS sales contacts.**

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Commercial register  
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Board: Klaus Ziegler  
  
Management Board:  
Gerhard Pegam, President & CEO  
Joachim Zichlarz  
Dr. Werner Faber

**Varistors, CeraDiodes**

Distribution:  
internal / external

091102VAR1e

1/1



**Product / Process Change Notification  
Produkt-/ Prozess-Änderungsmitteilung**

<b>1. ID No. / ID-Nr.:</b> KB 10/01		<b>2. Date of announcement / Datum der Ankündigung:</b> Nov. 02, 2009	
<b>3. Type / Produktgruppe:</b> VS 48, multilayer varistors (MLV) and CeraDiodes VS 48; Vielschichtvaristoren (MLV) und CeraDioden	<b>Old ordering code / Alte Bestell-Nr.:</b> B72500*T/D*K/A/H*V7	<b>New ordering code / Neue Bestell-Nr.:</b> B72500*T/D*K/A/H*V9	<b>Customer part number / Kundensachnummer:</b>
<p><b>4. Description of change / Beschreibung der Änderung:</b></p> <p>EPCOS has been successfully manufacturing multilayer varistors and CeraDiode® for many years as single and array components in case sizes 0201, 0402, 0603, 0805, 1003, 1206 and 1210 (single), as well as 0405, 0506, 0508, 0612 and 1012 on the basis of the chip-coating process. Here, the components are encapsulated in a glass-like passivation material.</p> <p>The composition of this passivation material has been optimized in the course of continuous product improvement. The components encapsulated with this new passivation material will represent the new standard and differ slightly in their visual appearance from those made with the previous passivation material.</p> <p>First, multilayer varistors and CeraDiodes in case size 0603 will be converted to the new passivation material. All the case sizes listed above will be gradually converted by the end of 2010. Their conversion will be announced in a separate PCN.</p> <p>The components with the new passivation material may be distinguished by the last two digits of the ordering coder:</p> <ul style="list-style-type: none"> <li>- Previous passivation material: B72*T/D*K/A/H*V7</li> <li>- New passivation material: B72*T/D*K/A/H*V9</li> </ul> <p>EPCOS fertigt seit vielen Jahren erfolgreich Vielschichtvaristoren und CeraDiode® als Single- und Array-Bauelemente in den Bauformen 0201, 0402, 0603, 0805, 1003, 1206 und 1210 (Single) und 0405, 0506, 0508, 0612 und 1012 mit dem sogenannten Chip-Coating-Verfahren. Bei diesem Verfahren werden die Bauelemente mit einem glasartigen Passivierungsmaterial umhüllt.</p> <p>Die Zusammensetzung dieses Passivierungsmaterials wurde im Zuge einer kontinuierlichen Produktverbesserung optimiert. Die mit dem neuen Passivierungsmaterial umhüllten Bauelemente werden den neuen Standard bilden und unterscheiden sich optisch leicht von den Bauelementen mit bisherigem Passivierungsmaterial.</p> <p>Zunächst werden die Vielschichtvaristoren und CeraDioden der Bauform 0603 auf das neue Passivierungsmaterial umgestellt, die anderen oben genannten Bauformen folgen bis Ende 2010. Deren Umstellung wird in einer separaten PCN mitgeteilt.</p> <p>Die Bauelemente mit dem neuen Passivierungsmaterial sind an den letzten zwei Stellen der Sachnummer erkennbar:</p> <ul style="list-style-type: none"> <li>- Bisheriges Passivierungsmaterial: B72*T/D*K/A/H*V7</li> <li>- Neues Passivierungsmaterial: B72*T/D*K/A/H*V9</li> </ul>			



**5. Effect on the product or for customers (quality, specification, lead time) /**

**Auswirkung auf das Produkt oder für den Kunden (Qualität, Spezifikation, Lieferzeiten):**

The multilayer varistors and CeraDiodes with the optimized passivation material "V9" satisfy the data book specifications as regards electrical and mechanical properties exactly like those manufactured with the previous passivation material "V7". All other specifications are also satisfied in accordance with the data book.

Die Vielschichtvaristoren und CeraDioden mit dem optimierten Passivierungsmaterial "V9" erfüllen ebenso wie die mit dem bisherigen Passivierungsmaterial "V7" gefertigten Bauelemente hinsichtlich elektrischer und mechanischer Eigenschaften die Datenbuchangaben und -spezifikationen. Auch alle anderen Angaben und Spezifikationen werden entsprechend Datenbuch eingehalten.

**6. Quality assurance measures / Maßnahmen zur Qualitätssicherung:**

Manufacture of multilayer varistors and CeraDiodes is a standard process at EPCOS. Manufacture of the components with the optimized passivation material is based on existing know-how and is implemented with existing and released equipment.

Series production takes place according to the standard control plans.

Die Fertigung von Vielschichtvaristoren und CeraDioden ist für EPCOS ein Standardprozess. Die Fertigung der Bauelemente mit dem optimierten Passivierungsmaterial basiert auf vorhandenem Know-how und wird mit bestehendem und freigegebenem Equipment gefertigt.

Die Serienfertigung erfolgt entsprechend den Standard-Produktionslenkungsplänen.

**7. Scheduled date of introduction / Geplante Einführung:**

The multilayer varistors and CeraDiodes in case size 0603 with the optimized passivation material may be ordered immediately. By February 1, 2010 at the latest, all multilayer varistors and CeraDiodes in case size 0603 will be produced with the optimized passivation material only. Within a transition period starting on February 1, remainders with previous passivation material might be shipped.

Multilayer varistors with the so called PLZT passivation technology and the suffix "V50", B72\*T\*K\*V50 are not effected from the change.

Die Vielschichtvaristoren und CeraDioden in der Bauform 0603 aus dem optimierten Passivierungsmaterial können sofort bestellt werden. Ab dem 1. Februar 2010 werden Vielschichtvaristoren und CeraDioden der Bauform 0603 ausschließlich mit dem neuen Passivierungsmaterial hergestellt. In einer Übergangszeit ab dem 1. Februar 2010 können noch Restbestände mit dem bisherigen Passivierungsmaterial ausgeliefert werden.

Nicht betroffen von der Umstellung sind Vielschichtvaristoren mit der sog. PLZT-Passivierungstechnologie, die am Suffix "V50" erkennbar sind, B725\*T\*K\*V50.

**8. Customer feedback / Rückmeldung vom Kunden:**

If EPCOS does not receive notification to the contrary within a period of 10 weeks, EPCOS assumes that the customer agrees to the change. For an interim period we cannot rule out that old as well as new products will be shipped.

Falls EPCOS innerhalb von 10 Wochen keine gegenteilige Mitteilung erhält, geht EPCOS davon aus, dass die geplante Änderung vom Kunden akzeptiert ist. Innerhalb einer Übergangszeit kann es vorkommen, dass sowohl alte wie auch neue Ware geliefert wird.

Quality Management:  
Name: Dr. W. Pint

Signature  
sgd. Dr. W. Pint



Product Marketing:

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Name: Ludwig Krieger

Signature

sgd. Ludwig Krieger

Customer acknowledgement

Bestätigung durch den Kunden

Signature



Cera Diodes

Material Data Sheet

Product Class:	Cera Diodes B72***D (suffix V9)
Date	28.09.2009
IMDS ID if available	
Version:	3.1

Product part (IMDS: semi component)	Material Group (IMDS Material)	Material (Classification) VDA 231	Substance	TMPS**) [wt-%]	CAS if applicable	typical mass of material [wt-%]	Traces see 1)
Active Part	Ceramic	4B	ZnO Bi2O3 Sb2O3 Co3O4 NiO Dopants*)	89 3 5 1 1 1	1314-13-2 1304-76-3 1309-64-4 1308-06-1 1313-99-1 -	94	
Termination	Heavy Metal Nobel Metal	1C 1D	Ag Pd	75 25	7440-22-4 7440-05-3	1	
Termination	Composite	5D	Ag Glass frit	90 10	7440-22-4 -	4,2	
	Heavy Metal	1C	Ni	100	7440-02-0	0,3	
	Heavy Metal	1C	Sn	100	7440-31-5	0,5	
<b>Sum in total:</b>						<b>100</b>	

sizes [ mm]	weight range [ g]	part numbers
0.6 x 0.3 x 0.3	0.0003	CDS1
1.0 x 0.5 x 0.5	0.002	CDS2
1.5 x 0.7 x 0.7	0.006	CDS3
2.5 x 0.8 x 0.8	0.008	CDS4

**Not part of a product class**

released by:	Dr. Bernhard	<b>Important remarks:</b> 1) The declaration limit is 0.1% as defined by IEC PAS 61906. Traces are product parts, substances etc. that are below a percentage of 0.1 % by weight, if not otherwise regulated (Limits for Traces can be taken from the Global Automotive Declarable Substance List (GADSL)). 2) This Material Data Sheet contains typical values of the respective products set forth herein. We expressly point out that all values and statements contained herein are based on our best present knowledge and cannot be regarded as binding statements or binding product specifications, unless otherwise explicitly agreed in writing. EPCOS AG AND ITS AFFILIATES HEREBY EXPRESSLY DISCLAIM ANY REPRESENTATION OR WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, WITH REGARD TO THE STATEMENTS AND VALUES CONTAINED HEREIN, INCLUDING BUT NOT LIMITED TO ANY REPRESENTATION OR WARRANTY OF MERCHANTABILITY OR SUITABILITY FOR ANY PURPOSE.
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*) Dopants: Substances not declarable or prohibited acc. to BADSL ) typical mass percentage of substance		

The products set forth herein are "RoHS-compatible". RoHS-compatible means that the products are compatible with the requirements of 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 ("Directive 2002/95/EC as amended by the Commission Decisions 2005/618/EC, 2005/717/EC; 2005/747/EC, 2006/310/EC, 2006/690/EC, 2006/691/EC and 2006/692/EC ("RoHS-Regulations")), and are compatible with the requirements of the provisions which will result from transformation of the RoHS-Regulations into national law to the extent such provisions reflect the RoHS-Regulations.

**RoHS - Exemptions for the product class / product according Annex and Commissions Decisions (status 03/2008):** (  valid  not valid )

no exemptions

Exemption 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

Exemption 6: Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminum containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.

Exemption 7 (a): Lead in high melting temperature type solder (i.e. lead-based alloys containing 85 % by weight or more lead).

Exemption 7 (c): lead in electronic ceramic parts (e.g. piezo electronic devices);

Exemption 15: Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages



Varistor

Material Data Sheet

Product Class:	Multilayer Varistor CT-Type B725**T* (suffix V9)
Date	28.9.2009
IMDS ID if available	
Version:	3.1

Product part (IMDS: semi component)	Material Group (IMDS Material)	Material (Classification) VDA 231	Substance	TMPS** [wt%]	CAS if applicable	typical mass of material [wt-%]	Traces see 1)
Active Part	Ceramic	4B	ZnO Bi2O3 Sb2O3 Co3O4 NiO Dopants*)	89 3 5 1 1 1	1314-13-2 1304-76-3 1309-64-4 1308-06-1 1313-99-1 -	94	
Termination	Heavy Metal Nobel Metal	1C 1D	Ag Pd	75 25	7440-22-4 7440-05-3	1	
Termination	Composite	5D	Ag Glass frit	90 10	7440-22-4	4,2	
	Heavy Metal	1C	Ni	100	7440-02-0	0,3	
	Heavy Metal	1C	Sn	100	7440-31-5	0,5	
<b>Sum in total:</b>						<b>100</b>	

sizes [ mm]	weight range [ g]	part numbers
1.0 x 0.5 x 0.5	0.002	0402
1.6 x 0.8 x 0.8	0.006	0603
2.0 x 1.25 x 1.1	0.017	0805
3.2 x 1.6 x 1.1	0.03	1206
3.2 x 2.5 x 1.3	0.06	1210
4.5 x 3.2 x 2.2	0.19	1812
5.7 x 5.0 x 1.5	0.25	2220

Not part of a product class

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*) Dopants: Substances not declarable or prohibited acc. to BADSL **) typical mass percentage of substance	

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- no exemptions
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- Exemption 7 (a): Lead in high melting temperature type solder (i.e. lead-based alloys containing 85 % by weight or more lead),
- Exemption 7 (c): lead in electronic ceramic parts (e.g. piezo electronic devices);
- Exemption 15: Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages