

## 规格书承认

客 户 Power Meter  
客 户 物 料 \_\_\_\_\_  
EPCOS Type S25K460E4R9,2K77  
EPCOS Series Type S25K460E4K77  
EPCOS Ordering Code B72225S4461K102  
Data Sheet a  
Dimension Drawing See below datasheet  
Date 2018-3-30

Prepared by:	Signed By: PD	Signed: QA	Issue Date:	Version:
Qian Li	Terry Tian	Mac Gao	2018-3-30	a

客户承认:

设计:	检验:	承认:

To ensure that the attached datasheet meets your requirement we ask you to return this cover sheet with your confirmation or otherwise comments. If we will get no reaction from you within 30 days we will assume that you accept the attached datasheet and subsequent deliveries will be in accordance with the data sheet.

PPD PD

## 金属氧化物压敏电阻

### 引线压敏电阻(高能量系列)

系列/型号: **SIOV- S25K460E4R9,2K77**  
物料号: **B72225S4461K102**  
日期: **2018-3-30**  
版本: **a**

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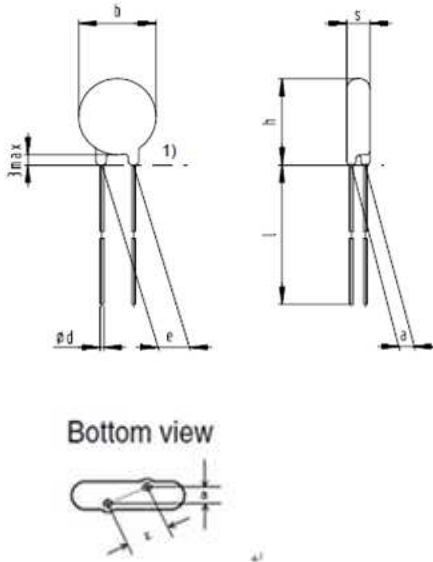
**SIOV 命名法:**

S	=	圆瓷片系列
25	=	瓷片直径
K	=	1mA 下 $V_V$ 允许公差: $\pm 10\%$
460	=	最大交流工作电压
E4	=	高能量系列
R9,2	=	引脚间距
K77	=	符合国家电网标准

**基本技术资料**

环境特性	to IEC 60068-1	40/105/56
工作温度	to IEC 61051	-40...+105 °C
储存温度		-40...+125 °C
耐压强度	to IEC 61051	$\geq 2.5$ kVRMS
绝缘	to IEC 61051	$\geq 100$ M $\Omega$

附图: 单位:毫米 (mm)



$b_{max}$	=	26,0
$h_{max}$	=	30,0
$s_{max}$	=	9,3
$e$	=	9,2(\text{typical value})^2)
$a$	=	5,6 (\text{typical value})^3)
$z$	=	10,0±0,8
$l_{min}$	=	25
$\text{Ø}d$	=	1,0±0,05

- 1) Seating plane in accordance with IEC 60717
- 2) typical values not measure
- 3) typical values not measure

### 电性参数:

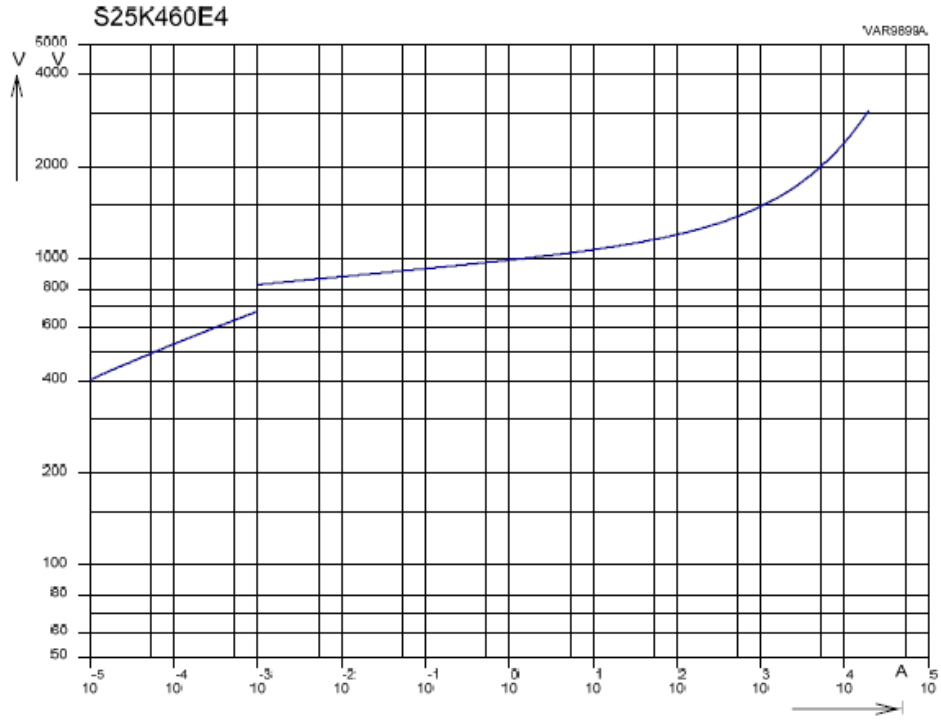
#### 最大额定值 (105°C)

最大交流工作电压		$V_{RMS}$	=	460V
最大直流工作电压		$V_{DC}$	=	615V
通流容量 (8/20µs)	1 次	$I_{max}$	=	20000A
通流容量 (8/20µs)	40 次	$I_{max}$	=	4000 A
能量耐量 (2ms)	1 次	$I_{max}$	=	220A
平均功率耗散		$P_{max}$	=	1,0W

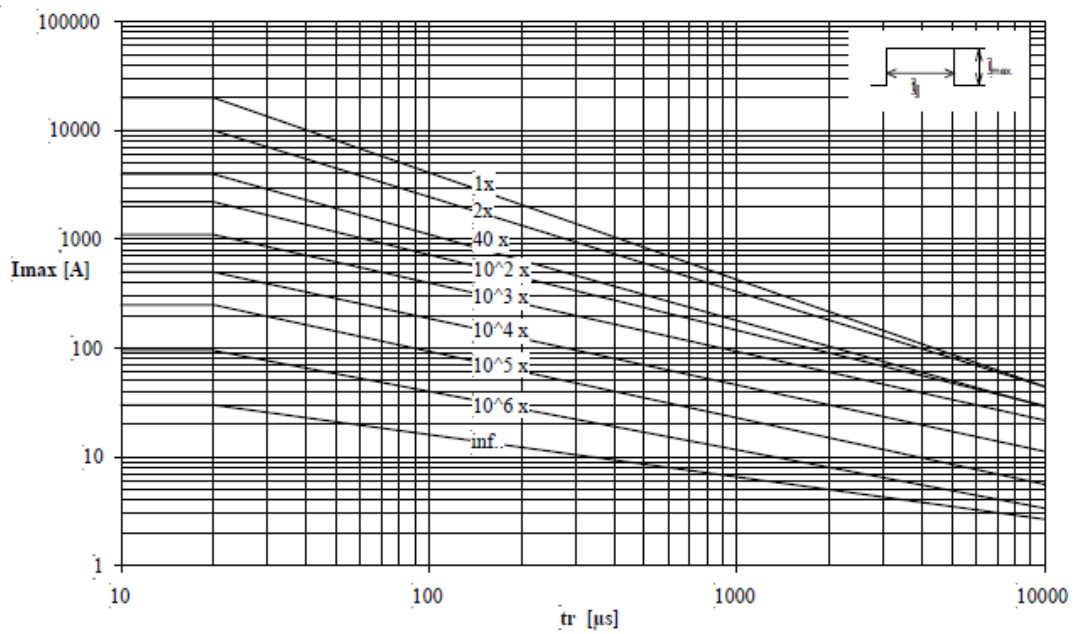
#### 特性 参数(25°C):

1mA 下压敏电压		$V_V$	=	750V ± 10%
150A 下钳位电压(8/20µs)		$V_{C,max}$	=	1240V
1 kHz 下电容量		$C_{max}$	=	2100pF
400V 下的漏电流		$I_{max}$	=	10uA

伏安特性曲线 VI:



降额曲线:



## 可靠性参数:

	特性	测试方法/描述	规范
电	压敏电压	用规定的电流测量出压敏电阻两引脚间的电压 $V_v$ ( $1 \text{ mA}_{\text{DC}} @ 0.2 - 2 \text{ s}$ ).	符合规定值
	钳位电压	用规定脉冲电流( $8/20\mu\text{s}$ )测量出压敏电阻两引脚间的最大电压.见下图. 	符合规定值
能	冲击电流降额, $8/20 \mu\text{s}$	$40 \times 4 \text{ kA}$ 次冲击电流 ( $8/20 \mu\text{s}$ ), 以一个方向冲击 20 次后, 另一个方向冲击 20 次, 相邻两次冲击的时间间隔为 90s.	$ \Delta V/V (1 \text{ mA})  \leq 10 \%$ (按照冲击电流测量) 无可见损坏
	冲击电流降额, 2 ms	1 次冲击电流 (2ms)	$ \Delta V/V (1 \text{ mA})  \leq 10 \%$ (按照冲击电流测量) 无可见损坏

## 可靠性参数:

	特性	测试方法/描述	规范										
机  械  性  能	拉力	对两引脚逐步加一定拉力,持续 10 秒, 然后目检是否有损坏.  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>引线直径</th> <th>拉力</th> </tr> </thead> <tbody> <tr> <td>0.5 mm</td> <td>5 N</td> </tr> <tr> <td>0.6 mm</td> <td>10 N</td> </tr> <tr> <td>0.8 mm</td> <td>10 N</td> </tr> <tr> <td>1.0 mm</td> <td>20 N</td> </tr> </tbody> </table>	引线直径	拉力	0.5 mm	5 N	0.6 mm	10 N	0.8 mm	10 N	1.0 mm	20 N	$ \Delta V/V (1 \text{ mA})  \leq 5 \%$ 焊锡点未脱开, 引线无损坏
	引线直径	拉力											
	0.5 mm	5 N											
0.6 mm	10 N												
0.8 mm	10 N												
1.0 mm	20 N												
振动	对产品进行一个单独的谐波振动. 然后对产品进行目检.具体参数见下表  频率范围:            10 .... 55 Hz 幅度:                    0.75 mm or 98 m/s <sup>2</sup> 持续时间:            6 h (3 x 2 h) 脉冲:                    正弦波	$ \Delta V/V (1 \text{ mA})  \leq 5 \%$ 无可见损坏											
可焊性	把引脚浸入 245°C 的无铅焊锡槽中距离本体大约 3 mm 深度, 持续 3 秒, 然后对引脚进行目检.	目检要求在足够光亮的地方进行, 并要求检查者有正常的视力或者借助 4-10 倍放大率的放大镜. 浸入部分的表面要有一层光滑明亮的焊锡层, 像针孔, 未沾锡处等不可聚集在一处, 且分散点不可过多.											

## 可靠性参数:

	特性	测试方法/描述	规范
机械性能	耐焊接热	将每根引线浸入温度为 $260 \pm 5^{\circ}\text{C}$ 的焊锡槽中 2.0 到 2.5 mm, 持续 $10 \pm 1$ s, 然后在室温, 正常湿度的状况下放置 1 到 2 小时. 测量 $V_V$ 的变化, 并检查是否有机机械损坏.	$ \Delta V/V (1 \text{ mA})  \leq 5\%$ 无可见损坏
	电气强度	<b>2500 V<sub>RMS</sub>, 60 s</b> 将压敏电阻放在一个装满直径为 $1.6 \pm 0.2$ mm 金属球的容器里, 只露 2 个引脚出来, 将两引脚连接起来当作一个电极, 把另外一个电极插入金属球当中, 在两电极中加指定电压.	无损坏

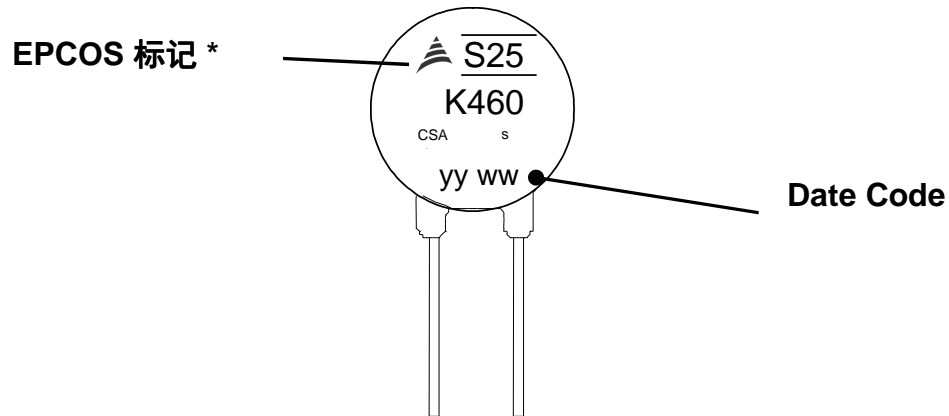


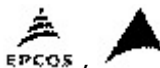
## 可靠性参数:

	特性	测试方法/描述	规范												
环	最大交流工作电压	在 $UCT \pm 2^{\circ}C$ 下持续加最大允许工作电压 1000 小时, 然后把样品在室温, 正常湿度下放置 1-2 小时. 测量 $V_v$ 的变化值.	$ \Delta V/V (1 \text{ mA})  \leq 10 \%$												
	湿热	把样品放置在 $40 \pm 2^{\circ}C$ 温度, 90-95 %相对湿度下 56 天(不加电压), 然后在室温, 正常湿度下放置 1-2 小时. 测量 $V_v$ 的变化值.	$ \Delta V/V (1 \text{ mA})  \leq 10 \%$												
境	气候顺序	样品依次经过以下环境: a) 干热, $UCT$ , 16 h b) 湿热, 第一次循环: $55^{\circ}C$ , 93 %相对湿度., 24 h c) 冷, $-40^{\circ}C$ , 2 h d) 湿热, 额外 5 次循环: $55^{\circ}C$ , 93 %相对湿度., 每循环 24h 然后在室温, 正常湿度下放置 1-2 小时. 测量 $V_v$ 的变化值.	$ \Delta V/V (1 \text{ mA})  \leq 10 \%$												
实	快速温度循环	按照下表的参数重复 5 次温度循环. 然后在室温, 正常湿度下放置 1-2 小时. 测量 $V_v$ 的变化值, 且目检外观是否有机机械损伤.	$ \Delta V/V (1 \text{ mA})  \leq 5 \%$ 无可见损坏												
验		<table border="1"> <thead> <tr> <th>步骤</th> <th>温度 (<math>^{\circ}C</math>)</th> <th>时间 (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40 \pm 3</math></td> <td><math>30 \pm 3</math></td> </tr> <tr> <td>2</td> <td>转换时间</td> <td><math>&lt; 10 \text{ s}</math></td> </tr> <tr> <td>3</td> <td><math>UCT</math></td> <td><math>30 \pm 3</math></td> </tr> </tbody> </table>	步骤	温度 ( $^{\circ}C$ )	时间 (min.)	1	$-40 \pm 3$	$30 \pm 3$	2	转换时间	$< 10 \text{ s}$	3	$UCT$	$30 \pm 3$	
步骤	温度 ( $^{\circ}C$ )	时间 (min.)													
1	$-40 \pm 3$	$30 \pm 3$													
2	转换时间	$< 10 \text{ s}$													
3	$UCT$	$30 \pm 3$													

备注: 更多详细资料请参考 '金属氧化物压敏电阻' 一书, 订购序号. EPC: 62002-7600

印字: (示意图):



\* Marking: Company name or tradename "EPCOS" or trademark ,

## Cautions and warnings

### General

1. EPCOS metal oxide varistors (SIOVs) are designed for specific applications and should not be used for purposes not identified in our specifications, application notes and data books unless otherwise agreed with EPCOS during the design-in-phase.
2. Ensure suitability of SIOVs through reliability testing during the design-in phase. The SIOVs should be evaluated taking into consideration worst-case conditions.
3. For applications of SIOVs in line-to ground circuits based on various international and local standards there are restrictions existing or additional safety measures required.

### Storage

1. Store SIOVs only in original packaging. Do not open the package before storage.
2. Storage conditions in original packaging:  

Storage temperature:	-25 °C ... +45 °C
Relative humidity:	<75% annual average, <95% on maximum 30 days a year.
Dew precipitation:	Is to be avoided.
3. Avoid contamination of SIOVs surface during storage, handling and processing.
4. Avoid storage of SIOVs in harmful environments which can affect the function during long-term operation (examples given under operation precautions).
5. The SIOV type series should be soldered within the time specified.  

SIOV-S, -Q, -LS	24 months
ETFV and SFS types	12 months

### Handling

1. SIOVs must not be dropped.
2. Components must not be touched with bare hands. Gloves are recommended.
3. Avoid contamination of the surface of SIOV electrodes during handling, be careful of the sharp edge of SIOV electrodes.

### **Soldering (where applicable)**

1. Use rosin-type flux or non-activated flux.
2. Insufficient preheating may cause ceramic cracks.
3. Rapid cooling by dipping in solvent is not recommended.
4. Complete removal of flux is recommended.

### **Mounting**

1. Potting, sealing or adhesive compounds can produce chemical reactions in the SIOV ceramic that will degrade the component's electrical characteristics.
2. Overloading SIOVs may result in ruptured packages and expulsion of hot materials. For this reason the SIOVs should be physically shielded from adjacent components.

### **Operation**

1. Use SIOVs only within the specified temperature operating range
2. Use SIOVs only within the specified voltage and current ranges.
3. Environmental conditions must not harm the SIOVs. Use SIOVs only in normal atmospheric conditions. Avoid use in the presence of deoxidizing gases (chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, etc), corrosive agents, humid or salty conditions, Avoid contact with any liquids and solvents.

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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.
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