

产品规格书

PRODUCT SPECIFICATION

客户名称:

CUSTOMER:

青岛海尔智能电子有限公司

产品名称:

PRODUCT NAME:

压敏电阻

型号:

MODEL:

14D561K-B(TVR14561KSY)

规格:

SPECIFICATION:

料号:

PART NO.:

供应商:

SUPPLIER:

惠州市三特电器有限公司

Huizhou Sante Electrical Appliance Co. Ltd.

地址:

ADDRESS:

惠州市博罗县罗阳镇义和大小塘村小塘组

Boluo County, Huizhou City, Luo Yang Zhen Yi Tang Cun Tang and the size of small group

TEL: 0752-6623066

Http:[www.stfuse.com](http://www.stfuse.com)

FAX: 0752-6637866

E-mail:2744550951@qq.com

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供方签章:

SUPPLIER:

需方签章:

CUSTOMER:

日期: 2019-2-20

DATE: 2019-2-20

日期:

DATE:

## ■ 特性

### Features

1. 符合 RoHS  
RoHS compliant
2. 本体尺寸: 18.0mm X19.5mm  
Body size: 18.0mm X19.5mm
3. 工作温度范围:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$   
Operating temperature range:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
4. 储存温度范围:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$   
Storage temperature range:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
5. 安规认证: UL /cUL / VDE / CQC  
Agency recognition: UL /cUL / VDE / CQC

## ■ 用途

### Applications

1. 电源供应器  
Power supply
2. 家用电器  
Home appliance
3. 工业设备  
Industrial equipment
4. 通信设备  
Telecommunication or telephone system
5. 智能控制型电表  
Smart meter
6. 电力线智能通讯设备  
PLC (Power line communication)
7. 照明  
Lighting products
8. 光伏系统  
Photovoltaic industry

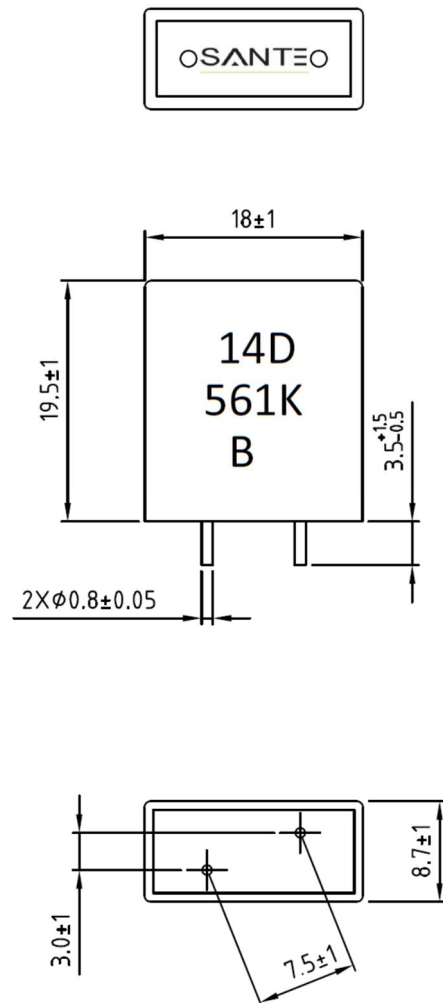
## ■ 型号说明:

Part Numbers System:

14 D 561 K B  
 ① ② ③ ④ ⑤

1. Disc Element Dia.  
14 - Ø14mm
2. Type  
D: Standard series
3. Varistor Voltage  
561=56X10<sup>1</sup>=560V
4. Tolerance  
K =±10%
5. Varistor Brand:  
B—TKS

■ 产品尺寸：(单位：mm)  
 Product Dimensions (Unit: mm)



廣東為勤興景電子有限公司

GUANGDONG WELKIN THINKING ELECTRONIC CO.,LTD

地址：廣東省東莞市虎門鎮懷德雅瑤村壹棟二巷7號第七層

電話： 0769- 82268299 傳真： 0769- 85103053

網址：

MANUFACTURING SITE

KAOHSIUNG FACTORY: No.51, Kaifa Road, Nantze Export Processing Zone,  
Kaohsiung City 81170, Taiwan  
TEL: 886-7-9616668 FAX: 886-7-9616698

CHANGZHOU FACTORY: No.6 Longmen Road, Wujin National High&New-Tech  
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TEL:86-519-86578999 FAX:86-519-86558643

**R** DONG GUAN FACTORY: Chiao-Tou Tsun, Sha-Tao Hsiang, Chang-An Town,  
Dong-Guan City 523863, Guangdong, China  
TEL:86-769-85542016 FAX:86-769-85546890

YICHANG FACTORY: No. 283 Xiaoting Avenue, Xiaoting Dist., Yichang  
City 443007, Hubei, China  
TEL:86-717-6510010 FAX:86-717-6511430



SPECIFICATION FOR APPROVAL

CUSTOMER 三特

CERTIFIED MODEL/TYPE TVR14561

PART NO. TVR14561KSY (RoHS)

APPLICATION \_\_\_\_\_

CUSTOMER P/N \_\_\_\_\_

ISSUE DATE Jan.29,2018

REV. NO. \_\_\_\_\_

REV. DATE \_\_\_\_\_

FOR CUSTOMER APPROVAL	CHECKED BY
	柳麗君
	APPROVED BY
	陳振東



Zinc Oxide Varistor TVR Type  
Part No. :TVR14561KSY

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**REVISED RECORD SHEET**

REV. NO	REV. DATE	REVISED CONTENT

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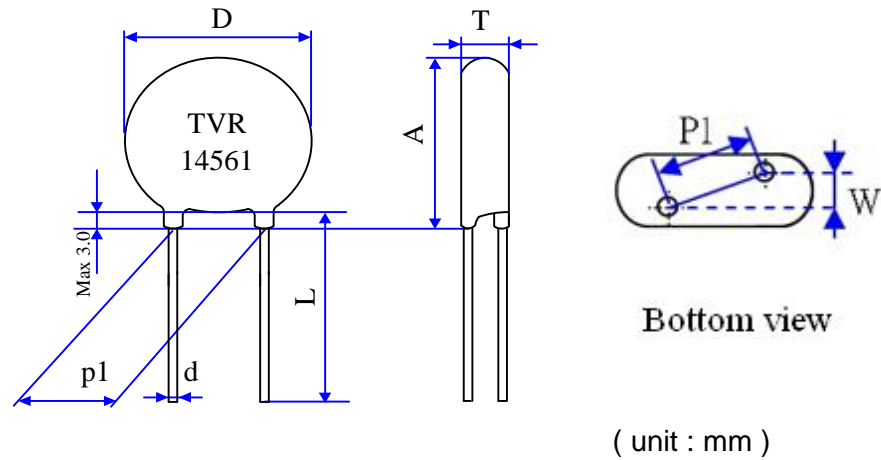
Part Number Code

Example :

**TVR**    **14**    **561**    **K**    **S**    **Y**  
**(1)**    **(2)**    **(3)**    **(4)**    **(5)**    **(6)**

No.	Item	Digit	Specification
(1)	Product Type	TVR	Thinking varistor TVR type
(2)	Body Size	14	φ 14 mm
(3)	Varistor Voltage	561	$56 \times 10^1 \text{ V} = 560\text{V} (V_{1\text{mA}})$
(4)	Tolerance of $V_{1\text{mA}}$	K	±10%
(5)	Appearance	S	Straight lead , epoxy coating
(6)	Optional Suffix	Y	RoHS compliance

Structure and Dimensions



Body Size	D	P1	d	A max.	L min.	T	W
f 14	13.5~16.0	7.5±0.5	0.80±0.05	19.0	26.5	4.0~5.9	3.0±1

**\*Coating material rating:UL 94 V-0**

Electrical Characteristics (Ambient Ta=25 °C )

Part No.	Varistor Voltage (@ 1mA DC)	Max. Continuous Voltage		Max. Clamping Voltage (8/20µs)		Max. Surge Current (8/20µs)	Max. Energy (10/1000µs)
	V <sub>1mA</sub> (V)	V <sub>AC(rms)</sub> (V)	V <sub>DC</sub> (V)	V <sub>p</sub> (V)	I <sub>p</sub> (A)	I (A)	W (J)
TVR14561KSY	560 ± 10 %	350	450	930	50	4500	125

Part No.	Rated Power	Impulse Response Time	Max. Leakage Current at 75%V <sub>1mA</sub>	Operating Temperature Range	Storage Temperature Range	Applications		
	P (W)	nSec	I <sub>L</sub> (mA)	( °C )	( °C )	UL 1449	IEC 60950-1	IEC 60065
TVR14561KSY	0.6	<25	20	-40 ~ +85	-40 ~ +125	SPD Type 5	Annex Q	Clause 14.12



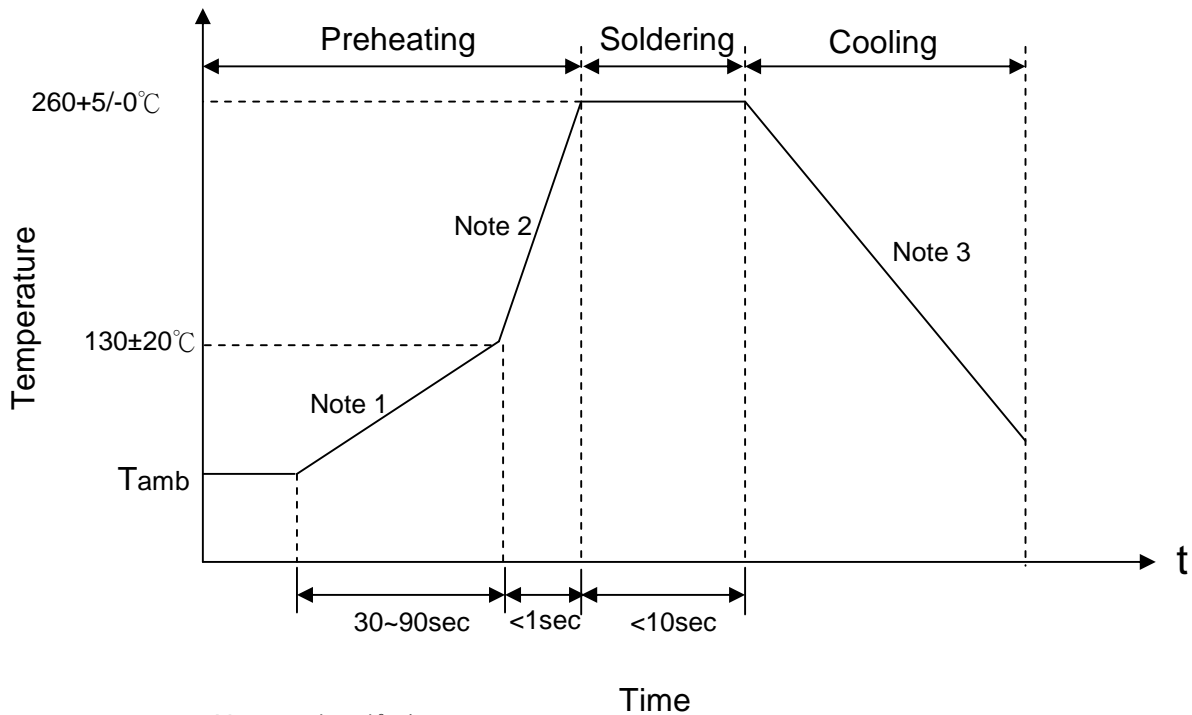
Reliability

Item	Standard	Test conditions / Methods	Specifications															
Tensile Strength of Terminals	IEC60068-2-21	Gradually applying the force specified and keeping the unit fixed for 10±1 sec.  <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;">0.5&lt;d≤0.8</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">0.8&lt;d≤1.25</td> <td style="text-align: center;">2.0</td> </tr> <tr> <td style="text-align: center;">1.25&lt;d</td> <td style="text-align: center;">4.0</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	0.5<d≤0.8	1.0	0.8<d≤1.25	2.0	1.25<d	4.0	No visible damage   $\Delta V/V_{1mA}$   ≤5%							
Terminal diameter (mm)	Force (Kg)																	
0.5<d≤0.8	1.0																	
0.8<d≤1.25	2.0																	
1.25<d	4.0																	
Bending Strength of Terminals	IEC60068-2-21	Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction.  <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;">0.5&lt;d≤0.8</td> <td style="text-align: center;">0.5</td> </tr> <tr> <td style="text-align: center;">0.8&lt;d≤1.25</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">1.25&lt;d</td> <td style="text-align: center;">2.0</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	0.5<d≤0.8	0.5	0.8<d≤1.25	1.0	1.25<d	2.0	No visible damage   $\Delta V/V_{1mA}$   ≤5%							
Terminal diameter (mm)	Force (Kg)																	
0.5<d≤0.8	0.5																	
0.8<d≤1.25	1.0																	
1.25<d	2.0																	
Vibration	IEC 60068-2-6	Frequency range:10~55Hz Amplitude:0.75mm or 98m/S <sup>2</sup> Direction:3 mutually perpendicular directions,2hrs each.	$\Delta V/V_{1mA}$   ≤5% No visible damage															
Solderability	IEC60068-2-20	245 ± 3 °C , 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 3 °C , 10 ± 1 sec	No visible damage   $\Delta V/V_{1mA}$   ≤5%															
High Temperature Storage	IEC60068-2-2	125 ± 5 °C , 1000 ± 24 hrs	No visible damage   $\Delta V/V_{1mA}$   ≤5%															
Damp Heat, Steady State	IEC 60068-2-78	The test is divided into two groups . a.40 ± 2°C , 90 ~ 95 % RH , 1344 hrs b.40 ± 2°C , 90 ~ 95 % RH , at 10%V <sub>DC</sub> , 1344 hrs	No visible damage   $\Delta V/V_{1mA}$   ≤10% Insulation Resistance ≥ 100MΩ															
Rapid Change of Temperature	IEC60068-2-14	The conditions shown below shall be repeated 5 cycles  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">-40 ± 3</td> <td style="text-align: center;">30 ± 3</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;">5 ± 3</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">85 ± 2</td> <td style="text-align: center;">30 ± 3</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;">5 ± 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 3	30 ± 3	2	Room temperature	5 ± 3	3	85 ± 2	30 ± 3	4	Room temperature	5 ± 3	No visible damage   $\Delta V/V_{1mA}$   ≤5%
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 3	30 ± 3																
2	Room temperature	5 ± 3																
3	85 ± 2	30 ± 3																
4	Room temperature	5 ± 3																
High Temp. Load	MIL-STD-202 Method 108	85 ± 2 °C , 1000 ± 24 hrs, at V <sub>DC</sub> or V <sub>rms</sub> (Max. Operating Voltage)	$\Delta V/V_{1mA}$   ≤10% No visible damage															

Item	Standard	Test conditions / Methods	Specifications
Operating Duty Cycle test	UL1449 4 <sup>th</sup>	6KV/3KA 1.2/50µs+8/20µs combination waveform with Vac(@ Deg 90) for 15 times. Interval time between tests is 60 secs.	$ \Delta V_p / V_p  \leq 10\%$ No visible damage
8/20µS Surge Life	IEC 61051-1 4.6	10,000 pulses( 8/20 µ S ) , unipolar, interval 10 secs, amplitude corr. to max. Surge current derating curves for 20 µ S	$ \Delta V / V_{1mA}  \leq 10\%$ No visible damage
10/1000µS Surge Life	IEC 61051-1 4.6	10/1000µS waveform, 10 surge currents,unipolar,interval 2mins, amplitude corr. to max. surge current derating curves for 1000µS	$ \Delta V / V_{1mA}  \leq 10\%$ No visible damage
Varistor Voltage Temp. Coefficient	Specification Standard	$\frac{V_{1mA} \text{ at } 85^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{60} \times 100 (\% / ^{\circ}\text{C} )$ $\frac{V_{1mA} \text{ at } -40^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{65} \times 100 (\% / ^{\circ}\text{C} )$	$-0.05 \leq TC \leq 0.05 (\% / ^{\circ}\text{C} )$
Voltage Proof	IEC 61051-1 4.9	Metal balls method, 2500 Vac 1 min	No visible damage

Soldering Recommendation

■ Wave Soldering Profile



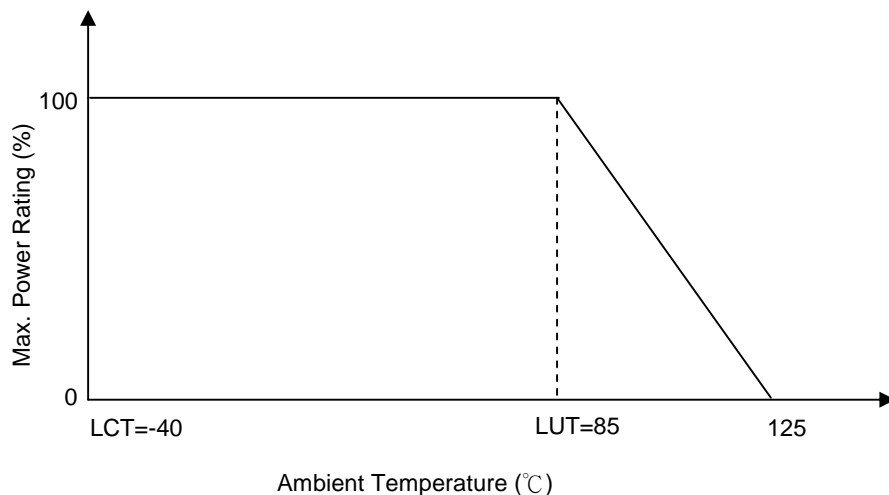
- Note 1 : (1~3) $^{\circ}\text{C}/\text{sec}$
- Note 2 : Approx.  $200^{\circ}\text{C}/\text{sec}$
- Note 3 :  $5^{\circ}\text{C}/\text{sec}$  Max

■ Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360 $^{\circ}\text{C}$ (max.)
Soldering Time	3 sec (max.)
Distance from Varistor	2 mm (min.)

### Power Derating Curve

When operating temperature exceeds 85°C, the power, the Max.continuous operation Voltage,the Max.Surge Current and the Max.Energy should be derated as below figure, the derated coefficient is -2.5%.



### RoHS Compliant Declaration

We hereby declare that the components delivered to your company are compliant with RoHS Directive 2011/65/EU.

### Warehouse Storage Conditions of Products

(I) Storage Conditions :

- 1.Storage Temperature : -10°C ~+40°C
- 2.Relative Humidity :  $\leq 75\%RH$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Safety Approvals (Certified Model/Type : TVR14561)



- \* UL 1449 4th/ cUL recognized (File # E314979)
- UL1449 (file number E314979) for use in SPD Type 5
- Meet the surge requirements 6KV/3KA combination wave of IEC 60950-1 Annex Q and IEC 60065 14.12



- \* VDE IEC 61051-1:2007-04 / IEC 61051-2:1991  
IEC 61051-2-2:1991 recognized (File # 5944)



- \* CQC GB/T10193-1997 \ GB/T10194-1997 recognized  
(File # CQC03001005165/CQC03001007654)

Certificates

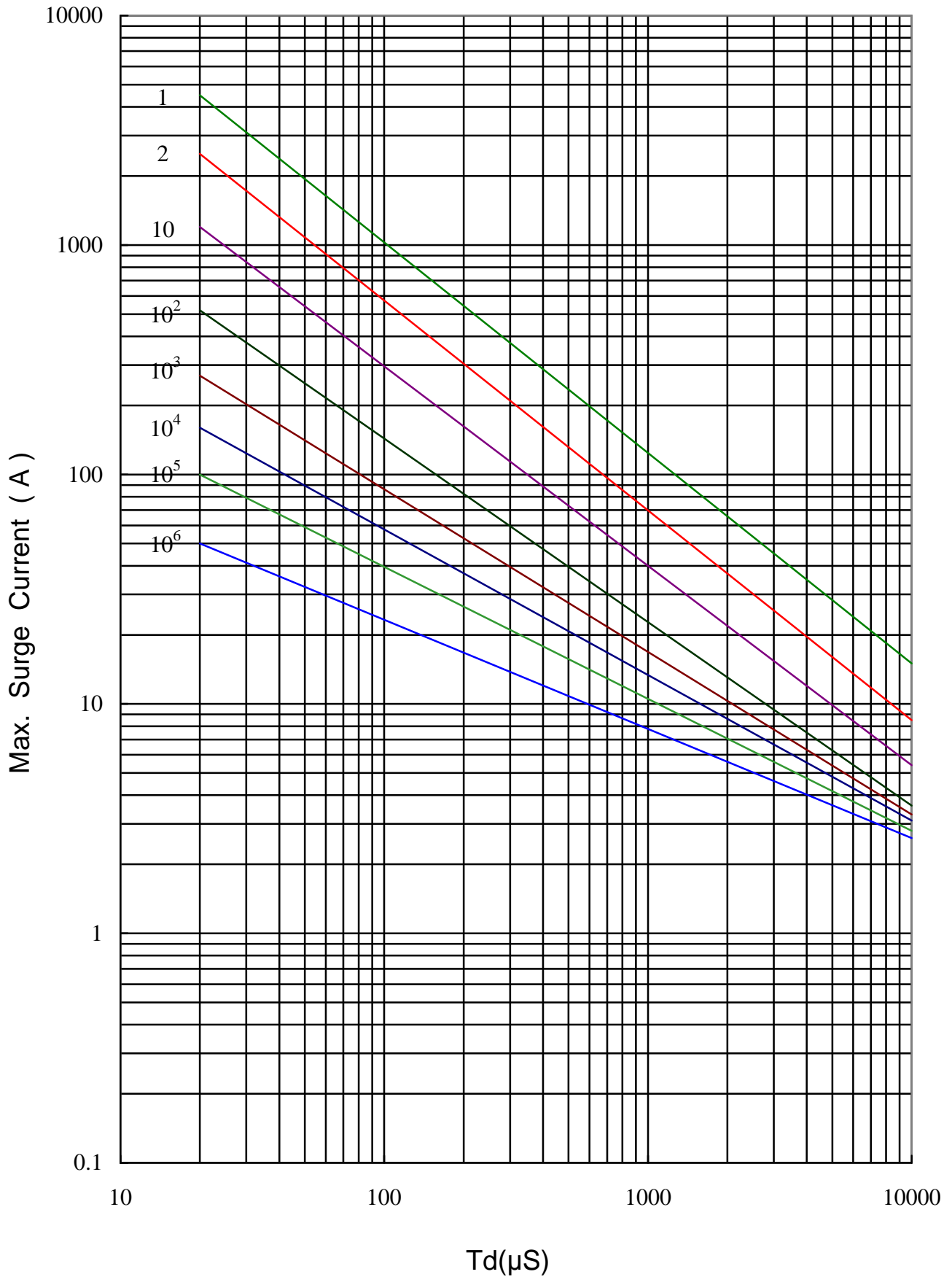
- (1) TS 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report

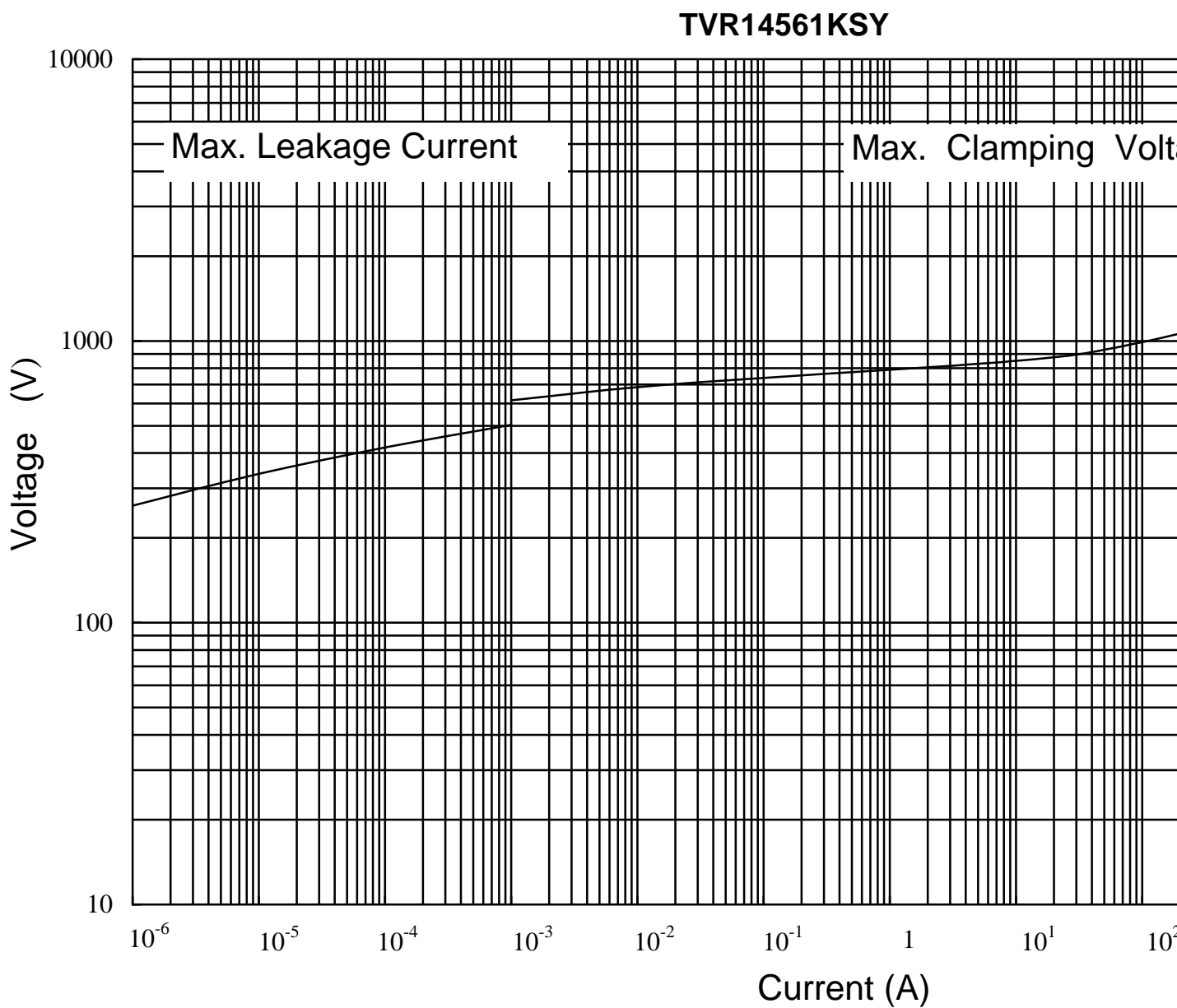
Max. Surge Current Derating Curves

**TVR14561KSY**



Zinc Oxide Varistor TVR Type  
Part No. :TVR14561KSY

Max. Leakage Current and Max. Clamping Voltage Curve



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