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SPECIFICATION FOR APPROVAL

CUSTOMER _____

CERTIFIED
MODEL/TYPE

TVA25511

PART NO.

TVA25511KQDCEU01(RoHS)

APPLICATION _____

CUSTOMER P/N _____

ISSUE DATE

May.22.2018

REV. NO. _____

REV. DATE _____

FOR CUSTOMER APPROVAL	CHECKED BY
	Yuan Yuan
	APPROVED BY
	Huaifang Zhang





REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT



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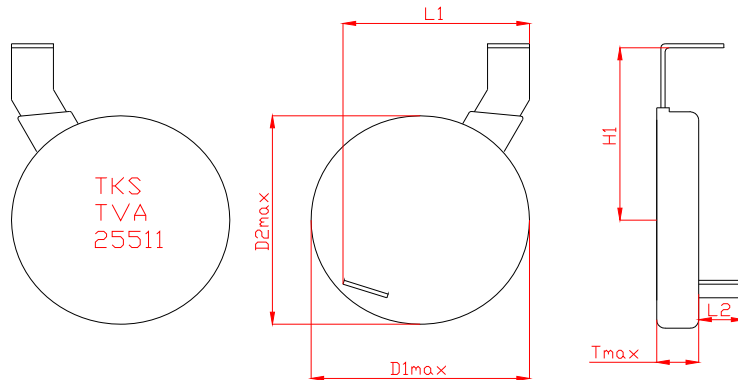
Part Number Code

Example :

TVA **25** **511** **K** **Q** **DC** **E** **U** **01**
 (1) (2) (3) (4) (5) (6) (7) (8) (9)

No.	Item	Digit	Specification
(1)	Product Type	TVA	Thinking varistor TVA type
(2)	Size	25	φ 25 mm
(3)	Varistor Voltage	511	$51 \times 10^1 \text{ V} = 510\text{V} (V_{1\text{mA}})$
(4)	Tolerance of $V_{1\text{mA}}$	K	±10%
(5)	Structure Type	Q	Plate type terminals
(6)	Terminal Type	DC	Terminal type code
(7)	Coating Material	E	Epoxy
(8)	RoHS Compliance	U	RoHS compliance
(9)	Optional Suffix	01	1.IL≤30uA 2.Tmax:5.5mm

Structure and Dimensions



L1	H1	L2	D1max	D2max	Tmax
22.2±0.5	21.5±0.5	5.4±0.5	26.5	27	5.5

(unit : mm)

Electrical Characteristics (Ambient $T_a=25^\circ\text{C}$)

Part No.	Varistor Voltage (@ 1mA DC)	Max. Continuous Voltage		Max. Clamping Voltage (8/20μS)		Nominal Discharging Current (8/20μS)	Max. Surge Current (8/20μS)
	V_{1mA} (V)	$V_{AC(rms)}$ (V)	V_{DC} (V)	V_p (V)	I_p (A)	I_n (A)	I (A)
TVA25511KQDCEU01	510±10%	320	415	1250	10000	10000	20000

Part No.	Max. Energy (2mS)	Rated Power	Impulse Response Time	Max. Leakage Current at 75% V_{1mA}	Reference Capacitance @1KHZ	Operating Temperature Range	Storage temperature Range
	W (J)	P (W)	nSec	$I_L(\mu\text{A})$	C (pF)	($^\circ\text{C}$)	($^\circ\text{C}$)
TVA25511KQDCEU01	230	1	<25	30	900	-40 ~ +85	-40 ~ +110



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 border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal cross-sectional area(mm²)</td> <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<S≤1.2</td> <td style="text-align: center;">0.8<d≤1.25</td> <td style="text-align: center;">2.0</td> </tr> <tr> <td style="text-align: center;">1.2<S</td> <td style="text-align: center;">1.25<d</td> <td style="text-align: center;">4.0</td> </tr> </table>	Terminal cross-sectional area(mm ²)	Terminal diameter (mm)	Force (Kg)	0.5<S≤1.2	0.8<d≤1.25	2.0	1.2<S	1.25<d	4.0	No visible damage ΔV/V _{1mA} ≤5%						
Terminal cross-sectional area(mm ²)	Terminal diameter (mm)	Force (Kg)																
0.5<S≤1.2	0.8<d≤1.25	2.0																
1.2<S	1.25<d	4.0																
Vibration	IEC 1051-1	Frequency range:10~55Hz Amplitude:0.75mm or 98m/S ² Direction:3 mutually perpendicular directions,2hrs each.	ΔV/V _{1mA} ≤5% No visible damage															
Solderability	IEC60068-2-20	245℃±3℃ , 3±0.3S	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 ΔV/V _{1mA} ≤5%															
High Temperature Storage	IEC60068-2-2	110 ± 5 °C , 1000 ± 24 hrs	No visible damage ΔV/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 _{DC} , 1344 hrs	No visible damage ΔV/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;">15 ± 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;">15 ± 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 3	30 ± 3	2	Room temperature	15 ± 3	3	85 ± 2	30 ± 3	4	Room temperature	15 ± 3	No visible damage ΔV/V _{1mA} ≤5%
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 3	30 ± 3																
2	Room temperature	15 ± 3																
3	85 ± 2	30 ± 3																
4	Room temperature	15 ± 3																
Endurance at Upper Category Temperature	IEC61051-4.20	85 ± 2 °C , 1000 ± 24 hrs, at V _{DC} or V _{rms} (Max. Operating Voltage)	ΔV/V _{1mA} ≤10% No visible damage															
8/20μS Operating duty withstand test	IEC61643	1. Preconditioning test : I _n , 15 times 2. Operating duty test : I _{max} , 2 times (equivalent condition)	ΔV/V _{1mA} ≤ 10% No visible damage															

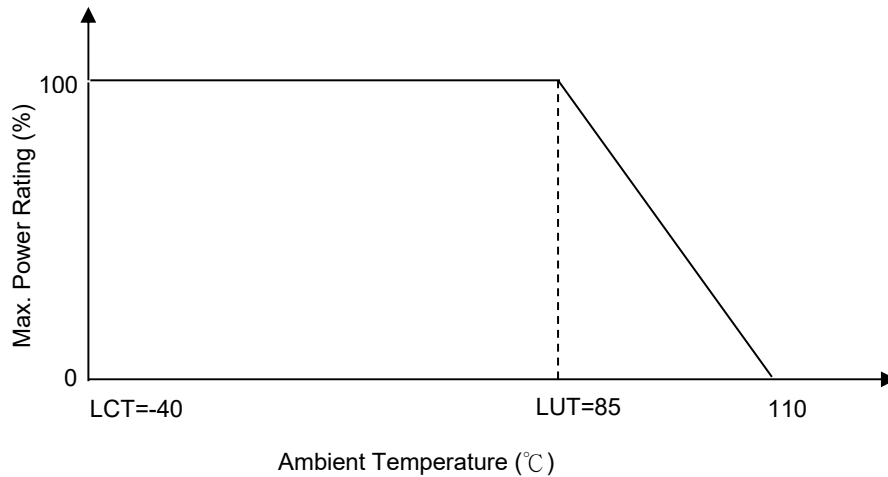


Reliability

Item	Standard	Test conditions / Methods	Specifications
10/1000 μ S Surge Life	CECC42000	10/1000 μ S waveform, 10 surge currents, unipolar, interval 2mins, amplitude corr. to max. surge current derating curves for 1000 μ S	$ \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	IEC61051-4.9	Metal balls method, 2500 Vac 1 min	No visible damage

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 -4%.



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 :TVA25511)



* UL 1449 4th / cUL recognized (File # E314979)

Certificates

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

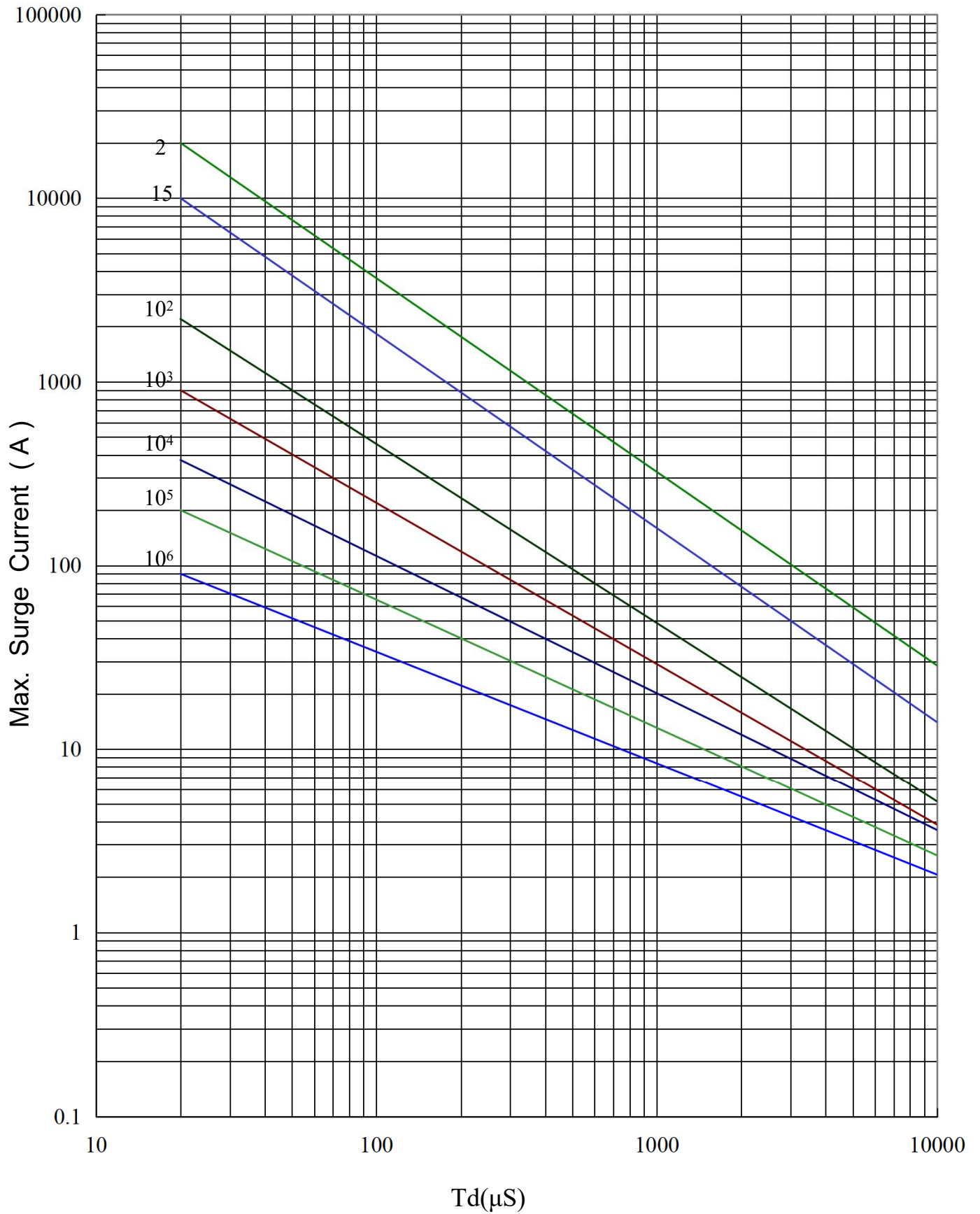
Test Report

- (1) RoHS test report



Max. Surge Current Derating Curves

TVA25511KQDCEU01





Max. Leakage Current and Max. Clamping Voltage Curve

