THINKING ELECTRONIC INDUSTRIAL CO., LTD.

HEAD OFFICE: 12F, No.93, Dashun 1st Rd., Zuoying Dist., Kaohsiung, Taiwan
TEL: 886-7-5577660 FAX: 886-7-5570560

MANUFACTURING SITE

☐ KAOHSIUNG FACTORY 1:No. 51, Kaifa Rd., N.E.P.Z, Kaohsiung City 81170, Taiwan
TEL: 886-7-9616668 FAX: 886-7-9616698

☐ KAOHSIUNG FACTORY 2:No. 2-2, Xinjian S. Rd., N.E.P.Z., Kaohsiung City 81170, Taiwan
TEL: 886-7-9630001 FAX: 886-7-3635113

☑ CHANGZHOU FACTORY: No.6 Longmen Rd., Wujin High & New-Tech Industrial Development Zone, Changzhou, Jiangsu, China 213161
TEL:86-519-86578999 FAX:86-519-86558643

☐ DONG GUAN FACTORY: No.45, East Rd., Sha-Tao Dist., Chang-An Town, Dongguan City, Guangdong, China 523863
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	
CERTIFIED MODEL/TYPE	TVA25431-Q
PART NO.	TVA25431KQDBE503(RoHS)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Jul.03.2019
REV. NO.	
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	Yuan Yuan
	APPROVED BY
	Huaifang Zhang

REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT

INDEX

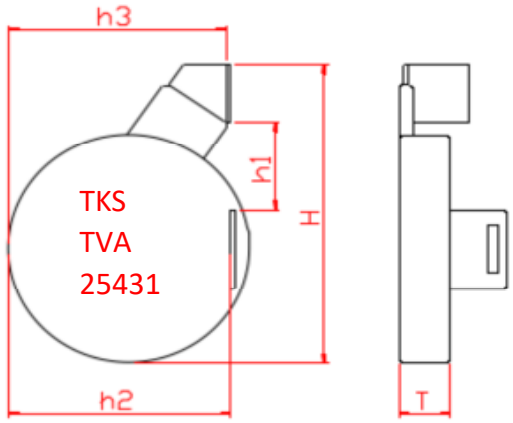
Part Number Code

Example :

TVA	**25**	**431**	**K**	**Q**	**DB**	**E**	**5**	**03**
(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	431	43×10^1 V = 430V (V_{1mA})
(4)	Tolerance of V_{1mA}	K	±10%
(5)	Structure Type	Q	Plate type terminals
(6)	Terminal Type	DB	Terminal type code
(7)	Coating Material	E	Epoxy
(8)	RoHS Compliance	5	RoHS compliance
(9)	Optional Suffix	03	In:10KA,Imax:20KA

Structure and Dimensions



(unit : mm)

H	h1	h2	h3	Tmax
32.0±1.0	9.5±1.0	23.9±1.0	22.9±1.0	6

Electrical Characteristics (Ambient Ta=25 ℃)

Part No.	Varistor Voltage (@ 1mA DC)	Max. Continuous Voltage		Max. Clamping Voltage (8/20μS)		Nominal Discharging Current (8/20μS)	Max. Surge Current (8/20μS)	Max. Energy (2mS)
	V_{1mA} (V)	$V_{AC(rms)}$ (V)	V_{DC} (V)	V_p (V)	I_P (A)	In (A)	I (A)	W (J)
TVA25431KQDBE503	430±10%	275	350	710	150	10000	20000	220

Part No.	Rated Power	Impulse Response Time	Max. Leakage Current at 75%V_{1mA}	Reference Capacitance @1KHZ	Operating Temperature Range	Storage Temperature Range
	P (W)	nSec	I_L(μA)	C (pF)	(℃)	(℃)
TVA25431KQDBE503	1	<25	20	1000	-40 ~ +85	-40 ~ +110

Reliability

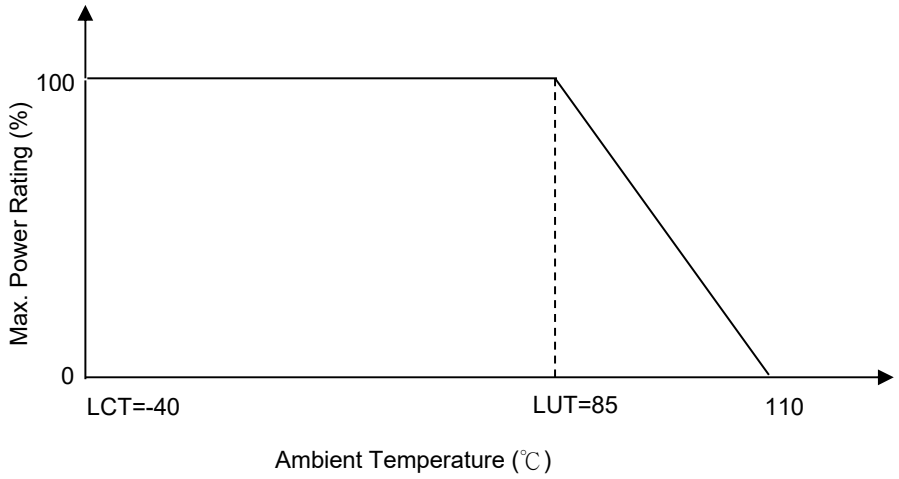
<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Tensile Strength of Terminals</td><td>IEC60068-2-21</td><td>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.
<table><tr><th>Terminal cross-sectional area(mm^2)</th><th>Terminal diameter (mm)</th><th>Force (Kg)</th></tr><tr><td>0.5<S≦1.2</td><td>0.8<d≦1.25</td><td>2.0</td></tr><tr><td>1.2<S</td><td>1.25<d</td><td>4.0</td></tr></table></td><td>No visible damage
｜△V/V_{1mA}｜≦5%</td></tr>
<tr><td>Vibration</td><td>IEC 1051-1</td><td>Frequency range:10~55Hz
Amplitude:0.75mm or 98m/S^2
Direction:3 mutually perpendicular directions,2hrs each.</td><td>｜△V/V_{1mA}｜≦5%
No visible damage</td></tr>
<tr><td>Solderability</td><td>IEC60068-2-20</td><td>245℃±3℃，3±0.3S</td><td>At least 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC60068-2-20</td><td>260 ± 3 ℃，10 ± 1 sec</td><td>No visible damage
｜△V/V_{1mA}｜≦5%</td></tr>
<tr><td>High Temperature Storage</td><td>IEC60068-2-2</td><td>110 ± 5 ℃，1000 ± 24 hrs</td><td>No visible damage
｜△V/V_{1mA}｜≦5%</td></tr>
<tr><td>Damp Heat, Steady State</td><td>IEC 60068-2-78</td><td>The test is divided into two groups .
a.40 ± 2℃，9 0 ~ 95 % RH， 1344 hrs
b.40 ± 2℃，9 0 ~ 95 % RH , at 10%V_{DC}， 1344 hrs</td><td>No visible damage
｜△V/V_{1mA}｜≦5%
Insulation Resistance
≧100MΩ</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC60068-2-14</td><td>The conditions shown below shall be repeated
5 cycles
<table><tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-40 ± 3</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>15 ± 3</td></tr><tr><td>3</td><td>85 ± 2</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>15 ± 3</td></tr></table></td><td>No visible damage
｜△V/V_{1mA}｜≦5%</td></tr>
<tr><td>Endurance at Upper Category Temperature</td><td>IEC61051-4.20</td><td>85 ± 2 ℃, 1000 ± 24 hrs, at V_{DC} or V_{rms}(Max. Operating Voltage)</td><td>｜△V/V_{1mA}｜≦10%
No visible damage</td></tr>
<tr><td>8/20μS Operating duty withstand test</td><td>IEC61643</td><td>1. Preconditioning test： In，15 times
2. Operating duty test：Imax，2 times</td><td>｜△V/V_{1mA}｜≦ 10%
No visible damage</td></tr>
</table>

Reliability

Item	Standard	Test conditions / Methods	Specifications
10/1000μS Surge Life	CECC42000	10/1000μS waveform, 10 surge currents,unipolar,interval 2mins, amplitude corr. to max. surge current derating curves for 1000μS	$\lvert \triangle V/V_{1mA} \rvert \leqq 10\%$ No visible damage
Varistor Voltage Temp. Coefficient	Specification Standard	$\frac{V_{1mA} \text{ at } 85℃ - V_{1mA} \text{ at } 25℃}{V_{1mA} \text{ at } 25℃} \times \frac{1}{60} \times 100\ (\% / ℃)$ $\frac{V_{1mA} \text{ at } -40℃ - V_{1mA} \text{ at } 25℃}{V_{1mA} \text{ at } 25℃} \times \frac{1}{65} \times 100\ (\% / ℃)$	-0.05≦TC≦0.05(%/℃)
Voltage Proof	IEC61051-4.9	Metal balls method, 2500 Vac 1 min	No visible damage

Power Derating Curve

When operating temperature exceeds 85℃, 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 2015/863/EU.

Warehouse Storage Conditions of Products

(I) Storage Conditions :

1.Storage Temperature : -10℃~+40℃

2.Relative Humidity : ≦75%RH

3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Safety Approvals (Certified Model/Type :TVA25431-Q)

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

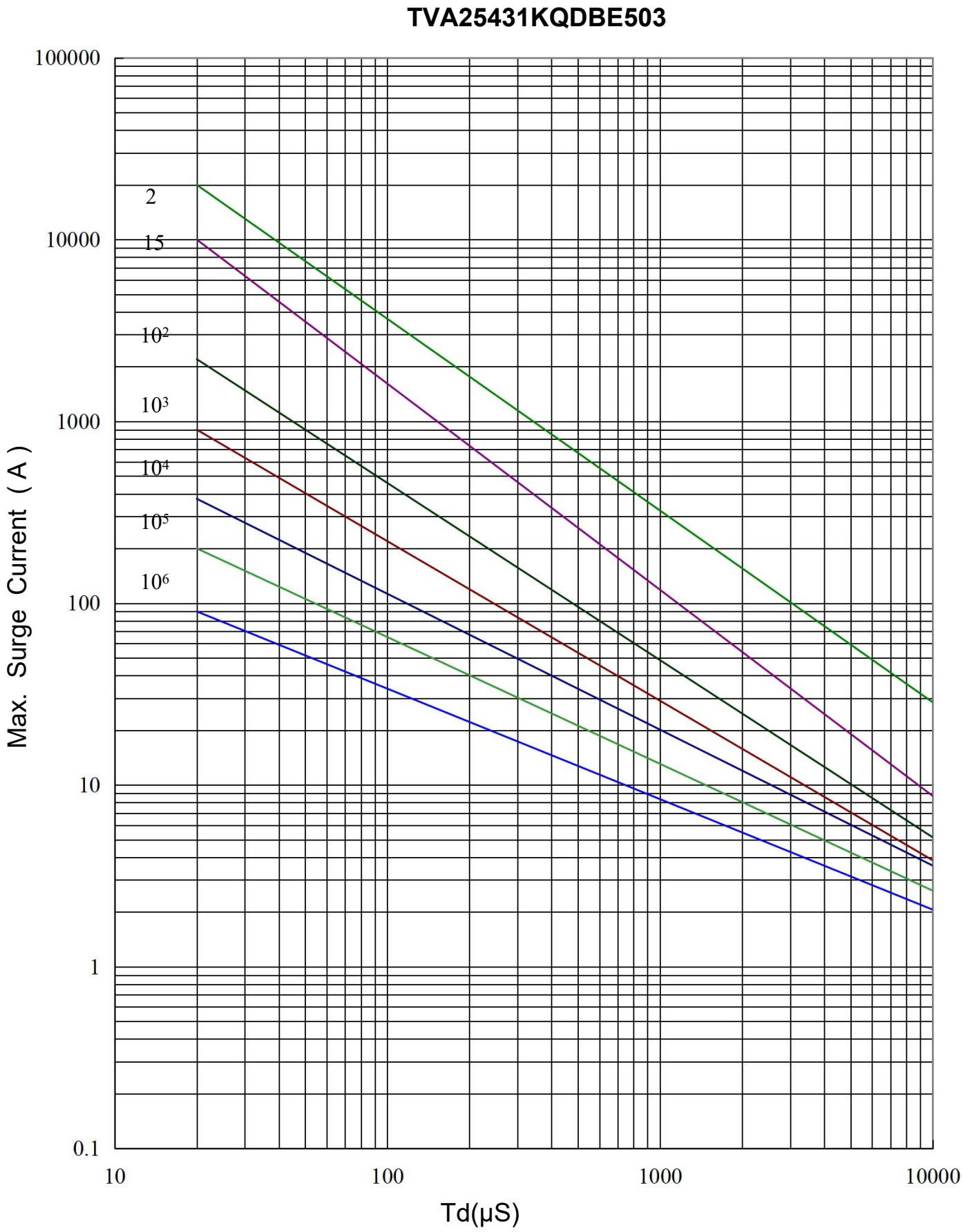
Certificates

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

Test Report

(1) RoHS test report

Max. Surge Current Derating Curves



Max. Leakage Current and Max. Clamping Voltage Curve