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## SPECIFICATION FOR APPROVAL

**CUSTOMER**

**CERTIFIED  
 MODEL/TYPE**

TVR07621-M

**PART NO.**

TVR07621KYC3CM(RoHS+HF)

**APPLICATION**

**CUSTOMER P/N**

**ISSUE DATE**

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FOR CUSTOMER APPROVAL	CHECKED BY
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	APPROVED BY
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Zinc Oxide Varistor TVR Type  
Part No. :TVR07621KYC3CM

**REVISED RECORD SHEET**

REV. NO	REV. DATE	REVISED CONTENT



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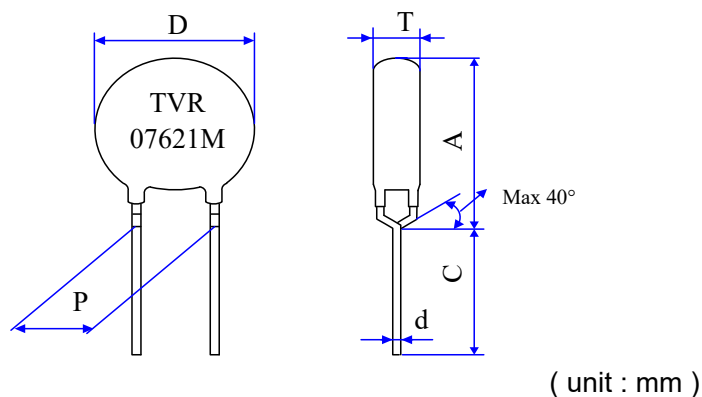
Part Number Code

Example :

**TVR**   **07**   **621**   **K**   **Y**   **C3C**   **M**  
 (1)   (2)   (3)   (4)   (5)   (6)   (7)

No.	Item	Digit	Specification
(1)	Product Type	TVR	Thinking varistor TVR type
(2)	Body Size	07	φ 07 mm
(3)	Varistor Voltage	621	$62 \times 10^1 \text{ V} = 620\text{V} (V_{1\text{mA}})$
(4)	Tolerance of $V_{1\text{mA}}$	K	±10%
(5)	Appearance	Y	Y Kink Lead, Silicon Coating
(6)	Internal Control Code	C3C	Cut 3.2 mm Lead & bulk
(7)	Optional Suffix	M	RoHS+HF compliance

Structure and Dimensions



Body Size	D	P	d	A max.	T	C
φ 07	6.4~9.6	5.0±1	0.6±0.02	11.5	4.88~7.32	3.2±0.5

\*Coating material rating:UL 94 V-0

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

Part No.	Varistor Voltage (@ 1mA DC)	Max. Continuous Voltage		Max. Clamping Voltage (8/20μS)		Max. Surge Current (8/20μS)	Max. Energy (10/1000μS)
	$V_{1mA}$ (V)	$V_{AC}(rms)$ (V)	$V_{DC}$ (V)	$V_p$ (V)	$I_p$ (A)	I (A)	W (J)
TVR07621KYC3CM	620 ± 10 %	395	510	1020	10	1750	50

Part No.	Rated Power	Impulse Response Time	Max. Leakage Current at 75% $V_{1mA}$	Operating Temperature Range	Storage temperature Range	Applications		
	P (W)	nSec	$I_L(\mu A)$	( $^\circ\text{C}$ )	( $^\circ\text{C}$ )	UL 1449	IEC 60950-1	IEC 60065
TVR07621KYC3CM	0.25	<25	20	-40 ~ +125	-40 ~ +150	SPD Type 5	—	—

The mechanical force acted on the wire lead may cause cracks and chips of coating ,but which does not affect the performance of the component

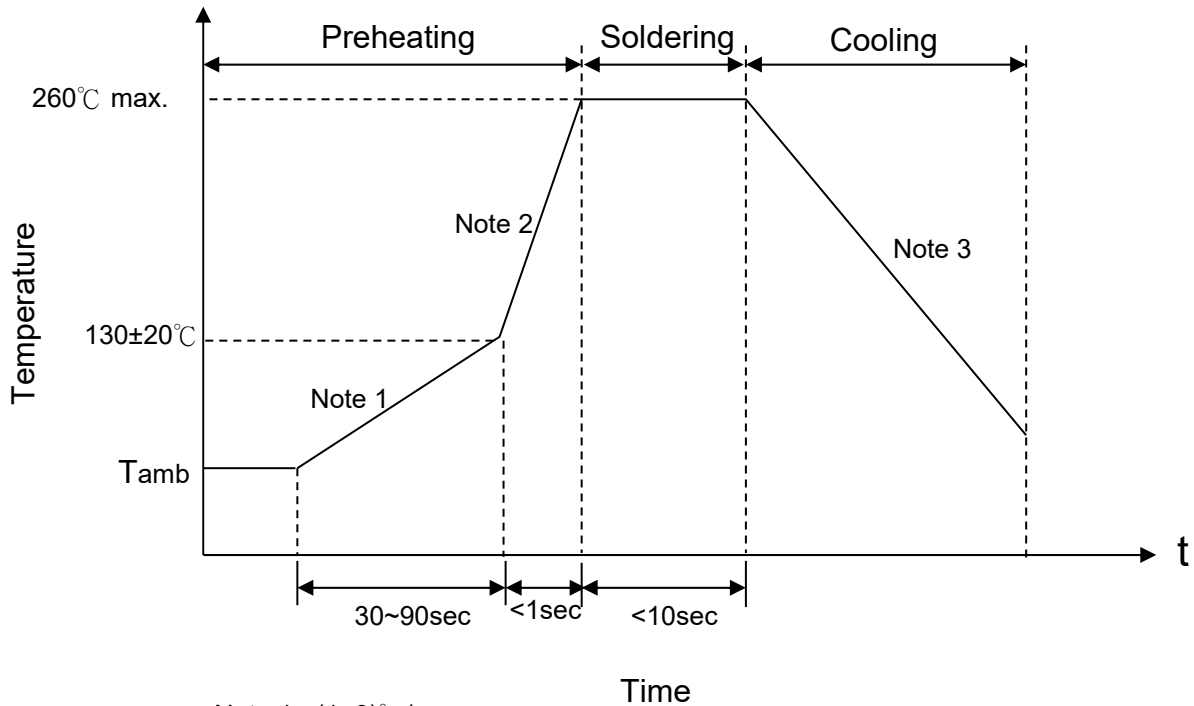
Reliability

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.  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   ΔV/V <sub>1mA</sub>   ≤5%															
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.  Terminal diameter (mm)      Force (Kg) ----- 0.5<d≤0.8                      0.5 0.8<d≤1.25                      1.0 1.25<d                              2.0	ΔV/V <sub>1mA</sub>   ≤5%															
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.	ΔV/V <sub>1mA</sub>   ≤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   ΔV/V <sub>1mA</sub>   ≤5%															
High Temperature Storage	IEC60068-2-2	150 ± 5 °C , 1000 ± 24 hrs	No visible damage   ΔV/V <sub>1mA</sub>   ≤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   ΔV/V <sub>1mA</sub>   ≤10% Insulation Resistance ≥ 100MΩ															
Rapid Change of Temperature	IEC60068-2-14	The conditions shown below shall be repeated 1000 cycles <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> <tr> <td>3</td> <td>125 ± 2</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 3	30 ± 3	2	Room temperature	5 ± 3	3	125 ± 2	30 ± 3	4	Room temperature	5 ± 3	No visible damage   ΔV/V <sub>1mA</sub>   ≤5%
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 3	30 ± 3																
2	Room temperature	5 ± 3																
3	125 ± 2	30 ± 3																
4	Room temperature	5 ± 3																
High Temp. Load	MIL-STD-202 Method 108	125 ± 2 °C , 1000 ± 24 hrs, at V <sub>DC</sub> or V <sub>rms</sub> (Max. Operating Voltage)	ΔV/V <sub>1mA</sub>   ≤10% No visible damage															
Flammability test	Specification Standard	The varistor shall be subjected to 60sec.applications of test flame. Burner:Bunsen gas burner 9000kcal/m <sup>3</sup> Diameter of flame nozzle: Φ9.5mm Position : the specimen shall be fixed horizontal Point of application shall be approximately center of the specimen	No catching fire,and no flaming drops															

Item	Standard	Test conditions / Methods	Specifications
8/20 $\mu$ S Surge Life	IEC 61051-1 4.6	10,000 pulses( 8/20 $\mu$ S ) , unipolar, interval 10 secs, amplitude corr. to max. Surge current derating curves for 20 $\mu$ S	$ \Delta V/V_{1mA}  \leq 10\%$ No visible damage
10/1000 $\mu$ S Surge Life	IEC 61051-1 4.6	10/1000 $\mu$ S waveform, 10 surge currents,unipolar,interval 2mins, amplitude corr. to max. surge current derating curves for 1000 $\mu$ S	$ \Delta V/V_{1mA}  \leq 10\%$ No visible damage
Varistor Voltage Temp. Coefficient	Specification Standard	$\frac{V_{1mA} \text{ at } 125^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{100} \times 100 (\% / ^{\circ}\text{C} )$ $\frac{V_{1mA} \text{ at } -40^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{65} \times 100 (\% / ^{\circ}\text{C} )$	$-0.05 \leq TC \leq 0.05 (\% / ^{\circ}\text{C} )$
Voltage Proof	IEC 61051-1 4.9	Metal balls method, 1000 Vac 1 min	No visible damage

## Soldering Recommendation

### Wave Soldering Profile



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

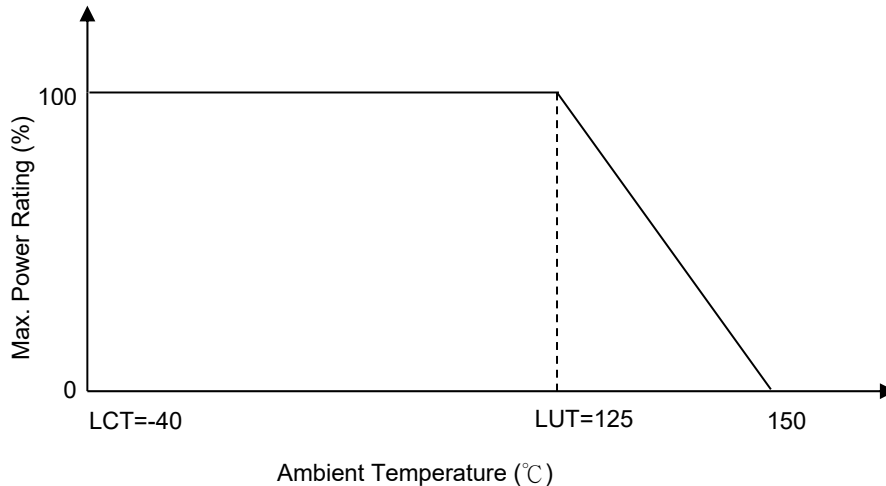
### Recommended Reworking Conditions with Soldering Iron

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  $125^{\circ}\text{C}$ , 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 :  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- 2.Relative Humidity :  $\leq 75\% \text{RH}$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Safety Approvals (Certified Model/Type:TVR07621-M)

- \* UL 1449 3rd / cUL recognized (File # E314979)
- UL1449 (file number E314979) for use in SPD Type 5



- \* VDE IEC 61051-1:2007-04 / IEC 61051-2:1991
- IEC 61051-2-2:1991 recognized (File # 40036061)



- \* CQC GB/T10193-1997 ` GB/T10194-1997 recognized
- (File #CQC15001128788/CQC15001128790)

Certificates

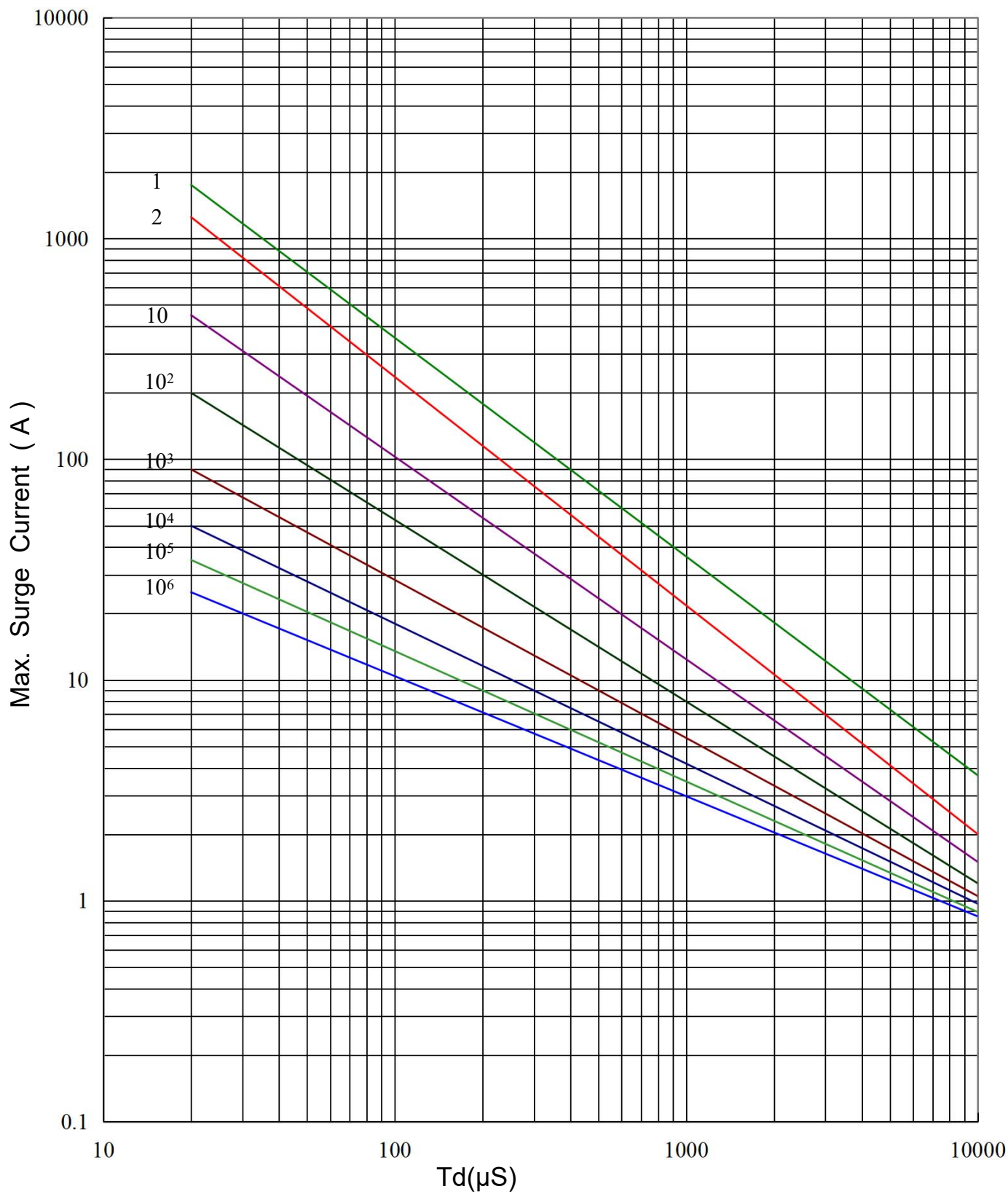
- (1) TS 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report
- (2) Halogen-free test report

Max. Surge Current Derating Curves

TVR07621KYC3CM





Max. Leakage Current and Max. Clamping Voltage Curve

