

Spec. No. :07D471K

RoHS Compliance

DAIN

Specification

Customs _____

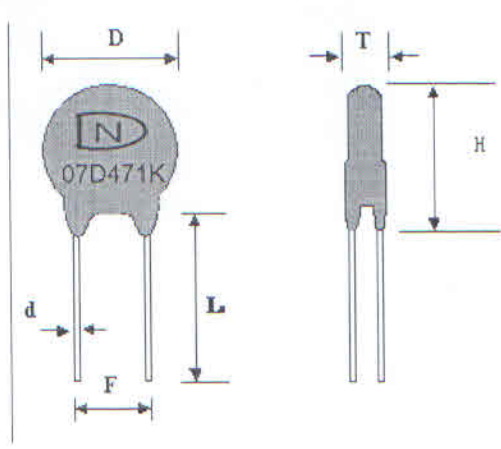
Partname (MOV) _____

Model 07D471K _____

Material Number _____


Customer Material Number _____

Manufacturer			Customer		
Edition	Verified	Approved	Admit	Verified	Approved

PART NO.	07D471K	07D471K	REV NO.	0/A	Pages: No.1 of 9 pages		
I. APPEARANCE							
<p>1-1. Dimensions (mm)</p> 			1-2. Marking				
<p>$D_{Max}: 8.5$</p>			1-3. Coating				
<p>$T_{Max}: 4.2$</p>			<p><input type="checkbox"/> No coating</p> <p><input checked="" type="checkbox"/> Coating</p> <table border="1" data-bbox="876 616 1471 1064"> <tr> <td data-bbox="876 616 1201 1064"> <p>Material</p> <p><input type="checkbox"/> PF resin</p> <p><input type="checkbox"/> Silicon</p> <p><input checked="" type="checkbox"/> Epoxy</p> <p><input type="checkbox"/> Others</p> </td> <td data-bbox="1201 616 1471 1064"> <p>Color</p> <p><input type="checkbox"/> Green</p> <p><input type="checkbox"/> Red</p> <p><input type="checkbox"/> Tan</p> <p><input type="checkbox"/> Black</p> <p><input checked="" type="checkbox"/> Blue</p> </td> </tr> </table>			<p>Material</p> <p><input type="checkbox"/> PF resin</p> <p><input type="checkbox"/> Silicon</p> <p><input checked="" type="checkbox"/> Epoxy</p> <p><input type="checkbox"/> Others</p>	<p>Color</p> <p><input type="checkbox"/> Green</p> <p><input type="checkbox"/> Red</p> <p><input type="checkbox"/> Tan</p> <p><input type="checkbox"/> Black</p> <p><input checked="" type="checkbox"/> Blue</p>
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<p>$d: 0.55 \pm 0.05$</p>			1-4. Leads				
<p>$L: \geq 20$</p>			<p><input type="checkbox"/> Tin - plated copper wire</p> <p><input checked="" type="checkbox"/> Tin-plated steel wire</p> <p><input checked="" type="checkbox"/> Straight <input type="checkbox"/> Axis-formed</p> <p><input type="checkbox"/> In-Forming <input type="checkbox"/> Out-Forming</p>				
<p>$F: 5 \pm 1.0$</p>			<p>$H_{Max}: 11.0$</p>				
<p>$L: \geq 20$</p>							

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2.Parameters of Technology		
Varistor Voltage (V)	423-517V	
Rated Power (W)	0.25	
Max. Claping Voltage (V)	Vc(V)	775
	Ip(A)	10
Max. Allowable Voltage (V)	AC	300
	DC	385
Energy (J)	10/1000us	42
	2ms	30
Max. Peak Current(8/20us) (A)	1time	1200
	2time	600
Operating Temperature Range (°C)	-40°C--85°C	

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<p>3. INSPECTION</p> <p>3-1. Lot Inspection</p> <p>Sampling with IEC410 / DIN ISO 2859-1 (GB/T2828.1-2003) ; Testing with IEC410/ DIN ISO 2859-1 (GB/T2828.1-2003);</p>					
<p>4. STORAGE CONDITIONS :</p> <p>4-1. Temperature : -10°C ~+40°C</p> <p>4-2. Humidity : ≤70%RH</p> <p>4-3. Term : ≤6 months (First-in/ First-out)</p> <p>4-4. Place :</p> <p>Do not exposing the components to the following conditions, otherwise, it may result in deterioration of characteristics. :</p> <p>1) Corrosive gas or deoxidizing gas.</p> <p>2) Flammable and explosive gases.</p> <p>3) Oil, water and chemical liquid.</p> <p>4) Under the sunlight.</p> <p>4-5. Handling after seal open: After unpacking of the minimum package, reseal it promptly or store it inside a sealed container with a drying agent.</p>					
<p>5. WARNING </p> <p>THE varistor shall not be operated beyond the specified Ratings and Environmental Conditions in the Catalog or the Specifications to prevent them from deterioration, breakdown, flaming or glowing. Following "Precautions for Safety" and "Application Notes" shall be taken in your major consideration.</p>					
<p>5. 1 Precautions for Safety</p> <p>1) The temperature of the working environment of the varistor must fall in the range required by technical conditions.</p> <p>2) The varistor shall not be operated exceeding the specified Max. Allowable Voltage in the Catalog or the Specification.</p> <p>3) The varistor shall not be operated beyond the "Max. Peak Current Rations" in the Catalog.</p> <p>4) It is recommended that the varistor shall be located 3mm away from the hest generating or combustible components.</p>					
<p>5. 2 Warning :</p> <p>When the varistor are applied between alive part and a metallic chassis of equipment, following safety countermeasures shall be taken to protect human from electric shock.</p> <p>1) The metallic chassis shall be earthed to the ground.</p> <p>2) A protective device against electric leakage must be installed in the equipment, or alternatively , a thermal type fuse should be attached closely to the varistor and series connected within its circuit.</p> <p>3) The live part shall be equipped with a protective cover for preventing electric shock.</p>					

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5. 3 Applicative Notes

Protective Devices for Varistors precause measures are to be taken against the accident damage.

1) In case of "Across the Line Use",the Varistor shall be protected by connecting a ground fault circuit interrupter of fusing.in series to the devices.

2) In case of "Line to Ground Use"the short-circuit of the varistor may not blow the current type fuse due to the grounding.

Resistance (between Line and Ground) which may cause flaming or burnout of the devices in the worst case. Following safety countermeasures(a or b) are recommended.

a) Connecting a "leakage current circuit breaker" in series to the varistor to be protected.

b) Use current type fuses and thermal type fuse which are themally coupled with the varistor each other.

5.4 Selection of Varistor Voltage Rating

1) General Precautions

In selection of Varistor Voltage Rating for line protection, following general precautions shall be taken in your consideration.

a) Maximum operating voltage shall be lower than the specified "Maximum Allowable voltage " of the varistor applied.

b) In selection of the varistor, reasonable margin is required against fluctuation of the primary line (or circuit) voltage. Special consideration must be giver to load unbalance of separately wired loads, short circuit between the live line and the neutral line or LC resonance at switching for a capacitive productive load.

2) (Line Surge Protection) select the varistor recommended in Table 1.

NOTES: For some electric equipments working under the phase voltage,the endurance of the short -time line voltage shall be taken into consideration during the design,and for such case,please select the varistor with"*".

3) Line to Ground Use (Line to Ground Surge Protection)selects the varistor recommended in Table1.

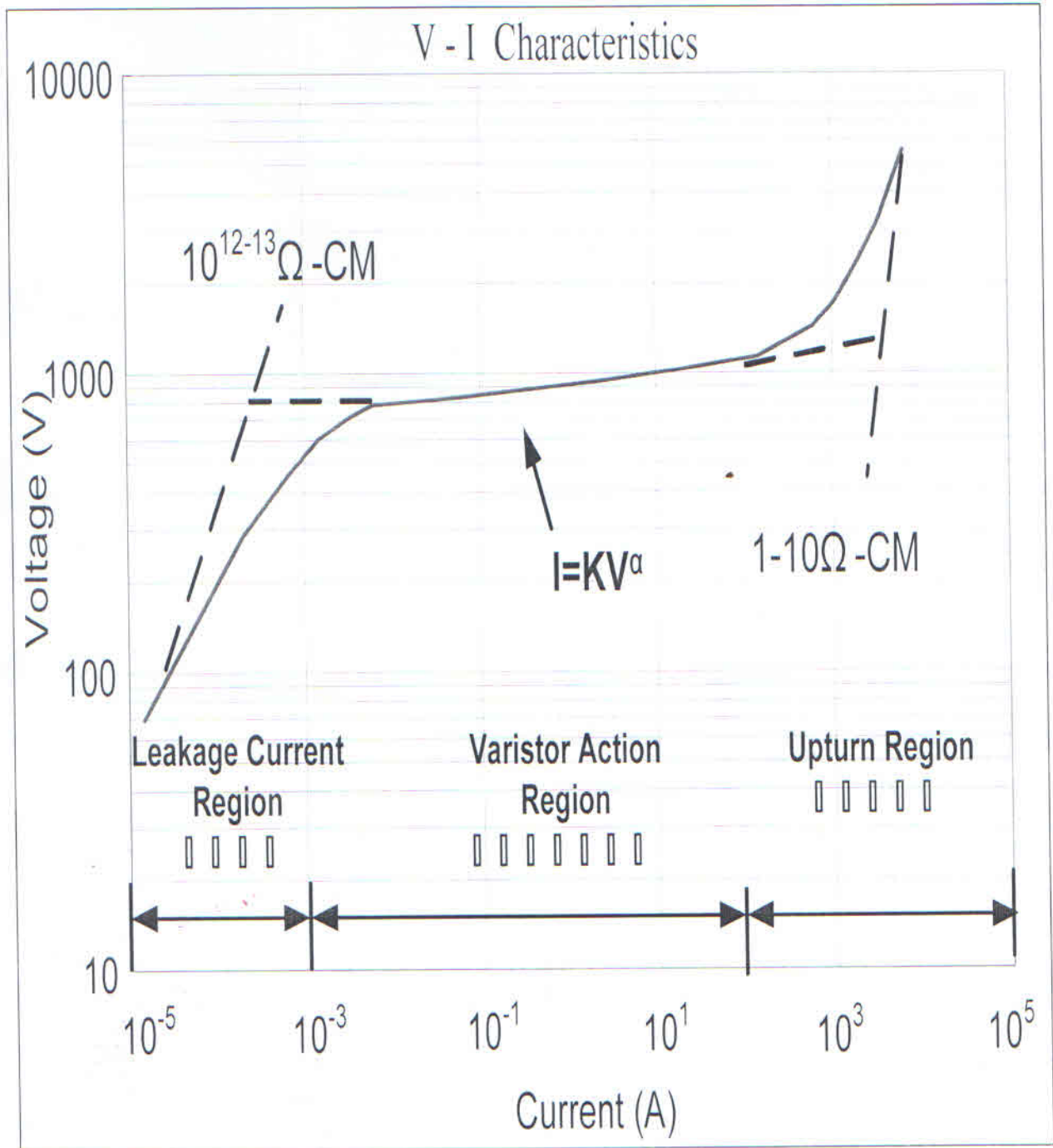
Table 1

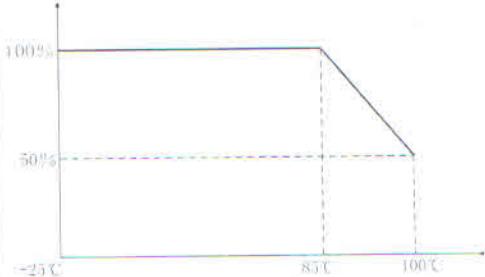

Line—Line Surge Protection		Line—Ground Surge Protection	
AC100V	MYG_D271	AC100	MYG_D821
AC120V	MYG_D331	AC120	MYG_D821
AC220	MYG_D471	AC220	MYG_D182
	MYG_D511		
	MYG_D561		
AC380	MYG_D681	AC380	MYG_D182
	MYG_D821		
	MYG_D921		

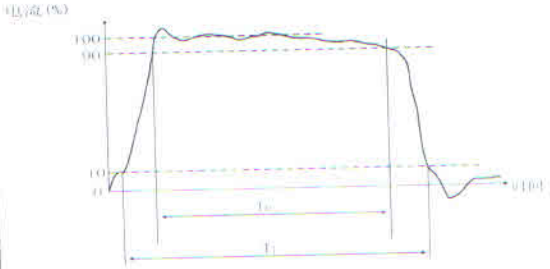
NOTES:"_": varistor diameter: 05、07、10、14、20 (05D、07D、10D、14D、20D)

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6. V/I curve V/I



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1.1 VARISTORS ELECTRICAL CHARACTERISTICS					
Technical term	Test Methods Description		Test Equipment	Specifications	
Varistors Voltage	The voltage between two terminals with the specified measuring current 1mA DC applied is called V _{1mA} .The measurement shall be made as fast as possible to avoid heat affection.		MYZ-5	The usual tolerance on varistors voltage is K: ±10%; L: ±15%。	
MAX Continuous AC or DC Voltage	 <p style="text-align: center;">最大允许使用电压降额图</p> <p>Maximum DC voltage that can be applied continuously in the specified operating temperature range.</p>		MAX Continuous AC Voltage ≈0.63 Multility Varistor voltage	The practical AC Voltage ≈0.45 Multility Varistor voltage	
Leakage current	The current passing through the varistors at the Maximum continuous DC voltage.		MYZ-5	Leakage current in the ratings (μA)	
MAX Clamping voltage	 <p style="text-align: center;">8/20μS Waveform Icon</p> <p>The peak voltage at class current (Standing surge current waveform is 8/20μS). The class current is a peak value of current which is 1/10 of the maximum peak current for 100 impulses at per minute for 8/20μS.</p>		T1=8μS±10% T2=20μS±10% MYZ-5	To meet the specified value	

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1.2 VARISTORS ELECTRICAL CHARACTERISTICS					
Technical term	Test Methods Description	Test Equipment	Specifications		
Energy	$(J) = k * I_p * V_c * 10^{-6}$ $k \text{ --- } 2000 \mu S, \quad k=2000;$ $10/1000 \mu S \quad k=1391;$ $I_p \text{ --- } 2000 \mu S \quad 10/1000 \mu S$ $V_c \text{ --- } 2000 \mu S \quad 10/1000 \mu S$ <p>The maximum energy within the varistors voltage change of $\pm 10\%$ when one impulse of $2000\mu S$ or $10/1000 \mu S$ is applied.</p> <p>For the 2mS waveform: $J=2*I_p*V_c*10^{-3}$ For the 10/1000 μS waveform: $J=1391*I_p*V_c*10^{-6}$</p> <p>Where J -- Energy absorbed in joules. Ip -- Maximum let-through current in amps. Vc-- Measured clamping voltage in volts.</p>  <p>2000 μS Square waveform shown</p>	2000 μS : TD=2000 $\pm 10\% \mu S$ TT $\leq 3000 \mu S$ MYZ-5 10/1000 μS T1=10 $\pm 10\% \mu S$ T2=1000 $\pm 10\% \mu S$	Varistor without the appearance of damage See specification tables. $\Delta V_{1mA} / V_{1mA} \leq 10\%$.		
Maximum Peak current	The maximum current within the varistors voltage change of $\pm 10\%$ with the standard impulse current ($8/20 \mu S$) applied one time.	MYZ-5	See specification tables. $\Delta V_{1mA} / V_{1mA} \leq 10\%$.		
Varistors voltage Temperature Coefficient	$\frac{U_{1mA} (85^\circ C) - U_{1mA} (25^\circ C)}{U_{1mA} (25^\circ C)} \times \frac{1}{60} \times 100\%$	THS-A5P-150	$\leq -0.05 \%/^\circ C$		
Capacitance	Typical value measured at 1Vrms and test frequency of 1kHz	CY 2646A	See specification tables.		

Standard test condition Temperature: 15°C-35°C; Relative humidity: 45%-75%; Air pressure: 86 Pa-106kPa.

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2. VARISTORS TECHNOLOGIC & MECHANICAL CHARACTERISTICS

Technical term	Test Methods Description	Test Equipment	Specifications
Solderability	After dipping the terminals to a depth of immersion 3.5-0.5 mm from the body in a soldering bath temperature $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 2 ± 0.5 seconds, the terminal shall be visually examined.	Tin Stove	Approximately 95% of the terminals shall be covered with solder uniformly.
Resistance to soldering heat	After each lead shall be dipped into a solder bath having a temperature $260 \pm 5^{\circ}\text{C}$ to a point 2.0 to 2.5mm from the body of the unit. Using shielding. Board($t=1.5\text{mm}$) ,be NEWd there for specified time (5D series: 5 ± 1 seconds and other series: 10 s),and then be stored at room temperature and humidity for 1 to 2 hours. The change of V1mA and mechanical damages are examined.	Tin Stove	No outstanding damage. $\Delta V1mA / V1mA \leq \pm 5\%$.
Solvent resistance of marking	Solvent: alcohol Rubbing material: cotton wool Thereafter, visual examination and the change of V1mA shall be examined.	Tampons Alcohol	Legible marking.
Component Solvent resistance	Solvent: $70 \pm 5\%$ and F113+ $30 \pm 5\%$ strang third mellow mixture, Solvent temperature: $23^{\pm 5}$, 5 ± 0.5 Min. Recovery: 4hours. Thereafter, visual examination and the change of V1mA shall be examined.	MYZ-5	No outstanding damage. $\Delta V1mA / V1mA \leq \pm 5\%$.
Robustness of terminations tensile bending	After gradually applying the force specified below and keeping the unit fixed for ten seconds. The terminal shall be visually examined for and damage. Lead diameter (mm): 0.6 0.8 1.0 Force (N): 1 10 20	MYZ-5	No outstanding damage. $\Delta V1mA / V1mA \leq \pm 5\%$.
vibration	Subjected to simple harmonic motion of 0.75mm amplitude 1.5mm maximum total excursion between limits of 10-55Hz.Frequency scan shall be traversed in one minute, This motion shall then be applied for period of two hours in each of three mutually perpendicular directions. The change shall be measured and meet the requirement with no outstanding damage.	Collision Taiwan	No outstanding damage. $\Delta V1mA / V1mA \leq \pm 5\%$.

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3.1 VARISTORS SECURITY AND ENVIRONMENTAL TEST

Technical term	Test Methods Description	Test Equipment	Specifications																														
Surge Life	<p>The change of ΔV_{1mA} shall be measured. After the impulse listed below is applied 10,000 times. Continuously with the interval of ten seconds at room temperature.</p> <table border="1"> <tr> <td rowspan="2">5D</td> <td>18v--68v</td> <td>2A</td> </tr> <tr> <td>82v--680v</td> <td>5A</td> </tr> <tr> <td rowspan="2">7D</td> <td>18v--68v</td> <td>9A</td> </tr> <tr> <td>82v--820v</td> <td>18A</td> </tr> <tr> <td rowspan="2">10D</td> <td>18v--68v</td> <td>18A</td> </tr> <tr> <td>82v--1800v</td> <td>35A</td> </tr> <tr> <td rowspan="2">14D</td> <td>18v--68v</td> <td>35A</td> </tr> <tr> <td>82v--1800v</td> <td>75A</td> </tr> <tr> <td rowspan="2">20D</td> <td>18v--68v</td> <td>75A</td> </tr> <tr> <td>82v--1800v</td> <td>150A</td> </tr> <tr> <td rowspan="2">25D 以上</td> <td>18v--68v</td> <td>110A</td> </tr> <tr> <td>82v--1800v</td> <td>225A</td> </tr> </table>	5D	18v--68v	2A	82v--680v	5A	7D	18v--68v	9A	82v--820v	18A	10D	18v--68v	18A	82v--1800v	35A	14D	18v--68v	35A	82v--1800v	75A	20D	18v--68v	75A	82v--1800v	150A	25D 以上	18v--68v	110A	82v--1800v	225A	<p>Pulser MYZ-5 Varistor Three Parametic Tester</p>	<p>No outstanding damage. $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$.</p>
5D	18v--68v		2A																														
	82v--680v	5A																															
7D	18v--68v	9A																															
	82v--820v	18A																															
10D	18v--68v	18A																															
	82v--1800v	35A																															
14D	18v--68v	35A																															
	82v--1800v	75A																															
20D	18v--68v	75A																															
	82v--1800v	150A																															
25D 以上	18v--68v	110A																															
	82v--1800v	225A																															
Temperature Cycle	<p>The Varistor follows removed after Temperature cycling, in place for more than one hour at room Temperature, within 24 hours measure the varistor voltage</p> <table border="1"> <tr> <th>Order</th> <th>Temperature</th> <th>Time</th> </tr> <tr> <td>1</td> <td>-40±3℃</td> <td>30 Min</td> </tr> <tr> <td>2</td> <td>Room Temp</td> <td>15 Min</td> </tr> <tr> <td>3</td> <td>+85±2℃</td> <td>30 Min</td> </tr> <tr> <td>4</td> <td>Room Temp</td> <td>15 Min</td> </tr> </table> <p>Cycles 5 times</p> <p>Condition the specimen to each temperature from step 1 to step 4 in this order for the period shown in the table of specifications, The change of V_{1mA} and mechanical damage shall be examined after 24±2 hours.</p> <table border="1"> <tr> <th>Step</th> <th>Temperature</th> <th>Period</th> </tr> <tr> <td>1</td> <td>-40±3℃</td> <td>30 Min</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>15 Min</td> </tr> <tr> <td>3</td> <td>+85±2℃</td> <td>30 Min</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>15 Min</td> </tr> </table> <p>5 Cycles</p>	Order	Temperature	Time	1	-40±3℃	30 Min	2	Room Temp	15 Min	3	+85±2℃	30 Min	4	Room Temp	15 Min	Step	Temperature	Period	1	-40±3℃	30 Min	2	Room Temp.	15 Min	3	+85±2℃	30 Min	4	Room Temp.	15 Min	<p>Low Temperature Test Chamber MYZ-5 Varistor Three Parametic Tester</p>	<p>Varistor voltage change rate $\leq \pm 5\%$. No outstanding damage. $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$.</p>
Order	Temperature	Time																															
1	-40±3℃	30 Min																															
2	Room Temp	15 Min																															
3	+85±2℃	30 Min																															
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Step	Temperature	Period																															
1	-40±3℃	30 Min																															
2	Room Temp.	15 Min																															
3	+85±2℃	30 Min																															
4	Room Temp.	15 Min																															
High temperature storage / Dry heat	<p>The specimen shall be subjected to 125±2℃ for 1000 hours in a drying oven without load and then stored at room temperature for 1-2 hours. The change of V_c shall be measured and meet the requirement with no outstanding damage.</p>	<p>101- A Type Blast Oven MYZ-5 Varistor three parametic Tester</p>	<p>$\Delta V_c / V_c \leq \pm 5\%$</p>																														

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3.2 VARISTORS SECURITY AND ENVIRONMENTAL TEST							
Technical term	Test Methods Description	Test Equipment	Specifications				
Low temperature storage/ Cold	Specimen shall be subjected to an ambient of $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 1000 hours. And after the specimen shall be left at room ambient for 1-2 hours. The change of V_c shall be measured and meet the requirement. With no outstanding damage.	THS-A5P-150 Humidity Chamber MYZ-3 Varistor three parametric Tester	$\Delta V_c / V_c \leq 5\%$				
Humidity	The specimen shall be subjected to $40^{\circ}\text{C}, 90$ to 95% R.H. for 1000 hours without load and then stored at room temperature for 1-2 hours. The change of V_c shall be measured and meet the requirement with no outstanding damage.	THS-A5P-150 Humidity Chamber MYZ-3 Varistor Three Parametric Tester	$\Delta V_c / V_c \leq \pm 5\%$				
Damp hest load Humidity load	After being continuously applied the maximum allowable voltage at $85 \pm 2^{\circ}\text{C}, 90-95\%$ R.H for 1000 hours, the specimen shall be stored at room temperature and humidity for 1-2 hours. The change of V_c shall be measured and meet the requirement with no outstanding damage.	THS-A5P-150 Humidity Chamber ADCS AC-DC Live Test Machine MYZ-5 Varistor three parametric tester	$\Delta V_c / V_c \leq \pm 10\%$				
High temperature load / Dry heat load	After being continuously applied the maximum allowable voltage at $85 \pm 2^{\circ}\text{C}$ for 1000 hours, the specimen shall be stored at room temperature and humidity for 1-2 hours. The change of V_c shall be measured and meet the requirement with no outstanding damage.	101-II A Type Blast Oven ADCS AC-Dc Live Test Machine MYZ-5 Varistor three parametric Tester	$\Delta V_c / V_c \leq \pm 10\%$				
Temperature cycle	Temperature cycle operation of the following table shall be repeated 5 times continuously. And then the specimen shall be left at room ambient for 1-2 hours. The change of V_c shall be measured and meet the requirement with no outstanding damage.						
	Stops	Temperature	Min.	Stops	Temperature	Min.	HLA High Temperature Cycling Tank MYZ-5 Varistor three parametric Tester No outstanding damage
	1	$-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$	30 ± 3	3	$-125^{\circ}\text{C} \pm 2^{\circ}\text{C}$	30 ± 3	
2	Room temperature	15 ± 3	4	Room temperature	15 ± 3		