

Issued-date: 2024-06-24	Name	Specification Sheet – 20D		
Revision	A		Page	1
STANDARD MANUAL				

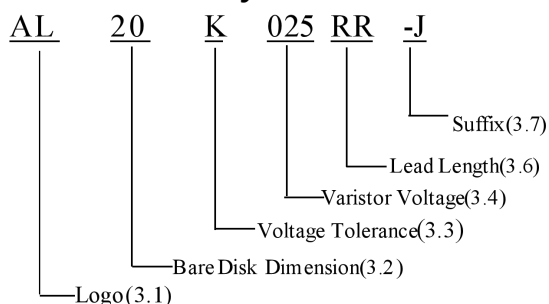
1. Description

Metal Oxide Varistor(MOV) is a nonlinear resistance component with zinc oxide(ZnO) as its main constituent, The resistance of an MOV is sensitive to changes in the applied voltage, Below the threshold voltage, the MOV exhibits high resistance, allowing only a negligibly small leakage current to flow, Once the threshold voltage is exceeded, the resistance of the MOV drops sharply, enabling the conduction of a large current, This characteristic makes the MOV suitable for detecting and suppressing surge voltage and overvoltage, thereby protect the circuit from damage caused by excessive voltage.

2. Features

- Low Voltage
- Low leakage current(high resistance)
- Small size, high energy absorption capacity
- Ability to withstand high voltage and high current
- Long lifespan and high stability
- Fast response speed
- RoHS & REACH Compliant
- The tube is recognized by UL1449 (List No. : E535562)

3. Part Number System



3.1 LOGO Name:

Code	AL
LOGO	Aillen

3.2 Dimension:

Code	20
Bare Disk Dimension	Φ20mm

3.3 Voltage Tolerance:

Code	M	K
Voltage Tolerance	±20%	±10%

Issued-date: 2024-06-24

Name

Specification Sheet – 20D

Revision

A

Page

2

STANDARD MANUAL

3.4 Varistor Voltage

Code	025
Voltage	25VAC

3.5 Package

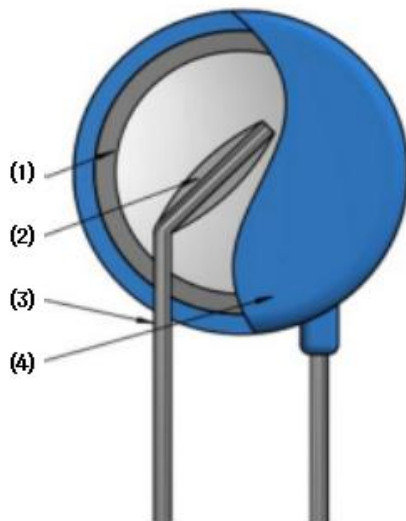
Code	RR
Package	Bulk

3.6 Suffix:

Inner Code

-J: High Surge type & High Energy

4.Product Structure:



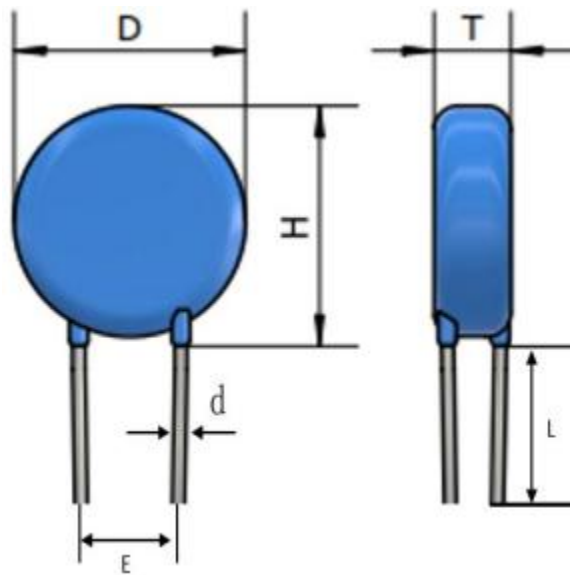
(1) Zinc oxide

(2) Tin(Sn)

(3) Lead

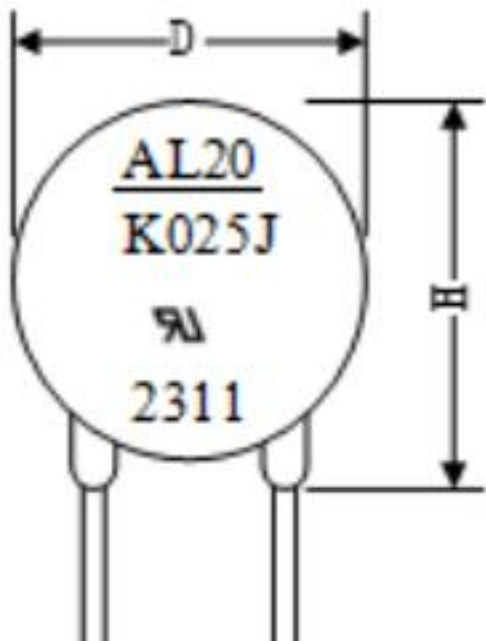
(4) Paint

5.Disk Dimensions:



Item	Size(mm)
D	23.0Max
H	26.0Max
T	4.4Max
d	1.0±0.1
E	10±0.8
L	20min

6.Marking



Issued-date: 2024-06-24

Name

Specification Sheet – 20D

Revision

A

Page

4

STANDARD MANUAL

7. Specifications:

No.	Item	Performance	Test methods
7.1	Varistor voltage (Vn)	V1mA: 35V~43V	Varistors be connected to a variable voltage source adjusted to maintain a current of 1 mA DC applied between 10 ms and 500 ms and the voltage across the varistor measured
7.2	Maximum Continuous Operating Voltage (MCOV)	AC: 25V rms DC: 31V	Maximum continuous AC sine wave (RMS) or DC voltage which may be applied.
7.3	Max. Clamping Voltage(VC)	77V at 20A	The maximum voltage across the varistor when applying the specified peak impulse current (8/20us waveform).
7.4	Nominal Discharge Current(In)	1500A	The peak current waveform of the varistor is 8/20 μ s, and 15 surges are applied with an interval of 1 minute. The voltage change rate of the varistor after the surge is $\leq \pm 10\%$
7.5	Maximum Discharge Current (Imax.)	3000A	By measuring the peak current of a varistor once, the waveform is 8/20 μ s, and the voltage change rate of the varistor is $\leq \pm 10\%$.
7.6	Rated Power (Pmax.)	0.2W	The maximum power value that a varistor can withstand at maximum operating voltage
7.7	Energy (Em)	28J	The max energy absorbed with the varistor voltage change less than $\pm 10\%$ when one impulse current waveform 10/1000μs is applied
7.8	Typical Capacitance (Reference) (Cv)	8500pf	The capacitance test frequency is 1KHz $\pm 10\%$, the measured voltage at room temperature is 1V, and the bias voltage is 0V.
7.9	Varistor Voltage Temperature Coefficient	-0.05~+0.05% °C	$\frac{V_{1mA \text{ at } 25^{\circ}\text{C}} - V_{1mA \text{ at } 105^{\circ}\text{C}}}{V_{1mA \text{ at } 25^{\circ}\text{C}}} \times \frac{1}{60} \times 100 (\%/^{\circ}\text{C})$
7.10	Leakage Current (IR)	$\leq 35\mu\text{A}$	The value of the direct current measured when 80% of the Varistor Voltage is applied to both ends of the varistor

8. Physical Test:

No.	Item	Accept STD	Test methods
8.1	Terminal Pull Strength	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$	1sPull:1Kg for ϕ 0.5mm and ϕ 0.8mm wire 2kg f or ϕ 1.0mm and ϕ 1.2mm wire Loading Times: 10 $\pm$ 1 Sec
8.2	Terminal Bending Strength	Bending Times $\geq$ 2Times $\Delta VB/VB\% \leq \pm 10\%$	Loading: 0.5 Kg, Bending: 90°
8.3	Torsion Test	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$	Loading: 1Kg, Rotate180°, Times: 2 Times
8.4	Solderability	Solderability $\geq$ 95%	Temp.235 $\pm$ 5°C Continuance Time:3.5 $\pm$ 0.5 Sec
8.5	Flammability	Burning Time: $\leq$ 5Sec;	Burning time: 10 Sec;
8.6	Vibration Test	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$	Frequency: 10~500HZ, Amplitude: 0.75mm, Test direction: X/Y/Z, Duration: 2 Hrs/axes
8.7	Shock Test	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$	Pulse Shape: Half-sine, Acceleration: 490m/S2, Duration of Pulse: 11 mS, Shock direction: X/Y/Z (total 6faces) , Shock times:3 Times /Direction;

9. Environment Test:

No.	Item	Accept STD	Test methods
9.1	Resistance to Soldering Heat	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$	Temp $260 \pm 5^{\circ}\text{C}$, Time Continuance $10 \pm 1 \text{ Sec}$
9.2	High Temp.Storage	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$ $IR \geq 1\text{G}\Omega$	Temp. $125 \pm 2^{\circ}\text{C}$, Time: $1000 \pm 24 \text{ hrs}$
9.3	Low Temp.Storage	No Outside Damage $\Delta VB/VB\% \leq \pm 5\%$	Temp. $-40 \pm 3^{\circ}\text{C}$, Time: $1000 \pm 24 \text{ hrs}$.
9.4	Damp Heat	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$ $IR \geq 100\text{M}\Omega$	Temp. $40 \pm 2^{\circ}\text{C}$, Humidity $90 \sim 95 \text{ R.H.}\%$, Times: 56 dayS
9.5	Temp.cycling test	No Outside Damage $\Delta VB/VB\% \leq \pm 5\%$	Low $-55 \pm 3^{\circ}\text{C}$, High Temp $125 \pm 2^{\circ}\text{C}$, Time 30 min , 5 Cycle .
9.6	High Temp.Load	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$ $IR \geq 1\text{G}\Omega$	Temp. $105 \pm 2^{\circ}\text{C}$, Voltage: AC MCOV, Time: $1000 \pm 24 \text{ hrs}$
9.7	Climatic Sequence	No Outside Damage $\Delta VB/VB\% \leq \pm 10\%$ $IR \geq 100\text{M}\Omega$	1.Temp.: $125 \pm 5^{\circ}\text{C}$, Time: 16 H ; 2.Temp.: $55 \pm 2^{\circ}\text{C}$, Humidity: $80 \sim 100 \text{ R.H}\%$, Times: 144 Hrs ; 3.Temp.: $-40 \pm 3^{\circ}\text{C}$, Times: 2 Hrs ; 4.Temp.: $55 \pm 2^{\circ}\text{C}$, Humidity: $80 \sim 100 \text{ R.H}\%$ Times: 21 days ;

10. Technical Term

No.	Item	Specifications	Description
10.1	Operating Temp.	-40°C~+105°C	The ambient temperature that can maintain the normal operation of varistors:
10.2	Storage Temp.	-40°C~+125°C	Storage temperature range of varistors (no voltage applied)
10.3	Transient ResponseTime	< 50ns	Time lag between application of surge and varistor's "turn-on" conduction action
10.4	Insulation Resistance	$\geq 1G\Omega$	Minimum resistance between shorted terminals and varistor surface
10.5	Hi-pot test	$\geq 2500VAC$	Minimum voltage applied for one minute between shorted terminals varistor surface

11. Attention

11.1 Varistor must operate within the specified ambient temp;

11.2 Do not clean the varistor with strong polar solvent such as ketone, ethers, benzene, halogenated hydrocarbon, to avoid damaging the encapsulating layer;

11.3 Please do not apply severe vibration, shock or pressure to MOV, to avoid surface resin or element cracking;

11.4 Please fix lead wires when bending or cutting. The distance between the bending point and the sealing of MOV shall be greater than 2mm;

11.5 If varistor is visually damaged, please replace it.