



嵩隆力上

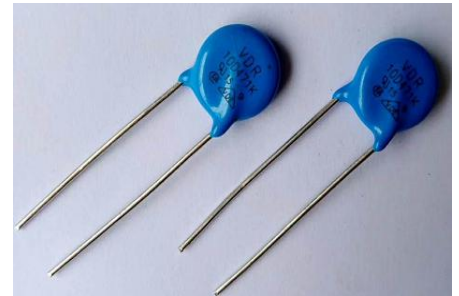
SONGLONG LISHANG

VDR Varistor  
10D SERIES

## METAL OXIDE VARISTOR – 10D SERIES

### FEATURES

- \* Wide operating voltage (V1mA) range from 18V to 1100V.
- \* Fast responding to transient over-voltage.
- \* Large absorbing transient energy capability.
- \* Low clamping ratio and no follow-on current.
- \* Meets MSL level 1, per J-STD-020
- \* Safety number : CUL- E317616      VDE- 40028836  
CQC-12001076479      ISO9001-2018



### APPLICATION

- \* Transistor, Diode, IC, Thyristor or Triac semiconductor protection.
- \* Surge protection in consumer electronics.
- \* Surge protection in industrial electronics.
- \* Surge protection in electronic home appliances, gas and petroleum appliances.
- \* Relay and electromagnetic valve surge absorption.



### General Characteristics Definition

- \* Operating Temperature:  $(-40^{\circ}\text{C} \sim +85^{\circ}\text{C})$  &  $(-40^{\circ}\text{C} \sim +125^{\circ}\text{C})$
- \* Storage Temperature:  $(-40^{\circ}\text{C} \sim +125^{\circ}\text{C})$
- \* Working Surface Temperature:  $+115^{\circ}\text{C}$
- \* Insulation Resistance:  $> 100\text{M } \Omega$
- \* Coating (Epoxy Resin): Flame-Retardant to UL 94 V-0

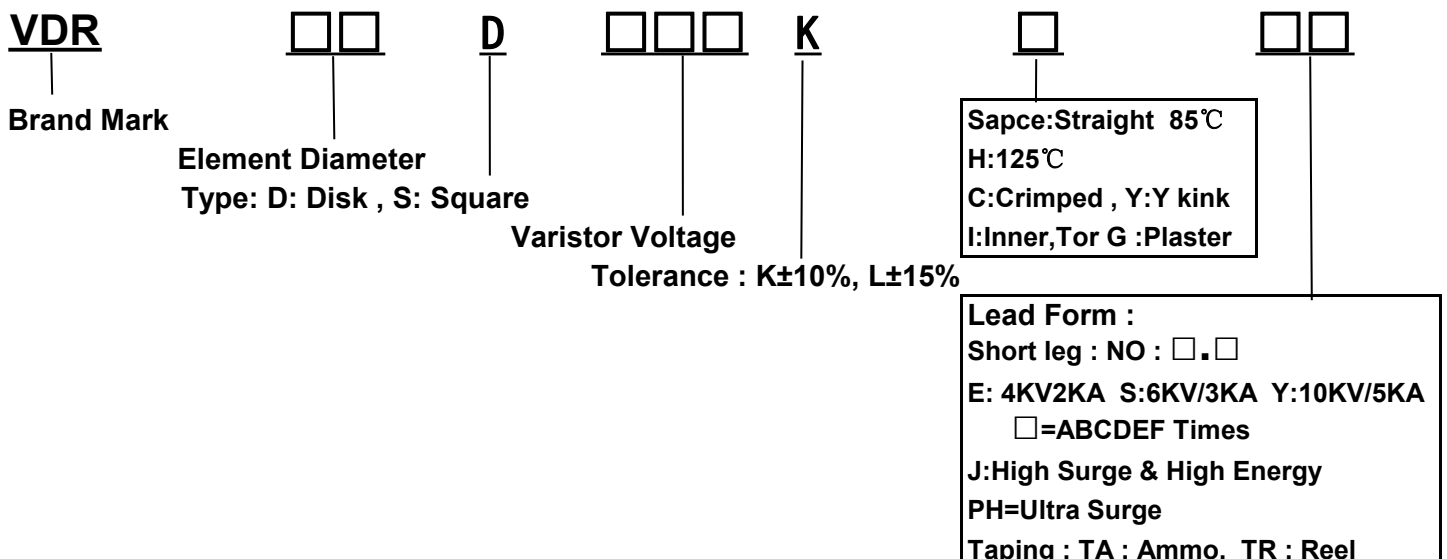


### Material

- \* Coating: Epoxy Resin
- \* Lead Wire: The Copper Wire
- \* Electrode: Silver      Solder
- \* Disk: Zinc Oxide



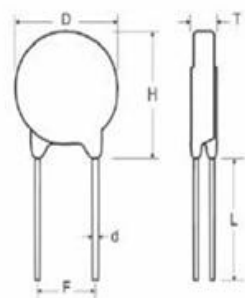
### PART NUMBER CODE



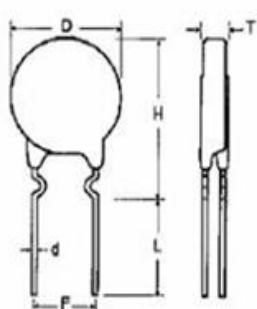


## ■ Dimensions

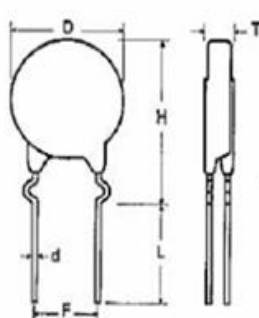
S Type(Straight Lead)



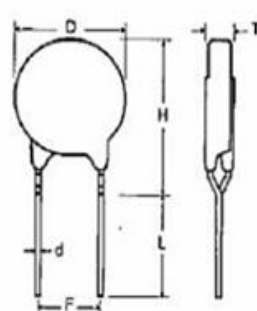
I Type(Inner Crimped Lead)



C Type(Out Crimped Lead)



Y Lead Type(Y Kink Lead)



Unit: mm

| Part No.    | Part No.     | T Max. | D Max. | H Max. |           | L min. | F ±0.8 | d ± 0.05 |
|-------------|--------------|--------|--------|--------|-----------|--------|--------|----------|
|             |              |        |        | S      | I / C / Y |        |        |          |
| VDR-10D180L | VDR-10D180LJ | 4.5    | 12.5   | 16.5   | 17.5      | 20.0   | 7.5    | 0.8      |
| VDR-10D220K | VDR-10D220KJ | 4.6    |        |        |           |        |        |          |
| VDR-10D270K | VDR-10D270KJ | 4.7    |        |        |           |        |        |          |
| VDR-10D330K | VDR-10D330KJ | 4.9    |        |        |           |        |        |          |
| VDR-10D390K | VDR-10D390KJ | 4.8    |        |        |           |        |        |          |
| VDR-10D470K | VDR-10D470KJ | 4.9    |        |        |           |        |        |          |
| VDR-10D560K | VDR-10D560KJ | 5.0    |        |        |           |        |        |          |
| VDR-10D680K | VDR-10D680KJ | 5.2    |        |        |           |        |        |          |
| VDR-10D820K | VDR-10D820KJ | 4.1    |        |        |           |        |        |          |
| VDR-10D101K | VDR-10D101KJ | 4.3    |        |        |           |        |        |          |
| VDR-10D121K | VDR-10D121KJ | 4.5    |        |        |           |        |        |          |
| VDR-10D151K | VDR-10D151KJ | 4.8    |        |        |           |        |        |          |
| VDR-10D181K | VDR-10D181KJ | 4.3    |        |        |           |        |        |          |
| VDR-10D201K | VDR-10D201KJ | 4.4    |        |        |           |        |        |          |
| VDR-10D221K | VDR-10D221KJ | 4.5    |        |        |           |        |        |          |
| VDR-10D241K | VDR-10D241KJ | 4.6    |        |        |           |        |        |          |
| VDR-10D271K | VDR-10D271KJ | 4.9    |        |        |           |        |        |          |
| VDR-10D301K | VDR-10D301KJ | 5.0    |        |        |           |        |        |          |
| VDR-10D331K | VDR-10D331KJ | 5.1    |        |        |           |        |        |          |
| VDR-10D361K | VDR-10D361KJ | 5.2    |        |        |           |        |        |          |
| VDR-10D391K | VDR-10D391KJ | 5.4    |        |        |           |        |        |          |
| VDR-10D431K | VDR-10D431KJ | 5.7    |        |        |           |        |        |          |
| VDR-10D471K | VDR-10D471KJ | 6.0    |        |        |           |        |        |          |
| VDR-10D511K | VDR-10D511KJ | 6.2    |        |        |           |        |        |          |
| VDR-10D561K | VDR-10D561KJ | 6.5    |        |        |           |        |        |          |
| VDR-10D621K | VDR-10D621KJ | 7.1    |        |        |           |        |        |          |
| VDR-10D681K | VDR-10D681KJ | 7.6    |        |        |           |        |        |          |
| VDR-10D751K | VDR-10D751KJ | 8.0    |        |        |           |        |        |          |
| VDR-10D781K | VDR-10D781KJ | 8.1    |        |        |           |        |        |          |
| VDR-10D821K | VDR-10D821KJ | 8.3    |        |        |           |        |        |          |
| VDR-10D911K | VDR-10D911KJ | 8.8    |        |        |           |        |        |          |
| VDR-10D102K | VDR-10D102KJ | 9.3    |        |        |           |        |        |          |
| VDR-10D112K | VDR-10D112KJ | 9.9    |        |        |           |        |        |          |



## ELECTRICAL CHARACTERISTIC

| Part Number |            | Maximum Allowable Voltage |        | Varistor Voltage | Maximum Voltage |       | Withstanding Surge Current |                 | Energy 10/1000μS |                 | Rated Power | Typical Capacitance (Reference) |
|-------------|------------|---------------------------|--------|------------------|-----------------|-------|----------------------------|-----------------|------------------|-----------------|-------------|---------------------------------|
| Standard    | High Surge | AC (V)                    | DC (V) | V1mA(V)          | IP(A)           | VC(V) | I(A) Standard              | I(A) High Surge | I(A) Standard    | I(A) High Surge | (W)         | @1KHzPF                         |
| 10D180L     | 10D180LJ   | 11                        | 14     | 18(15.0~21.6)    | 5               | 36    | 500                        | 1000            | 2.1              | 3.0             | 0.05        | 5600                            |
| 10D220K     | 10D220KJ   | 14                        | 18     | 22(19.5~26.0)    | 5               | 43    | 500                        | 1000            | 2.5              | 5.0             | 0.05        | 4500                            |
| 10D270K     | 10D270KJ   | 17                        | 22     | 27(24~31)        | 5               | 53    | 500                        | 1000            | 3.0              | 6.0             | 0.05        | 3700                            |
| 10D330K     | 10D330KJ   | 20                        | 26     | 33(29.5~36.5)    | 5               | 65    | 500                        | 1000            | 4.0              | 7.0             | 0.05        | 3000                            |
| 10D390K     | 10D390KJ   | 25                        | 31     | 39(35~43)        | 5               | 77    | 500                        | 1000            | 4.6              | 9.0             | 0.05        | 2400                            |
| 10D470K     | 10D470KJ   | 30                        | 38     | 47(42~52)        | 5               | 93    | 500                        | 1000            | 5.5              | 11.0            | 0.05        | 2100                            |
| 10D560K     | 10D560KJ   | 35                        | 45     | 56(50~62)        | 5               | 110   | 500                        | 1000            | 7.0              | 13.0            | 0.05        | 1800                            |
| 10D680K     | 10D680KJ   | 40                        | 56     | 68(61~75)        | 5               | 135   | 500                        | 1000            | 8.2              | 15.0            | 0.05        | 1500                            |
| 10D820K     | 10D820KJ   | 50                        | 65     | 82(74~90)        | 25              | 135   | 2500                       | 3500            | 12.0             | 17.0            | 0.4         | 1200                            |
| 10D101K     | 10D101KJ   | 60                        | 85     | 100(90~110)      | 25              | 165   | 2500                       | 3500            | 15.0             | 18.0            | 0.4         | 1000                            |
| 10D121K     | 10D121KJ   | 75                        | 100    | 120(108~132)     | 25              | 200   | 2500                       | 3500            | 18.0             | 21.0            | 0.4         | 830                             |
| 10D151K     | 10D151KJ   | 95                        | 125    | 150(135~165)     | 25              | 250   | 2500                       | 3500            | 22.0             | 25.0            | 0.4         | 670                             |
| 10D181K     | 10D181KJ   | 115                       | 150    | 180(162~198)     | 25              | 300   | 2500                       | 3500            | 27.0             | 30.0            | 0.4         | 560                             |
| 10D201K     | 10D201KJ   | 130                       | 170    | 200(185~225)     | 25              | 330   | 2500                       | 3500            | 30.0             | 35.0            | 0.4         | 500                             |
| 10D221K     | 10D221KJ   | 140                       | 180    | 220(198~242)     | 25              | 360   | 2500                       | 3500            | 32.0             | 39.0            | 0.4         | 450                             |
| 10D241K     | 10D241KJ   | 150                       | 200    | 240(216~264)     | 25              | 395   | 2500                       | 3500            | 35.0             | 42.0            | 0.4         | 420                             |
| 10D271K     | 10D271KJ   | 175                       | 225    | 270(243~297)     | 25              | 455   | 2500                       | 3500            | 37.0             | 49.0            | 0.4         | 370                             |
| 10D301K     | 10D301KJ   | 190                       | 250    | 300(270~330)     | 25              | 505   | 2500                       | 3500            | 40.0             | 54.0            | 0.4         | 330                             |
| 10D331K     | 10D331KJ   | 210                       | 275    | 330(297~363)     | 25              | 550   | 2500                       | 3500            | 43.0             | 58.0            | 0.4         | 300                             |
| 10D361K     | 10D361KJ   | 230                       | 300    | 360(324~396)     | 25              | 595   | 2500                       | 3500            | 47.0             | 65.0            | 0.4         | 280                             |
| 10D391K     | 10D391KJ   | 250                       | 320    | 390(351~429)     | 25              | 650   | 2500                       | 3500            | 60.0             | 70.0            | 0.4         | 260                             |
| 10D431K     | 10D431KJ   | 275                       | 350    | 430(387~473)     | 25              | 710   | 2500                       | 3500            | 65.0             | 80.0            | 0.4         | 230                             |
| 10D471K     | 10D471KJ   | 300                       | 385    | 470(423~517)     | 25              | 775   | 2500                       | 3500            | 67.0             | 85.0            | 0.4         | 210                             |
| 10D511K     | 10D511KJ   | 320                       | 415    | 510(459~561)     | 25              | 845   | 2500                       | 3500            | 69.0             | 90.0            | 0.4         | 200                             |
| 10D561K     | 10D561KJ   | 350                       | 460    | 560(504~616)     | 25              | 920   | 2500                       | 3500            | 70.0             | 92.0            | 0.4         | 180                             |
| 10D621K     | 10D621KJ   | 385                       | 505    | 620(558~682)     | 25              | 1025  | 2500                       | 3500            | 72.0             | 95.0            | 0.4         | 160                             |
| 10D681K     | 10D681KJ   | 420                       | 560    | 680(612~748)     | 25              | 1120  | 2500                       | 3500            | 75.0             | 98.0            | 0.4         | 150                             |
| 10D751K     | 10D751KJ   | 460                       | 615    | 750(675~825)     | 25              | 1240  | 2500                       | 3500            | 77.0             | 100.0           | 0.4         | 140                             |
| 10D781K     | 10D781KJ   | 485                       | 640    | 780(702~858)     | 25              | 1290  | 2500                       | 3500            | 80.0             | 105.0           | 0.4         | 130                             |
| 10D821K     | 10D821KJ   | 510                       | 670    | 820(738~902)     | 25              | 1355  | 2500                       | 3500            | 85.0             | 110.0           | 0.4         | 120                             |
| 10D911K     | 10D911KJ   | 550                       | 745    | 910(819~1001)    | 25              | 1500  | 2500                       | 3500            | 93.0             | 130.0           | 0.4         | 110                             |
| 10D102K     | 10D102KJ   | 625                       | 825    | 1000(900~1100)   | 25              | 1650  | 2500                       | 3500            | 102.0            | 140.0           | 0.4         | 100                             |
| 10D112K     | 10D112KJ   | 680                       | 895    | 1100(990~1210)   | 25              | 1815  | 2500                       | 3500            | 115.0            | 150.0           | 0.4         | 90                              |

The tolerance of varistor voltage between 18V and 68V is more than 10%.



## Reliability Test

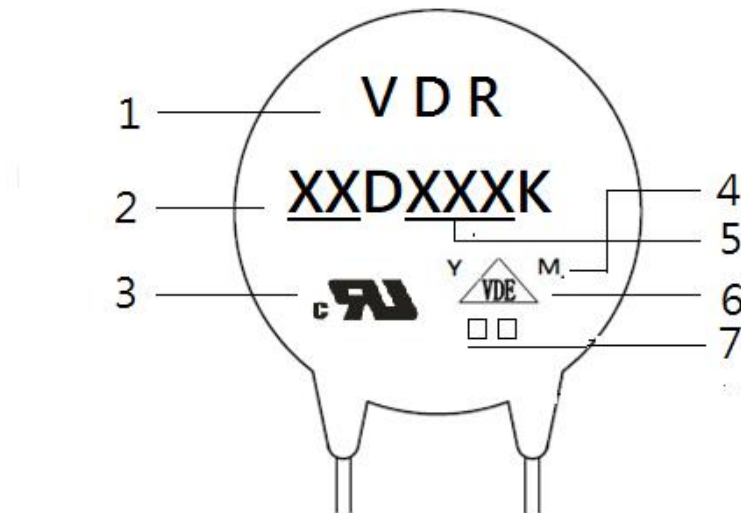
### Mechanical Ratings

| Test Parameter                      | Test Condition / Description                                                                                                                                                                                                                                                                                                  |          |         | Performance Requirements                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|----------------------------------------------------|
| Terminal Pull Strength              | After gradually applying the load specified below and keeping the unit fixed for ten seconds, the terminal shall be visually examined for any damage.                                                                                                                                                                         | Diameter | Loading | No visible damage                                  |
|                                     |                                                                                                                                                                                                                                                                                                                               | 0.6mm    | 1.0 Kg  |                                                    |
|                                     |                                                                                                                                                                                                                                                                                                                               | 0.8mm    | 1.0 Kg  |                                                    |
|                                     |                                                                                                                                                                                                                                                                                                                               | 1.0mm    | 2.0 Kg  |                                                    |
| Terminal Bending Strength           | The unit shall be secured with its terminal kept vertical and the weight specified below be applied in the axial direction. The terminal shall gradually be bent by 90° in one direction, then 90° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined. | Diameter | Loading | No visible damage                                  |
|                                     |                                                                                                                                                                                                                                                                                                                               | 0.6mm    | 0.5 Kg  |                                                    |
|                                     |                                                                                                                                                                                                                                                                                                                               | 0.8mm    | 0.5 Kg  |                                                    |
|                                     |                                                                                                                                                                                                                                                                                                                               | 1.0mm    | 1.0 Kg  |                                                    |
| Vibration                           | The Specimen shall be vibrated by its lead wires with a total amplitude of 1.5mm and a varying frequency of 10~55~10HZ(each minutes) for a period of 2 hours respectively in each X,Yand Z directions.                                                                                                                        |          |         | No visible damage<br>$\Delta VB/VB\% \leq \pm 5\%$ |
| Soldering-solderability             | After dipping the terminal to depth of approximately 3mm from the specimen in a soldering bath of 260°C for 10±1(D5: 5±1) seconds. Thereafter the terminal shall be visually examined.                                                                                                                                        |          |         | Terminations shall be uniformly tinned             |
| Soldering-Resistance to Solder Heat | After preheating the specimen, the specimen shall be completely immersed into a soldering bath having a temperature of 260±5°C for 10±1 (D5: 5±1) seconds or iron of 400±5°C for 3±0.5 seconds. There after the change of Vb and mechanical damage shall be examined.                                                         |          |         | No visible damage<br>$\Delta VB/VB\% \leq \pm 5\%$ |

### ENVIRONMENTAL RATINGS

|                          |                                                                                                                                                                                                                                                                                                                                      |      |           |                                                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------------------------------------------------|
| Dry Heat Loading         | The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined.<br>temp : 125±2°C ; Period : 1000±24hours.                     |      |           | $\Delta VB/VB\% \leq \pm 10\%$                      |
| High Temperature Storage | In a drying oven without load.<br>Ambient temp : 125±2°C ; period : 1000±24hours                                                                                                                                                                                                                                                     |      |           | $\Delta VB/VB\% \leq \pm 5\%$                       |
| Damp Heat Loading        | The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined.<br>condition : 40±2°C , 90 to 95%R.H. ; period : 1000±24 hours |      |           | $\Delta VB/VB\% \leq \pm 10\%$                      |
| Temperature Cycle        | Condition the specimen to each temperature form step 1 to step 4 in this order for the period shown in the table of specifications. The change of Vb and mechanical damage shall be examined after 2 hours.                                                                                                                          | Step | Temp°C    | Period                                              |
|                          |                                                                                                                                                                                                                                                                                                                                      | 1    | -40±3°C   | 30 min.                                             |
|                          |                                                                                                                                                                                                                                                                                                                                      | 2    | Room Temp | 15 min.                                             |
|                          |                                                                                                                                                                                                                                                                                                                                      | 3    | 85±2°C    | 30 min.                                             |
|                          |                                                                                                                                                                                                                                                                                                                                      | 4    | Room Temp | 15 min.                                             |
| Surge Lifetime Rating    | The change of Vb shall be measured after the impulse listed below is applied 10,000 times continuously with the interval of ten seconds at room temperature.                                                                                                                                                                         |      |           | No visible damage<br>$\Delta VB/VB\% \leq \pm 10\%$ |
| Voltage Proof            | Voltage : 2500VAC Leakage Current ≤ 0.5mA Time : 60 Seconds                                                                                                                                                                                                                                                                          |      |           | No Breakdown                                        |

## MARKING CODE



- 1 SongLong Lishang Logo
  - 2 Disk Size
  - 3 CUL Accreditation Logo
  - 4 "Y" & "M" Product Line Code
  - 5 Varistor Voltage
  - 6 VDE Accreditation Logo
  - 7 Energy and frequency of combined wave
- "J" is High Surge Code, not "J" is Standard Surge  
"H" is High temperature range ,not "H" is Standard

## Packaging specification / bulk packaging quantity

Unit:Pcs

| Dimension       | Part No.     | Bag | Small Carton | Carton |
|-----------------|--------------|-----|--------------|--------|
| 10D             | 180L to 112K | 500 | 5,000        | 10,000 |
| 10D (Short leg) | 180L to 112K | 500 | 7,500        | 15,000 |