



## METAL OXIDE VARISTOR – 20D J2 & J3 SERIES

### FEATURES

- \* Wide operating voltage (V1mA) range from 18V to 1800V.
- \* 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 : UL- E317616  
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.

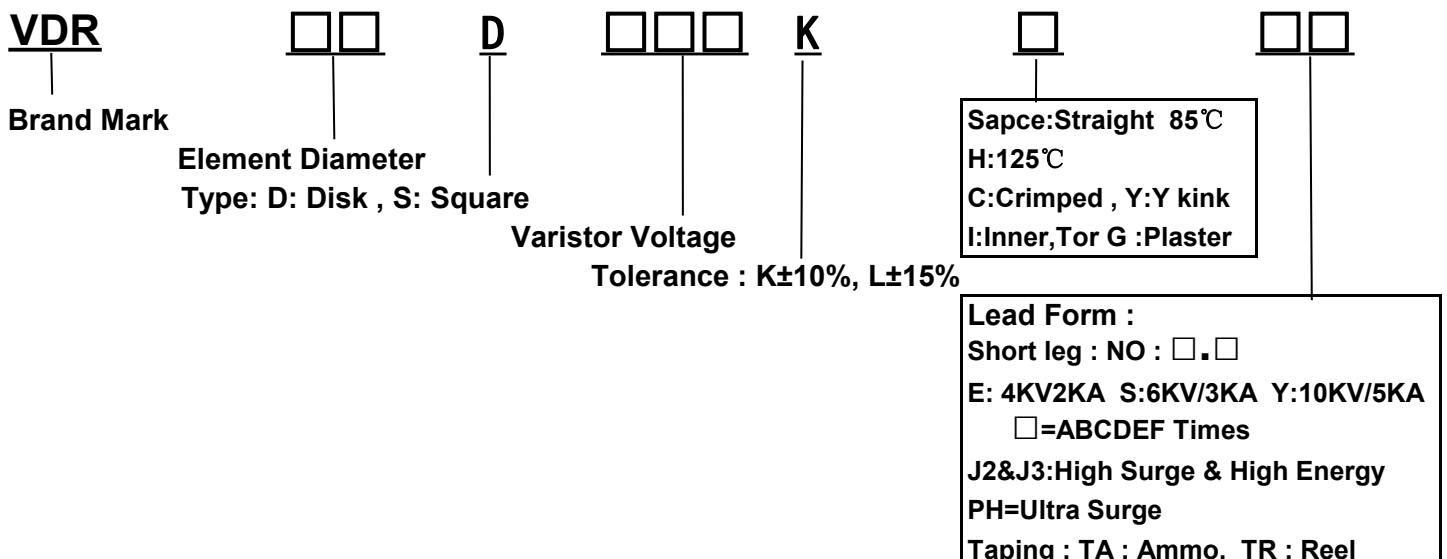
### General Characteristics Definition

- \* Operating Temperature: (-40 °C ~ +85 °C )
- \* Storage Temperature: (-40 °C ~ +125 °C)
- \* Working Surface Temperature: +115 °C
- \* Insulation Resistance: > 100M Ω
- \* 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

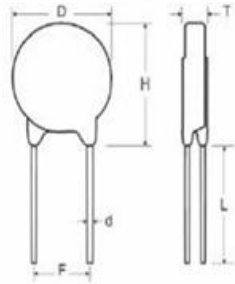
### PART NUMBER CODE



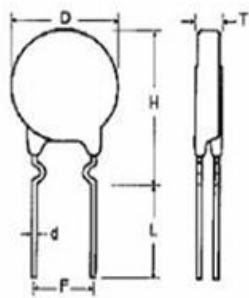


■ Dimensions

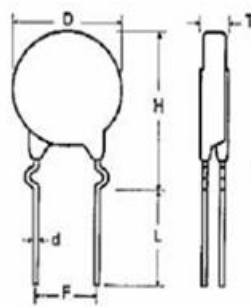
S Type(Straight Lead)



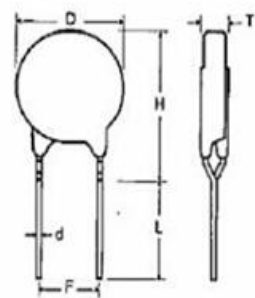
I Type(Inner Crimped Lead)



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	d ± 0.05
				S	I / C / Y			
VDR-25D180L	VDR-25D180LJ	4.8	28.0	32.0	34.0	20.0	10.0±1.0 12.5±1.0	1.0
VDR-25D220K	VDR-25D220KJ	4.9						
VDR-25D270K	VDR-25D270KJ	5.0						
VDR-25D330K	VDR-25D330KJ	5.2						
VDR-25D390K	VDR-25D390KJ	5.5						
VDR-25D470K	VDR-25D470KJ	5.1						
VDR-25D560K	VDR-25D560KJ	5.4						
VDR-25D680K	VDR-25D680KJ	5.7						
VDR-25D820K	VDR-25D820KJ	4.5						
VDR-25D101K	VDR-25D101KJ	4.7						
VDR-25D121K	VDR-25D121KJ	4.8						
VDR-25D151K	VDR-25D151KJ	4.9						
VDR-25D181K	VDR-25D181KJ	5.2						
VDR-25D201K	VDR-25D201KJ	5.3						
VDR-25D221K	VDR-25D221KJ	5.8						
VDR-25D241K	VDR-25D241KJ	5.3						
VDR-25D271K	VDR-25D271KJ	5.4						
VDR-25D301K	VDR-25D301KJ	5.5						
VDR-25D331K	VDR-25D331KJ	5.7						
VDR-25D361K	VDR-25D361KJ	6.0						
VDR-25D391K	VDR-25D391KJ	6.2						
VDR-25D431K	VDR-25D431KJ	6.6						
VDR-25D471K	VDR-25D471KJ	6.7						
VDR-25D511K	VDR-25D511KJ	7.0						
VDR-25D561K	VDR-25D561KJ	7.4						
VDR-25D621K	VDR-25D621KJ	7.7						
VDR-25D681K	VDR-25D681KJ	7.8						
VDR-25D751K	VDR-25D751KJ	8.0						
VDR-25D781K	VDR-25D781KJ	8.2						
VDR-25D821K	VDR-25D821KJ	8.4						
VDR-25D911K	VDR-25D911KJ	9.0						
VDR-25D102K	VDR-25D102KJ	9.5						
VDR-25D112K	VDR-25D112KJ	10.1						
VDR-25D122K	VDR-25D122KJ	10.8						
VDR-25D142K	VDR-25D142KJ	12.6						
VDR-25D162K	VDR-25D162KJ	13.2						
VDR-25D182K	VDR-25D182KJ	14.5						



### ELECTRICAL CHARACTERISTIC

Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping 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	(J) Standard	(J) High Surge	(W)	@1KHzPF
25D180L	25D180LJ	11	14	18(15.0~21.6)	30	36	4500	8000	20	24	0.25	45000
25D220K	25D220KJ	14	18	22(19.5~26.0)	30	43	4500	8000	25	30	0.25	29000
25D270K	25D270KJ	17	22	27(24~31)	30	53	4500	8000	30	36	0.25	26500
25D330K	25D330KJ	20	26	33(29.5~36.5)	30	65	4500	8000	35	42	0.25	18000
25D390K	25D390KJ	25	31	39(35~43)	30	77	4500	8000	40	48	0.25	13500
25D470K	25D470KJ	30	38	47(42~52)	30	93	4500	8000	50	60	0.25	11500
25D560K	25D560KJ	35	45	56(50~62)	30	110	4500	8000	60	72	0.25	10500
25D680K	25D680KJ	40	56	68(61~75)	30	135	4500	8000	70	84	0.25	9050
25D820K	25D820KJ	50	65	82(74~90)	150	135	15000	20000	80	96	1.2	7700
25D101K	25D101KJ	60	85	100(90~110)	150	165	15000	20000	100	120	1.2	6300
25D121K	25D121KJ	75	100	120(108~132)	150	200	15000	20000	120	144	1.2	5200
25D151K	25D151KJ	95	125	150(135~165)	150	250	15000	20000	160	192	1.2	4300
25D181K	25D181KJ	115	150	180(162~198)	150	300	15000	20000	175	210	1.2	3500
25D201K	25D201KJ	130	170	200(185~225)	150	330	15000	20000	190	228	1.2	3200
20D221K	20D221KJ	140	180	220(198~242)	150	360	15000	20000	200	240	1.2	2900
25D241K	25D241KJ	150	200	240(216~264)	150	395	15000	20000	220	264	1.2	2650
25D271K	25D271KJ	175	225	270(243~297)	150	455	15000	20000	255	306	1.2	2400
25D301K	25D301KJ	190	250	300(270~330)	150	505	15000	20000	275	330	1.2	2100
25D331K	25D331KJ	210	275	330(297~363)	150	550	15000	20000	300	360	1.2	1900
25D361K	25D361KJ	230	300	360(324~396)	150	595	15000	20000	330	396	1.2	1750
25D391K	25D391KJ	250	320	390(351~429)	150	650	15000	20000	360	432	1.2	1600
25D431K	25D431KJ	275	350	430(387~473)	150	710	15000	20000	380	456	1.2	1500
25D471K	25D471KJ	300	385	470(423~517)	150	775	15000	20000	400	480	1.2	1400
25D511K	25D511KJ	320	415	510(459~561)	150	845	15000	20000	420	504	1.2	1250
25D561K	25D561KJ	350	460	560(504~616)	150	920	15000	20000	440	528	1.2	1150
25D621K	25D621KJ	385	505	620(558~682)	150	1025	15000	20000	450	540	1.2	1050
25D681K	25D681KJ	420	560	680(612~748)	150	1120	15000	20000	460	552	1.2	950
25D751K	25D751KJ	460	615	750(675~825)	150	1240	15000	20000	510	612	1.2	850
25D781K	25D781KJ	485	640	780(702~858)	150	1290	15000	20000	530	636	1.2	850
25D821K	25D821KJ	510	670	820(738~902)	150	1355	15000	20000	570	684	1.2	500
25D911K	25D911KJ	550	745	910(819~1001)	150	1500	15000	20000	620	744	1.2	700
25D102K	25D102KJ	625	825	1000(900~1100)	150	1650	15000	20000	685	822	1.2	650
25D112K	25D112KJ	680	895	1100(990~1210)	150	1815	15000	20000	720	864	1.2	600
25D122K	25D122KJ	750	990	1200(1080~1320)	150	1980	15000	20000	795	954	1.2	550
25D142K	25D142KJ	880	1140	1400(1260~1540)	150	2310	15000	20000	850	1020	1.2	500
25D162K	25D162KJ	1000	1280	1600(1400~1760)	150	2640	15000	20000	970	1164	1.2	450
25D182K	25D182KJ	1100	1465	1800(1620~1980)	150	2970	15000	20000	1092	1310	1.2	400

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

**25D201K To 25D911K does have UL certification**



## Reliability Test

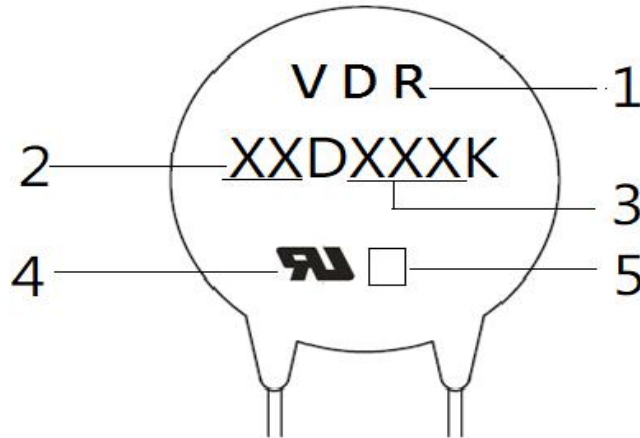
### Mechanical Ratings

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,Y and Z directions.			No visible damage $\Delta VB/VB\% \leq \pm 5\%$
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 $\Delta VB/VB\% \leq \pm 5\%$

### 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. temp : 125±2°C ; Period : 1000±24hours.			$\Delta VB/VB\% \leq \pm 10\%$	
High Temperature Storage	In a drying oven without load. 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. 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	No visible damage $\Delta VB/VB\% \leq \pm 10\%$
		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 $\Delta VB/VB\% \leq \pm 10\%$	
Voltage Proof	Voltage : 2500VAC Leakage Current ≤ 0.5mA Time : 60 Seconds			No Breakdown	

### MARKING CODE



- 1 SongLong Lishang Logo
- 2 Disk Size
- 3 Varistor Voltage
- 4 UL Accreditation Logo
- 5 “J” is High Surge Code ,not “ J ” is Standard

### Packaging specification / bulk packaging quantity

Unit:Pcs

Dimension	Part No.	Bag	Small Carton	Carton
25D	180L to 182K	100	600	1,200
25D (Short leg)	180L to 182K	100	800	1,600