
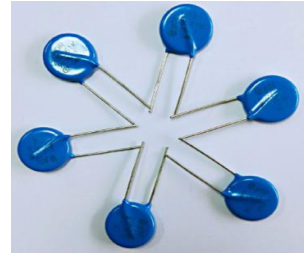




# METAL OXIDE VARISTOR – 14D SERIES

## 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 ISO9001-2018
- \* Safety number :  E317616 VDE-40028836 CQC-12001078540



## 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.



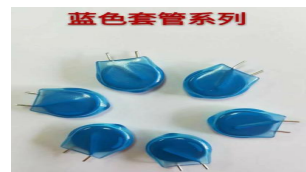
## General Characteristics Definition

- \* Operating Temperature: (-40 °C ~+85 °C ) & ( -40 °C ~+125 °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

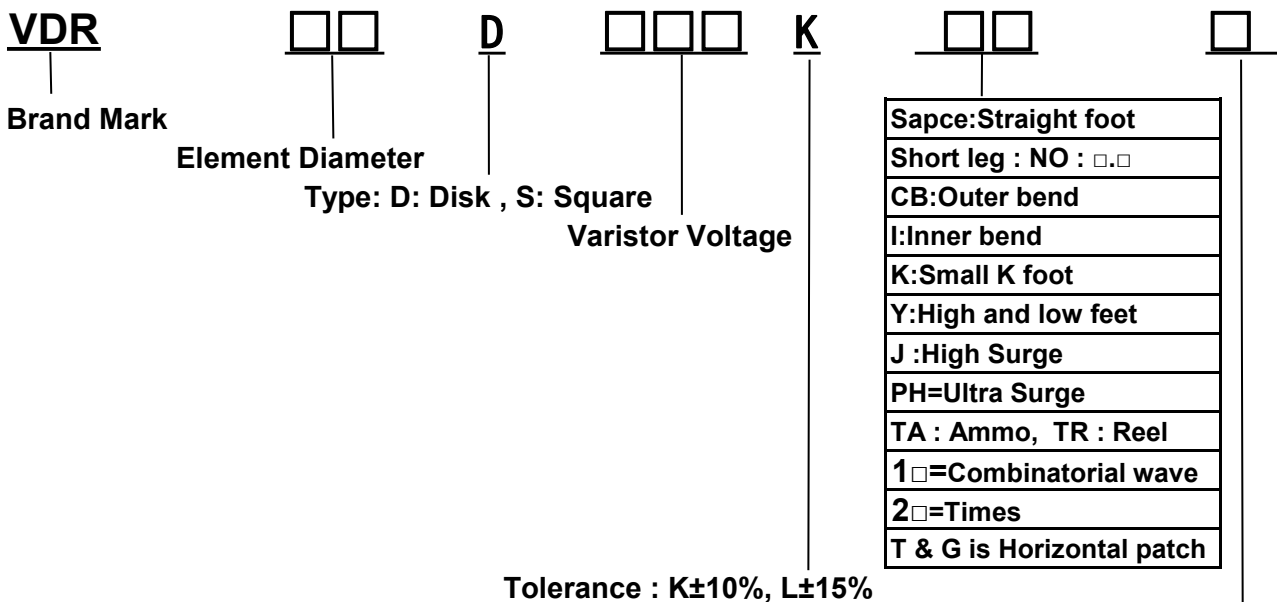


## Material

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



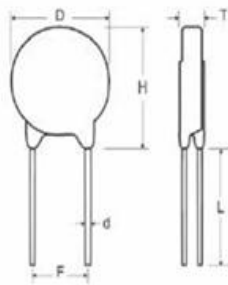
## Part Number Code



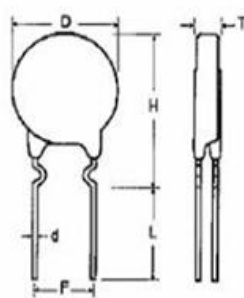
Sapce is 85°C
"H" is 125°C

**Dimensions**

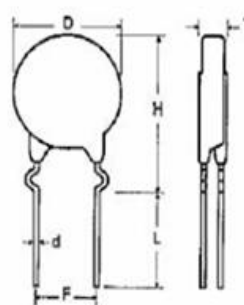
S Type(Straight Lead)



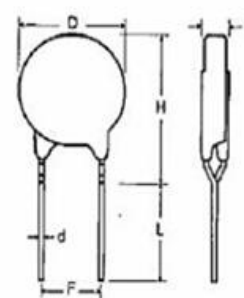
I Type(Inner Crimped Lead)



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-14D180L	VDR-14D180LJ	4.5	16.5	21.0	23.0	20.0	7.5	0.8
VDR-14D220K	VDR-14D220KJ	4.6						
VDR-14D270K	VDR-14D270KJ	4.7						
VDR-14D330K	VDR-14D330KJ	4.9						
VDR-14D390K	VDR-14D390KJ	4.8						
VDR-14D470K	VDR-14D470KJ	4.9						
VDR-14D560K	VDR-14D560KJ	5.0						
VDR-14D680K	VDR-14D680KJ	5.2						
VDR-14D820K	VDR-14D820KJ	4.1						
VDR-14D101K	VDR-14D101KJ	4.3						
VDR-14D121K	VDR-14D121KJ	4.4						
VDR-14D151K	VDR-14D151KJ	4.2						
VDR-14D181K	VDR-14D181KJ	4.3						
VDR-14D201K	VDR-14D201KJ	4.4						
VDR-14D221K	VDR-14D221KJ	4.5						
VDR-14D241K	VDR-14D241KJ	4.6						
VDR-14D271K	VDR-14D271KJ	4.7						
VDR-14D301K	VDR-14D301KJ	4.8						
VDR-14D331K	VDR-14D331KJ	5.0						
VDR-14D361K	VDR-14D361KJ	5.2						
VDR-14D391K	VDR-14D391KJ	5.2						
VDR-14D431K	VDR-14D431KJ	5.4						
VDR-14D471K	VDR-14D471KJ	5.9						
VDR-14D511K	VDR-14D511KJ	6.1						
VDR-14D561K	VDR-14D561KJ	6.4						
VDR-14D621K	VDR-14D621KJ	6.8						
VDR-14D681K	VDR-14D681KJ	7.1						
VDR-14D751K	VDR-14D751KJ	7.2						
VDR-14D781K	VDR-14D781KJ	7.3						
VDR-14D821K	VDR-14D821KJ	7.5						
VDR-14D911K	VDR-14D911KJ	7.6						
VDR-14D102K	VDR-14D102KJ	8.0						
VDR-14D112K	VDR-14D112KJ	8.5						
VDR-14D122K	VDR-14D122KJ	9.0						
VDR-14D142K	VDR-14D142KJ	10.5						
VDR-14D162K	VDR-14D162KJ	11.0						
VDR-14D182K	VDR-14D182KJ	12.0						



### 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	(A) High Surge	I(J) Standard	I(J) High Surge	(W)	@1KHzPF
14D180L	14D180LJ	11	14	18(15.3~20.7)	10	36	1000	2000	4	7	0.1	11000
14D220K	14D220KJ	14	18	22(19.8~24.2)	10	43	1000	2000	5	8	0.1	9100
14D270K	14D270KJ	17	22	27(24.3~29.7)	10	53	1000	2000	6	10	0.1	7400
14D330K	14D330KJ	20	26	33(29.7~36.3)	10	65	1000	2000	8	12	0.1	6100
14D390K	14D390KJ	25	31	39(35.1~42.9)	10	77	1000	2000	9	13	0.1	5100
14D470K	14D470KJ	30	38	47(42.3~51.7)	10	93	1000	2000	10	17	0.1	4300
14D560K	14D560KJ	35	45	56(50.4~61.6)	10	110	1000	2000	11	20	0.1	3600
14D680K	14D680KJ	40	56	68(61.2~74.8)	10	135	1000	2000	14	24	0.1	2900
14D820K	14D820KJ	50	65	82(73.8~90.2)	50	135	4500	6000	22	27	0.6	2400
14D101K	14D101KJ	60	85	100(90~110)	50	165	4500	6000	28	33	0.6	2000
14D121K	14D121KJ	75	100	120(108~132)	50	200	4500	6000	32	40	0.6	1700
14D151K	14D151KJ	95	125	150(135~165)	50	250	4500	6000	40	53	0.6	1300
14D181K	14D181KJ	115	150	180(162~198)	50	300	4500	6000	50	60	0.6	1100
14D201K	14D201KJ	130	170	200(185~225)	50	330	4500	6000	57	70	0.6	1000
14D221K	14D221KJ	140	180	220(198~242)	50	360	4500	6000	60	78	0.6	830
14D241K	14D241KJ	150	200	240(216~264)	50	395	4500	6000	63	84	0.6	740
14D271K	14D271KJ	175	225	270(243~297)	50	455	4500	6000	70	99	0.6	670
14D301K	14D301KJ	190	250	300(270~330)	50	505	4500	6000	77	108	0.6	610
14D331K	14D331KJ	210	275	330(297~363)	50	550	4500	6000	85	115	0.6	560
14D361K	14D361KJ	230	300	360(324~396)	50	595	4500	6000	93	130	0.6	510
14D391K	14D391KJ	250	320	390(351~429)	50	650	4500	6000	100	140	0.6	460
14D431K	14D431KJ	275	350	430(387~473)	50	710	4500	6000	115	155	0.6	430
14D471K	14D471KJ	300	385	470(423~517)	50	775	4500	6000	125	175	0.6	430
14D511K	14D511KJ	320	415	510(459~561)	50	845	4500	6000	126	180	0.6	390
14D561K	14D561KJ	350	460	560(504~616)	50	920	4500	6000	127	185	0.6	360
14D621K	14D621KJ	385	505	620(558~682)	50	1025	4500	6000	128	190	0.6	320
14D681K	14D681KJ	420	560	680(612~748)	50	1120	4500	6000	130	200	0.6	290
14D751K	14D751KJ	460	615	750(675~825)	50	1240	4500	6000	143	210	0.6	270
14D781K	14D781KJ	485	640	780(702~858)	50	1290	4500	6000	148	220	0.6	260
14D821K	14D821KJ	510	670	820(738~902)	50	1355	4500	6000	157	235	0.6	240
14D911K	14D911KJ	550	745	910(819~1001)	50	1500	4500	6000	175	255	0.6	220
14D102K	14D102KJ	625	825	1000(900~1100)	50	1650	4500	6000	190	280	0.6	200
14D112K	14D112KJ	680	895	1100(990~1210)	50	1815	4500	6000	213	310	0.6	180
14D122K	14D122KJ	750	990	1200(1080~1320)	50	1980	4500	6000	232	324	0.6	160
14D142K	14D142KJ	880	1140	1400(1260~1540)	50	2310	4500	6000	238	327	0.6	150
14D162K	14D162KJ	1000	1280	1600(1400~1760)	50	2640	4500	6000	243	331	0.6	140
14D182K	14D182KJ	1100	1465	1800(1620~1980)	50	2970	4500	6000	250	335	0.6	130

14D180L & 14D220K does not have VDE certification



## Reliability Test

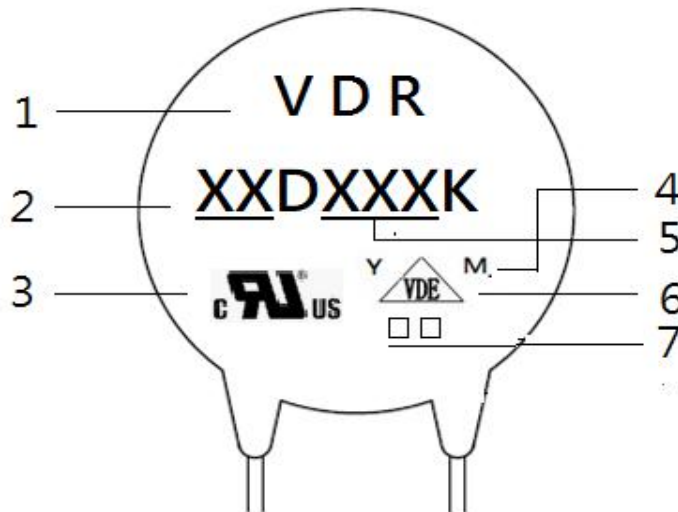
### Mechanical Ratings


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



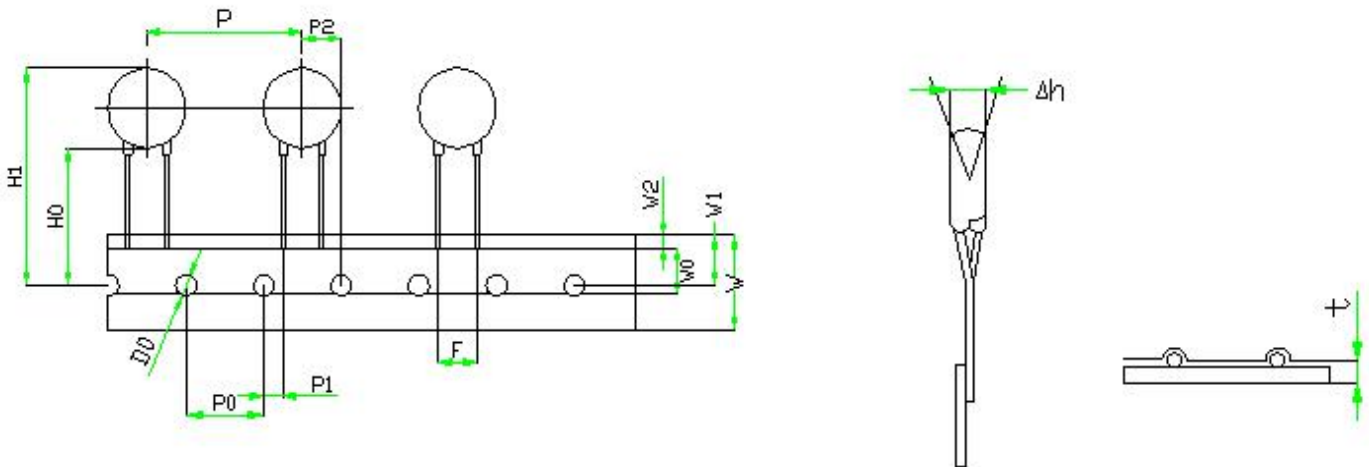
- 1 VDR
- 2 Disk Size
- 3  Accreditation Logo
- 4 “Y” & “M” Product Line Code
- 5 Varistor Voltage
- 6 VDE Accreditation Logo
- 7 “J” is High Surge Code,not “J” is Standard Surge  
“H” is High temperature range ,not “H” is Standard

### Packaging specification / bulk packaging quantity

Unit:Pcs

Dimension	Part No.	Bag	Small Carton	Carton
14D	180L to 112K	500	3,000	6,000
14D (Short leg)	180L to 112K	500	4,000	8,000

**Taping and Dimensions ( 14D )**

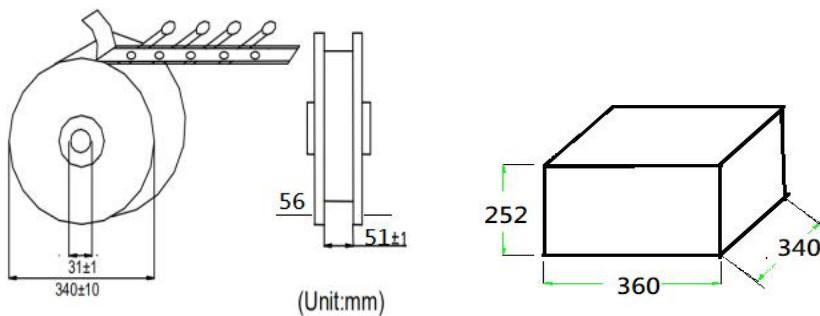


ITEM.	P	P0	P1	P2	F	Δh	W	W0	W1	W2	H1	H0	Do	t
ToL.	25.4	12.7	2.6	6.35	7.5	0	18	8	9	3	40	20	4	0.4
Nor.	±1.0	±0.3	±0.5	±1.3	±0.8	±0.5	±0.8	±1.0	±0.5	Max	Max	±1.0	±0.2	±0.3

(Unit:mm)

**Packaging**

■ **Reel Packing**

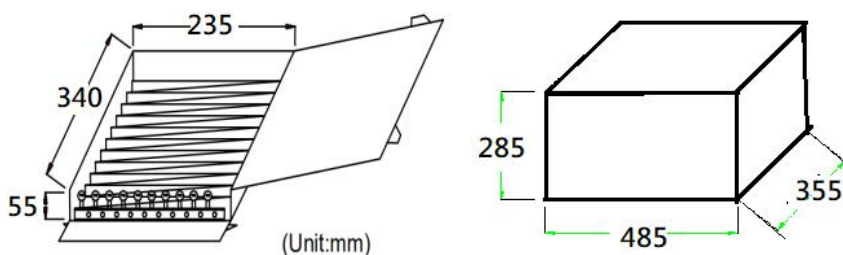


(Unit:mm)

Disc Size/mm	pcs/reel
Φ 05/07(180~391)	1500
Φ 05/07(431~821)	1000
Φ 10(180~391)	1000
Φ 10(431~911)	750
Φ 10(102~112)	500
Φ 14(180~391)	750
Φ 14(431~112)	500
Φ 20(180~681)	500
Φ 20(751~112)	250

**4 Reels/ Carton**

■ **Ammo Packing**



(Unit:mm)

Disc Size/mm	pcs/ box
Φ 05/07(180~821)	1000
Φ 10(181~361)	750
Φ 10(391~621)	400
Φ 10(681~112)	300
Φ 14(181~271)	500
Φ 14(301~112)	250

**10 Boxes/Carton**