



## Radial Lead Varistor (MOV)

### Description

The 10DEC Series radial leaded varistors provides an ideal circuit protection solution for lower DC voltage applications by offering higher surge ratings than ever before available in such small discs. The maximum peak surge current rating can reach up to 3.5KA (8/20  $\mu$ s pulse) to protect against high peak surges, including indirect lightning strike interference, system switching transients and abnormal fast transients from the power source.

### Features

- ◆ Wide operating voltages ranging from 50Vrms to 510Vrms(AC)
- ◆ Fast response time of less than 25ns, instantly clamping the transient over voltage.
- ◆ High surge current handling capability.
- ◆ High energy absorption capability.
- ◆ Low clamping voltages, providing better surge protection
- ◆ Low capacitance values, providing digital switching circuitry protection.
- ◆ High insulation resistance, preventing electric arching to the adjacent devices or circuits.

### Applicable

- ◆ 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.

### Part Numbering

**10 - D - XXX - K - X - X**  
( 1 ) ( 2 ) ( 3 ) ( 4 ) ( 5 ) ( 6 )

(1) Size(mm) : 05mm to 32mm

(2) Type : D: Disk, S: Square

(3) Varistor Voltage : 470( $47 \times 10^0=47V$ ) , 471(  $47 \times 10^1=470V$ )

(4) Tolerance : K $\pm$ 10%, L $\pm$ 15%, M $\pm$ 20%

(5) Surge Current Standard: E: 4KV/2KA

(6) C: 4KV /2KA sub 0 , 90 , 180 , 270 four phases, each phases of positive and negative 5 times Total



### Material

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

### General Characteristics Definition

- ◆ Operating Temperature: -40°C~ +85°C
- ◆ Storage Temperature: -40°C~ +125°C
- ◆ Working Surface Temperature: +115°C
- ◆ Insulation Resistance: > 100M $\Omega$
- ◆ Coating (Epoxy Resin): Flame-Retardant to UL 94V-0
- ◆ Approval Standard and File Number:  
VDE : 40046112  
CQC : 16001161421  
CSA&CUL : E489912

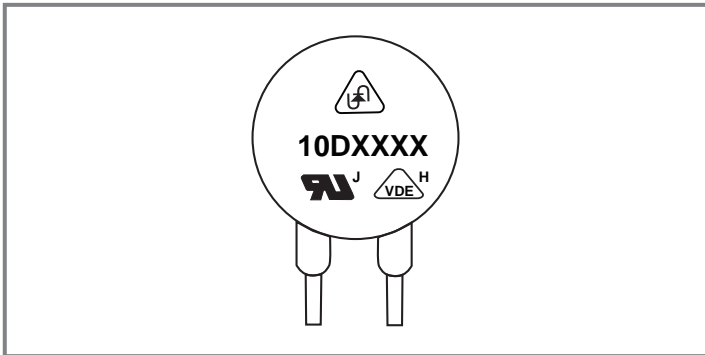
Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Part Number	Maximum Allowable Voltage		Varistor Voltage V1mA (V)	Withstanding Surge Current 8/20µS  1.2/50us & 8/20us combination of wave, 4KV / 2KA sub 0, 90, 180, 270 four phases, each phases of positive and negative 5 times Total	Max Clamping Voltage		Maximum Energy (10/1000µs)  (J) Standard	Rated Power  (W)
	VAC (V)	VDC (V)			Vc (V)	IP (A)		
10D820KEC	50	65	82(73.8-90.2)	40times	135	25	17	0.4
10D101KEC	60	85	100(90-110)	40times	165	25	18	0.4
10D121KEC	75	100	120(108-132)	40times	200	25	21	0.4
10D151KEC	95	125	150(135-165)	40times	250	25	25	0.4
10D181KEC	115	150	180(162-198)	40times	300	25	30	0.4
10D201KEC	130	170	200(185-225)	40times	340	25	35	0.4
10D221KEC	140	180	220(198-242)	40times	360	25	39	0.4
10D241KEC	150	200	240(216-264)	40times	395	25	42	0.4
10D271KEC	175	225	270(243-297)	40times	455	25	49	0.4
10D301KEC	190	250	300(270-330)	40times	505	25	54	0.4
10D331KEC	210	275	330(297-363)	40times	550	25	58	0.4
10D361KEC	230	300	360(324-396)	40times	595	25	65	0.4
10D391KEC	250	320	390(351-429)	40times	650	25	70	0.4
10D431KEC	275	350	430(387-473)	40times	710	25	80	0.4
10D471KEC	300	385	470(423-517)	40times	775	25	85	0.4
10D511KEC	320	415	510(459-561)	40times	845	25	90	0.4
10D561KEC	350	460	560(504-616)	40times	920	25	92	0.4
10D621KEC	385	505	620(558-682)	40times	1025	25	95	0.4
10D681KEC	420	560	680(612-748)	40times	1120	25	98	0.4
10D751KEC	460	615	750(675-825)	40times	1240	25	100	0.4
10D781KEC	485	640	780(702-858)	40times	1290	25	105	0.4
10D821KEC	510	670	820(738-902)	40times	1355	25	110	0.4

Approval Standard And File Number

Certified Model No.	 E489912	 VDE 40046112	 CQC 16001161421	CSA & CUL E489912
10D820KEC	YES	YES	YES	YES
10D101KEC	YES	YES	YES	YES
10D121KEC	YES	YES	YES	YES
10D151KEC	YES	YES	YES	YES
10D181KEC	YES	YES	YES	YES
10D201KEC	YES	YES	YES	YES
10D221KEC	YES	YES	YES	YES
10D241KEC	YES	YES	YES	YES
10D271KEC	YES	YES	YES	YES
10D301KEC	YES	YES	YES	YES
10D331KEC	YES	YES	YES	YES
10D361KEC	YES	YES	YES	YES
10D391KEC	YES	YES	YES	YES
10D431KEC	YES	YES	YES	YES
10D471KEC	YES	YES	YES	YES
10D511KEC	YES	YES	YES	YES
10D561KEC	YES	YES	YES	YES
10D621KEC	YES	YES	YES	YES
10D681KEC	YES	YES	YES	YES
10D751KEC	YES	YES	YES	YES
10D781KEC	YES	YES	YES	YES
10D821KEC	YES	YES	YES	YES

Part Marking



Marking	
Trademark	UN logo
Part No.	10DXXXXK
Standard for Safety	UL / VDE / CQC
EC	4KV/2KA 40times

Packaging Information

Unit:Pcs

Dimension	Part No.	Bag	Small Carton	Carton
10D	180L to 112K	500	5000	10000
10D (Short leg)	180L to 112K	500	7500	15000

Package Dimensions Unit: mm

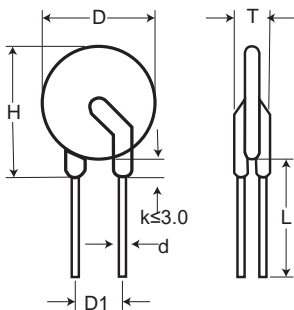


TABLE1	
Symbol	Dimension
H(max.)	16.5
L(min.)	20.0
D(max.)	12.5/14.5
D1(±0.8)	7.50
T(max.)	TABLE2
d(±0.05)	0.80

TABLE2			
Model	T(max.)	Model	T(max.)
820K	4.1	511K	6.2
101K	4.3	561K	6.5
121K	4.5	621K	7.1
151K	4.8	681K	7.6
181K	4.3	751K	8.0
201K	4.4	781K	8.1
221K	4.5	821K	8.3
241K	4.6		
271K	4.9		
301K	5.0		
331K	5.1		
361K	5.2		
391K	5.4		
431K	5.7		
471K	6.0		

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-solder ability	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 $\Delta VB/VB\% \leq \pm 5\%$	

Reliability Test (ENVIRONMENTAL RATINGS)

Test Parameter	Test Condition / Description			Performance Requirements	
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. Ambient 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 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.			$\Delta VB/VB\% \leq \pm 10\%$	
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. Vb and mechanical damage shall be examined.			No visible damage $\Delta VB/VB\% \leq \pm 10\%$	
Voltage Proof	Voltage: 2500VAC Leakage Current $\leq 0.5mA$ Time: 60 Seconds			No Breakdown	

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