

Metal Oxide Varistors (MOV) Datasheet

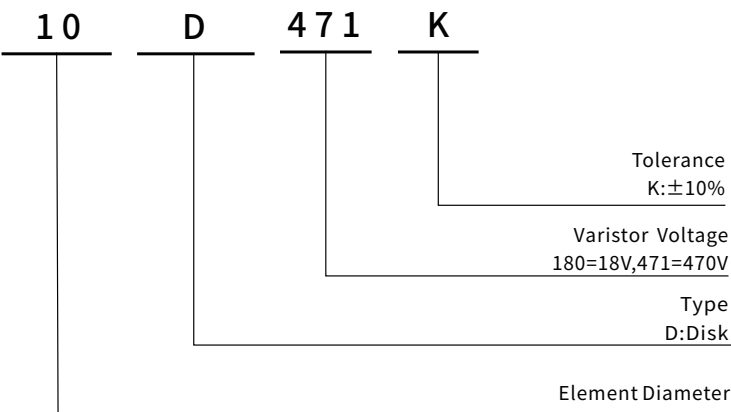
Features

- 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 following-on current.
- Coating (Epoxy Resin): Flame-Retardant to UL94 V-0
- Meets MSL level 1,per J-STD-020
- Operating Temperature: -40°C ~+105°C
- Storage Temperature: -40°C ~+125°C
- Safety Certification : UL/CUL , TÜV

Applications

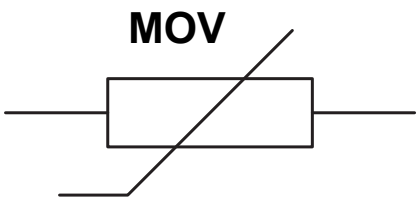
- Surge protection in electronic home appliances,gas and petroleum appliances
- Surge protection in industrial electronics
- Surge protection in consumer electronics
- Transistor,diode,IC,Thyristor or Triac semiconductor protection
- Relay and electromagnetic valve surge absorption

Part Number Code

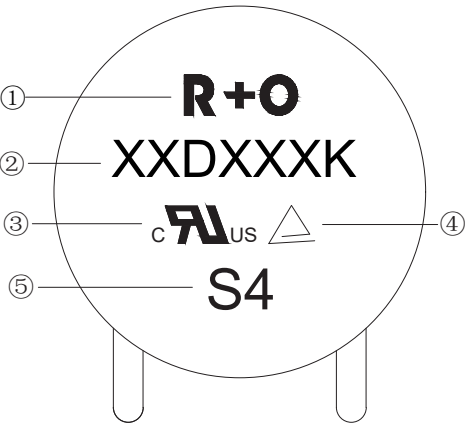


Varistors
Voltage
18V to 1100V

10D SERIES



Marking Code



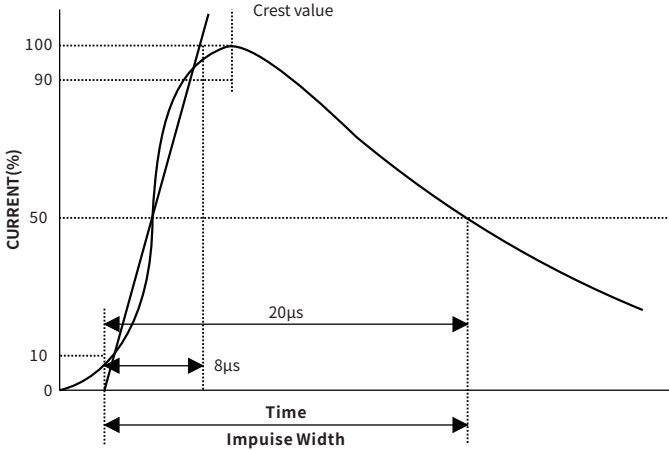
- ① HJC Logo
- ② Part Number
- ③ UL+CUL Safety Certification Mark
- ④ TÜV Safety Certification Mark
- ⑤ Date Code

● **Electrical Characteristics** (Ta=25°C Unless otherwise specified)

Part Number	Marking	Varistor Voltage	Max. Allowable Voltage		Max. Energy (10/1000μs)	Max. Clamping Voltage (8/20μs)		Withstanding Surge Current (8/20μs)	Rated Power	Typical Capacitance (Reference)
		V _{1mA} (V)	V _{AC} (V)	V _{DC} (V)	(J)	I _P (A)	V _C (V)	(A)	(W)	@1KHz(pF)
10D180K	10D180K	18(15~22)	11	14	2.8	5	38	500	0.05	7500
10D220K	10D220K	22(20~26)	14	18	3.5	5	43	500	0.05	6000
10D270K	10D270K	27(24.3~31.1)	17	22	4.2	5	53	500	0.05	4800
10D330K	10D330K	33(29.7~37.9)	20	26	5.2	5	65	500	0.05	4200
10D390K	10D390K	39(35.2~44.8)	25	31	6.2	5	77	500	0.05	3700
10D470K	10D470K	47(43~53)	30	38	7.4	5	93	500	0.05	3300
10D560K	10D560K	56(51~63)	35	45	8.8	5	110	500	0.05	2900
10D680K	10D680K	68(62~76)	40	56	11	5	135	500	0.05	2500
10D820K	10D820K	82(74~90)	50	65	13	25	135	2500	0.4	2100
10D101K	10D101K	100(90~110)	60	85	16	25	165	2500	0.4	1700
10D121K	10D121K	120(108~132)	75	100	19	25	200	2500	0.4	1500
10D151K	10D151K	150(135~165)	95	125	24	25	250	2500	0.4	1300
10D181K	10D181K	180(162~198)	115	150	28	25	300	2500	0.4	470
10D201K	10D201K	200(180~220)	130	170	32	25	340	2500	0.4	430
10D221K	10D221K	220(198~242)	140	180	35	25	360	2500	0.4	390
10D241K	10D241K	240(216~264)	150	200	38	25	395	2500	0.4	360
10D271K	10D271K	270(243~297)	175	225	43	25	455	2500	0.4	330
10D301K	10D301K	300(270~330)	195	250	47	25	505	2500	0.4	290
10D331K	10D331K	330(297~363)	210	275	52	25	550	2500	0.4	280
10D361K	10D361K	360(324~396)	230	300	57	25	595	2500	0.4	260
10D391K	10D391K	390(351~429)	250	320	61	25	650	2500	0.4	240
10D431K	10D431K	430(387~473)	275	350	68	25	710	2500	0.4	220
10D471K	10D471K	470(423~517)	300	385	74	25	775	2500	0.4	190
10D511K	10D511K	510(459~561)	320	418	74	25	845	2500	0.4	180
10D561K	10D561K	560(504~616)	350	460	74	25	920	2500	0.4	180
10D621K	10D621K	620(558~682)	385	505	74	25	1025	2500	0.4	160
10D681K	10D681K	680(612~748)	420	560	74	25	1120	2500	0.4	140
10D751K	10D751K	750(675~825)	460	615	75	25	1240	2500	0.4	130
10D781K	10D781K	780(702~858)	485	640	78	25	1290	2500	0.4	130
10D821K	10D821K	820(738~902)	510	670	85	25	1355	2500	0.4	130
10D911K	10D911K	910(819~1001)	550	745	93	25	1500	2500	0.4	120
10D102K	10D102K	1000(900~1100)	625	825	102	25	1650	2500	0.4	100
10D112K	10D112K	1100(990~1210)	680	895	115	25	1815	2500	0.4	90

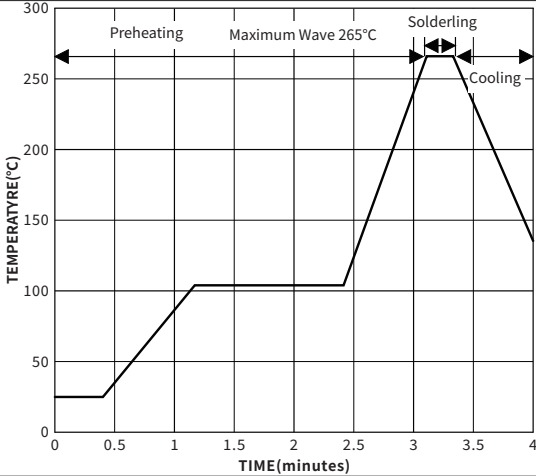
Note: Leakage Current @75%V_{1mA}: 180K~680K,IR ≤ 50μA ; 820K~112K,IR ≤ 25μA

Electrical Ratings

Items	Test Condition/Description	Requirement								
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.	To meet the specified value								
Maximum Allowable Voltage	The recommended maximum sine wave voltage(RMS)orthe Maximum DC voltage can be applied continuously.									
Maximum Clamping Voltage	The maximum voltage between two terminals with the specification standard impulse current. Applied waveform:8/20μs 									
Rated Wattage	The maximum average power that can be applied within the specified ambient temperature.									
Energy	The maximum energy within the varistor voltage change of ±10% when one impulse of 10/1000μs or 2ms is applied.									
Withstanding Surge Current	The maximum current within the varistor voltage change of ±10% with the standard impulse current(8/20μs)applied one time.									
Surge Life	The change of Vb shall be measured after the impulse listed below which is applied 10,000 times continuously with the interval of ten seconds at room temperature. <table><tr><td>Series</td><td>Varistor Voltage</td><td>Surge Current (8/20μs)</td></tr><tr><td rowspan="2">10D Series</td><td>180K to 680K</td><td>50A</td></tr><tr><td>820K to 112K</td><td>100A</td></tr></table>	Series	Varistor Voltage	Surge Current (8/20μs)	10D Series	180K to 680K	50A	820K to 112K	100A	$\frac{\Delta Vb}{Vb} \leq 10\%$
Series	Varistor Voltage	Surge Current (8/20μs)								
10D Series	180K to 680K	50A								
	820K to 112K	100A								

● Recommended Soldering Conditions

Wave Lead Free Soldering Recommendation



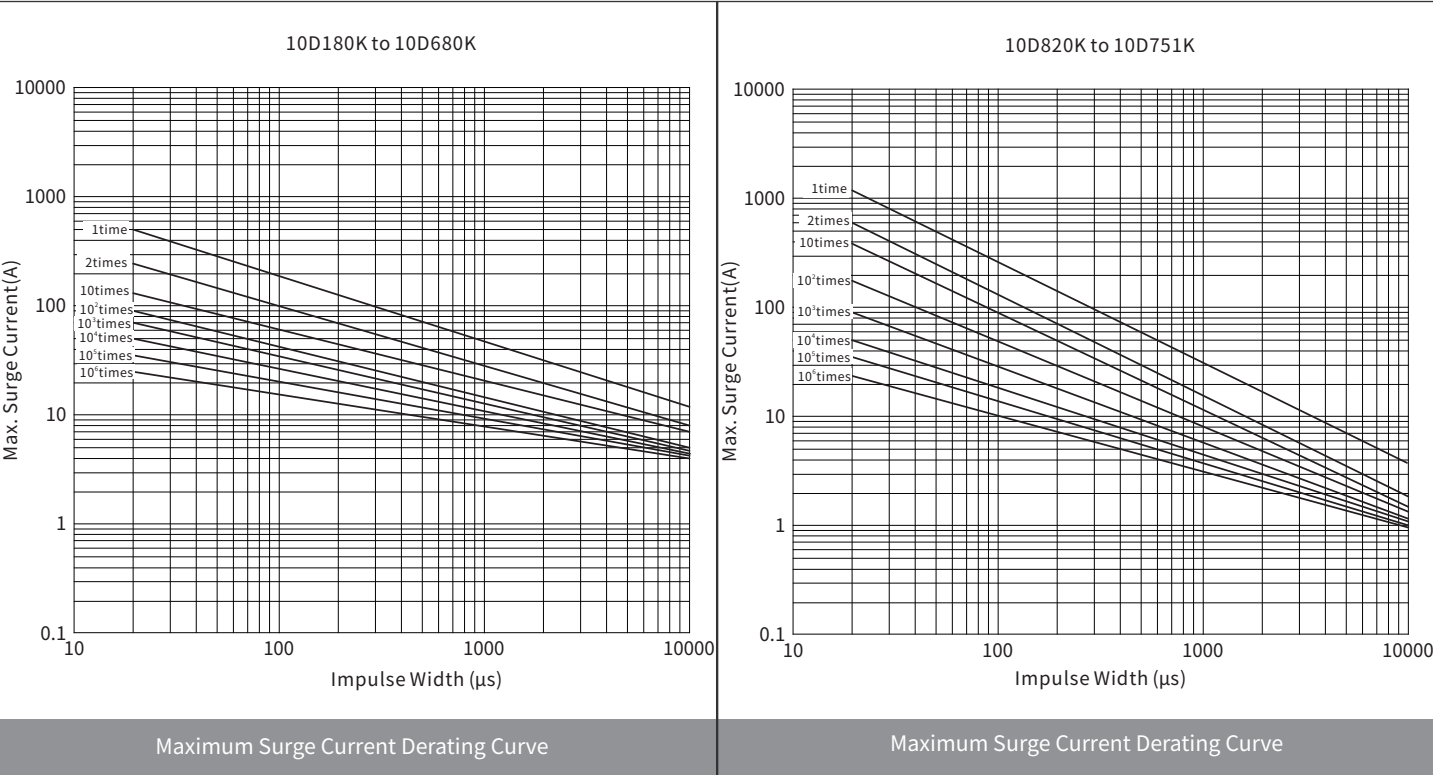
The graph shows the temperature profile for wave lead-free soldering. The y-axis is Temperature (°C) from 0 to 300, and the x-axis is Time (minutes) from 0 to 4. The profile includes a preheating phase (0-1 min), a maximum wave temperature of 265°C (1-2.5 min), a soldering phase (2.5-3.5 min), and a cooling phase (3.5-4 min).

Item	Conditions
Peak Temperature	265°C
Dipping Time	10 secs. Max
Soldering	1 time

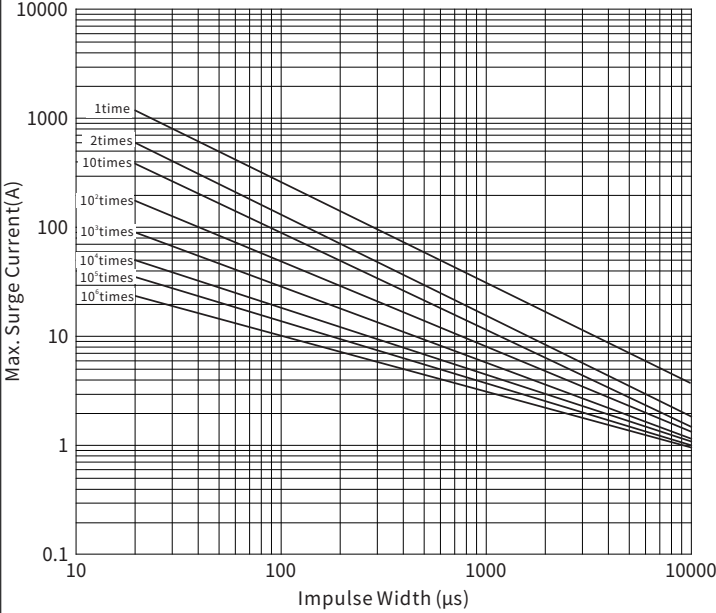
Recommendation Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C Max
Soldering Time	3 secs. Max
Distance from Varistor	2 mm Min

● Maximum Surge Current Derating Curve (Ta=25°C Unless otherwise specified)



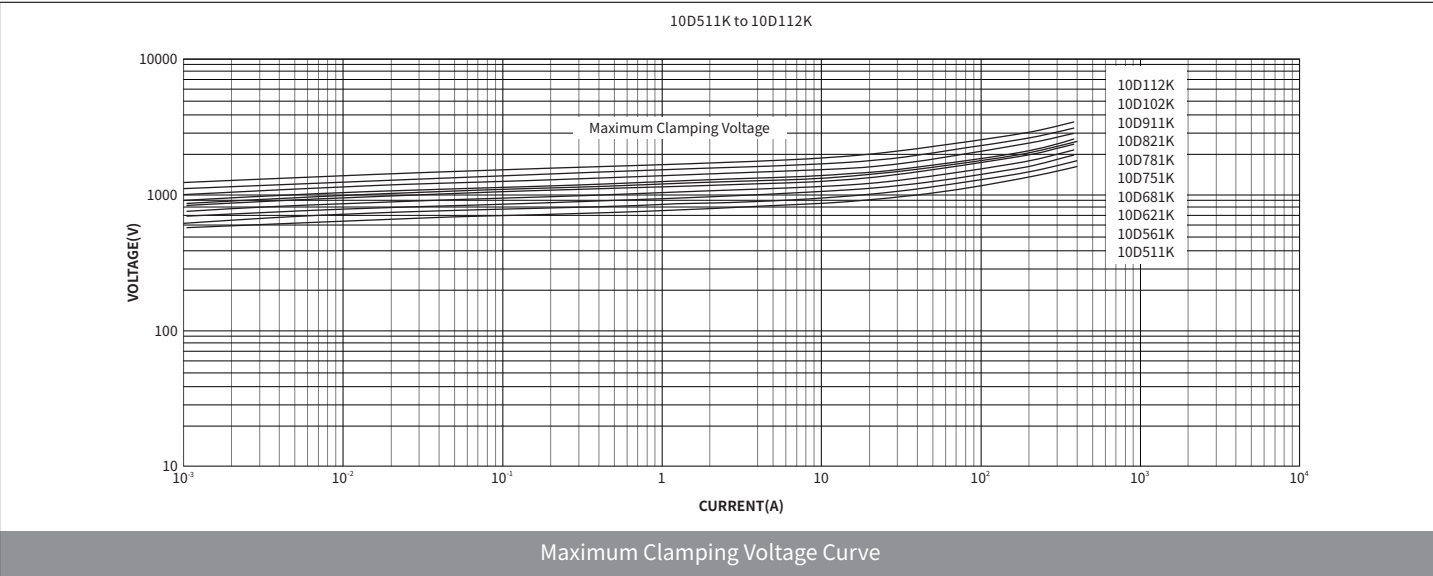
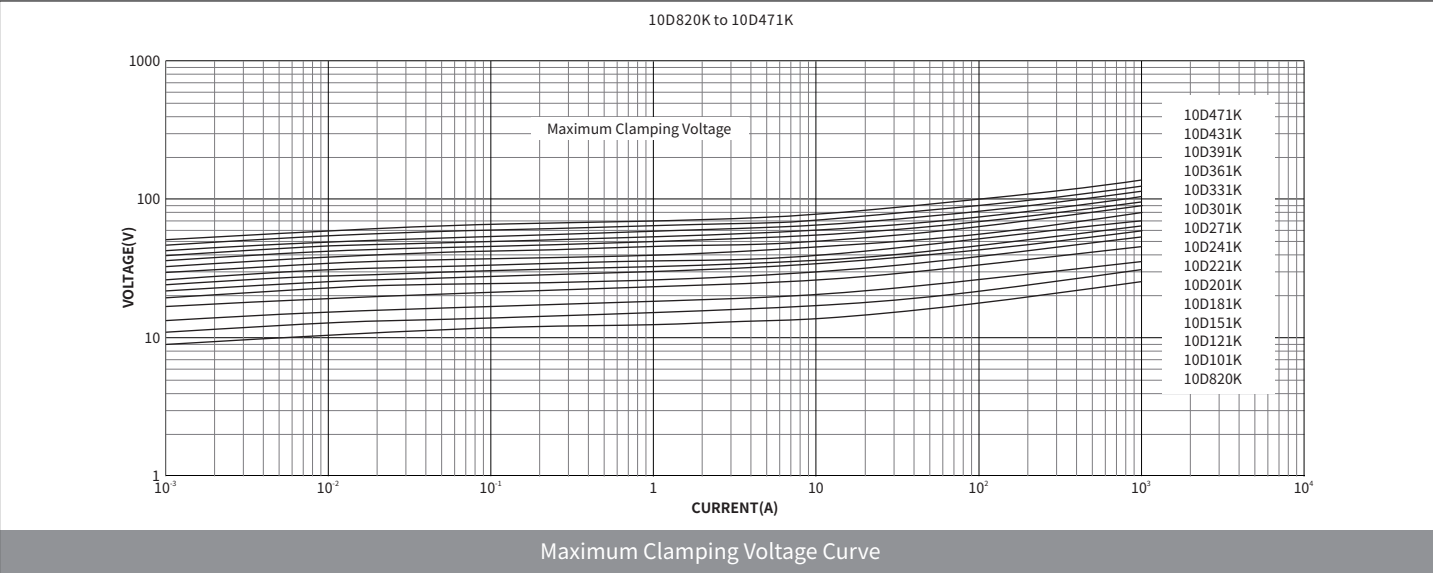
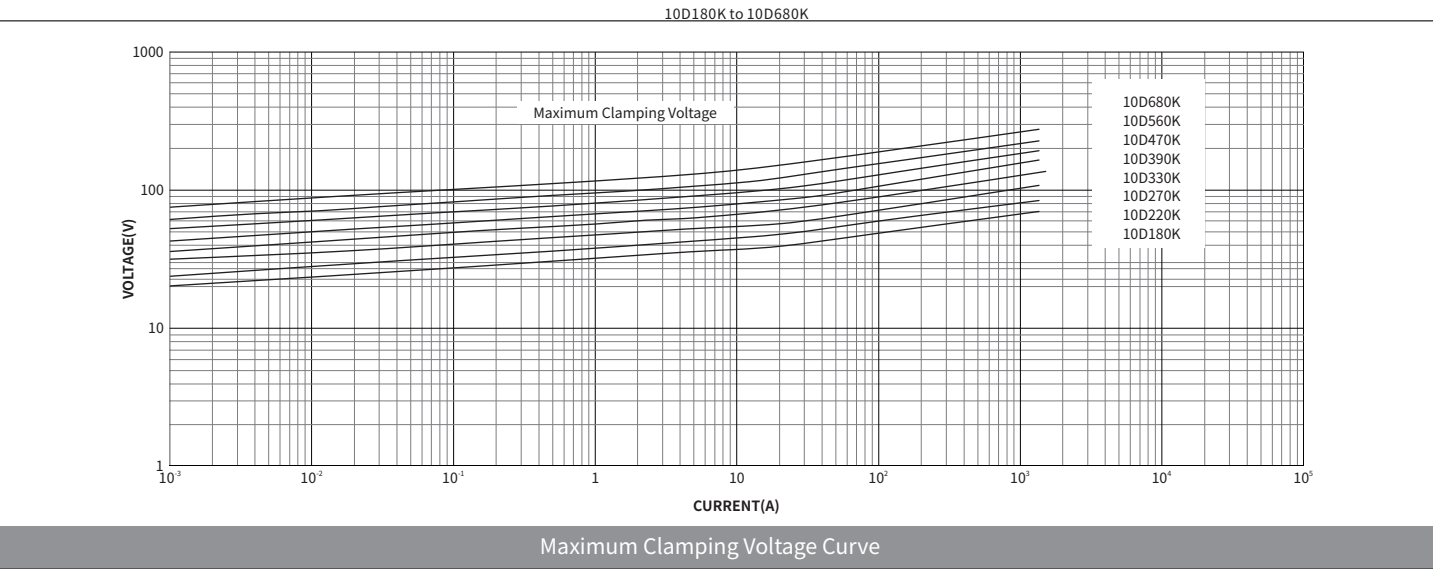
10D820K to 10D751K



This graph shows the maximum surge current derating curve for 10D820K to 10D751K. The y-axis is Max. Surge Current (A) on a log scale from 0.1 to 10000, and the x-axis is Impulse Width (μs) on a log scale from 10 to 10000. Multiple curves are shown for different pulse widths: 1time, 2times, 10times, 10^2times, 10^3times, 10^4times, 10^5times, 10^6times, 10^7times, 10^8times, 10^9times, and 10^10times.

Maximum Surge Current Derating Curve

● Maximum Clamping Voltage Curve (Ta=25°C Unless otherwise specified)



● Dimensions

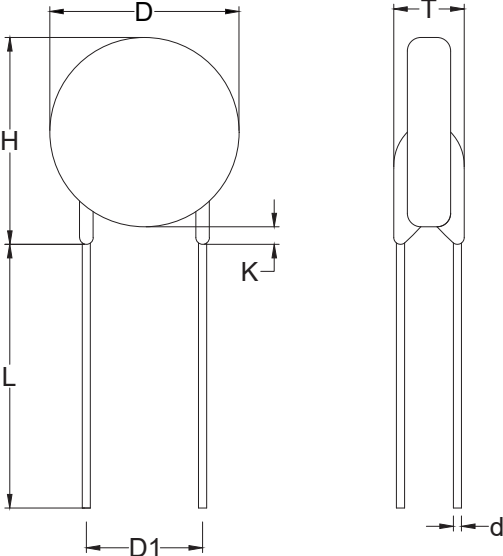
	TABLE 1				
	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	D	10.0	12.0	0.393	0.472
	H	10.5	15.0	0.413	0.591
	L	15.0	-	0.591	-
	K	-	2.5	-	0.099
	D1	6.5	8.5	0.260	0.335
	d	0.7	0.9	0.028	0.036
	T(max)	TABLE 2			

TABLE 2 T(max.)					
Voltage	Millimeters	Inches	Voltage	Millimeters	Inches
18V-39V	4.5	0.177	330V-390V	5.5	0.217
47V-68V	5.0	0.197	430V-560V	6.0	0.236
82V-150V	4.5	0.177	620V-780V	7.0	0.276
180V-270V	5.0	0.197	820V-1100V	8.2	0.323

● Ordering Information

SERIES	DELIVERY MODE	MPQ(PCS)
10D SERIES	Bulk	500