

Metal Oxide Varistors (MOV) Datasheet

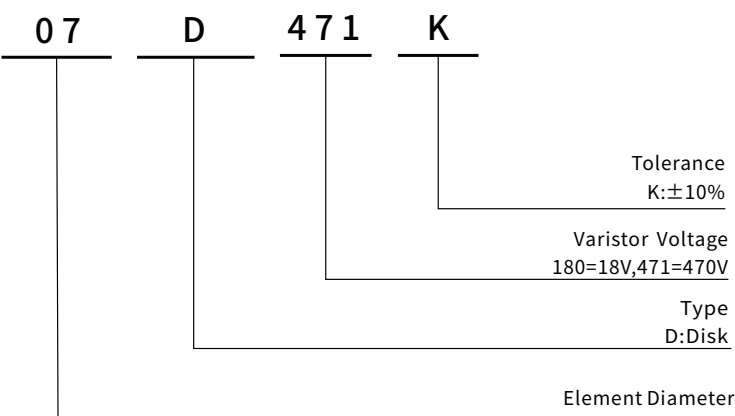
Features

- Wide operating voltage(V1mA)range from 18V to 820V
- 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

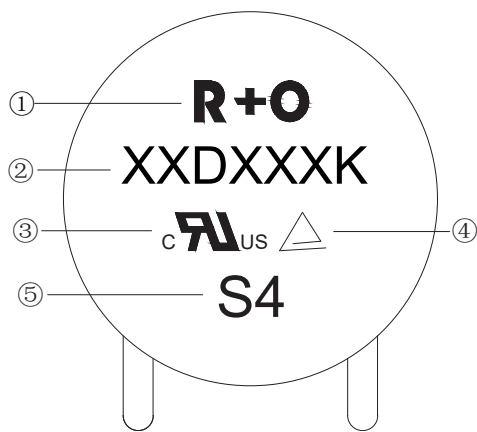
Applications

- 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



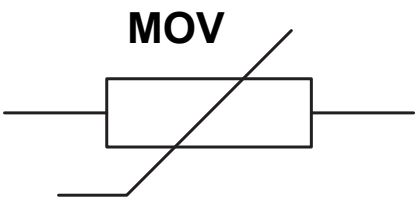
Marking Code



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

Varistors
Voltage
18V to 820V

07D SERIES

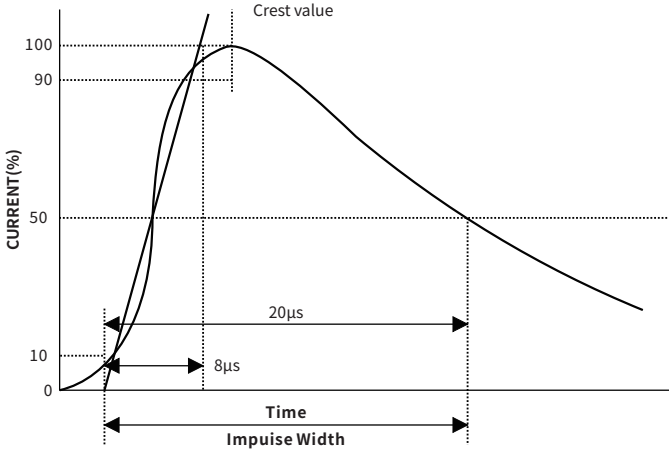


● **Electrical Characteristics** (Ta=25°C Unless otherwise specified)

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)
07D180K	07D180K	18(15~22)	11	14	1.3	2.5	38	250	0.02	3500
07D220K	07D220K	22(20~26)	14	18	1.7	2.5	43	250	0.02	2800
07D270K	07D270K	27(24.3~31.1)	17	22	2	2.5	53	250	0.02	2200
07D330K	07D330K	33(29.7~37.9)	20	26	2.4	2.5	65	250	0.02	1800
07D390K	07D390K	39(35.2~44.8)	25	31	2.8	2.5	77	250	0.02	1800
07D470K	07D470K	47(43~53)	30	38	3.5	2.5	93	250	0.02	1150
07D560K	07D560K	56(51~63)	35	45	4.1	2.5	110	250	0.02	1050
07D680K	07D680K	68(62~76)	40	56	5.0	2.5	135	250	0.02	970
07D820K	07D820K	82(74~90)	50	65	6.0	10	135	1200	0.25	930
07D101K	07D101K	100(90~110)	60	85	7.4	10	165	1200	0.25	860
07D121K	07D121K	120(108~132)	75	100	8.0	10	200	1200	0.25	670
07D151K	07D151K	150(135~165)	95	125	10	10	250	1200	0.25	490
07D181K	07D181K	180(162~198)	115	150	12	10	300	1200	0.25	330
07D201K	07D201K	200(180~220)	130	170	14	10	340	1200	0.25	240
07D221K	07D221K	220(198~242)	140	180	15	10	360	1200	0.25	190
07D241K	07D241K	240(216~264)	150	200	16	10	395	1200	0.25	165
07D271K	07D271K	270(243~297)	175	225	19	10	455	1200	0.25	150
07D301K	07D301K	300(270~330)	195	250	22	10	505	1200	0.25	135
07D331K	07D331K	330(297~363)	210	275	24	10	550	1200	0.25	130
07D361K	07D361K	360(324~396)	230	300	26	10	595	1200	0.25	125
07D391K	07D391K	390(351~429)	250	320	26	10	650	1200	0.25	105
07D431K	07D431K	430(387~473)	275	350	29	10	710	1200	0.25	100
07D471K	07D471K	470(423~517)	300	385	31	10	775	1200	0.25	90
07D511K	07D511K	510(459~561)	320	418	34	10	842	1200	0.25	80
07D561K	07D561K	560(504~616)	350	460	34	10	920	1200	0.25	75
07D621K	07D621K	620(558~682)	385	505	36.0	10	1025	1200	0.25	70
07D681K	07D681K	680(612~748)	420	560	36	10	1120	1200	0.25	65
07D751K	07D751K	750(675~825)	460	615	39	10	1240	1200	0.25	65
07D781K	07D781K	780(702~858)	485	640	41	10	1290	1200	0.25	60
07D821K	07D821K	820(738~902)	510	670	43	10	1355	1200	0.25	60

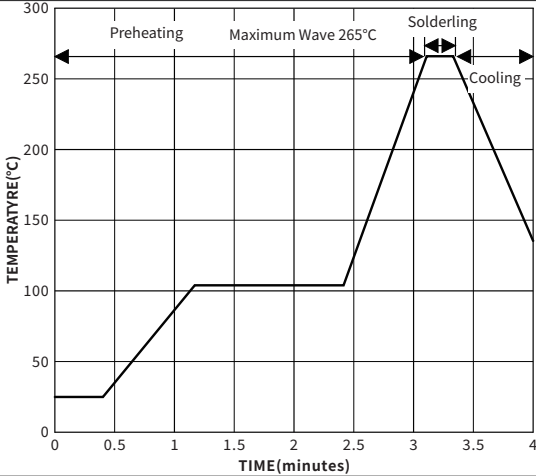
Note: Leakage Current @75%V_{1mA}: 180K~680K,IR ≤ 50μA ; 820K~821K,IR ≤ 25μA

● 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">07D Series</td><td>180K to 680K</td><td>15A</td></tr><tr><td>820K to 821K</td><td>50A</td></tr></table>	Series	Varistor Voltage	Surge Current (8/20μs)	07D Series	180K to 680K	15A	820K to 821K	50A	$\frac{\Delta Vb}{Vb} \leq 10\%$
Series	Varistor Voltage	Surge Current (8/20μs)								
07D Series	180K to 680K	15A								
	820K to 821K	50A								

● Recommended Soldering Conditions

Wave Lead Free Soldering Recommendation



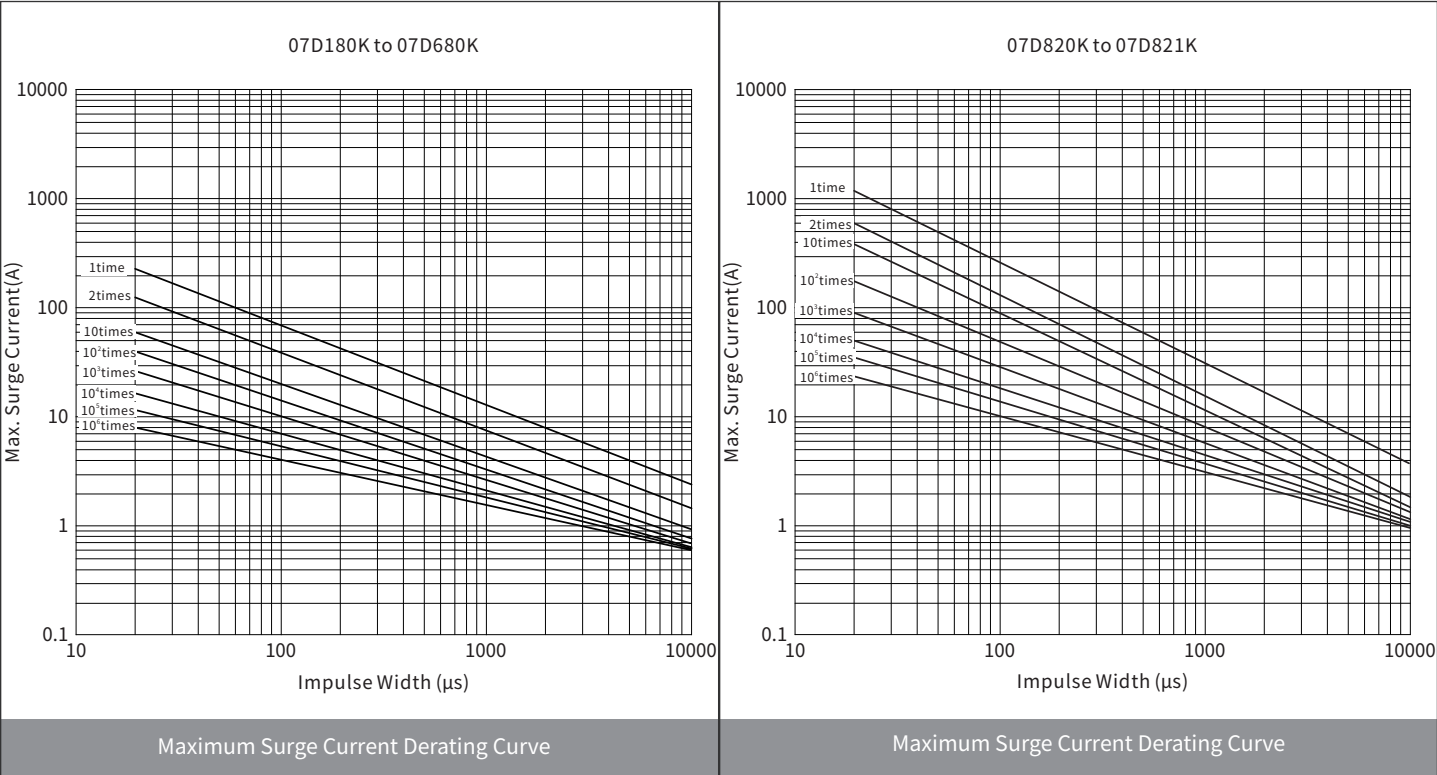
The graph shows the temperature profile for wave lead-free soldering. The y-axis is Temperature (°C) from 0 to 300, and the x-axis is Time (minutes) from 0 to 4. The profile includes a preheating phase (0-1 min), a dwell at 100°C (1-2.5 min), a heating phase to 265°C (2.5-3.2 min), a soldering dwell at 265°C (3.2-3.5 min), and a cooling phase (3.5-4 min).

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

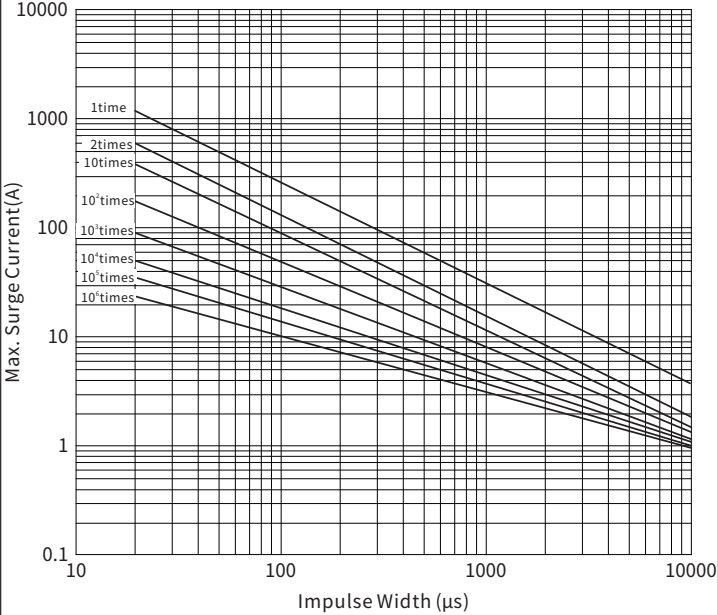
Recommendation Reworking Conditions with Soldering Iron

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)



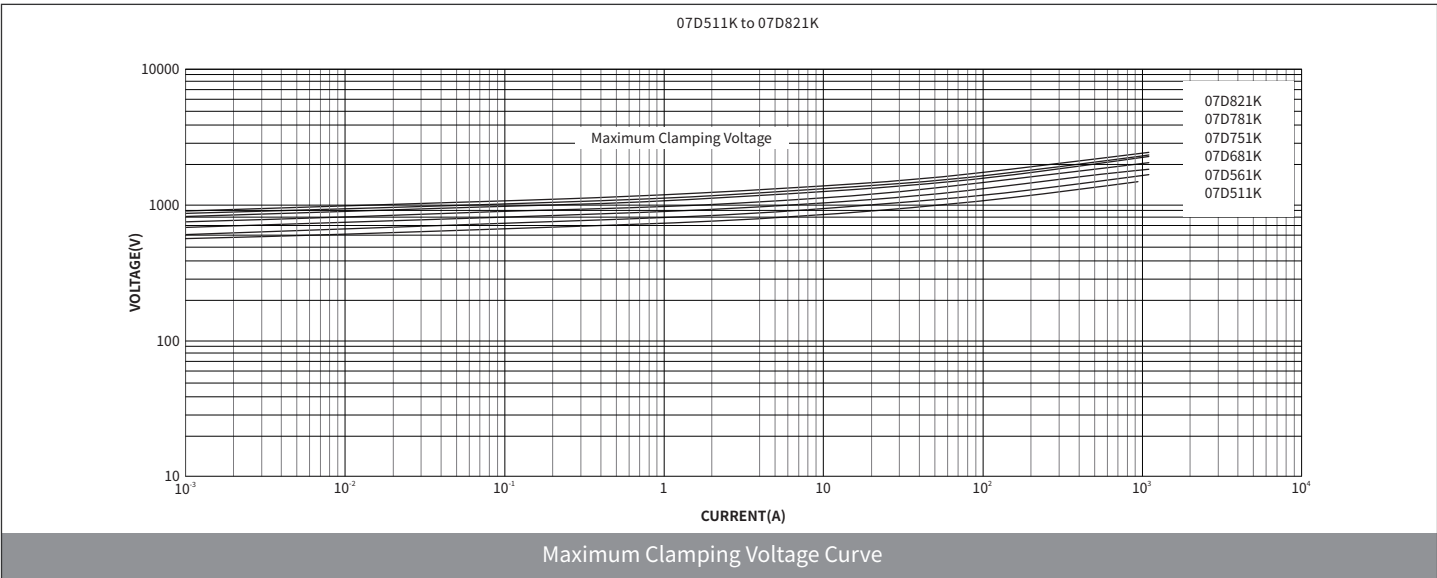
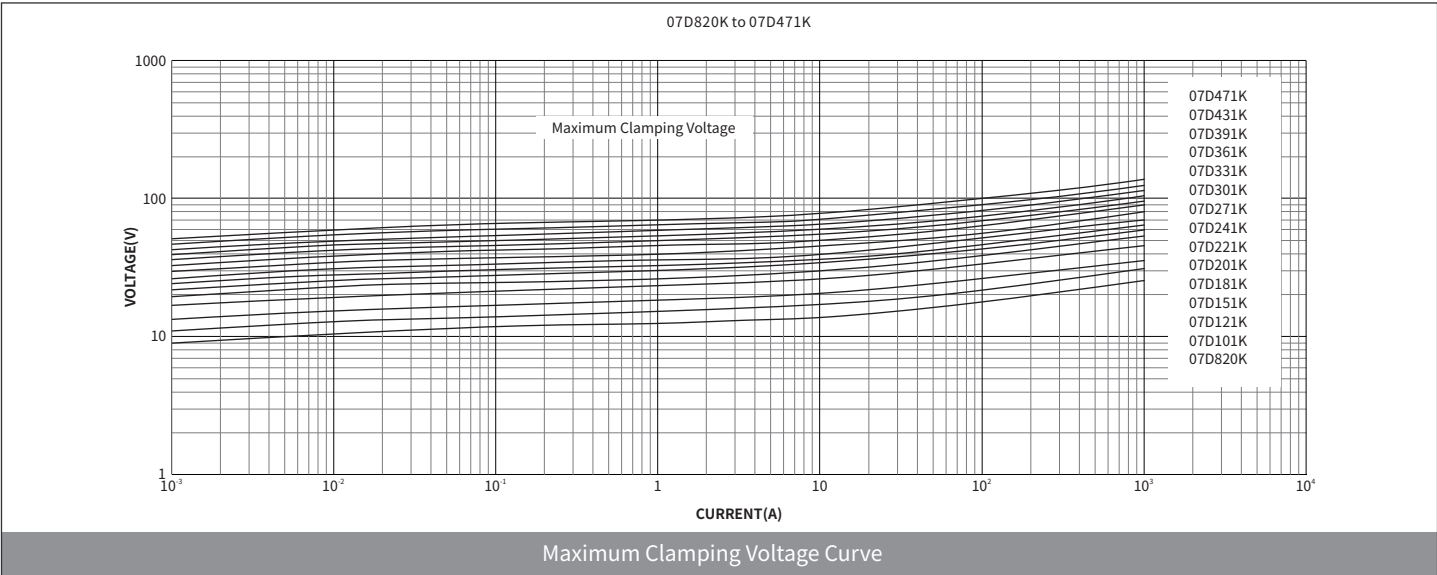
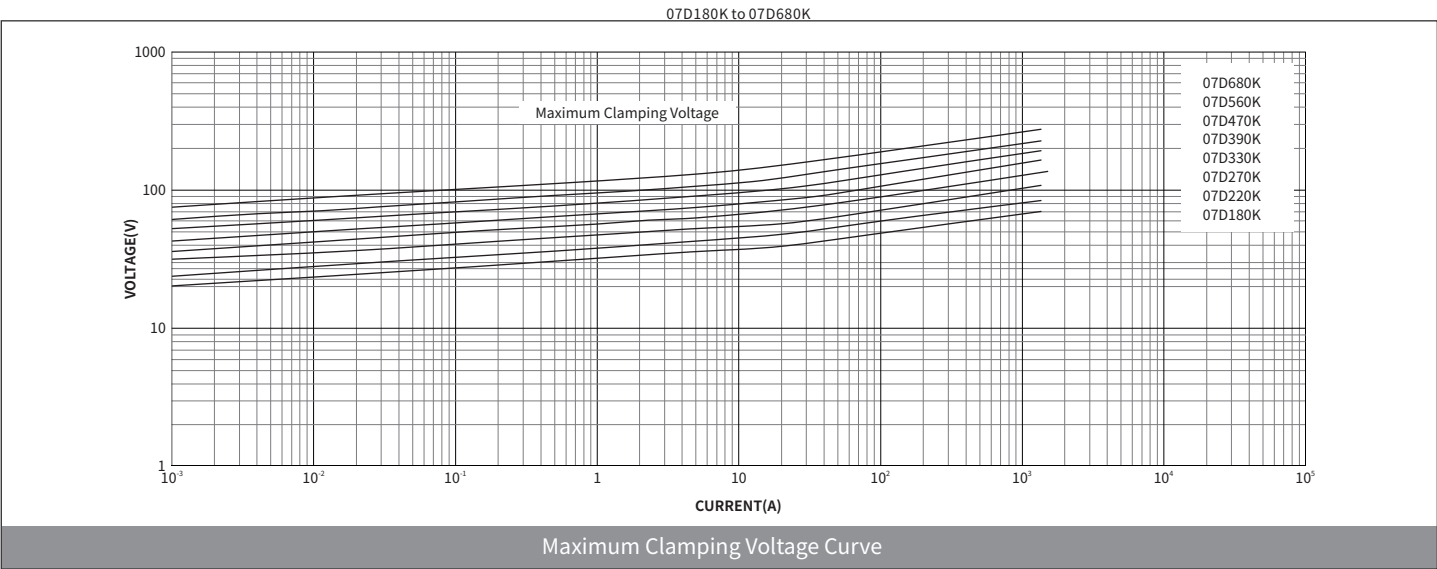
07D820K to 07D821K



This graph shows the maximum surge current derating for components 07D820K to 07D821K. The y-axis is Max. Surge Current (A) on a log scale from 0.1 to 10000. The x-axis is Impulse Width (μs) on a log scale from 10 to 10000. Multiple curves are shown for different numbers of times (1time, 2times, 10times, 10^2times, 10^3times, 10^4times, 10^5times, 10^6times, 10^7times, 10^8times, 10^9times, 10^10times).

Maximum Surge Current Derating Curve

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



● Dimensions

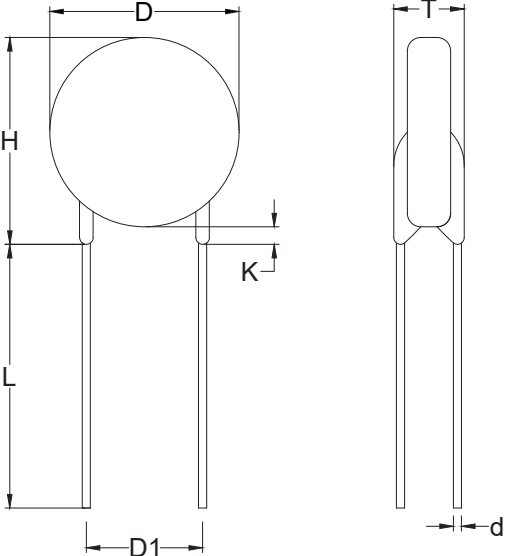
	TABLE 1				
	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	D	7.0	9.0	0.276	0.355
	H	7.5	12.0	0.296	0.473
	L	15.0	-	0.591	-
	K	-	2.5	-	0.099
	D1	4.0	6.0	0.158	0.237
	d	0.5	0.7	0.020	0.028
	T(max)	TABLE 2			

TABLE 2 T(max.)					
Voltage	Millimeters	Inches	Voltage	Millimeters	Inches
18V-39V	3.9	0.154	330V-390V	4.9	0.193
47V-68V	4.4	0.174	430V-560V	5.7	0.225
82V-150V	3.9	0.154	620V-780V	6.5	0.256
180V-270V	4.3	0.170	820V	6.8	0.268

● Ordering Information

SERIES	DELIVERY MODE	MPQ(PCS)
07D SERIES	Bulk	1,000