

**Features**

- I Wide operating voltage (V1mA) range from 18V to 1800V
- I Fast responding to transient over-voltage.
- I Large absorbing transient energy capability.
- I Low clamping ratio and no following-on current.



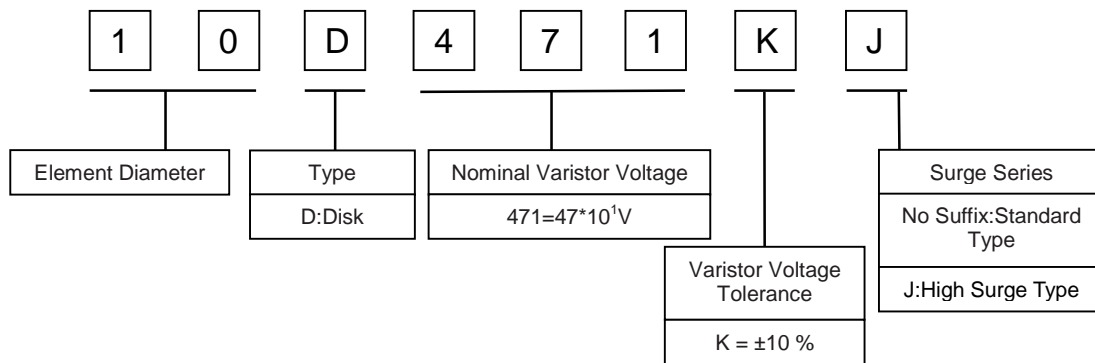
**General Information**

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

**General Characteristics**

- I Body: Nickel Plated
- I Devices with No Leads: Nickel Plated
- I Operating Temperature: -40°C to +85°C
- I Storage Temperature: -40 °C to +125°C
- I Axial Devices: Tin Plated

**Part Number Code**



**Electrical Characteristics**

Type Number		Varistor Voltage	Max. Allowable Voltage		Max. Energy (2ms)		Max. Clamping Voltage (8/20µs)		Withstanding Surge Current (8/20µs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V <sub>1mA</sub> (V)	V <sub>Ac</sub> (V)	V <sub>Dc</sub> (V)	(J) Standard	(J) High Surge	I <sub>p</sub> (A)	V <sub>c</sub> (V)	I(A) Standard	I(A) High Surge	(W)	@1KHz(pf)
10D180K	/	16~20	11	14	1.6	/	5	38	500	/	0.05	7500
10D220K	/	20~24	14	18	2.0	/	5	43	500	/	0.05	6000
10D270K	/	24~30	17	22	2.4	/	5	53	500	/	0.05	4800
10D330K	/	30~36	20	26	3.0	/	5	65	500	/	0.05	4200
10D390K	/	35~43	25	31	3.5	/	5	77	500	/	0.05	3700
10D470K	/	42~52	30	38	4.2	/	5	93	500	/	0.05	3300
10D560K	/	50~62	35	45	5.0	/	5	110	500	/	0.05	2900
10D680K	/	61~75	40	56	6.1	/	5	135	500	/	0.05	2500
10D820K	10D820KJ	74~90	50	65	7.4	9.2	25	135	2500	3500	0.4	2100
10D101K	10D101KJ	90~110	60	85	9.0	11.3	25	165	2500	3500	0.4	1700
10D121K	10D121KJ	108~132	75	100	10.8	13.5	25	200	2500	3500	0.4	1500
10D151K	10D151KJ	135~165	95	125	13.5	16.9	25	250	2500	3500	0.4	1300
10D181K	10D181KJ	162~198	115	150	16.2	20.3	25	300	2500	3500	0.4	470
10D201K	10D201KJ	180~220	130	170	18.0	22.5	25	340	2500	3500	0.4	430
10D221K	10D221KJ	198~242	140	180	19.8	24.8	25	360	2500	3500	0.4	390
10D241K	10D241KJ	216~264	150	200	21.6	27.0	25	395	2500	3500	0.4	360
10D271K	10D271KJ	243~297	175	225	24.3	30.4	25	455	2500	3500	0.4	330
10D301K	10D301KJ	270~330	195	250	27.0	33.8	25	505	2500	3500	0.4	290
10D331K	10D331KJ	297~363	210	275	29.7	37.1	25	550	2500	3500	0.4	280
10D361K	10D361KJ	324~396	230	300	32.4	40.5	25	595	2500	3500	0.4	260
10D391K	10D391KJ	351~429	250	320	35.1	43.9	25	650	2500	3500	0.4	240
10D431K	10D431KJ	387~473	275	350	38.7	48.4	25	710	2500	3500	0.4	220
10D471K	10D471KJ	423~517	300	385	42.3	52.9	25	775	2500	3500	0.4	190
10D511K	10D511KJ	459~561	320	418	42.3	52.9	25	845	2500	3500	0.4	180
10D561K	10D561KJ	504~616	350	460	42.3	52.9	25	920	2500	3500	0.4	180
10D621K	10D621KJ	558~682	385	505	42.3	52.9	25	1025	2500	3500	0.4	160
10D681K	10D681KJ	612~748	420	560	42.3	52.9	25	1120	2500	3500	0.4	140
10D751K	10D751KJ	675~825	460	615	42.3	52.9	25	1240	2500	3500	0.4	130
10D781K	10D781KJ	702~858	485	640	42.3	52.9	25	1290	2500	3500	0.4	130
10D821K	10D821KJ	738~902	510	670	44.3	55.4	25	1355	2500	3500	0.4	130
10D911K	10D911KJ	819~1001	550	745	49.1	61.4	25	1500	2500	3500	0.4	120
10D951K	10D951KJ	855~1045	580	780	51.3	64.1	25	1570	2500	3500	0.4	110
10D102K	10D102KJ	900~1100	625	825	54.0	67.5	25	1650	2500	3500	0.4	100
10D112K	10D112KJ	990~1210	680	895	59.4	74.3	25	1815	2500	3500	0.4	90
10D122K	10D122KJ	1080~1320	750	990	90.0	95.0	25	1980	2500	3500	0.4	85
10D152K	10D152KJ	1350~1650	900	1220	80.0	100.0	25	2475	2500	3500	0.4	80
10D182K	10D182KJ	1620~1980	1000	1465	97.2	121.5	25	2970	2500	3500	0.4	60

Note: The energy (10/1000µs) is about 1.4 times of energy(2ms)



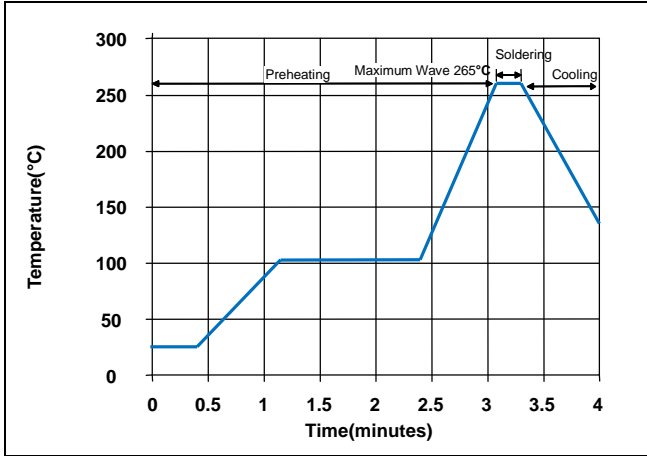
**Electrical Ratings**

Items	Test Condition/Description	Requirement					
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.						
Maximum Allowable Voltage	The recommended maximum sine wave voltage (RMS) or the Maximum DC voltage can be applied continuously.						
Maximum Clamping Voltage	<p>The maximum voltage between two terminals with the specification standard impulse current. Applied waveform: 8/20μs</p> <p style="text-align: center;"> <math>T1 = 1.25 \cdot T = 8\mu s \pm 20\%</math>  <math>T2 = 20\mu s \pm 20\%</math> </p>		To meet the Specified value				
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 $\pm 10\%$ when one impulse of 10/1000μs or 2ms is applied.						
Withstanding Surge Current	The maximum current within the varistor voltage change of $\pm 10\%$ with the standard impulse current (8/20μs) applied one time.						
Surge Life	<p>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.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="text-align: center;">10Φ series</td> <td style="text-align: center;">180K to 680K</td> <td style="text-align: center;">50A (8/20μs)</td> </tr> <tr> <td style="text-align: center;">820K to 112K</td> <td style="text-align: center;">100A (8/20μs)</td> </tr> </table>		10Φ series	180K to 680K	50A (8/20μs)	820K to 112K	100A (8/20μs)
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	820K to 112K	100A (8/20μs)					



**Soldering Recommendation**

**Wave Lead Free Soldering Recommendation**

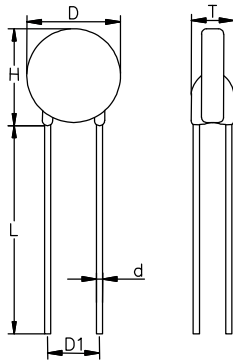


Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds (max.)
Soldering	1 time

**Recommendation Reworking Conditions with Soldering Iron**

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 seconds (max.)
Distance from Varistor	2mm (min.)

**Dimensions**



Symbol	Millimeters	Inches
H(max)	15.0	0.591
L(min)	15.0	0.591
D(max)	12.0	0.472
D1(±1.0)	7.5	0.295
T(max)	TABLE 2	
d(±0.1)	0.8	0.031

Packaging Quantity: 500pcs/bag

TABLE 2---T(max.)

Model	Millimeters	Inches	Model	Millimeters	Inches
180K~390K	6.5	0.256	431K~561K	9.0	0.354
470K~680K	7.0	0.276	621K~781K	9.5	0.374
820K~151K	7.5	0.295	821K~122K	10.0	0.394
181K~271K	8.0	0.315	152K	10.5	0.413
331K~391K	8.5	0.335	182K	11.0	0.433

