5D Series

METAL OXIDE VARISTORS

Features

- Wide operating voltage (V1mA) range from 18V to 750V
- Fast responding to transient over-voltage.
- Large absorbing transient energy capability.
- Low clamping ratio and no following-on current.

General Information

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

General Characteristics

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

Part Number Code

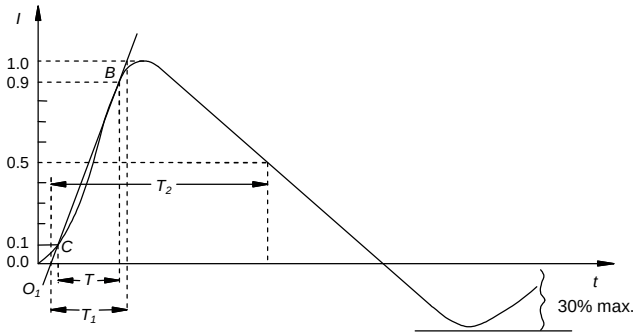
5	D	4	7	1	K
Element Diameter	Type	Nominal Varistor Voltage			Varistor Voltage Tolerance
	D:Disk	471=47*10^{1}V			K = ±10 %

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)
	V_{1mA}(V)	V_{AC}(V)	V_{DC}(V)	(J)	I_P(A)	V_C(V)	I(A)	(W)	@1KHz(pf)
5D180K	16~20	11	14	0.3	1	40	100	0.01	2400
5D220K	20~24	14	18	0.4	1	48	100	0.01	1800
5D270K	24~30	17	22	0.5	1	60	100	0.01	1500
5D330K	30~36	20	26	0.6	1	73	100	0.01	1200
5D390K	35~43	25	31	0.7	1	86	100	0.01	1000
5D470K	42~52	30	38	0.8	1	104	100	0.01	850
5D560K	50~62	35	45	1.0	1	123	100	0.01	700
5D680K	61~75	40	56	1.2	1	145	100	0.01	560
5D820K	74~90	50	65	1.5	5	150	400	0.1	480
5D101K	90~110	60	85	1.8	5	175	400	0.1	420
5D121K	108~132	75	100	2.2	5	210	400	0.1	360
5D151K	135~165	95	125	2.7	5	260	400	0.1	280
5D181K	162~198	115	150	3.2	5	320	400	0.1	200
5D201K	180~220	130	170	3.6	5	355	400	0.1	160
5D221K	198~242	140	180	4.0	5	380	400	0.1	110
5D241K	216~264	150	200	4.3	5	415	400	0.1	85
5D271K	243~297	175	225	4.9	5	475	400	0.1	75
5D301K	270~330	195	250	5.4	5	525	400	0.1	75
5D331K	297~363	210	275	5.9	5	575	400	0.1	75
5D361K	324~396	230	300	6.5	5	620	400	0.1	70
5D391K	351~429	250	320	7.0	5	675	400	0.1	70
5D431K	387~473	275	350	7.7	5	745	400	0.1	65
5D471K	423~517	300	385	8.5	5	810	400	0.1	55
5D511K	459~561	320	418	9.2	5	882	400	0.1	55
5D561K	504~616	350	460	10.1	5	968	400	0.1	50
5D621K	558~682	385	505	11.2	5	1072	400	0.1	45
5D681K	612~748	420	560	12.2	5	1176	400	0.1	40
5D751K	675~825	460	615	13.5	5	1300	400	0.1	35

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

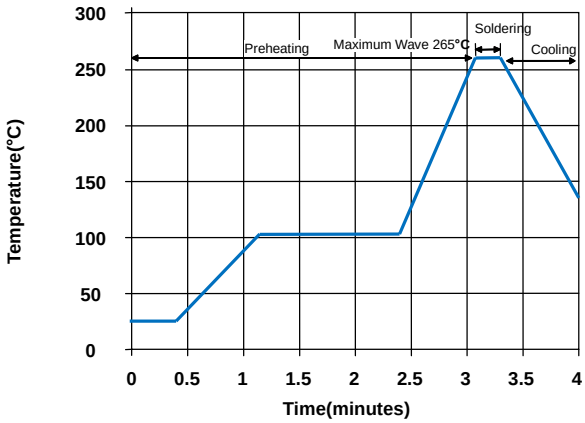
Electrical Ratings

<table>
<tr><th>Items</th><th>Test Condition/Description</th><th>Requirement</th></tr>
<tr><td>Varistor Voltage</td><td>The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.</td><td rowspan="6">To meet the Specified value</td></tr>
<tr><td>Maximum Allowable Voltage</td><td>The recommended maximum sine wave voltage (RMS) or the Maximum DC voltage can be applied continuously.</td></tr>
<tr><td>Maximum Clamping Voltage</td><td>The maximum voltage between two terminals with the specification standard impulse current.
Applied waveform: 8/20μs
 

T1=1.25*T=8μs±20%
T2=20μs±20%</td></tr>
<tr><td>Rated Wattage</td><td>The maximum average power that can be applied within the specified ambient temperature.</td></tr>
<tr><td>Energy</td><td>The maximum energy within the varistor voltage change of ±10% when one impulse of 10/1000μs or 2ms is applied.</td></tr>
<tr><td>Withstanding Surge Current</td><td>The maximum current within the varistor voltage change of ±10% with the standard impulse current (8/20μs) applied one time.</td></tr>
<tr><td>Surge Life</td><td>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 rowspan="2">5Φ series</td><td>180K to 680K</td><td>5A (8/20μs)</td></tr>
<tr><td>820K to 751K</td><td>20A (8/20μs)</td></tr>
</table></td><td>$\frac{\Delta Vb}{Vb} \leq \pm 10\%$</td></tr>
</table>

Soldering Recommendation

Wave Lead Free Soldering Recommendation



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

Recommendation Reworking Conditions with Soldering Iron

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

Dimensions

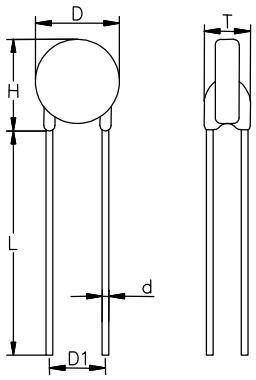


TABLE 1		
Symbol	**Millimeters**	**Inches**
H(max)	10.0	0.394
L(min.)	15.0	0.591
D(max)	7.0	0.276
D1(±1.0)	5.0	0.197
T(max.)	TABLE 2	
d(±0.1)	0.6	0.024
Packaging Quantity: 1000pcs/bag		

TABLE 2---T(max.)

Model	Millimeters	Inches	Model	Millimeters	Inches
180K~390K	4.0	0.157	331K~391K	6.0	0.236
470K~680K	4.5	0.177	431K~561K	6.5	0.256
820K~151K	5.0	0.197	621K~751K	7.0	0.276
181K~271K	5.5	0.217			