DATA SHEET

METAL OXIDE VARISTOR – 7Φ SERIES

FEATURE

- ✧ Wide operating voltage (V_{1mA}) range from 18V to 820V.
- ✧ Fast responding to transient over-voltage.
- ✧ Large absorbing transient energy capability.
- ✧ Low clamping ratio and no follow-on current.
- ✧ Meets MSL level 1, per J-STD-020

APPLICATION

- ✧ 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.

GENERAL CHARACTERISTICS DEFINITION

- ✧ Operating Temperature：-40℃ ~ +85℃
- ✧ Storage Temperature： -40℃ ~ +125℃

PART NUMBER CODE

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Element Diameter

Type
D: Disk
S: Square

Varistor Voltage

Tolerance
K: ±10%
L: ±15%
M: ±20%

PACKAGE DIMENSIONS

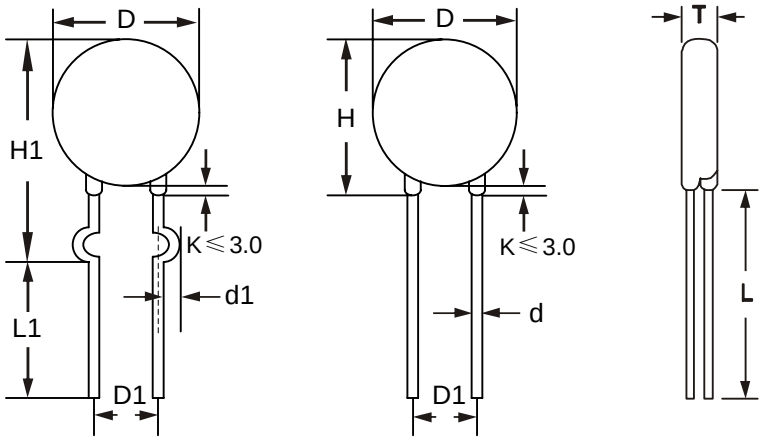


TABLE 1 unit:mm	
Symbol	Dimensions
H(max.)	12.0
H1(max.)	13.5
L(min.)	20.0
L1(min.)	15.0
D(max.)	9.0
D1(±0.8)	5.0
T(max.)	TABLE 2
d(±0.05)	0.6
d1(±0.4)	1.2

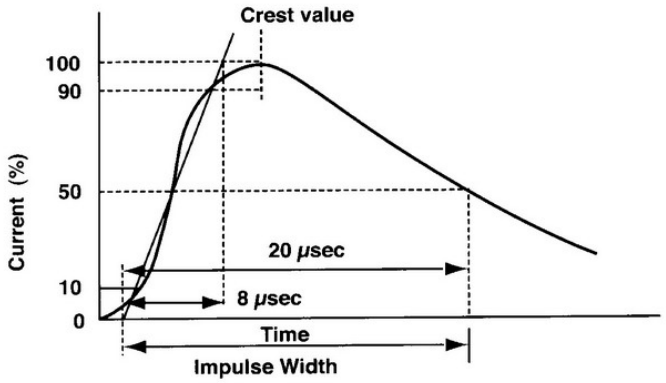
TABLE 2 unit:mm			
Model	T(Max.)	Model	T(Max.)
180K	4.50	241K	4.60
220K	4.60	271K	4.90
270K	4.70	301K	5.00
330K	4.90	331K	5.10
390K	4.80	361K	5.20
470K	4.90	391K	5.40
560K	5.00	431K	5.70
680K	5.20	471K	6.00
820K	4.10	511K	6.20
101K	4.30	561K	6.50
121K	4.50	621K	7.10
151K	4.80	681K	7.30
181K	4.30	751K	7.06
201K	4.40	781K	7.24
221K	4.50	821K	7.48

ELECTRICAL CHARACTERISTIC

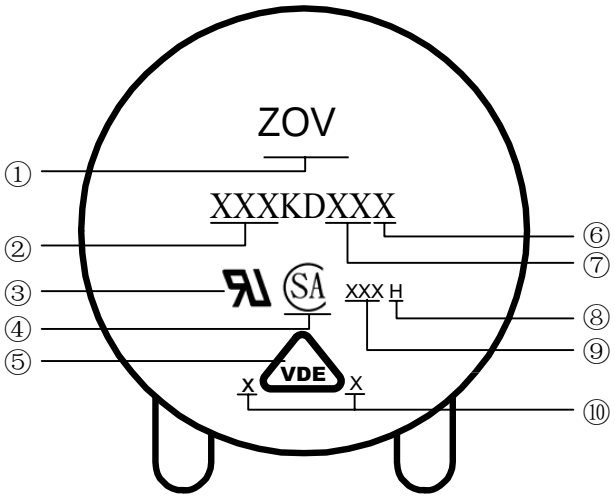
Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V_{AC}(V)	V_{DC}(V)	V_{1mA}(V)	I_P(A)	V_C(V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHZ(pf)
07D180K	07D180J	11	14	18(15~21.6)	2.5	36	250	500	0.9	2.0	0.02	2800
07D220K	07D220J	14	18	22(19.5~26)	2.5	43	250	500	1.1	2.4	0.02	2300
07D270K	07D270J	17	22	27(24~31)	2.5	53	250	500	1.4	3.0	0.02	1800
07D330K	07D330J	20	26	33(29.5~36.5)	2.5	65	250	500	1.7	3.5	0.02	1500
07D390K	07D390J	25	31	39(35~43)	2.5	77	250	500	2.1	4.0	0.02	1300
07D470K	07D470J	30	38	47(42~52)	2.5	93	250	500	2.5	5.0	0.02	1100
07D560K	07D560J	35	45	56(50~62)	2.5	110	250	500	3.1	6.0	0.02	890
07D680K	07D680J	40	56	68(61~75)	2.5	135	250	500	3.6	7.0	0.02	740
07D820K	07D820J	50	65	82(74~90)	10	135	1200	1750	5.5	10.0	0.25	600
07D101K	07D101J	60	85	100(90~110)	10	165	1200	1750	6.5	12.0	0.25	500
07D121K	07D121J	75	100	120(108~132)	10	200	1200	1750	7.8	13.0	0.25	420
07D151K	07D151J	95	125	150(135~165)	10	250	1200	1750	9.7	13.0	0.25	330
07D181K	07D181J	115	150	180(162~198)	10	300	1200	1750	11.7	16.0	0.25	280
07D201K	07D201J	130	170	200(180~220)	10	340	1200	1750	13.0	17.0	0.25	250
07D221K	07D221J	140	180	220(198~242)	10	360	1200	1750	14.0	19.0	0.25	230
07D241K	07D241J	150	200	240(216~264)	10	395	1200	1750	15.0	21.0	0.25	210
07D271K	07D271J	175	225	270(243~297)	10	455	1200	1750	18.0	24.0	0.25	185
07D301K	07D301J	190	250	300(270~330)	10	500	1200	1750	20.0	26.0	0.25	165
07D331K	07D331J	210	275	330(297~363)	10	550	1200	1750	23.0	28.0	0.25	150
07D361K	07D361J	230	300	360(324~396)	10	595	1200	1750	25.0	32.0	0.25	140
07D391K	07D391J	250	320	390(351~429)	10	650	1200	1750	25.0	35.0	0.25	130
07D431K	07D431J	275	350	430(387~473)	10	710	1200	1750	28.0	40.0	0.25	115
07D471K	07D471J	300	385	470(423~517)	10	775	1200	1750	30.0	42.0	0.25	105
07D511K	07D511J	320	415	510(459~561)	10	845	1200	1750	30.0	45.0	0.25	100
07D561K	07D561J	350	460	560(504~616)	10	925	1200	1750	30.0	49.0	0.25	90
07D621K	07D621J	385	505	620(558~682)	10	1025	1200	1750	33.0	55.0	0.25	80
07D681K	07D681J	420	560	680(612~748)	10	1120	1200	1750	33.0	60.0	0.25	75
07D751K	07D751J	460	615	750(675~825)	10	1240	1200	1750	67.2	65.0	0.25	70
07D781K	07D781J	485	640	780(702~858)	10	1290	1200	1750	67.2	65.0	0.25	70
07D821K	07D821J	510	670	820(738~902)	10	1355	1200	1750	67.2	70.0	0.25	60

The tolerance of varistor voltage between 18V and 27V is more than 10%.

ELECTRICAL RATINGS

<table>
<tr><th>Item</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 call 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: 8/20μsec.
 
</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 10/1000μsec. or 2 msec. 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 (8/20μsec.) applied one time.</td></tr>
<tr><td>Varistor Voltage Temp. Coefficient</td><td>$\frac{\text{Vb at 20℃ - Vb at 70℃}}{\text{Vb at 20℃}} \times \frac{1}{50} \times 100\ (\%/℃)$</td><td>0.05% / ℃max</td></tr>
<tr><td>Surge Life</td><td>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.
<table>
<tr><td rowspan="2">5Φ series</td><td>180K to 680K</td><td>10A (8/20μsec.)</td></tr>
<tr><td>820K to 751K</td><td>20A (8/20μsec.)</td></tr>
<tr><td rowspan="2">7Φ series</td><td>180K to 680K</td><td>25A (8/20μsec.)</td></tr>
<tr><td>820K to 821K</td><td>50A (8/20μsec.)</td></tr>
<tr><td rowspan="2">10Φ series</td><td>180K to 680K</td><td>50A (8/20μsec.)</td></tr>
<tr><td>820K to 112K</td><td>100A (8/20μsec.)</td></tr>
<tr><td rowspan="2">14Φ series</td><td>180K to 680K</td><td>75A (8/20μsec.)</td></tr>
<tr><td>820K to 182K</td><td>150A (8/20μsec.)</td></tr>
<tr><td rowspan="2">20Φ series</td><td>180K to 680K</td><td>100A (8/20μsec.)</td></tr>
<tr><td>820K to 182K</td><td>200A (8/20μsec.)</td></tr>
</table></td><td>$\frac{\Delta Vb}{Vb} \le \pm 10\%$</td></tr>
</table>

MARKING CODE



① ZOV Logo
② Varistor Voltage
③ UL Accreditation Logo
④ CSA Accreditation Logo
⑤ VDE Accreditation Logo
⑥ “J”is High Surge Code,not “J”is Standard Surge
⑦ Disk Size
⑧ “H”is Halogen Free Code,not “H”is Halogen
⑨ Date Code
⑩ Product Line Code