

DATA SHEET

METAL OXIDE VARISTOR – 10Φ SERIES

FEATURE

- ✧ Wide operating voltage (V_{1mA}) range from 18V to 1100V.
- ✧ 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



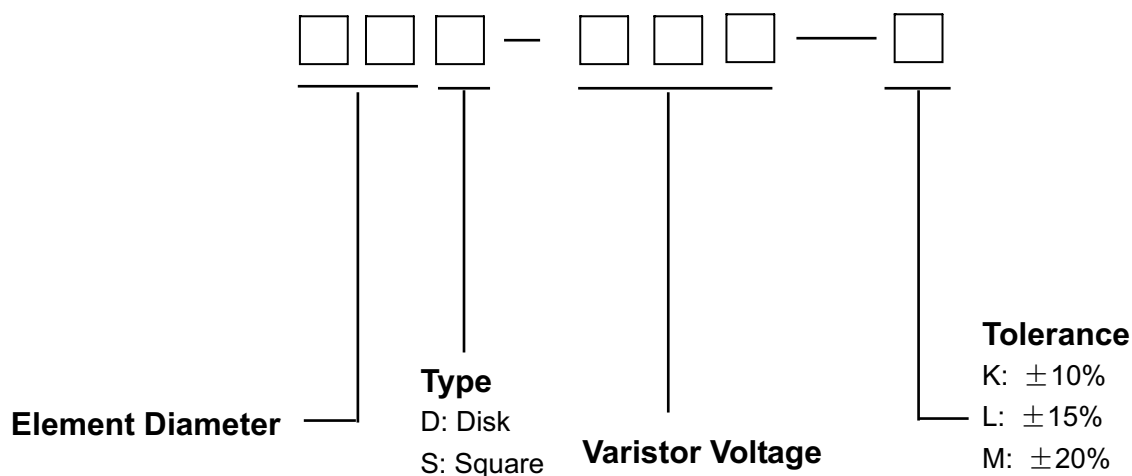
APPLICATION

- ✧ 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: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ✧ Storage Temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

PART NUMBER CODE



PACKAGE DIMENSIONS

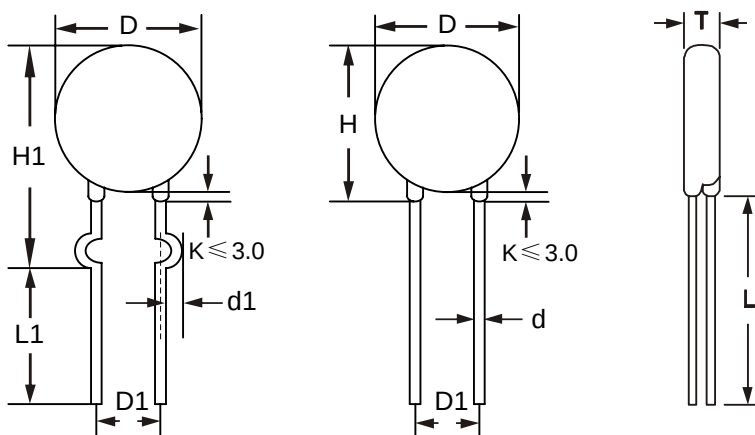


TABLE 1

unit:mm

Symbol	Dimensions
H(max.)	16.5
H1(max.)	17.5
L(min.)	20.0
L1(min.)	15.0
D(max.)	12.5
D1(±0.8)	7.5
T(max.)	TABLE 2
d(±0.05)	0.8
d1(±0.4)	1.4

TABLE 2

unit:mm

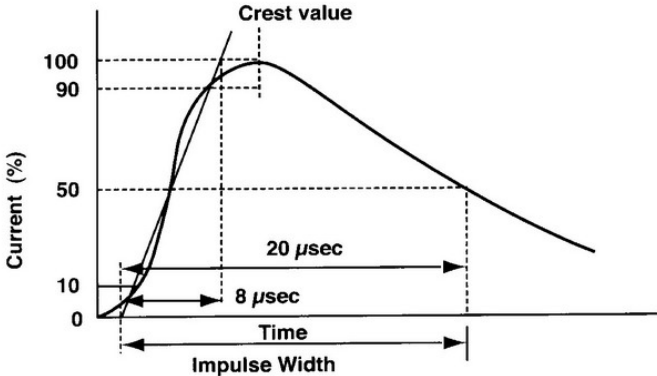
Model	T(max.)	Model	T(max.)
180K	4.6	301K	5.5
220K	4.7	331K	5.8
270K	4.8	361K	6.0
330K	5.0	391K	6.2
390K	5.3	431K	6.5
470K	5.4	471K	6.7
560K	5.5	511K	6.8
680K	5.6	561K	7.0
820K	4.7	621K	7.3
101K	4.9	681K	7.6
121K	5.1	751K	8.0
151K	5.4	781K	8.1
181K	4.8	821K	8.3
201K	5.0	911K	8.8
221K	5.1	102K	9.3
241K	5.2	112K	9.9
271K	5.4		

ELECTRICAL CHARACTERISTIC

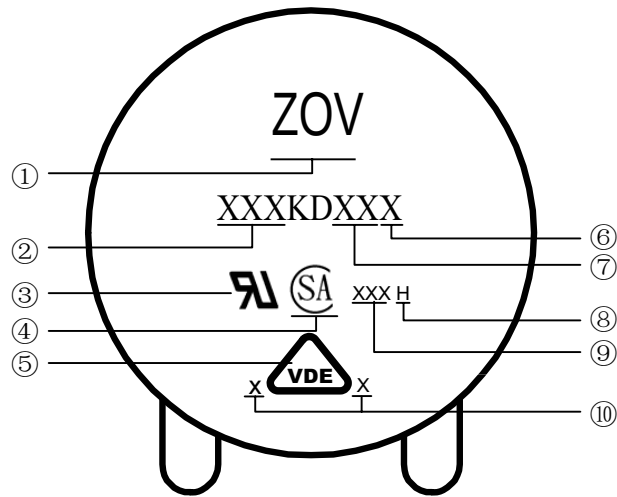
Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V _{AC} (V)	V _{DC} (V)	V _{1mA} (V)	I _P (A)	V _C (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHZ(pf)
10D180K	10D180J	11	14	18(15~21.6)	5	36	500	1000	2.1	3.0	0.05	5600
10D220K	10D220J	14	18	22(19.5~26)	5	43	500	1000	2.5	5.0	0.05	4500
10D270K	10D270J	17	22	27(24~31)	5	53	500	1000	3.0	6.0	0.05	3700
10D330K	10D330J	20	26	33(29.5~36.5)	5	65	500	1000	4.0	7.0	0.05	3000
10D390K	10D390J	25	31	39(35~43)	5	77	500	1000	4.6	9.0	0.05	2400
10D470K	10D470J	30	38	47(42~52)	5	93	500	1000	5.5	11.0	0.05	2100
10D560K	10D560J	35	45	56(50~62)	5	110	500	1000	7.0	13.0	0.05	1800
10D680K	10D680J	40	56	68(61~75)	5	135	500	1000	8.2	15.0	0.05	1500
10D820K	10D820J	50	65	82(74~90)	25	135	2500	3500	12.0	17.0	0.4	1200
10D101K	10D101J	60	85	100(90~110)	25	165	2500	3500	15.0	18.0	0.4	1000
10D121K	10D121J	75	100	120(108~132)	25	200	2500	3500	18.0	21.0	0.4	830
10D151K	10D151J	95	125	150(135~165)	25	250	2500	3500	22.0	25.0	0.4	670
10D181K	10D181J	115	150	180(162~198)	25	300	2500	3500	27.0	30.0	0.4	560
10D201K	10D201J	130	170	200(180~220)	25	340	2500	3500	30.0	35.0	0.4	500
10D221K	10D221J	140	180	220(198~242)	25	360	2500	3500	32.0	39.0	0.4	450
10D241K	10D241J	150	200	240(216~264)	25	395	2500	3500	35.0	42.0	0.4	420
10D271K	10D271J	175	225	270(243~297)	25	455	2500	3500	37.0	49.0	0.4	370
10D301K	10D301J	190	250	300(270~330)	25	500	2500	3500	40.0	54.0	0.4	330
10D331K	10D331J	210	275	330(297~363)	25	550	2500	3500	43.0	58.0	0.4	300
10D361K	10D361J	230	300	360(324~396)	25	595	2500	3500	47.0	65.0	0.4	280
10D391K	10D391J	250	320	390(351~429)	25	650	2500	3500	60.0	70.0	0.4	260
10D431K	10D431J	275	350	430(387~473)	25	710	2500	3500	65.0	80.0	0.4	230
10D471K	10D471J	300	385	470(423~517)	25	775	2500	3500	67.0	85.0	0.4	210
10D511K	10D511J	320	415	510(459~561)	25	845	2500	3500	69.0	90.0	0.4	200
10D561K	10D561J	350	460	560(504~616)	25	925	2500	3500	70.0	92.0	0.4	180
10D621K	10D621J	385	505	620(558~682)	25	1025	2500	3500	72.0	95.0	0.4	160
10D681K	10D681J	420	560	680(612~748)	25	1120	2500	3500	75.0	98.0	0.4	150
10D751K	10D751J	460	615	750(675~825)	25	1240	2500	3500	77.0	100.0	0.4	130
10D781K	10D781J	485	640	780(702~858)	25	1290	2500	3500	80.0	105.0	0.4	130
10D821K	10D821J	510	670	820(738~902)	25	1355	2500	3500	85.0	110.0	0.4	120
10D911K	10D911J	550	745	910(819~1001)	25	1500	2500	3500	93.0	130.0	0.4	110
10D102K	10D102J	625	825	1000(900~1100)	25	1650	2500	3500	102.0	140.0	0.4	100
10D112K	10D112J	680	895	1100(990~1210)	25	1815	2500	3500	115.0	155.0	0.4	90

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

ELECTRICAL RATINGS

Item	Test Condition/Description	Requirement																									
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA.DC applied is call Vb.	To meet the specified value																									
Maximum Allowable Voltage	The recommended maximum sine wave voltage (RMS) or the maximum DC voltage can be applied continuously.																										
Maximum Clamping Voltage	The maximum voltage between two terminals with the specification standard impulse current. Applied waveform: 8/20μsec. 																										
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 10/1000μsec. or 2 msec. is applied.																										
Withstanding Surge Current	The maximum current within the varistor voltage change of ±10% with the standard impulse current (8/20μsec.) applied one time.																										
Varistor Voltage Temp. Coefficient	$\frac{V_b \text{ at } 20^{\circ}\text{C} - V_b \text{ at } 70^{\circ}\text{C}}{V_b \text{ at } 20^{\circ}\text{C}} \times \frac{1}{50} \times 100 (\% ^{\circ}\text{C})$	0.05% / °C max																									
Surge Life	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>	5Φ series	180K to 680K	10A (8/20μsec.)	820K to 751K	20A (8/20μsec.)	7Φ series	180K to 680K	25A (8/20μsec.)	820K to 821K	50A (8/20μsec.)	10Φ series	180K to 680K	50A (8/20μsec.)	820K to 112K	100A (8/20μsec.)	14Φ series	180K to 680K	75A (8/20μsec.)	820K to 182K	150A (8/20μsec.)	20Φ series	180K to 680K	100A (8/20μsec.)	820K to 182K	200A (8/20μsec.)	$\frac{\Delta V_b}{V_b} \leq \pm 10\%$
5Φ series	180K to 680K		10A (8/20μsec.)																								
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	820K to 182K	200A (8/20μsec.)																									

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