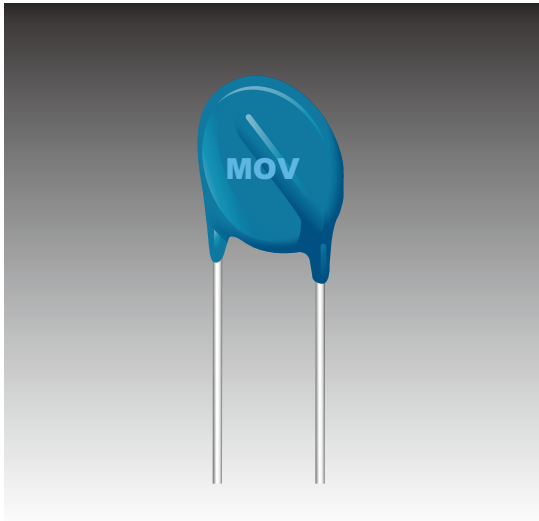




Metal Oxide Varistors

Varistor>07D180~821KJ Series



Applications

- 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.

Features

- Wide operating voltage (V1mA) range from 8V to 1800V.
- Fast responding to transient over-voltage.
- Large absorbing transient energy capability.
- Low clamping ratio and no following-on current.

General Information

The MOV-07DxxxK Series of 7 mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 18 V to 820 V and Vrms voltages from 11 V to 510 V.

The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.

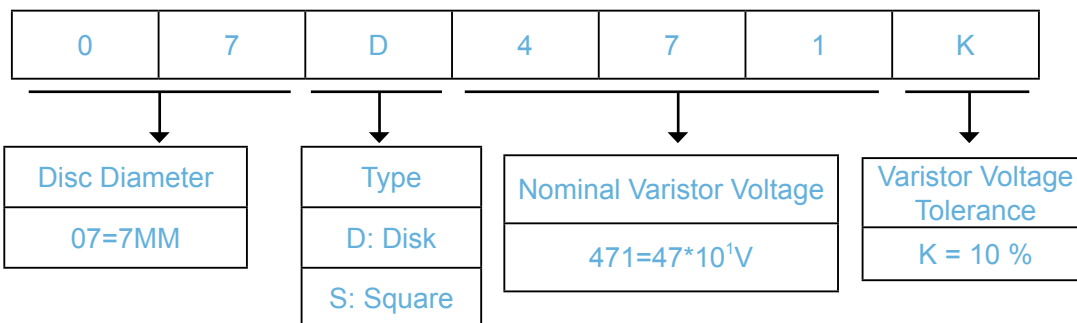
General Characteristics

No Radioactive Material
 Storage Temperature: -55°C to +125°C
 Operating Temperature: -55°C to +85°C
 Body: Nickel Plated
 Leads: Surface-mount, Axial Devices: Tin Plated
 Devices with No Leads: Nickel Plated

Packaging Information

Part Number	Component package	Quantity	Packaging Option	Packaging Specification
7D	7.0	1000	BOX	2000

Product Name



Electrical Characteristics (@ TA = 25 °C Unless Otherwise Noted)

Type 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	07D180KJ	11	14	18(15~21.6)	2.5	36	250	500	0.9	2.0	0.02	2800
07D220K	07D220KJ	14	18	22(19.5~26)	2.5	43	250	500	1.1	2.4	0.02	2300
07D270K	07D270KJ	17	22	27(24~31)	2.5	53	250	500	1.4	3.0	0.02	1800
07D330K	07D330KJ	20	26	33(29.5~36.5)	2.5	65	250	500	1.7	3.5	0.02	1500
07D390K	07D390KJ	25	31	39(35~43)	2.5	77	250	500	2.1	4.0	0.02	1300
07D470K	07D470KJ	30	38	47(42~54)	2.5	93	250	500	2.5	5.0	0.02	1100
07D560K	07D560KJ	35	45	56(50~62)	2.5	110	250	500	3.1	6.0	0.02	900
07D680K	07D680KJ	40	56	68(61~75)	2.5	135	250	500	3.6	7.0	0.02	740
07D820K	07D820KJ	50	65	82(74~90)	10	135	1200	1750	5.5	10.0	0.25	600
07D101K	07D101KJ	60	85	100(90~110)	10	165	1200	1750	6.5	12.0	0.25	500
07D121K	07D121KJ	75	100	120(108~132)	10	200	1200	1750	7.8	13.0	0.25	420
07D151K	07D151KJ	95	125	150(135~165)	10	250	1200	1750	9.7	13.0	0.25	330
07D181K	07D181KJ	115	150	180(162~198)	10	300	1200	1750	11.7	16.0	0.25	280
07D201K	07D201KJ	130	170	200(180~220)	10	340	1200	1750	13.0	17.0	0.25	250
07D221K	07D221KJ	140	180	220(198~242)	10	360	1200	1750	14.0	19.0	0.25	230
07D241K	07D241KJ	150	200	240(216~264)	10	395	1200	1750	15.0	21.0	0.25	210
07D271K	07D271KJ	175	225	270(243~297)	10	455	1200	1750	18.0	24.0	0.25	185
07D301K	07D301KJ	190	250	300(270~330)	10	500	1200	1750	20.0	26.0	0.25	165
07D331K	07D331KJ	210	275	330(297~363)	10	550	1200	1750	23.0	28.0	0.25	150
07D361K	07D361KJ	230	300	360(324~396)	10	595	1200	1750	25.0	32.0	0.25	140
07D391K	07D391KJ	250	320	390(351~429)	10	650	1200	1750	25.0	35.0	0.25	130
07D431K	07D431KJ	275	350	430(387~473)	10	710	1200	1750	28.0	40.0	0.25	115
07D471K	07D471KJ	300	385	470(423~517)	10	775	1200	1750	30.0	42.0	0.25	105
07D511K	07D511KJ	320	415	510(459~561)	10	845	1200	1750	30.0	45.0	0.25	100
07D561K	07D561KJ	350	460	560(504~616)	10	925	1200	1750	30.0	49.0	0.25	90
07D621K	07D621KJ	385	505	620(558~682)	10	1025	1200	1750	33.0	55.0	0.25	80
07D681K	07D681KJ	420	560	680(612~748)	10	1120	1200	1750	33.0	60.0	0.25	75
07D751K	07D751KJ	460	615	750(675~825)	10	1240	1200	1750	67.2	65.0	0.25	70
07D781K	07D781KJ	185	640	780(702~858)	10	1290	1200	1750	67.2	65.0	0.25	70
07D821K	07D821KJ	510	670	820(738~902)	10	1355	1200	1750	67.2	70.0	0.25	60

Electrical Rating

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.																									
Rated Wattaget	The maximum average power that can be applied within the specified ambient temperature.																									
I _{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.	$\frac{\Delta V_b}{V_b} \leq \pm 10\%$																								
Surge Life	<p>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.</p> <table border="1"> <tbody> <tr> <td rowspan="2">5D 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">7Dseries</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">10D series</td> <td>180K to 680K</td> <td>50A (8/20µsec.)</td> </tr> <tr> <td>820K to 182K</td> <td>100A (8/20µsec.)</td> </tr> <tr> <td rowspan="2">14D 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">20D 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> </tbody> </table>		5D series	180K to 680K	10A (8/20µsec.)	820K to 751K	20A (8/20µsec.)	7Dseries	180K to 680K	25A (8/20µsec.)	820K to 821K	50A (8/20µsec.)	10D series	180K to 680K	50A (8/20µsec.)	820K to 182K	100A (8/20µsec.)	14D series	180K to 680K	75A (8/20µsec.)	820K to 182K	150A (8/20µsec.)	20D series	180K to 680K	100A (8/20µsec.)	820K to 182K
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Current Energy and Power Dissipation Ratings

Should transients occur in rapid succession, the average power dissipation is the energy (watt-seconds) per pulse times the number of pulses per second. The power so developed must be within the specifications shown on the Device Ratings and Specifications Table for the specific

device. The operating values of a MOV need to be derated at high temperatures as shown above. Because varistors only dissipate a relatively small amount of average power they are not suitable for repetitive applications that involve substantial amounts of average power dissipation.

Figure 1A - Power Derating for Epoxy Coated

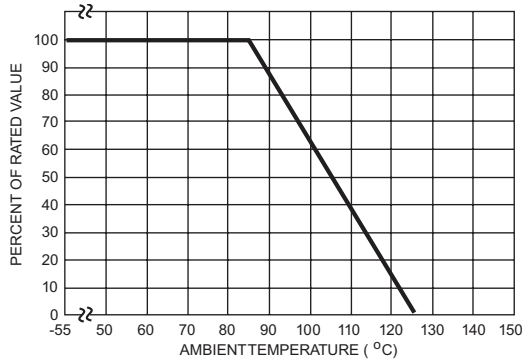
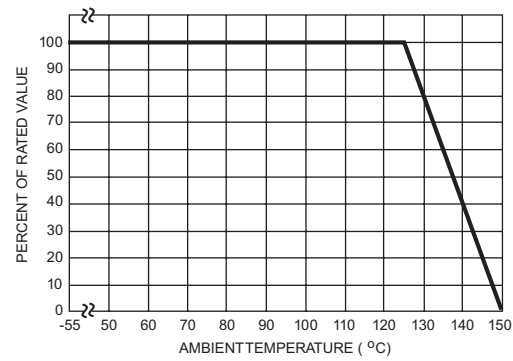


Figure 1B - Power Derating for Pholenic Coated



Peak Pulse Current Test Waveform

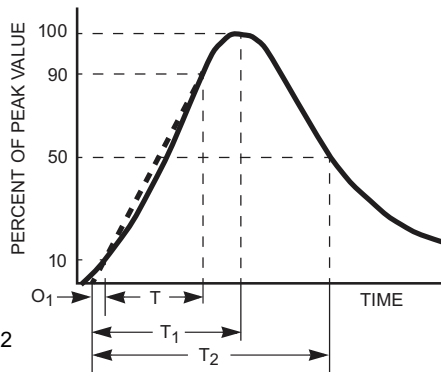


Figure 2

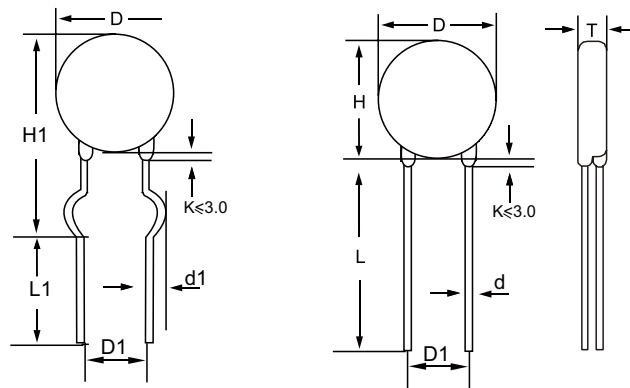
- O_1 = Virtual Origin of Wave
- T = Time from 10% to 90% of Peak
- T_1 = Rise Time = $1.25 \times T$
- T_2 = Decay Time

Example - For an 8/20 μ s Current Waveform:

$8\mu\text{s} = T_1 = \text{Rise Time}$

$20\mu\text{s} = T_2 = \text{Decay Time}$

Package Dimensions



Unit:mm

TABLE 1

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

Model	T(max.)	Model	T(max.)
180K	4.5	221K	4.5
220K	4.6	241K	4.6
270K	4.7	271K	4.9
330K	4.9	301K	5.0
390K	4.8	331K	5.1
470K	4.9	361K	5.2
560K	5.0	391K	5.4
680K	5.2	431K	5.7
820K	4.1	471K	6.0
101K	4.3	511K	6.2
121K	4.5	561K	6.5
151K	4.8	621K	6.4
181K	4.3	681K	6.5
201K	4.4	751K	6.5

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