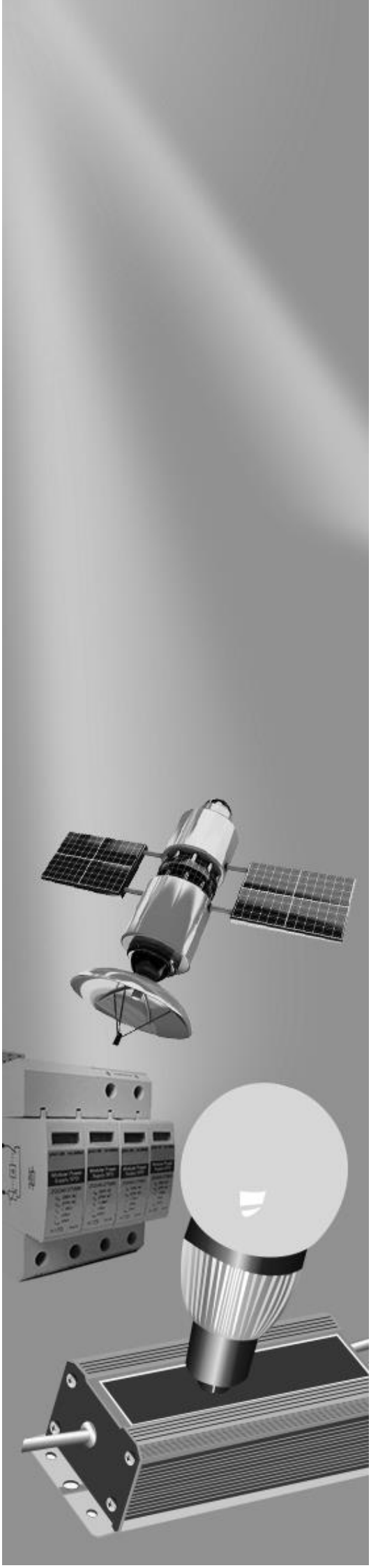
DATA SHEET

METAL OXIDE VARISTORS
HIGH SURGE SERIES

14D-X8 series

RoHS compliant & Halogen free



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Metal Oxide Varistor：14D-X8 Series



■ Features

1. RoHS compliant
2. Halogen-free series are available.
3. Body size：Φ14mm
4. High peak surge current rating up to 8KA (8/20μs pulse)
5. Operating voltage range：130Vac ~ 550Vac
6. Agency recognition：UL / CSA / VDE/ CQC

■ Recommended Applications

1. Power supply
2. Home appliance
3. Industrial equipment
4. Telecommunication or telephone system
5. Smart meter
6. PLC (Power line communication)
7. Lighting products
8. Photovoltaic industry

■ Parameters

	14D-X8 Series	Units
AC Voltage Range (Vac)	130 to 550	V
DC Voltage Range (Vdc)	170 to 745	V
Peak Current for 8/20μS Current Wave	8000	A
Energy Range For 10/1000μS Current Wave	82 to 295	J
Operation Ambient Temperature Range	-40 to +105	℃
Storage Temperature Range	-40 to +125	℃
Varistor Voltage Range Vn (Vdc)	200 to 910	V
Voltage Proof	>2500	V
Temperature Cycle (-40~125℃)	5	cycles

■ Part Number Code

4	7	1	K	D	14	J	–	O	X8	T	R
1	2	3	4	5	6	7		8	9	10	11

Varistor Voltage(V1mA)	
471	47x10¹V=470V
561	56x10¹V=560V

Tolerance of Voltage	
K	±10%

Body Size	
14	Φ14mm

Surge current
8KA

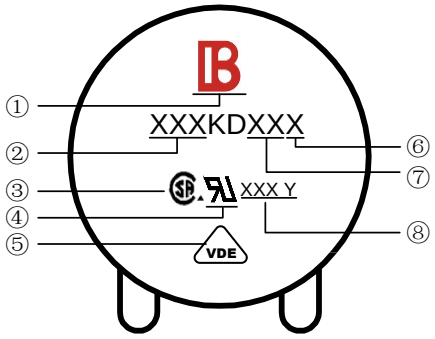
Surge	
J	High surge

Appearance	
D	round, epoxy coating

Lead formation	
O	Outside Kink Lead
F	In Line Kink Lead
Blank	Straight lead

Packaging	
TR	Tape & reel packing (hole pitch:12.7mm)
TB	Tape & ammo box packing (hole pitch:12.7mm)
ER	Tape & reel packing (hole pitch:15.0mm)
EB	Tape & ammo box packing (hole pitch:15.0mm))
Blank	Bulk

■ Marking Code



① Brightking Logo
② Varistor Voltage
③ CSA Accreditation Logo
④ UL Accreditation Logo
⑤ VDE Accreditation Logo
⑥ “J” is High Surge Code, no “J” is Standard Surge
⑦ Disk Size
⑧ Internal control code

■ Structure and Dimensions

Structure

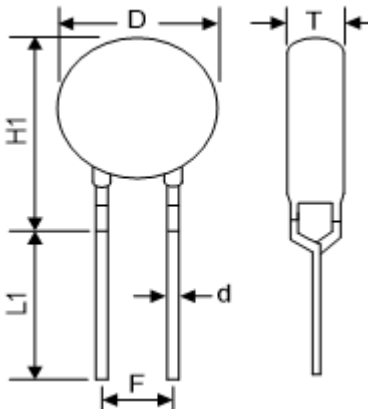


Fig 1. In Line Kink Lead

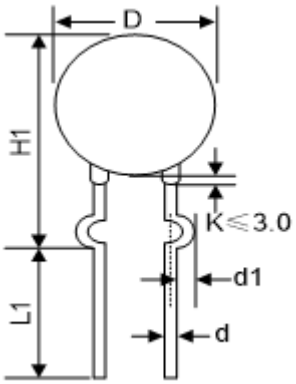


Fig 2. Outside Kink Lead

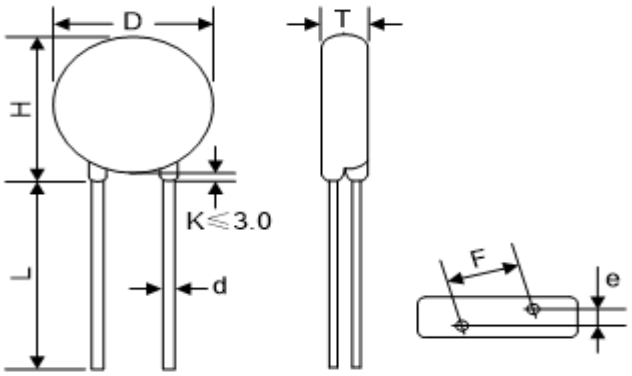


Fig 3. Straight Lead

■ Dimension Table

Table 1

Unit: mm

Symbol	Dimension
H (max.)	21.5
H1 (max.)	23.0
L (min.)	20.0
L1 (min.)	15.0
D (max.)	18.5
F (±0.8)	7.5
T (max.)	Table 2
e (±0.8)	Table 2
d (±0.05)	0.8
d1 (±0.4)	1.4

Table 2

Unit: mm

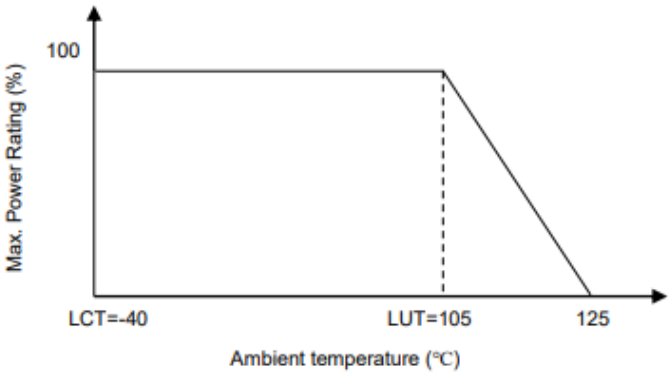
Model	T (max.)	e	Model	T (max.)	e
201K	4.3	2.0	471K	5.8	3.2
221K	4.4	2.1	511K	6.1	3.4
241K	4.5	2.2	561K	6.4	3.6
271K	4.6	2.4	621K	6.8	3.9
301K	4.8	2.5	681K	7.1	4.2
331K	5.0	2.5	751K	7.2	4.3
361K	5.2	2.7	781K	7.3	4.4
391K	5.4	2.8	821K	7.5	4.6
431K	5.6	3.0	911K	7.5	5.0

■ Electrical Characteristics

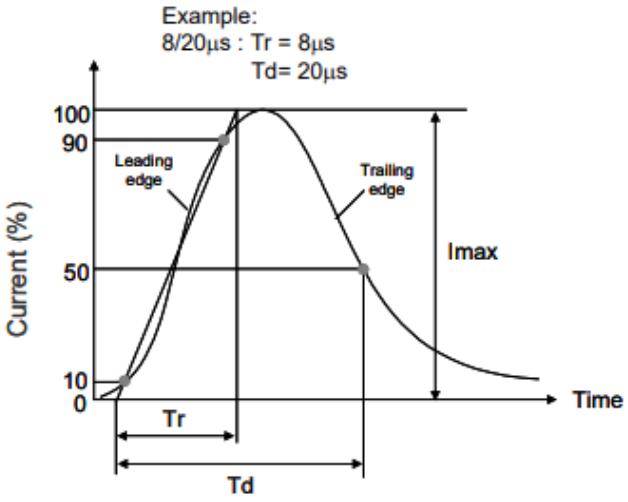
14D-8KA Series

Part No.	Varistor Voltage (@ 1mA DC)	Max. Continuous Voltage		Max. Clamping Voltage (8/20μs)		Max. Surge Current (8/20μs)	Rated Power	Max. Energy (10/1000μs)
	V_{1mA}	$V_{ac(rms)}$	V_{dc}	I_P	V_P	I_{max}	P	W_{max}
	(V)	(V)	(V)	(A)	(V)	(A)	(W)	(J)
201KD14J-X8	200 (180~220)	130	170	50	340	8000	0.6	82
221KD14J-X8	220 (198~242)	140	180	50	360	8000	0.6	90
241KD14J-X8	240 (216~264)	150	200	50	395	8000	0.6	98
271KD14J-X8	270 (243~297)	175	225	50	455	8000	0.6	116
301KD14J-X8	300 (270~330)	190	250	50	500	8000	0.6	128
331KD14J-X8	330 (297~363)	210	275	50	550	8000	0.6	140
361KD14J-X8	360 (324~396)	230	300	50	595	8000	0.6	158
391KD14J-X8	390(351~429)	250	320	50	650	8000	0.6	170
431KD14J-X8	430(387~473)	275	350	50	710	8000	0.6	185
471KD14J-X8	470(423~517)	300	385	50	775	8000	0.6	205
511KD14J-X8	510(459~561)	320	415	50	845	8000	0.6	220
561KD14J-X8	560(504~616)	350	460	50	930	8000	0.6	240
621KD14J-X8	620(558~682)	385	505	50	1020	8000	0.6	250
681KD14J-X8	680(612~748)	420	560	50	1120	8000	0.6	260
751KD14J-X8	750(675~825)	460	615	50	1240	8000	0.6	270
781KD14J-X8	780(702~858)	485	640	50	1290	8000	0.6	275
821KD14J-X8	820(738~902)	510	670	50	1355	8000	0.6	280
911KD14J-X8	910(819~1001)	550	745	50	1500	8000	0.6	295

■ Power Derating Curve

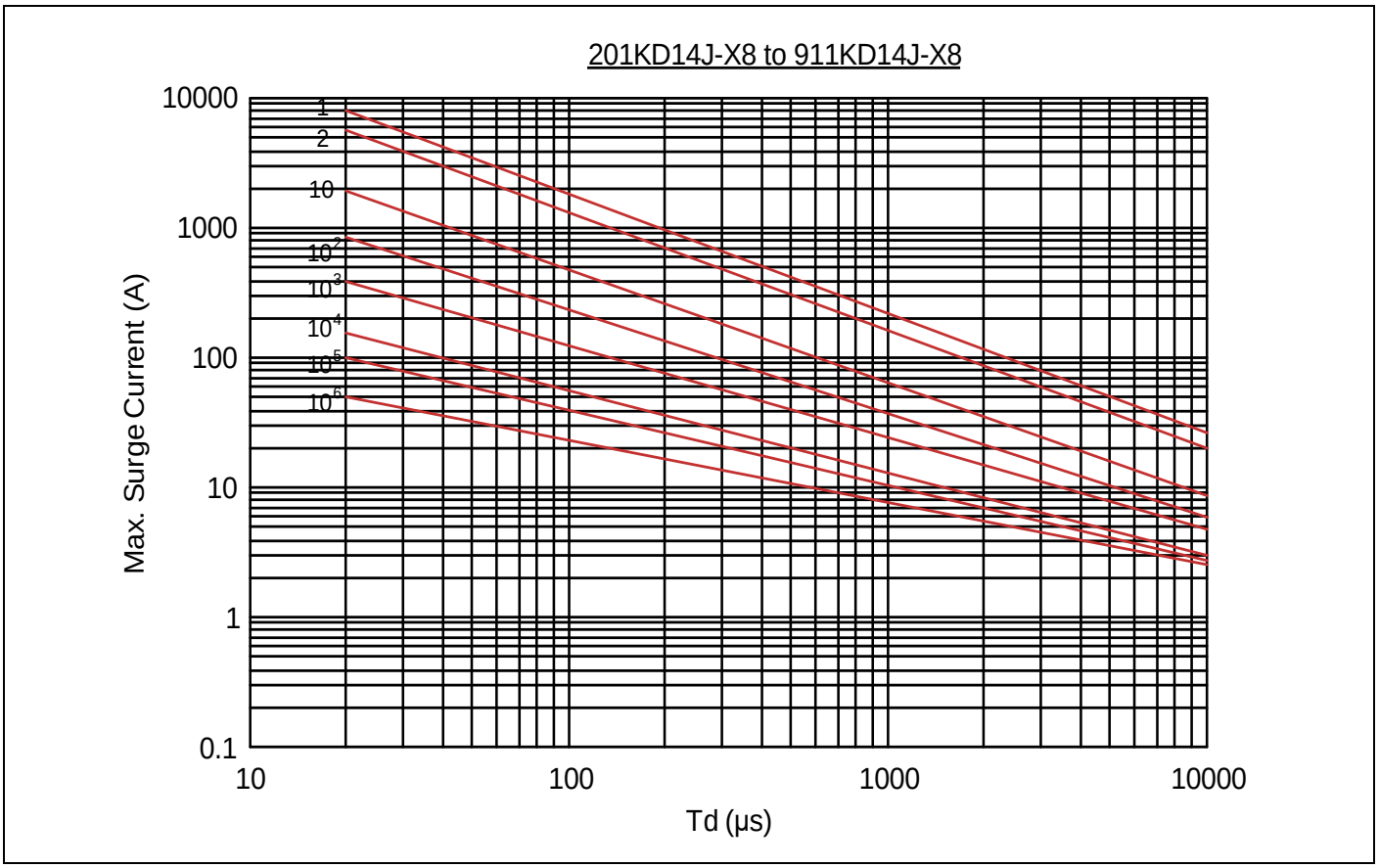


■ Surge Current Standard Waveform



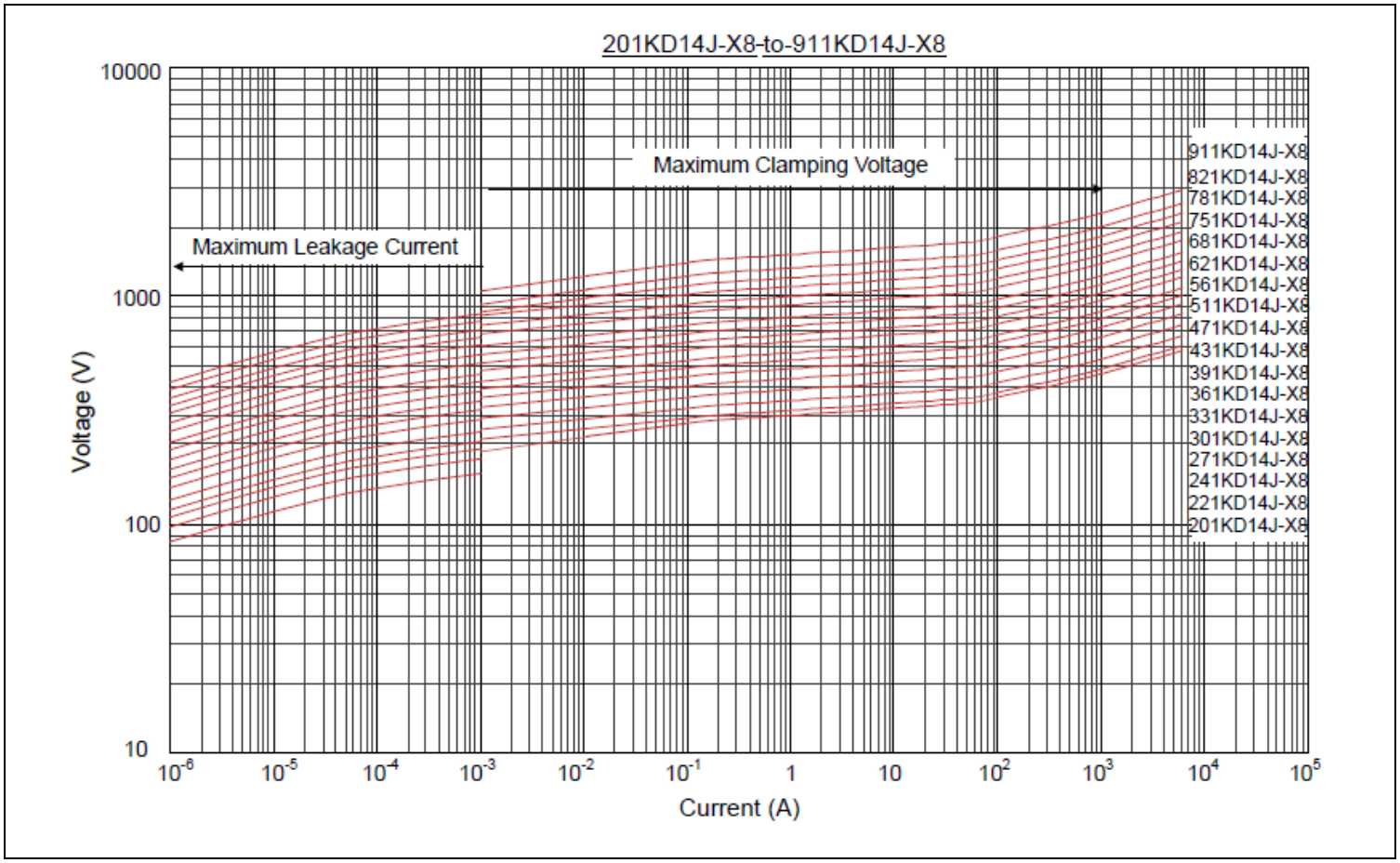
■ Maximum Surge Current Derating Curve

14D Max. Surge Current Derating Curves



■ Maximum Leakage Current and Maximum Clamping Voltage Curve

14D Max. Leakage Current and Max. Clamping Voltage Curves

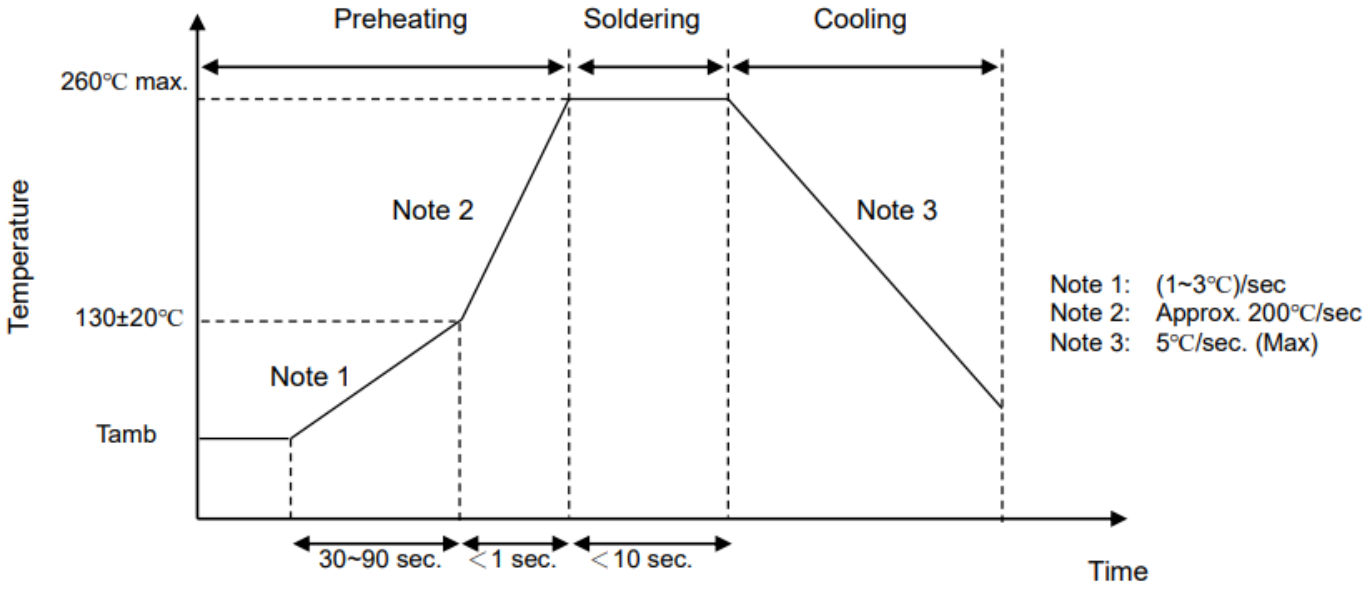


■ Reliability

Item	Standard	Test conditions / Methods	Specifications
Tensile Strength of Terminals	IEC 60068-2-21	Gradually apply the specified force and keep the unit fixed for 10±1 sec Terminal diameter (mm) / Force (Kg) 0.5<d≦0.8 : 1.0 0.8<d≦1.25 : 2.0	|△V1mA /V1mA| ≦5% No visible damage
Bending Strength of Terminals	IEC 60068-2-21	Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction Terminal diameter (mm) / Force (Kg) 0.5<d≦0.8 : 0.5 0.8<d≦1.25 : 1.0	|△V1mA /V1mA| ≦5% No visible damage
Vibration	IEC 60068-2-6	Frequency range: 10 ~ 55 Hz Amplitude: 0.75mm or 98 m/s2 Direction: 3 mutually perpendicular directions, 2 hrs each.	|△V1mA /V1mA| ≦5% No visible damage
Solderability	IEC 60068-2-20	245 ± 3 ℃, 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder
Resistance to Soldering Heat	IEC 60068-2-20	260 ± 3 ℃, 10 ± 1 sec	|△V1mA /V1mA| ≦5% No visible damage
High Temperature Storage	IEC 60068-2-2	125±5℃ x 1000± 24hrs	|△V1mA /V1mA| ≦5% No visible damage
Low Temperature Storage	IEC 60068-2-1	-40±2℃ x 1000± 24hrs	|△V1mA /V1mA| ≦5% No visible damage
Damp Heat, Steady State	IEC 60068-2-78	The test is divided into two groups: a. 40±2℃, 90 ~ 95 % RH, 1344hrs b. 40±2℃, 90 ~ 95 % RH, at 10%Vdc, 1344hrs	|△V1mA /V1mA| ≦5% No visible damage Insulation Resistance ≧100MΩ
Rapid Change of Temperature	IEC 60068-2-14	The conditions shown below shall be repeated 5 cycles。 Step 1: -40±3 : 30±3 Step 2: Room temperature : 5±3 Step 3: 125±3 : 30±3 Step 4: Room temperature : 5±3	|△V1mA /V1mA| ≦5% No visible damage
High Temp. Load	MIL-STD-202 Method 108	105±2℃, 1000±24hrs at VDC or V rms (Max. Continuous Voltage)	|△V1mA /V1mA|≦10 % No visible damage
8/20μs Surge Life	IEC 61051-1	8/20μs waveform, 10 surge currents, unipolar, interval 30 sec, amplitude corresponding to max. surge current derating curves for 20μs.	|△V1mA /V1mA|≦10 % No visible damage
10/1000μs Surge Life	IEC 61051-1	10/1000μs waveform, 10 surge currents, unipolar, interval 2 mins, amplitude corresponding to max. surge current derating curves for 1000μs.	|△V1mA /V1mA|≦10 % No visible damage
Voltage Proof	IEC 61051-1	Metal balls method, 2500 Vac 1 min	No visible damage

■ Soldering Recommendation

● Wave Soldering Profile

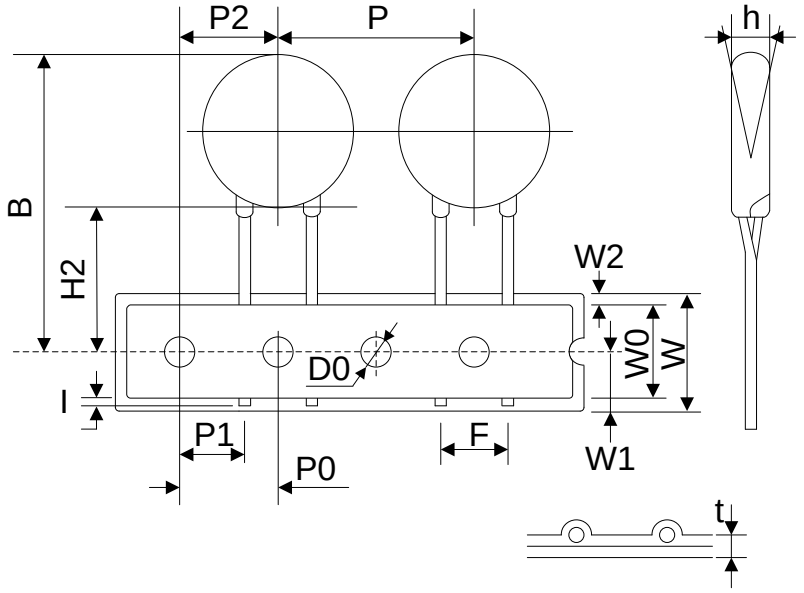


● Recommended Reworking Conditions with Soldering Iron

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

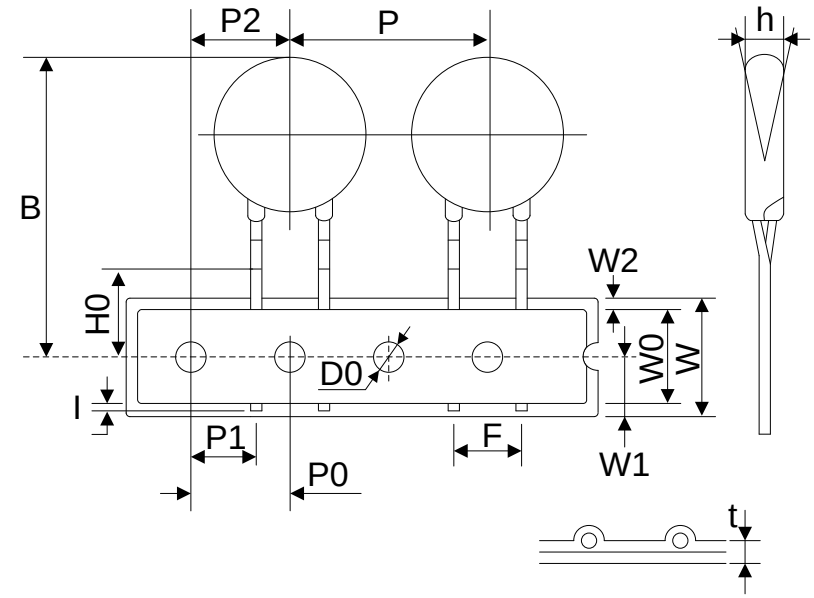
■ Taping Dimensions

● Straight lead



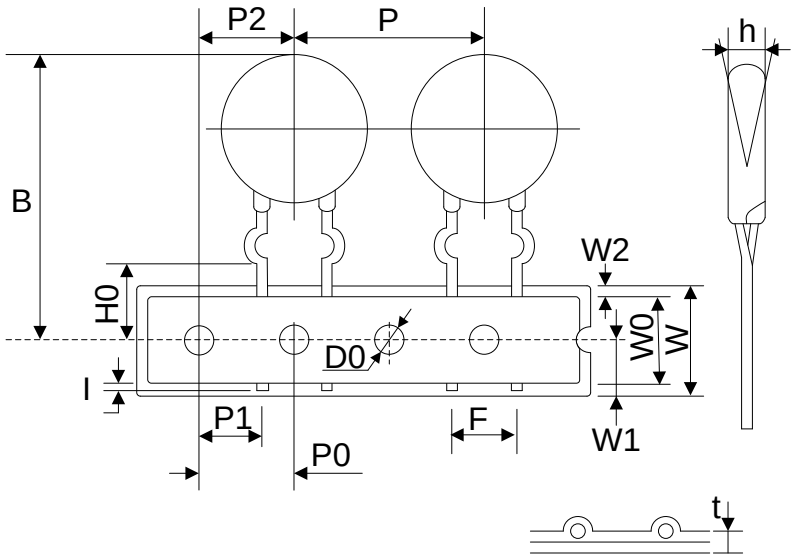
Symbol	Dimension (mm)
P	25.4±1.0
P0	12.7±1.0
P1	8.95±0.7
P2	12.7±1.3
F	7.5±0.8
h	0±4
W	18.0±1.0
W0	12.0±1.0
W1	9.0±0.5
W2	3.0max
H2	20.0±2.0
I	2.0max
D0	4.0±0.2
t	0.6±0.3
B	42max

● In Line Kink Lead



Symbol	Dimension (mm)
P	25.4±1.0
P0	12.7±1.0
P1	8.95±0.7
P2	12.7±1.3
F	7.5±0.8
h	0±4
W	18.0±1.0
W0	12.0±1.0
W1	9.0±0.5
W2	3.0max
H0	16.0±1.0
I	2.0max
D0	4.0±0.2
t	0.6±0.3
B	42max

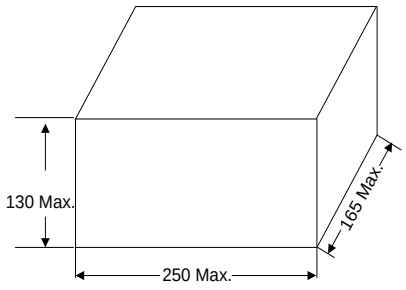
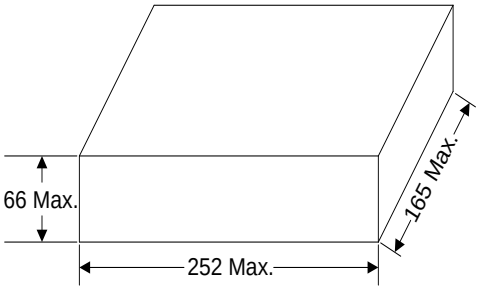
- **Outside Kink Lead**



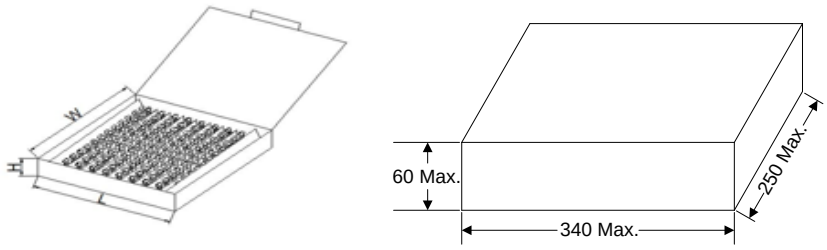
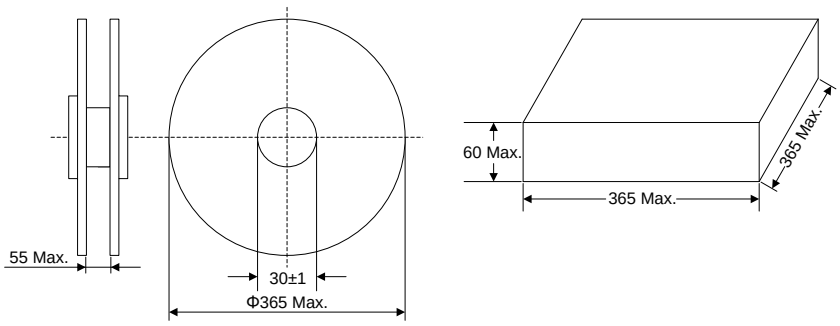
Symbol	Dimension (mm)
P	25.4±1.0
P0	12.7±1.0
P1	8.95±0.7
P2	12.7±1.3
F	7.5±0.8
h	0±4
W	18.0±1.0
W0	12.0±1.0
W1	9.0±0.5
W2	3.0max
H0	16.0±1.0
I	2.0max
D0	4.0±0.2
t	0.6±0.3
B	42max

■ Quantity

- **Bulk Packing**

Packaging Dimensions (Unit: mm)	Voltage Type	Quantity
In bulk for Terminals Untrimmed Products 	201K~331K	400pcs/bag, 4bags/box
	361K~621K	300pcs/bag, 4bags/box
	681K~911K	250pcs/bag, 4bags/box
In bulk for Terminals Trimmed Products 	201K~331K	400pcs/bag, 4bags/box
	361K~621K	300pcs/bag, 4bags/box
	681K~911K	250pcs/bag, 4bags/box

- **Reel Packing**

Packaging Dimensions (Unit: mm)	Voltage Type	P0：12.7mm (pcs/box)	P0：15.0mm (pcs/box)
Tape & Box 	201K-241K	750	500
	271K-331K	600	500
	361K-621K	500	400
	681K-751K	400	400
	781K-911K	350	300
Tape & Reel 	201K-331K	1000	750
	361K-621K	750	600
	681K-751K	500	600
	781K-911K	400	500

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