THE DATASHEET OF

101KD25

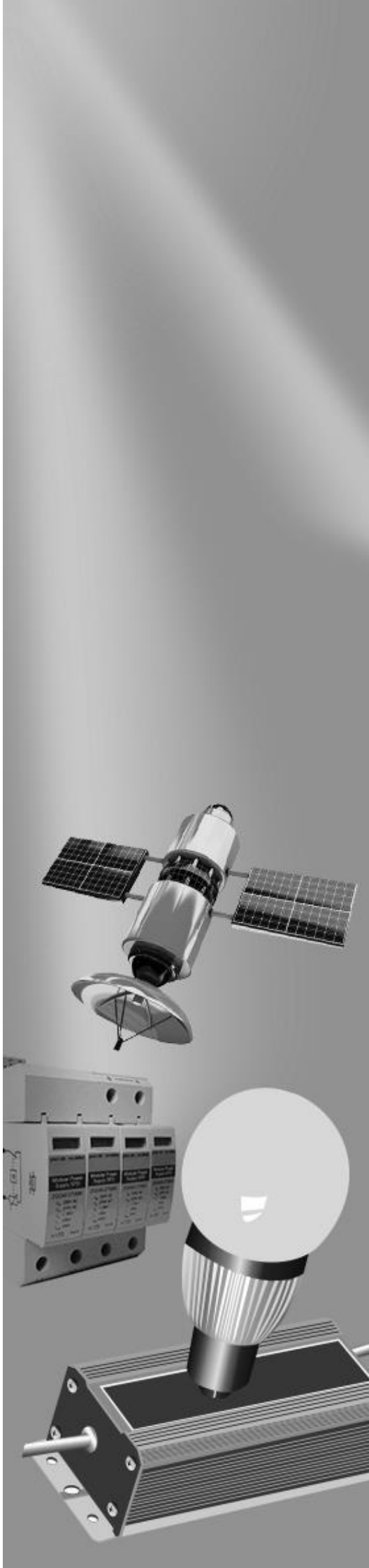
Innovative Service Around the Globe YAGEO

DATA SHEET

METAL OXIDE VARISTORS
POWER SUPPLY

25D series

RoHS compliant & Halogen free



Product specification– September 04, 2023 V.3

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Metal Oxide Varistor (MOV) Data Sheet

Features

- Wide operating voltage (V_{1mA}) range from 18V to 1800V
- 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
- Operating Temperature：-40℃ ~ +105℃
- Storage Temperature：-40℃ ~ +125℃
- Safety certification：UL、CSA、VDE

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

Part Number Code

4	7	1	K	D	2	5	—	P12.5

Varistor Voltage
180: 18V
101: 100V
102: 1000V

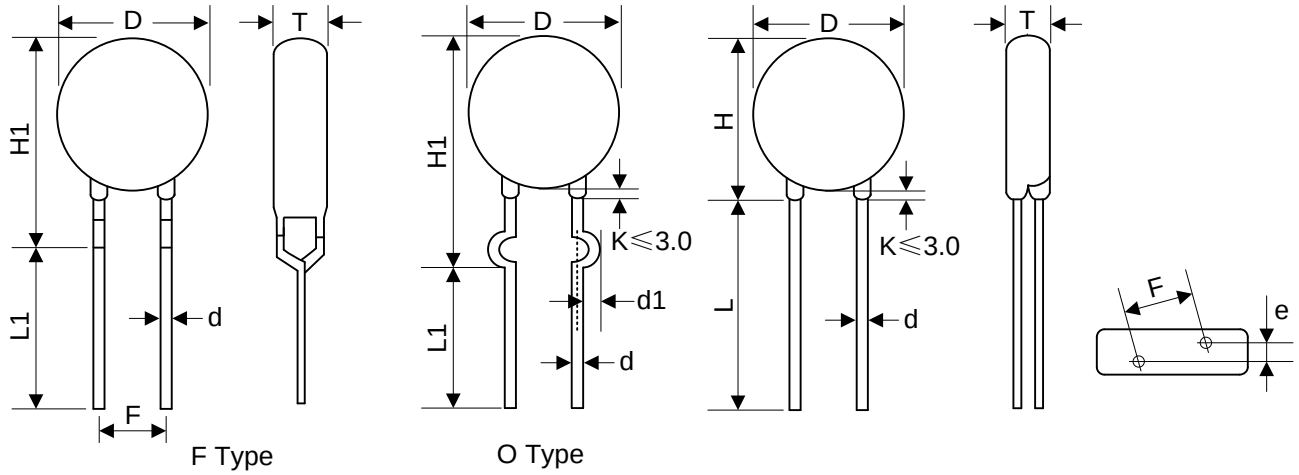
Tolerance
K: ±10%

Type
D: Disk

Element Diameter
25

Pitch
No suffix: 10mm
P12.5: 12.5mm

Dimensions



Notes: Varistor voltage≥1200V, structure diagram is F type.

Table 1

Unit: mm

Symbol	Dimension
H	27.0~31.5
H1	28.0~34.0
L(min.)	20.0
L1(min.)	15.0
D	25.0~28.0
F(±1.0)	10.0/12.5
T	Table 2
e(±0.8)	Table 2
d(±0.1)	1.0
d1(±0.4)	1.4/1.6

Table 2

Unit: mm

Model	T	e	Model	T	e
180K	2.5~4.8	1.7	361K	3.4~5.9	2.9
220K	2.6~4.9	1.8	391K	3.5~6.1	3.0
270K	2.6~5.0	2.0	431K	3.7~6.4	3.2
330K	2.7~5.2	1.9	471K	3.8~6.7	3.4
390K	2.6~5.5	2.0	511K	3.9~7.0	3.6
470K	2.7~5.1	2.1	561K	4.1~7.3	3.8
560K	2.8~5.4	2.3	621K	4.3~7.6	4.1
680K	2.9~5.7	2.6	681K	4.5~7.8	4.4
820K	2.6~4.5	2.0	751K	4.8~8.0	4.5
101K	2.9~4.6	2.2	781K	4.9~8.1	4.6
121K	2.9~4.8	2.4	821K	5.1~8.4	4.8
151K	2.7~4.9	2.0	911K	5.3~8.9	5.2
181K	2.8~5.2	2.1	102K	5.9~9.5	5.2
201K	2.9~5.2	2.2	112K	6.3~10.1	5.6
221K	3.0~5.3	2.3	122K	6.4~10.7	6.0
241K	3.1~5.8	2.4	142K	7.4~12.6	6.8
271K	3.1~5.3	2.6	162K	7.9~13.2	7.6
301K	3.2~5.5	2.7	182K	8.1~14.5	8.4
331K	3.2~5.7	2.7			

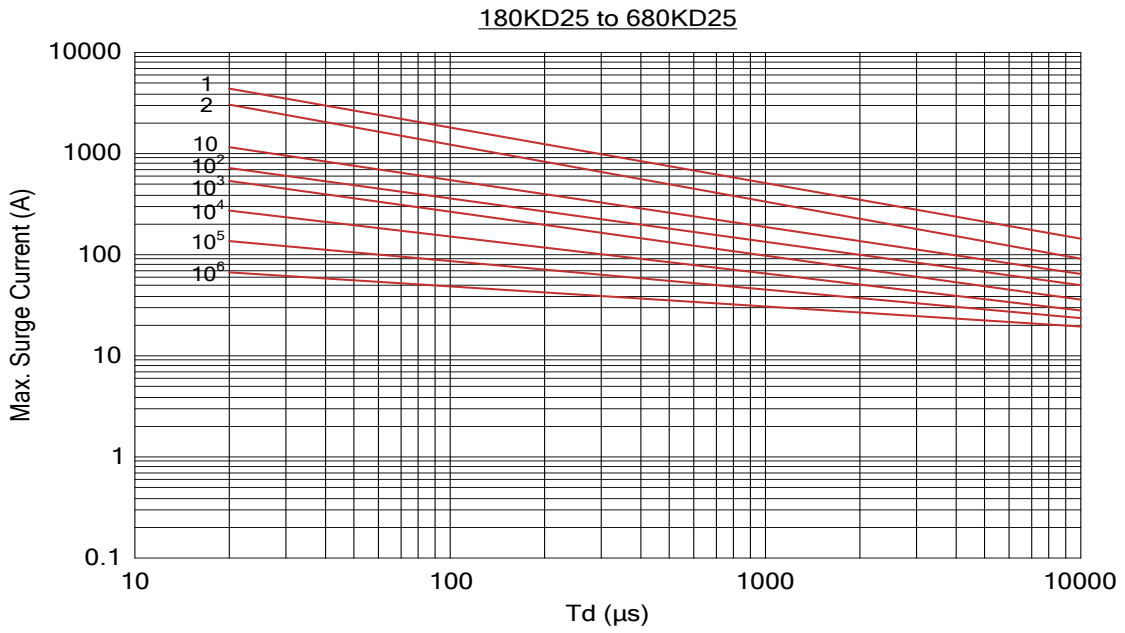
Electrical Characteristics

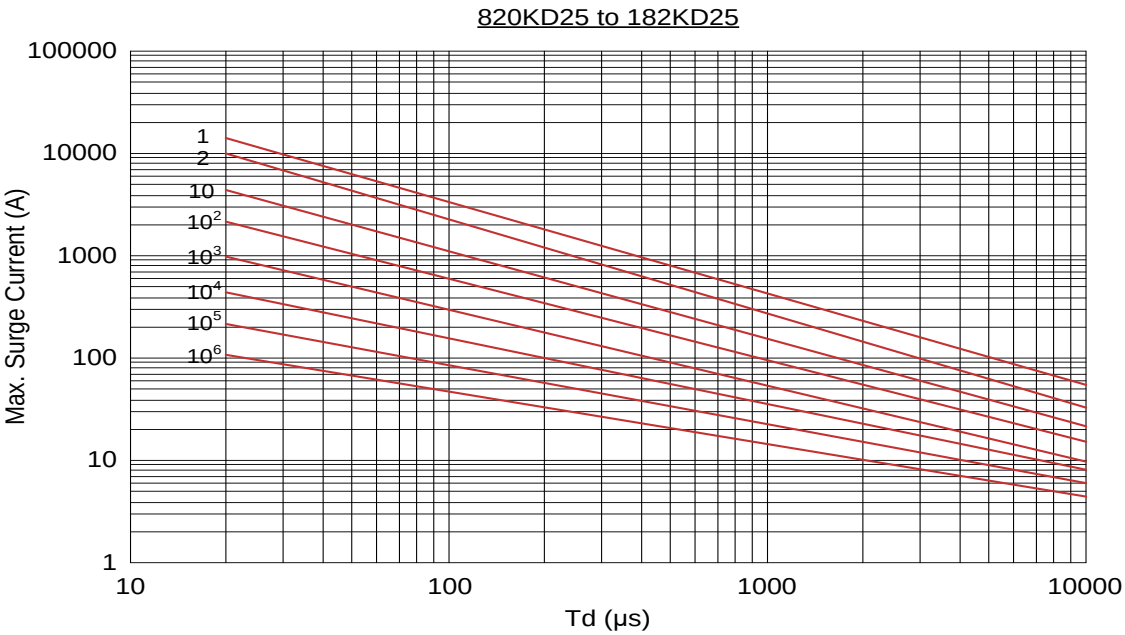
Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current	Maximum Energy (10/1000μs)	Rated Power	Typical Capacitance (Reference)
	V_{AC}(V)	V_{DC}(V)	V_{1mA}(V)	I_P(A)	V_C(V)	I (A)	(J)	(W)	@1KHz (pf)
180KD25	11	14	18(15~21.6)	30	36	4500	20	0.25	45000
220KD25	14	18	22(19.5~26)	30	43	4500	25	0.25	29000
270KD25	17	22	27(24~31)	30	53	4500	30	0.25	26500
330KD25	20	26	33(29.5~36.5)	30	65	4500	35	0.25	18000
390KD25	25	31	39(35~43)	30	77	4500	40	0.25	13500
470KD25	30	38	47(42~52)	30	93	4500	50	0.25	11500
560KD25	35	45	56(50~62)	30	110	4500	60	0.25	10500
680KD25	40	56	68(61~75)	30	135	4500	70	0.25	9050
820KD25	50	65	82(74~90)	150	135	15000	80	1.2	7700
101KD25	60	85	100(90~110)	150	165	15000	100	1.2	6300
121KD25	75	100	120(108~132)	150	200	15000	120	1.2	5200
151KD25	95	125	150(135~165)	150	250	15000	160	1.2	4300
181KD25	115	150	180(162~198)	150	300	15000	175	1.2	3500
201KD25	130	170	200(180~220)	150	340	15000	190	1.2	3200
221KD25	140	180	220(198~242)	150	360	15000	200	1.2	2900
241KD25	150	200	240(216~264)	150	395	15000	220	1.2	2650
271KD25	175	225	270(243~297)	150	455	15000	255	1.2	2400
301KD25	190	250	300(270~330)	150	500	15000	275	1.2	2100
331KD25	210	275	330(297~363)	150	550	15000	300	1.2	1900
361KD25	230	300	360(324~396)	150	595	15000	330	1.2	1750
391KD25	250	320	390(351~429)	150	650	15000	360	1.2	1600
431KD25	275	350	430(387~473)	150	710	15000	380	1.2	1500
471KD25	300	385	470(423~517)	150	775	15000	400	1.2	1400
511KD25	320	415	510(459~561)	150	845	15000	420	1.2	1250
561KD25	350	460	560(504~616)	150	925	15000	440	1.2	1150
621KD25	385	505	620(558~682)	150	1025	15000	450	1.2	1050
681KD25	420	560	680(612~748)	150	1120	15000	460	1.2	950
751KD25	460	615	750(675~825)	150	1240	15000	510	1.2	850
781KD25	485	640	780(702~858)	150	1290	15000	530	1.2	850
821KD25	510	670	820(738~902)	150	1355	15000	570	1.2	800
911KD25	550	745	910(819~1001)	150	1500	15000	620	1.2	700
102KD25	625	825	1000(900~1100)	150	1650	15000	685	1.2	650
112KD25	680	895	1100(990~1210)	150	1815	15000	720	1.2	600
122KD25	750	990	1200(1080~1320)	150	1980	15000	792	1.2	550
142KD25	880	1140	1400(1260~1540)	150	2310	15000	850	1.2	500
162KD25	1000	1280	1600(1440~1760)	150	2640	15000	970	1.2	450
182KD25	1100	1465	1800(1620~1980)	150	2970	15000	1092	1.2	400

Notes: 1. The tolerance of varistor voltage between 18V and 27V is more than 10%.

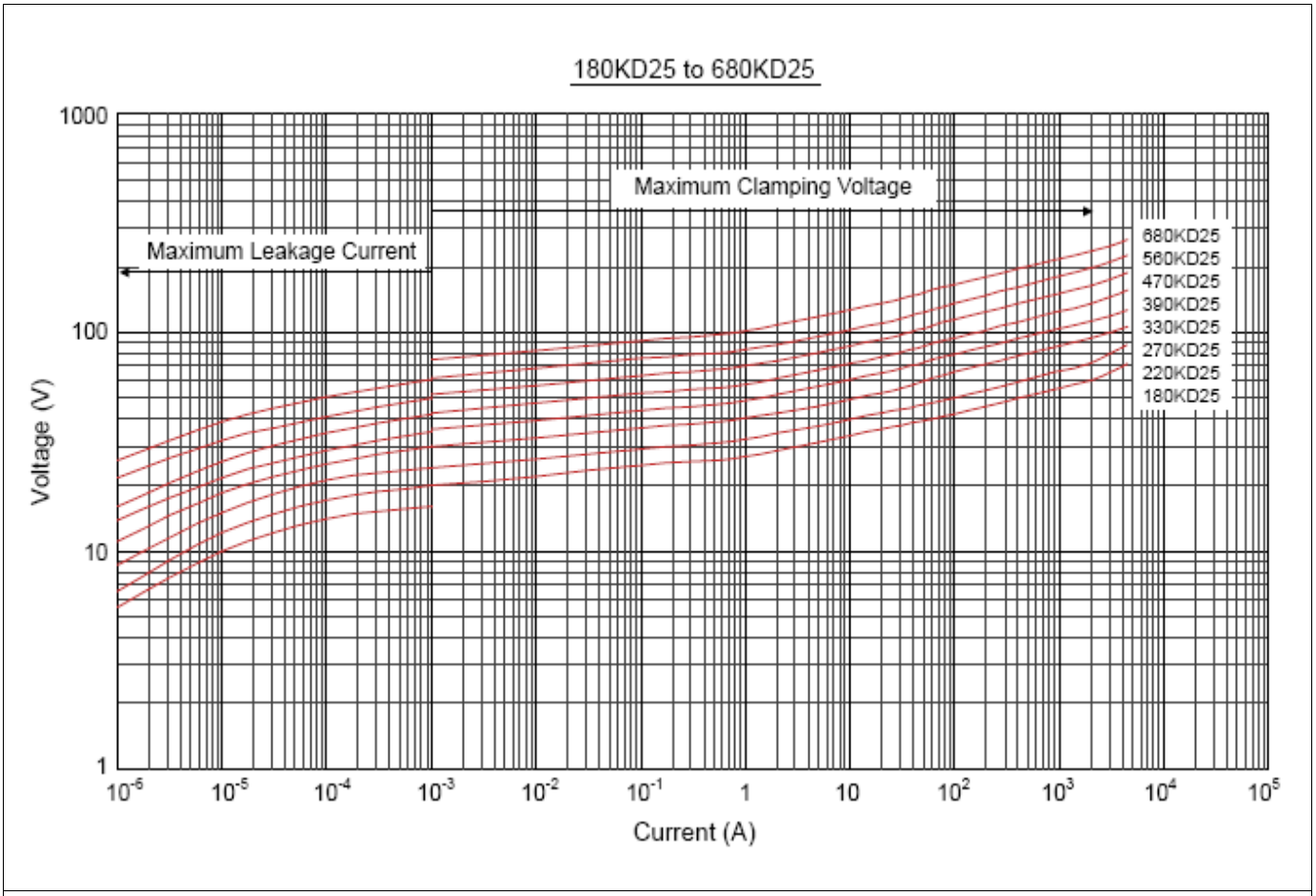
2. Leakage Current (@83% of V_{1mA})：IR≤50μA (180K~680K) ; IR≤40μA (820K~182K)

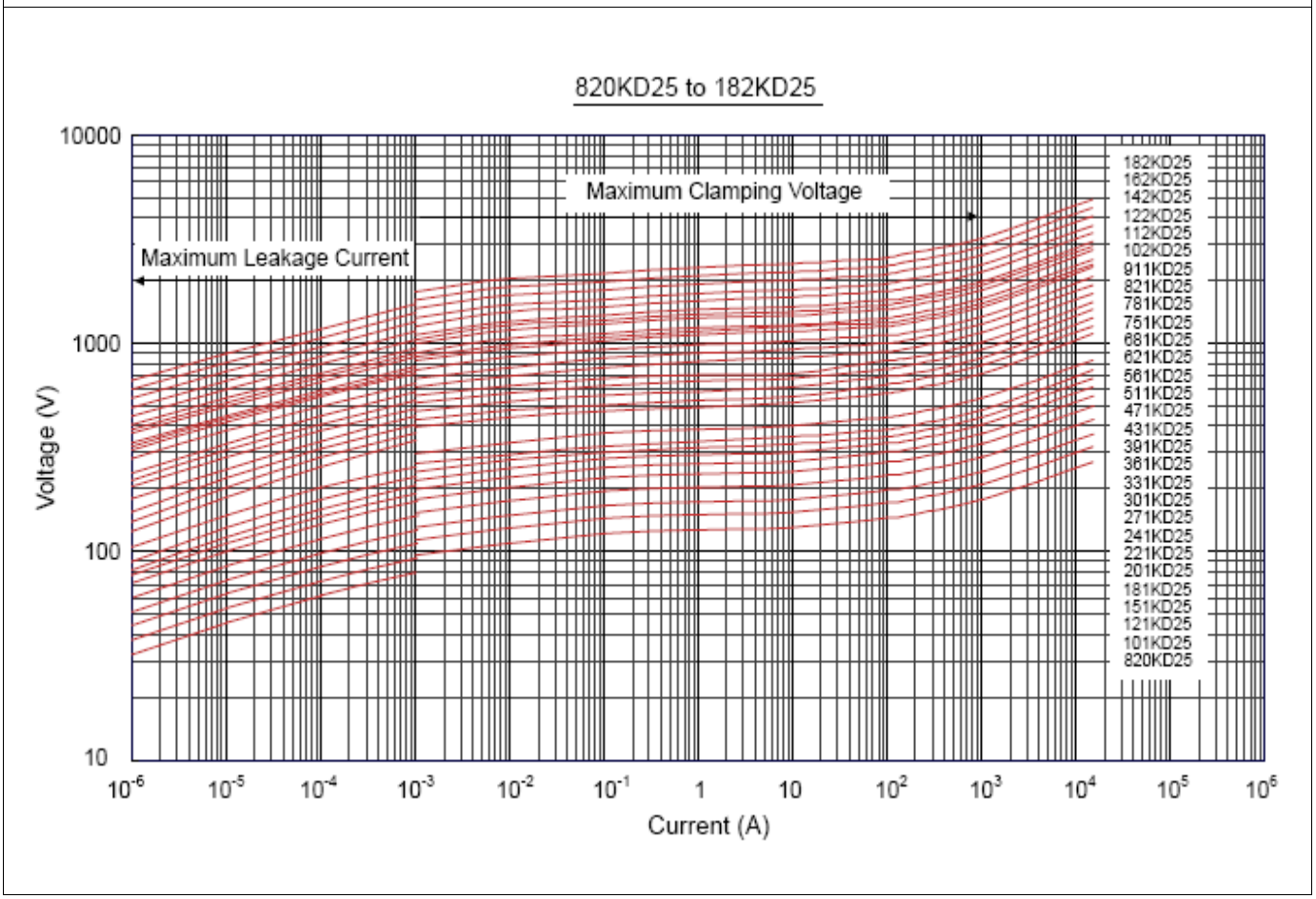
Maximum Surge Current Derating Curve





Maximum Leakage Current and Maximum Clamping Voltage Curve



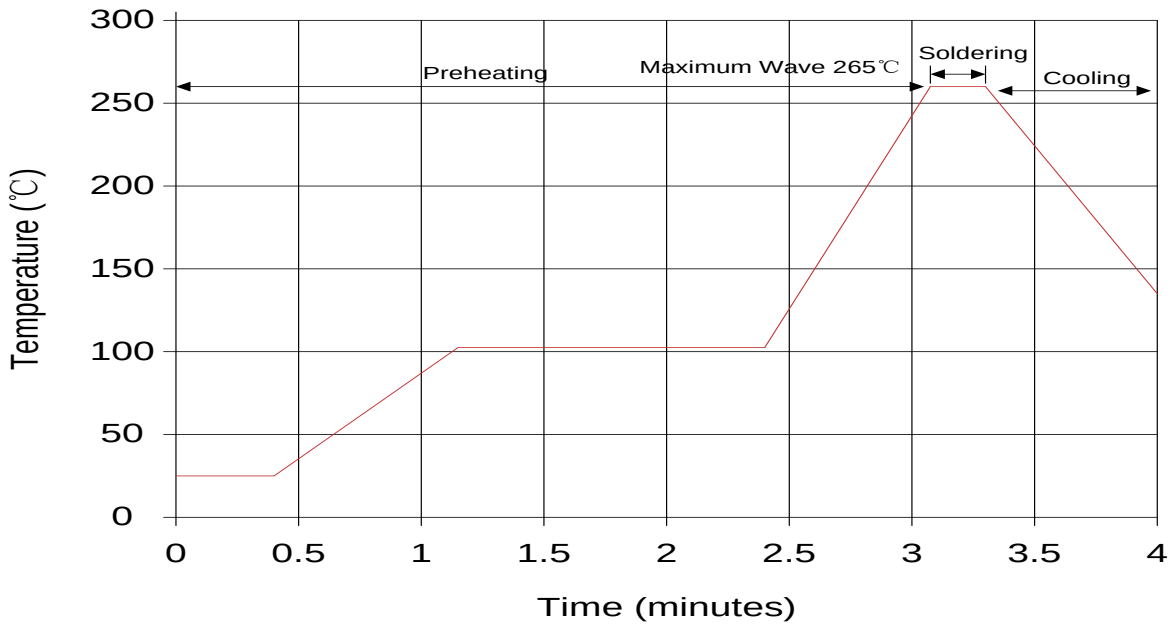


Reliability

Items	Standard	Test conditions / Methods	Specifications
Tensile Strength of Terminals	IEC60068-2-21	Gradually applying the force specified and keeping 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 1.25＜d / 4.0	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
Bending Strength of Terminals	IEC60068-2-21	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 1.25＜d / 2.0	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
Vibration	IEC60068-2-6	Frequency range: 10~55 Hz Amplitude: 0.75mm or 98m/s^2 Direction: 3 mutually perpendicular directions, 2hrs each.	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
Solderability	IEC60068-2-20	Solder Temp: 245±5℃ Dipping Time: 2±0.5 sec	At least 95% of terminal electrode is covered by new solder
Resistance to Soldering Heat	IEC60068-2-20	Solder Temp: 260±5℃ Dipping Time: 10±1 sec	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
High Temperature Storage	IEC60068-2-2	Ambient Temp: 125±2℃ Duration: 1000±24hrs	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
Low Temperature Storage	IEC60068-2-1	Ambient Temp: -40±2℃ Duration: 1000±24hrs	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
Damp Heat, Steady State	IEC60068-2-78	The test is divided into two groups . a. 40±2℃ , 90~95% RH for 1344±24hrs b. 40±2℃ , 90~95% RH,at 10%VDC ,1344±24 hrs	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 10\%$ Insulation Resistance≧100MΩ
High Temperature Load	MIL-STD-202 Method 108	Ambient Temp: 105±2℃ Duration: 1000±24hrs Load: Max. Allowable Voltage In AC.	$\|\Delta V_{1mA}/V_{1mA}\| \leq 10\%$
Temperature Cycle	IEC60068-2-14	The conditions shown below shall be repeated 5 cycles Step / Temperature (℃) / Period (minutes) 1 / -40±3 / 30±3 2 / Room temperature / 5±3 3 / 125±3 / 30±3 4 / Room temperature / 5±3	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 5\%$
8/20uS Surge Life	IEC61051-1	8/20μS waveform,10 surge currents, unipolar, interval 30secs,amplitude corresponding to max. surge current derating curves for 20μS.	No visible damage △Vb(1mA)≦±10%
10/1000μS Surge Life	IEC61051-1	10/1000μS waveform,10 surge currents, unipolar, interval 2mins,amplitude corresponding to max. surge current derating curves for 1000μS.	No visible damage $\|\Delta V_{1mA}/V_{1mA}\| \leq 10\%$
Voltage Proof	IEC61051-1	Metal balls method, 2500Vac 1 min.	No visible damage

Soldering Recommendation

Lead-free Wave Soldering Recommendation

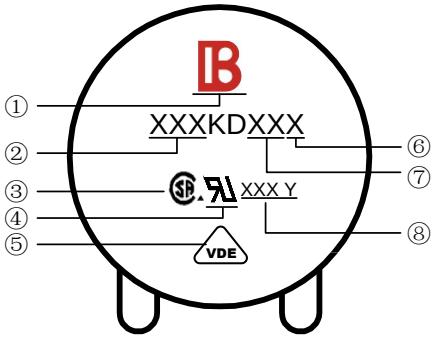


Item	Conditions
Peak Temperature	265℃
Dipping Time	10 seconds (max.)
Soldering	1 time

Recommendation Reworking Conditions with Soldering Iron

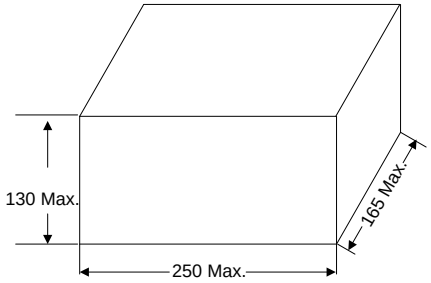
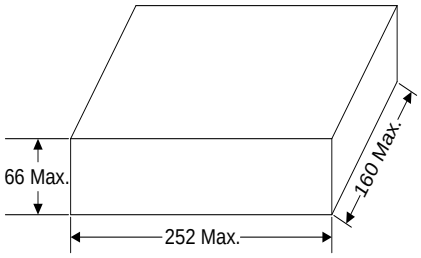
Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 seconds (max.)
Distance from Varistor	2mm (min.)

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

Quantity

Packaging Dimensions (Unit: mm)	Quantity
In bulk for Terminals Untrimmed Products 	100pcs/bag 4bags/box (180K~621K)
	50pcs/bag 4bags/box (681K~182K)
In bulk for Terminals Trimmed Products 	100pcs/bag 4bags/box (180K~621K)
	50pcs/bag 4bags/box (681K~182K)

Storage Condition of Products

(I) Storage Conditions :

1.Storage Temperature : -10℃ ~ +40℃

2.Relative Humidity : ≦80%RH

3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

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