JJV10D Disc Varistors

Rev.1.1

FEATURES

- Wide operating voltages rangingfrom 11to680 V_{RMS}
- Fast response time of less than 25ns, instantly clamping the transient over voltage
- High surge current handling capability
- High energy absorption capability
- Low clamping voltages, providing better surge protection
- Low capacitance values, providing digital switching circuitry protection
- High insulation resistance, preventing electric arching to the adjacent devices or circuits

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

APPLICABLE STANDARDS

- UL1449
- VDE (IEC61051-1, -2, -2-2, IEC60950-1Annex Q)
- CQC (GB/T10193, GB/T10194, GB4943.1, GB8898)

TYPE CODE DESIGNATION

JJV □□ D □□□ K □ □ □

- JJV: JieJie Semiconductor Varistors
- Size(mm): 05mm to 32mm
- Type: D: Disk; S: Square
- Varistor voltage: 180L(18V) to 821K(820V)
- Tolerance: K±10%, L±15%, M±20%
- Lead form: P: straight; C: crimped; I: inner Y: Y kink E: 4KV/2KA; S: 6KV/3KA; Y: 10KV/5KA J: high surge & high energy
- Taping mode: TA: Ammo; TR: Reel
- S:short leg; No: □.□
- H:epoxy coating 125℃

GENERAL TECHNICAL DATA

Parameter	Value	Unit
Operating temperature	-40 to +85	℃
Storage temperature	-40 to +125	℃
Working surface temperature	+115	℃
Insulation resistance	≥100	MΩ
Coating (epoxy resin)	Flame-retardant to UL 94 V-0	

RATINGS AND CHARACTERISTICS

Part No	Maximum allowable voltage		Energy 10/1000μs		Withstanding surge current 8/20μs				Rated POWER	Varistor voltage	Max clamping voltage	Capacitance
	AC V_{RMS}	DC	Standard	High surge	Standard (A)		High surge (A)		W	at 1mA	at 5A	1KHz
	V	V	J	J	1 TIME	2 TIME	1 TIME	2 TIME		V	V	PF
10D180L	11	14	2.8	3.0	500	250	1000	500	0.05	18(15-21)	38	5600
10D220K	14	18	4.5	5.0	500	250	1000	500	0.05	22(20-24)	43	4500
10D270K	17	22	6.0	6.5	500	250	1000	500	0.05	27(24-30)	53	3700
10D330K	20	26	7.4	8.0	500	250	1000	500	0.05	33(30-36)	65	3000
10D390K	25	31	9.1	9.5	500	250	1000	500	0.05	39(35-43)	77	2600
10D470K	30	38	10.8	11	500	250	1000	500	0.05	47(42-52)	93	2100
10D560K	35	45	12.9	13	500	250	1000	500	0.05	56(50-62)	110	1800
10D680K	40	56	15.4	16	500	250	1000	500	0.05	68(61-75)	135	1500

Part No	Maximum allowable voltage		Energy 10/1000μs		Withstanding surge current 8/20μs				Rated POWER	Varistor voltage	Max clamping voltage	Capacitance
	AC V_{RMS}	DC	Standard	High surge	Standard (A)		High surge (A)		W	at 1mA	at 25A	1KHz
	V	V	J	J	1 TIME	2 TIME	1 TIME	2 TIME		V	V	PF
10D820K	50	65	16.8	17.0	2500	1250	3500	2500	0.4	82(74-90)	135	1200
10D101K	60	85	18.2	18.5	2500	1250	3500	2500	0.4	100(90-110)	165	1000
10D121K	75	100	21.0	21.5	2500	1250	3500	2500	0.4	120(108-132)	200	830
10D151K	95	125	15.2	26.0	2500	1250	3500	2500	0.4	150(135-165)	250	670
10D181K	115	150	30.8	38.0	2500	1250	3500	2500	0.4	180(162-198)	300	560
10D201K	130	170	42.0	42.5	2500	1250	3500	2500	0.4	200(185-225)	330	500
10D221K	140	180	46.2	46.5	2500	1250	3500	2500	0.4	220(198-242)	360	450
10D241K	150	200	50.4	51.0	2500	1250	3500	2500	0.4	240(216-264)	395	420
10D271K	175	225	57.4	58.0	2500	1250	3500	2500	0.4	270(243-297)	455	370
10D301K	190	250	63.0	63.5	2500	1250	3500	2500	0.4	300(270-330)	505	330
10D331K	210	275	68.6	69.0	2500	1250	3500	2500	0.4	330(297-363)	550	300
10D361K	230	300	74.2	75.0	2500	1250	3500	2500	0.4	360(324-396)	595	280
10D391K	250	320	81.2	82.0	2500	1250	3500	2500	0.4	390(351-429)	650	260
10D431K	275	350	88.2	89.0	2500	1250	3500	2500	0.4	430(387-473)	710	230
10D471K	300	385	96	100	2500	1250	3500	2500	0.4	470(423-517)	775	210
10D511K	320	415	98	102	2500	1250	3500	2500	0.4	510(459-561)	845	200
10D561K	350	460	100	104	2500	1250	3500	2500	0.4	560(504-616)	920	180
10D621K	385	505	102	106	2500	1250	3500	2500	0.4	620(558-682)	1025	160
10D681K	420	560	104	108	2500	1250	3500	2500	0.4	680(612-748)	1120	150
10D751K	460	615	110	118	2500	1250	3500	2500	0.4	750(675-825)	1240	140
10D781K	485	640	118	120	2500	1250	3500	2500	0.4	780(702-858)	1290	130
10D821K	510	670	122	125	2500	1250	3500	2500	0.4	820(738-902)	1355	120
10D911K	550	745	128	134	2500	1250	3500	2500	0.4	910(819-1001)	1500	110
10D102K	625	825	131	140	2500	1250	3500	2500	0.4	1000(900-1100)	1650	100
10D112K	680	895	133	155	2500	1250	3500	2500	0.4	1100(990-1210)	1815	90

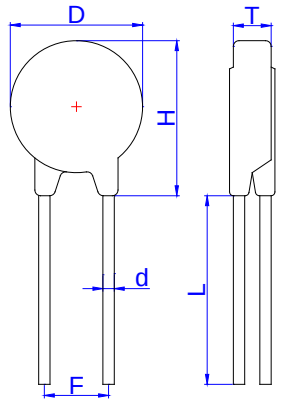
RELIABILITY TESTS - Mechanical Ratings

<table>
<tr><th>Parameter</th><th colspan="3">Condition</th><th>Requirements</th></tr>
<tr><td rowspan="4">Terminal Pull Strength</td><td rowspan="4">Aftergraduallyapplying theload specifiedbelowandkeeping theunitfixedfortenseconds,theterminal shall bevisually examinedforanydamage.</td><td>Diameter</td><td>Loading</td><td rowspan="4">Novisible damage</td></tr>
<tr><td>0.6mm</td><td>1.0Kg</td></tr>
<tr><td>0.8mm</td><td>1.0Kg</td></tr>
<tr><td>1.0mm</td><td>2.0Kg</td></tr>
<tr><td rowspan="4">Terminal Bending Strength</td><td rowspan="4">The unit shall be secured with its terminal kept vertical and the weight specified below be applied in the axial direction. The terminal shall gradually be bent by 90° in one direction, then 90° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined.</td><td>Diameter</td><td>Loading</td><td rowspan="4">Novisible damage</td></tr>
<tr><td>0.6mm</td><td>0.5Kg</td></tr>
<tr><td>0.8mm</td><td>0.5Kg</td></tr>
<tr><td>1.0mm</td><td>1.0Kg</td></tr>
<tr><td>Vibration</td><td colspan="3">The specimen shall be vibrated by its lead wires with a total amplitude of 1.5mm and a varying frequency of 10~55~10HZ(each minutes) for a period of 2 hours respectively in each X, Yand Z directions.</td><td>Novisible damage $\Delta V_{1mA}/V_{1mA} \leq \pm 5$ %</td></tr>
<tr><td>Soldering-solderability</td><td colspan="3">After dipping the terminal to depth of approximately 3mm from the specimen in a soldering bath of 260℃ for 10±1 (D5:5±1) seconds. Thereafter the terminal shall be visually examined.</td><td>Terminations shall be uniformly tinned</td></tr>
<tr><td>Soldering-Resistance to Solder Heat</td><td colspan="3">After preheating the specimen, the specimen shall be completely immersed into a soldering bath having a temperature of 260±5℃ for 10±1 (D5:5±1) seconds or iron of 400±5℃ for 3±0.5 seconds. Thereafter the change of V_{1mA} and mechanical damage shall be examined.</td><td>Novisible damage $\Delta V_{1mA}/V_{1mA} \leq \pm 5$ %</td></tr>
</table>

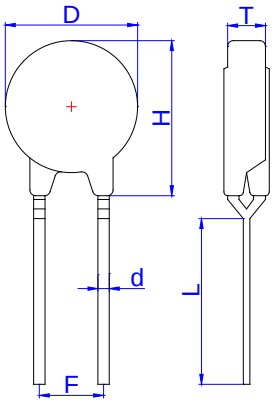
RELIABILITY TESTS - Environmental ratings

<table>
<tr><th>Parameter</th><th colspan="4">Condition</th><th>Requirements</th></tr>
<tr><td>Dry HeatLoading</td><td colspan="4">The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter the change of V_{1mA} and mechanical damage shall be examined.
Ambient temp.: 125±2℃; Period: 1000±24hours.</td><td>$\Delta V_{1mA}/V_{1mA}\leq\pm10\%$</td></tr>
<tr><td>High Temperature Storage</td><td colspan="4">In a drying oven without load.
Ambient temp.: 125±2℃; period: 1000±24hours</td><td>$\Delta V_{1mA}/V_{1mA}\leq\pm5$ %</td></tr>
<tr><td>Damp Heat Loading</td><td colspan="4">The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of $V_{1mA}$and mechanical damage shall be examined.
Ambient condition: 40±2℃,90 to 95%R.H.; period:1000±24 hours</td><td>$\Delta V_{1mA}/V_{1mA}\leq\pm10\%$</td></tr>
<tr><td>Temperature Cycle</td><td colspan="3">Condition the specimen to each temperature form step 1 to step4 in this order for the period shown in the table of specifications. The change of $V_{1mA}$and mechanical damage shall be examined after 2 hours. Repeat 5 cycles.</td><td>Step / Temp(℃) / Period
1 / -40±3℃ / 30 min.
2 / RoomTemp. / 15 min.
3 / 85±2℃ / 30 min.
4 / RoomTemp. / 15 min.</td><td>Novisible damage
$\Delta V_{1mA}/V_{1mA}\leq\pm10\%$</td></tr>
<tr><td>Surge Lifetime Rating</td><td colspan="4">The change of V_{1mA} shall be measured after the impulse listed below is applied 10,000 times continuously with the interval often seconds at room temperature.</td><td>Novisible damage
$\Delta V_{1mA}/V_{1mA}\leq\pm10\%$</td></tr>
<tr><td>Voltage Proof</td><td colspan="4">Voltage: 2500V_{AC}; Leakage Current≤0.5mA; Time: 60 Seconds</td><td>No Breakdown</td></tr>
</table>

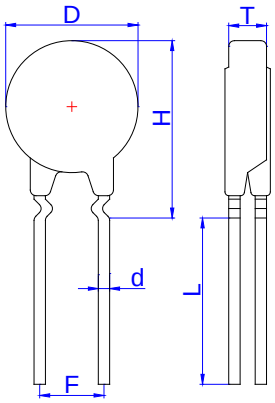
DIMENSIONAL DRAWINGS



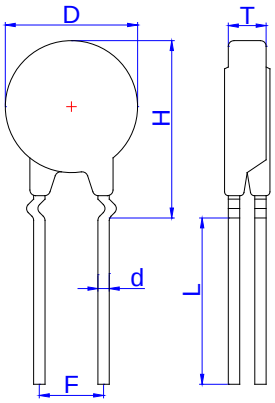
S Type (Straight Lead)



Y Lead Type (Y Kink Lead)



I Type (Inner Crimped Lead)



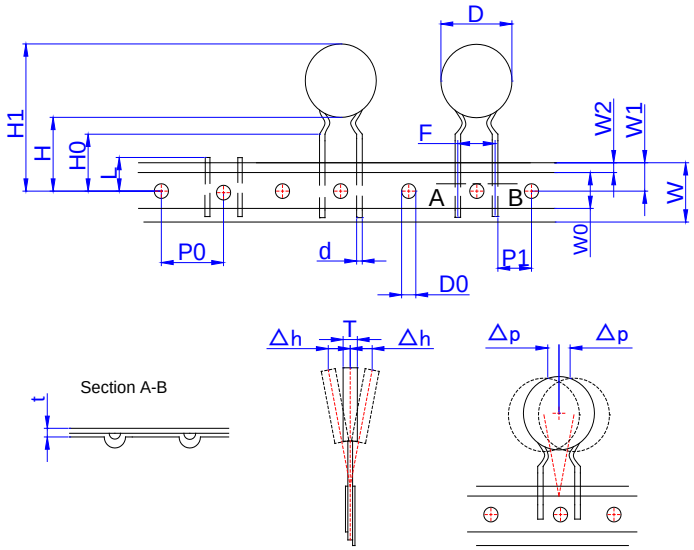
C Type (Out Crimped Lead)

Ref.		Dimensions					
		Millimeters			Inches		
		Min.	Typ.	Max.	Min.	Typ.	Max.
D	/			12.5			0.492
	6KV/3KA			14.5			0.571
L		15.0			0.591		
d		0.75	0.80	0.85	0.030	0.031	0.033
F		6.7	7.5	8.3	0.264	0.295	0.327
H	SB			16.0			0.630
	CB/IB/YB			20.0			0.787
T	10D112K			7.8			0.307
	10D102K			7.6			0.299
	10D911K			7.2			0.283
	10D821K			6.8			0.268
	10D751K			6.5			0.256
	10D681K			6.4			0.252
	10D621K			6.4			0.252
	10D561K			6.2			0.244
	10D511K			5.8			0.228
	10D471K			5.6			0.220
	10D431K			5.3			0.209
	10D391K			5.1			0.201
	10D361K			5.0			0.197
	10D331K			4.8			0.190
	10D301K			4.7			0.185
	10D271K			4.5			0.177
	10D241K			4.3			0.169
	10D221K			4.2			0.165
	10D201K			4.1			0.161
	10D181K			4.1			0.161
	10D151K			4.8			0.190
	10D121K			4.5			0.177
	10D101K			4.3			0.169
	10D820K			4.1			0.161
	10D680K			4.5			0.177
	10D560K			4.5			0.177
	10D470K			4.5			0.177
	10D390K			4.5			0.177
	10D330K			4.5			0.177
	10D270K			4.5			0.177
	10D220K			4.5			0.177
	10D180L			4.5			0.177

MARKING

Trademark	
Part No.	10D180L~121K
Standard for safety	UL/ VDE/ CQC
Date Code	Y: Year M: Month
J	High surge
E*/ S*/ Y*	4KV/2KA / 6KV/3KA / 10KV/5KA

TAPINGAND PACKAGING SPECIFICATION OF LEADED VARISTORS

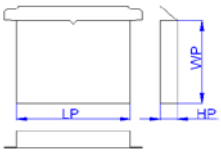
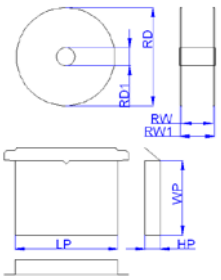


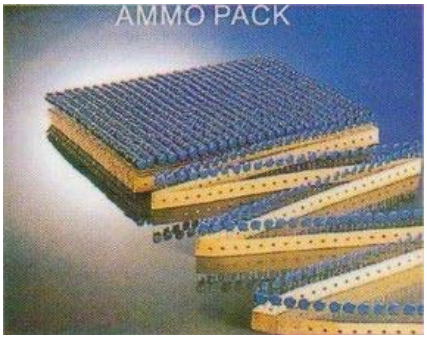
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D	Refer to "Dimensional drawings"					
T	Refer to "Dimensional drawings"					
d	0.75	0.8	0.85	0.03	0.031	0.033
P0	12.4	12.7	13.0	0.49	0.5	0.51
P1	8.15	8.95	9.75	0.32	0.35	0.38
F	6.7	7.5	8.3	0.26	0.30	0.33
Δh	Depends on T					
Δp		0	2.0		0	0.079
W	17.5	18.0	18.5	0.69	0.71	0.73
W0	11.0			0.43		
W1	8.5	9.0	9.75	0.33	0.35	0.37
W2			3.0			0.12
H	18.0	18.0	18.2	0.71	0.71	0.72
H0	15.5	16.0	16.5	0.61	0.63	0.65
H1			45.0			1.77
D0	3.8	4.0	4.2	0.15	0.16	0.17
t			0.9			0.04
L			11.0			0.43

1) The value of H applies only to unkinked types

2) H_0 = 18 mm upon request applies only to kinked types.

- Taping mode

Packing	Dimensions	Symbol	10D
AMMO		LP	335mm
		WP	243mm
		HP	50mm
		Carton	355×260×537
REEL		RD	340mm
		RD1	30±0.5mm
		RW	51mm
		RW1	56mm
		LP	345mm
		WP	345mm
		HP	65mm
		Carton	360×360×480

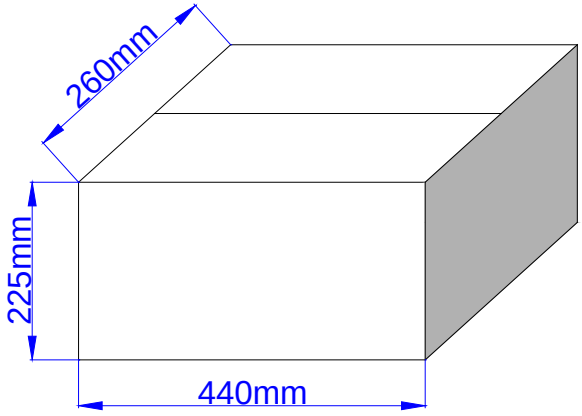


- Quantity of taping packing(pcs)

Dimension	Part No.	Ammo		Reel	
		Box	Carton	Box	Carton
10D	180L to 471K	1000	10000	1500	6000
10D	511K to 821K	800	8000	1300	5200

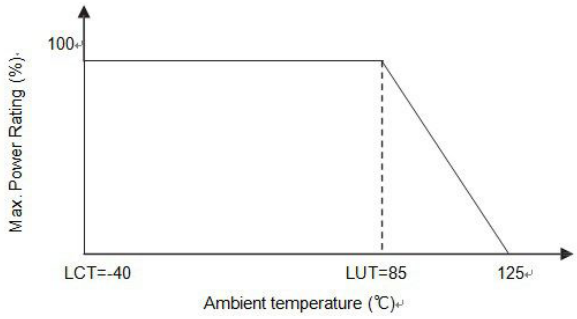
- Quantity of bulk packing method (pcs)

Dimension	Part No.	Bag	Small Carton	Carton
10D	180L to 112K	500	5000	10000
10D (short leg)	180L to 112K	500	7500	15000

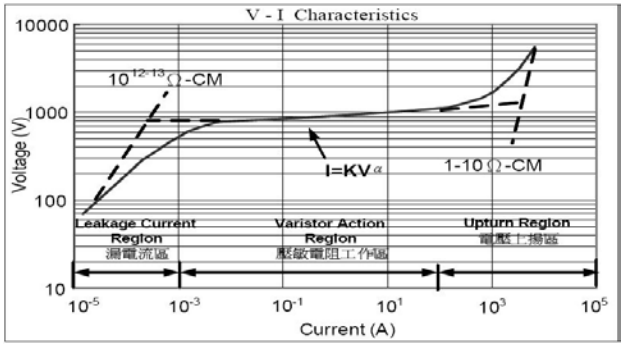


VARISTOR CHARACTERISTICS CURVE

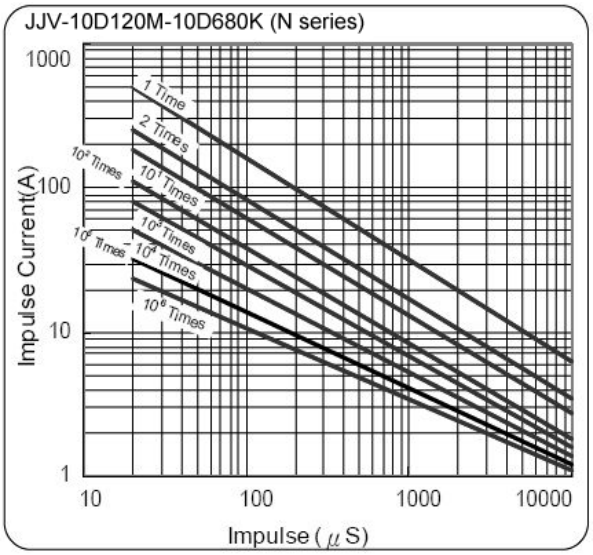
Power derating curve

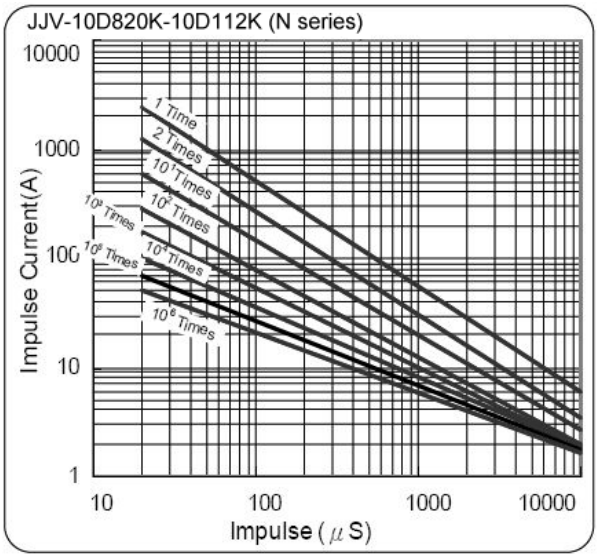


Varistor V-I characteristics curve

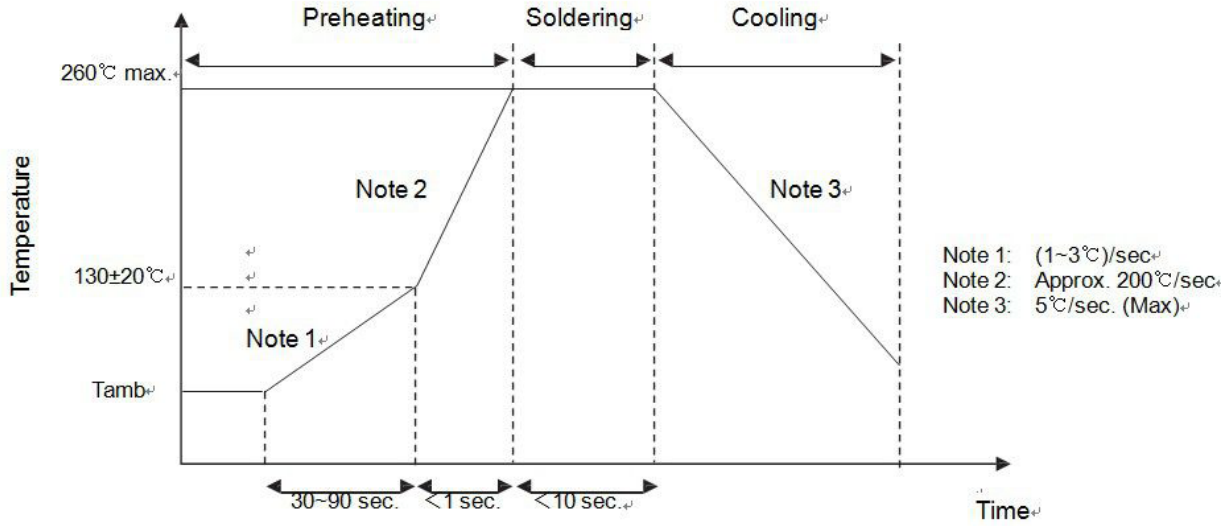


Surge life time ratings N (standard) / K (low capacitance) series



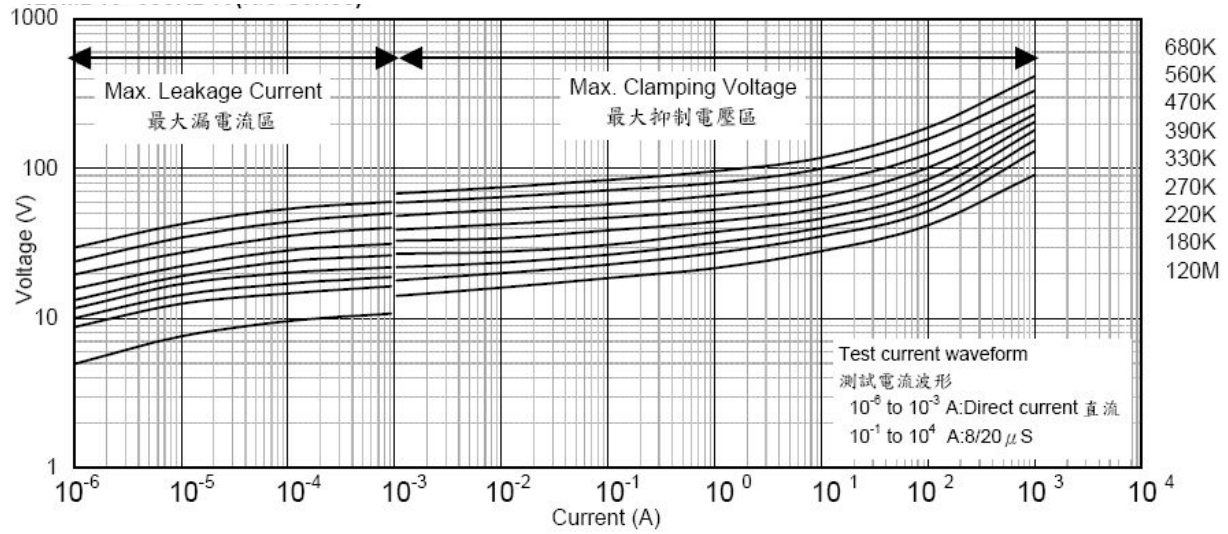


Soldering recommendation - wave soldering profile

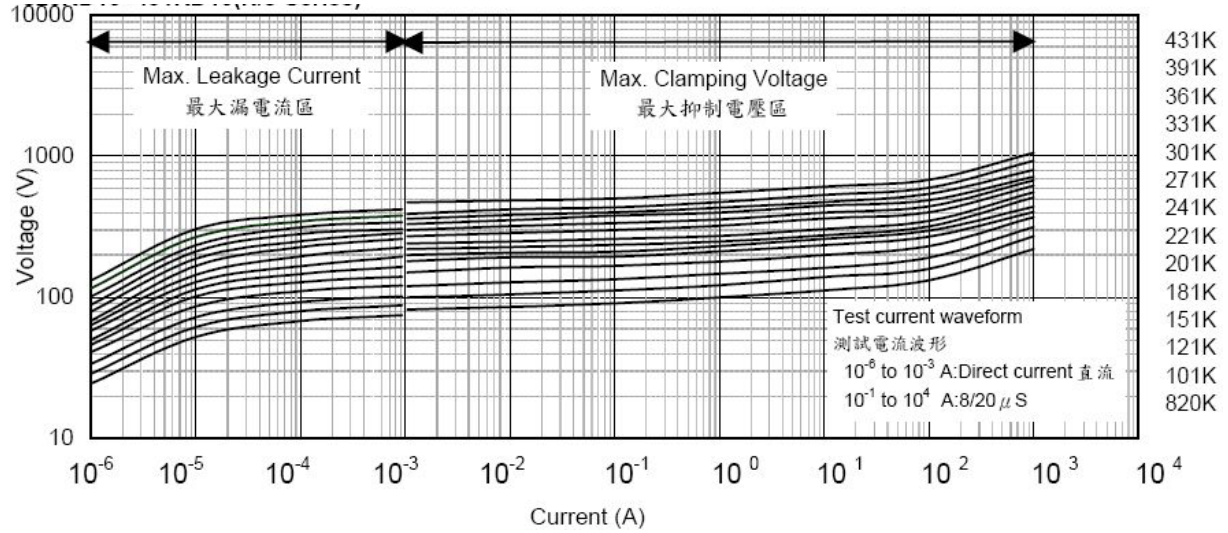


V-Icurves

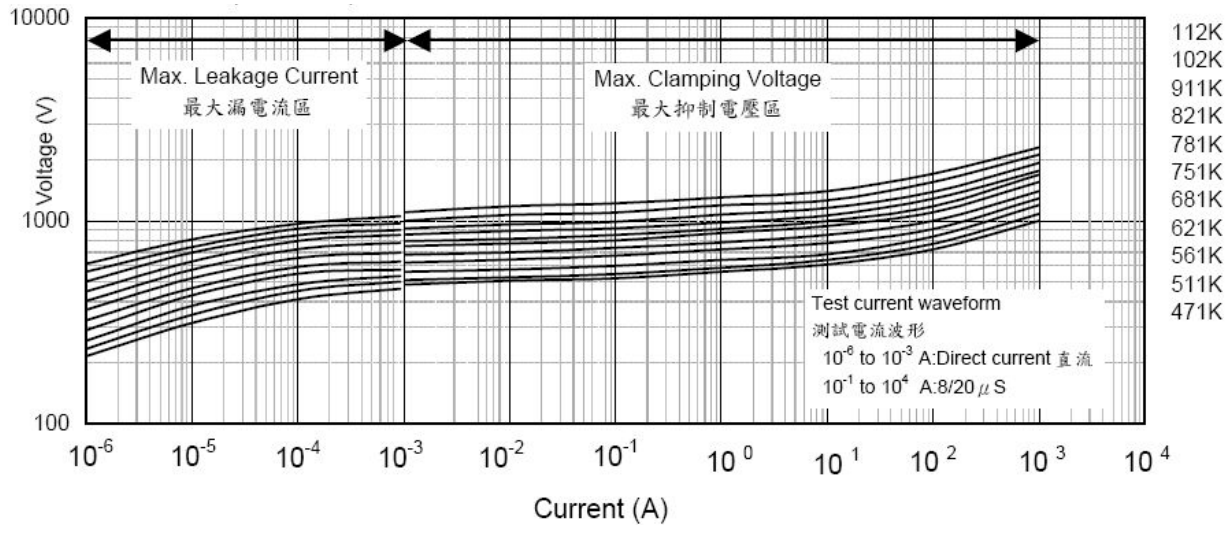
JJV-10D120M-10D680K (N/J series)



JJV-10D820K-10D431K (N/J series)



JJV-10D471K-10D112K (N/J series)



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