JJV14D Disc Varistors

Rev.1.1

FEATURES

- Wide operating voltages rangingfrom 11to1,000 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 10A	1KHz
	V	V	J	J	1 TIME	2 TIME	1 TIME	2 TIME		V	V	PF
14D180L	11	14	6.6	7.0	1000	500	2000	1000	0.1	18(15-21)	38	11100
14D220K	14	18	7.6	8.0	1000	500	2000	1000	0.1	22(20-24)	43	9100
14D270K	17	22	9.7	10.0	1000	500	2000	1000	0.1	27(24-30)	53	7400
14D330K	20	26	12.3	12.5	1000	500	2000	1000	0.1	33(30-36)	65	6100
14D390K	25	31	13.2	13.0	1000	500	2000	1000	0.1	39(35-43)	77	5100
14D470K	30	38	16.8	17.0	1000	500	2000	1000	0.1	47(42-52)	93	4300
14D560K	35	45	19.6	20	1000	500	2000	1000	0.1	56(50-62)	110	3600
14D680K	40	56	23.8	24	1000	500	2000	1000	0.1	68(61-75)	135	2900

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 50A	1KHz
	V	V	J	J	1 TIME	2 TIME	1 TIME	2 TIME		V	V	PF
14D820K	50	65	29.4	30.0	4500	2500	6000	5000	0.6	82(74-90)	135	2400
14D101K	60	85	33.6	35.0	4500	2500	6000	5000	0.6	100(90-110)	165	2000
14D121K	75	100	40.6	42.0	4500	2500	6000	5000	0.6	120(108-132)	200	1700
14D151K	95	125	51.8	53.0	4500	2500	6000	5000	0.6	150(135-165)	250	1300
14D181K	115	150	58.8	74.0	4500	2500	6000	5000	0.6	180(162-198)	300	1100
14D201K	130	170	75.2	78.6	4500	2500	6000	5000	0.6	200(185-225)	330	1000
14D221K	140	180	79.8	80.5	4500	2500	6000	5000	0.6	220(198-242)	360	900
14D241K	150	200	82.6	86.0	4500	2500	6000	5000	0.6	240(216-264)	395	830
14D271K	175	225	84.0	94.0	4500	2500	6000	5000	0.6	270(243-297)	455	740
14D301K	190	250	103	105	4500	2500	6000	5000	0.6	300(270-330)	505	670
14D331K	210	275	112	115	4500	2500	6000	5000	0.6	330(297-363)	550	610
14D361K	230	300	123	130	4500	2500	6000	5000	0.6	360(324-396)	595	560
14D391K	250	320	135	140	4500	2500	6000	5000	0.6	390(351-429)	650	510
14D431K	275	350	145	155	4500	2500	6000	5000	0.6	430(387-473)	710	460
14D471K	300	385	147	175	4500	2500	6000	5000	0.6	470(423-517)	775	430
14D511K	320	415	148	180	4500	2500	6000	5000	0.6	510(459-561)	845	390
14D561K	350	460	150	186	4500	2500	6000	5000	0.6	560(504-616)	920	360
14D621K	385	505	155	188	4500	2500	6000	5000	0.6	620(558-682)	1025	320
14D681K	420	560	160	190	4500	2500	6000	5000	0.6	680(612-748)	1120	290
14D751K	460	615	180	210	4500	2500	6000	5000	0.6	750(675-825)	1240	270
14D781K	485	640	190	211	4500	2500	6000	5000	0.6	780(702-858)	1290	260
14D821K	510	670	203	235	4500	2500	6000	5000	0.6	820(738-902)	1355	230
14D911K	550	745	208	255	4500	2500	6000	5000	0.6	910(819-1001)	1500	220
14D102K	625	825	212	280	4500	2500	6000	5000	0.6	1000(900-1100)	1650	200
14D112K	680	895	217	310	4500	2500	6000	5000	0.6	1100(990-1210)	1815	180
14D152K	900	1200	266	420	4500	2500	6000	5000	0.6	1500(1350-1650)	2475	130
14D182K	1000	1465	336	510	4500	2500	6000	5000	0.6	1800(1620-1980)	2970	110

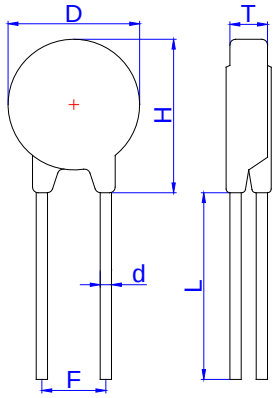
RELIABILITY TESTS - Mechanical Ratings

<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>

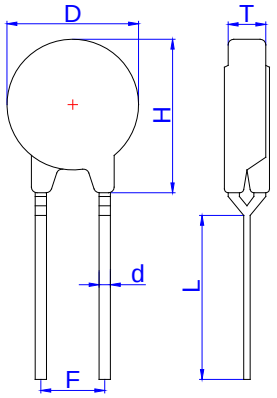
RELIABILITY TESTS - Environmental ratings

<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 V1mA 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 rowspan="5">Temperature Cycle</td><td rowspan="5">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</td><td>Temp(℃)</td><td>Period</td><td rowspan="5">Novisible damage
$\Delta V_{1mA}/V_{1mA}\leq\pm10\%$</td></tr>
<tr><td>1</td><td>-40±3℃</td><td>30 min.</td></tr>
<tr><td>2</td><td>RoomTemp.</td><td>15 min.</td></tr>
<tr><td>3</td><td>85±2℃</td><td>30 min.</td></tr>
<tr><td>4</td><td>RoomTemp.</td><td>15 min.</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>

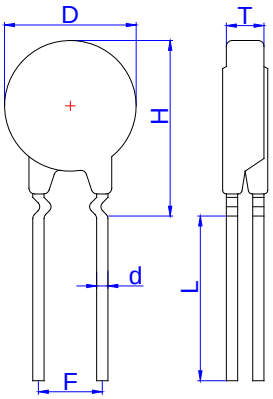
DIMENSIONAL DRAWINGS



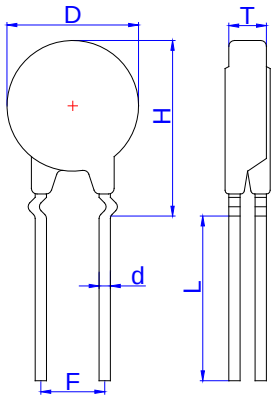
S Type (Straight Lead)



Y Lead Type (Y Kink Lead)



I Type (Inner Crimped Lead)



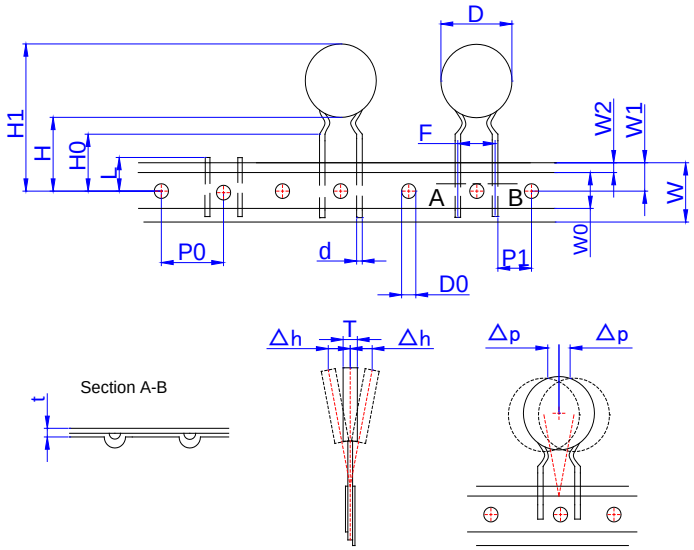
C Type (Out Crimped Lead)

Ref.		Dimensions					
		Millimeters			Inches		
		Min.	Typ.	Max.	Min.	Typ.	Max.
D				17.0			0.669
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			18.0			0.709
	CB/IB/YB			22.0			0.866
T	14D182K			12.5			0.492
	14D152K			11.0			0.433
	14D112K			8.5			0.335
	14D102K			7.8			0.307
	14D911K			7.6			0.299
	14D821K			7.2			0.283
	14D781K			6.8			0.268
	14D751K			6.5			0.256
	14D681K			6.4			0.252
	14D621K			6.4			0.252
	14D561K			6.2			0.244
	14D511K			5.8			0.228
	14D471K			5.6			0.220
	14D431K			5.3			0.209
	14D391K			5.1			0.201
	14D361K			5.0			0.197
	14D331K			4.8			0.190
	14D301K			4.7			0.185
	14D271K			4.5			0.177
	14D241K			4.3			0.169
	14D221K			4.2			0.165
	14D201K			4.1			0.161
	14D181K			4.1			0.161
	14D151K			4.8			0.190
	14D121K			4.5			0.177
	14D101K			4.3			0.169
	14D820K			4.1			0.161
	14D680K			4.1			0.161
	14D560K			4.1			0.161
	14D470K			4.5			0.177
	14D390K			4.5			0.177
	14D330K			4.2			0.165
	14D270K			4.0			0.157
	14D220K			4.0			0.157
	14D180L			4.0			0.157

MARKING

Trademark	
Part No.	14D180L~182K
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

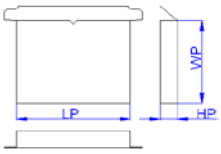
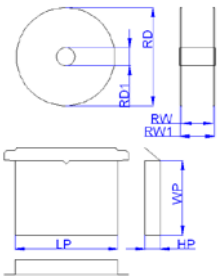


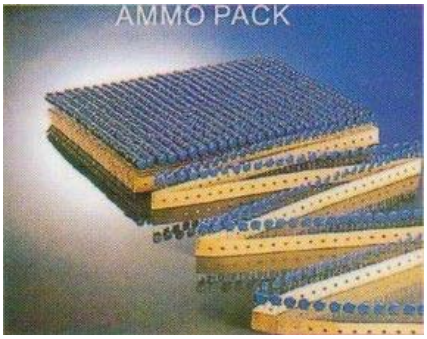
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D	Refer to "Dimensional drawings"					
T	Refer to "Dimensional drawings"					
d	0.75	0.8	0.85	0.03	0.031	0.033
P0	12.4	12.7	13.0	0.49	0.5	0.51
P1	8.15	8.95	9.75	0.32	0.35	0.38
F	6.7	7.5	8.3	0.26	0.30	0.33
Δh	Depends on T					
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	14D
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

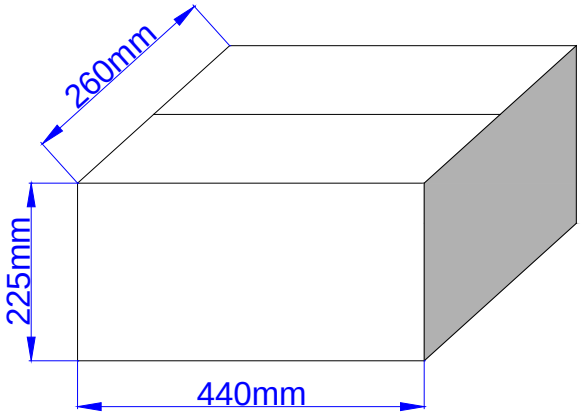


- Quantity of taping packing(pcs)

Dimension	Part No.	Ammo		Reel	
		Box	Carton	Box	Carton
14D	180L to 471K	1000	10000	500	2000
14D	511K to 821K	800	8000	300	1200

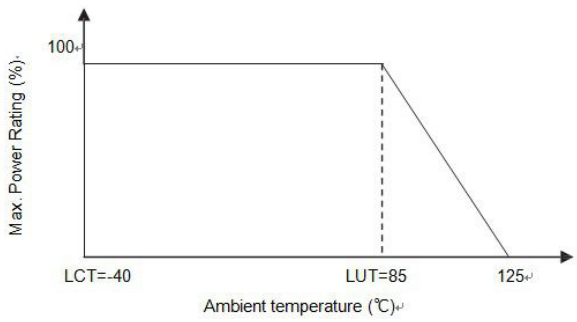
- Quantity of bulk packing method (pcs)

Dimension	Part No.	Bag	Small Carton	Carton
14D	180L to 681K	500	3000	6000
14D (short leg)	180L to 681K	500	4000	8000
14D	751L to 182K	500	2500	5000
14D (short leg)	751L to 182K	500	3000	6000

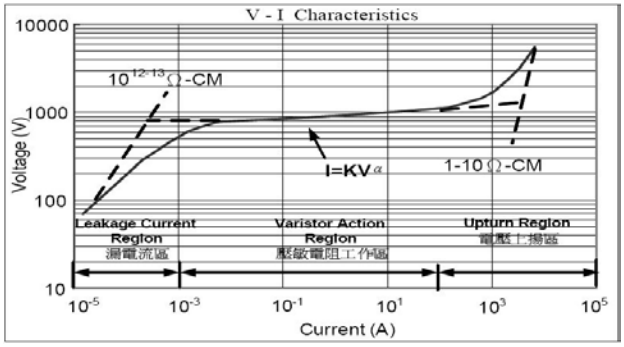


VARISTOR CHARACTERISTICS CURVE

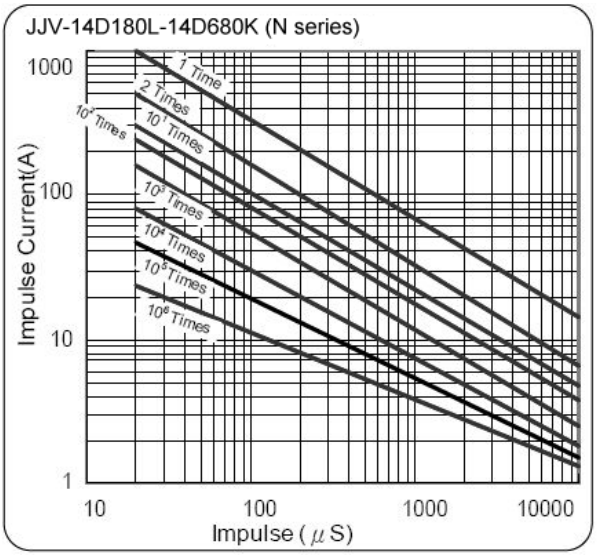
Power derating curve

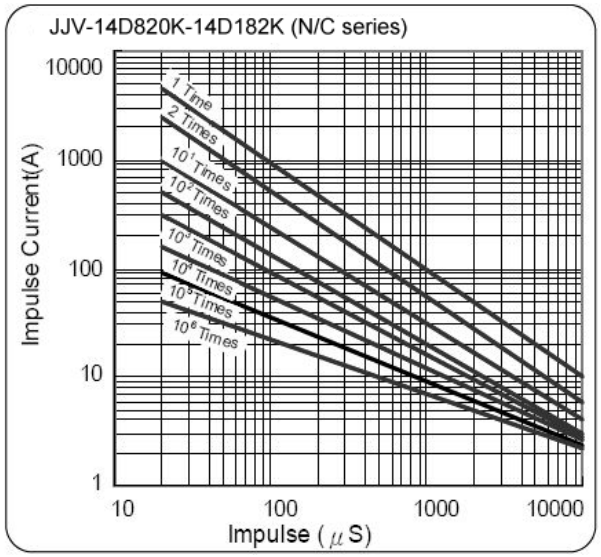


Varistor V-I characteristics curve

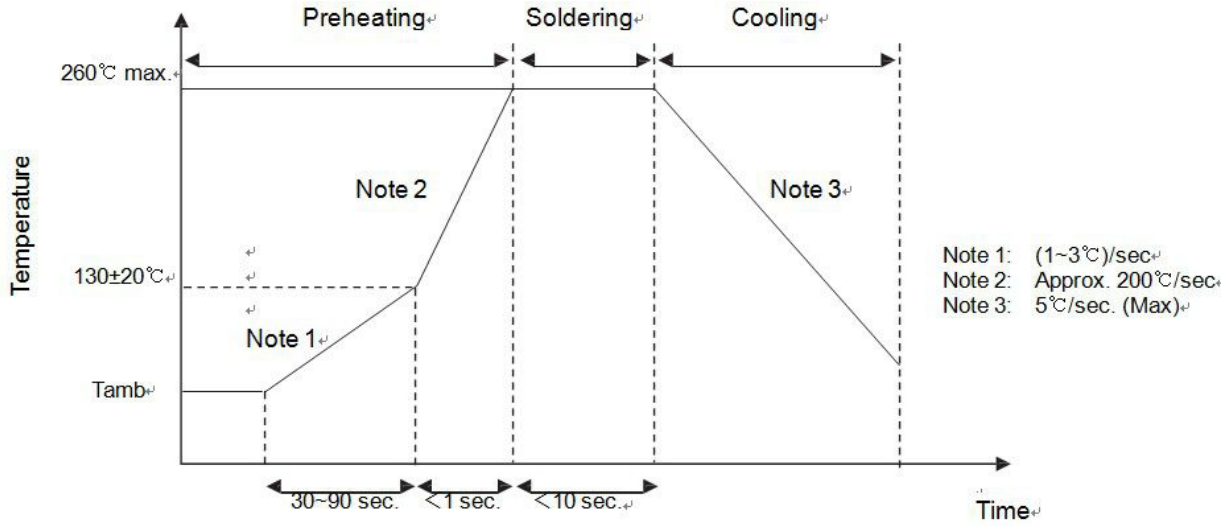


Surge life time ratings N (standard) / K (low capacitance) series



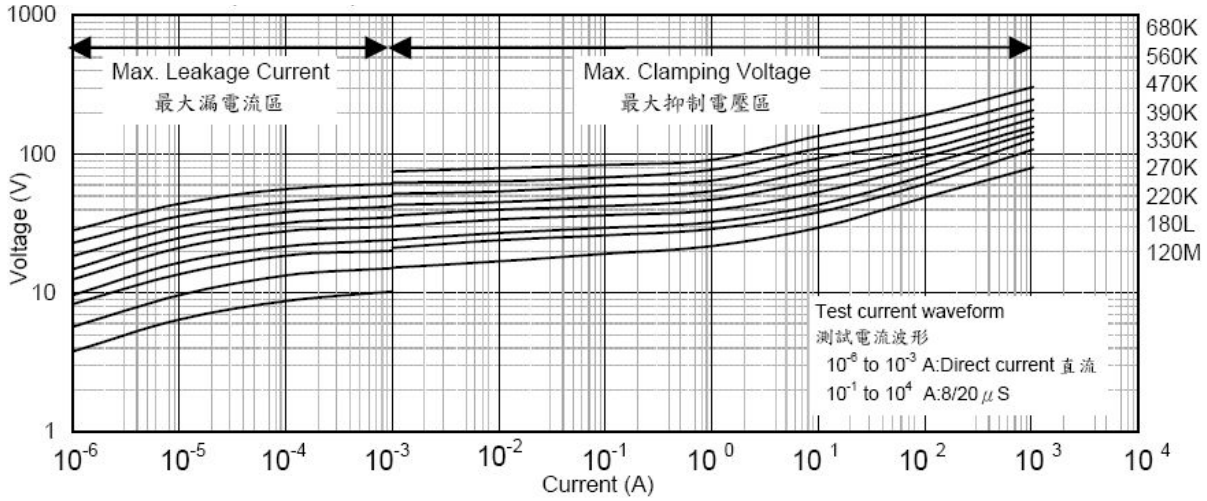


Soldering recommendation - wave soldering profile

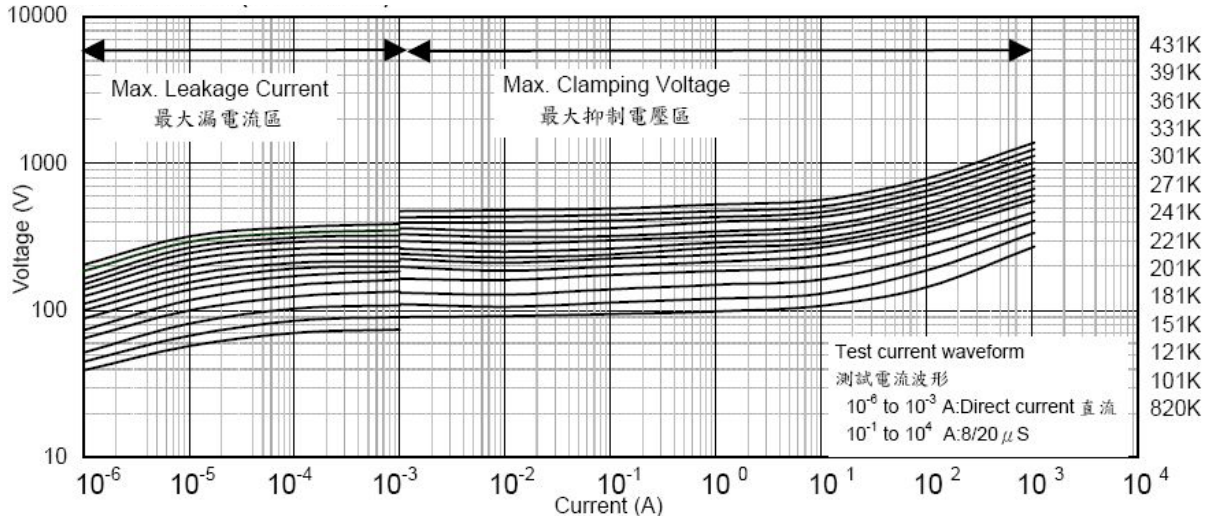


V-Icurves

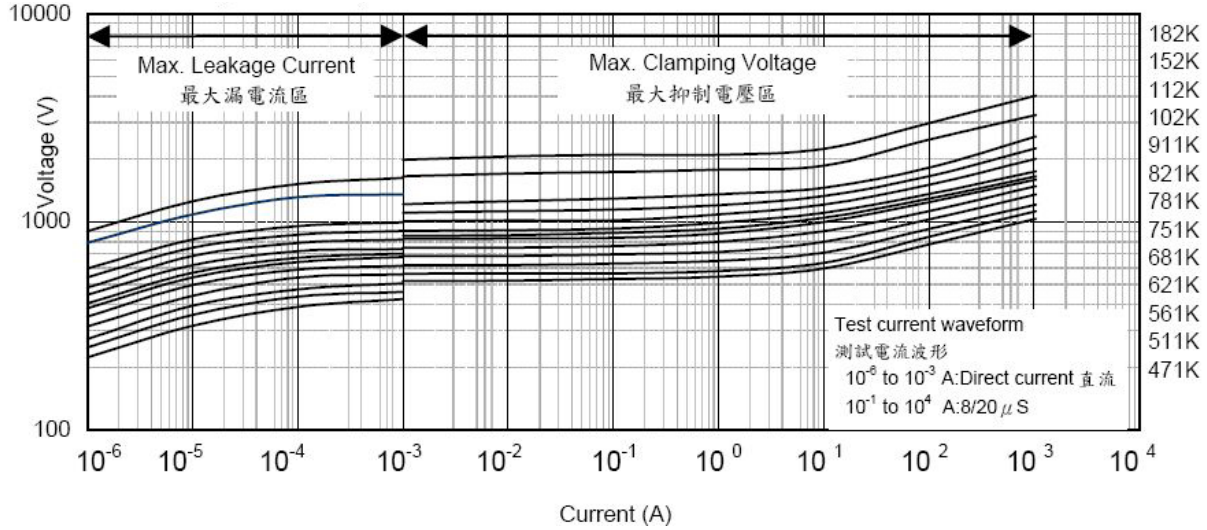
JJV-14D180L-14D680K (N/J/S series)



JJV-14D820K-14D431K (N/J/S series)



JJV-14D471K-14D182K (N/J/S series)



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