

Features

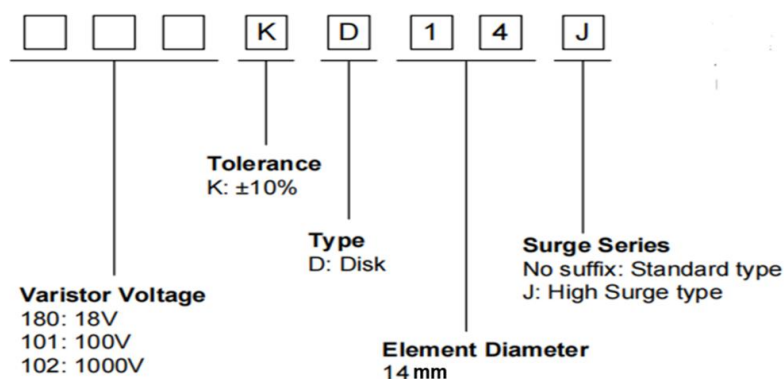
- ◆ Wide operating voltage (V_{1mA}) range from 18V to 1800V
- ◆ Fast responding to transient over-voltage
- ◆ Large absorbing transient energy capability
- ◆ Low clamping ratio and no follow-on current
- ◆ Meets MSL level 1, per J-STD-020
- ◆ Large absorbing transient current capability
- ◆ Operating Temperature: $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$
- ◆ Storage Temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$



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 Coding System



Dimensions

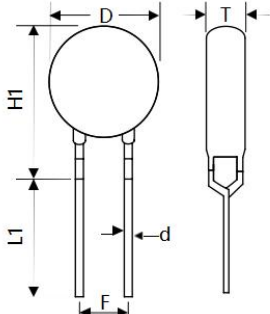
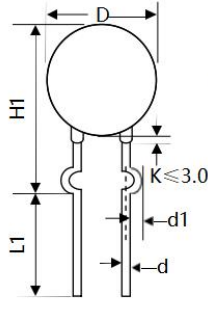
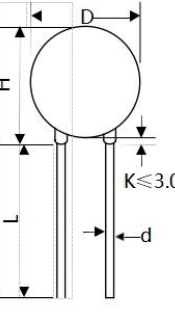
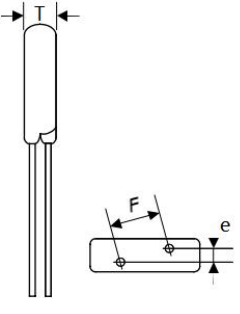
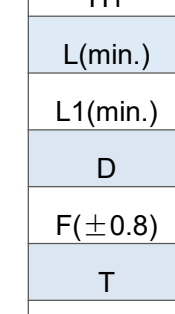
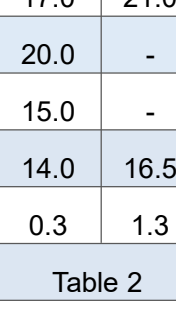
	Ref.	Millimeters	
		Min	Max
	H	14.5	20.0
	H1	17.0	21.0
	L(min.)	20.0	-
	L1(min.)	15.0	-
	D	14.0	16.5
	F(±0.8)	0.3	1.3
	T	Table 2	
	e(±0.8)	Table 2	
	d(±0.05)	0.75	0.85
	d1(±0.4)	1	1.8

Table2
Millimeters

Model	T	e	Model	T	e
180K	2.0~3.9	1.5	361K	2.9~5.2	2.7
220K	2.1~4.0	1.6	391K	3.0~5.4	2.8
270K	2.1~4.1	1.8	431K	3.2~5.6	3.0
330K	2.2~4.3	1.7	471K	3.3~5.8	3.2
390K	2.1~4.1	1.8	511K	3.4~6.1	3.4
470K	2.2~4.3	1.9	561K	3.6~6.4	3.6
560K	2.3~4.6	2.1	621K	3.8~6.8	3.9
680K	2.4~4.8	2.4	681K	4.0~7.1	4.2
820K	2.1~4.1	1.8	751K	4.3~7.2	4.3
101K	2.4~4.2	2.0	781K	4.4~7.3	4.4
121K	2.4~4.4	2.2	821K	4.6~7.5	4.6
151K	2.2~4.1	1.8	911K	4.8~7.5	5.0
181K	2.3~4.2	1.9	102K	5.4~8.0	5.0
201K	2.4~4.3	2.0	112K	5.8~8.5	5.4
221K	2.5~4.4	2.1	122K	5.9~9.0	5.8
241K	2.6~4.5	2.2	142K	6.9~10.5	6.6
271K	2.6~4.6	2.4	162K	7.4~11.0	7.4
301K	2.7~4.6	2.5	182K	7.6~12.0	8.2
331K	2.7~5.0	2.5			

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

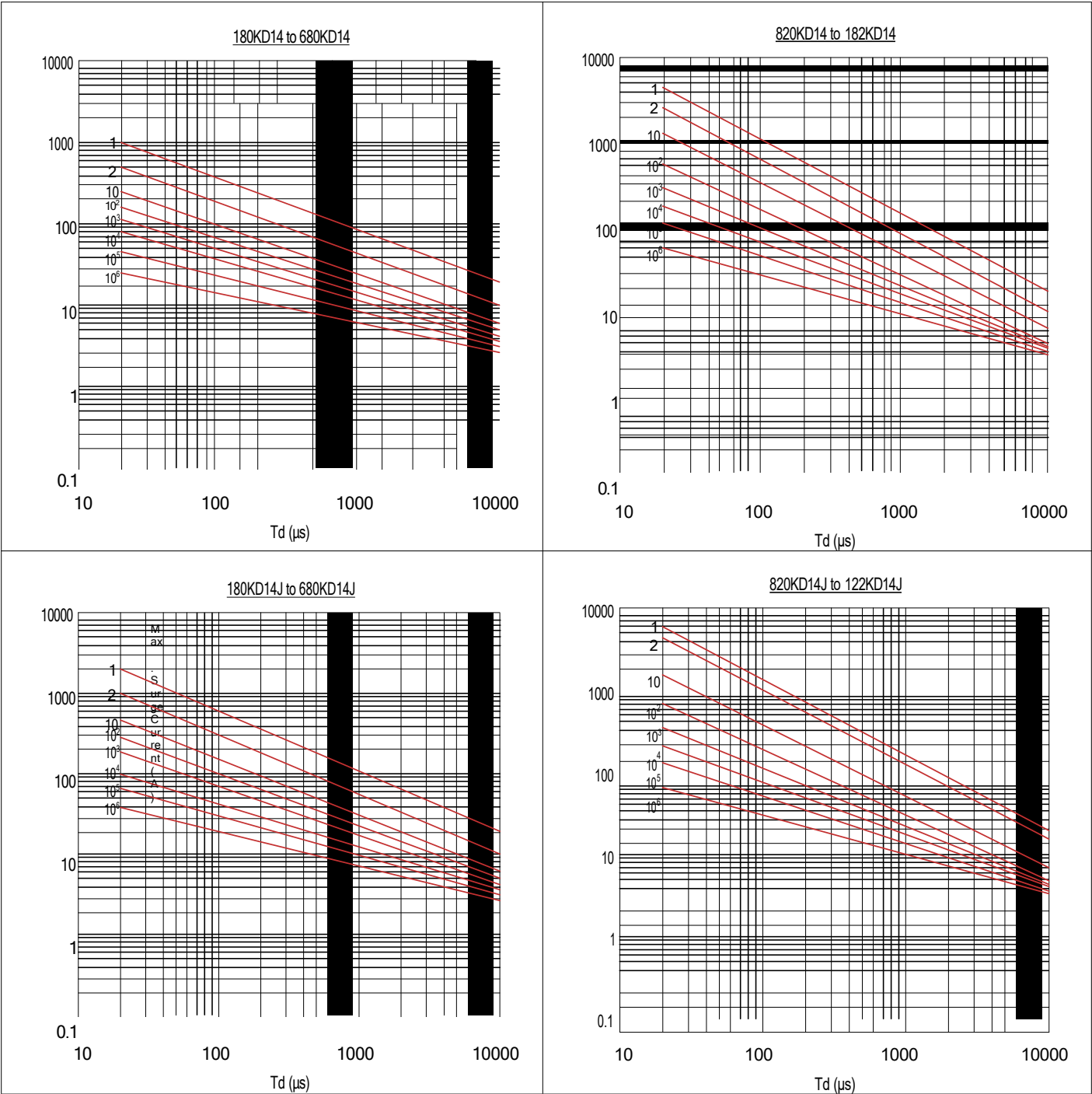
Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000 μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	$V_{AC}(V)$	$V_{DC}(V)$	$V_{1mA}(V)$	$I_P(A)$	$V_C(V)$	I (A) Standard	I (A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz (pf)
180KD14	180KD14J	11	14	18(15~21.6)	10	36	1000	2000	4.0	7.0	0.1	11100
220KD14	220KD14J	14	18	22(19.5~26)	10	43	1000	2000	5.0	8.0	0.1	9100
270KD14	270KD14J	17	22	27(24~31)	10	53	1000	2000	6.0	10.0	0.1	7400
330KD14	330KD14J	20	26	33(29.5~36.5)	10	65	1000	2000	7.5	12.0	0.1	6100
390KD14	390KD14J	25	31	39(35~43)	10	77	1000	2000	8.6	13.0	0.1	5100
470KD14	470KD14J	30	38	47(42~52)	10	93	1000	2000	10.0	17.0	0.1	4300
560KD14	560KD14J	35	45	56(50~62)	10	110	1000	2000	11.0	20.0	0.1	3600
680KD14	680KD14J	40	56	68(61~75)	10	135	1000	2000	14.0	24.0	0.1	2900
820KD14	820KD14J	50	65	82(74~90)	50	135	4500	6000	22.0	27.0	0.6	2400
101KD14	101KD14J	60	85	100(90~110)	50	165	4500	6000	28.0	33.0	0.6	2000
121KD14	121KD14J	75	100	120(108~132)	50	200	4500	6000	32.0	40.0	0.6	1700
151KD14	151KD14J	95	125	150(135~165)	50	250	4500	6000	40.0	53.0	0.6	1300
181KD14	181KD14J	115	150	180(162~198)	50	300	4500	6000	50.0	60.0	0.6	1100
201KD14	201KD14J	130	170	200(180~220)	50	340	4500	6000	57.0	70.0	0.6	1000
221KD14	221KD14J	140	180	220(198~242)	50	360	4500	6000	60.0	78.0	0.6	900
241KD14	241KD14J	150	200	240(216~264)	50	395	4500	6000	63.0	84.0	0.6	830
271KD14	271KD14J	175	225	270(243~297)	50	455	4500	6000	70.0	99.0	0.6	740
301KD14	301KD14J	190	250	300(270~330)	50	500	4500	6000	77.0	108	0.6	670
331KD14	331KD14J	210	275	330(297~363)	50	550	4500	6000	85.0	115	0.6	610
361KD14	361KD14J	230	300	360(324~396)	50	595	4500	6000	93.0	130	0.6	560
391KD14	391KD14J	250	320	390(351~429)	50	650	4500	6000	100	140	0.6	510
431KD14	431KD14J	275	350	430(387~473)	50	710	4500	6000	115	155	0.6	460
471KD14	471KD14J	300	385	470(423~517)	50	775	4500	6000	118	175	0.6	430
511KD14	511KD14J	320	415	510(459~561)	50	845	4500	6000	121	180	0.6	390
561KD14	561KD14J	350	460	560(504~616)	50	925	4500	6000	125	185	0.6	360
621KD14	621KD14J	385	505	620(558~682)	50	1025	4500	6000	128	190	0.6	320
681KD14	681KD14J	420	560	680(612~748)	50	1120	4500	6000	130	200	0.6	290
751KD14	751KD14J	460	615	750(675~825)	50	1240	4500	6000	143	210	0.6	270
781KD14	781KD14J	485	640	780(702~858)	50	1290	4500	6000	148	220	0.6	260
821KD14	821KD14J	510	670	820(738~902)	50	1355	4500	6000	157	235	0.6	240
911KD14	911KD14J	550	745	910(819~1001)	50	1500	4500	6000	175	255	0.6	220
102KD14	102KD14J	625	825	1000(900~1100)	50	1650	4500	6000	190	280	0.6	200
112KD14	112KD14J	680	895	1100(990~1210)	50	1815	4500	6000	213	310	0.6	180
122KD14	122KD14J	750	990	1200(1080~1320)	50	1980	4500	6000	232	324	0.6	160
142KD14	/	880	1140	1400(1260~1540)	50	2310	4500	/	238	/	0.6	150
162KD14	/	1000	1280	1600(1440~1760)	50	2640	4500	/	243	/	0.6	140
182KD14	/	1100	1465	1800(1620~1980)	50	2970	4500	/	250	/	0.6	130

Notes: 1. The tolerance of varistor voltage between 18V and 27V is more than 10%;
2. Leakage Current (@83% of V_{1mA}): $I_R \leq 50\mu\text{A}$ (180K~680K) ; $I_R \leq 25\mu\text{A}$ (820K~182K).

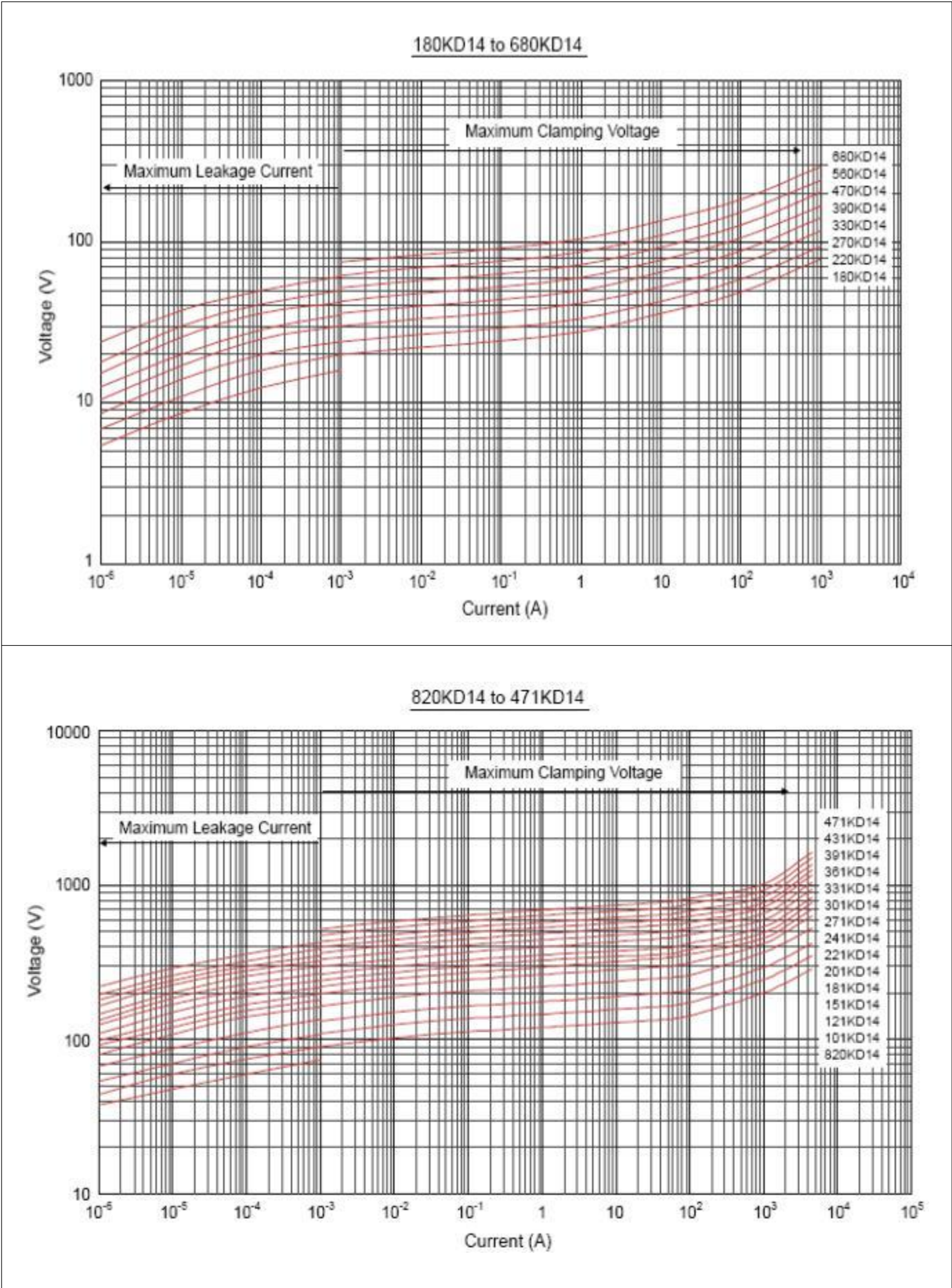
Reliability

Items	Standard	Specifications	Test conditions / Methods				
Tensile Strength of Terminals	IEC60068-2-21	No visible damage Δ V1mA/V1mA ≤5%	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				
Bending Strength of Terminals	IEC60068-2-21	No visible damage Δ V1mA/V1mA ≤5%	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				
Vibration	IEC60068-2-6	No visible damage Δ V1mA/V1mA ≤5%	Frequency range: 10~55 Hz Amplitude: 0.75mm or 98m/s2 Direction: 3 mutually perpendicular directions, 2hrs each.				
Solderability	IEC60068-2-20	At least 95% of terminal electrode is covered by new solder	Solder Temp: 245±5℃ Dipping Time: 2±0.5 sec				
Resistance to Soldering Heat	IEC60068-2-20	No visible damage Δ V1mA/V1mA ≤5%	Solder Temp: 260±5℃ Dipping Time: 10±1 sec				
High Temperature Storage	IEC60068-2-2	No visible damage Δ V1mA/V1mA ≤5%	Ambient Temp: 125±2℃ Duration: 1000±24hrs				
Low Temperature Storage	IEC60068-2-1	No visible damage Δ V1mA/V1mA ≤5%	Ambient Temp: -40±2℃ Duration: 1000±24hrs				
Damp Heat, Steady State	IEC60068-2-78	No visible damage Δ V1mA/V1mA ≤10% Insulation Resistance ≥ 100M Ω	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				
High Temperature Load	MIL-STD-202 Method 108	Δ V1mA/V1mA ≤10%	Ambient Temp: 105±2℃ Duration: 1000±24hrs Load: Max. Allowable Voltage In AC.				
Temperature Cycle	IEC60068-2-14	No visible damage Δ V1mA/V1mA ≤5%	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		
8/20μS Surge Life	IEC61051-1	No visible damage ΔVb(1mA) ≡ ± 10%	1.2/50@8/20μs waveform,6KV/3KA , 4 phase angles 0° /90° /180° /270° ,10 times per phase, a total of 40 times, with an interval of 1 minute				
10/1000μS Surge Life	IEC61051-1	No visible damage Δ V1mA/V1mA ≤10%	1.2/50@8/20μs waveform,6KV/3KA , 4 phase angles 0° /90° /180° /270° ,10 times per phase, Total 40 times, interval time: 1min				
Voltage Proof	IEC61051-1	No visible damage	Metal balls method, 2500Vac 1 min.				

Maximum Surge Current Derating Curve



Maximum Leakage Current and Maximum Clamping Voltage Curve



Wave Soldering Parameters

