

1、特点 Features

1.1 先进的封装工艺，封装材料满足 UL94-V0

Advanced encapsulation technology, Coating materials conforming to UL94V-0 standard.

1.2 结构紧凑，体积小，节省空间

Compact structure, small volume and space saving

1.3 优越的高温高湿性能

Superior high temperature and humidity performance.

1.4 强大的抑制高浪涌强电流能力

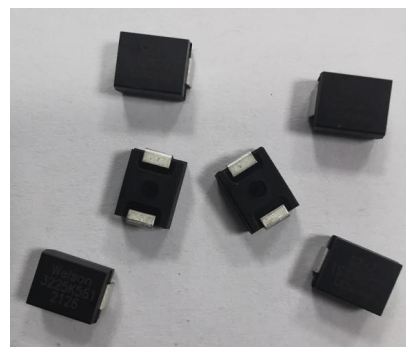
Strong ability to suppress high surge and strong current

1.5 SMD 料盘包装，适用于无铅回流焊/波峰焊自动贴装

SMD tray packaging, suitable for lead-free reflow soldering / wave soldering automatic mounting.

1.6 符合 RoHS、REACH

Comply with RoHS and REACH



2、应用 Applications

2.1 LED 电路保护 LED circuit protection

2.2 工业设备 Industrial equipment

2.3 通讯设备 Communication equipment

2.4 汽车电子 Automotive electronics

3、适用标准 Applicable standards

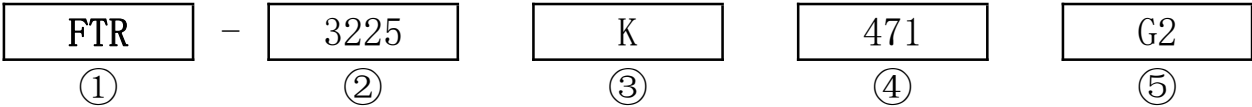
3.1 UL1449

3.2 IEC61051-1, -2, -2-2, IEC60950-1 Annex Q

3.3 GB/T10193, GB/T10194, GB4943.1, GB8898

3.4 IEC61000-4-5

4、编码规则 Part Number Code

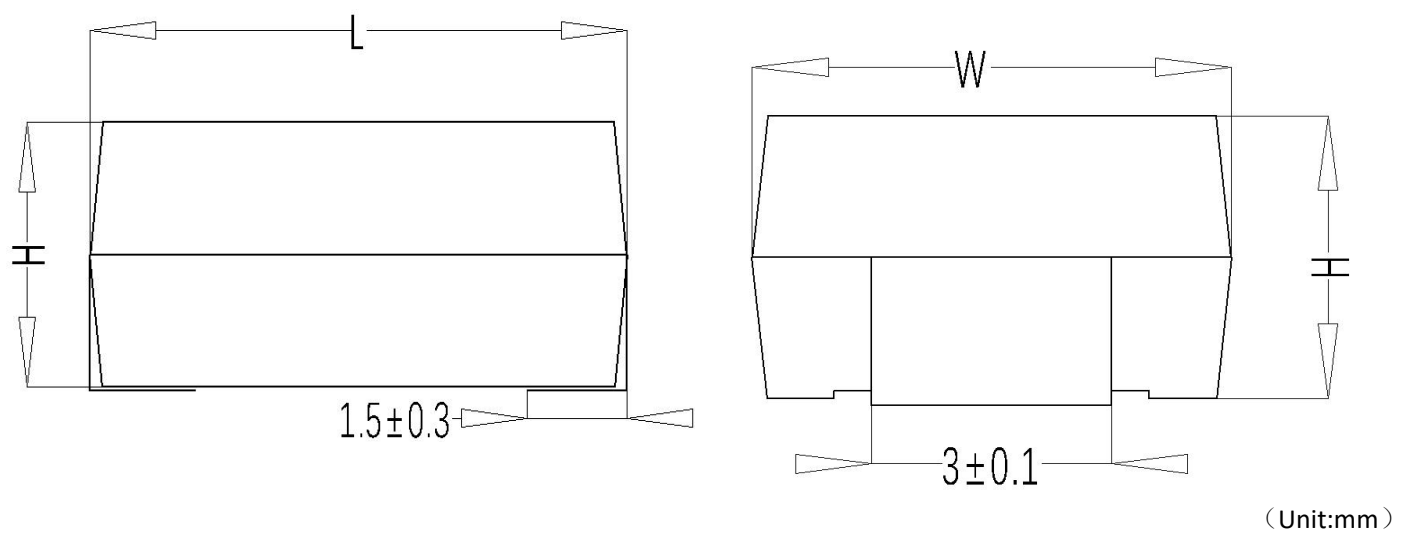


- ①品牌标志 Brand logo: FTR
- ②贴片尺寸 SMD Size:
3225=8.2x6.3mm
- ③压敏电压公差 Varistor voltage tolerance: ±10%
- ④压敏电压 Varistor voltage (V1mA) :47x10¹=470V
- ⑤料盘卷装 Reel packing: 15 寸料盘 1820pcs/盘 15” Reel 1820pcs/reel

5、通用参数 General specifications

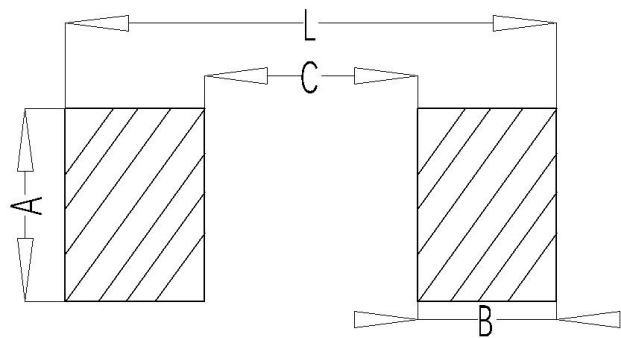
参数名称 Parameter Name	参数值 value	单位 Unit
工作温度 Operating temperature	-55 ~ +125	℃
储存温度 Storage Temperature	-55 ~ +125	℃
耐电压 Voltage Proof	≥2.5	KVRMS
绝缘电阻 Insulation Resistance	≥100	M Ω

6、结构与尺寸 Structures and Dimensions



尺寸 SIZE	压敏电压范围 (V) Varistor Voltage Range (V)	L	W	H
3225	V1ma=201—681	8.2±0.3	6.3±0.3	3.8±0.3
	V1ma=751—821			5.2±0.3

7、焊盘尺寸 Soldering Pads Size



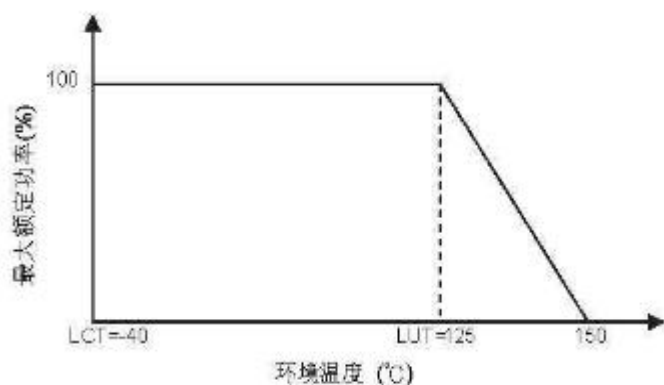
尺寸 Size	A	B	C	L
3225	3.5	2.8	4.5	10.1

8、电气特性 Electrical Characteristics

型号 Part No.	压敏电压 Varistor Voltage (@1mA DC)	最大连续 工作电压 Max. Allowable Voltage		最大 限制电压 Max. Clamping Voltage (8/20μs)		最大 冲击电流 Max. Impulse Current (8/20μs)	最大 通流能量 Max. flow energy (40 次)	最大 能量 Max. Energy (10/1000μ s)	额定 功率 Rated Power	参考 电容 Capacitance @1KHZ
	V _{1mA} (V)	V _{AC} (V)	V _{DC} (V)	V _p (V)	I _p (A)	I _{max} (A)	(KV) (KA)	W max (J)	P (W)	C(pF)
3225K201	200(180-220)	130	170	340	10	1200	2KV / 1KA	11.0	0.25	200
3225K221	220(198-242)	140	180	360	10	1200	2KV / 1KA	12.0	0.25	180
3225K241	240(216-264)	150	200	395	10	1200	2KV / 1KA	13.0	0.25	170
3225K271	270(243-297)	175	225	455	10	1200	2KV / 1KA	15.0	0.25	150
3225K301	300(270-330)	195	250	500	10	1200	2KV / 1KA	17.0	0.25	150
3225K331	330(297-363)	210	275	550	10	1200	2KV / 1KA	18.0	0.25	150
3225K361	360(324-396)	230	300	595	10	1200	2KV / 1KA	20.0	0.25	115
3225K391	390(351-429)	250	320	650	10	1200	2KV / 1KA	21.0	0.25	105
3225K431	430(387-473)	275	350	710	10	1200	2KV / 1KA	23.0	0.25	95
3225K471	470(423-517)	300	385	775	10	1200	2KV / 1KA	25.0	0.25	90
3225K511	510(459-561)	320	410	845	10	1200	2KV / 1KA	25.0	0.25	85
3225K561	560(504-616)	350	450	930	10	1200	2KV / 1KA	26.0	0.25	80
3225K621	620(558-682)	395	510	1020	10	1200	2KV / 1KA	28.0	0.25	78
3225K681	680(612-748)	420	560	1120	10	1200	2KV / 1KA	30.0	0.25	75
3225K751	750(675-825)	460	615	1235	10	1200	2KV / 1KA	32.0	0.25	70

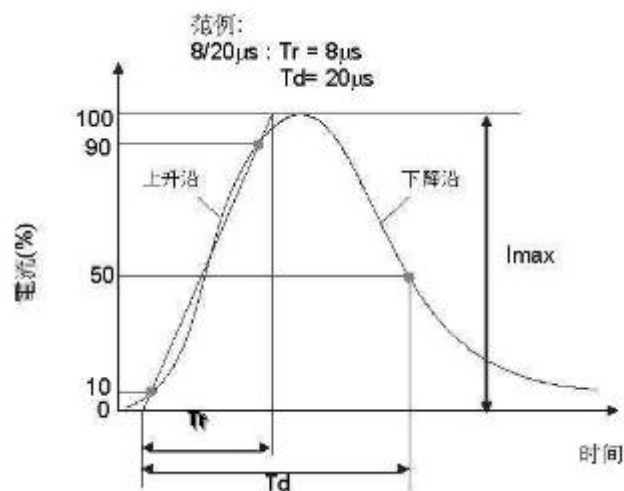
功率减额曲线

Power Derating Curve



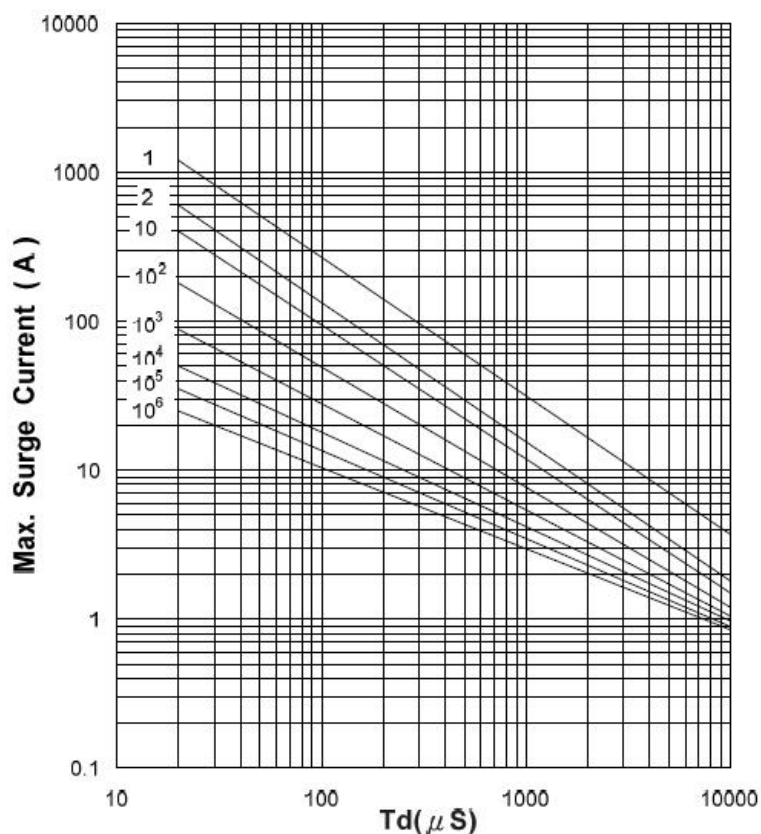
冲击电流标准波形

Surge Current Standard Waveform

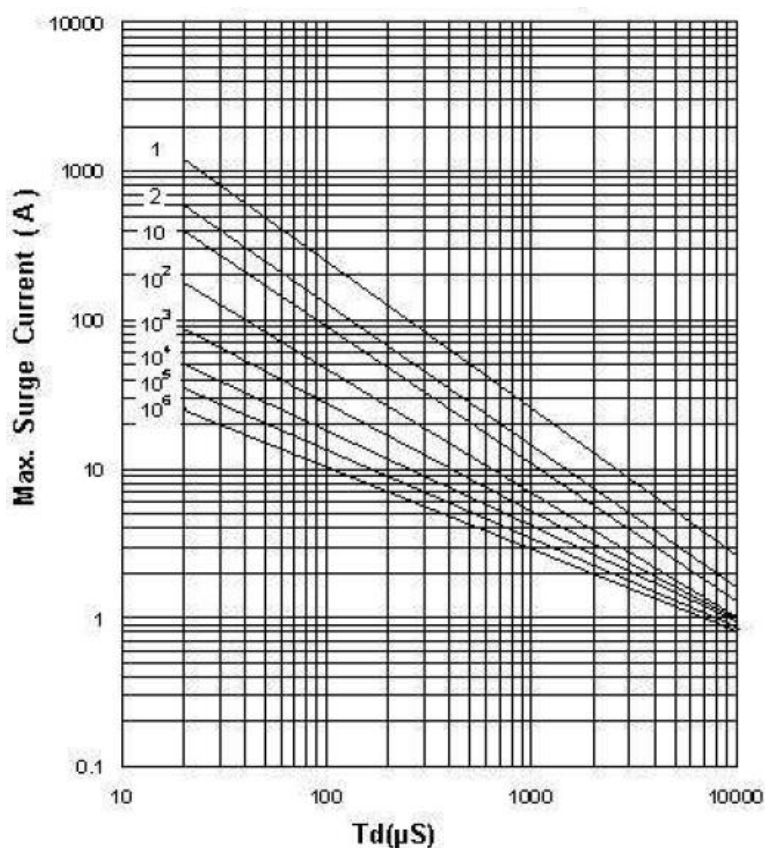


最大冲击电流减额曲线 Max. Surge Current Derating Curves

3225K201 – 3225K471



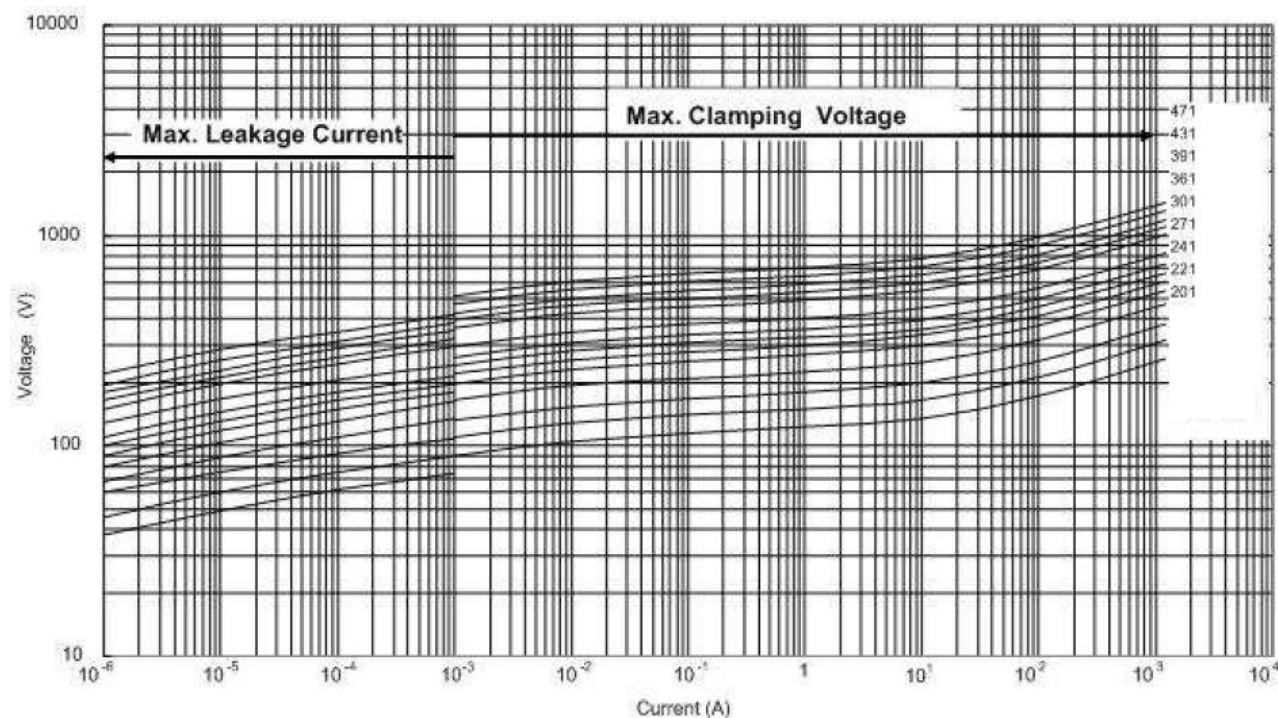
3225K511 – 3225K821



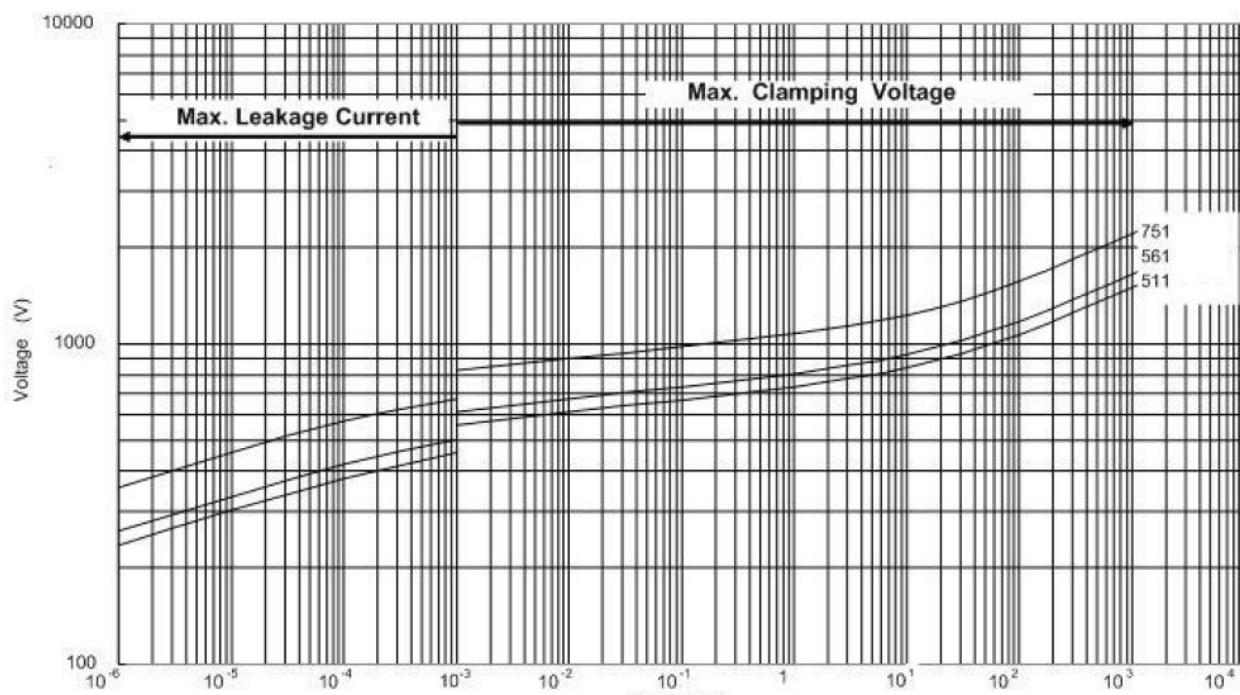
最大漏电流与最大限制电压曲线

Max. Leakage Current and Max. Clamping Voltage Curves

3225K201 – 3225K471

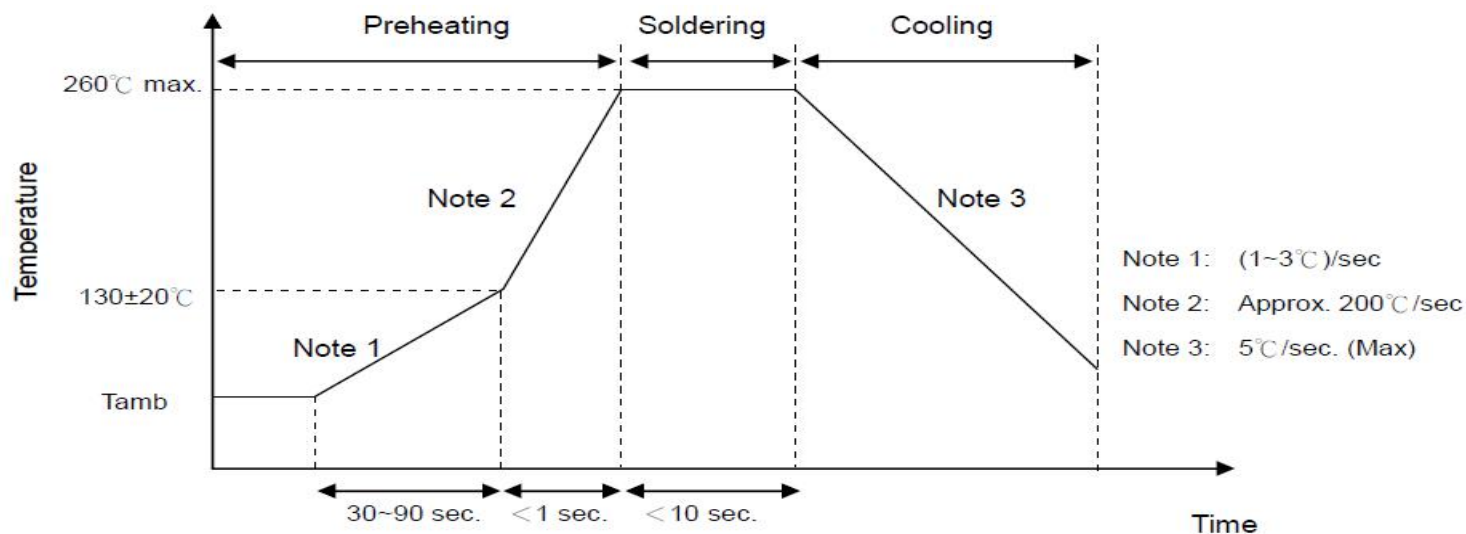


3225K511 – 3225K751

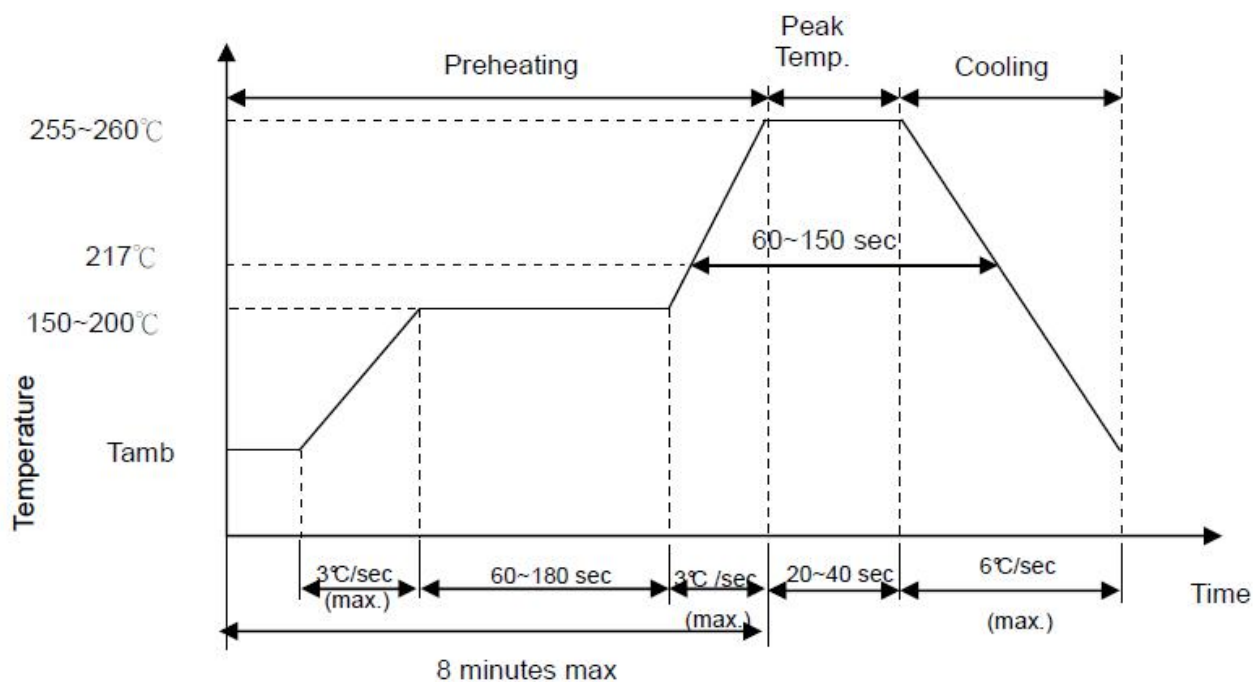


9、推荐焊接条件 Soldering Recommendation

9.1 波峰焊曲线 Wave Soldering Profile



9.2 无铅回流焊曲线 Lead-free reflow soldering Profile



9.3 烙铁重工焊接条件 Recommended Reworking Conditions with Soldering Iron

项目 Item	条件 Conditions
烙铁头部温度 Temperature of Soldering Iron-tip	360°C (max)
焊接时间 Soldering Time	3s(max)
烙铁头直径 Diameter of Soldering Iron-tip	Φ3mm(max)

10、可靠性试验 Reliability

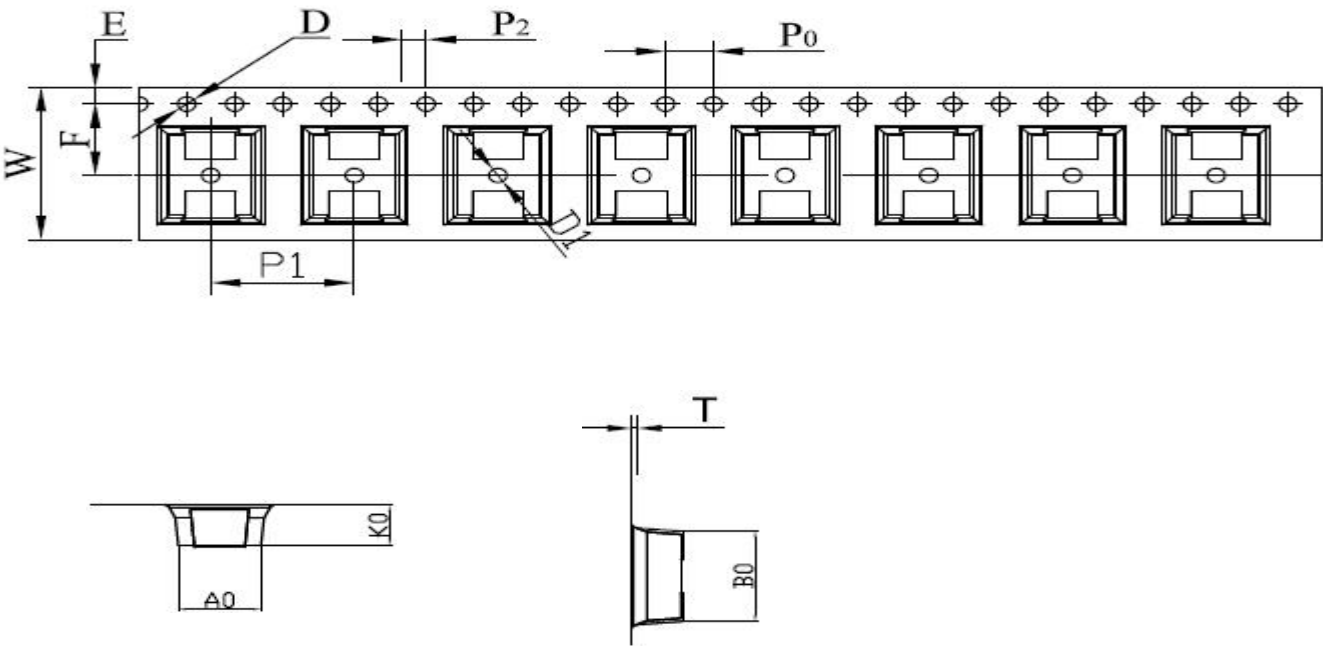
项目 Item	测试项目标准 Standard	测试方法 Test conditions / Methods	规格值 Specifications															
耐振性 Vibration	IEC 1051-1	将成品置于振动机上，施与一单谐振动（振幅：0.75mm）和振幅 1.5mm，振动频率周期为 10Hz—55Hz—10Hz，对三个垂直方向各试验 2 个小时，然后检测成品外在损伤。 Frequency range: 10~55Hz Amplitude: 0.75mm or 98m/s2 Direction: 3 mutually perpendicular directions, 2 hrs each.	$ \Delta V/V_{1mA} \leq 5\%$ 无外在损伤 No visible damage															
可焊性 Solderability	IEC 60068-2-20	将成品引脚浸入 235℃±5℃的焊锡液中 2±0.5 秒取出 245±3℃, 3±0.3 sec	上锡均匀且面积≥95% At least 95% of terminal electrode is covered by new solder															
耐焊接热性 Resistance to Soldering Heat	IEC 60068-2-20	将成品引脚浸入 350℃±10℃的焊锡液中 10±1 秒取出 350±10℃, 10±1 sec	$ \Delta V/V_{1mA} \leq 5\%$															
高温储存 High Temperature Storage	IEC 60068-2-2	将成品置于 125±5℃烤箱中 1000 小时，取出后置于常温 1-2 个小时，然后测量压敏电压 125±5℃ x 1000 ±24 hrs	$ \Delta V/V_{1mA} \leq 5\%$															
耐湿性 Damp Heat, Steady State	IEC60068-2-3	1、将成品置于温度 40±2℃湿度 95%环境中 1000 个小时 2、将成品置于温度 40±2℃湿度 95%环境中，且施加最大允许工作电压 1000 个小时 1. 40±2℃, 90 ~ 95 % RH, 1000hrs. 2. 40±2℃, 90 ~ 95 % RH, at MAV, 1000hrs	无外在损伤 No visible damage $ \Delta V/V_{1mA} \leq 10\%$ 绝缘电阻≥100MΩ IR≥100MΩ															
冷热冲击 Rapid Change of Temperature	IEC 60068-2-14	以如下表的温度周期加于成品 5 次，然后置于室温 1-2 小时测量压敏电压 The conditions shown below shall be repeated 5 cycles <table><tr><th>Step</th><th>Temperature(℃)</th><th>Period(minutes)</th></tr><tr><td>1</td><td>-40±3</td><td>30±3</td></tr><tr><td>2</td><td>Room temperature</td><td>5±3</td></tr><tr><td>3</td><td>+125±2</td><td>30±3</td></tr><tr><td>4</td><td>Room temperature</td><td>5±3</td></tr></table>	Step	Temperature(℃)	Period(minutes)	1	-40±3	30±3	2	Room temperature	5±3	3	+125±2	30±3	4	Room temperature	5±3	无外在损伤 No visible damage $ \Delta V/V_{1mA} \leq 5\%$
Step	Temperature(℃)	Period(minutes)																
1	-40±3	30±3																
2	Room temperature	5±3																
3	+125±2	30±3																
4	Room temperature	5±3																

项目 Item	测试项目标准 Standard	测试方法 Test conditions / Methods	规格值 Specifications
高温负荷 High Temp. Load	IEC61051-4.20	将成品施加最大允许电压置于温度 125 ± 2℃ 烤箱中 1000 小时，然后置于室温 1-2 小时测量压敏电压 85 ± 2℃ , 1000 ± 24 hrs at VDC or Vrms (Max. Continuous Voltage)	$ \Delta V/V_{1mA} \leq 10\%$
电压温度系数 Voltage temperature coefficient	规格标准 Specification Standard	$\frac{V_{1mA \text{ at } 125^{\circ}\text{C}} - V_{1mA \text{ at } 25^{\circ}\text{C}}}{V_{1mA \text{ at } 25^{\circ}\text{C}}} \times \frac{1}{100} \times 100 (\%/^{\circ}\text{C})$	$-0.05 \leq T_c \leq 0 (\%/^{\circ}\text{C})$
耐电压 Voltage Proof	IEC61051-4.8	将成品表面封装体，以金属线绕成紧密线圈状，于线圈出头端与引脚端输入电压 AC2500V 施加 1 分钟 Metal balls method, 2500 Vac 1 min	无外在损伤 No visible damage

11、 包装 Packaging

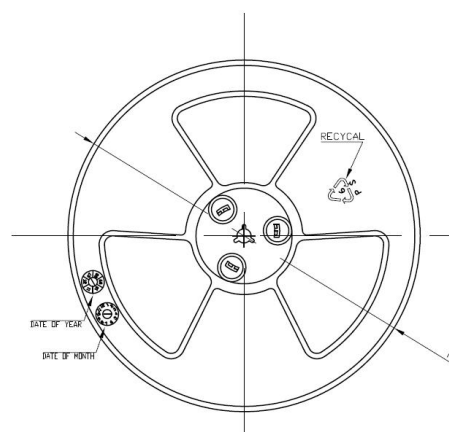
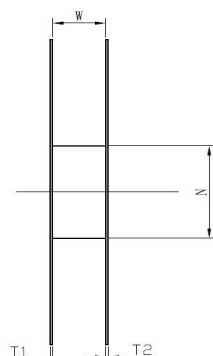
11.1 编带包装方式说明 Taping Packaging Specification

16mm 载带尺寸 16mm plastic embossed

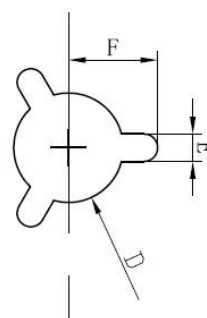


symbol	AO	BO	KO	PO	P1	P2	长度/ 盘
Spec	6.60±0.1	8.70±0.1	4.50±0.1	4.00±0.10	12.0±0.10	2.00±0.10	24000mm
symbol	W	T	E	F	DO	D1	元件/ 盘
Spec	16.0±0.3	0.40±0.05	1.75±0.10	7.5±0.1	1.50 ^{+0.1} ₋₀	1.50±0.10	1820 pcs

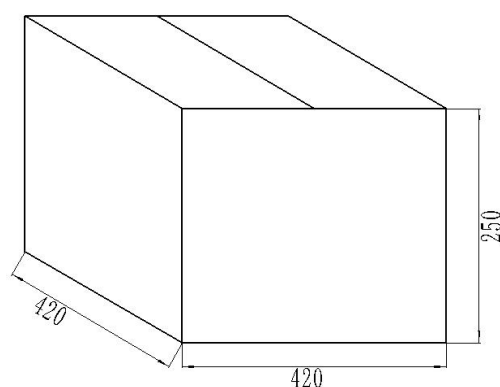
11.2 15 寸胶盘尺寸 15" rubber plate Size



SPEC	16
E±0.5	2.3
F±0.5	10.75
W±0.2	16.4
T1±0.3	2.2
T2±0.3	2.2
A $\begin{smallmatrix} +0 \\ -2 \end{smallmatrix}$	Ø380
N±3.0	Ø100
D±0.3	13.3



11.3 包装纸箱 Packaging Box



1820pcsX11卷
20020pcs

