

# 承认书



## SPECIFICATION FOR APPROVAL

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Add:Floor 1-3 building 5 B18 standard workshop Suqiao Industrial ParkGuilin economic  
and Technological Development ZoneGuilin City Guangxi Zhuang Autonomous Region

客户名称:

CUSTOMER :

产品名称:

PART NAME : 贴片型氧化锌压敏电阻 SMD Zinc Oxide Varistor

认证型号:

CERTIFIED MODEL : HVR\*\*D\*\*\*

产品编码:

Product code:

产品料号:

PART No. : HVR\*\*D\*\*\*KT

客户料号:

CUSTOMER P/N :

其他说明:

REMARK :

编制日期: Compile Date:	2024-03-19	修订日期: Revision date:		版本: Edition:	1.0
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供应商确认 Supplier confirmation			
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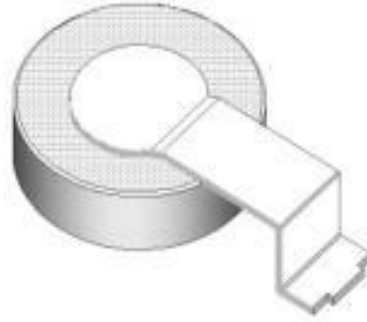
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	产品名称 Product Name	压敏电阻 HVR 系列 Varistor HVR Type	版本 Edition	1.0
	规格型号 Specification model	HVR**D***KT	修订日期 Revision date	2024-03-19

## 一、应用领域 Application area

- 1、LED 灯 LED light
- 2、电工仪表 Electrical instrument
- 3、安防设备 Security equipment
- 4、通讯设备 Communication equipment
- 5、家电产品 Household appliances



## 二、产品特点 Product features

- 1、满足 RoHS 要求 Meet ROHS requirements
- 2、贴片封装，方便自动化 Patch packaging for easy automation
- 3、节省人工，性价比高 Save labor, cost effective
- 4、采用高能量压敏芯片，吸收能量密度大、脉冲性能好  
High energy chip with high energy density and good pulse performance
- 5、性能长时间保持稳定 Performance with stability for a long time.
- 6、工作温度范围：-40℃ ~ 125℃ Working temperature range

## 三、产品编码规则 Part Number Code

HVR	10	D	271	K	T			
1	2	3	4	5	6			

编号 No.	项目 Item	编码 Code	说明 Specification
1	产品类型 Product Type	HVR	至敏电子压敏电阻 HVR 系列 "SEMISAM" varistor HVR type
2	本体尺寸 Body Size	10	Φ10mm
3	产品形态 Product form	D	圆片型 Disc Type
4	压敏电压 Varistor Voltage	271	270V
5	压敏电压公差 Varistorvoltage tolerance	K	±10 %
6	应用方式 Application mode	T	贴片 SMD

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#### 四、外形尺寸 Shape Size

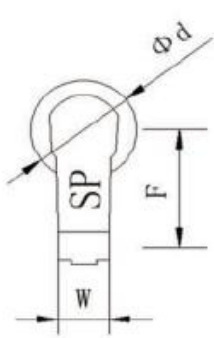


Fig.1 Appearance

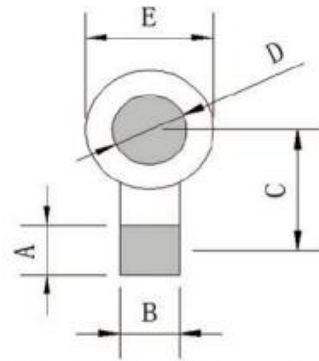
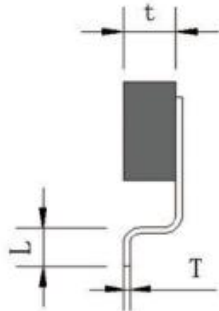


Fig.2 Bonding pad

(Unit:mm)

物料编号 Part No.	$F \pm 0.3$	$W \pm 0.2$	$d \pm 0.3$	$T \pm 0.2$	$t \pm 0.2$	$L \pm 0.4$	颜色 Colour
05D271K	5.75	2.4	5.0	0.3	1.4	2.0	蓝色 Blue
05D471K	5.75	2.4	5.0	0.3	2.4	2.0	白色 White
05D511K	5.75	2.4	5.0	0.3	2.4	2.0	浅黄色 pale yellow
05D561K	5.75	2.4	5.0	0.3	2.4	2.0	粉红色 Pink
05D621K	5.75	2.4	5.0	0.3	2.4	2.0	青色 Cyan
07D271K	6.75	2.8	6.8	0.3	1.4	2.0	蓝色 Blue
07D471K	6.75	2.8	6.8	0.3	2.4	2.0	白色 White
07D511K	6.75	2.8	6.8	0.3	2.4	2.0	浅黄色 pale yellow
07D561K	6.75	2.8	6.8	0.3	2.4	2.0	粉红色 rose
07D621K	6.75	2.8	6.8	0.3	2.4	2.0	青色 Cyan
10D271K	8.25	3.0	10.0	0.3	1.4	2.0	蓝色 Blue
10D471K	8.25	3.0	10.0	0.3	2.4	2.0	白色 White
10D511K	8.25	3.0	10.0	0.3	2.5	2.0	浅黄色 pale yellow
10D561K	8.25	3.0	10.0	0.3	2.6	2.0	粉红色 rose
10D621K	8.25	3.0	10.0	0.3	2.6	2.0	青色 Cyan

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## 五、焊盘尺寸设计建议 Suggestion design size for solder plate.

物料编号 Part No.	A	B	C	D	E
05D**	2.5	3.5	5.75	2.7	5.0
07D**	2.5	3.8	6.75	3.4	7.0
10D**	2.5	4.0	8.75	4.0	10.0

## 六、主要电气性能 Main electrical performance

物料编号 Part No.	压敏电压 Varistor Voltage @1mA	最大工作电压 Max.Operating Voltage		漏电流 Max.Leakage Current	额定功率 Rated Power	电容值 Reference Capacitance	最大限制电压 Max.Clamping Voltage @8/20μs		最大冲击电流 Max Surge Current @8/20μs		最大通流能力 Maximum flow capacity
	VDC	VAC	VDC	μA	W	Pf	VDC	Ip-A	I1:1time	I2:2times	KV/KA
05D271K	270±10%	175	220	≤20	0.10	75	475	5	800	500	1.0/0.5
05D471K	470±10%	300	380	≤20	0.10	55	810	5	800	500	1.0/0.5
05D511K	510±10%	320	410	≤20	0.10	55	875	5	800	500	1.0/0.5
05D561K	560±10%	350	450	≤20	0.10	50	• 960	5	800	500	1.0/0.5
05D621K	620±10%	385	510	≤20	0.10	50	960	5	800	500	1.0/0.5
07D271K	270±10%	175	220	≤20	0.25	150	455	10	1750	1250	2.0/1.0
07D471K	470±10%	300	380	≤20	0.25	90	775	10	1750	1250	2.0/1.0
07D511K	510±10%	320	410	≤20	0.25	85	845	10	1750	1250	2.0/1.0
07D561K	560±10%	350	450	≤20	0.25	80	930	10	1750	1250	2.0/1.0
07D621K	620±10%	385	510	≤20	0.25	80	1025	10	1750	1250	2.0/1.0
10D271K	270±10%	175	220	≤20	0.40	380	455	25	3500	2500	4.0/2.0
10D471K	470±10%	300	380	≤20	0.40	250	775	25	3500	2500	4.0/2.0
10D511K	510±10%	320	410	≤20	0.40	230	845	25	3500	2500	4.0/2.0
10D561K	560±10%	350	450	≤20	0.40	210	930	25	3500	2500	4.0/2.0
10D621K	620±10%	385	510	≤20	0.40	190	1025	25	3500	2500	4.0/2.0

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## 七、可靠性 Reliability

参数	试验方法 Test method	判定依据 Judgment basis
外观 appearance	目视 Visual test	无明显损伤 No visible damage
引线拉力强度 Lead pull strength	逐渐增加压敏电阻器两条引线端点的负荷直至下表的重量, 然后保持 10 秒, 目视检查有无损伤。拉力 10N, 10second Gradually increase the load of the two lead ends of the varistor until the weight in the table below, then hold for 10 seconds and visually inspect for damage.pull10N,10 秒	无明显损伤 No visible damage $\Delta V_{1mA/V 1mA} \leq \pm 5\%$
振动 vibration	对样品施加简谐振动 (振幅 0.75mm) ,频率 10-55Hz, 每 1 分钟为 1 个频率变化周期 (10 Hz -55 Hz -10 Hz) , 三个轴向分别施加 2 小时, 然后目视检查有无损伤。 Apply simple harmonic vibration (amplitude 0.75mm) to the sample,frequency 10-55Hz, one frequency change cycle per minute (10 Hz -55 Hz - 10Hz), three axially respectively for 2 hours, and then visually inspect There is no damage.	无明显损伤 No visible damage $\Delta V_{1mA/V 1mA} \leq 5\%$
可焊性 Solderability	将引线浸入锡槽距产品包封层 2 mm 处, 锡槽温度 $255 \pm 5^\circ\text{C}$ , 浸焊时间 2~3 秒, 目视检查焊接均匀度。 Immerse the lead wire into the tin bath 2 mm away from the product packaging layer, the bath temperature is $255 \pm 5^\circ\text{C}$ , the immersion welding time is 2~3 s, and visually check the welding uniformity.	约 90% 的引线表面被焊锡覆盖 About 90% of the lead surface is covered with solder
耐焊接热 Resistance to welding heat	将引线浸入锡槽距产品包封层 2-2.5 mm 处, 锡槽温度 $255 \pm 5^\circ\text{C}$ , 浸焊时间 $10\text{s} \pm 1\text{s}$ , 然后在室内放置 1-2 小时, 再测压敏电压的变化率和 目视检查有无损伤。 Leads are immersed in the tin bath at a distance of 2-2.5 mm from the encapsulant layer of the product. Tin bath temperature is $255 \pm 5^\circ\text{C}$ , dip soldering time is $10 \pm 1$ s, and then placed in a room for 1-2 hours. Then the varistor voltage change rate is measured. Check for damage.	无明显损伤 No visible damage $\Delta V_{1mA/V 1mA} \leq 5\%$
高温储存	样品在 $125 \pm 2^\circ\text{C}$ 环境下测试 $1000 \pm 24$ 小时 (最大工作电压) $125 \pm 2^\circ\text{C}$ , $1000 \pm 24$ hrs, at VDC or Vrms (Max Operating Voltage)	无明显损伤 No visible damage $\Delta V_{1mA/V 1mA} \leq \pm 5\%$
低温储存 Low temperature storage	在 $-40 \pm 2^\circ\text{C}$ 下放置 1000 小时, 然后在室温下保存 1 - 2 小时, 测量其特性。 at $-40 \pm 2^\circ\text{C}$ for 1000Hr and then stored at room temperature one or two hours .Its characteristics shall be measured.	无明显损伤 No visible damage $\Delta V_{1mA/V 1mA} \leq \pm 5\%$

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## 八、耐脉冲性能测试方法 Test method for pulse resistance

### 1、最大冲击电流(8/20 μs) Maximum pulse current(8/20 μs)

实验方法：从批号中抽取两组各 10 只贴片压敏电阻，测试压敏电压、漏电流参数，其中一组施加峰值电流 I1 雷电脉冲一次，另一组施加峰值电流 I2 雷电脉冲两次（间隔 60 秒），冷却后测试样品压敏参数。试验后，要求样品外观无可见损伤，压敏电压变化率 ≤10%，试验后漏电流 ≤30 μA，非线性系数 ≥20。

Exam method: Take out from 2 groups of 10 SMD varistors to test varistor parameter and leakage current. 1 of group applied the peak current I1 to make lightning pulse once, the other of group applied the peak current I2 to make lightning pulse twice (between 60 seconds), Doing test for sample in varistor parameter after cooling. After the test, the sample appearance is required to have no visible damage of looking, And Varistor voltage rate of change is less than 10%, And It is less than 30 μA after test for leakage current, the nonlinear coefficient is more than 20.

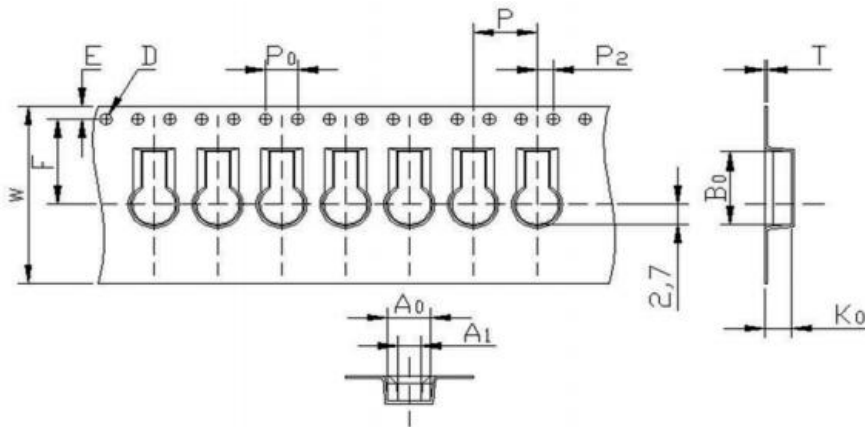
### 2、最大通流能力(8/20 -1.2/50 μs 组合波) Maximun current capacity(8/20 -1.2/50 μsCombine waves)

实验方法：从批号中抽取 10 只贴片压敏电阻，测试压敏参数，施加开路电压和短路电流峰值分别为最大通流能力电压/电流值的组合波脉冲 40 次（两次之间间隔 60 秒，每隔 5 次转换脉冲信号方向），冷却后测试样品压敏参数。试验后，要求样品外观无可见损伤，压敏电压变化率 ≤10%，试验后漏电流 ≤50 μA，非线性系数 ≥20。

Exam method: Take out from a batch of 10 SMD varistors to test varistor parameter. Apply open circuit voltage and short circuit. The peak current is the maximum current capacity voltage/current value of the combined wave pulse is 40 times (60 seconds between two times, and change the direction of the pulse signal per five times), Doing test for sample in varistor parameter after cooling. After the test, the sample appearance is required to have no visible damage of looking, And Varistor voltage rate of change is less than 10%, And It is less than 50 μA after test for leakage current, the nonlinear coefficient is more than 20.

## 九、包装 Packing(Unit:mm)

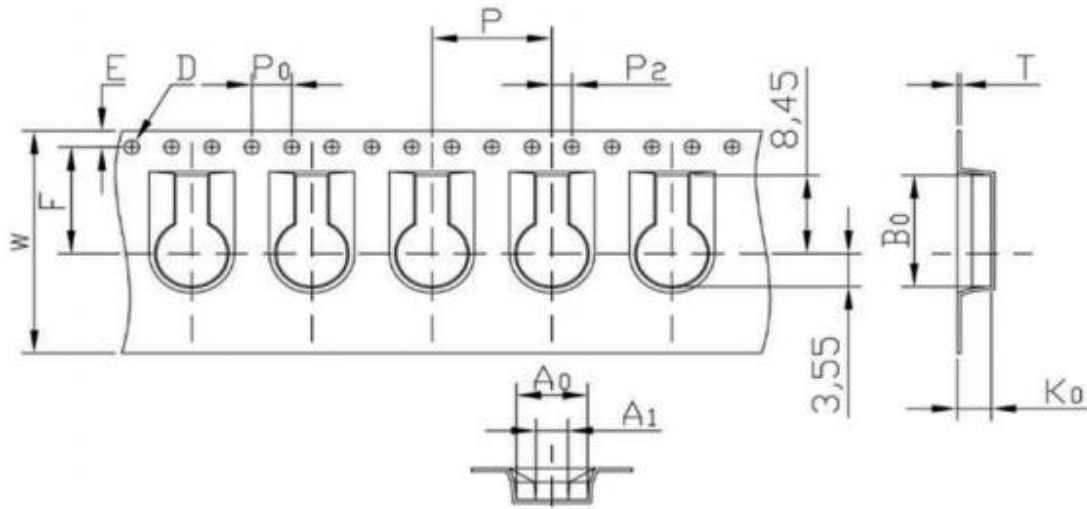
### 1.05D Series



物料编号 Part No.	W±0.3	E±0.1	F±0.1	T±0.1	P±0.1	P0±0.1	P2±0.1	D0±0.1	A0±0.1	A1±0.1	K0±0.1	B0±0.1
05D Series	24.00	1.75	11.50	0.35	8.00	4.00	2.00	Φ1.50	5.35	2.85	3.40	9.80

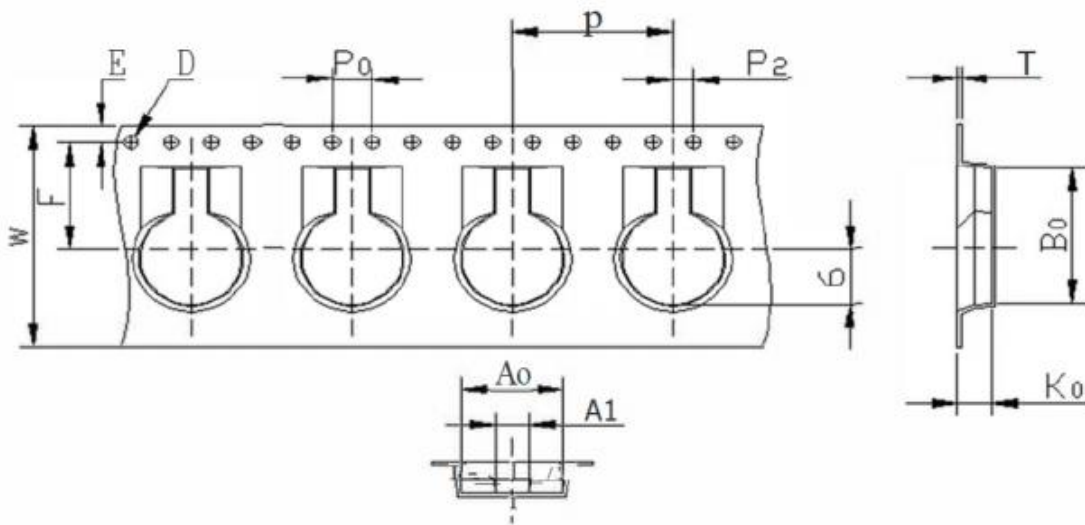
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2.07D Series



物料编号 Part No.	W±0.3	E±0.1	F±0.1	T±0.1	P±0.1	P <sub>0</sub> ±0.1	P <sub>2</sub> ±0.1	D <sub>0</sub> ±0.1	A <sub>0</sub> ±0.1	A <sub>1</sub> ±0.1	K <sub>0</sub> ±0.1	B <sub>0</sub> ±0.1
07D Series	24.00	1.75	11.50	0.35	12.00	4.00	2.00	Φ1.50	7.10	3.20	3.40	12.00

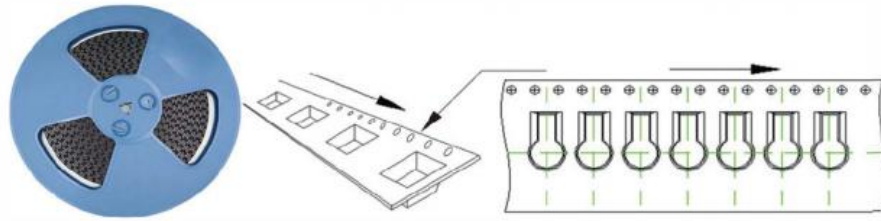
3.10D Series



物料编号 Part No.	W±0.3	E±0.1	F±0.1	T±0.1	P±0.1	P <sub>0</sub> ±0.1	P <sub>1</sub> ±0.1	D <sub>0</sub> ±0.1	A <sub>0</sub> ±0.1	A <sub>1</sub> ±0.1	K <sub>0</sub> ±0.1	B <sub>0</sub> ±0.1
10D Series	24.00	1.75	11.50	0.35	16.00	4.00	2.00	Φ1.50	10.10	3.40	3.40	14.65



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物料编号 Part No.	05D	07D	10D
数量 Quantity	3000PCS	2000PCS	1500PCS
尺寸 Size	15 inch	15 inch	15 inch

## 十、注意事项 Matters needing attention

1、适用 LED 灯、电工仪表、安防设备、通讯设备、家电等产品，考虑到产品适用性、可靠性，除非在设计阶段得到本公司的允许，不应该应用于其他方面。

Applicable to LED lights, electrical instruments, security equipment, communication equipment, home appliances and other products, Concern for products of applicability and reliability of the product, should not be used in other applications unless the company's permission in the design stage.

2、为了确保贴片压敏电阻在实际使用中的可靠性，在设计阶段应该考虑到极端工作条件，并留有一定的余量。In order to ensure the reliability of the SMD varistor in practical, It should be considered under extreme working conditions in the design stage, Also some allowance should be left.

3、为避免飞弧，压敏电阻芯片边缘应与其它导电器件至少间隔 2.5mm 以上，若空间允许，该间隔越大越好。In order to avoid friction spark, the edge of the varistor chip should be at least 2.5mm space from other conductive devices. And It's bigger and better.

4、为提高产品安全可靠性，建议芯片本体圆形电极作为 L 线，方形五金端子作为 N 线进行设计焊盘。In order to improve the safety and reliability of the product, it is suggested that the circular electrode of the chip body to be as the L line and the square hardware terminal to be as the N line to design for solder plate.

5、为降低硅桥损坏几率，不建议将压敏电阻设计安装在整流后的直流电路中使用。In order to reduce the probability of damage to the silicon bridge, it is not recommended install in DC circuit after rectification to working.

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## 十一、使用环境 Environment

环境温度 Ambient temperature:  $-40-125^{\circ}\text{C}$  相对湿度 Relative humidity:  $\leq 95\%$

大气压 Atmos: 86-106Kpa

振动频率 Vibration frequency: 10-50Hz

加速度 Accelerated speed:  $98\text{m/S}^2$

## 十二、仓库存储条件 Warehouse Storage Conditions of Products

1. 本产品仅以原包装存放, 存放前请勿打开包装.

Store this product only in original packaging, Do not open the package before storage.

2. 原包装的储存条件:

Storage conditions in original packaging:

储存温度:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ ; 相对湿度: 年均  $< 75\%$ .

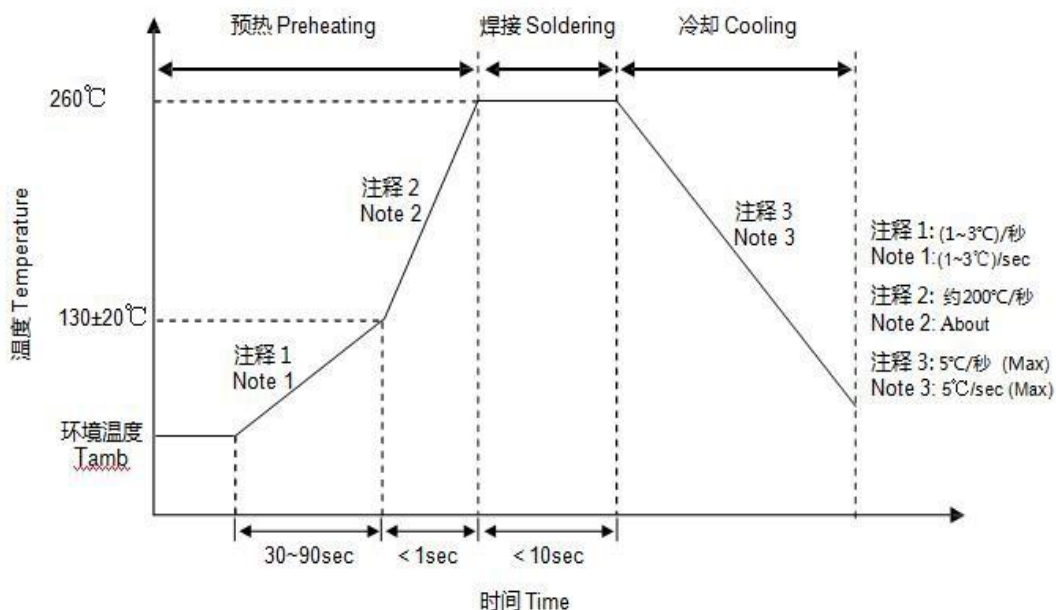
Storage Temperature :  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ ; Relative humidity:  $< 75\%$  annual average.

3. 远离腐蚀性的空气和阳光, 避免将本产品存放在长期可能影响功能的有害环境中 Keep away from corrosive atmosphere and sunlight, Avoid storage of this product in harmful environments that can affect the function during long-term

4. 储存期: 1 年

Period of Storage : 1 year

## 十三、焊接建议 Soldering Recommendation



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使用烙铁推荐的返工条件

Recommended Reworking Conditions with Soldering Iron

项目 Item	条件 Conditions
烙铁头温度 Temperature of Soldering Iron-tip	360°C (max.)
焊接时间 Soldering Time	3 sec (max.)
与压敏电阻的距离 Distance from Varistor	2 mm (min.)

## 十四、安规认证 Safety Approval

安规认证 Safety Approval	认证编号 Certification NO.
UL/CUL	E479221
CQC	05D:CQC17001162232 07D:CQC17001162233 10D:CQC17001162772
TUV	07D:J 50420591 10D:J 50420593