

 HOLLYLAND(CHINA) ELECTRONICS TECHNOLOGY CORPORATION LTD. HOLLYLAND(XIAMEN) TECHNOLOGY CORPORATION LTD.	<b>产品规格书</b> <b>PRODUCT SPECIFICATION</b>	ISSUED DATE:	2018/04/10
	12F RoHS & Pb-Free 系列 12F RoHS & Pb-Free SERIES	REV. No.:	A04
		DOC. No.:	HLD-PSI-8090
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制定 PREPARED BY		审核 CHECKED BY		批准 APPROVED BY	
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## 1. 适用范围 SCOPE

本规格书适用于获得 UR、CUR 认证的 12F RoHS & Pb-Free 系列 HOLLY® 的表面贴装型快速熔断保险丝。

This specification defines the technical requirements of Surface Mount Fast-blow type 12F RoHS & Pb-Free series with HOLLY® brand, which has been approved by UR and CUR.

产品部件号为:            型号                      额定电流                      额定电压  
Construction of Part No.: Type                      Rated Current                      Rated Voltage  
例如 For Example:            12F                                      0500                                      L1

L1 DENOTES FOR 24V    L1 表示 24V

L2 DENOTES FOR 32V    L2 表示 32V

L3 DENOTES FOR 63V    L3 表示 63V

## 产品部件号 PART NUMBER

产品部件 Part Number	额定电流 Rated Current	标识 Marking	额定电压 Rated Voltage	电阻 Nominal Resistance( Ohms)	参考熔化 I <sup>2</sup> t Normal Melting I <sup>2</sup> t(A <sup>2</sup> Sec.) (t=1ms)
12F-0100L2/ L3	100mA	a	32V AC 63V DC	13.0000	0.00024
12F-0125 L2/ L3	125mA	e		11.0000	0.00036
12F-0150 L2/ L3	150mA	f		9.0000	0.00074
12F-0200 L2/ L3	200mA	t		5.5000	0.0010
12F-0250 L2/ L3	250mA	A		3.0000	0.0014
12F-0315 L2/ L3	315 mA	U		2.5000	0.0018
12F-0375 L3	375mA	X		2.0000	0.0026
12F-0400 L3	400 mA	Y	63V AC 63V DC	1.8500	0.0029
12F-0500 L3	500mA	B		1.0500	0.0049
12F-0630 L3	630mA	D		0.7500	0.0095
12F-0750 L3	750mA	F		0.5000	0.015
12F-0800 L3	800mA	G		0.4000	0.020
12F-010 L3	1A	1		0.2500	0.042
12F-013 L3	1.25A	J		0.1150	0.046
12F-015 L3	1.5A	K		0.9500	0.099
12F-016 L3	1.6A	L		0.0820	0.108
12F-020 L3	2A	2		0.0760	0.114
12F-025 L3	2.5A	O	24V AC 32V DC	0.0380	0.136
12F-030 L3	3A	3		0.0340	0.276
12F-032 L1/ L2	3.15A	P		0.0320	0.631
12F-035 L1/ L2	3.5A	S		0.0260	0.695
12F-040 L1/ L2	4A	4		0.0230	0.784
12F-050 L1/ L2	5A	5		0.0160	1.225
12F-060 L1/ L2	6A	6		0.0110	1.600
12F-063 L1/ L2	6.3A	T		0.0100	1.652
12F-070 L1/ L2	7A	7		0.0090	1.890

阻抗范围: 参考电阻±25% The range of resistance: Reference Resistance ±25%

## 2. 相关标准及认证情况 APPLICABLE STANDARDS & APPROVED DETAILS

2.1 相关标准 APPLICABLE STANDARDS: UL 248-1, UL 248-14.

2.2 认证情况 APPROVED DETAILS

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额定电压 RATED VOLTAGE	UR		CUR	
	认证范围 APPROVED RANGE	认证号码 CERT. No.	认证范围 APPROVED RANGE	认证号码 CERT. No.
32V AC	0.1A – 0.375A	E156471	0.1A – 0.375A	E156471
63V AC	0.4A – 3A		0.4A – 3A	
24V AC	3.15A – 7A		3.15A – 7A	
63V DC	0.1A – 3A		0.1A – 3A	
32V DC	3.15A – 7A		3.15A – 7A	

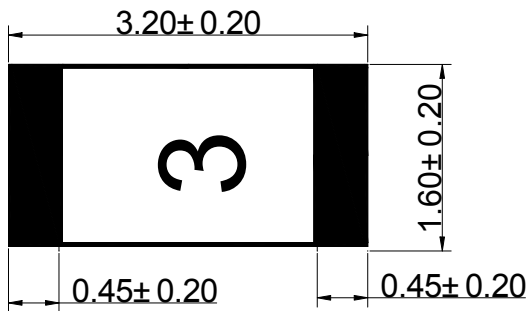
### 3. 公司地址 ADDRESS

中国福建省厦门市翔安区舩山东二路 829 号  
NO.829, Fangshan East 2<sup>nd</sup> Road, Xiang'an, Xiamen, Fujian, China

### 4. 外形尺寸与原材料 DIMENSION & MATERIALS

#### 4.1 外形尺寸 DIMENSION: 单位 Unit: mm

Top View  
俯视图



Side View  
侧视图



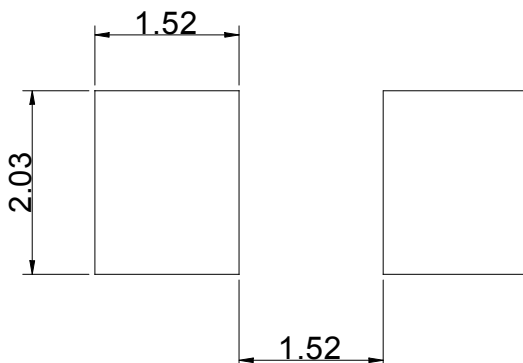
备注：“3”表示额定电流 3 安培

REMARK: The marking 3 denotes that the rated current is 3A

#### 4.2 PCB 焊盘尺寸推荐 Pad Layout Recommended: 单位 Unit: mm

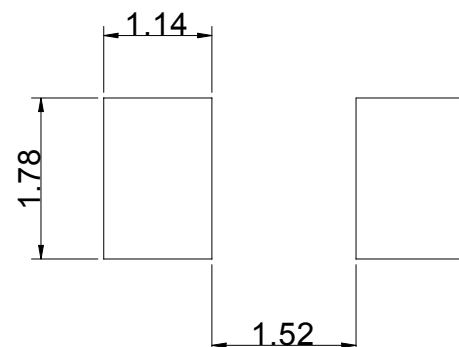
适合波峰焊

FOR WAVE SOLDER



适合红外焊

FOR INFRARED SOLDER



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#### 4.3 原材料 MATERIALS

编号 No.	部 件 PARTS	材 料 MATERIALS	备 注 REMARK
1	基板 Substrate	陶瓷 Ceramic	符合 RoHS & Pb-Free 指令要求 RoHS & Pb-Free Compliant
2	可 熔 体 Fusible Element	<b>银钯、银或金</b> <b>Silver and palladium</b> 、Silver or Gold	
3	保护层 Protective Coating	玻璃 Glass	
4	端电极 Terminals	银 Silver	
5	电镀层 Plating	先镀镍 1-7 $\mu$ m, 再镀锡 3-10 $\mu$ m 1-7 $\mu$ m Ni plated, then 3-10 $\mu$ m Sn plated	

#### 5. 机械特性 MECHANICAL PERFORMANCES

保险丝应安装在 1.6mm 厚的覆铜箔环氧玻璃布层压板的试验板上, 将试验板装有保险丝的一面向下, 放在弯曲夹具上, 试验板以 1mm/s 的速率弯曲到 1mm。试验板应允许从弯曲位置恢复过来, 并从试验夹具上拆下。试验结束后, 保险丝端电极仍应固定牢固。

The fuse-links shall be mounted on the test board, which is made of epoxide woven glass fabric copper-clad laminated 1.6mm thickness sheet. The test board, with the fuse-links on the underside, shall be placed in the bending jig. The board shall then be bent by 1mm at the rate of 1 mm/s. The test board shall be allowed to recover from the bent position, and then be removed from the test jig. After the test, the terminals shall remain firmly attached.

#### 6. 电气特性 ELECTRICAL PERFORMANCES

##### 6.1 测试条件 TEST CONDITIONS

A. 全部测试条件都应在环境温度  $25 \pm 5^\circ\text{C}$  条件下进行, 在此期间温度变化不允许达到  $5^\circ\text{C}$  和到极限范围。

All electrical tests shall be conducted at an ambient temperature of  $25 \pm 5^\circ\text{C}$ . The ambient temperature shall not vary more than  $5^\circ\text{C}$  during the test, and must be within these limits.

B. 当两个或两个以上的保险丝串联测试时, 保险丝管座的放置位置应保证使任何两个进行测试的保险丝所用的保险丝管座之间的间隙不能小于 50mm。将保险丝管座连在一起的导线以及将保险丝管座与测试电路直接相连接的任何电流测试装置相连, 及其与电源相连的连接线为带绝缘的铜导线。每根导线的长度应为 250mm, 而且该导线的横截面积约为  $1\text{mm}^2$ 。

When two or more fuse-links are tested in series, the test fuse-bases shall be located so that there will be a spacing of not less than 50mm between any two fuse-links under test. The conducting wire connecting the test fuse-bases together, and the one connecting the test fuse-bases to any current measuring devices connected directly to the test circuit and the source of supply, shall be insulated copper wire. The length of each conducting wire shall be 250 mm, and the cross-sectional area of the wire shall be approximately  $1\text{mm}^2$ .

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### 6.2 负载能力测试 CURRENT-CARRYING CAPACITY TEST

当保险丝通以 100%额定电流的条件下进行测试时，在 4 小时内电路不应断开，保险丝不被电流熔化，表面不破裂和烧焦。

When a fuse is carrying 100% of rated current for continuing 4 hours, no open circuit, melt fusible element, or ruptured surface of fuse shall occur in any manner during this test.

### 6.3 温度上升试验 TEMPERATURE RISING TEST

当保险丝通以 100%额定电流的条件下进行测试时，在达到热量平衡后，测量保险丝表面的温度，保险丝表面的温度上升必须等于或低于 75℃。

Measure the temperature of the surface of the fuse under the 100% of rated current, when the thermal equilibrium reaches. The temperature rise on the surface of each fuse shall be 75℃ or less.

注：温度上升 = 保险丝表面的温度 - 环境温度

Note: Temperature Rising = Fuse temperature - Ambient temperature

### 6.4 预飞弧时间/电流特性 PRE-ARCING TIME / CURRENT CHARACTERISTICS

当保险丝通以下表规定的电流时，其熔断时间必须符合下表的要求，且陶瓷基板不应破裂、飞脱。

When the current in the following table is passing the fuse, its opening time must be in accordance with the requirements in the following table. Moreover, no cracking or shattering shall occur.

%额定电流 % of Rated Current	熔断时间 Opening Time	
	100mA--5A	6A--7A
100%	最快 4 小时 4 hours Min.	
250%	最慢 10 秒 10 seconds Max.	
350%		最慢 1 秒 1 seconds Max.

### 6.5 分断能力 INTERRUPTING RATING

这些型号的保险丝的分断能力应能达到下表规定的相应的各种安全认证的分断能力要求。保险丝分断电路后，陶瓷基板不应破裂、飞脱。

The interrupting rating should reach the interrupting current rating given in the following table. And after this test, there should be no cracking or shattering of the fuse.

额定电流 RATED CURRENT	UR	CUR
	分断能力 INTERRUPTING RATING	分断能力 INTERRUPTING RATING
0.1A – 0.375A	50A @ 32V AC	50A @ 32V AC
	50A @ 63V DC	50A @ 63V DC
0.4A – 3A	50A @ 63V AC	50A @ 63V AC
	50A @ 63V DC	50A @ 63V DC
3.15A – 7A	35A @ 24V AC	35A @ 24V AC
	50A @ 32V DC	50A @ 32V DC

### 6.6 电阻测试 COLD RESISTANCE TEST

环境温度为 25±5℃，测试电流不大于保险丝额定电流的 10%。

Test current less than or equal to 10% of rated current to the fuse for cold resistance test at an ambient temperature of 25±5℃.



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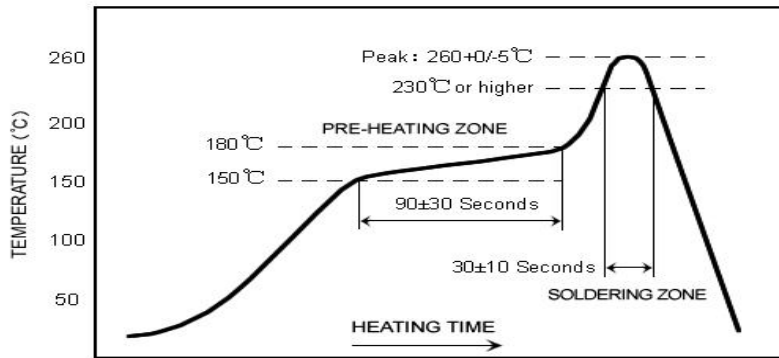
6.7 焊接参数 SOLDERING PARAMETERS

焊接时陶瓷面或印字面朝上 The ceramic side or marking side should be upside when be solder on the PCB.

6.7.1 红外线回流焊----峰值温度  $260\pm 0/-5^{\circ}\text{C}$ ，5 秒，

Infrared Reflow soldering ----Peak Temperature  $260\pm 0/-5^{\circ}\text{C}$ ，5 seconds.

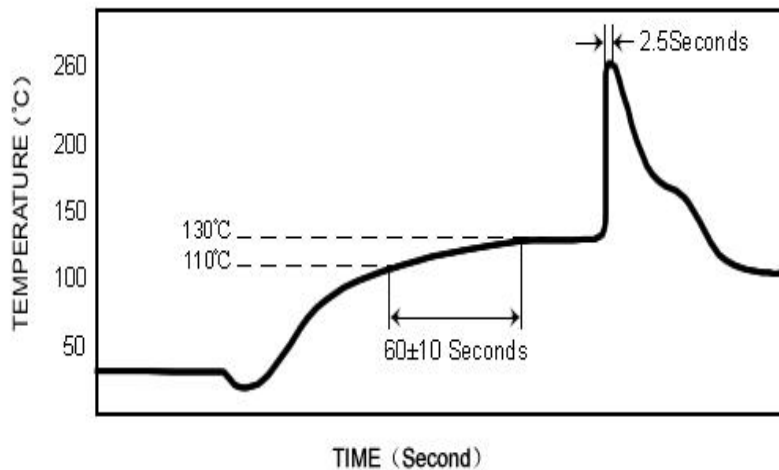
Recommend Reflow Profile:



6.7.2 波峰焊----峰值温度  $260\pm 0/-5^{\circ}\text{C}$ ，2.5 秒，

Wave soldering ----Peak Temperature  $260\pm 0/-5^{\circ}\text{C}$ ，2.5 seconds.

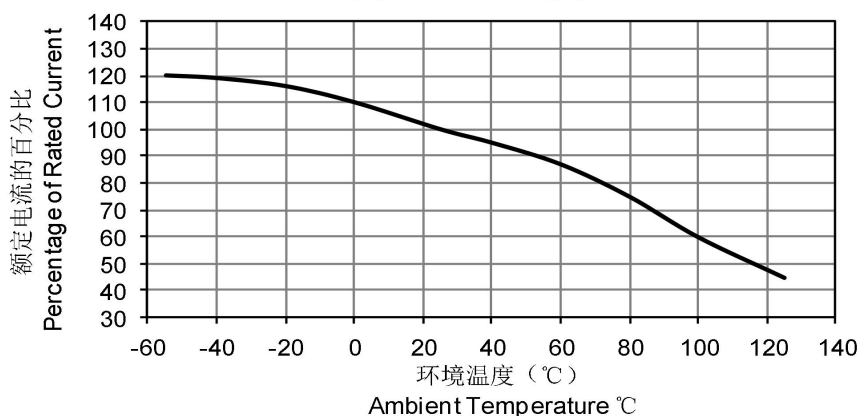
Recommend Wave Profile:



6.8 环境温度对负载能力的影响 AMBIENT TEMPERATURE EFFECT ON CURRENT-CARRYING CAPACITY

负载能力修正表

Chart of Correction Factor





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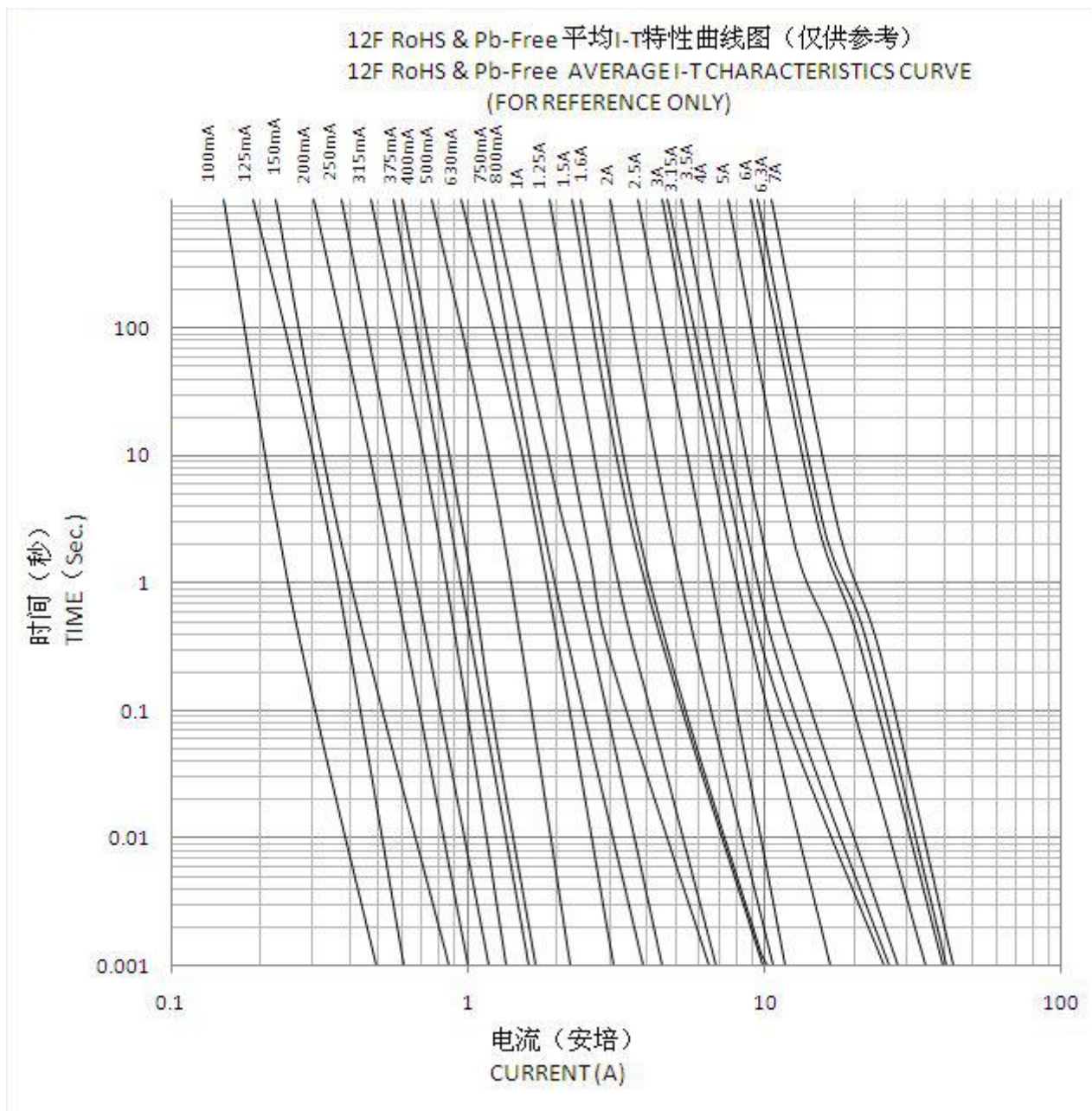
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6.9 平均 I-T 特性曲线图(仅供参考) THE AVERAGE I-T CHARACTERISTICS CURVE (For Reference Only)







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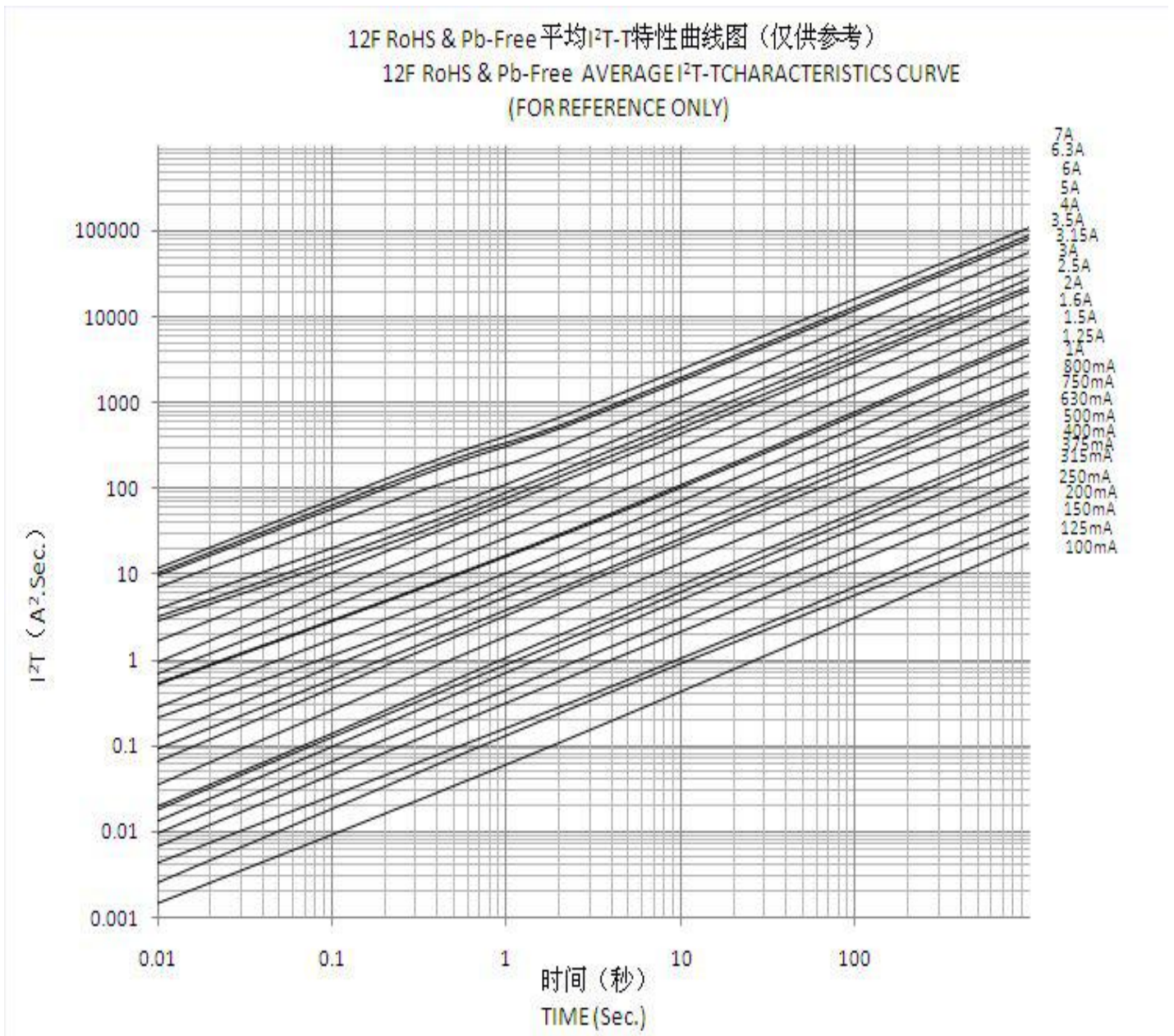
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6.10 平均 I<sup>2</sup>T-T 特性曲线图((仅供参考) THE AVERAGE I<sup>2</sup>T-T CHARACTERISTICS CURVE (For Reference Only)



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## 7. 产品标志 MARKINGS

7.1 保险丝表面印有相应的标志，标志应易于看清。

The relevant markings shall be marked on the surface of the fuse and shall be easily visible.

7.2 标记：The markings for every fuse shall be prescribed as below according to the types:

1) 每个保险丝本体上应标有额定电流的代码。

Every fuse shall be marked the code of rated current that signed in the first page.

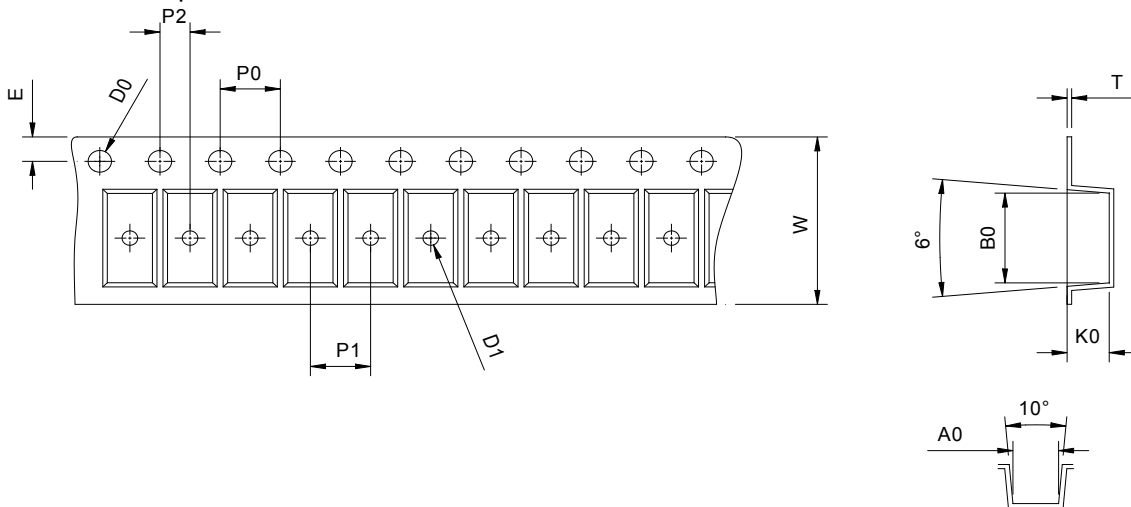
2) 额定电压、额定电流、商标、安全认证标志、型号名称在包装标签上标识。

The Rated Voltage, Rated Current, Trademark, Safety Approval Logo and Type should be marked on the packing label.

## 8. 包装要求 PACKING DETAILS

参照产品包装编带标准 EIA-481-D。Punched Carrier taping and Reel packing according to EIA-481-D.

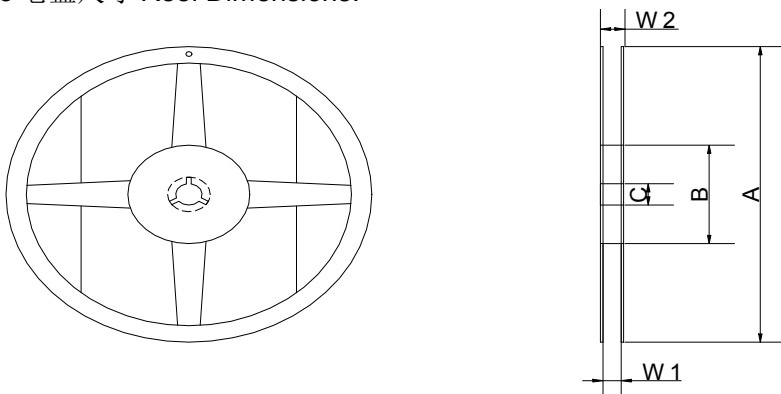
8.1 编带尺寸 Tape Dimensions:



ITEM	A0	B0	K0	W	E	F	P0	P1	P2	D0	D1	T
Dimensions	1.75	3.35	0.80	8.0	1.75	3.50	4.0	4.0	2.0	1.50	1.00	0.20
Tolerance	±0.05	±0.05	±0.05	±0.20	±0.10	±0.05	±0.10	±0.10	±0.05	+0.1/-0	+0.1/-0	±0.02

8.2 送料间距 Feeding pitch: 4mm

8.3 卷盘尺寸 Reel Dimensions:







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ITEM	A	B	C	W <sub>1</sub>	W <sub>2</sub>
Dimensions	178±2	60 Min.	13+0.5/-0.2	8.4+1.5/-0.0	11.4±2

8.4 每卷 5,000 只保险丝 5,000EA fuses / reel

8.5 外盒尺寸 Box Dimensions: 长 L\*宽 W\*高 H=180±2\*180±2\*18±1mm

9. 环境性能 ENVIRONMENTAL PERFORMANCES

9.1 工作温度 Operating Temperature: -55℃~90℃.

9.2 储存温度 Storing Temperature: -55℃~85℃.

10. 信赖性试验 RELIABILITY TEST

项目 Item	试验方法 Test Methods	规定值 Specification
负载寿命 Load life	室温下, 通额定电流 4 小时 4 hours at rated current @ room Temp.	△R: ±10%
耐湿负载 Load life moisture	40℃, 90-95% R.H., 通额定电流的 70% 1.5 小时, 断 0.5 小时, 共 500 小时 40℃, 90-95% R.H., 70% Rated current, 1.5 hours ON, 0.5 hours OFF, 500 hours	△R: ±10%
温度循环 Temperature cycle	-40℃(30min)~+120℃(30min)10 个循环 -40℃(30min)~+120℃(30min) 10 cycles	△R: ±10%
弯曲强度 Bending Strength test	支撑点间隔 90mm, 弯曲 1 次, 幅度 3mm Distance between holding points is 90mm, Bending 3mm, 1 time	无机械损伤 No mechanical damages
耐焊接热性 Resistance to soldering heat	260℃±5℃, 10s±0.5s	△R: ±10%
可焊性 Solderability	235℃±5℃, 3.5s+0.5/-0s	最小覆盖率 95% 95% coverage min.
耐溶剂性 Resistance to solvent	MIL-STD-202F-215	保护层和标识无明显损伤 No evidence of damages to protective coating and marking
锡须 Tin Whisker	40℃, 90~95%R.H., 放置 500 小时 40℃, 90~95%R.H., 500 hours	锡须 Tin Whisker <50 μm