



Microfuse RoHS & Pb-free
好利® 保险丝管



产品规格书

PRODUCT SPECIFICATION

玻璃管保险丝（速断型）

GLASS TUBE FUSE (FAST-BLOW)

51NM RoHS SERIES

编码: A03 HLD-PSI-8063 2022/8/30

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1 适用范围/ SCOPE

本规格书适用于公司生产并获得 UL、CUL、CSA、PSE、KC 安全标准认证的 51NM RoHS 系列 HOLLY® 商标的小型保险丝管。

This specification defines the technical requirements of miniature fuse type 51NM RoHS series with HOLLY® brand, which are approved by UL, CUL, CSA, PSE and KC.

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/ Example: 51NM 010 H

* 额定电压/ Rated Voltage: H - 250V L-125V

产品部件号/ PART NUMBER

产品部件号 PART NUMBER	型号规格 MODEL DETAIL
51NM-0100 H/L	51NM 100mA 250V/125V
51NM-0125 H/L	51NM 125mA 250V/125V
51NM-0160 H/L	51NM 160mA 250V/125V
51NM-0200 H/L	51NM 200mA 250V/125V
51NM-0250 H/L	51NM 250mA 250V/125V
51NM-0300 H/L	51NM 300mA 250V/125V
51NM-0315 H/L	51NM 315mA 250V/125V
51NM-0350 H/L	51NM 350mA 250V/125V
51NM-0375 H/L	51NM 375mA 250V/125V
51NM-0400 H/L	51NM 400mA 250V/125V
51NM-0500 H/L	51NM 500mA 250V/125V
51NM-0600 H/L	51NM 600mA 250V/125V
51NM-0630 H/L	51NM 630mA 250V/125V
51NM-0700 H/L	51NM 700mA 250V/125V
51NM-0750 H/L	51NM 750mA 250V/125V
51NM-0800 H/L	51NM 800mA 250V/125V
51NM-010 H/L	51NM 1A 250V/125V
51NM-012 H/L	51NM 1.2A 250V/125V
51NM-013 H/L	51NM 1.25A 250V/125V
51NM-015 H/L	51NM 1.5A 250V/125V
51NM-016 H/L	51NM 1.6A 250V/125V

51NM-020 H/L	51NM 2A 250V/125V
51NM-025 H/L	51NM 2.5A 250V/125V
51NM-030 H/L	51NM 3A 250V/125V
51NM-032 H/L	51NM 3.15A 250V/125V
51NM-035 H/L	51NM 3.5A 250V/125V
51NM-040 H/L	51NM 4A 250V/125V
51NM-050 H/L	51NM 5A 250V/125V
51NM-060 H/L	51NM 6A 250V/125V
51NM-063 H/L	51NM 6.3A 250V/125V
51NM-070 H/L	51NM 7A 250V/125V
51NM-080 H/L	51NM 8A 250V/125V
51NM-090 H/L	51NM 9A 250V/125V
51NM-100 H/L	51NM 10A 250V/125V
51NM-120 H/L	51NM 12A 250V/125V
51NM-150 H/L	51NM 15A 250V/125V
51NM-200 H/L	51NM 20A 250V/125V

2 相关标准/ APPLICABLE STANDARDS

2.1 51NM RoHS 系列产品适用的相关标准是 UL248-1、UL248-14、CSA C22.2 NO.248.1-00、CSA C22.2 NO.248.14-00、JIS C6575、㉔ 02(KC)。

Applicable standards for 51NM RoHS series are UL248-1, UL248-14, CSA C22.2 NO.248.1-00, CSA C22.2 NO.248.14-00, JIS C6575 and ㉔ 02(KC).

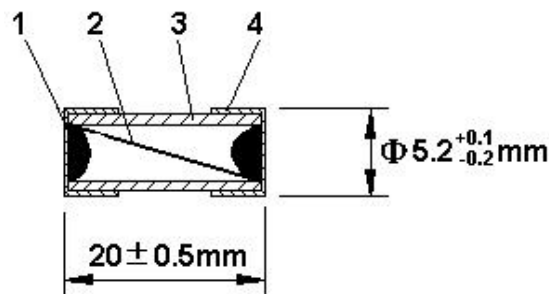
2.2 认证情况/ APPROVED DETAILS

安全认证 SAFETY APPROVALS	额定电压 RATED VOLTAGE	认证范围 APPROVED RANGE	认证号码 CERT. NO.
UL/CUL	125Vac/dc	32mA~8A	E156471
	250Vac/dc	32mA~8A	
UR/CUR	250Vac/dc	3A~8A	E156471
CSA	125Vac/dc	32mA~8A	LR101178
	250Vac/dc		
PSE	125Vac/dc	1A~5A	JET2489-3 1003-1017
		5.1A~15A	JET2489-3 1003-1020

	250Vac/dc	1A~5A	JET2489-3 1003-1018
		5.1A~15A	JET2489-3 1003-1019
KC	250Vac/dc	100mA~250mA	SU05008-3003D
		300mA~2A	SU05008-3004D
		2.5A~7A	SU05008-3028D

3 构造图/ CONSTRUCTION FIG.&DIMENSION

3.1 DIMENSION (Unit: mm)



编号 No.	品名 PART	材料名 MATERIAL MODEL	备注 NOTE
1	焊锡 Solder	无铅焊锡/ Pb Free	额定电流 $I_n \leq 12A$
		含铅高温焊锡/ Pb Contained High Temperature Solder	额定电流 $I_n > 12A$
2	可熔体 Element	金属丝/Metal Wire	/
3	管体/ Tube	玻璃管/ Glass Tube	/
4	铜帽/Cap	黄铜/ Brass	镀镍/ Nickel Plated

3.2 玻璃管/ GLASS TUBE

玻璃管无破裂、缺损或污染等现象，且须透明易辨其内部的可熔体。

The glass tube shall be transparent as to be easily distinguished fusing element with naked eyes and have no

defects such as crack, injury and contamination.

3.3 铜帽/ CAP

铜帽应焊接牢固，以保证在未损坏熔断体时，铜帽不能被卸脱。样品在 15℃-35℃水中浸 24 小时取出后，在每个端帽上，均匀地施加拉力至 10N，保持 1 分钟，铜帽不应脱落。

Cap should be firmly attached so that it is not possible to remove them without damaging the fuse itself. The samples are immersed in water for 24 hours at a temperature between 15℃ and 35℃. After remove from the water, an axial pull steadily increasing to 10N is applied to each cap for 1 minute.

3.4 焊点/ SOLDERING JOINT

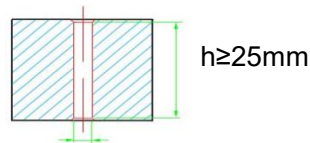
焊接铜帽端时，铜帽外表面不能有残留的助焊剂、焊锡、可熔体等异物。

Soldering joint in end cap shall not be melted during normal operation and shall not have solder chips on tube, element in view and outer surface of caps.

3.5 准直度/ ALIGNMENT

保险丝应能依自身重量能通过准直度卡规, 准直度卡规的图形如下。

The entire length of the fuse shall pass through the gauge by the fuses own weight. The construction of gauge is as follows.



$$D=5.48 \pm 0.01\text{mm}$$

4 机械特性/ MECHANICAL PERFORMANCES

保险丝应能承受下列两项试验。/ Fuse shall withstand the following tow testing

4.1 拉力试验/ Tensile Strength

固定保险丝的一端铜帽，然后在另一端铜帽上，沿水平轴方向施加 10N 的拉力，两端铜帽不应松动且管体不应破碎。

When one end cap of the specimen is fixed and then the tensile force 10N is applied to the other end cap in a direction to separate the end caps, no looseness of end caps or damage of fuse-tube shall occur.

4.2 管体强度试验/ Strength of Fuse-tube

两端铜帽固定好后，在玻璃管的中心位置施加 25N 的压力，管体不应破碎。

When middle parts of end caps at both ends of the specimen are supported and then the force 25N is applied to the middle part of the fuse-tube, no damage of the fuse-tube shall occur.

5 电气特性/ ELECTRICAL PERFORMANCE

5.1 测试条件/ TEST CONDITION

全部测试条件都应在环境温度 $24^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 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 are conducted at an ambient temperature of $24 \pm 3^{\circ}\text{C}$. The ambient temperature is not allowed to vary more than 5°C during the test, and must be within these limits.

5.2 技术参数/ TECHNICAL PARAMETERS

具体技术参数如下表

The specific technical parameters are shown in the table below..

额定电流 Rated Current (A)	电阻 electric resistance(Ω)	I ² T	额定电流 Rated Current (A)	电阻 electric resistance(Ω)	I ² T
200mA	2.0400	0.02697	2A	0.1380	5.149
250mA	1.4500	0.03371	2.5A	0.0430	5.761
300mA	1.1000	0.04045	3A	0.0355	9.722
315mA	1.0700	0.04247	3.15A	0.0328	9.835
350mA	2.3800	0.04719	3.5A	0.0290	13.52
400mA	1.5400	0.06145	4A	0.0246	15.80
500mA	1.2300	0.07681	5A	0.0189	29.11
600mA	0.8450	0.1224	6A	0.0149	47.42
630mA	0.7810	0.1790	6.3A	0.0137	59.24
750mA	0.5670	0.3040	7A	0.0125	73.10
800mA	0.5160	0.3550	8A	0.0105	100.0
1A	0.3780	0.6167	9A	0.0089	153.9
1.2A	0.2790	1.400	10A	0.0080	171.0
1.25A	0.2670	1.540	12A	0.0063	306.2
1.5A	0.2070	2.076	15A	0.0055	382.8
1.6A	0.1880	3.450			

5.3 负载能力测试/ CURRENT-CARRYING CAPACITY TEST

当保险丝通以 100%倍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，管体不破裂。

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

5.4 温度上升试验/ TEMPERATURE RISE TEST

当保险丝通以 100%倍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℃。注：温度上升=保险丝表面的温度－环境温度。

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

Note: Temp. rise = fuse temp. — room temp.

5.5 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，且铜帽不能飞脱、管体不应破裂、损坏。

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, that is, the pre-arcing time. Moreover, neither damage of the fuse-tube nor shattering of the cap shall occur.

熔断电流/ % of Rated Current	熔断时间/ Open Time
135%	1 hour Maximum
200%	5 sec. Maximum

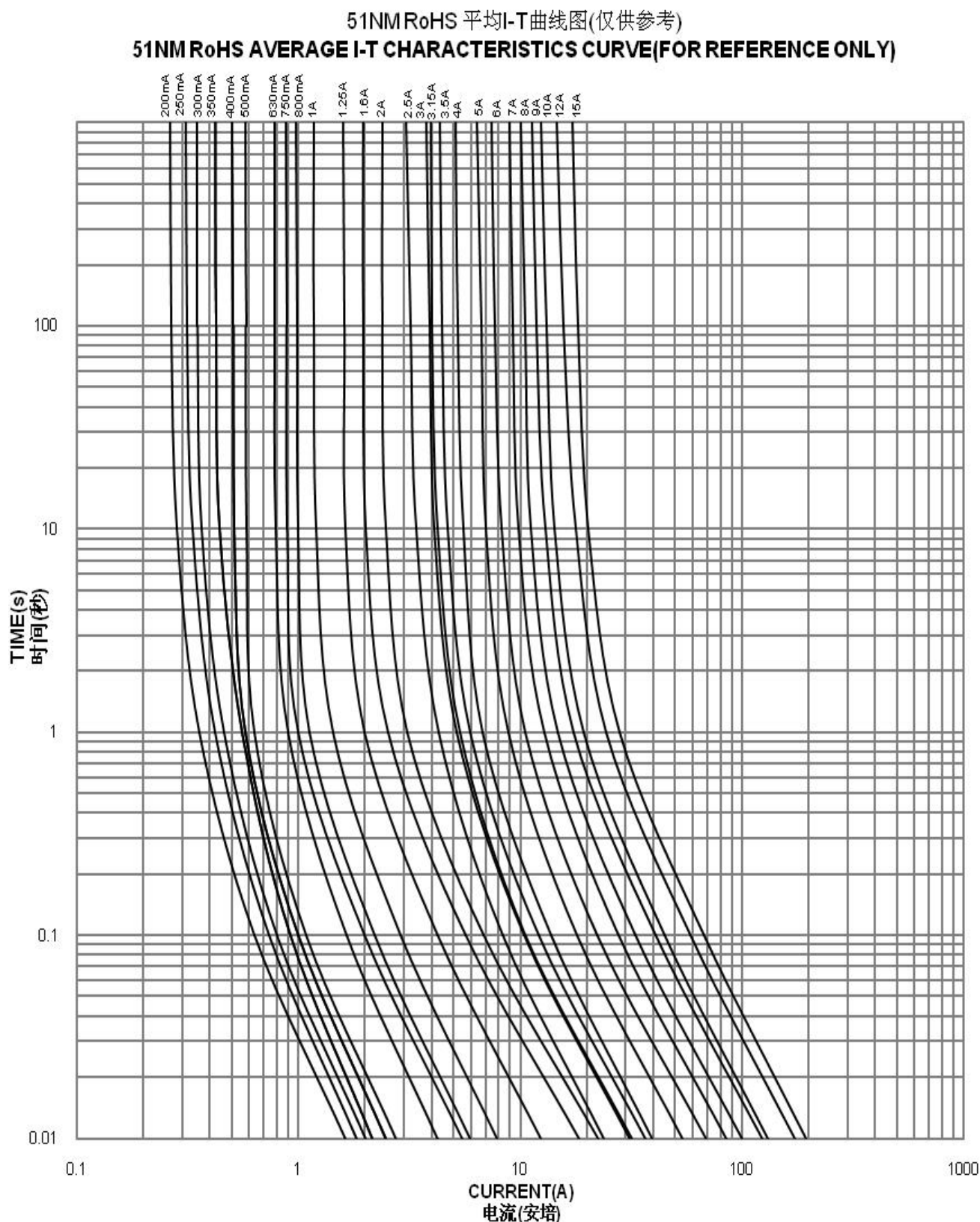
5.6 分断能力/ INTERRUPTING CAPACITY

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，保险丝管不应破裂、铜帽飞脱、且铜帽两端的绝缘电阻不小于 0.1MΩ。

The interrupting capacity should reach the interrupting rated current given in the following table. And after this test, there should be no damage of the fuse-tube or shattering of the caps. After this test, the insulation resistance between the end caps shall be not less than 0.1MΩ.

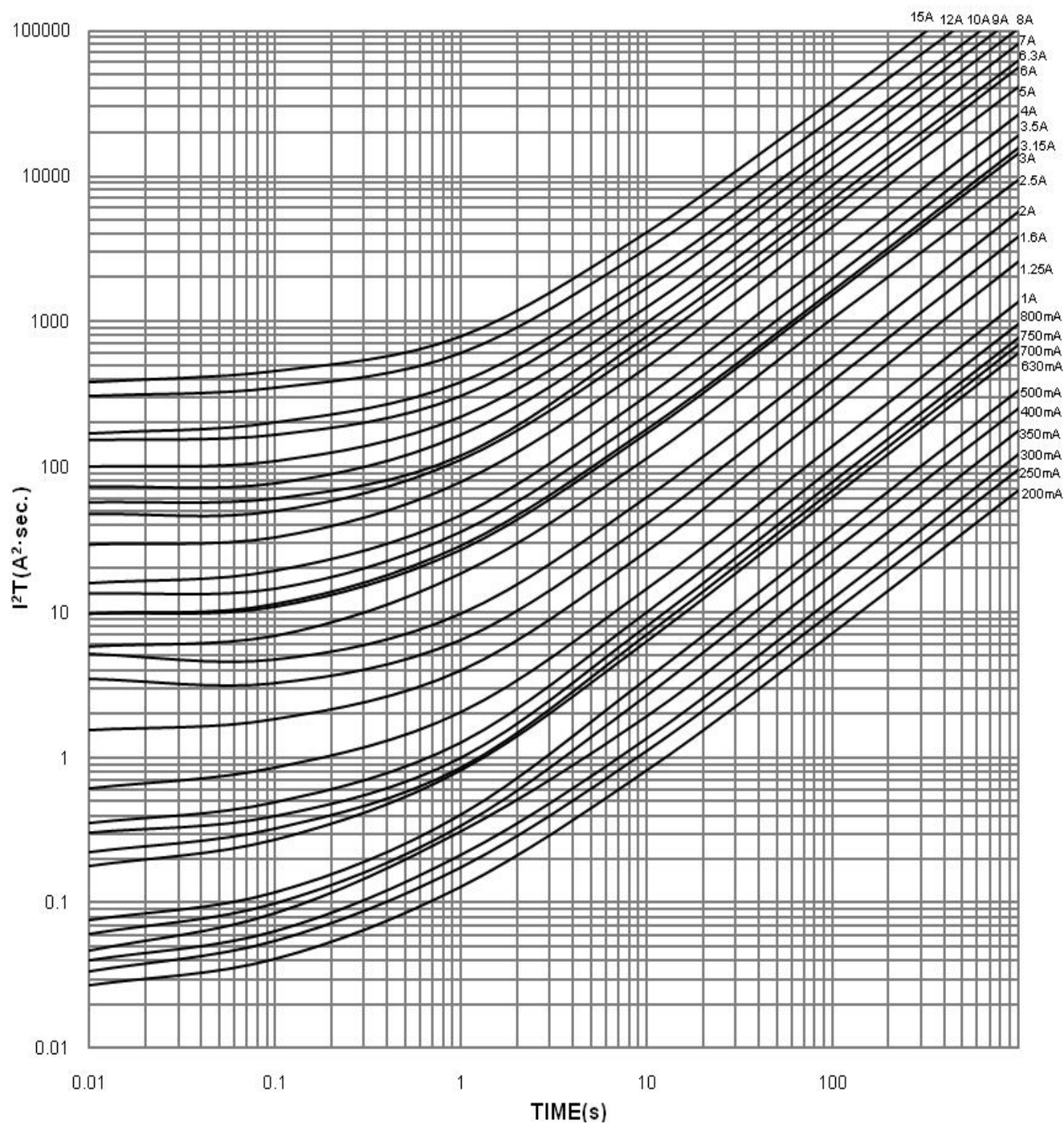
安全认证 SAFETY APPROVALS	认证范围 APPROVED RANGE	额定电压 RATED VOLTAGE	分断电流 BREAKING CURRENT
UL/CUL	32mA~8A	125V	10000A
	32mA~1A	250V	35A
	1.1A~2.5A	250V	100A
UR/ CUR	3A~8A	250V	100A
CSA	100mA~8A	125V	10000A
	32mA~1A	250V	35A
	1.1A~3.5A	250V	100A
	3.6A~8A	250V	200A
PSE	1A~15A	125V	100A
	1A~15A	250V	100A
KC	100mA~7A	250V	100A

5.7 平均 I-T 特性曲线图(仅供参考)/ THE AVERAGE I-T CHARACTERISTICS CURVE(FOR REFERENCE ONLY)



5.8 平均 I²T-T 特性曲线图(仅供参考)/ THE AVERAGE I²T-T CHARACTERISTICS CURVE(FOR REFERENCE ONLY)

51NM RoHS Average I²T-T Characteristics Curve(For Reference Only)



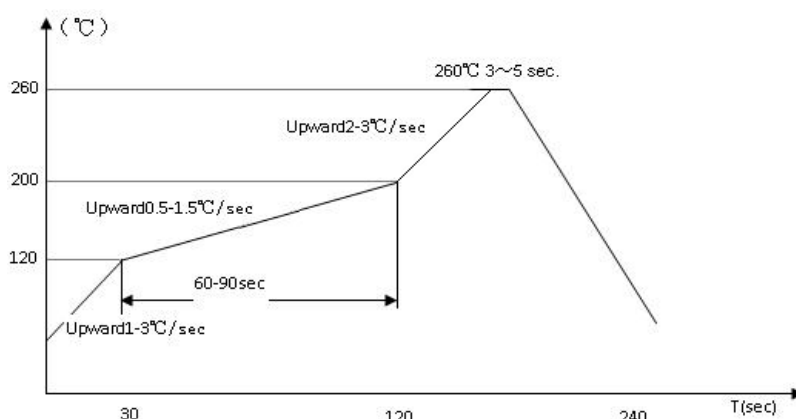
5.9 焊接参数/ Soldering Parameters

1) 波峰焊---260℃，最大 10 秒。 / Wave soldering---260℃, 10 seconds Maximum.

建议波峰焊接图形/ Suggest wave soldering graphics

2) 手工焊接/ Manual soldering: 350℃, 3sec. Max..

3) 耐热焊接/ Resistance to soldering heat: 260℃, 10sec. Max

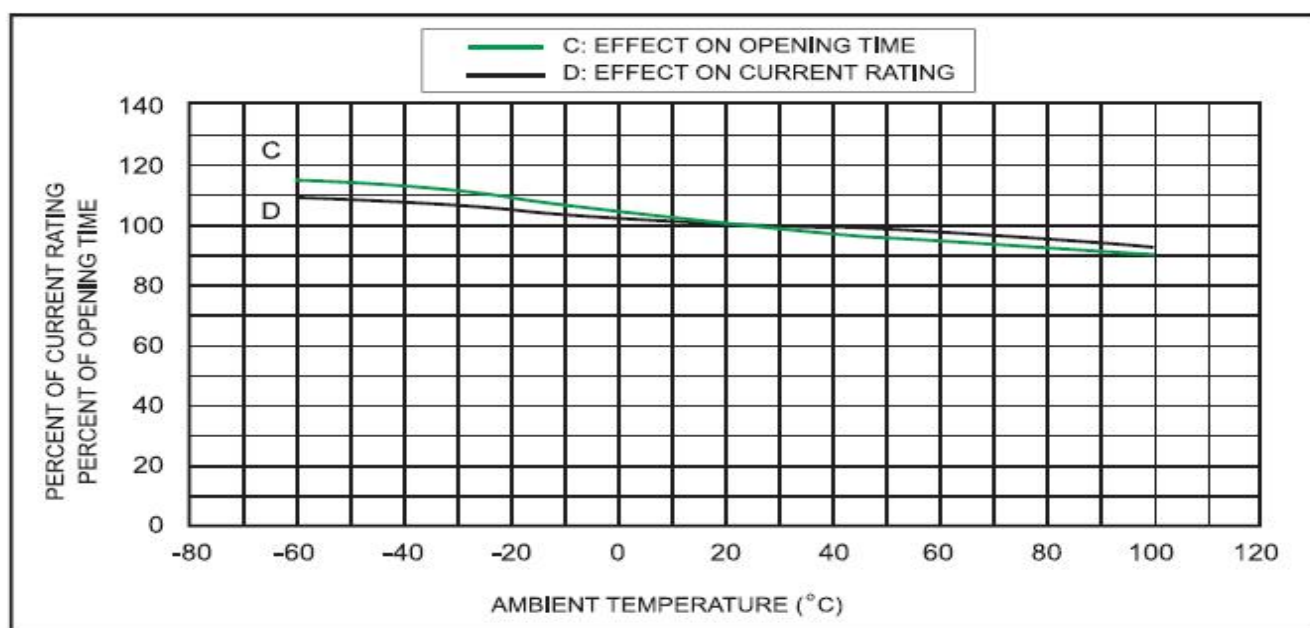


5.10 电阻测试/ COLD RESISTANCE TEST

环境温度为 $25 \pm 2^\circ\text{C}$ ，测试电流不大于保险丝额定电流的 10%。

Input 10% of fuse rated current to fuse for cold resistance test at surrounding temperature of $25 \pm 2^\circ\text{C}$.

5.11 温度降额曲线/ Temperature rating curve



(II) Effect on rating and opening time in 5In of fast-blow and slow-blow fuse

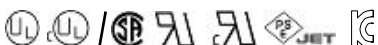
6 产品标志/ MARKING

6.1 保险丝上的标志应易于看清。

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

6.2 每个保险丝应标有下列标记。

The markings for every fuse shall be prescribed as below according to the types.

1) 安全认证标志/ Safety approval logo: 

2) 型号名称/ Type: 51NM or NM(只有 PSE 认证时不需打 51 标记/ 51 is not marked on the cap for the fuses that only have PSE approval.)

3) 商标/ Trademark: 

4) 额定电压/ Rated Voltage

5) 额定电流/ Rated Current

注: 1)、2) 和 3)应标注在保险丝管一端铜帽的侧面。

Note: 1), 2) and 3) should be marked on the one side cap of the fuse.

4) 和 5)应标注在保险丝管另一端铜帽的侧面。

4), 5)should be marked on the other side cap of the fuse.

7 包装要求/ PACKING DETAILS

7.1 外箱包装方式/ EXTERNAL CARTON PACKING

7.1.1 包装方式 A/ MODE A

7.1.1.1 参考尺寸: 长×宽×高=320×240×165mm。

Reference Dimension: length×width×height=320×240×165mm.

7.1.1.2 包装细节: 200EA/小塑料袋; 25 小塑料袋/大塑料袋; 2 大塑料袋/每箱。

Packing Details: 200EA/ little plastic-bag; 25 little plastic-bags/ big plastic-bag; 2 big plastic-bags/ External Carton.

7.1.2 包装方式 B/ PACKING MODE B

7.1.2.1 参考尺寸: 长×宽×高=375×245×165mm。

Reference Dimension: Length×Width×Height=375×245×165mm.

7.1.2.2 包装细节: 包装细节: 200EA/小塑料袋; 5 小塑料袋/盒; 10 盒/每箱。

Packing Details: 200EA/ little plastic-bag; 5 little plastic-bags/ box; 10 boxes/ External Carton.

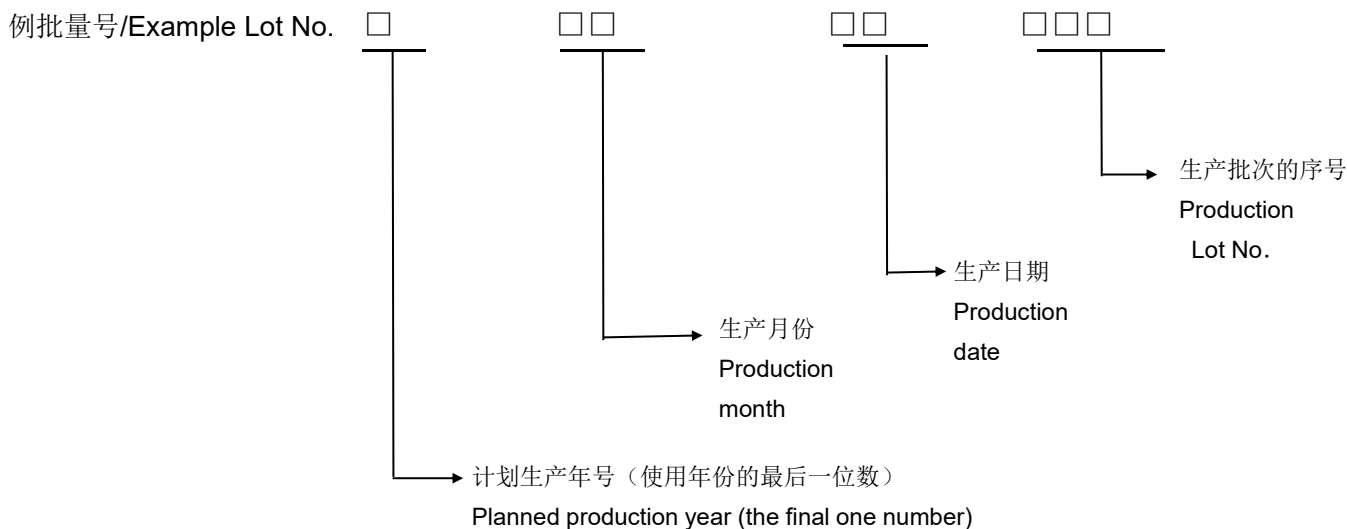
产品的包装应能达到防潮、抗振的作用, 以防在运输或贮存过程中产品受潮或损坏。

Packing shall be so carried out that the products will not absorb moisture or be damaged during transportation or storage.

7.2 标签/ LABEL

标签应包括型号、额定电流、额定电压、分断电流、商标、安全标志、批量号码、公司名称、RoHS 标志、绿色“G”和“QA”标志。

The label in the smallest package in which the fuses are put shall contain the Type, Rated current, Rated voltage, Interrupting current, Trademark, Safety approval logo, Lot. No., Company mane, “RoHS” mark, green “G” and “QA” mark.



8 环境参数/ ENVIRONMENT PARAMETERS

8.1 工作温度/ Operating Temperature: -55℃～125℃.

8.2 储存温度/ Storage Temperature: -55℃～85℃.

9 信赖性试验/RELIABILITY TEST

项目/ Item	试验要求/ Test Requirement	试验条件/ Test Condition
高温试验 High Temperature Test	试验后保险丝管的电阻符合范围；电气特性符合： 200%≤5 秒、135%≤1 小时、100%≥4 小时。 After high temperature test, the resistance value of the fuses shall be in range. Electrical Characteristics: 200%≤5 seconds, 135%≤1hour, 100%≥4hours.	测试温度：105±2℃，测试时间：1000 小时。 Test Temperature: 105 ± 2 ℃ , Test Time: 1000hours.
低温试验 Low Temperature Test	试验后保险丝管的电阻符合范围；电气特性符合： 200%≤5 秒、135%≤1 小时、100%≥4 小时。 After low temperature test, the resistance value of the fuses shall be in range. Electrical Characteristics: 200%≤5 seconds, 135%≤1hour, 100%≥4hours.	测试温度：-20±2℃，测试时间：1000 小时。 Test Temperature: -20±2℃, Test Time: 1000hours.
高湿试验 High Humidity Test	试验后保险丝管的电阻符合范围；电气特性符合： 200%≤5 秒、135%≤1 小时、100%≥4 小时。 After high humidity test, the resistance value of the fuses shall be in range. Electrical Characteristics: 200%≤5 seconds, 135%≤1hour, 100%≥4hours.	测试温度：40±2℃，测试湿度：90%~95%，测试时间：96 小时。 Test Temperature: 40 ± 2 ℃ , Test Humidity: 90%~95%, Test Time: 96hours.
热冲击试验 Thermal Shock Test	试验后保险丝管的电阻符合范围；电气特性符合： 200%≤5 秒、135%≤1 小时、100%≥4 小时。 After thermal shock test, the resistance value of	每个循环：-40℃放置 30 分钟后再 85℃放置 30 分钟，测试 10 循环。 -40 ℃ / 30minutes → 85 ℃ /

	the fuses shall be in range. Electrical Characteristics: $200\% \leq 5$ seconds, $135\% \leq 1$ hour, $100\% \geq 4$ hours.	30minutes, 10 cycles.
落下、冲击试验 Falling Shock Test	铜帽应固定牢固,以保证在未损坏熔断体时,铜帽不能被卸下。铜帽表面镀层应牢固不易脱落,每个端帽应能经受专用的设备外加的轴向拉力 10N,保持 1 分钟。玻璃管必须无缺陷破裂、缺损。试验后保险丝管的电阻符合范围;电气特性符合: $200\% \leq 5$ 秒、$135\% \leq 1$ 小时、$100\% \geq 4$ 小时。 Cap should be firmly attached so that it is not possible to remove them without damaging the fuse itself. The means of attachment shall be sufficient to withstand an axial pull of 10N applied to each cap for 1 minute. The cap shall be nickel plated firmly. The glass tube shall have no defects such as crack and injury. After falling shock test, the resistance value of the fuses shall be in range. Electrical Characteristics: $200\% \leq 5$ seconds, $135\% \leq 1$ hour, $100\% \geq 4$ hours.	一箱 10,000 个保险丝管从一米高自由落下,跌落 20 次。 10,000EA fuses/ one external carton, Falling Height: 1 meter, Falling Times: 20.