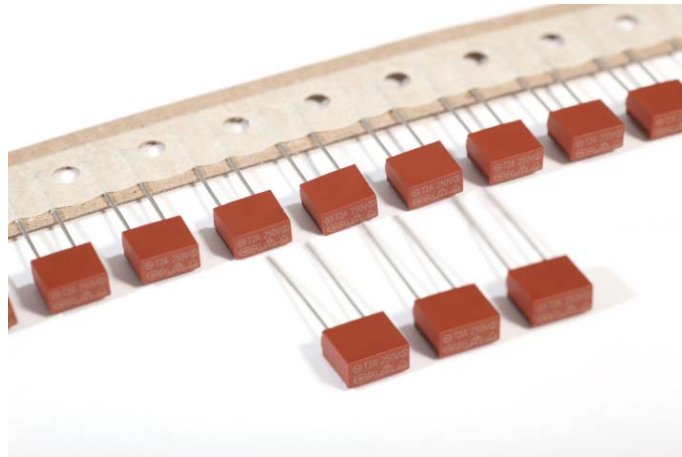




Microfuse RoHS & Pb-free
好利® 保险丝管



产品规格书

PRODUCT SPECIFICATION

径向引线式保险丝（慢断型）
RADIAL LEAD MICROFUSE (TIME-LAG)
5ET RoHS SERIES
编码：B06 HLD-PSI-8041 2022/08/05

制定：

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1.适用范围/SCOPE

本规格书适用于本公司生产并获得CCC、UR/CUR、SEMKO、PSE、VDE、BSI、KC、TUV认证的5ET RoHS系列HOLLY®商标的超小型保险丝。This specification defines the technical requirements of sub-miniature fuse type 5ET RoHS series with HOLLY® brand, which are approved by CCC, UR/CUR, SEMKO, PSE, VDE, BSI, KC and TUV.

产品部件号为: 型号 额定电流 额定电压 包装方式
 Construction of part no: type rated current rated voltage packing mode
 例如/ For Example: 5ET 0100 H A

* 额定电压 Rated voltage: L-125V H - 250V H₁ - 300V H₂-400V

* 包装方式/ Packaging mode: A - 编带包装 Ammo-pack; B - 散装 Bulk. (未标注 A 或 B, 包装根据引线长度)

产品部件号/ PART NUMBER

产品部件号 PART NUMBER	型号规格 MODEL DETAIL
5ET-0050 H A/B	5ET T50mA 250V
5ET-0063 H A/B	5ET T63mA 250V
5ET-0080 H A/B	5ET T80mA 250V
5ET-0100 L/H/H ₁ A/B	5ET T100mA 125V/250V/300V
5ET-0125 L/H/H ₁ A/B	5ET T125mA 125V/250V/300V
5ET-0160 L/H/H ₁ A/B	5ET T160mA 125V/250V/300V
5ET-0200 L/H/H ₁ A/B	5ET T200mA 125V/250V/300V
5ET-0250 L/H/H ₁ A/B	5ET T250mA 125V/250V/300V
5ET-0315 L/H/H ₁ /H ₂ A/B	5ET T315mA 125V/250V/300V/400V
5ET-0400 L/H/H ₁ /H ₂ A/B	5ET T400mA 125V/250V/300V/400V
5ET-0500 L/H/H ₁ /H ₂ A/B	5ET T500mA 125V/250V/300V/400V
5ET-0630 L/H/H ₁ /H ₂ A/B	5ET T630mA 125V/250V/300V/400V
5ET-0800 L/H/H ₁ /H ₂ A/B	5ET T800mA 125V/250V/300V/400V
5ET-010 L/ H/H ₁ /H ₂ A/B	5ET T1A 125V/250V/300V/400V
5ET-013 L/H/H ₁ /H ₂ A/B	5ET T1.25A 125V/250V/300V/400V
5ET-016 L/H/H ₁ /H ₂ A/B	5ET T1.6A 125V/250V/300V/400V
5ET-020 L/H/H ₁ /H ₂ A/B	5ET T2A 125V/250V/300V/400V
5ET-025 L/H/H ₁ /H ₂ A/B	5ET T2.5A 125V/250V/300V/400V
5ET-032 L/H/H ₁ /H ₂ A/B	5ET T3.15A 125V/250V/300V/400V
5ET-040 L/H/H ₁ /H ₂ A/B	5ET T4A 125V/250V/300V/400V
5ET-050 L/H/H ₁ /H ₂ A/B	5ET T5A 125V/250V/300V/400V
5ET-063 L/H/H ₁ /H ₂ A/B	5ET T6.3A 125V/ 250V/300V
5ET-080 L/H/H ₁ /H ₂ A/B	5ET T8A 125V/250V/300V/400V
5ET-100 L/H/H ₁ /H ₂ A/B	5ET T10A 125V/ 250V/300V

型号规格: 型号 特性符号 额定电流 额定电压
 MODEL DETAIL: Type Characteristic Symbol Rated Current Rated Voltage
 例如/ Example: 5ET T 2A 250V

*特性符号/ Characteristic Symbol: T – 慢断型/ Time-Lag.

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

2.1 5ET RoHS 系列产品适用的相关标准是 IEC 60127 和 GB 9364。

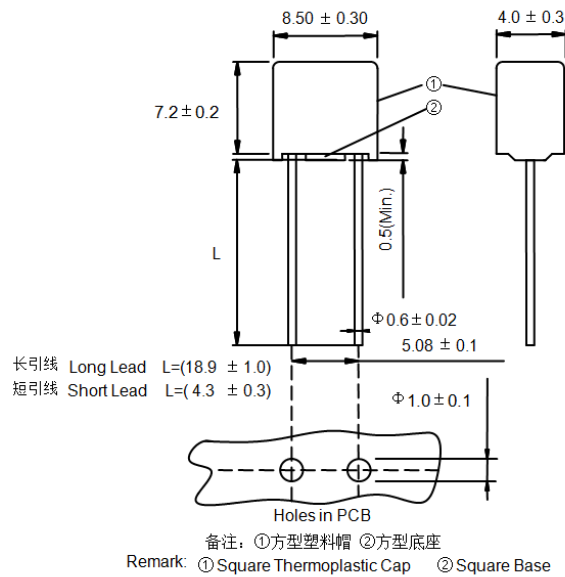
Applicable standards for 5ET RoHS series are IEC 60127 and GB 9364.

2.2 认证情况/ APPROVED DETAILS

额定电压 Rated Voltage	PSE		UR/CUR		CCC		VDE	
	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.
250V _{ac} / 300V _{ac}	1A~5A	JET2489-31007-1008	315mA~10A(250V _{ac})	E156471	100mA~6.3A	20209702070 00163	100mA~6.3A(250V _{ac}) 1A~6.3A(300V _{ac})	40015669
	6.3A~10A	JET2489-31007-1009			100mA~6.3A (125V _{dc} /300V _{ac})	8A, 10A		
125V _{dc}	/				/	/	/	/
400V _{ac}	/		315mA~10A		/	/	/	/
额定电压 Rated Voltage	KC		SEMKO		BSI		TUV	
	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.	认证范围 Approved Range	认证号码 Cert. No.
250V _{ac}	100mA	SU05008-8007D	100mA~6.3A	SE-S-2001280	100mA~6.3A	KM52652	50mA~10A	J50248340
	125mA~800mA	SU05008-8008D						
	1A~2.5A	SU05008-8009D						
	3.15A~6.3A	SU05008-8010D						

3.外形尺寸与原材料 DIMENSIONS & MATERIALS

3.1 构造图/ CONSTRUCTION FIG. & DIMENSION



3.2 原材料规格/ MATERIALS

品名/ PART	材料/ MATERIAL	备注/ REMARK
方形塑料帽/ Square Thermoplastic Cap	工程塑料/ Thermoplastic	棕色/ Mahogany
底座/ Base	工程塑料/ Thermoplastic	黑色/ Black
引线/ Lead	镀锡铜线/ Tin Plated Copper Wire	/
焊锡/ Solder	无铅/ Pb Free	/
可熔体/ Fusible Element	玻璃纤维线+金属丝/ Glass Fiber+ Metal Wire	/

3.3 方形塑料帽/ SQUARE THERMOPLASTIC CAP

方形塑料帽无破裂、缺损或污染等现象。

Square Thermoplastic Cap shall have no defects such as crack, injury and contamination.

3.4 塑料件阻燃性能/ FLAMMABILITY CIASSIFICATION: UL 94V-0.

4.机械特性/ MECHANICAL PERFORMANCES

保险丝应能承受下列二项试验。 Fuse shall withstand the following two tests.

4.1 拉力试验/ TENSILE TEST

将保险丝保持在一个固定的位置，沿引线方向施加 10N 的拉力，引线、方形塑料帽不能松动并且方形塑料帽不应破裂。 When fuse is fixed and the tensile force 10N is applied in a direction to lead, no looseness of leads and square thermoplastic cap or damage of square thermoplastic cap shall occur.

4.2 推力试验/ THRUST TEST

将保险丝保持在一个固定的位置，沿引线方向施加 2N 的推力，引线、方形塑料不能松动并且方形塑料不应破裂。 When fuse is fixed and the thrust 2N is applied in a direction to lead, no looseness of leads and square thermoplastic cap or damage of square thermoplastic cap shall occur.

5.电气特性/ ELECTRICAL PERFORMANCES

5.1 测试条件/ TEST CONDITIONS

A 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 a 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.

B 每个保险丝支架，水平安装在非导电的胶木测试板上，以便被测的保险丝在测试板上能保持水平。

Each fuse-holder is to be mounted horizontally on a test board of non-conducting bakelite, so that each fuse under test is held in a horizontal position above the board .

5.2 标称冷电阻、电压降、平均 I^2T 值(供参考)、最大持续功耗/ NOMINAL COLD RESISTANCE, VOLTAGE DROP, AVERAGE I^2T VALUE(FOR REFERENCE ONLY) And MAXIMUM SUSTAINED DISSIPATION

额定电流 Rated Current	标称冷电阻 Nominal Cold Resistance(Ω)	1.0I _n 最大电压降 1.0I _n VOLTAGE DROP Max.(mV)	平均 I^2T 值 Average I^2T Value(A ² .sec.)	1.5I _n 最大持续功耗 1.5I _n Maximum Sustained Dissipation (mW)
50mA	6.5300	550	0.006447	155
63mA	3.9000	480	0.012907	160
80mA	2.6200	400	0.019062	165
100mA	2.0500	350	0.02623	170
125mA	1.3400	300	0.04499	180
160mA	0.8700	280	0.08755	190
200mA	1.2200	260	0.1181	200
250mA	0.4780	240	0.3206	220
315mA	0.4800	220	0.5153	250
400mA	0.2900	200	0.7761	280
500mA	0.2110	190	1.631	310
630mA	0.1460	180	2.329	360
800mA	0.1035	160	5.145	430
1A	0.0783	140	6.619	500
1.25A	0.0570	130	12.23	600
1.6A	0.0411	120	22.03	730

额定电流 Rated Current	标称冷电阻 Nominal Cold Resistance(Ω)	1.0I _n 最大电压降 1.0I _n VOLTAGE DROP Max.(mV)	平均I ² T值 Average I ² T Value(A ² .sec.)	1.5I _n 最大持续功耗 1.5I _n Maximum Sustained Dissipation (mW)
2A	0.0325	100	43.08	870
2.5A	0.0236	100	50.05	1000
3.15A	0.0179	100	73.53	1200
4A	0.0134	100	128.3	1400
5A	0.0099	100	176.8	1680
6.3A	0.0075	100	309.5	2000
8A	0.0050	100	305.7	2500
10A	0.0040	100	439.2	3000

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

当保险丝通以 150%倍额定电流的条件下进行测试时，在 1 小时内电路不应断开，保险丝不被电流熔断，方形塑料帽不破裂、脱落。

A fuse shall carry 150% of rated current for 1 hour or more, and the circuit shall not be opened. While the fuse is carrying this current, no open circuit, melt fusible element, and square thermoplastic cap shall not be charred or ruptured in any manner.

5.4 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，且方形塑料帽不能飞脱、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, there shall be not damaged or shattered of the square thermoplastic cap.

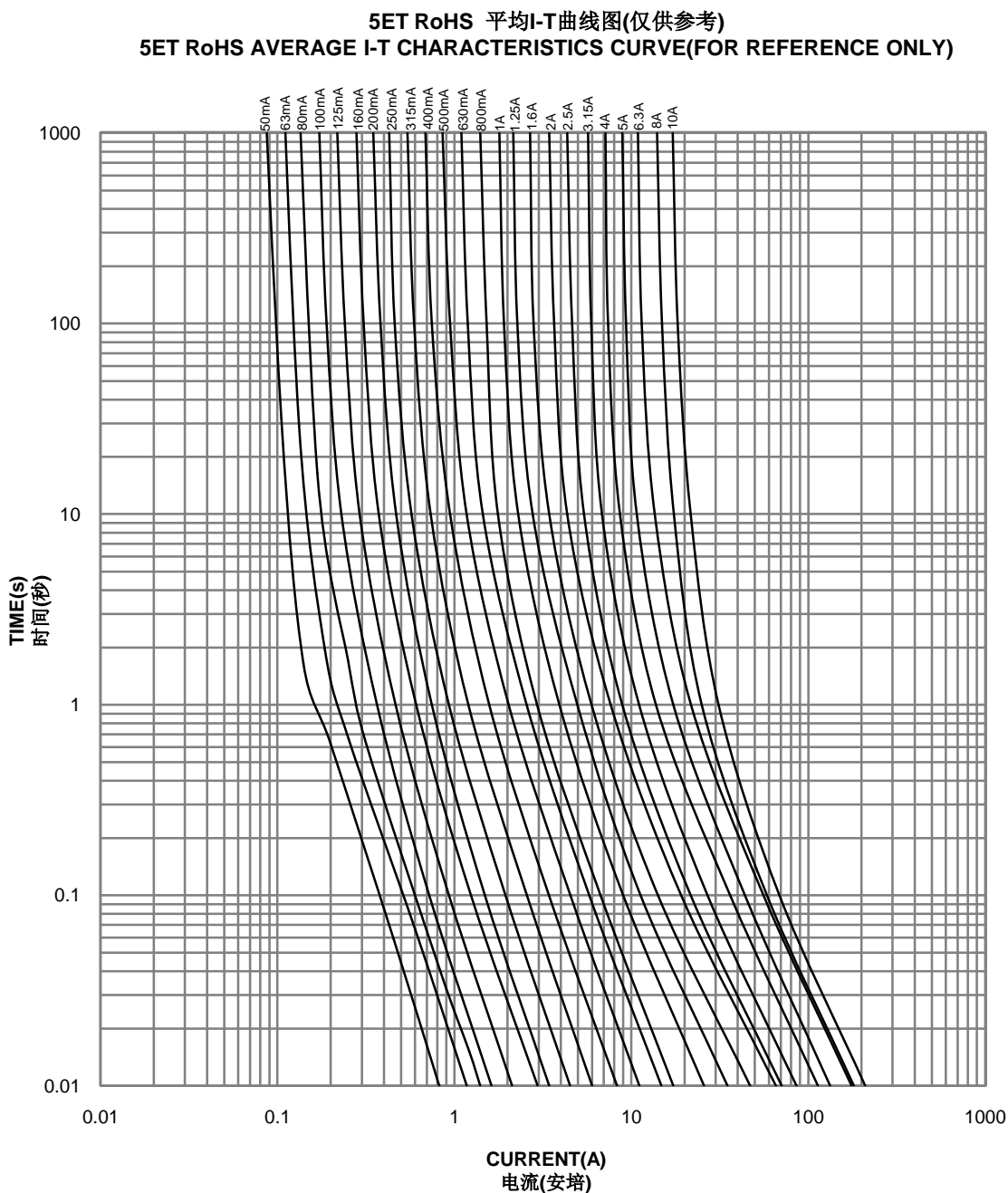
额定电流 Rated Current	2.1 I _n	2.75 I _n		4 I _n		10 I _n	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.
≥50mA, 且≤6.3A	2min.	400ms	10s	150ms	3s	20ms	150ms
>6.3A, 且≤10A	5min	1s	20s	150ms	3s	20ms	150ms

5.5 分断能力/ BREAKING CAPACITY

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，方形塑料帽不应飞脱、损坏。The breaking capacity should reach the rated breaking current given in the following table. And after this test, there shall be not damaged or shattered of the square thermoplastic cap.

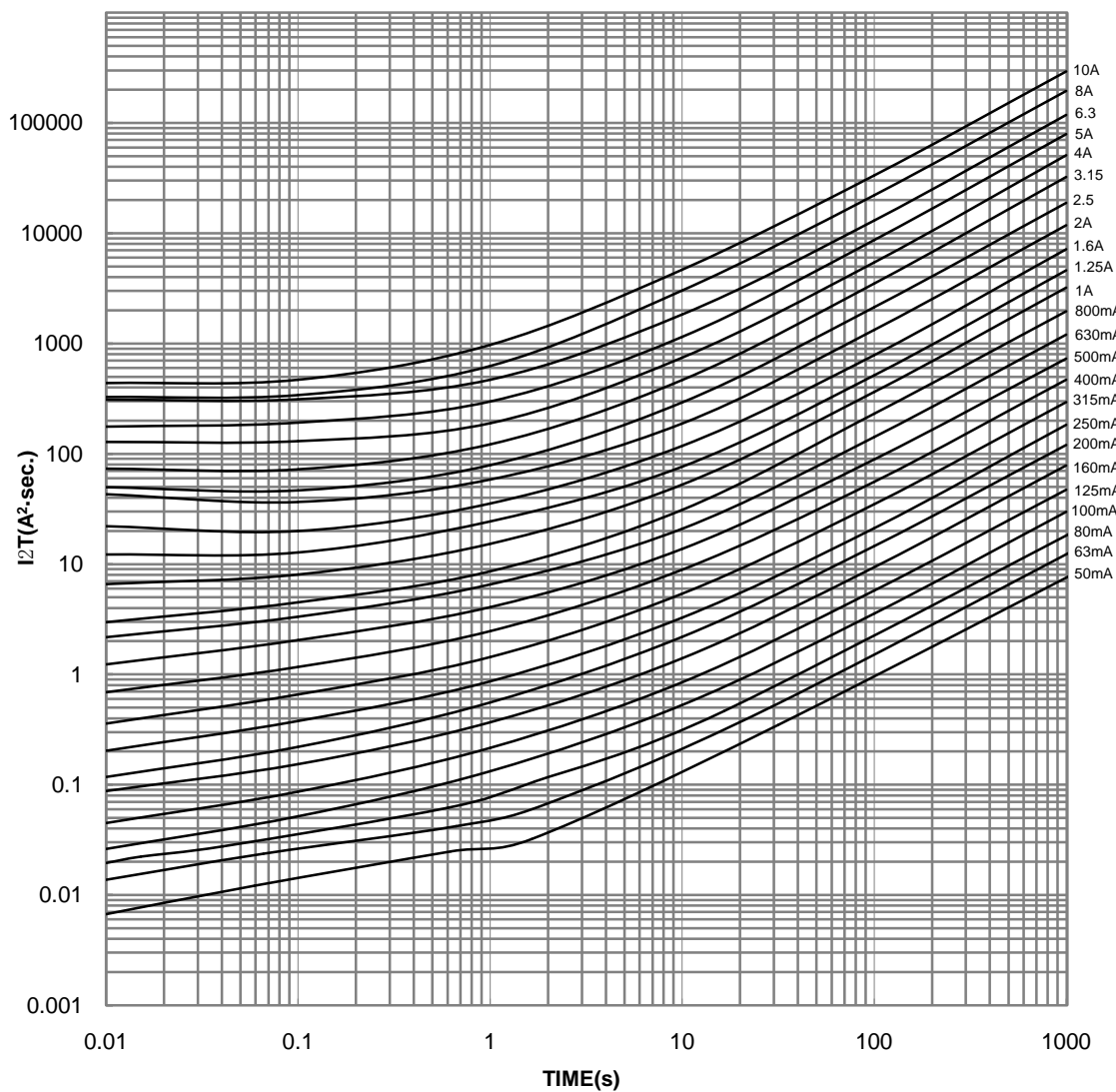
额定电压 RATED VOLTAGE	分断电流/ BREAKING CURRENT				
	SEMKO/BSI/KC	CCC/VDE	UR/CUR	TUV	PSE
250V _{ac}	35A(100mA~3.15A) or 10I _n (4A~10A)		130A/200A (315mA~10A)	130A (50mA~10A)	100A(1A~6.3A)
300V _{ac}	/	35A(100mA~3.15A) or 10I _n (4A~6.3A)	50A (100mA~6.3A)	/	
125V _{dc}	/	/	/	/	/
400V _{ac}	/	/	100A (315mA~10A)	/	/

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



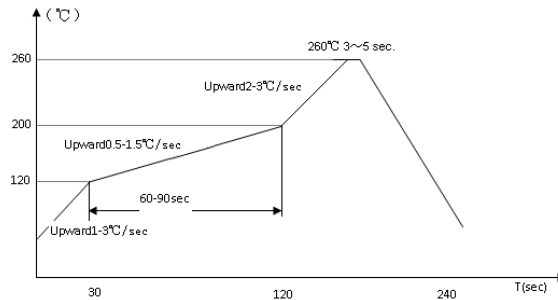
5.7 平均 I^2T -T特性曲线图(仅供参考)/THE AVERAGE I^2T -T CHARACTERISTICS CURVE(FOR REFERENCE ONLY)

5ET RoHS Average I^2T -T Characteristics Curve(For Reference Only)



5.8 焊接参数/ SOLDERING PARAMETERS

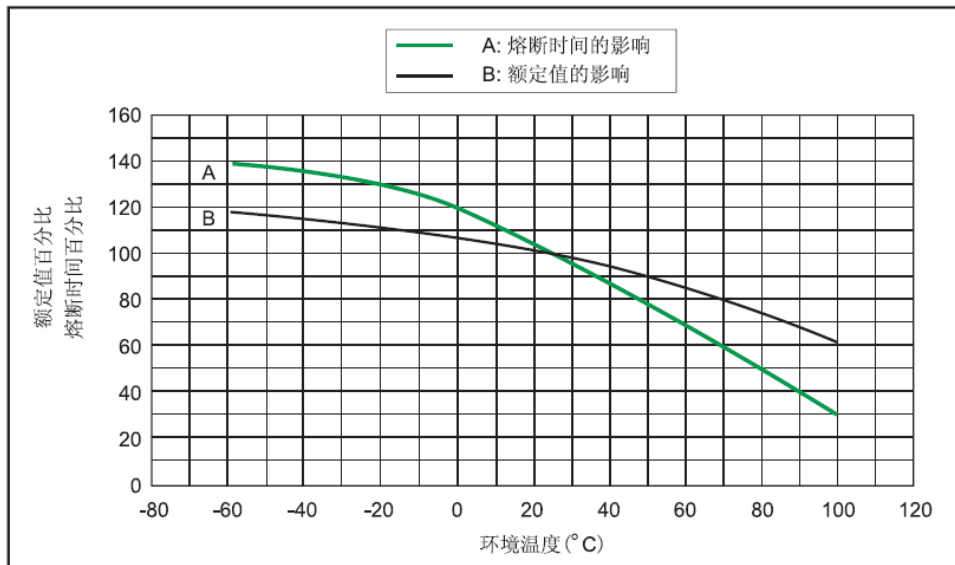
- 1) 波峰焊接/ Wave soldering: 260°C, 10sec. Max..
建议波峰焊接图形/ Suggest wave soldering graphics



- 2) 手工焊接/ Manual soldering: 300°C, 3sec. Max..
- 3) 耐热焊接/ Resistance to soldering heat: 260°C, 10sec. Max..

5.9 工作温度/ OPERATING TEMPERATURE: -55°C ~ +125°C.

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



5.11 储存温度/ STORAGE TEMPERATURE: -55°C ~ 85°C.

5.12 电阻测试/ COLD RESISTANCE TEST

环境温度为 25±2°C，测试电流不大于保险丝额定电流的 10%。

Input less than or equal to 10% of fuse rated current to fuse for cold resistance test at surrounding temperature of 25±2°C.

5.13 相比漏电起痕指数(CTI)/ Comparative Tracking Index(CTI)

CTI 475 V, 根据 IEC60112 《固体绝缘材料耐电痕化指数和相比电痕化指数的测定方法》。

CTI 475V, According IEC 60112<Method for the determination of the proof and the comparative tracking indices of solid insulating materials>.



6. 产品标志/ MARKINGS

6.1 保险丝上的标志应易于看清。

The relevant markings shall be marked on round thermoplastic cap 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) 商标/ Trademark: 
- 3) 特性符号/ Characteristics Symbol: T
- 4) 额定电流/ Rated Current
- 5) 额定电压/ Rated Voltage

6.3 标签应包括：型号、额定电流、额定电压、安全标志、批量号码、绿色的“QA”和“G”签章。

The label shall contain the Type, Rated current, Rated voltage, Safety approval logo, Lot. No., “QA” & “G” seals in green.

7.包装要求/ PACKING DETAILS

7.1 包装方式 A/ PACKING MODE A

编带式包装：按编号 NLBZ-007 图纸要求包装。

AMMO-PACK: according to the drawing (No.: NLBZ-007) (Please see the attachment).

7.2 包装方式 B/ PACKING MODE B

散装包装/ BULK PACKING:

7.2.1 短引线/ Short Lead(4.3mm)

7.2.1.1 塑料袋参考尺寸 Plastic Bag Size: 长×宽×厚 length × width × thickness=140×100×0.07mm.

7.2.1.2 内盒参考尺寸 Inner Box Size: 长×宽×高 length × width × height=140×100×60mm.

7.2.1.3 外箱参考尺寸 External Carton Size: 长×宽×高 length × width × height=320×240×165mm.

7.2.1.4 包装要求 Packing Details: 250 个/袋; 4 袋/盒; 10 盒/箱。250EA/Bag; 4Bags/Box; 10Boxes/Exported Carton.

7.2.2 长引线/ Long lead(18.9mm)

7.2.2.1 内盒参考尺寸 Inner Box Size:长×宽×高 length × width × height=65×65×230mm

7.2.2.2 外箱参考尺寸 External Carton Size: 长×宽×高 length × width × height=335×295×260mm

7.2.2.3 包装要求: 500 个/内盒 (内垫一层气泡布); 20 内盒/外箱。Packing Details: 500EA/ Inner Box (put one layer bubble film in each inner box); 20 Inner Boxes/ External Carton.

7.3 所有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 should meet the requirements of anti-moisture and anti-shaking so that the products will not absorb moisture or be damaged during transportation or storage.

8. 信赖性试验/ RELIABILITY TEST

Test Description	Testing condition	Acceptance Criteria
Temperature rise test	100% testing current, 1h	$\leq 75^{\circ}\text{C}$
Resistance to soldering heat test	Use $1.5 \pm 0.5\text{mm}$ PCB, dip solder bath $260 \pm 5^{\circ}\text{C}$, $10 \pm 3\text{sec}$.	<10% variation on DCR & V-drop
Endurance test	100% testing current, 100 cycles, 1h on /15 min. off	<10% variation on DCR & V-drop
Maximum sustained dissipation	After the endurance test, measure at 150% testing current, 1h	\leq specified value
Test at elevated temperature	$70 \pm 2^{\circ}\text{C}$, 100% testing current, 1h	<10% variation on DCR & V-drop
Solderability test, no aging	Immerse to flux $5 \pm 1\text{sec}$. then dip in solder bath $245 \pm 5^{\circ}\text{C}$, $10 \pm 0.5\text{sec}$.	Solder coverage >95% of the termination surface
Solderability test, dry aging, $155 \pm 5^{\circ}\text{C}$, 16hrs	Immerse to flux $5 \pm 1\text{sec}$. then dip in solder bath $245 \pm 5^{\circ}\text{C}$, $10 \pm 0.5\text{sec}$.	Solder coverage >95% of the termination surface
Solderability test, steam aging, 8hrs	Immerse to flux $5 \pm 1\text{sec}$. then dip in solder bath $245 \pm 5^{\circ}\text{C}$, $10 \pm 0.5\text{sec}$.	Solder coverage >95% of the termination surface
Temperature cycle test	10 cycles, $-40^{\circ}\text{C}/30\text{min}$. to $85^{\circ}\text{C}/30\text{min}$.	<10% variation on DCR & V-drop
Steady life test	100% testing current, 100hrs, $25 \pm 5^{\circ}\text{C}$	<10% variation on DCR & V-drop
Humidity test	$40 \pm 2^{\circ}\text{C}$, 90~95%RH, 96hrs	<10% variation on DCR & V-drop
High Temperature Test	$105 \pm 2^{\circ}\text{C}$, 1000hrs	<10% variation on DCR & V-drop
Low Temperature Test	$-20 \pm 2^{\circ}\text{C}$, 1000hrs	<10% variation on DCR & V-drop
Vibration Test	10-55-10HZ, 1.25mm, 8hrs of each axis in XYZ direction	<10% variation on DCR & V-drop
Salt Spray Test	$35 \pm 2^{\circ}\text{C}$, 5% Salt Water Spray, 48hrs	<10% variation on DCR & V-drop

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[FCC16202ABTP](#) [F0603G0R03FNTR](#) [7010.9962.63](#) [SEF 12A 65V \(G\)](#) [MST 250mA 250V](#) [TB60](#) [06 100.4](#) [TBF50](#) [TBF40](#)
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[R06.000.0.5](#) [R06.000.0.75](#) [R06.000.8](#) [R06.100.0.75](#) [R06.100.8](#) [R06.100.0.375](#) [R06.100.0.5](#) [R06.000.7](#) [R06.100.7](#) [S0603-S-2.0A](#) [F06F3.5](#)
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