



深圳市蓝宝安科电子有限公司

Shenzhen LanbaoAnke Electronics Co.,Ltd.

# 承 认 书

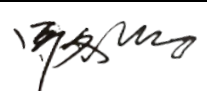
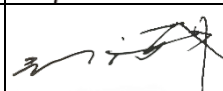
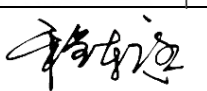
## APPROVAL SHEET

|         |              |
|---------|--------------|
| 编号 NO.  | LB-0603TD-01 |
| 版次 Ver. | A/3          |

|                |  |
|----------------|--|
| 客户<br>Customer |  |
|----------------|--|

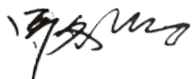
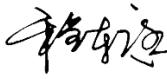
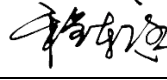
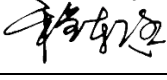
|               |                        |
|---------------|------------------------|
| 品名<br>Product | 贴片保险丝 SMD FUSE         |
| 系列<br>Series  | 0603TD系列 0603TD Series |

| 料号Part No.      | 规格描述Specification | 备注Remark |
|-----------------|-------------------|----------|
| 蓝宝<br>LB FUSE   |                   |          |
| 客 户<br>Customer |                   |          |

| 供应商-蓝宝<br>Supplier-LB fuse | 零件承认章<br>Approval Signet                                                            | 客户<br>Customer | 零件承认章<br>Approval Signet                                                            |
|----------------------------|-------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|
| 制作<br>Make                 |  |                |  |
| 审查<br>Check                |  |                |                                                                                     |
| 批准<br>Approval             |  |                |                                                                                     |

| 联络Contact         |             |             |                    |
|-------------------|-------------|-------------|--------------------|
| 业务Sales           | 电话Telephone | 手机Cellphone | 邮箱E-mail           |
|                   |             |             | lanbaofuse@163.com |
| 零件承认后敬请回签一份给我司留存。 |             |             |                    |

## History of Change变更记录

| NO. | 日期<br>Date | 描述<br>Description | 版次<br>Edition | 修改<br>modified by                                                                   | 审核<br>Checked by                                                                    |
|-----|------------|-------------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1   | 2018.6.6   | 新制订               | A/1           |  |  |
| 2   | 2023.5.30  | 更改为新封面            | A/2           |  |  |
| 3   | 2023.12.15 | 增加9.2产品PN编码规则     | A/3           |  |  |
| 4   |            |                   |               |                                                                                     |                                                                                     |
| 5   |            |                   |               |                                                                                     |                                                                                     |
| 6   |            |                   |               |                                                                                     |                                                                                     |
| 7   |            |                   |               |                                                                                     |                                                                                     |
| 8   |            |                   |               |                                                                                     |                                                                                     |
| 9   |            |                   |               |                                                                                     |                                                                                     |
| 10  |            |                   |               |                                                                                     |                                                                                     |
| 11  |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |
|     |            |                   |               |                                                                                     |                                                                                     |

## 1.适用范围 / SCOPE

本规格书适用于蓝宝公司0603TD系列慢熔断型过电流保护贴片保险丝。

This specification is applicable to over-current protection thick film fuse for 0603TD slow blow series produced by LANBAO corporation.

## 2.产品特点/ Features

高浪涌电流承受能力 / High inrush current withstanding capability

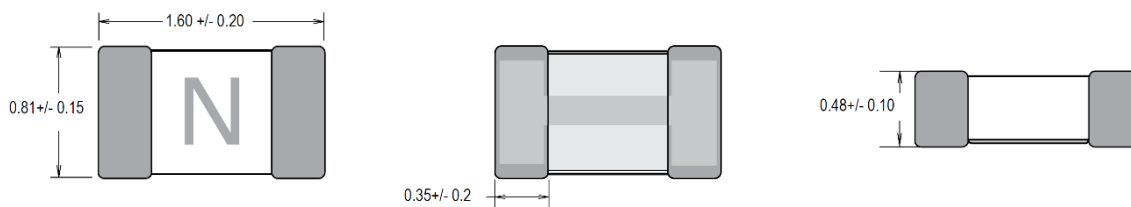
兼容回流焊和波峰焊 / Compatible with reflow and wave solder

陶瓷和玻璃结构 / Ceramic and glass construction

工作温度-55℃ to 125℃ / Operating temperature -55℃ to 125℃

无铅无卤素材料 / Lead Free and Halogen free material

## 3.产品尺寸/ Dimensions (mm)



说明：元件的陶瓷面印标示，保护玻璃与字符颜色均为绿色。

Notes: The element is marked with ceramic face print, Protective glass and character color are green.

## 4.基本信息/ ORDERING INFORMATION

| Specifications<br>规格 | Voltage Rating<br>额定电压           | Current Rating<br>额定电流 | Breaking Capacity<br>分断电流                        | Typical Cold Resistance (mΩ)<br>标准冷电阻 | Typical Pre-Arcing I2T (A²Sec)<br>熔化热值 | Marking<br>标记 |
|----------------------|----------------------------------|------------------------|--------------------------------------------------|---------------------------------------|----------------------------------------|---------------|
| 0603TD750mA          | 24Vdc<br>32Vdc<br>48Vdc<br>63Vdc | 750mA                  | 24VDC@50A<br>32VDC@50A<br>48VDC@50A<br>63VDC@50A | 400                                   | 0.02                                   | G             |
| 0603TD1A             |                                  | 1A                     |                                                  | 250                                   | 0.011                                  | B             |
| 0603TD1.5A           |                                  | 1.5                    |                                                  | 150                                   | 0.045                                  | H             |
| 0603TD2A             |                                  | 2A                     |                                                  | 78                                    | 0.115                                  | K             |
| 0603TD2.5A           |                                  | 2.5A                   |                                                  | 49                                    | 0.14                                   | L             |
| 0603TD3A             |                                  | 3A                     |                                                  | 35                                    | 0.28                                   | O             |
| 0603TD3.5A           |                                  | 3.5A                   |                                                  | 28                                    | 0.5                                    | R             |
| 0603TD4A             |                                  | 4A                     |                                                  | 18                                    | 0.6                                    | S             |
| 0603TD5A             |                                  | 5A                     |                                                  | 14                                    | 1.9                                    | T             |
| 0603TD6A             |                                  | 6A                     |                                                  | 11                                    | 2.3                                    | V             |
| 0603TD7A             |                                  | 7A                     |                                                  | 9.5                                   | 3                                      | X             |
| 0603TD8A             |                                  | 8A                     |                                                  | 7                                     | 4.5                                    | Z             |

说明/Notes :

a. “典型电阻”是在通以小于额定电流的 10%的弱电流条件下量测的阻抗.

Nominal Resistance measured with < 10% rated current ;

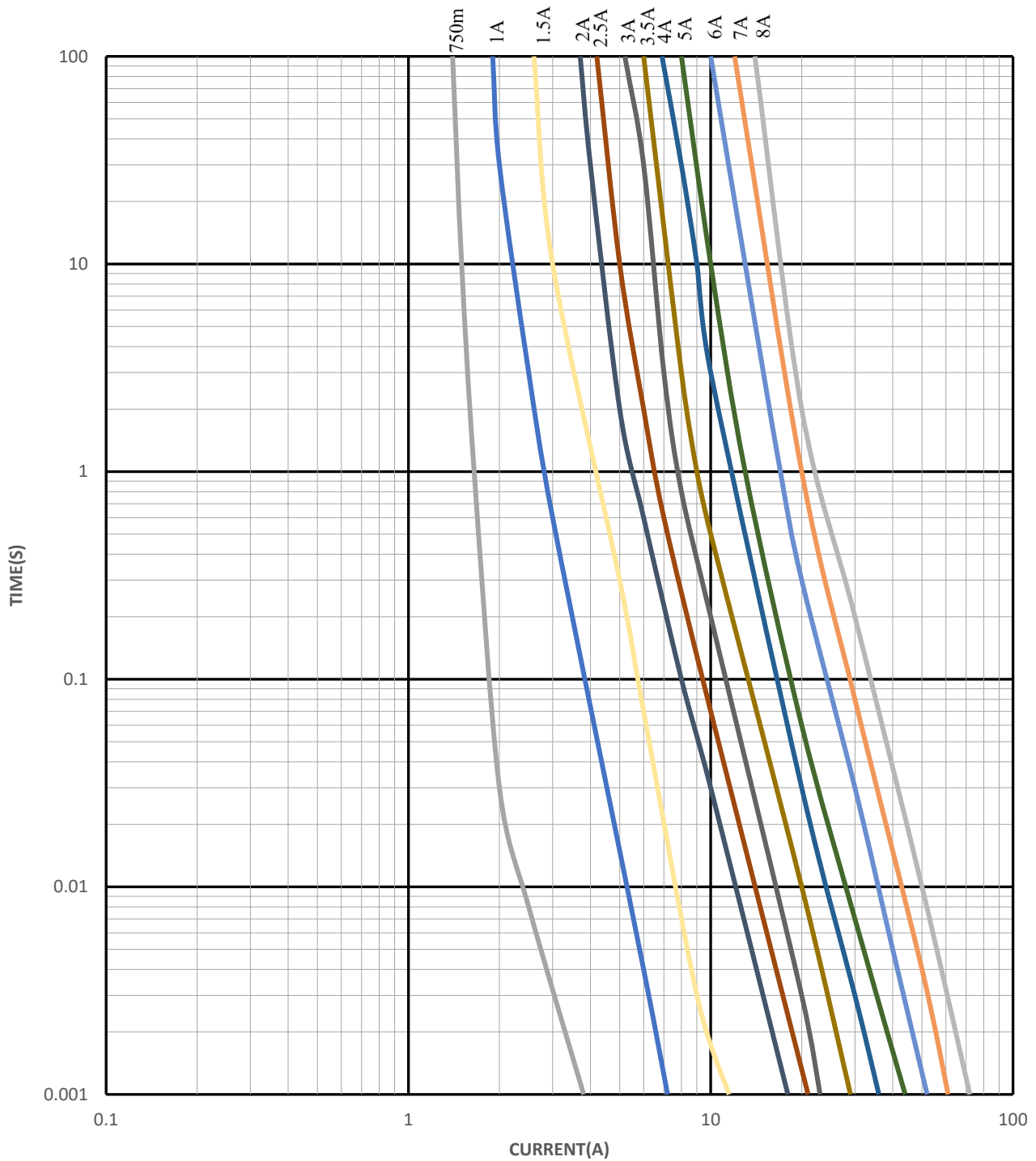
b. “典型 I2t ”基于通电10倍额定电流时的测量.

Typical Pre-arcing I2t are measured at 10In Current

## 5. 时间-电流特性/ Pre-Arcing Time-Current Characteristics (limits)

| Rated Current | % of Current Rating | Clearing Time at 25°C |      |
|---------------|---------------------|-----------------------|------|
|               |                     | Min                   | Max  |
| 750mA-8.0A    | 100%                | 4hours                | /    |
|               | 200%                | 1s                    | 120s |
|               | 350%                | /                     | 3s   |

Time-Current Curve



## 6. 信赖性测试规范 RELIABILITY TEST STANDARD

| # | 项目<br>Item                         | 内容<br>Contain                                                                                                                                                                                                                                                             | 判断标准<br>Criteria                                                                                                                    |
|---|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 分断能力测试<br>Breaking capacity        | V =32V DC; I=50A                                                                                                                                                                                                                                                          | 没有持续电弧、燃烧、爆炸现象<br>No a permanent arcing, ignition, bursting<br>UL248-1/-14                                                          |
| 2 | 可焊性<br>Solder ability              | 锡炉温度 $245^{\circ}\text{C}\pm 5^{\circ}\text{C}$ , 浸入深度 $2.0\text{mm}\pm 0.5\text{mm}$ , 浸锡时间 $5\pm 0.5\text{s}$ , 放在20X放大镜下检查锡覆盖率<br>$T=245^{\circ}\text{C}\pm 5^{\circ}\text{C}$ , $t=5\text{s}\pm 0.5\text{s}$ ; magnifier: 20X                                         | 锡覆盖率 $\geq 95\%$<br>Cover $\geq 95\%$<br>MIL-STD-202 Method 208                                                                     |
| 3 | 抗焊性测试<br>Soldering heat resistance | 1.将样品焊在对应的PCB板上进行三次回流焊接 /N=3 times<br>2.测试前后记录样品阻值/Record the resistance                                                                                                                                                                                                  | 无裂纹/损伤, 标识清晰可辨; 前后阻值偏差 $\leq 15\%$ ;<br>No crack and damage, Marking is easily legible<br>$\Delta R < 15\%$ MIL-STD-202 Method 210F |
| 4 | 冷热冲击<br>Thermal Shock              | 试验温度设定为 $25^{\circ}\text{C}\sim -55^{\circ}\text{C}\sim 25^{\circ}\text{C}\sim 125^{\circ}\text{C}$ , 最高温度和最低温度分别保持15 分钟, 高低温转换时间不超过5分钟, 5个循环<br>$-55^{\circ}\text{C}$ 15min $\rightarrow 25^{\circ}\text{C}$ 5min $\rightarrow +125^{\circ}\text{C}$ 15min ;<br>5 cycles | 外观无裂纹/损伤, 前后阻值偏差 $< 10\%$<br>No crack and damage, $\Delta R < 10\%$<br>MIL-STD-202G Test condition A                                |
| 5 | 振动测试<br>Vibration                  | 频率范围:10~15~10Hz/min<br>振动振幅:1.5mm<br>Frequency range:10~15~10Hz/min<br>Vibration amplitude:1.5mm                                                                                                                                                                          | 无明显机械损伤<br>$\Delta R < 10\%$<br>No mechanical damages<br>MIL-STD-202, Method 201A                                                   |
| 6 | 盐雾试验<br>Salt spray test            | 溶液浓度: $5\pm 0.1\%$ ; 连续放置48小时<br>5% salt solution,48hr                                                                                                                                                                                                                    | $\Delta R < 10\%$<br>Legible appearance<br>MIL-STD-202, Method 101                                                                  |
| 7 | 弯曲试验<br>Bending test               | 以1mm/s的速度将试验板弯曲1mm,保持时间60s<br>Bending:1mm, time:60s                                                                                                                                                                                                                       | 试验前后阻值变化 $\leq 15\%$ ; 保险丝焊盘无明显的裂缝<br>$\Delta R < 15\%$ , No mechanical damages IEC 60127-4                                         |

## 7. 环境特性 / ENVIRONMENTAL CHARACTERISTIC

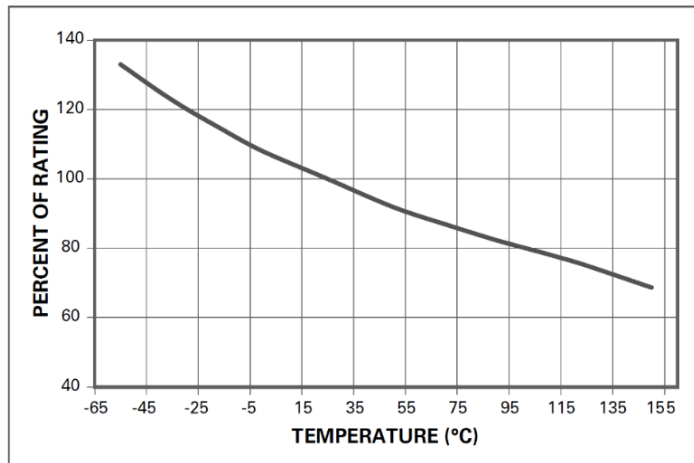
7-1 工作温度范围:  $-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$  / Operating Temperature:  $-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$ 。

若贵司工作环境温度超出 $23\pm 3^{\circ}\text{C}$ 范围, 在选用保险丝规格时, 需考虑操作环境温度对保险丝的影响。

请参照: 温度-电流曲线图。

When choosing the fuse's specification, if the operating environmental temperature beyond the scope from  $20\sim 26^{\circ}\text{C}$ , you should consider the environmental temperature's affection to fuses.  
please refer:

Temperature Re-rating Curve



## 7-2 存储条件 / Storage Conditions

在温度10°C~40°C、相对湿度≤75%的密闭条件下可存放2年。

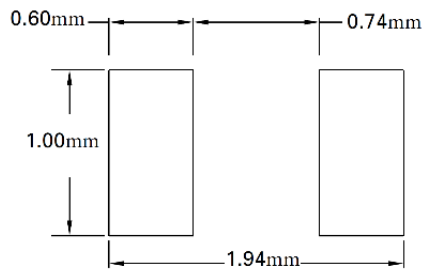
在温度10°C~40°C、相对湿度为95%的非露天下最多可存放30天。

Under airtight in temperature10°C~40°C、relative humidity ≤75% can store 2 years.

Without dew in temperature10°C~40°C、relative humidity be 95% maximum value for 30days.

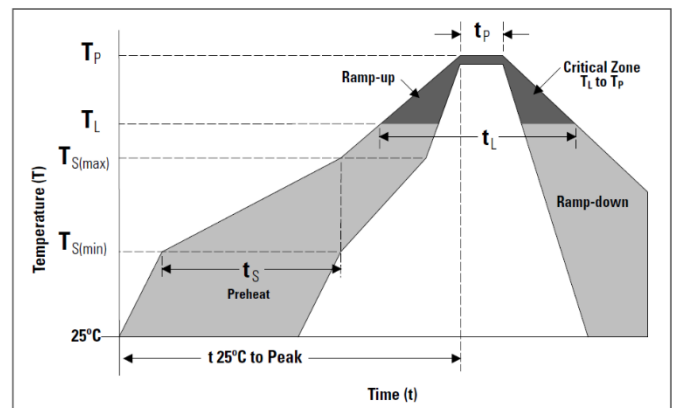
## 8. 焊盘尺寸及焊接条件 / SOLDER PAD SIZE AND WELDING CONDITIONS

### 8-1 焊盘尺寸建议 / Recommended Size of the Pad.



### 8-2 焊接参数/Soldering Parameters

| Reflow Condition                                       |                                    | Pb – free assembly      |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Pre Heat                                               | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                        | - Time (Min to Max) ( $t_s$ )      | 60 – 180 seconds        |
| Average Ramp-up Rate (Liquidus Temp ( $T_L$ ) to peak) |                                    | 3°C/second max.         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                    | 5°C/second max.         |
| Reflow                                                 | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 10 – 30 seconds         |
| Ramp-down Rate                                         |                                    | 6°C/second max.         |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes max.          |
| Do not exceed                                          |                                    | 260°C                   |
| Wave Soldering                                         |                                    | 260°C, 10 seconds max.  |



## 9. 包装规格 / PN编码规则/ PACKING SPECIFICATION/PN ENCODING RULES

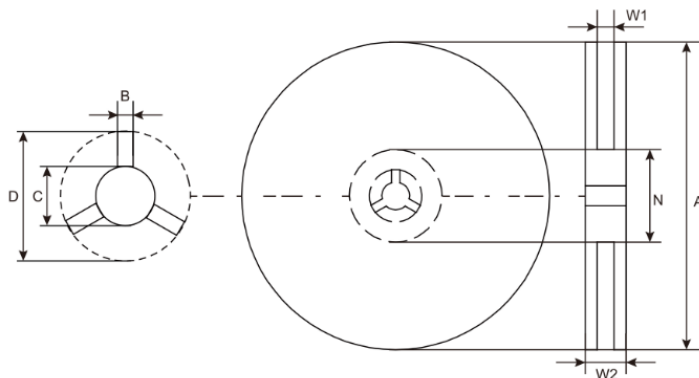
### 9-1 包装数量、重量 / QUANTITY & WEIGHT

| 系列 Series | 数量Quantity   | 重量Weight   |
|-----------|--------------|------------|
| 0603TD    | 5000pcs/Reel | 130±20 (g) |

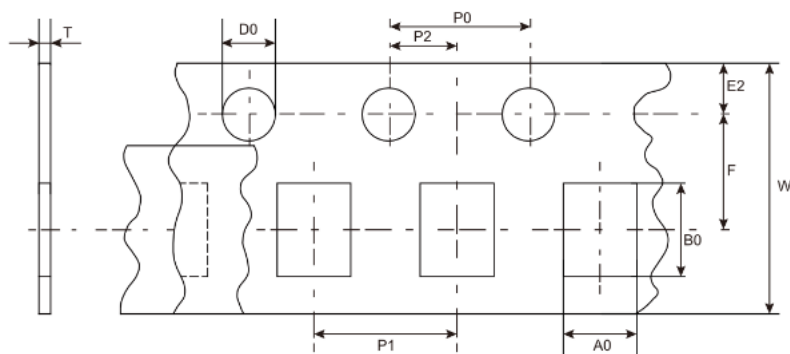
### 9-2 PN编码规则/PN ENCODING RULES

|                                |                                    |          |                         |                   |                      |            |
|--------------------------------|------------------------------------|----------|-------------------------|-------------------|----------------------|------------|
| 1 Part Numbering System (编码结构) |                                    |          |                         |                   |                      |            |
|                                |                                    |          |                         |                   |                      |            |
| 2                              | FULL DESCRIPTION FORMAT (详细内容描述格式) |          |                         |                   |                      |            |
|                                | 制造商Manufacturer                    | Series系列 | Rated current额定电流       | Rated voltage额定电压 | Packaging包装          | - 补充码      |
|                                | xx                                 | xxxxx    | xxxx                    | x                 | xx                   | XX         |
|                                | LB                                 | 0603FF   | 0100=100mA              | E=24V             | 00=Tape & Reel 编带+卷盘 | 01=XX客制化要求 |
|                                |                                    | 0603TD   | 1100=1A                 | F=32V             |                      | 02=低阻产品    |
|                                |                                    | 1206FF   | 2100=10A                | G=36V             |                      |            |
|                                |                                    | 1206TD   |                         | H=48V             |                      |            |
|                                |                                    |          |                         | I=63V             |                      |            |
|                                |                                    |          |                         | J=72V             |                      |            |
|                                |                                    |          |                         | B=125V            |                      |            |
|                                |                                    |          |                         |                   |                      |            |
| 3                              | Example例如:                         | P/N      | LB1206TD1100B00         |                   |                      |            |
|                                |                                    | 规格描述     | LB品牌 1206TD 1A125V 编带包装 |                   |                      |            |

## 9-2 卷轮与载带规格 / Reel & Tape specifications



| Reel | Item      | A     | B        | C         | D         | N    | W1       | W2        |
|------|-----------|-------|----------|-----------|-----------|------|----------|-----------|
|      | Spec.(mm) | 178±5 | 1.6 Min. | 12.8 Min. | 20.8 Min. | 58±2 | 8.4 Min. | 12.4 Max. |



| Tape | Item      | A0        | B0        | D0        | E2        | F         |
|------|-----------|-----------|-----------|-----------|-----------|-----------|
|      | Spec.(mm) | 1.10±0.05 | 1.90±0.05 | 1.55±0.05 | 1.75±0.10 | 3.50±0.05 |
|      | Item      | P0        | P1        | T         | W         |           |
|      | Spec.(mm) | 4.00±0.10 | 4.00±0.10 | 0.60±0.05 | 8.00±0.10 |           |

## 10. 其他 / OTHERS

10-1 如果在使用中有超出本规格书的要求，必须经由双方协商确认。

In the event that an impropriety is found beyond this specification, it shall be fixed by mutual agreement between the parties.

10-2 如果本规格书有不适当的情况，必须通过双方协商并由本公司修改。

In the event that an impropriety is found in this specification, LANBAO ELECTRICAL shall amend it by mutual agreement between the parties.

Attachment: UL Certification

2023/6/5 09:47

UL Certification: E213695 - Fuses



# UL **iQ** for Fuses



## Fuses

E213695

### Guide Information

## ZHONG SHAN LANBAO ELECTRICAL APPLIANCES CO LTD

West Xing Pu Rd, Huang Pu, Zhongshan Guangdong 528429 CN

### 0603FF, 0603HI or 0603TD

Supplemental micro fuses: surface mount

| <u>Size</u><br><u>mm(in)</u>         | <u>Amps</u><br><u>(A)</u> | <u>Volts</u><br><u>(V)</u> | <u>Interrupting</u><br><u>Rating (A)</u> |
|--------------------------------------|---------------------------|----------------------------|------------------------------------------|
| 1.6 x 0.8 x 0.5 (0.06 x 0.03 x 0.02) | 0.25 - 8                  | 24Vdc                      | 50                                       |
|                                      | 0.25 - 8                  | 32Vdc                      | 50                                       |
|                                      | 0.25 - 8                  | 48Vdc                      | 50                                       |
|                                      | 0.25 - 8                  | 63Vdc                      | 50                                       |

Report Date: 2022-01-07

Last Revised: 2022-01-07

© 2023 UL Solutions

