

INDIVIDUAL SPECIFICATION SHEET

Product Name: 表面贴装保险丝

Part Number: TB Series

Revision: B



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Rev.	Effective Date	Changed Contents
A	2020-6-16	New release
B	2021-4-08	Update Spedfications

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PREPARED BY



APPROVED BY



1. 产品特性及应用范围 / Description, Features and Applications

随着《国家集成电路产业发展推进纲要》的发布，集成电路产业投资基金，行业俗称“大基金”的大力扶持，近年来中国在云计算、物联网、大数据、智能电网、智能交通、新能源汽车、工业控制等行业迅猛发展，高端集成电路从设计、研发、制造全产业链产品的核心技术实现完全自主掌握成为发展的必然趋势，TLC TB系列应运而生，专为领先的云计算服务器、通信基站电源、区块链伺服器/控制器、新能源汽车电池管理系统而设计，为高端集成电路初、次级电路板保驾护航。

Descriptions:

The TLC TB series square Surface Mount fuses are designed for high-end cloud computing servers, telecom base station power supplies, blockchain servers, and new energy vehicle battery management systems, RoHS compliant, Halogen Free and lead(Pb) exempts of the requirements of RoHS Directive(2002/95/EC), with U.S. (UL/CSA) safety agency approvals. Provide board level primary and secondary circuit protection in a wide variety of applications. With excellent inrush current withstanding capability, excellent reliability for thermal and mechanic shock, also have a high reliability and stable solder ability, end caps are available in gold/silver plated.

Features:

Slow-blow	Small size(10.25mm*3.2mm)
High current rating available	Wide operating temperature range(-55°C to 125°C)
Low temperature de-rating	RoHS compliant, Halogen Free
Tape and Reel for automatic placement	Conflict free metals

Applications:



LED lighting	Notebook PC	Battery devices	LCD/PDP devices
LCD backlight inverter	Portable Devices	Power supply	Networking devices
PC server	Cooling fan system	Storage system	Telecom system
Wireless base station	White goods	Game console	Office equipment
Digital camera	Industrial equipment	Medical equipment	Automotive devices

2. 安规认证标准及编号 / Standards and Agency Approvals



2.1 执行标准：遵循 UL 248-14。

Standards: In accordance with UL 248-14.

2.2 认证范围 Certification

安规标准 Agency	认证范围 Ampere Range	证书编号 Agency File Number
	0.05 ~60A	E467707(JDYX2)
	0.05 ~ 60A	E467707(JDYX8)


2.3 目录编号 Catalogue No., ● 已认证 Approved / ○ 认证中 Pending


目录编号 Catalog No.	额定电流 Ampere Rating	额定电压 Voltage Rating	分断能力 Breaking Capacity	冷阻值 Nominal Cold Resistance (ms)	最大电压降 Max Voltage Drop(mv)	熔化热能 I ² T Melting Integral (A ² .S)	安规认证 Agency Approvals	
								
TB1	1A	300VAC/DC 250VAC/DC 125VAC/DC 72VDC	200A@125VAC/DC 200A@250VAC/DC 200A@300VAC/DC 500A@72VDC	75	275	0.91	●	●
TB2	2A			50	250	3.99	●	●
TB2.5	2.5A			45	250	5.46	●	●
TB3	3A			36	250	7.88	●	●
TB3.5	3.5A			29	225	10.40	●	●
TB4	4A			23	225	16.59	●	●
TB5	5A			18	225	36.75	●	●
TB6	6A			15	190	57.75	●	●
TB6.3	6.3A			12.10	190	68.25	●	●
TB7.5	7.5A			10.30	180	75.60	●	●
TB8	8A			9.20	160	87.15	●	●
TB10	10A			8.05	150	95.55	●	●
TB15	15A			4.50	150	213.15	●	●
TB20	20A			3.30	150	378.00	●	●
TB25	25A			2.25	150	591.15	●	●
TB30	30A			1.98	120	850.50	●	●
TB40	40A			1.20	120	1428.00	●	●
TB50	50A			0.99	120	2046.45	●	●
TB60	60A			0.79	120	3031.35	●	●

- DC Cold Resistance are measured at <10% of rated current in ambient temperature of 25°C;
- Typical Pre-arching I²t are calculated at 10*I_n Current or 8ms;

3. 产品标示 / Product Marking

保险丝上需有下列标示 / The fuses shall have the following markings, 示例 Example:

	50mA
①	②

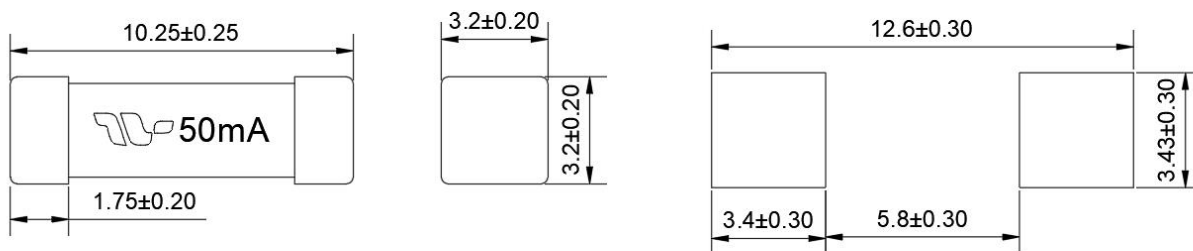
①	标识/LOGO: 
②	额定电流/Rated Current (A): _____ A 或 or _____ mA

注:对于标示的大小和位置没有规定/Note: Size and position of the markings shall not be provided.

4. 结构及尺寸 / Dimensions and Structure

单位: 毫米/Unit:mm

Recommended pad layout



5. 材料明细 / Material Details

编号 NO.	零件名称 Part Name	材质 Material
①	端帽End caps	黄铜镀金Au Plated Brass Cap
②	主体Body	陶瓷管Non-Transparent Square Ceramic Tube
③	熔丝Fuse element	合金Cu-Ag Alloy wire

6. 产品特性 / Product Characteristics

编号 NO.	项目 Item	内容 Content	参考标准 Reference standards
1	产品标识 Product Marking	Brand, Ampere Rating	TLC marking standards
2	工作温度 Operating Temperature	-55°C to 125°C	IEC60068-2-1/2
3	可焊性 Solderability	T=240°C±5°C, t=3sec±0.5sec, Coverage≥95%	MIL-STD-202, Method 208
4	耐焊接热 Resistance to Soldering Heat	10 sec at 260°C	MIL-STD-202, Method 210, Test condition B
5	绝缘阻抗 Insulation Resistance (after Opening)	10,000 ohms minimum	MIL-STD-202, Method 302, Test Condition A
6	热冲击 Thermal Shock	5 cycles, -65°C / +125°C, 15 minutes at each extreme	MIL-STD-202, Method 107, Test Condition B

7	机械冲击 Mechanical Shock	100G's peak for 6 milliseconds, 3cycles	MIL-STD-202, Method 213, Test I
8	振动试验 Vibration	0.03"amplitude, 10-55 Hz in 1 min. 2hrs each XYZ=6hrs	MIL-STD-202, Method 201
9	耐湿性 Moisture Resistance	10 cycles	MIL-STD-202, Method 106
10	盐雾试验 Salt Spray	5% salt solution, 48hrs	MIL-STD-202, Method 101, Test Condition B

7.电气特性 / Electrical Characteristics

7.1 实验条件 Test Condition:

所有测试环境温度为 $25\pm 5^{\circ}\text{C}$ 。

All electrical test is to be conducted with the ambient air at a temperature of $25\pm 5^{\circ}\text{C}$.

7.2 分断能力 Interrupting Rating:

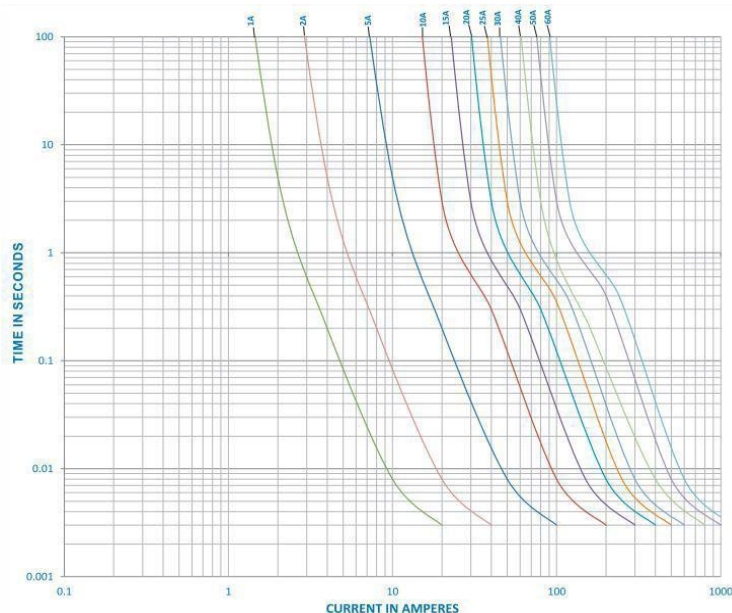
保险丝承受分断能力: 50A@250Vac, 200A@125Vac.

Breaking Capacity: 50A@250Vac, 200A@125Vac.

7.3 熔断时限 / Operating Characteristics

额定电流的%	熔断时间
% of Ampere Rating(In)	Blowing Time
100% * In	大于4 小时(4 hours Min)
200% * In	小于 60 秒 (60 sec Max)
1000% * In	最短 1 毫秒 (1 ms Min)

7.4 平均时间电流曲线图 / Average Time Current Curves

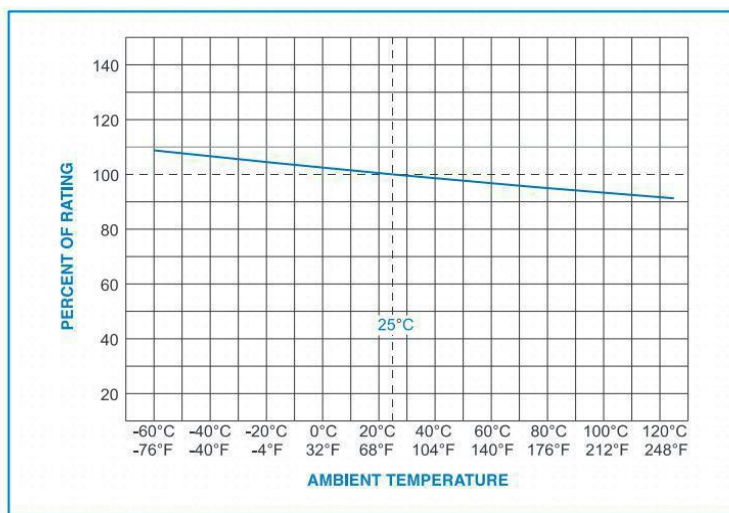


8. 环境特性 / Environmental Characteristic

若操作环境温度超出 $25\pm 5^{\circ}\text{C}$ 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，请参照如下：温度-电流曲线图。

When choosing the fuse's specification, if the operating environmental temperature beyond the scope from $20\sim 30^{\circ}\text{C}$, engineer should consider the environmental temperature's affection to fuses.

Please refer: Temperature Derating Curve:



9. 建议焊接参数 / Recommended Soldering Parameters

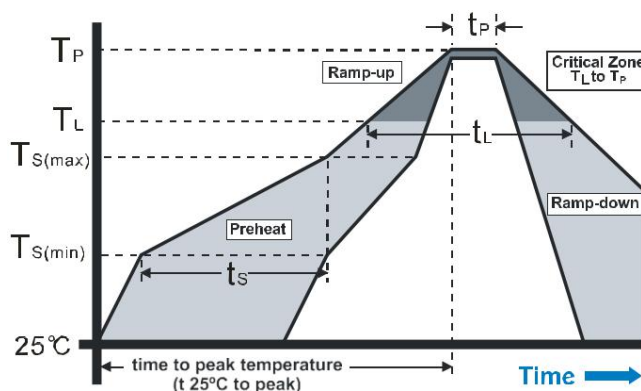
A. 波峰/回流焊参数 / Wave /Reflow Soldering Parameters:

锡膏工艺 / Solder paste process.

锡炉温度 / Solder Pot Temperature: 260°C Max;

焊接时间 / Solder Dwell Time: 5 seconds max

Reflow Condition		Pb-Free assembly
Average ramp-up rate ($T_s(\text{max})$ to T_p)		5°C /second max.
Preheat	Temperature Min ($T_s(\text{min})$)	150°C
	Temperature Max	200°C
	Time (Min to Max) (t_s)	60-120 seconds
Reflow	Temperature (T_L)	220°C
	Time Max (t_L)	60 seconds
Peak Temperature (T_p)		260°C max
Ramp-down Rate		5°C /second max
Time 25°C to peak Temperature (T_p)		8 minutes max



B. 手工焊参数 / Hand-Solder Parameters:

烙铁温度 / Solder Iron Temperature: $300\pm 5^{\circ}\text{C}$

焊接时间 / Heating Time: 1~2 s Max

10. 包装 / Packaging

2000 个每卷 / 2,000 pcs in 13 inches dia. reel, 24mm wide tape, EIA Standard 481

11.其他 / Others

11.1 如果在使用中有超出本规格书的要求，须经双方协商确认。

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

11.2 如果本规格书有不适当的情况，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, TLC. shall amend it by mutual agreement between the parties.

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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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[R06.100.0.75](#) [R06.100.0.375](#) [R06.100.0.5](#) [R06.000.7](#) [R06.100.7](#) [S0603-S-2.0A](#) [F06F3.5](#) [F12F20](#) [TA3VT2](#) [F12F1](#) [F06F7](#) [F06T3.5](#)
[F06F0.375](#) [F06T8](#) [F12F30](#) [4T2A250V](#) [R12.100.7](#) [R12.100.30](#) [R06.000.0.25](#) [R12.100.6](#) [R12.000.0.25](#) [R12.000.6](#) [R12.000.10](#)