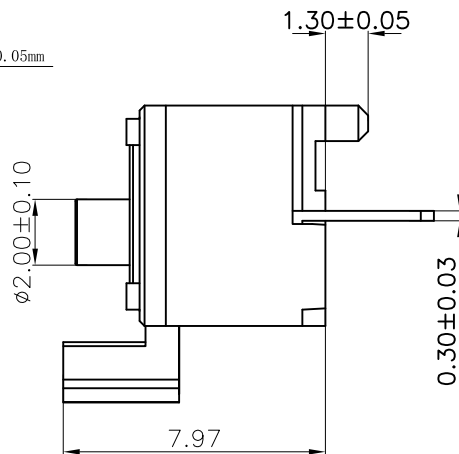
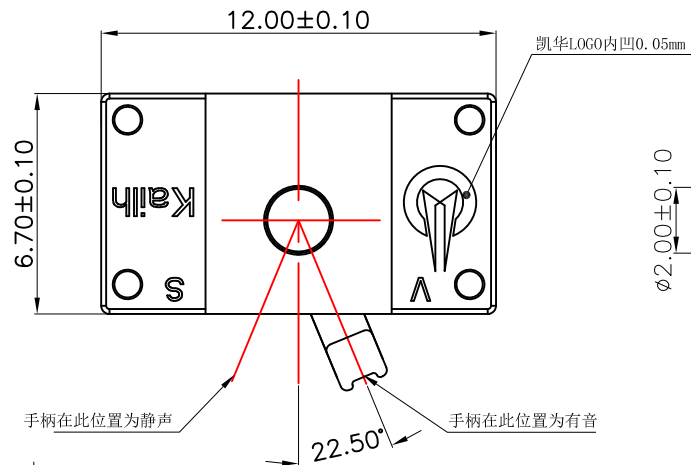
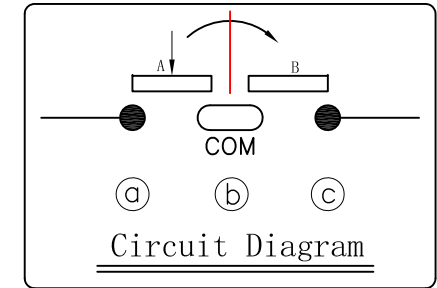
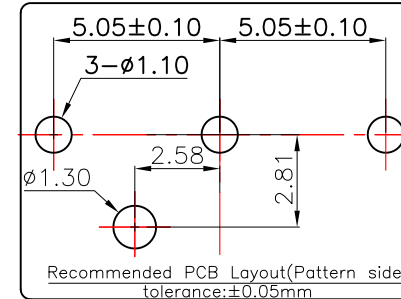
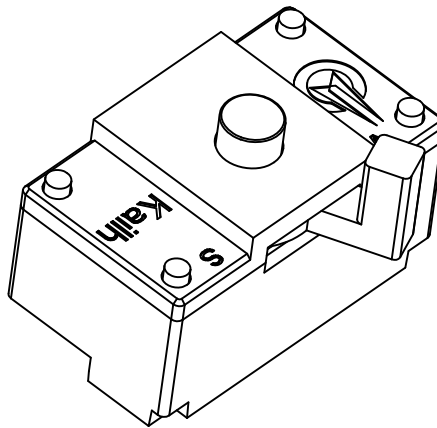


ABIDE BY ROHS



Only For Reference



Specification :

- 1. Rating : DC12V 50mA
- 2. Contact Resistance : 100mΩ Max
- 3. Insulation Resistance : 100MΩ Min (DC250V)
- 4. Withstand Voltage : AC250V (50-60Hz) for 1 minute
- 5. Operation Force : Initial 70±15gf (Silent side), Initial 70±15gf (Voice side)
- 6. Free Position : Initial 7.60±0.20mm
- 7. CR=(OF-CF)/OF*100%: Initial 30%⁺²⁰₋₁₀ (Voice side), Initial 30%⁺²⁰₋₁₅ (Silent side)
- 8. Initial Pre-Travel: 0.30±0.25mm
- 9. Life Cycles : min 5,000,000 (Both side)

⑨	Fixed tray	—	1	Nylon	Black	
⑧	Handle	—	1	Nylon	Yellow	
⑦	Terminal	2	1	BRASS(0.30t)	Plating Silver	
⑥	Terminal	1	1	BRASS(0.30t)	Plating Silver	
⑤	Base	—	1	Nylon	Blue	UL94HB
④	Contact	—	2	AG-SUS301EH		
③	Rubber pad	—	2	Rubber		UL94HB
②	Cover	—	1	PBT	White	UL94HB
①	Keystoke	—	1	POM	Blue	UL94HB
ITEM	PART NAME	TER'NO.	QTY.	MATERIAL	FINISHING	REMARK

APPROVALS		DATE	东莞市凯华电子有限公司 DONGGUAN CITY KAIHUA ELECTRONICS CO.,LTD			
DRAWN	ZLQ	2021.07.28	Kaih			
CHECKED			TITLE: Micro Switch			
APPROVALS			PART NO. CMI126701D01			
TOLERANCES ARE		30<L ±0.30 10<L≤30 ±0.20 5<L≤10 ±0.15 L≤5 ±0.10	ANGLE	UNIT: mm	SCALE: 1:1	PROJ: 1 OF 1
		±2°	DRAWING NO.	KHA-M11267-001EN		

ECN NO.	REV.	DATE.	DESCRIPTION.	CHANGE.	CHECK.	APPRO.
	A		NEW			



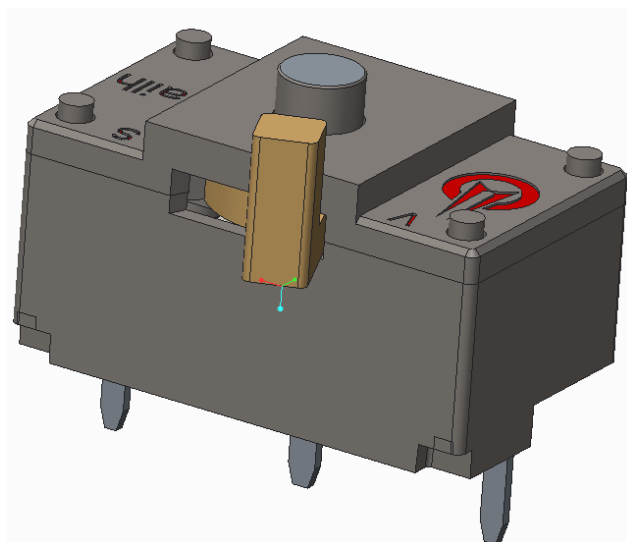
凱華電子
KAIHUA EEELETRONICS

Document Number:

KH-PS2201-14

产品规格书

Product Specification



P/N: CMI126701D01			Title : Micro Switch		
Rev.	ECN	Release and Revision Description:	Prepared By/Date:	Checked By/Date:	Approved By/Date:
A	---	New releasing 初版发行	黄云/2021.01.11	胡远峰/2021.01.11	郑建军/2021.01.11



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1. Scope/范围:

This Product Specification covers the requirement of Micro switch on product performance, test methods and quality assurance provisions.

本规格书内容涵盖微动开关产品的要求，包括性能指标、测试方法及质量保证方面等。

2. Product Application/产品应用:

The Switch is applied in all types of Computer mouse. Please let us know before using any of the products in the application not described above.

该微动开关产品适用于所有类型的电脑鼠标，如果用于本文中未提及的领域请在使用前告知。

3. Technology Parameters/技术参数:

Ambient Humidity 工作湿度:	45~85% R.H.;
Operating Temperature Range 使用温度范围:	-10℃~+70℃;
Storage Temperature Range 保存温度范围:	-20℃~+70℃;
Suggested storage period 贮存期限:	about 6 months 最多 6 个月;
Normal Condition:	
Ambient temperature 环境温度:	20±5℃
Relative humidity 相对湿度:	65%±5% R.H.;
Air pressure 气压:	86~101KPa;
Contact Resistance 接触阻抗:	100 mΩ Max;
Micro Noise Operation Force 静音操作力:	80±30gf;
Operation Force 有声操作力:	80±30gf;
Solder Ability 可焊性:	锡铅焊 245±5℃ 5±0.5s;
	无铅焊 255±5℃ 5±0.5s;
Withstand Soldering Temperature 耐焊接热:	波峰焊焊接: 260±5℃ 5±0.5s;

4. Ratings/额定性能要求:

Rating 额定负荷:	DC12V / 50mA;
Insulation Resistance 绝缘电阻:	≥100MΩ/ DC 250V;
Withstand Voltage 耐电压:	AC 250V 1 Minute;
Mechanical Life 机械寿命:	5,000,000 Cycles.

5. Profile Dimensions /外形尺寸:

见成品图纸规格

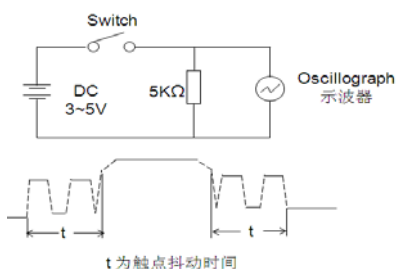


6. Electrical Performance/电气性能:

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
6.1	Contact Resistance 接触电阻	Static load: (Operation force)x2, which is applied on the center of Switch stem. 静态负载: 动作力的 2 倍, 施加在手柄中心. Measurement tool: Contact resistance Meter. 测量工具: 微电流接触电阻计 (1KHz, 20mV, 5~50mA) 在低电流 ($\leq 100\text{mA}$) 条件下测试. Measured at low current (100mA or less).	100m Ω Max 100m Ω 以下
6.2	Insulation Resistance 绝缘电阻	Apply a Voltage of DC 250 V for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 输入 250V DC 电压 1 分钟, 按如下接触方法测试: (1) 端子与端子之间. (2) 端子与外壳之间.	100M Ω Min 100 兆欧以上
6.3	Dielectric withstanding voltage 耐电压	Apply a Voltage of AC 250 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 输入 250V AC 电压 1 分钟, 按如下接触方法测试: (1) 端子与端子之间. (2) 端子与外壳之间.	No evidence of breakdown 无瞬断、击穿等破坏.
6.4	Bouncing 触点抖动	Operation speed: 3~4 times/s 操作速度: 每秒 3~4 次 Slightly push the center of stem by 3~4 times/s, to test the bounce at "ON" and "OFF" 以每秒 3~4 次的速度, 轻轻在手柄中心加力, 在"导通"与"瞬断"间测试. Oscillo scope 示波器 Switch Bouncing Test Circuit 抖动测定回路.	Before Life cycle: On: 5ms MAX, 5 毫秒以下 Off: 5ms MAX, 5 毫秒以下 After Life cycle: On: 10ms MAX, 10 毫秒以下 Off: 10ms MAX, 10 毫秒以下



触点抖动用图:



7. Mechanical Performance/机械性能:

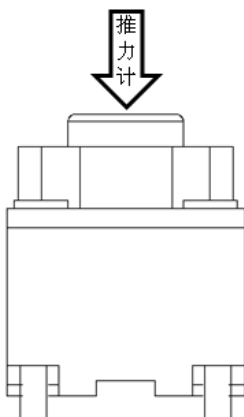
Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
7.1	The load curve 荷重曲线	Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 开关的动作方向为垂直放置，向手柄中心逐渐施加负荷直到停止. Force OF CF RF PT MD OT Push Travel	See page 10 见第 10 页
7.2	Movement Characteristic 动作特征	Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 开关的动作方向为垂直放置，向手柄中心逐渐施加负荷直到停止. PP OP OF CF RF OT Mounting Surface	See page 10 见第 10 页



7.3

Static
Strength
静止强度

A static load of 0.5 Kgf shall be applied in the direction of button operation for a period of 60 seconds.
在手柄动作方向施加 0.5kgf 的静负荷 60 秒, 然后测试参数.



No damage (Electrical and mechanical)
电气和机械性能正常.

7.4

Stem Pull
Strength
手柄拉拔强度

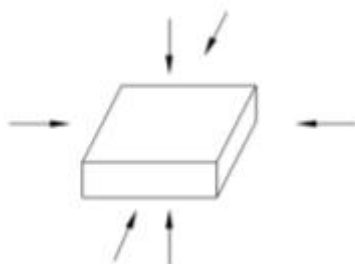
Break by a pull force applied opposite to the direction of stem operation.
在推柄动作方向反向垂直施加拉力, 使其破坏的程度.

500gf Min

7.5

Shock
机械冲击

Measured by according to the below condition:
(1) Acceleration: 80g 加速度: 80g
(2) Cycles of test: 3 cycles each in 6 directions, for a total of 18 cycles.
试验次数: 每个方向 3 次, 6 个方向共 18 次.



Shall meet No.6, 7.1, 7.2.
满足 6, 7.1, 7.2 要求.



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7.6

Life Test
寿命测试

- (1) Weight: 150gf
砵码: 150gf
- (2) Operation speed: 2~3cycles/s
操作速度: 2~3 次/秒
- (3) Push force: Maximum value of operation force.
按压力: 操作力规格值的上限.
- (4) Cycles: 5,000,000 times Min
操作次数: 500 万次以上

Contact resistance:
10000m Ω Max
接触电阻: 10000 毫欧以下

Bouncing: 20ms Max
触点抖动: 20 毫秒以下

Operation force :
Variation rate within $\pm 30\%$

操作力的变化范围在初始值的 $\pm 30\%$ 以内.

8. Environmental Performance/环境性能:

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
8.1	Cold test 耐寒性	(1) Temperature : $-20 \pm 2^{\circ}\text{C}$ 温度: $-20 \pm 2^{\circ}\text{C}$ (2) Duration of test: 96h 持续时间: 96 小时 (3) Take off a drop water 去掉水珠 (4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200m Ω 以下 满足: No. 6.2 to 6.4 No. 7.1 to 7.2
8.2	Heat test 耐热性	(1) Temperature : $70 \pm 2^{\circ}\text{C}$ 温度: $70 \pm 2^{\circ}\text{C}$ (2) Duration of test: 96h 持续时间: 96 小时 (3) Take off a drop water 去掉水珠 (4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200m Ω 以下 满足: No. 6.2 to 6.4 No. 7.1 to 7.2

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8.3

Temperature
cycle
温度循环

(1) Test cycles: 5 cycles

试验周期: 5 个周期

(2) Standard condition after test: 1h

试验后的放置条件: 1 小时

	Temperature 温度	Duration of test 持续时间
1 cycle 一次循环	20±5℃	1h
	-20±5℃	1h
	20±5℃	1h
	70±5℃	1h

Contact resistance:

200mΩ Max

Shall meet :

No. 6.2 to 6.4

No. 7.1 to 7.2

接触电阻 200mΩ 以下

满足:

No. 6.2 to 6.4

No. 7.1 to 7.2

8.4

Soldering
heat test
耐焊接热

Soldering area: T/2 of PWB thickness.

(PWB: T=1.6mm)

焊接面积: 印刷基板的 1/2 厚度处

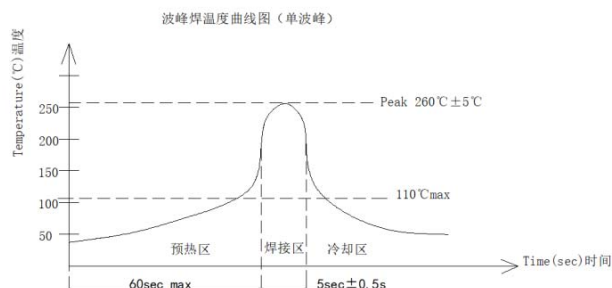
Soldering temperature: 260±5℃

Soldering time: 5±0.5s

(板下焊接脚处) 波峰焊焊接温度: 260±5℃

焊接时间: 5±0.5 秒

DIP 波峰焊温度曲线图



Automatic Reflow soldering 自动回流焊接:
For the product of SMT, according to below
condition:

Soldering temperature: 260±5℃

Soldering time: 5±0.5s

(整个产品) 回流焊焊接温度: 260±5℃

焊接时间: 5±0.5 秒

Appearance:
No abnormality.
外观无异常



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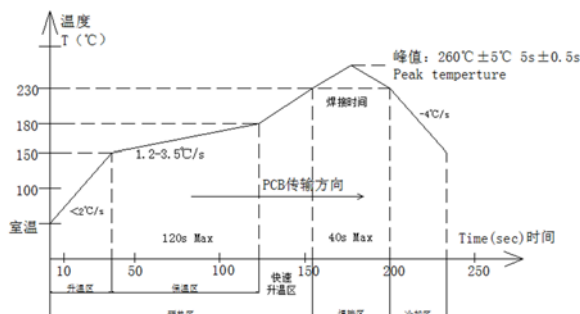
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SMT回流焊温度曲线图



8.5

Solderability
可焊性

Lead-tin soldering 锡铅焊接:
Soldering temperature: $245 \pm 5^{\circ}\text{C}$
Soldering time: $5 \pm 0.5\text{s}$
焊接温度: $245 \pm 5^{\circ}\text{C}$
焊接时间: 5 ± 0.5 秒

Lead free soldering 无铅焊接:
Soldering temperature: $255 \pm 5^{\circ}\text{C}$
Soldering time: $5 \pm 0.5\text{s}$
焊接温度: $255 \pm 5^{\circ}\text{C}$
焊接时间: 5 ± 0.5 秒

At least 90% of surface area of immersed portion shall be covered by solder.
浸焊面积大于 90% 以上.

8.6

Humidity test
耐湿性

- (1) Temperature : $60 \pm 2^{\circ}\text{C}$
温度: $60 \pm 2^{\circ}\text{C}$
- (2) relative humidity: 90~95% R.H.
相对湿度: 90~95% R.H.
- (3) Duration of test: 96h
持续时间: 96 小时
- (4) Take off a drop water
去掉水珠
- (5) Standard conditions after test: 1h
试验后的放置条件: 1 小时

Contact resistance:
 $200\text{m}\Omega$ Max
Shall meet :
No. 6.2 to 6.4
No. 7.1 to 7.2
接触电阻 $200\text{m}\Omega$ 以下
满足:
No. 6.2 to 6.4
No. 7.1 to 7.2

8.7

Salt Spray
盐雾测试

Apply the following environment to test:
根据下列条件进行测试:

- (1) Temperature : $35 \pm 5^{\circ}\text{C}$
温度: $35 \pm 5^{\circ}\text{C}$;
- (2) Salt water density: $5 \pm 1\%$
盐水浓度: $5 \pm 1\%$;
- (3) Duration: 24 hours
持续时间: 24 小时;
- (4) After test, the salt deposit shall be removed by running water.
实验后将盐沉积物用水冲掉

Appearance:
No corrosion spot, no crack, no base plate naked.
外观: 无腐蚀点, 无裂纹, 无裸露基材.

Contact Resistance:
 $200\text{m}\Omega$ Max
接触电阻: 200 毫欧以下.

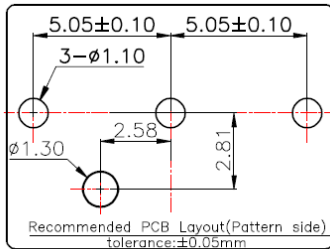
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 凱華電子 KAIHUA EEELETRONICS		Product Specification <table><tr><td>P/N:</td><td>DOC. No.:</td><td>Rev.:</td><td>Page:</td></tr><tr><td>CMI126701D01</td><td>KH-PS2201-14</td><td>A</td><td>10/12</td></tr></table>				P/N:	DOC. No.:	Rev.:	Page:	CMI126701D01	KH-PS2201-14	A	10/12
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8.8	Withstand K ₂ S 硫化测试	Apply the following environment to test: 根据下列条件进行测试 (1) Temperature: Natural 温度: 常温状态下 (2)K ₂ S Density: 2%; 硫化钾浓: 2% (3) Duration: 2 minute. 持续时间: 2 分钟		Appearance: No corrosion spot, no crack, no base plate naked. 外观: 无腐蚀点, 无 裂纹, 无裸露基材. Contact Resistance: 200 m Ω Max 接触电阻: 200 毫欧 以下									

9. Recommended PCB Layout 推荐的 PCB 安装焊盘规格:

(Top View)



(Single face board T=1.6mm)

10. Operation (FP/OP/PT/OF/) Movement Characteristic 动作特征:

Parameter	Unit	Specification	Remark
FP	mm	7.6±0.25	
PT	mm	0.30±0.25	
OF1	gf	70±15	
OF2	gf	70±15	
切换力	gf	150±80	
CR	%	30%+20/-10 (有声) 30%+20/-15 (静音)	

11. Packaging 包装:

Packaging type: 1000 PCS/Pe bag, 10000 Pcs/outer cartons .

包装方式: 1000Pcs/PE 袋, 10000Pcs/外纸箱



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12. Precaution 注意事项:

12.1 Immersion Soldering condition 浸焊条件

ITEM 项目	CONDITION 条 件
Preheat temperature 预热温度	110℃ Max (Ambient temperature of soldering surface of P.W.B) 110℃ 以下(印刷基板焊锡面周围的温度)
Preheat time 预热时间	60s, Max 60 秒以内`
Area of flux 助焊剂面积	1/2 Max of PWB Thickness 印刷基板厚度的 1/2 以内
Temperature of solder 焊锡温度	260±5℃ 260±5℃
Time of immersion 浸焊时间	5±0.5s 5±0.5 秒
Number of soldering 焊接次数	2time Max (But should down heat of the first soldering) 2 次以内
Printed wiring board 印刷基板	Single side copper-clad laminates 单面铜箔

(1) After switches were soldered, please be careful not to clean switches with solvent.

开关浸焊后,注意不要用溶剂清洗.

(2) Under the condition of using soldering iron, soldering temperature shall be $350\pm5^{\circ}\text{C}$ max within 3 sec.

在使用烙铁的情况下,焊锡温度应在 $350\pm5^{\circ}\text{C}$ 以下,焊接时间3秒以内.

12.2 Notes 注意点:

(1) Please be cautious not to give excessive static load or shock to switches.

注意不要施加超负荷的压力或晃动开关.

(2) Please be careful not to stack up P. W. B. after switches were soldered.

开关焊接以后,印刷基板注意不要叠放.

(3) Preservation under high temperature and high humidity or corrosive gas should be avoided

Especially. When you need to preserve for a long period, do not open the carton.

保管时尤其应注意避开高湿高温和有腐蚀性气体的环境. 如需长时间保存,请不要打开包装箱.

(4) The standard storage period is 3 months, with maximum up to 6months, preferably to be used as soon as possible. After opening the package, you should put the remaining switches in a plastic bag to prevent from damp and corrosive gas.

保存标准为 3 个月,限度为 6 个月以内,请尽早使用. 打开包装后,有剩余品时,应将剩余部分以胶袋包装好以同外界隔离,请进行合适的防湿,防腐蚀气体等处理后进行保管.

(5) This Product Specification is considered as the technical agreement on product between the receiving customer and Kailh. Any information on Product Catalogue which is in conflict with or



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different from the corresponding information of this document is considered as invalid.

该规格书为客户与凯华公司产品在技术方面的共识,其他相关数据上与该规格书不一致的内容都是无效的.

- (6) It will be considered that customer already confirmed and accepted this specification if customer issue purchase order to us directly.

无论顾客收到规格书后有没有信息反馈直接向我公司订货,我们将认为顾客对此产品已验证合格.

- (7) If there is no order or no request for new specification after 1 year upon this specification is issued, the specification will be regarded as invalid.

本产品规格书从生效日起 1 年后, 如果没有订货或再次申请最新规格书时请做无效处理.

- (8) Products meet the ROHS & REACH environmental management substances control standards
产品满足 ROHS & REACH 环境管理物质管制标准

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