



东莞市铭标电子科技有限公司
MINGBIAO ELECTRONICS CO., LTD

承 认 书

APPROVE SHEET

客户名称 Customer: _____

品 名 Part name: Tact Switch

型 号 Part Number: THCM31-043JB-R

Design/Date	Check/Date	Review/Date	Approval/Date

贵公司承认印 Approval signatures

Approval/Date	Remark

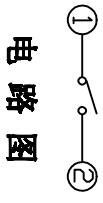
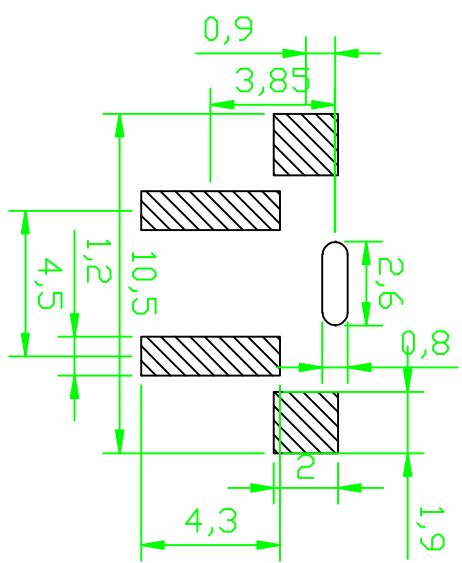
Send us a copy of reference , thank you! 日期 Date:

地址: 广东省东莞市长安镇沙头社区猫山东路 101 号

Add: Dongguan City, Guangdong Province, Chang'an Town, Sand head community The cat shandong road, No. 101

Ntel: 0769-81581583

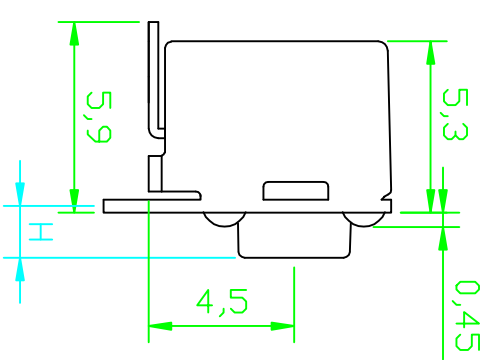
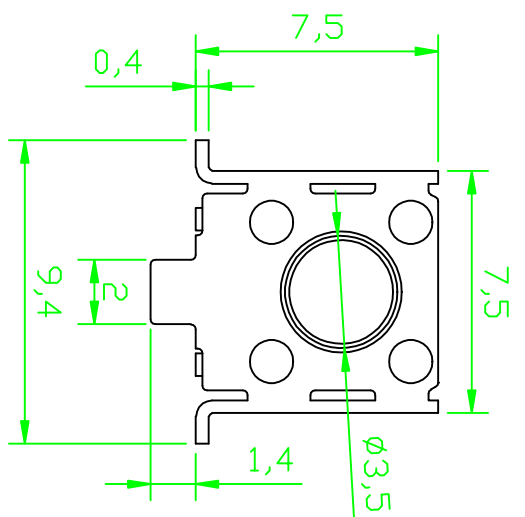
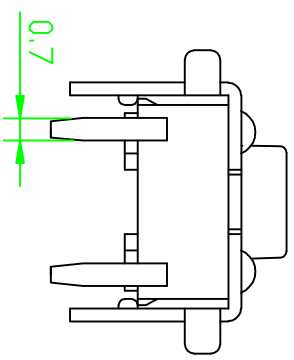
H	对应高度
0.9	4.3h
1.6	5h
2.1	5.5h
2.6	6h
3.1	6.5h
3.6	7h
4.1	7.5h
4.6	8h
5.1	8.5h
5.6	9h
6.1	9.5h
6.6	10h



主要技术规格:

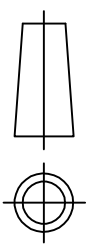
1. 额定值: 50mA DC12V
2. 接触电阻: 100m
3. 操作力: 160±50gf
4. 行程: 0.20±0.1mm
5. 绝缘电阻: 100m
6. 抗电强度: 250V 50HZ 1Min.
7. 寿命: 10万 Cycles

材料:
 本体: PPA (黑色)
 按钮: PPA (黑色)
 卡片: 黄铜 (镀银)
 弹片: 不锈钢 (镀银)
 盖板: 铜 (镀铜锡)



东莞市铭标电子科技有限公司
 Ming Mark Electronic Technology Co., Ltd.

第一视角



名称:
 轻触开关

型号: 66贴片支架 (上贴2.0)

THCM31-043JB-R

标记	处数	更改文件号	签名	日期	比例	公差	名称
设计		邱尚林		2019.10.04	mm	>0.5-2 ±0.10	THCM31-043JB-R
审核		邱尚林		2019.10.04	重量	>2-5 ±0.25	
批准		朱明华		2019.10.04		>5-10 ±0.30	
					角度	±0.5°	

1.1	SERIES	系列:	轻触开关
<hr/>			
1.2	MODEL NO.	型号:	THCM31-043JB-R
<hr/>			
1.3	RATING	额定值:	50mA 12VDC
<hr/>			
1.4	TRAVEL	行程:	0.25±0.10mm
<hr/>			
1.5	OPERATING FORCE	动作力	110~210gf
<hr/>			
1.5.1	PUSH FORCE	按压力:	160±50gf
<hr/>			
1.5.2	RETURN FORCE	回弹力:	>40gf(min)
<hr/>			
1.6	LIFE	寿命:	100,000 次
<hr/>			
1.7	CONTACT RESISTANCE	接触电阻:	100mΩ
<hr/>			
1.8	INSULATION RESISTANCE	绝缘电阻:	100MΩ
<hr/>			
1.9	DIELECTRIC STRENGTH	抗电强度:	100V 50Hz 1Min
<hr/>			
1.10	OPERATING TEMPERATURE	使用温度:	-30~+85℃
<hr/>			
1.11	STORAGE TEMPERATURE	保存温度:	-40~+85℃
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2. SIZES、STRUCTURE 尺寸、结构

2.1 OUTLINE DRAWING 外形图

2.2 BILL OF MATERIALS 物料清单

No. 序号	Picture 图片	Name 名称	Quantity 数量	Material 材料	Surface Treatment 表面处理	Color 颜色	Remarks 备注
1		按钮	1	PPA	清洗	黑色	/
2		支架	1	黄铜	镀铜锡	银白色	Sn≥0.30um Cu ≥0.15um
3		弹片	1	不锈钢覆银	单面覆银	银色	Ag≥0.30um
4		端子	4	黄铜	镀银	银色	Ag≥0.10um Ni≥0.15um
5		基座	1	PPA	清洗	黑色	内部含端子
6							
7							
8							
9							
10							

Note: if you need other material and color, please communicate with our sales staff in advance.

注: 如需其他材料与颜色, 请事先与我司业务人员沟通。

3.1 STANDARD CONDITION 试验、测试状态

Unless otherwise specified, the test and measurements shall be carried out as follows:

除另有规定外，试验和测量应按以下方式进行：

Ambient temperature 温度:5~35℃

Relative humidity 相对湿度:45~85%

Air pressure 气压:86~106kPa (860~1060mbar)

However if doubt arises on the decision based on the measured values under the above-mentioned conditions, the following condition shall be employed:

但在对判定产生疑义时，按下述状态实施：

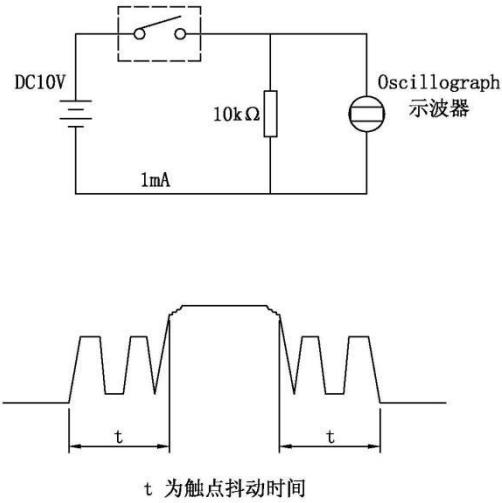
Ambient temperature 温度:20±2℃

Relative humidity 相对湿度:65±5%

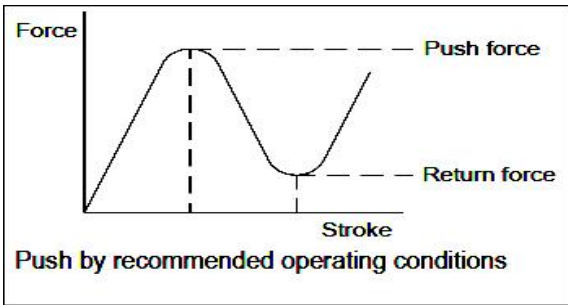
Air pressure 气压:86~106kPa (860~1060mbar)

3.2 ELECTRICAL PERFORMANCE 电气性能

Item 项目	Test Condition 测试条件	Requirements 要求
3.2.1 Contact Resistance 接触电阻	Applying static load twice the actuating force to the center of the stem, measurements shall be made with a 1 kHz small-current contact resistance meter. 用两倍的动作力作静负载施加于按钮的中心，并用 1 千赫小电流接触电阻仪测量	100mΩ max 100 毫欧以下
3.2.2 Insulation Resistance 绝缘电阻	Measurements shall be made following application of DC 100V potential between terminals and between individual terminals and frame for one minute. 在端子与端子之间、端子与外壳之间增加 DC 100V，持续一分钟	100MΩ min. 100 兆欧以上
3.2.3 Withstand Voltage 耐电压	AC 100V (50Hz or 60Hz) and induction current 1mA shall be applied for test between terminals and between terminals and frame for one minute. 在端子与端子之间、端子与外壳之间增加 AC 100V (50Hz 或 60Hz) 感应电流 1mA 条件下，持续 1 分钟	There shall be no breakdown. 无击穿现象出现。
3.2.4 Bounce 抖动	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per second), Bounce shall be tested when "ON" and "OFF".	ON 时: 3ms 以下 OFF 时: 20ms 以下

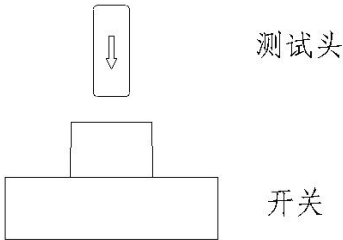
		<p>在正常使用中（以每秒 3-4 次周期）轻轻地在手柄中心加力，在通与断瞬间测试抖动。</p> 	
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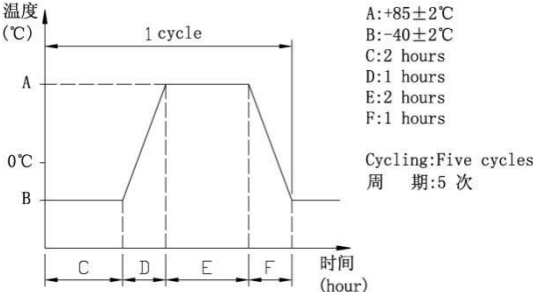
3.3 MECHANICAL PERFORMANCE 机械性能

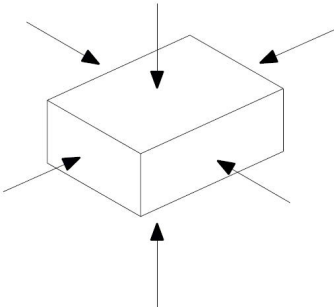
Item 项目	Test Condition 测试条件	Requirements 要求	
3.3.1 Operating Force 动作力	Push by recommended operating condition. 按规定的操作条件施加压力。 	Push force (按压力)	Return force (回弹力)
		160± 50gf	40gf (min)
3.3.2 Travel to closure 动作行程	Push by recommended operating condition. $F = (\text{Operating Force}) \times 2$ 按规定的操作条件施加压力。 $F = \text{动作力} \times 2$	0.20±0.1mm	
3.3.3 Terminal Strength 端子强度	A static force of 300g being applied in one direction on the tip of the terminal for 1 mintue. 一个 300 克之静负荷施加于端子顶部的一个方向持续 1 分钟。	There shall be of mechanical and electrical damage. 无任何迹象显示机械及电器性能之损坏。	

3.3.4	Knob Strength 手柄强度	Place the switch vertically to the operation direction, test the maximum pulling force that knob can withstand 3KG. 开关垂直于操作方向放置，测量推柄所能承受的最大拉力 3KG。	There shall be of mechanical and electrical damage. 无任何迹象显示机械及电器性能之损坏。																								
3.3.5	Vibration Test 耐振性	1) Vibration range 振动范围:10~55Hz 2) Amplitude 全振幅:1.5mm 3) Sweep rate:10-55-10Hz for 1 minute 扫描速度:10-55-10Hz 1分钟 4) Vibration direction:X, Y, Z(3 directions) 振动方向:X, Y, Z(3方向) 5) Vibration time:Each direction 2 hours (Total 6 hours) 振动时间:每个方向2个小时(共6个小时)	1) Item 3.2.1 2) Item 3.2.2 3) Item 3.2.3 4) Item 3.2.4 5) Item 3.3.1 6) Item 3.3.2																								
3.3.6	Soldering Test 可焊性试验	The tip of the terminal shall be dipped 0.5mm in the solder bath within temperature of $260 \pm 5^{\circ}\text{C}$ for $3 \pm 1.0\text{s}$. 端子顶部被侵入锡池 0.5mm 深，温度 $260 \pm 5^{\circ}\text{C}$ ，时间 3 ± 1.0 秒。	Over 95% of the immersed surface was covered by tin . 侵入的部分 95%以上表面将被锡覆盖。																								
3.3.7	Soldering Resistant Test 耐焊性试验	1) Soldering temperature $260 \pm 5^{\circ}\text{C}$, soldering time $3 \pm 0.5\text{s}$, immersion depth up to the surface of the board, thickness of PCB 1.6mm. 焊炉焊的温度控制在 $260 \pm 5^{\circ}\text{C}$ ，时间为 3 ± 0.5 秒，于(基板)厚度 1.6mm。 2) Manual soldering temperature $350 \pm 5^{\circ}\text{C}$, soldering time $3 \pm 0.5\text{s}$, however excessive pressure shall not be applied to the terminal. 手焊接时温度控制在 $350 \pm 5^{\circ}\text{C}$ ，时间为 3 ± 0.5 秒，但不能在端子上施加异常压力。	Without deformation of case or excessive looseness of electrical properties 本体无变形，能满足于机械、电器性能。																								
3.3.8	Reflow Soldering Heat Test 回流焊接热 试验	 <table border="1" data-bbox="438 1989 991 2139"> <thead> <tr> <th>Parts</th> <th>Temperature (°C)</th> <th>Time at temperature(sec)</th> <th>Treatments</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>NO - 150</td> <td></td> <td></td> </tr> <tr> <td>B</td> <td>150 - 180</td> <td>90 ± 30</td> <td>Pre-heating zone</td> </tr> <tr> <td>C</td> <td>180 - 230</td> <td></td> <td></td> </tr> <tr> <td>D</td> <td>230 - 255 - 230</td> <td>30 (Peak : 3 MAX.)</td> <td>Soldering zone</td> </tr> <tr> <td>E</td> <td>230 to NO</td> <td></td> <td>Cooling zone</td> </tr> </tbody> </table>	Parts	Temperature (°C)	Time at temperature(sec)	Treatments	A	NO - 150			B	150 - 180	90 ± 30	Pre-heating zone	C	180 - 230			D	230 - 255 - 230	30 (Peak : 3 MAX.)	Soldering zone	E	230 to NO		Cooling zone	Without deformation of case or excessive looseness of electrical properties 本体无变形，能满足于机械、电器性能
Parts	Temperature (°C)	Time at temperature(sec)	Treatments																								
A	NO - 150																										
B	150 - 180	90 ± 30	Pre-heating zone																								
C	180 - 230																										
D	230 - 255 - 230	30 (Peak : 3 MAX.)	Soldering zone																								
E	230 to NO		Cooling zone																								

3.4 CLIMATIC CHARACTERISTICS 耐候性能

Item 项目	Test Condition 测试条件	Requirements 要求
3.4.1 Life Test 寿命测试	<p>100, 000cycles of operation at a rate of 100-120 cycles per minute with loading 负载条件，每分钟 100-120 次的速度操作 100, 000 次。</p> <p>安装示意图</p>  <p>The diagram illustrates the test setup. It shows a rectangular test head (测试头) with a downward-pointing arrow, positioned above a switch (开关). The switch is represented as a rectangular component with a smaller rectangular protrusion on top.</p>	<p>1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。</p> <p>2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。</p> <p>3) Operating force 30% initial value. 动作力变化范围初始值 30%。</p> <p>4) Item 3.2.3</p> <p>5) Item 3.3.2</p>
3.4.2 Cold Resistant Test 耐寒试验	<p>At $-30\pm 2^{\circ}\text{C}$ for 96H, test after keeping in normal condition for 30 min. 在 $-30\pm 2^{\circ}\text{C}$ 环境中放 96 小时，再置于正常环境中，30 分钟后进行测试。</p>	<p>1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。</p> <p>2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。</p> <p>3) Item 3.2.3</p> <p>4) Item 3.2.4</p> <p>5) Item 3.3.1</p> <p>6) Item 3.3.2</p>
3.4.3 Heat Resistant Test 耐热试验	<p>$80\pm 2^{\circ}\text{C}$ for 96H, test after keeping in normal condition for 30 min. 在 $80\pm 2^{\circ}\text{C}$ 环境中放 96 小时，再置于正常环境中，30 分钟后进行测试。</p>	<p>1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。</p> <p>2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。</p> <p>3) Item 3.2.3</p> <p>4) Item 3.2.4</p> <p>5) Item 3.3.1</p> <p>6) Item 3.3.2</p>

3.4.4	Temperature Cycling Test 温度交变试验	<p>According to following figure, after 5cycles, test after keeping in normal condition for 30 min.</p> <p>如图示之环境中，循环5次后，再置于正常环境中，30分钟后进行测试。</p>  <p>The graph shows a temperature profile over time. The y-axis is Temperature (°C) and the x-axis is Time (hour). A cycle consists of: C (2 hours) at temperature B (-40±2°C), D (1 hour) ramping up to A (+85±2°C), E (2 hours) at temperature A, and F (1 hour) ramping down to B. The total cycle time is 6 hours. The test is repeated 5 times.</p> <p>Legend: A: +85±2°C B: -40±2°C C: 2 hours D: 1 hours E: 2 hours F: 1 hours Cycling: Five cycles 周期: 5次</p>	1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。 2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。 3) Item 3.2.3 4) Item 3.2.4 5) Item 3.3.1 6) Item 3.3.2
3.4.5	Moisture Resistant Test 耐湿试验	<p>At 60±2°C 90~95% RH for 96H, test after keeping in normal condition for 30 min.</p> <p>在 60±2°C 90~95%环境中放 96 小时，再置于正常环境中，30 分钟后进行测试。</p>	1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。 2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。 3) Item 3.2.3 4) Item 3.2.4 5) Item 3.3.1 6) Item 3.3.2
3.4.6	Salt Mist Test 盐雾试验	1) Temperature: 35±2°C 2) Cycle: 8 Hours testing(3 Times) and 1 Hours stop. Based on total 24 hours. 3) Salt solution concentration: 5±1% by weight. 1) 测试温度: 35±2°C 2) 循环次数: 8 小时喷雾 1 小时停，连续 3 次. 喷雾 24 小时。 3) 盐雾浓度: 5±1%	1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。 2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。 3) Item 3.2.3 4) Item 3.2.4 5) Item 3.3.1 6) Item 3.3.2

3.4.7	Withstand H ₂ S 耐 H ₂ S	1) Density: 3±1 ppm 浓度: 3±1 ppm 2) Temperature: 40±2°C 温度: 40±2°C 3) Relative humidity: 90~95% 相对湿度: 90~95% 4) Duration of test: 24h 持续时间: 24 小时 5) Standard conditions after test: 1h 试验后的放置条件: 1 小时	1) Contact resistance 200mΩ Max. 接触电阻 200 mΩ 以下。 2) Insulation resistance 100 Min. 绝缘电阻 100 MΩ 以上。 3) Item 3.2.3 4) Item 3.2.4 5) Item 3.3.1 6) Item 3.3.2
3.4.8	Shock 耐冲击性	Measure after test at a condition below 在下列条件下进行测试后的量度 Peak acceleration---80G 冲击加速度---80G Test time-6 direction ,each 3 times total 18 times 测试次数-6 个方向, 各 3 次, 共计 18 次 	1) Operating force 30% initial value. 动作力变化范围初始值 30%。 2) Item 3.2.1 3) Item 3.2.2 4) Item 3.2.3

4. SOLDERING 焊接

4.1 CONDITIONS FOR SOLDERING 焊接条件

Preheat temperature:110°C max(Embilomental temperature of soldering surface of P.C.B)

预热温度: 110°C 以下 (印刷基板焊锡周围的温度)

Preheat time:60 sec,max

预热时间:60 秒以内

Area of flux:1/2 max of P.C.B thickness

助焊剂面积:印刷基板厚度的 1/2 以内

Temperature of solder:245±5°C max

焊锡温度:245±5°C max

Times of immersion:Within 5 sec

浸焊时间:5 秒以内

Soldering number:Within 2 times(But should bring down heat of the first silding)

浸焊次数:2 次以内(但应把第一次焊锡的温度降下来)

Printed wiring board:Single sided copper-clad laminates

印刷基板:单面铜箔

4.2 Precaution 注意事项

4.2.1 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。

4.2.2 In the case of using soldering iron, soldering conditions shall be 280°C max and 3 sec max. 在使用烙铁的情况下, 焊锡温度应在 280°C 以下、3 秒内。

4.2.3 Right after switches were soldered; please be careful not to load on the knobs of switches. 浸焊后, 注意不要在手柄顶部施加负荷。

4.2.4 Follow recommended P.C.B. Piercing plan in the outside drawing page. 印刷基板的安装孔尺寸参见产品图。

4.2.5 Please be cautious not to give excessive static load or shock to switches. 注意不要施加超过负荷的压力或晃动开关。

4.2.6 Please be careful not to pile up P.C.B. After switches were soldered. 开关焊接以后, 印刷基板注意不要叠放。

4.2.7 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。

5. OTHER PRECAUTIONS 其他注意事项

5.1 Following the soldering process, do not try to clean the switch with a solvent or the like.

进行焊接过程中, 不可以用溶剂或类似品清洗开关。

5.2 Safeguard the switch assembly against flux penetration from its topside.

防止助焊剂从开关的顶端渗入。

5.3 The color of the product in the product catalog, and the kind of color is different.

本产品目录中产品的颜色, 与实物的颜色有所差异。

5.4 Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods most.

交货后保证开关处于密封状态并库存时间不超过 90 天以上。

6. Reel Packaging 盘装

6.1 Scope 范围 This specification covers the requirements of the reel packaging for SMT standard type of tact switches. 该规范包含 SMT 标准型拨动开关的绕带封装的要求

6.2 Packaging Quantity

封装数量

6.2.1 The number of the reels. 转轴数量

6.2.2 The number of the switches. 产品数量 0.5K pcs switches shall be packed in a reel. 一个转轴包 0.5K 只产品

6.2.3 It should be noted that we regard two cartons

对出口包装需注意用两个箱子包装

mentioned above as on package for export.