

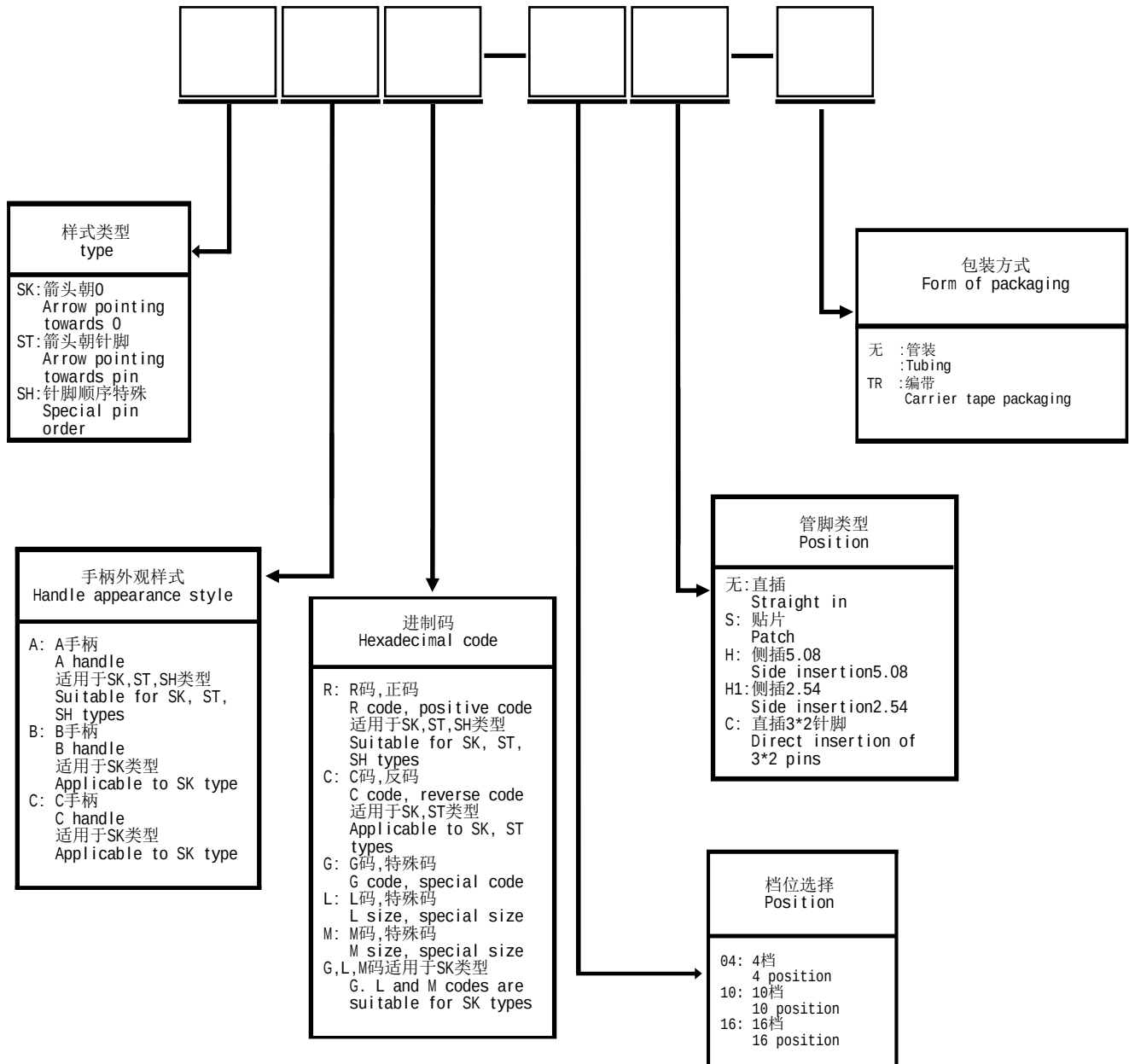
## - 规格书 -

产品型号: SKAR-16S-TR

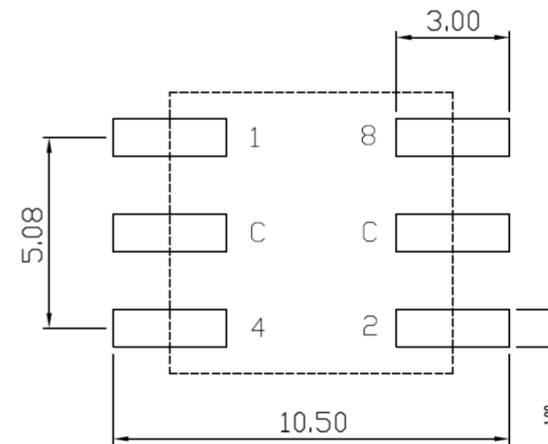
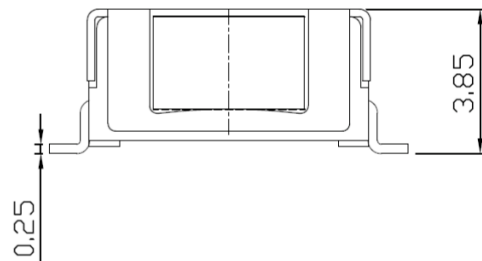
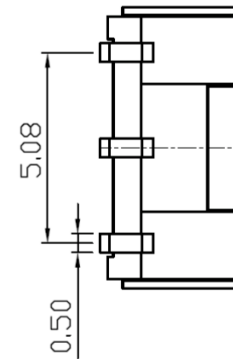
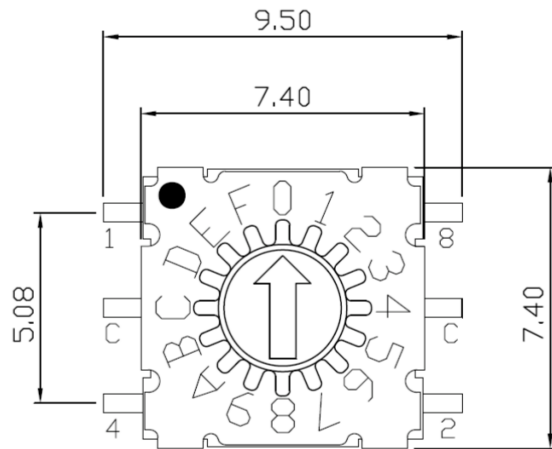
产品名称: 旋转编码开关

# SM SWITCH CO.,LTD

Add : 江苏省无锡市新吴区弘毅路8号金帛座706室  
韩国京畿道富川市三鹊路22号富川科技园103-506栋  
TEL : +86-510-8591-9217  
H.P : 138-6177-3466  
E-mail: SMSWITCH@SIMAOKJ.COM  
Web : WWW.SIMAOKJ.CN



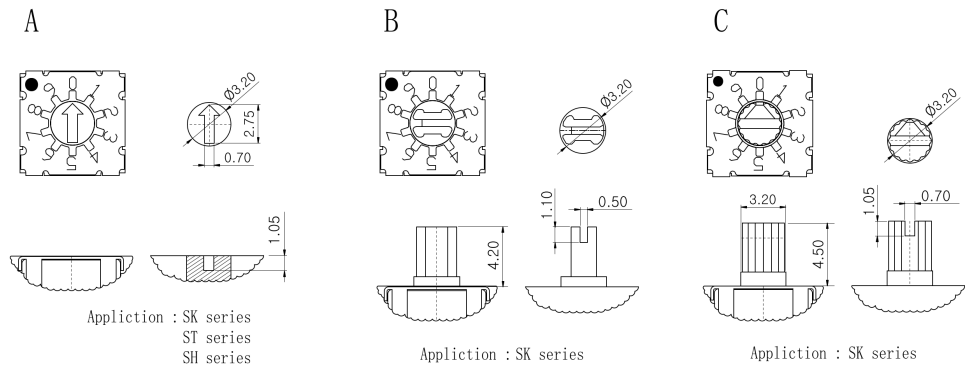
● Please check the type of switch according to the type specification.



P.C.B. DIMENSION

|       |          |                                                                                       |     |                              |  |
|-------|----------|---------------------------------------------------------------------------------------|-----|------------------------------|--|
| D'SGD | H.S LEE  |  |     | TITLE: MINIROTARY DIP SWITCH |  |
|       |          | CO                                                                                    | mm  | MODELNO: SKAR-16S-TR         |  |
| CHKD  | J.S KIM  | Scale                                                                                 | 1:1 | SM SWITCH CO.,LTD            |  |
| APPD  | Y.D WANG | Rev                                                                                   | A/0 |                              |  |

# 1 手柄尺寸外观 Handle size and appearance



# 2 编码表 Code

## R Real Code

| 10 Position | Real Code |   |   |   |   |
|-------------|-----------|---|---|---|---|
|             | C         | 1 | 2 | 4 | 8 |
| 0           | •         |   |   |   |   |
| 1           | •         | • |   |   |   |
| 2           | •         |   | • |   |   |
| 3           | •         | • | • |   |   |
| 4           | •         |   |   | • |   |
| 5           | •         |   | • | • |   |
| 6           | •         | • | • | • |   |
| 7           | •         | • | • | • | • |
| 8           | •         |   |   |   | • |
| 9           | •         | • |   |   | • |

Actuator Color  
SK Type : Red  
ST Type : Green  
SH Type : Yellow

| 16 Position | Real Code |   |   |   |   |
|-------------|-----------|---|---|---|---|
|             | C         | 1 | 2 | 4 | 8 |
| 0           | •         |   |   |   |   |
| 1           | •         | • |   |   |   |
| 2           | •         |   | • |   |   |
| 3           | •         | • | • |   |   |
| 4           | •         |   |   | • |   |
| 5           | •         | • | • | • |   |
| 6           | •         |   |   |   | • |
| 7           | •         | • | • | • | • |
| 8           | •         |   |   |   | • |
| 9           | •         | • |   |   | • |
| 10          | •         | • | • | • | A |
| 11          | •         | • | • | • | B |
| 12          | •         |   |   |   | C |
| 13          | •         | • | • | • | D |
| 14          | •         | • | • | • | E |
| 15          | •         | • | • | • | F |

Actuator Color  
SK Type: Gray  
ST Type: Indigo

## C Complement Code

| 10 Position | Complement Code |   |   |   |   |
|-------------|-----------------|---|---|---|---|
|             | C               | 1 | 2 | 4 | 8 |
| 0           | •               | • | • | • | • |
| 1           | •               |   | • | • | • |
| 2           | •               | • |   | • | • |
| 3           | •               |   | • |   | • |
| 4           | •               | • | • |   | • |
| 5           | •               | • | • | • | • |
| 6           | •               | • |   | • | • |
| 7           | •               |   | • | • | • |
| 8           | •               | • | • | • | • |
| 9           | •               |   | • | • | • |

Actuator Color  
SK Type : Orange  
ST Type : Black

| 16 Position | Complement Code |   |   |   |   |
|-------------|-----------------|---|---|---|---|
|             | C               | 1 | 2 | 4 | 8 |
| 0           | •               | • | • | • | • |
| 1           | •               |   | • | • | • |
| 2           | •               | • |   | • | • |
| 3           | •               |   | • |   | • |
| 4           | •               | • | • |   | • |
| 5           | •               | • | • | • | • |
| 6           | •               | • |   | • | • |
| 7           | •               |   | • | • | • |
| 8           | •               | • | • | • | • |
| 9           | •               | • |   | • | • |
| 10          | •               | • | • | • | A |
| 11          | •               | • | • | • | B |
| 12          | •               |   |   |   | C |
| 13          | •               | • | • | • | D |
| 14          | •               | • | • | • | E |
| 15          | •               | • | • | • | F |

Actuator Color  
SK Type: Ivory

## G Gray Code

| 10 Position | Gray Code |   |   |   |   |
|-------------|-----------|---|---|---|---|
|             | C         | 1 | 2 | 4 | 8 |
| 0           | •         | • |   |   | • |
| 1           | •         | • |   |   |   |
| 2           | •         | • | • |   |   |
| 3           | •         |   | • |   |   |
| 4           | •         |   |   | • |   |
| 5           | •         | • | • | • |   |
| 6           | •         | • |   | • |   |
| 7           | •         |   |   |   | • |
| 8           | •         |   |   |   | • |
| 9           | •         | • |   |   | • |

Actuator Color  
SK Type : Brown

| 16 Position | Gray Code |   |   |   |   |
|-------------|-----------|---|---|---|---|
|             | C         | 1 | 2 | 4 | 8 |
| 0           | •         | • |   |   |   |
| 1           | •         | • |   |   |   |
| 2           | •         | • | • |   |   |
| 3           | •         |   | • |   |   |
| 4           | •         |   |   | • |   |
| 5           | •         | • | • | • |   |
| 6           | •         | • |   | • |   |
| 7           | •         |   |   |   | • |
| 8           | •         | • | • | • | • |
| 9           | •         | • |   | • | • |
| 10          | •         | • | • | • | A |
| 11          | •         | • | • | • | B |
| 12          | •         |   |   |   | C |
| 13          | •         | • | • | • | D |
| 14          | •         | • | • | • | E |
| 15          | •         | • | • | • | F |

Actuator Color  
SK Type : Blue

## L Code

| 4 Position | L Code |   |   |   |
|------------|--------|---|---|---|
|            | C      | 0 | 1 | 2 |
| 0          | •      | • |   |   |
| 1          | •      | • | • |   |
| 2          | •      |   | • | • |
| 3          | •      |   |   | • |

## M Code

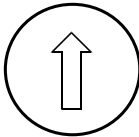
| 4 Position | M Code |   |   |   |
|------------|--------|---|---|---|
|            | C      | 1 | 2 | 3 |
| 1          | •      | • |   |   |
| 2          | •      |   | • |   |
| 3          | •      |   |   | • |
| 4          | •      | • |   | • |



迷你旋转编码开关  
产品规格书  
MINI ROTARY DIP SWITCH  
SPECIFICATION

Rev. 7  
P: 1/6

1. 规格:  
Style:  
本规范描述“旋转开关”主要用作信号开关电气设备具有一般要求的机械和电气特性。  
This specification describes "Rotary Switch" mainly used as signal switch of electric devices with the general requirements of mechanical and electrical characteristics.
- 1.1 操作/存储温度范围:  $-55^{\circ}\text{C} \sim +125^{\circ}\text{C} / -60^{\circ}\text{C} \sim +125^{\circ}\text{C}$   
Operating / Storage Temperature Range :  $-55^{\circ}\text{C} \sim +125^{\circ}\text{C} / -60^{\circ}\text{C} \sim +125^{\circ}\text{C}$
2. 电流范围:  
Current Range  
2.1 未工作状态: 400 mA, 42V None-Switching : 400 mA, 42V  
2.2 工作状态: 150 mA, 42V Switching : 150 mA, 42V
3. 操作类型 : 旋转  
Type of Actuation : Rotating
4. 测试顺序:  
Test Sequence:

| 电气性能<br>ELECTRIC PERFORMANCE | 项目<br>ITEM | 描述<br>DESCRIPTION                        | 试验条件<br>TEST CONDITIONS                                                                                                                                                                                 | 要求<br>REQUIREMENTS                                                                       |
|------------------------------|------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                              | 1          | 目测<br>Visual Examination                 | 通过目测检查, 无需任何压力和测试<br>By visual examination check without any out pressure & testing.                                                                                                                    | 应无影响产品使用能力的缺陷<br>There shall be no defects that affect the serviceability of the product |
|                              | 2          | 接触电阻<br>Contact Resistance               | ①在与每个开关及相关的两个端子之间进行测量<br>To be measured between the two terminal associated with each switch pole<br>②测量应采用1kHz电流接触电阻计<br>Measurements shall be made with a 1kHz shall current contact resistance meter | 80mΩ max.<br>(initial)                                                                   |
|                              | 3          | 绝缘电阻<br>Insulation Resistance            | 250V DC 1分钟±5秒<br>250V DC, 1minute±5seconds                                                                                                                                                             | 100MΩ min                                                                                |
|                              | 4          | 介质耐压<br>Dielectric withstanding Volotage | 250V AC (50Hz或60Hz) 应施加在所有相邻端子之间以及端子和框架之间1分钟<br>250V AC(50Hz or 60Hz) shall be applied between all the adjacent terminal and between the terminal and the frame For 1 minute                            | 不得有击穿或闪络现象<br>There shall be no breakdown or flashover                                   |
|                              | 5          | 动作力<br>Operation Force                   | 应用于操作方向<br>Applied in the direction of operation<br>                                                                 | 120gf ± 30gf                                                                             |



迷你旋转编码开关  
产品规格书  
MINI ROTARY DIP SWITCH  
SPECIFICATION

Rev. 7  
P: 2/6

机械性能  
MACHINPERFORMANCE

|    |                                     |                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                     |
|----|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 6  | 工作寿命<br>Operation Life              | 应在以下试验后进行测量:<br>1) 100mA, 42V直流电阻负载<br>2) 操作速率: 15~20次循环/分钟<br>3) 平均无故障寿命: 25000次<br>Measurements shall be made following the test set forth below:<br>1)100mA, 42V DC resistive load<br>2)Rate of operation: 15~20cycles/minute<br>3)Average fault-free life: 25,000 steps                                                      | 1) 如第3、4、项所示<br>2) 接触电阻: 最大200mΩ<br>3) 试验后的最终结果<br>1) As shown in item 3,4<br>2) Contact Resistance: 200mΩ max<br>3) Final-after test               |
| 7  | 低温测试<br>Resistance Low Temperature  | 在进行以下试验后, 样品应在正常温度和湿度条件下放置一小时<br>测量前:<br>1) 温度: -60℃ ± 3℃<br>2) 时间: 96小时<br>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made:<br>1)Temperature: -60℃ ± 3℃<br>2)Time: 96 hours                                                  | 如项目2~5所示<br>As shown in item 2~5                                                                                                                    |
| 8  | 高温测试<br>Resistance High Temperature | 在进行以下试验后, 样品应在正常温度和湿度条件下放置一小时<br>在进行测量之前:<br>1) 温度: 125℃ ± 2℃<br>2) 时间: 96小时<br>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made:<br>1) Temperature: 125℃ ± 2℃<br>2) Time: 96 hours                                            | 1) 如项目3~5<br>2) 所示, 接触电阻: 最大200mΩ<br>1) As shown in item 3~5<br>2) Contact Resistance: 200mΩ max                                                    |
| 9  | 湿度测试<br>Resistance Humidity         | 在进行以下试验后, 样品应在正常温度和 湿度条件下放置一小时<br>测量前:<br>1) 温度: 40℃ ± 2℃<br>2) 相对湿度: 90~95%<br>3) 时间: 96小时<br>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made:<br>1)Temperature: 40℃ ± 2℃<br>2)Relative humidity: 90~95%<br>3)Time: 96 hours | 1) 如第4项所示<br>2) 接触电阻: 最大200mΩ<br>3) 绝缘电阻: 最小10MΩ<br>1) As shown in item 4<br>2) Contact Resistance: 200mΩ max<br>3) Insulation Resistance: 10MΩ min |
| 10 | 焊接条件<br>Solder Condition            | 1. 手工焊接3s/350℃<br>Iron Soldering 3s / 350℃<br>2. 波峰焊5s/280℃<br>Wave Soldering 5s / 280℃<br>3. 回流焊10s/260℃<br>Reflow Soldering 10s / 260℃                                                                                                                                                                                         |                                                                                                                                                     |
| 11 | 储存条件<br>Storage conditions          | 保管时尤其应注意避开高湿高温和有腐蚀性气体的环境。如需要长时间保存, 请放置在常温干燥处。<br>When storing, special attention should be paid to avoiding environments with high humidity, high temperature, and corrosive gases. If it needs to be stored for a long time, please place it in a dry place at room temperature.                                                |                                                                                                                                                     |

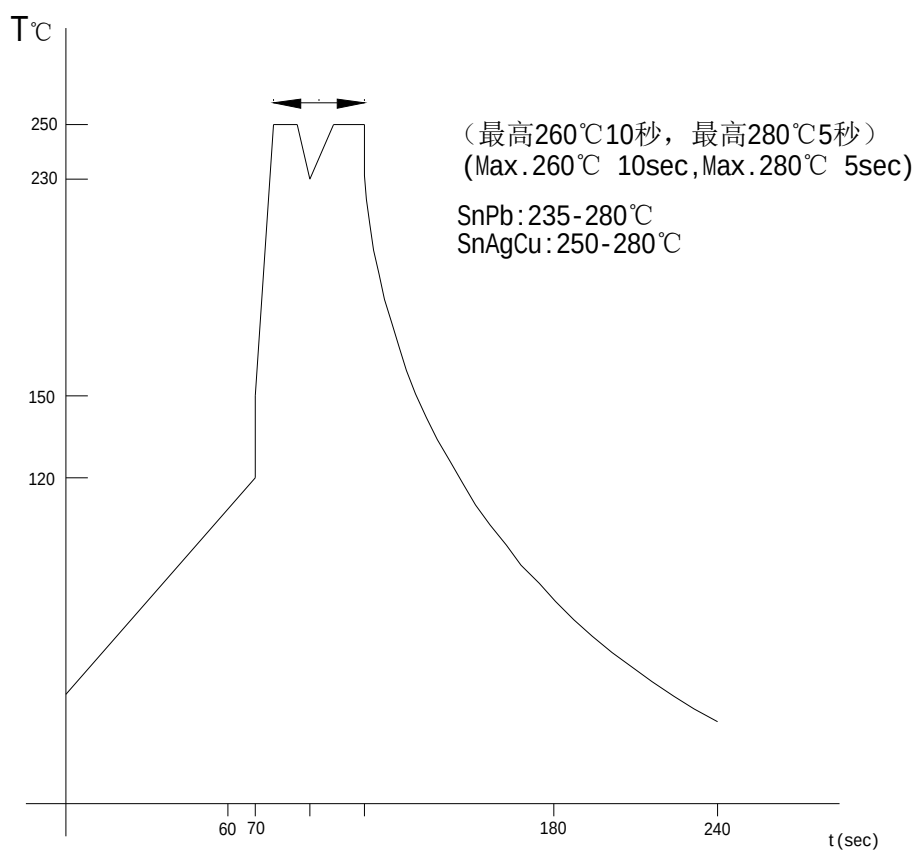
5. 该项目符合"ROHS"  
This item is "ROHS" Compliant

6. 手工焊接  
manual Soldering

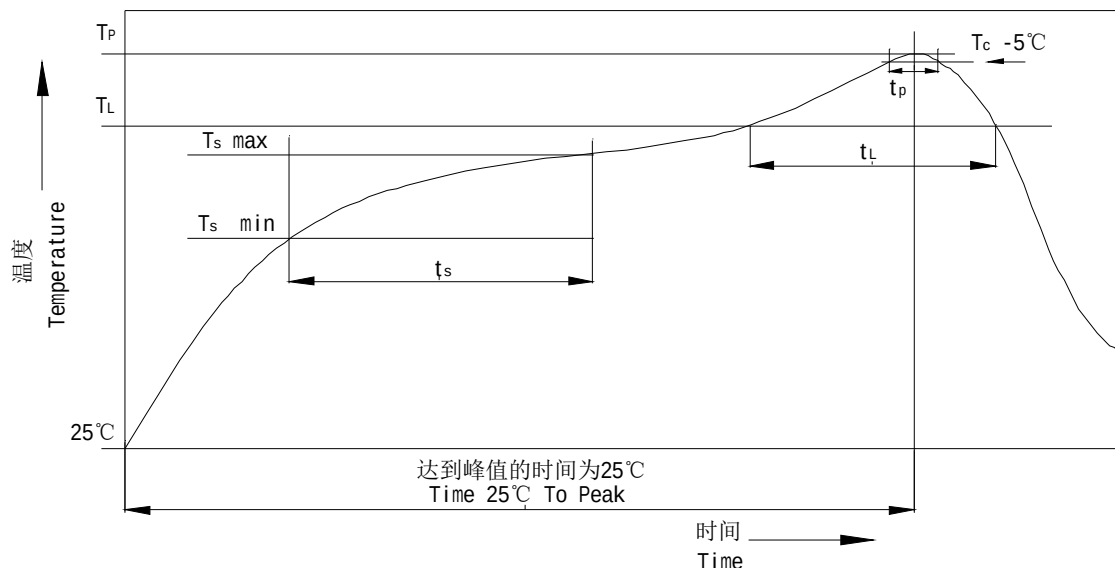
: 最高350℃最高3秒

: Max.350℃ Max.3sec

7. 波峰焊条件:  
Wave Soldering Conditions:



8. 回流焊接条件:  
Reflow Soldering Conditions:



1) 分类回流配置文件  
Classification Reflow Profiles

| 配置功能<br>Profile Feature                                                                                                                                        | 无铅组件<br>Pb-Free Assembly                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 平均上升速率 (Ts最大值至TP)<br>Average Ramp-UP Rate(Ts max to TP)                                                                                                        | 最大3°C/秒<br>3°C/second max                                    |
| 预热<br>- 最低温度 (Ts Min)<br>- 最高温度 (Ts max)<br>- 时间 (Ts Min至Ts Max)<br>Preheat<br>- Temperature Min(Ts min)<br>- Temperature Max(Ts max)<br>- Time (ts min to ts) | 150°C<br>200°C<br>60-180秒<br>150°C<br>200°C<br>60-180seconds |
| 保持在以上的时间:<br>- 温度 (TL)<br>- 时间 (tL)<br>Time maintained above:<br>- Temperature (TL)<br>- Time (tL)                                                             | 217°C<br>60-150秒<br>217°C<br>60-150seconds                   |
| 峰值/分类温度 (TP)<br>Peak/Classification Temperature(TP)                                                                                                            | 260°C+0°C/-5°C                                               |
| 实际峰值温度 (TP) 5°C以内的时间<br>Time within 5°C of actual Peak Temperature(TP)                                                                                         | 最小30秒<br>min 30 seconds                                      |
| 缓降速率<br>Ramp-Down Rate                                                                                                                                         | 最高6°C/秒<br>6°C/sec max                                       |
| 达到峰值温度的时间为25°C<br>Time 25°C to Peak Temperature                                                                                                                | 最多8分钟<br>8 minutes max                                       |





迷你旋转编码开关  
产品规格书  
MINI ROTARY DIP SWITCH  
SPECIFICATION

Rev. 7  
P: 5/6

9. 部件说明  
ParList

| 序号<br>NO | 部件名称<br>Part Name  | 数量<br>Q'ty | 材质名称<br>Materials      | 表面处理<br>Treatment      | 备注<br>Remark                                                                       |
|----------|--------------------|------------|------------------------|------------------------|------------------------------------------------------------------------------------|
| 1        | 外壳<br>Cover        | 1          | 不锈钢<br>Stainless Steel |                        |                                                                                    |
| 2        | 弹片<br>Spring plate | 1          | 不锈钢<br>Stainless Steel |                        |                                                                                    |
| 3        | 辅助器<br>Guide Plate | 1          | 不锈钢<br>Stainless Steel |                        |                                                                                    |
| 4        | 连接器<br>Contact     | 1          | 铜合金<br>Copper Alloy    | 镀层: 金<br>Plating: Gold | 金 0.03 $\mu$ m 最小<br>镍 0.1 $\mu$ m 最小<br>Au 0.03 $\mu$ m Min<br>Ni 0.1 $\mu$ m Min |
| 5        | 接触引脚<br>Terminal   | 1          | 黄铜<br>Brass            | 镀层: 金<br>Plating: Gold | 金 0.03 $\mu$ m 最小<br>镍 0.3 $\mu$ m 最小<br>Au 0.03 $\mu$ m Min<br>Ni 0.3 $\mu$ m Min |
| 6        | 手柄<br>Rotor        | 1          | LCP                    |                        |                                                                                    |
| 7        | 底座<br>Base         | 1          | LCP                    |                        |                                                                                    |
| 8        | O型圈<br>O-Ring      | 1          | 硅胶<br>Silicone         |                        |                                                                                    |



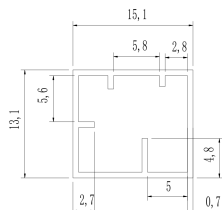
# 迷你旋转编码开关 产品规格书 MINI ROTARY DIP SWITCH SPECIFICATION

Rev. A  
P: 6/6

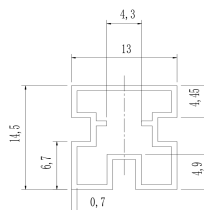
## 10. 包装方式 Packaging method

### 10.1 管装 Pipe installation

适用于侧插H1.H类型, 65pcs/管  
Suitable for side insertion  
H1.H type, 65pcs/tube



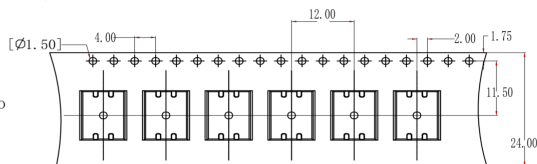
适用于直插, 贴片类型, 68pcs/管  
Suitable for direct insertion,  
smt type, 68pcs/tube



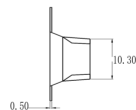
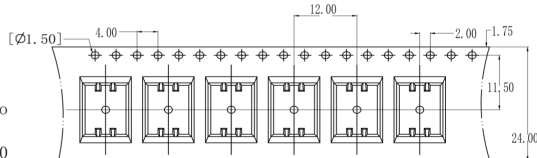
### 10.2 编带 Braiding



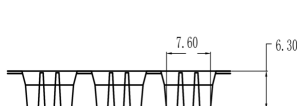
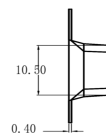
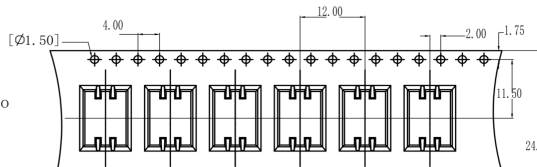
适用于  
SKAR-S  
1300一卷  
Applicable to  
one roll of  
SKAR-S 1300



适用于  
SKB(C)R-S  
600一卷  
Applicable to  
one roll of  
SKB(C)R-S 600



适用于  
SDCR-S  
900一卷  
Applicable to  
one roll of  
SDCR-S 900



适用于  
SDAR-S  
1500一卷  
Suitable for  
one roll of  
SDAR-S 1500

