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| SFKRT-001 | SFKRT/SFNRT SWITCHES SPECIFICATIONS SFKRT/SFNRT 觸壓式製品規格書 | 98.11.19 |
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1. General 一般事項

1.1 Scope : This specification covers the requirements for single key switches which have no keytop.
(TACT SWITCHES:MECHANICAL CONTACT).

適用範圍: 本規格書適用於不含鍵帽之單鍵開關(觸壓式開關:機械式接點)

1.2 Operating Temperature Range -20~+70°C (normal humidity normal press.) 使用溫度範圍: -20~+70°C (常濕常壓條件下)

1.3 Storage Temperature Range -30~+80°C (normal humidity normal press.) 存放溫度範圍: -30~+80°C (常濕常壓條件下)

1.4 Test conditions : The standard test conditions shall be 5~35°C in temperature , 45~85% RH and 860~1060mbar in atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at 20±2°C, 65±5% RH. and 860~1060mbar.

試驗狀態: 若無特別規定限制, 則以溫度 5~35°C, 相對濕度 45~85%, 氣壓 860~1060mbar 之標準狀態測之。但對此標準狀態之測定值發生判定疑問或有特別要求則以基準狀態(溫度 20±2°C 相對濕度 65±5% . 氣壓 860~1060mbar)為準測定

2. Appearance, construction and dimensions. 外觀. 構造. 尺寸

2.1 Appearance : There shall be no defects that affect the serviceability of the product. 不得有影響製品機能之缺陷.

2.2 Construction dimensions : Shall conform to the assembly drawings. 構造及尺寸: 必須與組立圖符合.

3. Type of actuation : Tactile feedback

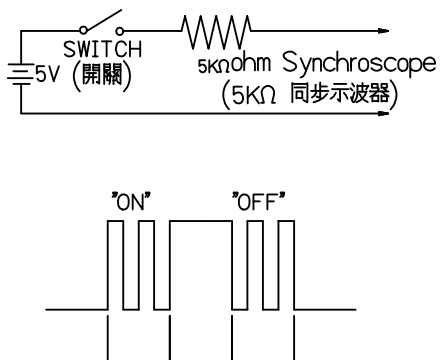
動作型式: 有觸感之反饋

4. Contact arrangement: 1 poles 1 throws (Details of contact arrangement are given in the assembly drawings.)

接點構成: 單極單投式(詳細如組立圖所示)

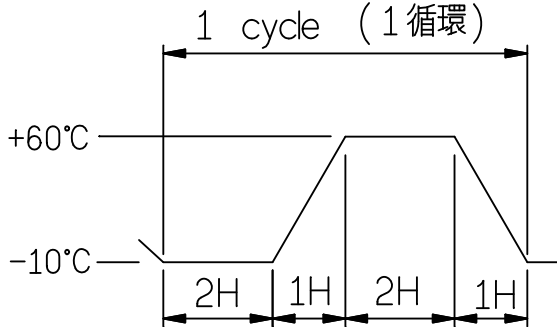
5. Maximum ratings : 最大額定: DC12V 50mA

6. Electrical performance 電氣性能

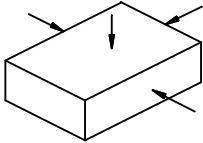
| Property 項目 | Test conditions 試驗條件 | Performance 判定基準 |
|--|---|--|
| 6.1 Contact resistance 接觸阻抗 | Applying a static load twice the actuating force to the center of the stem measurements shall be made with a 1 kHz small-current or DC5V 100mA contact resistance meter. 將兩倍於動作力之靜負荷加於柄之中央以 1 k Hz 小電流或 DC5V 100mA 接觸阻抗計測定之。 | 100 m ohm max. 100 mΩ 以下 |
| 6.2 Insulation resistance 絕緣阻抗 | Measurements shall be made following application of DC 100V potential across terminals and across terminals and frame for one minute . 以 DC 100V 之電壓加於端子相互間及端子與外框間 1 分鐘測定之 | 100 M ohm min. 100 MΩ 以上 |
| 6.3 Dielectric with standing voltage 耐電壓 | AC 250V (50~60Hz) shall be applied across terminals and across terminals and frame for one minute. 以 AC 250V (50~60Hz) 之電壓加於端子相互間及端子與外框間 1 分鐘測定之 | There shall be no breakdown. 不可有絕緣破壞之現象 |
| 6.4 Bounce 接點之瞬間接觸跳動時間 | Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec) bounce shall be tested at "ON" and "OFF". 以 3-4 次/秒之正常使用速度輕輕地敲打柄之中央, 開關在"開"及"關"之位置均需測定之  | 10 m sec max. 10 m sec 以下. |

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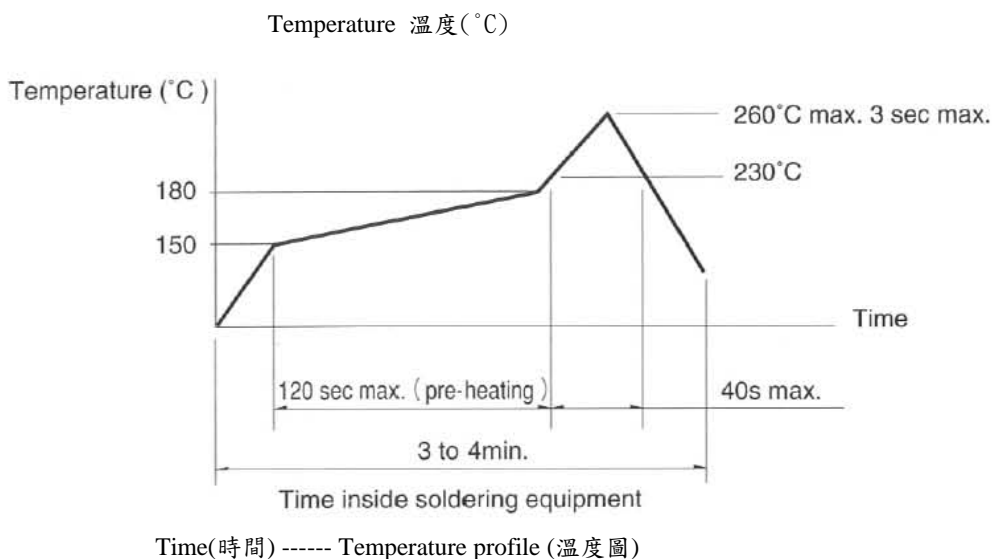
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| 7.Mechanical performance 機械性能 | | | | | | |
| | Property 項目 | Test conditions 試驗條件 | | | Performance 判定基準 | |
| 7.1 | Actuating force 動作力 | Placing the switch such that the direction of switch operation is horizon and then gradually increasing the load applied to the center of the stem the maximum load required for the stem to come to a stop shall be measured. 將開關之操作部置於水平方向，並在把柄的中央逐漸增加荷重，直到柄不動為止，量取施力期間之最大荷重值。 | | | As showing in assembly drawing. 依組立圖上規定。 | |
| 7.2 | Travel 移動量 | Placing the switch such that the direction of switch operation is horizon and then applying a static load twice the actuating force to the center of the stem the travel distance for the stem to come to a stop shall be measured. 將開關之操作部置於水平方向，並在把柄的中央加兩倍於動作力之靜負荷測量柄被壓到不動時之移動距離。 | | | 0.2±0.15 mm | |
| 7.3 | Return force 復歸力 | The sample switch is installed such that the direction of switch operation is horizon and upon depression of the stem in its center the whole travel distance the force of the stem to return to its free position shall be measured. 將開關之操作部置於水平方向，並在把柄的中央施力，使之移動全行程距離再測量其復歸至原來位置之力量。 | | | As showing in assembly drawing. 依組立圖上規定。 | |
| 7.4 | Stop strength 止動強度 | Placing the switch such that the direction of switch operation is vertical a static load of 3 kgf shall be applied in the direction of stem operation for a period of 60 seconds. 將開關之操作部置於垂直方向，並沿操作方向加 3 kgf 之靜負荷 60 秒。 | | | There shall be no sign of damage mechanically and electrically. 不得有電氣及機構上之破壞現象 | |
| 8.Weather-proof 耐候性能 | | | | | | |
| | Property 項目 | Test conditions 試驗條件 | | | Performance 判定基準 | |
| 8.1 | Resistance to low temperatures 耐寒性能 | Switch for testing being kept in the conditions at -30±2°C in temperature for 96 hours, and in a normal ambient condition for one hour, then to be measured within one hour. Drops of water being taken away. -30±2°C 放置 96 小時試驗後，置於常溫常溼中 1 小時，除去水滴後，在 1 小時內測定之 | | | Item 6 Item 7.1,7.2 同 6 項 同 7.1, 7.2 項 | |
| 8.2 | Heat resistance 耐熱性能 | Switch for testing being kept in the conditions at 80±2°C in temperature for 96 hours, and in a normal ambient condition for one hour, then to be measured within one hour. 80±2°C 放置 96 小時試驗後，置於常溫常溼中 1 小時，在 1 小時內測定之 | | | Item 6 Item 7.1,7.2 同 6 項 同 7.1, 7.2 項 | |
| 8.3 | Moisture resistance 耐溼性能 | Switch for testing being kept in the conditions at 60±2°C in temperature and 90~95% RH for 96 hours, and in a normal ambient condition for one hour then to be measured within one hour. 在溫度 60±2°C，相對溼度 90~95% 放置 96 小時試驗後，置於常溫常溼中 1 小時，除去水滴後在 1 小時內測定之。 | | | Contact resistance:200 m ohm max. Insulation resistance:10_M ohm min. Item 6.3, 6.4 Item 7.1, 7.2 接觸阻抗在 500 mΩ 以下 絕緣阻抗在 10 MΩ 以上 同 6.3, 6.4 項 同 7.1, 7.2 項 | |
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| Property 項目 | | Test conditions 試驗條件 | | | Performance 判定基準 | |
| 8.4 | Temperature cycling 耐溫度循環試驗 | After 5 cycles of following conditions, the switch shall be allowed to stand under room temperature and humidity conditions for 1 hour and measurement shall be made within 1 hour after that. Water drops shall be removed. 以下記條件做5個週期的試驗後放置1小時以內測試之但是水珠必須去除  | | | Item 6 Item 7.1, 7.2 同6項 同7.1, 7.2項 | |
| 9.Endurance 耐久性能 | | | | | | |
| Property 項目 | | Test conditions 試驗條件 | | | Performance 判定基準 | |
| 9.1 | Operating life 有負載壽命試驗 | Measurements shall be made following the test set forth below: (1).DC 5V 5mA resistive load (2).Rate of operation 1 to 1.5 operations per second (3).Depression : Upper limit of the actuating force (4).Cycles of operation : 10×10^4 cycles (1). DC 5V 5mA (阻抗負載) (2). 動作速度: 2~3 次/秒 (3). 壓下力量: 動作力之上限 (4). 動作次數: 10×10^4 次 | | | Contact resistance: 1000 m ohm max. Insulation resistance: 10 M ohm min. Bounce 20 m sec max. Actuating force: $\pm 30\%$ of initial force. Item 6.3 Item 7.2 接觸阻抗 1000mΩ以下 絕緣阻抗 10 MΩ以上 接點之瞬間跳動時間 20msec 以下 動作力在初期值之 $\pm 30\%$ 以內 同6.3, 7.2項 | |
| 9.2 | Vibration resistance 耐振動性 | Measurements shall be made following the set forth below: (1).Range of oscillation : 10 to 55 Hz (2).Amplitude pk-to-pk : 1.5 mm (3).Cycle of sweep : 10-55-10 Hz in one minute approx. (4).Mode of sweep : Logarithmic sweep or uniform sweep. (5).Direction of oscillation : Three mutually perpendicular directions including the direction of stem travel . (6).Duration of testing : 2 hours each for a total of 6 hours (1). 振動數範圍: 10~55 Hz (2). 全振幅: 1.5 mm (3). 掃瞄週期: 10-55-10 Hz 約1分鐘 (4). 掃瞄振動之變化方式: 近似對數或直線 (5). 振幅方向: 相互垂直之三個方向(含柄移動之方向) (6). 試驗時間: 各2小時(計6小時) | | | Item 6 Item 7.1, 7.2 同6項 同7.1, 7.2項 | |
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| | Property 項目 | Test conditions 試驗條件 | Performance 判定基準 |
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| 9.3 | Impact shock resistance 耐衝擊性 | Measurements shall be made following the test set forth below: (1) Acceleration : 80g (2) Cycle of test : 3 cycles a total of 18 cycle. (1) 用 80g 加速度 (2) 沿圖示 6 個方向, 每方向 3 次共 18 次. <div style="text-align: center; margin-top: 10px;">  </div> | Item 6 Item 7.1, 7.2 同 6 項 同 7.1, 7.2 項 |

◇◇◇Switch Handling Precaution ◇◇◇使用上應注意事項
 1. Reflow Soldering condition. Reflow 焊錫條件



Caution 注意事項

- (1) The condition mentioned above is the temperature on the P.C board surface on which parts are mounted. There are cases where board's temperature greatly differs from switch's surface temperature. depending on the board's material, size, thickness, etc. Care, therefore, should be taken to prevent the switch's surface temperature from exceeding 240°C.
 上述條件為 P.C.B 組裝表面溫度, 部份基板因材質, 大小及厚度等引起基板溫度與 SW 表面溫度很大差異, SW 表面溫度勿超過 240°C 請確認
- (2) As the conditions vary some how depending on the kind of reflow soldering equipment, please make sure you have the right one before use.
 因 REFLOW 爐的種類不同, 條件設定上亦有所差異, 使用前詳加確認。

2. Other precautions 其它注意事項

- (1) Following the soldering process do not try to clean the switch with a solvent or the like.
 在焊錫過程中, 不可用溶劑或類似品清洗開關。
- (2) Safeguard the switch assembly against flux penetration.
 焊錫時請注意防止助焊劑從開關滲入。
- (3) Please have the products keep in close status and the storage time is 90 days guaranty agter delivering the goods at most.
 為了避免保管場所的環境引起端子變色, 未到使用之前, 請勿拆封. TACT SW 的保存期限出貨後 3 個月內。
- (4) Please understand that the specifications other then electric and mechanical characteristics and outside dimensions may be changed at our own discretion.

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1.Scope 適用範圍

This specification covers the requirements of the taping packaging for SFKRT standard type of TACT switches.
本規範適用於 TACT switches SFKRT 之承載帶包裝方式。

2.Packaging Materials 包裝材料

| Item 項目 | Material 材料 |
|------------------|-------------------------|
| Package 包裝箱 | Cartons. |
| Reel 捲盤 | Antistatic Polystyrene. |
| Carrier Tape 承載帶 | Conductive Polystyrene. |
| Cover Tape 封口帶 | Polyster heat active. |

3.ackaging Quantity 包裝數量

3.1.The number of the reels. 捲盤數量

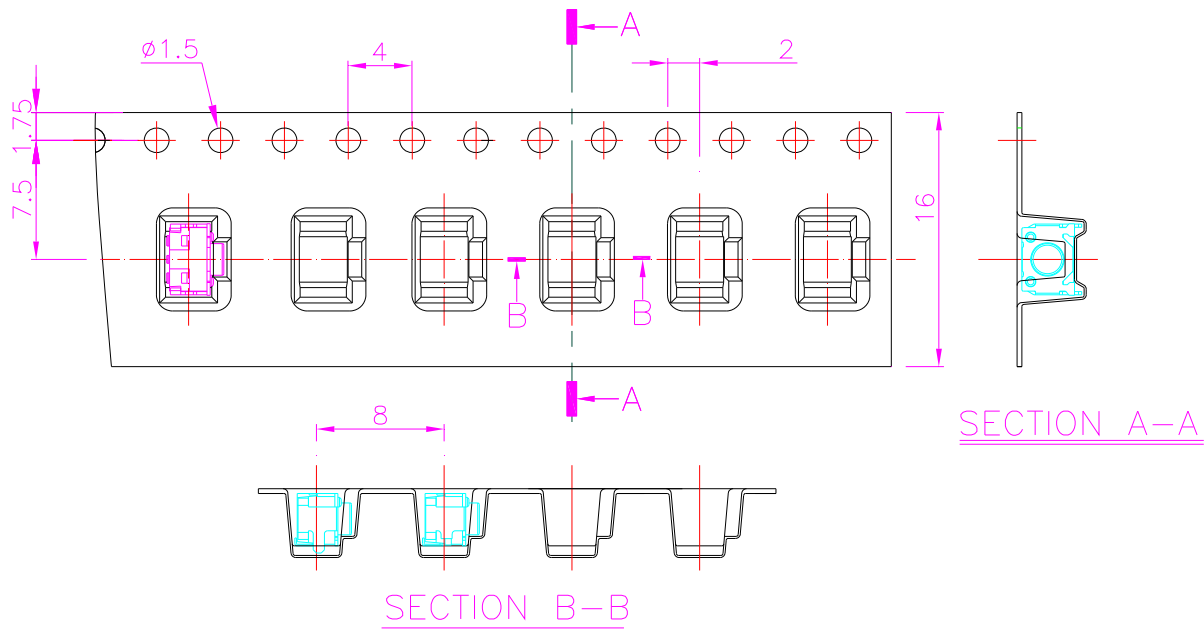
Fourteen(14)reels at maximum, which contain 28,000 switches, shall be packed in a package.
每個包裝箱可裝 14 捲, 計 28,000 個開關。

The number of the switches. 開關數量

3.2.

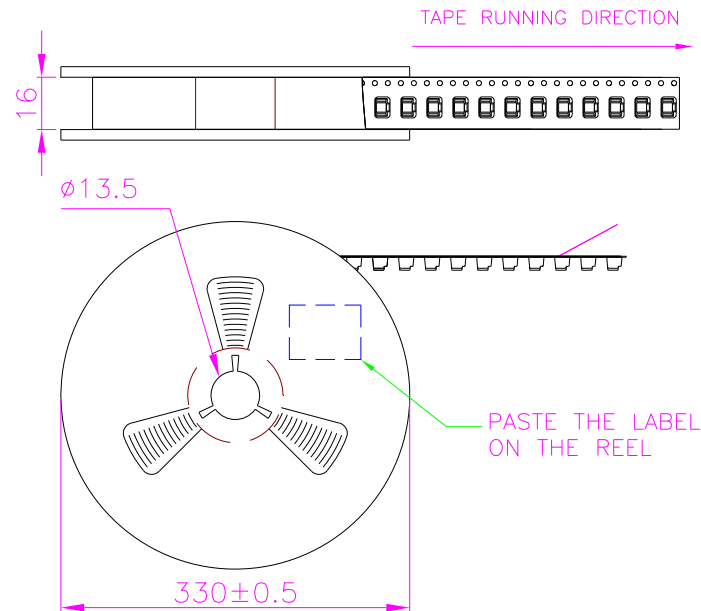
2,000 switches shall be packed in a reel.每捲包裝數量 2,000 個。

Carrier Tape Form and Dimensions 承載帶形狀及尺寸



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5.Reel Form and Dimensions 捲盤形狀及尺寸



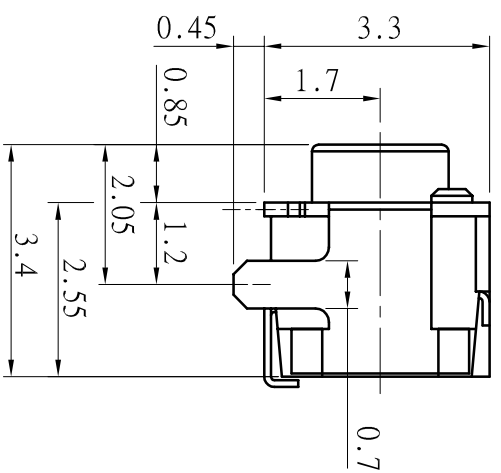
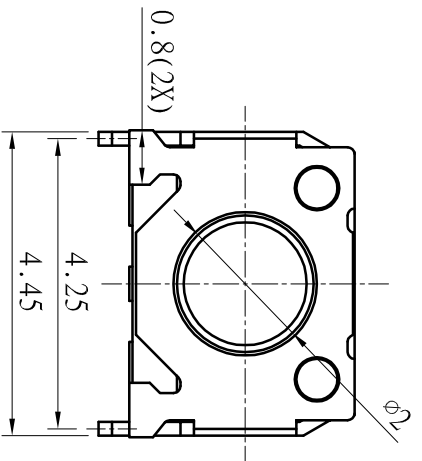
6.Packaging Procedure 包裝方式

- 6.1. At the beginning of reeling, the end of the tape, 160mm or more, shall be empty and fit into the groove in the reel core.
料捲起點約 160 mm (或更多) 承載帶須空出並固定於蕊心。
- 6.2. After reeling, the end of the tape 180mm, shall be empty and the tape edge shall be cut in 45°.
料捲終點承載帶須空出約 180mm 尾端並裁成 45° 角。
The cover tape shall be extended 180±10 mm from the tape edge and fixed with tape.
封口帶須從承載帶終點延伸約 180±10 mm 並與承載帶固定。
- 6.3. Total number of missing switches shall be less than 2 in one reel.
每捲漏裝數不可超過 2PCS.

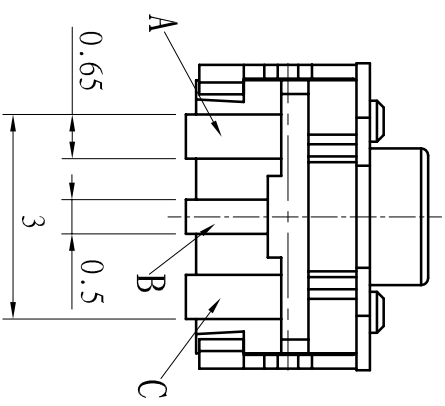
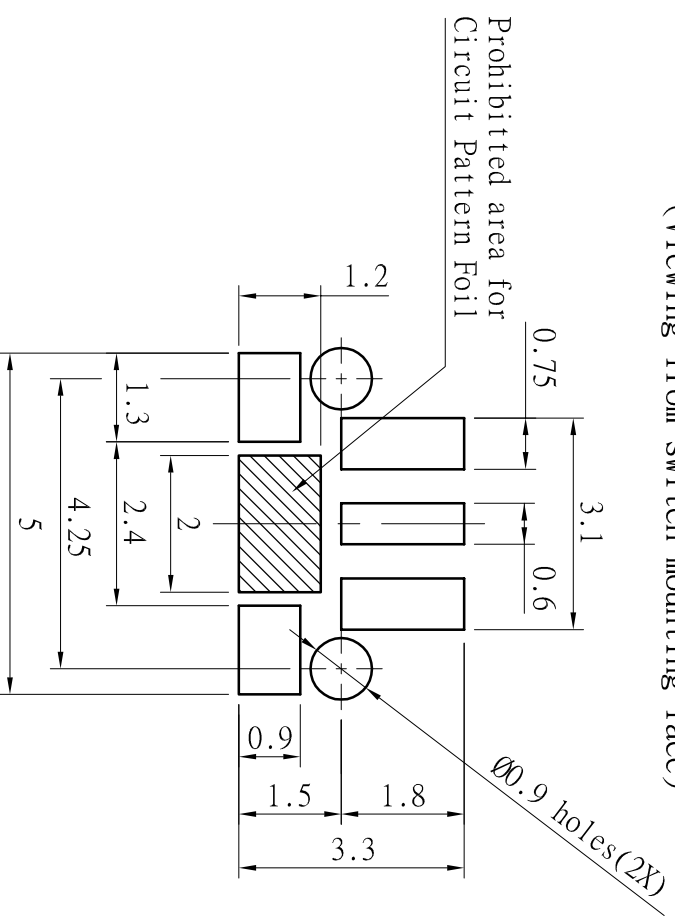
7.Storage Condition 保存狀態

- 7.1. Storage Environment 儲存環境
-20 to 30°C, 20 to 60%RH.
溫度 -20~30°C, 溼度 20~60%RH.
(Storage in high temperature and high humidity shall be avoided).
(儲存時避免放置於高濕高溫下)。

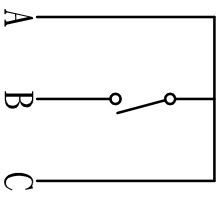
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Printed circuit board dimensions
P.C.B基板尺寸位置圖
(Viewing from switch mounting face)



CIRCUIT DIAGRAM
回路圖



| | | | | | | |
|---------------|---------------------|-------------|----------------------|-------------------|----------------------------|-------------------|
| SFKRTMB1120T | Horizontal | 0.2 | 160±50gf | 50gf | 100,000 cycles | With guide bosses |
| TYPE OF MODEL | Operating direction | Travel (mm) | ACTUATING FORCE (gf) | RETURN FORCE (gf) | Operating life (5mA 5V DC) | Variety |

註記：
1. 如左表(一)為單體零件型名，若以承載帶包裝則型名追加“T”，例如SFKRTMB1120→SFKRTMB1120T。

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| TOLERANCE UNLESS OTHERWISE SPEC. (未指定容許尺寸之公差) | |
| BASIC DIMENSIONS | TOLERANCE |
| UP TO 10 | ±0.2 |
| ABOVE 10 TO 100 | ±0.3 |
| ABOVE 100 | ±0.5 |
| ANGULAR DIMENSIONS | ±3° |

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|------------|------------|------------|--------------|----|
| 零件號碼 | 名稱 | 材料 | 規格 | 顏色 |
| 三角法 | 單位 | 比例 | SFKRTMB Type | |
| 承認 | 設計 | 承認 | 組立圖 | |
| 2011.05.05 | 2011.05.05 | 2011.05.05 | SFKRTMB1120T | |
| 承認 | 設計 | 承認 | 圖號 | |
| 2011.05.05 | 2011.05.05 | 2011.05.05 | SFKRTMB1120T | |
| 承認 | 設計 | 承認 | 圖號 | |
| 2011.05.05 | 2011.05.05 | 2011.05.05 | SFKRTMB1120T | |