SFKHR-001	SFKH SWITCHES SPECIFICATIONS SFKH 觸 壓 式 製 品 規 格 書	95.10.05

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℃(normal humidity ☆normal press.)使用溫度範圍: -20 +70℃(常濕常壓條件下)

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

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

試 驗 狀 態 : 若無特別規定限制，則以溫度 5 35℃，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℃ 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.

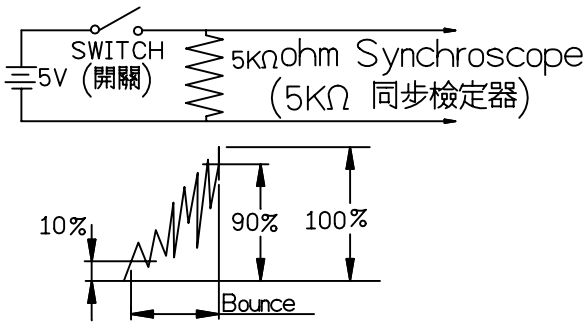
2.2 Construction dimensions : Shall conform to the assembly drawings.構造及尺寸:必須與組立圖符合.

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:DC 12 V 50 mA

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 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 	5 m sec max. 5 m sec 以下.

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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 vertical 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垂直方向, 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 drowing. 依組立圖上規定.
7.2	Travel 移動量	Placing the switch such that the direction of switch operation is vertical 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垂直方向, 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.	$0.25\ ^{+0.2}_{-0.1}$ mm
7.3	Return force 復歸力	The sample switch is installed such that the direction of switch operation is vertical 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垂直方向, 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 drowing. 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 3kgf 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
7.5	Stem strength 操作部(柄)之強度	Placing the switch such that the direction of switch operation is vertical the maximum force to withstand a pull applied opposite to the direction of stem operation shall be measured. 將開關之操作部置於垂直方向, 並在與柄之操作方向相反方向,施加拉力,測量其最大拉力量.	3 kgf.

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℃ 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℃ 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℃ 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. 80±2℃ 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
8.3	Moisture resistance 耐溼性能	Switch for testing being kept in the conditions at 60±2℃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℃ ,相對溼度 90~95%放置 96 小時試驗後,置於常溫常濕中 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 200 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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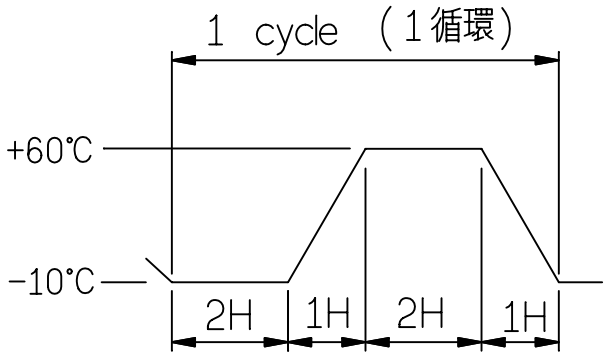
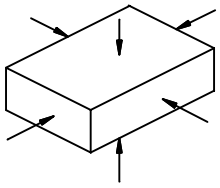
	Property 項 目	Test conditions 試 驗 條 件	Performance 判 定 基 準
8.4	Temperature cycling 耐溫度循環試驗	After 5 cycles of following conditions, the switch shall be allowed to stand under room temperature and humidity conditions for 1 hour and measurement shall be made within 1 hour after that. Water drops shall be 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 2 to 3 operations per second (3)Depression : Upper limit of the actuating force (4)Cycles of operation : 100gf : 5×10^4 cycles 160gf : 5×10^4 cycles 260 gf : 5×10^4 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 100gf : 5×10^4 cycles 160gf : 5×10^4 cycles 260 gf : 5×10^4 cycles	Contact resistance:200 m ohm max. Insulation resistance:10 m ohm min. Bounce 10 m sec max. Actuating force:±30% of initial force. Item 6.3 Item 7.2 接觸阻抗 200mΩ以下 絕緣阻抗 10 MΩ以上 接點之瞬間跳動時間 10msec 以下動作力在初期值之±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

	Property 項 目	Test conditions 試 驗 條 件	Performance 判 定 基 準
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. 	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. In case an automatic flow soldering apparatus is used for soldering adhere to the following conditions:
若以自動焊錫機實施焊錫時,必須附帶下列條件:

Item 項目	Soldering condition 焊錫條件
(1)Preheat temperature 預熱溫度	100℃ max. (Ambient temperature of printed circuit board on its soldering on its soldering side) 100℃以下(P.C.B 焊錫面周圍之溫度).
(2)Preheat time 預熱時間	45 sec max. 45 秒以下.
(3)Flux foaming 助焊劑泡沫	To such an extent that flux will be kept flush with the printed circuit board s top surface on which components are mounted. Preparatory flux must not be applied to that side of printed circuit board on which components are mounted and to the area where terminals are located. 焊錫時助焊劑應防止上升至P.C.B 之零件面,且不可塗預備助焊劑於 P.C.B 零件面及端子部 必要時可於過錫爐前,先塗一層助焊劑滲透防止劑於 P.C.B 零件面端子部
(4)Soldering temperature 焊錫溫度	255℃ max. 255℃ 以下
(5)Duration of solder immersion 焊錫浸漬時間	5 sec max. 5 秒以下
(6)Allowable frequency of soldering process 容許焊錫次數	2 times max. 2 次以下(恢復常溫時,才可進行第二次焊錫)

2. In case an manual soldering apparatus is used for soldering adhere to the following conditions:
若以手動焊錫實施焊錫時,必須附帶下列條件:

Item 項目	Soldering condition 焊錫條件
(1)Soldering temperature 焊錫溫度	350℃ max. 350℃ 以下
(2)Continuous soldering time 連續焊錫時間	3 sec max. 3 秒以下

3.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 from its top side.
焊錫時請注意防止助焊劑從開關頂部滲入.

(3)Please have the products keep in close status and the storage time is90days 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 use flux of specific gravity 0.81MIN. (Temperature conditions:20℃).
請使用比重 0.81 以上 FLUX(溫度條件 20℃).

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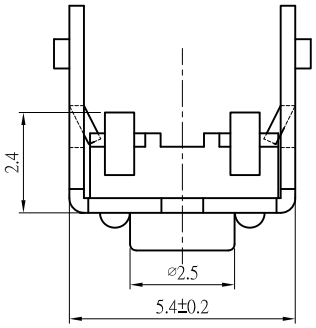
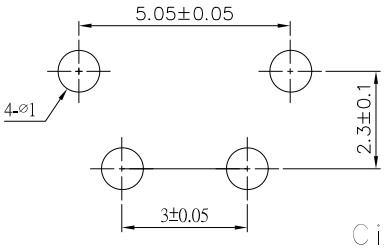
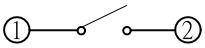
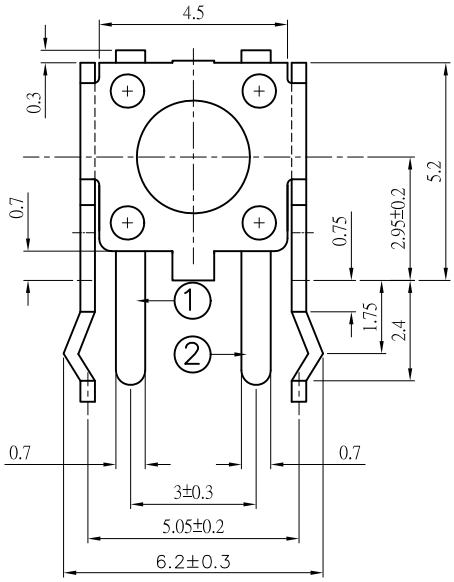


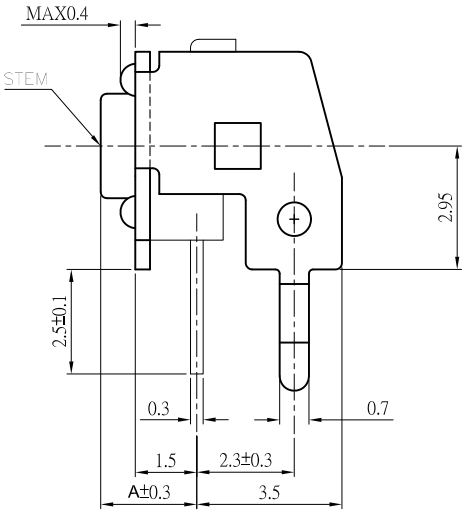
P.C.B Mounting Hole Dimensions



Circuit Diagram







PS. THE RUST OF THE CUT-EDGE SURFACE AND THE MOTTLE ON THE MATERIAL IS ACCEPTABLE.

SFKHRAA1430	4.5	RED (紅)	260±70	50Min	
SFKHRAA1420	4.5	GRAY (灰)	160±50	50Min	
SFKHRAA1410	4.5	BLACK(黑)	100±50	10Min	
SFKHRAA1330	3.3	RED (紅)	260±70	50Min	
SFKHRAA1320	3.3	GRAY (灰)	160±50	50Min	
SFKHRAA1310	3.3	BLACK(黑)	100±50	10Min	
TYPE OF MODEL	DIM A	STEM COLOR	ACTUATING FORCE (gf)	RETURN FORCE(gf)	REMARK(*)

P/NO.	P/NAME	MATERIAL	SPEC.	TREATMENT	QTY.

SYMB.	DATE	APPD.	CHKD	DSGD.	APPD.	CHKD.	DSGD.
					KE 設計課 97.11.04 張乃文	KE 設計課 97.11.04 張乃文	KE 設計課 97.11.04 陳昭宇

UNIT mm

SCALE

SFKHR

TITLE TACT SWITCH

NO.

FORWARD ELECTRONICS CO.,LTD.