

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

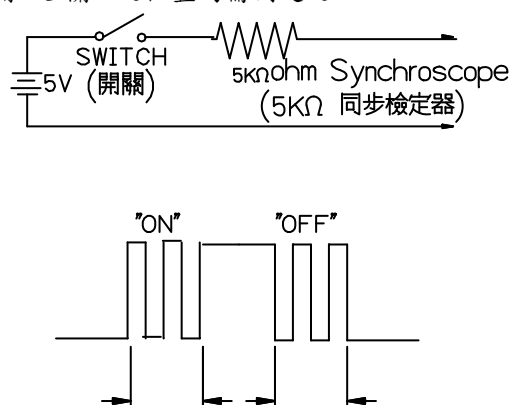
動作型式: 有觸感之反饋

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: DC 12 V 50 mA

6. Electrical performance 電氣性能

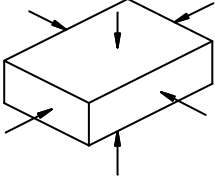
Property 項目	Test conditions 試驗條件	Performance 判定基準
6.1 Contact resistance 接觸阻抗	Applying a static load twice the actuating force to the center of the stem measurements shall be made with a 1 kHz small-current contact resistance meter. 將兩倍於動作力之靜負荷加於柄之中央以 1 kHz 小電流接觸阻抗計測定之。	100 m ohm max. 100 mΩ 以下
6.2 Insulation 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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SFKHD-001		SFKHD SWITCHES SPECIFICATIONS SFKHD 觸壓式製品規格書			99.01.01	
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 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 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。			0.5 ±0.15mm	
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 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 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	
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. Drops of water being taken away. 80±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	
8.3	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 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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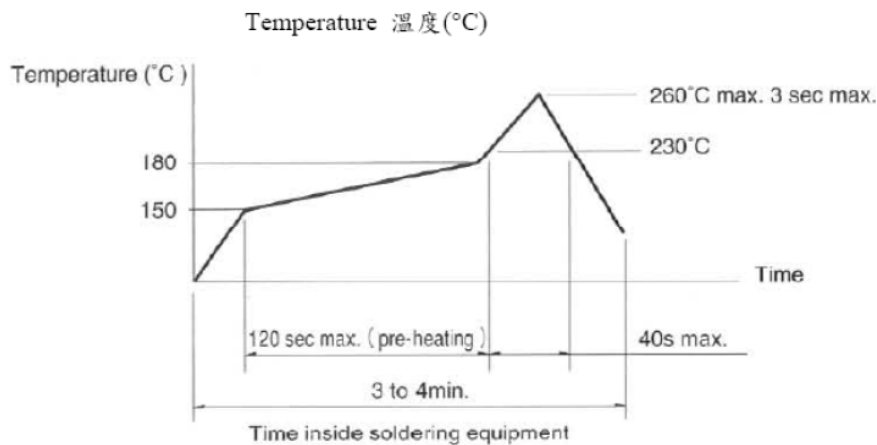
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SFKHD-001		SFKHD SWITCHES SPECIFICATIONS SFKHD 觸壓式製品規格書			99.01.01		
Property 項目		Test conditions 試驗條件			Performance 判定基準		
8.4 Temperature cycling 耐溫度循環試驗		After 5 cycles of following conditions, the switch shall be allowed to stand under room temperature 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 <div style="text-align: center;"> </div>			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 : 1×10^5 cycles 160 gf : 1×10^5 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 : 1×10^5 cycles 160 gf : 1×10^5 cycles			Contact resistance: 200 m ohm max. Insulation resistance: 10 m ohm min. Bounce 10 m sec max. Actuating force: $\pm 30\%$ 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 $\pm 30\%$ 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	
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. Reflow Soldering condition .



Time(時間) ----- Temperature profile (溫度圖)

Caution 注意事項

- 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 260°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 260°C 請確認
- 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

- 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.
- 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.
- 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.

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SFKHD-001

SFKHD SWITCHES SPECIFICATIONS

SFKHD 觸壓式製品規格書

99.01.01

◇◇◇◇LED Switch Handling Precaution ◇◇◇◇使用上應注意事項

1. Electrical and optical characteristics (Ta=25°C) 電氣與光學特性

	Vr (Max)	Reverse Voltage Ir (Max)	Recommend Operating Current If	Pd (mW) (Max)	VF(at20mA)		Iv(at20mA)	
					Max	Typ	Min	Typ
Red	DC 5V	100μA	20mA	72	2.4V	1.9	42.9	100
Yellow Green	DC 5V	100μA	20mA	72	2.4V	1.9	20	40
Yellow	DC 5V	100μA	20mA	72	2.4V	1.9	90.9	200
White	DC5V	50μA	20mA	120	4.0V	3.0	500	870
Blue	DC 5V	50μA	20mA	120	4.0V	3.2	27	60

LED reliability test

Test Item 項目	Test item 測試項目	Test Conditions 試驗條件	Note
1	Resistance to Soldering Heat (Reflow Soldering)	Tsld=260°C , 10sec	2 times
2	Operation Life	If=20mA/Ta=25°C	1000hrs
3	High Temperature Storage	Ta=100°C	1000hrs
4	High Temperature High Humidity Storage	T=65 ± 5°C , RH=90-95%RH	240hrs
5	Low Temperature Storage	Ta=-40°C	1000hrs
6	Thermal shock Test	100 ± 5°C ~ 40 ± 5°C (each 30min)	100cycles
7	High Light Up Test	Ta=100 ± 5°C /If=20mA	168hr

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1.Scope 適用範圍

This specification covers the requirements of the taping packaging for SFKHD standard type of TACT switches.
本規範適用於 TACT switches SFKHD 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

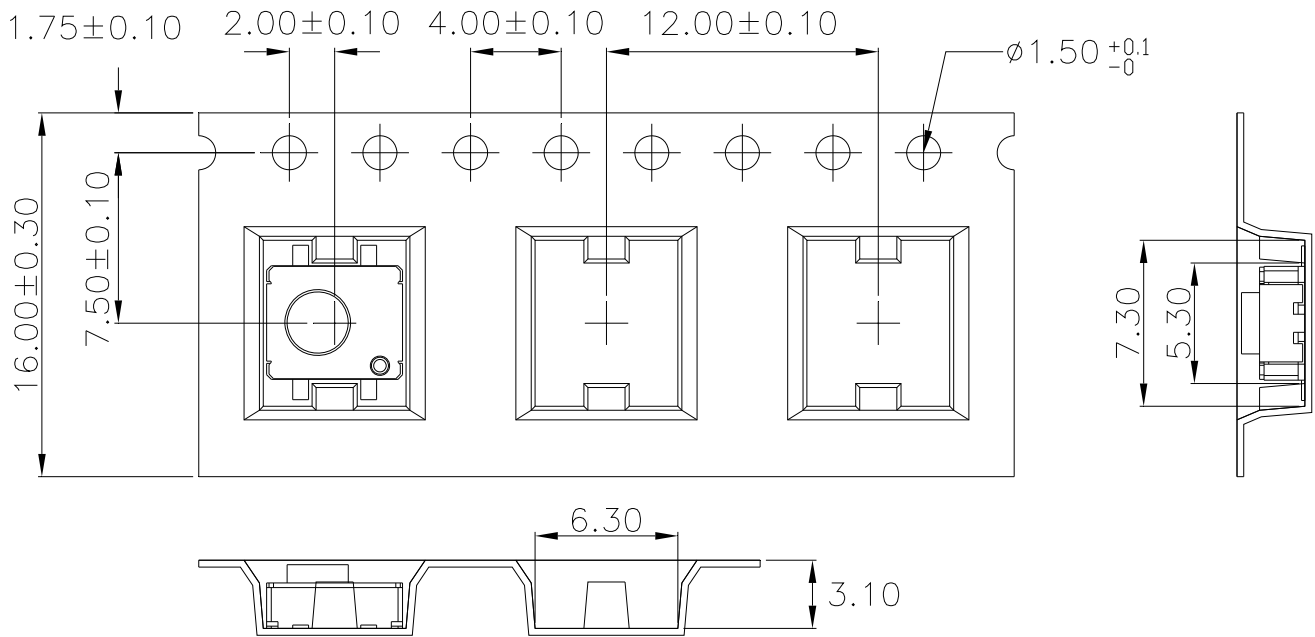
3.1.The number of the reels. 捲盤數量

14 reels at maximum, which contain 23,100 switches, shall be packed in a package.
每個包裝箱可裝 14 捲, 計 23,100 個開關。

3.2.The number of the switches. 開關數量

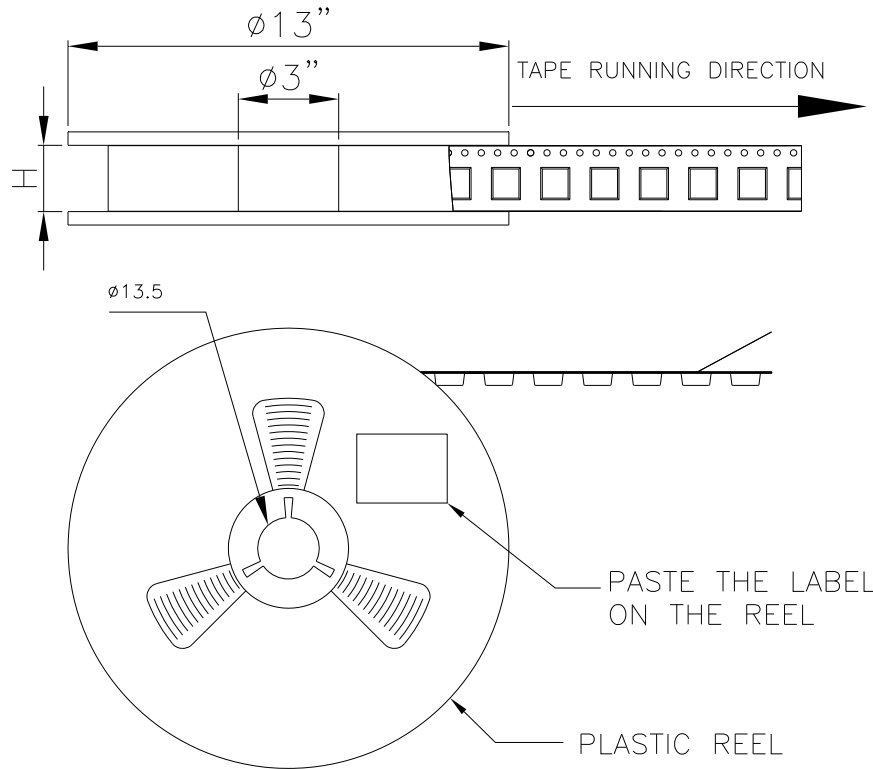
1650 switches shall be packed in a reel.每捲包裝數量 1650 個。

4.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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未指定容許差尺寸之公差 TOLERANCES UNLESS OTHERWISE SPEC	
10以下(UP TO 10)	±0.3
10~100(ABOVE 10 TO 100)	±0.5
100以上(ABOVE 100)	±0.8
角度 (ANGULAR DIMENSIONS)	±0.3

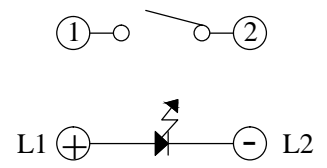
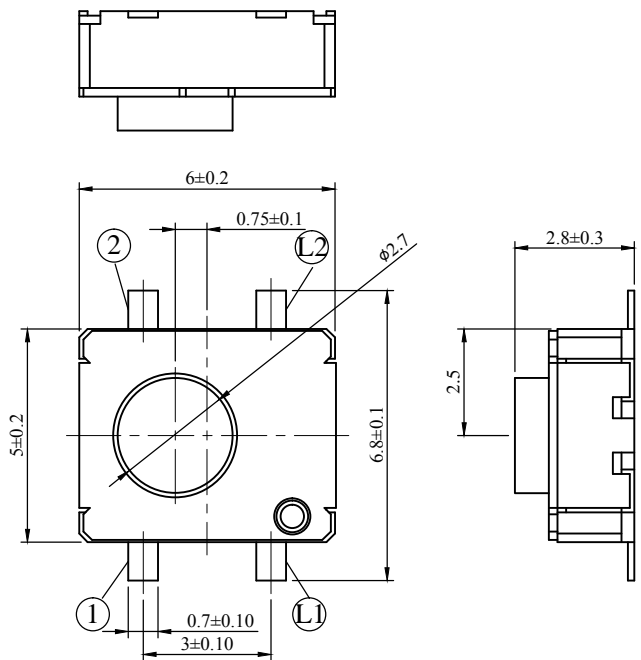
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LED Color

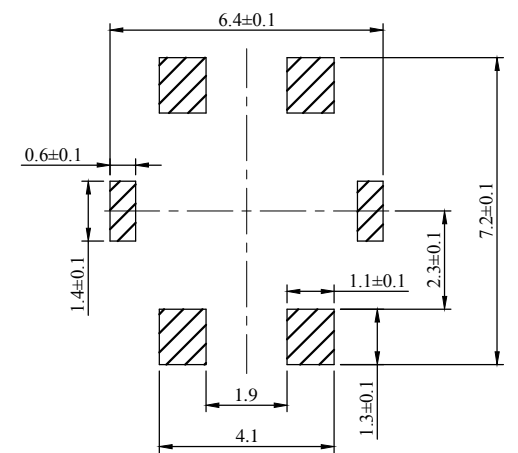
Force

LED Color	1	Red
	2	Yellow
	3	Green
	4	Blue
	5	White

2	160±50gf
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CIRCUIT DIAGRAM



P.C.B mounting hole dimensions

NOTE: 1. THE RUST OF THE CUT-EDGE SURFACE AND THE MOTTLE ON THE MATERIAL IS ACCEPTABLE.
(切斷面生鏽, 表面黑斑可.)

2. PRODUCT SPECIFICATIONS NO: SFKHD-001
(適用製品規格書: SFKHD-001)

零件號碼	名	稱	材	料	規	格	表	面	處	理
			三角法	單位 mm	比例 10/1	SFKHD				
			承認	校對	設計	圖名 ASSEMBLY DRAWING				
記號	年月日	承認	校對	設計	承認	校對	設計	圖號		