



萬達光電科技股份有限公司
HIGGSTEC INC.

PRODUCT SPECIFICATIONS

產品規範書

Customer (客戶): _____
Model (型式): T121S-5CAC09A-0068P4-150MH
Mode (種類): Vandal Proof Capacitive Analog
Touch Panel
Date (日期): MAY. 13, 2011
Version (版本): 1.07.01

Customer Approval

客戶簽認

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規格變更記錄

Model [型式]: T121S-5CAC09A-0068P4-150MH

<Remarks> [備註欄]

01. Circumscription The specification is for analog capacitive vandal proof touch panel.

[範圍]

[此規格適用於類比電容式防爆觸控螢幕]

02. Features

[特性]

Item [項目]		Specifications [規格]
(1)	Type [型式]	Analog Capacitive +Vandal Proof [類比電容式+防爆]
(2)	Input Mode [操作模式]	Finger [手觸]
(3)	Connector [連接方式]	FFC+EMI

03. General Specification

[規格總則]

Item [項目]		Specifications [規格]
(1)	Frame Size [外框尺寸]	272.47±0.50 X 205.94±0.50 mm
(2)	View Area [可視區]	251.67±0.50 X 190.20±0.50 mm
(3)	Precision Area [動作區]	248.87±0.30 X 187.40±0.30 mm
(4)	Total Thickness [總厚度]	6.80±0.40 mm
(5)	Tail Length [出線長度]	155.00±6.00 mm

04. Environmental Characteristics

[環境特性]

Item [項目]		Specifications [規格]	
		Temperature [溫度]	Humidity [濕度] (Non Condensing) [不可結露]
(1)	Operation [操作]	-20°C ~ +70°C	20%RH ~ 85%RH *
(2)	Storage [儲存]	-40°C ~ +85°C	10%RH ~ 90%RH *

Note: The environment is under normal atmosphere pressure.

[註:於正常的 1 大氣壓下]

* While the environment temperature is above 65°C, the humidity will be allowed in below 50%RH .

[65°C 以上高溫環境時，濕度允許在 50%RH 以下]

05 Optical Characteristics

[光學特性]

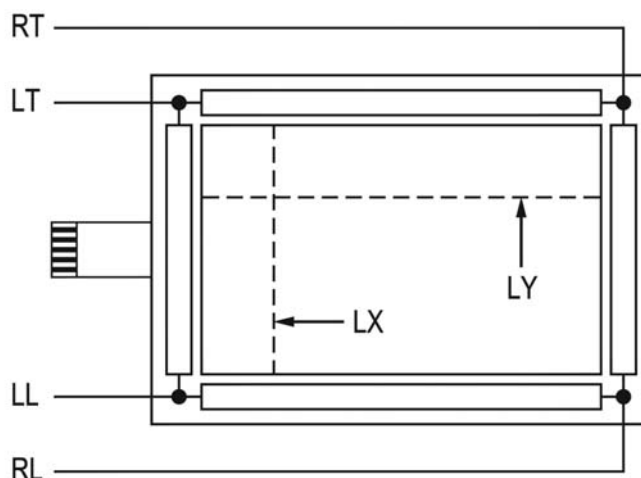
Item [項目]		Specifications [規格]
(1)	Transparency [透光度]	88% ± 3% (measured by BYK-Gardner)
(2)	Reflective rate [反射率]	3% ± 1% (measured by BYK-Gardner)

06 Electrical Characteristics

[電子特性]

Item [項目]		Specifications [規格]
(1)	Loop Resistance [迴路阻抗]	X:80~1000Ω, Y:80~1000Ω (See Figure 6-1)
(2)	Linearity [線性]	$X \leq 1.5\%$, $Y \leq 1.5\%$ (after 25 points calibration) (See Figure 10-2)
(3)	Response [作動時間]	According to Integration time of controller
(4)	Insulation [絕緣阻抗]	$\geq 20\text{M}\Omega/25\text{V}(\text{DC})$
(5)	Endurance [耐電壓]	No acting damage at DC50V/60sec.

*(2)線性測試,人員使用食指劃線測試為測試方法



Note : Loop Resistance X = short RT and RL , short LT and LL , measure the resistance between RT and LT
 Loop Resistance Y = short RT and LT , short RL and LL ,measure the resistance between RT and RL



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07. Mechanical Characteristics

[機械特性]

Item [項目]		Specification [規格]	Condition [條件]
(1)	Operating Force [作動力]	Finger [手觸]	$\leq 10g$
(2)	Impact [撞擊]	510g, 50mm diameter ball dropped at center area from height of 1.3 meter [50ψ/510g 鋼球高度=1.3m]	1 time, no damage [Impact at center area] [中央區域撞擊 1 次, 不能破損]
(3)	Static Load [靜態承重]	10kg within 10cm ² area for 30sec [10kg 置於 10cm ² 內, 30 秒]	Satisfy (1) of Item 7 and (1), (2), (4) of Item 6 [符合 7 項目 (1) 及 6 項目 (1), (2), (4)]
(4)	Hardness [硬度]	7H pencil, pressure 750g/45° [鉛筆 7H, 壓力 750g/45° (ASTM D3363)]	$\geq 7H$
(5)	Peeling [剝離]	800g/cm by vertical 90° [800g/cm, 垂直 90°]	Satisfy (1) of Item 6 [符合 6 項目 (1)]
(6)	TAIL Bending [TAIL 繞折]	90° 10 times left & right [90° 角, 左右來回 10 次]	Satisfy (1) of Item 6 [符合 6 項目 (1)]
(7)	Abrasive Resistance Surface [表面耐磨]	stencil density 800# [鋼絲密度 800#]	Weighted 100g 1500 cycles [荷重 100g 1500 次 cycles]

08. Reliability

[信賴性]

Item [項目]		Specification [規格]	Condition [條件]
(1)	Constant Temperature / Humidity [恆溫恆濕]	70°C / 90%RH, 240 hrs and normalized for 4 hrs [70°C / 90%RH, 240 小時, 回常溫 4 小時後始可測試]	(1), (4) of Item 6; (2) of item 6 satisfies $X \leq 2.5\%$, $Y \leq 2.5\%$ [6 項目 (1)、(4); 6 項目 (2) 符合 $X \leq 2.5\%$, $Y \leq 2.5\%$]
(2)	Heat Cycle [高溫循環]	70°C / 240 hrs and normalized for 4 hrs [70°C / 240 小時, 回常溫 4 小時後始可測試]	
(3)	Cold Cycle [低溫循環]	-40°C / 240 hrs and normalized for 4 hrs [-40°C / 240 小時, 回常溫 4 小時後始可測試]	
(4)	Thermal Cycle [冷熱循環]	-40°C ~ 70°C [60 min./cycle] * 50 cycles and normalized for 4 hrs [-40°C ~ 70°C, 每循環 60 分鐘, 共 50 次循環, 回常溫 4 小時後始可測試]	

09. Durability

[耐久性]

Item [項目]		Specification [規格]	Condition [條件]
(1)	Knock Test [觸擊測試]	200,000,000 times [2 億次]	(1), (4) of Item 6; (2) of item 6 satisfies $X \leq 2.5\%$, $Y \leq 2.5\%$ [6 項目 (1)、(4); 6 項目 (2) 符合 $X \leq 2.5\%$, $Y \leq 2.5\%$]

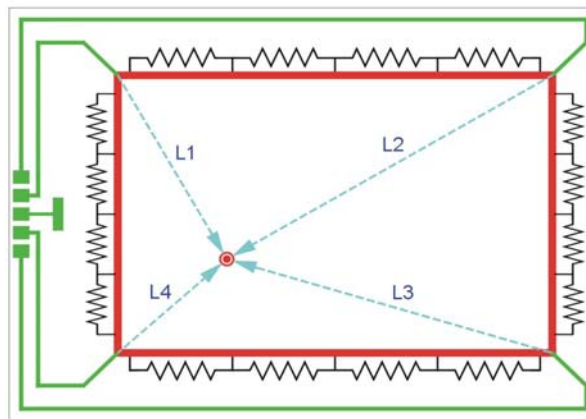
10. Inspection Methods :

[檢查方法]

(1) Linearity Condition [線性測試條件]

Short RT and RL(or short RL and LL) and voltage DC 5V is applied , short LT and LL (or short RT and LT) and ground is applied , using finger to draw staight points LX and LY at 5.0mm intervals within pattern area and detect the voltage at SG.. To measure the voltage differences between RT and LT(or RT and RL) (Fig 10-1) (Fig 10-2)

[將 RT , RL 短路(或 RL , LL 短路)並接上 5V 的直流電, 另外將 LT , LL 短路(或 RT , LT 短路)並接上接地線 0V, 以 5.0mm 的間隔, 利用手指(Finger)劃直線(如圖 2 中 LX 和 LY),並量測 SG 的電壓, 量測並計算 RT 與 LT 間的電位差(或 RT 與 RL 間的電位差)] (Fig 10-1) (Fig 10-2)



$$X \text{ 軸} = (L1 + L4 - L2 - L3) / (L1 + L2 + L3 + L4)$$

$$Y \text{ 軸} = (L3 + L4 - L1 - L2) / (L1 + L2 + L3 + L4)$$

Figure 10-1

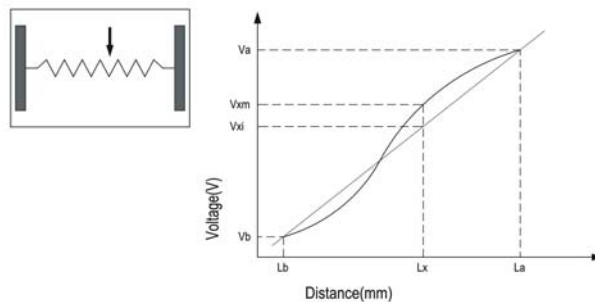


Figure 10-2

$$\text{※ Linearity: } [| V_{xm} - V_{xi} |] / (V_a - V_b) \times 100\%$$

(2) Specification [規範]

linearity must be meet the electrical specification outlined in Item 6

[線性必須符合 6 項目的電性規範]

11. Appearance Inspection

[外觀檢查]

(1) The flaws and impurities are allowed outside viewing area except for those affecting electrical functions.

[(1) 只要不影響電器功能性，可視區外之外觀瑕疵是可以被允許的]

(2) The inspection was performed with two 20W(1800±500 LUX) fluorescent lamp lighting from back or side. The panel was placed 45cm away from eyes. (Figure 11-1).

[(2) 檢測始用之燈光為二盞 20W(1800±500 LUX) 白熾燈光，並於面板後側或上側照射，檢測時須放置在離眼睛 45cm 處(Figure11-1)]

1. 檢驗治具

2. 眼睛檢驗方向

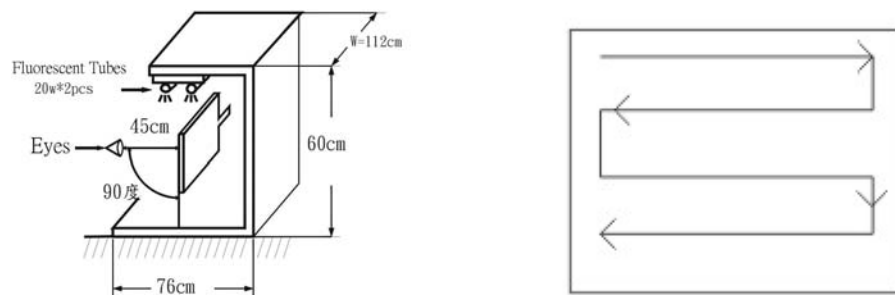


Figure 11-1

(3) Glass Flaw [玻璃瑕疵]

Item [項目]	Picture [圖示]	Specification [規格]
Corner Flaw [角瑕疵]		$X \leq 3.0\text{mm}$ $Y \leq 3.0\text{mm}$ $Z \leq T$
Edge Flaw [邊緣瑕疵]		$X \leq 3.0\text{mm}$ $Y \leq 3.0\text{mm}$ $Z \leq T$
Progressive Flaw [裂縫瑕疵]		Not allowed [不允許]

Note: T=Glass thickness

(4) Please refer to Appendix I : Appearance Specification.

[(4) 外觀規格請詳見(附註 1)]

12. Attention of Mounting Condition

[裝機注意事項]

- (1) The gasket support of touch panel must be designed on the outside of Viewable area, as well as to avoid pressing on touch panel accidentally, the enclosure must be designed with enough clearance to panel surface. To avoid pressing error on touch panel accidentally, please remain space between the surface of panel and the Bezel. (Figure 12-1)
[請將固定觸控屏用的支撐體(support)設計於可視區(Viewable area)之外。為避免不小心碰到觸控屏而產生動作，請預留空間於面板與機體外殼之間]
- (2) Bezel opening must not touch Viewable Area, Bezel opening must be designed between Viewable Area and Precision Area.
[外殼內緣(Bezel opening)應設計於可視區及動作區之間，並且不得碰到可視區]
- (3) We recommend elastic material made support.
[建議使用彈性物質製成的支撐體]
- (4) The edge of touch panel is conductive. Don't touch it with metal after mounting.
[觸控屏面板四周有可能會導電，安裝時後請勿與其他金屬物質接觸]
- (5) Please take notice of the grounding of power while mounting the touch screen, otherwise it may have unstable situation
[電容式觸控螢幕的組裝必須注意電源的接地，不然可能會有不穩定的情況發生]
- (6) Please do not pull on tail during assembly. Do not bend at 90° and each bend angle should no less than R:5m/m.
[組裝時不可拉扯 TAIL 訊號線，且不可直接彎折 90° 度每處彎曲處都需保持最小 R 角(R=5m/m)]
- (7) Capacitive touch panel should not be operated near high interfere environment which may result in unstable performance.
[電容式觸控屏，不可以於高干擾環境內使用，不然會發生不穩定情況]
- (8) After installation, please perform 4 point or 25 point calibration
[裝設完成需利用定位工具進行 4 點及 25 點校正]
- (9) During assembly Capacitive touch panel with LCD Panel must truly pastes fixedly to prevent touch panel rocks and displacement due to outside force pressing on touch screen or bezel/case.
[電容式觸控面板與 LCD Panel 組裝時，必須確實黏貼固定，不可因外力按壓觸控面板或機殼，而造成觸控面板晃動偏移。]
- (10) The gap at least 3.0mm distance in between Capacitive touch panel with LCD panel during installation.
[安裝電容式觸控面板與 LCD Panel 之間的間隙至少需有 3.0mm 以上的距離。]



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- (11) Capacitive touch panel must be far away for high frequency or high voltage component such as Inverter, installing the Tail and Control Board opposite of voltage source and far away from the voltage source are suggested.

[電容式觸控屏，不可以於高干擾環境內使用，不然會發生不穩定情況，如 Inverter 或手機等.....，並建議 Tail 與 Control Board 最好裝置在電壓源的對邊，遠離電壓源。]

- (12) Installs metal case on Control Board periphery to obstruct the external noise influence, and decrease unnecessary disturbance.

[Control Board的周圍加裝鐵殼以屏蔽外來雜訊之影響，減低不必要之干擾。]

- (13) Do not install other high voltage heavy machinery equipped into the same power loop.

[勿於同一電源迴路上加裝其他重機械之高負載設備。]

5 Wire Surface Capacitive Touch Panel Assembly Guide + Vandal

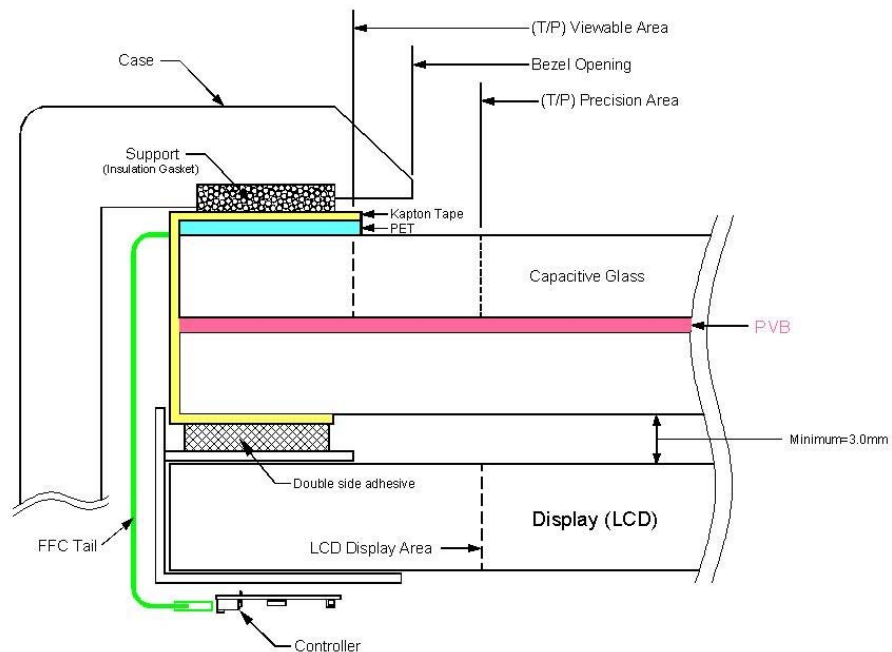


Figure 12-1



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13. Guaranty

[保固]

HIGGSTEC comes with a 2-year guaranty on all HIGGSTEC products. HIGGSTEC guaranty provide for repair and replacement without any charge during this period.

HIGGSTEC reserves the right in its sole discretion to determine the defects received, and will take the responsibility if there is any defect or damages.

[除了下列 4 點所述外，萬達光電所生產製造的產品保固期限為 2 年，若判定為萬達光電之責任，則產品更換。萬達光電保留判定責任歸屬之權益]

Limited warranty does not cover the following situations:

[有限度保固，不包括下列幾點]

Notice: HIGGSTEC is not responsible for following situation:

1. Damages caused by improper handling from clients, such as the shipping period or manufacturing processes.

[在客戶的製程或運輸中,因客戶自身疏忽所造成對產品的傷害及破損]

2. Damages caused by either natural disaster or human factors after receiving the products.

[在客戶收到萬達光電之產品後,因為天災人禍所造成的傷害及破損]

3. Damage caused by self-repairs, and modifications or disassembling of HIGGSTEC products from clients without prior notice.

[沒有知會萬達光電共同討論，而自行變更、維修、拆卸產品所造成的傷害及破損]

4. Damage caused by user error ; failing to follow normal operation procedures or using paper tools.

[客戶端於觸控屏使用操作上,該使用正確的動作及工具操作觸控屏,因客戶未依正確操作使用造成產品 傷害及破損]

14. Appendices

[附註]

Item [項目]	Content [內容]	Page number [頁數]
Appendix I [附註一]	Appearance Specification [外觀檢查規格]	1 page
Appendix II [附註二]	Assembly Notice [組裝注意事項]	2 page



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15. Caution

[注意事項]

Storage [儲存]	<p>Store panel under the temperature and humidity range pre-specified. Direct sunlight exposure or piling should be avoided. [儲存要注意溫/濕度條件，且不可直接暴露於陽光下，或堆疊造成直接加壓面板]</p> <p>Ship Method (1) must use legal couriers to transport products. (2) fragile products ; beware of vibration and dropping during transit. [搬運方法 (1) 需顧用合法搬運公司進行貨物搬運 (2) 產品為易碎品，搬運時需注意震動、掉落]</p> <p>Stacking method (1) based on standard air/ocean freight regulation (2) pallet use recommended for stacking (3) monitor stack weight and height to prevent damage to bottom stack [堆疊方法 (1) 依空運或海運堆放標準 (2) 建議利用棧板進行堆疊作業 (3) 注意堆疊重量及高度，不可造成最下層包裝箱發生變形或破損]</p>
Unpack [拆裝]	<p>Unpack the box with the printed red arrow pointing up. [注意檢查包裝箱已發現來貨外箱已有嚴重變形或破損時，應立即拍照佐證，以避免損壞]</p>
Handling [握持]	<p>(1) Use clean sacks or glove to prevent fingerprints and/or stains left on the panel. Extra attention and carefulness should be taken while handling the glass edge. [配戴清潔的指套、手套、口罩，以避免造成指紋、髒污或不小心被玻璃邊緣割傷]</p> <p>(2) Avoid touching the viewing area before installation/integration. [安裝組合時，避免接觸可視區]</p> <p>(3) Holding the panel instead of the tail at all time. [拿取面板時，不可直接拿取 tail 部份]</p>
Cleaning [清潔]	<p>(1) Use neutral detergent or isopropyl alcohol on a clean soft cloth to clean the panel surface. [使用乾淨且柔軟的布，沾中性清潔劑或酒精進行清潔]</p> <p>(2) Prevent using any kind of chemical solvent, acidic or alkali solution. [不能使用化學溶劑或酸鹼液進行清潔]</p> <p>(3) Foreign objects and prints that can be wiped off are not regulated under the specification , can be ignored. [表面可擦拭及排除的異物及異紋並不列入判定規範內，可被乎略]</p>

Installing and Assembling [組合與裝配]	<p>(1) Excessive force or strain to the panel or tail is prohibited. [注意避免加壓或拉扯面板及 tail]</p> <p>(2) Retain at least 3.0 mm clearance between panel and display module. [最少保留 3.0mm 的空間於面板及顯示器之間]</p> <p>(3) Gasket or cushion pads around the edge of the panel may segregate water and/or dust contamination. [在設計機構時，注意四周邊緣需有緩衝墊，以避免滲水或聚集灰塵]</p> <p>(4) Maintain a minimal 5R when bending tail to prevent dead fold or fold mark. [組裝時應保持最小 5R 的折彎尺寸，並避免死折或有折痕現象]</p> <p>(5) Flaws in customer module design may cause functionality issues after assembly. [客戶端設計模組若有疏失時，會造成觸控屏組裝後，產生變形或破損現象會影響正常觸控功能]</p>
Operating [操作]	<p>(1) Touch the panel with your finger or stylus only to assure normal operation. Any sharp edged or hard objects are prohibited. [應用手指或專用觸控工具，不能使用尖銳、堅硬的物體書寫輸入]</p> <p>(2) Operate the panel in a steady environment. Abrupt variation on temperature and humidity may cause malfunction of the panel. [急遽的溫/濕度變化會有結露現象，易造成面板功能失效，所以穩定的環境條件是必要的]</p> <p>(3) Avoid applying excessive activation force or sudden impact on the panel surface. [避免應用過大觸動力或瞬間衝擊面板表面]</p>
Others [其他]	<p>(1) Keep the panel surface clean. Prevent any kind of adhesive applied on the surface. [請保持表面清潔，不要貼膠帶於面板上]</p> <p>(2) Avoid high voltage and/or static charge. [避免高壓與靜電]</p> <p>(3) HIGGSTEC has the right to change the materials and/or specifications. [萬達光電保有變更規格及材料的權利]</p>

Appearance Specification

【Appendix I】

外觀檢查

Unit:mm

	Item 【項目】	Specification 【規格】
1.	Scratch 【刮傷/線狀異紋】	(1) $W \leq 0.25\text{mm}$ ($L \leq 25\text{mm}$) → OK
2.	Air Bubbles Coat peeling 【汽泡/點異紋/鍍膜剝落/ 透明點狀不良】	(1) $W \leq 1.7\text{mm}$ → OK
3.	Linear Object 【線狀異物/毛屑】	(1) $W \leq 0.25\text{mm}$ ($L \leq 6\text{mm}$) → OK
4.	Particle White/Black Spots 【白點/異物】	(1) $D \leq 1.0\text{mm}$ → OK
5.	Displacement 【玻璃膠合位移】	(1) Displacement $\leq 0.3\text{mm}$ → OK

<Endorse> 【備註欄】

1. All appearance flaws outside precision area are acceptable. 【except glass flaws , corner flaws , edge flaws , progressive flaws and scratches mast follow appearance inspection

[所有外觀不良，只要超出 PA 區，均忽略不計【除玻璃破損、缺角、邊緣瑕疵、裂縫、刀傷問題，依成品外觀檢驗規範進行檢驗】。]

2. D=Diameter=直徑。

3. W=Width=寬度。

4. L=Length=長度。

5. $D \leq 0.13\text{mm}$ 可忽略不計 → OK。

6. FA dimension of vandal proof products must meet DIM tolerance (+/- 0.5)

[防爆型產品外型 F.A 尺寸，要符合 DIM 圖公差(±0.5)。]



HIGGSTEC INC.

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