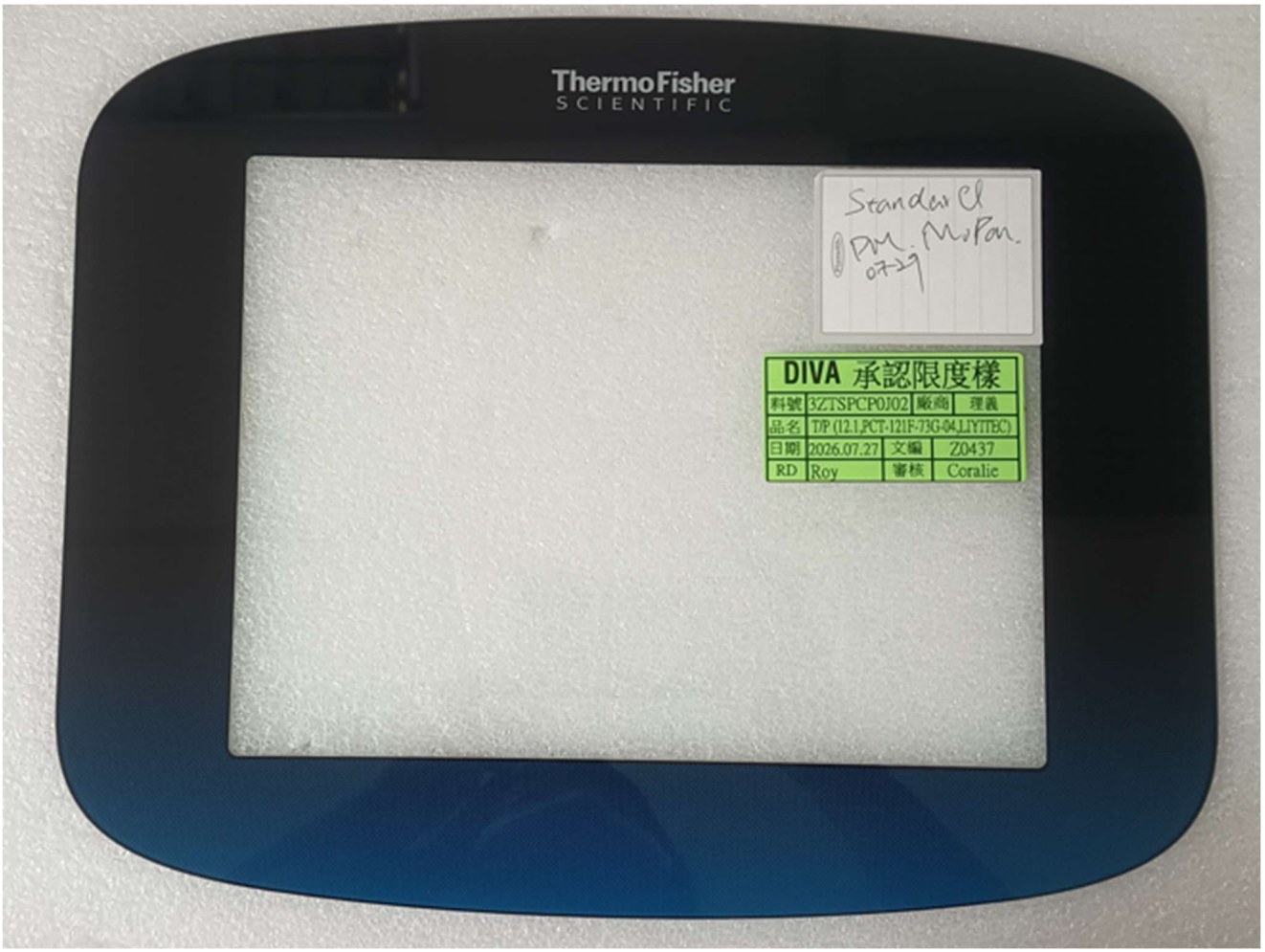
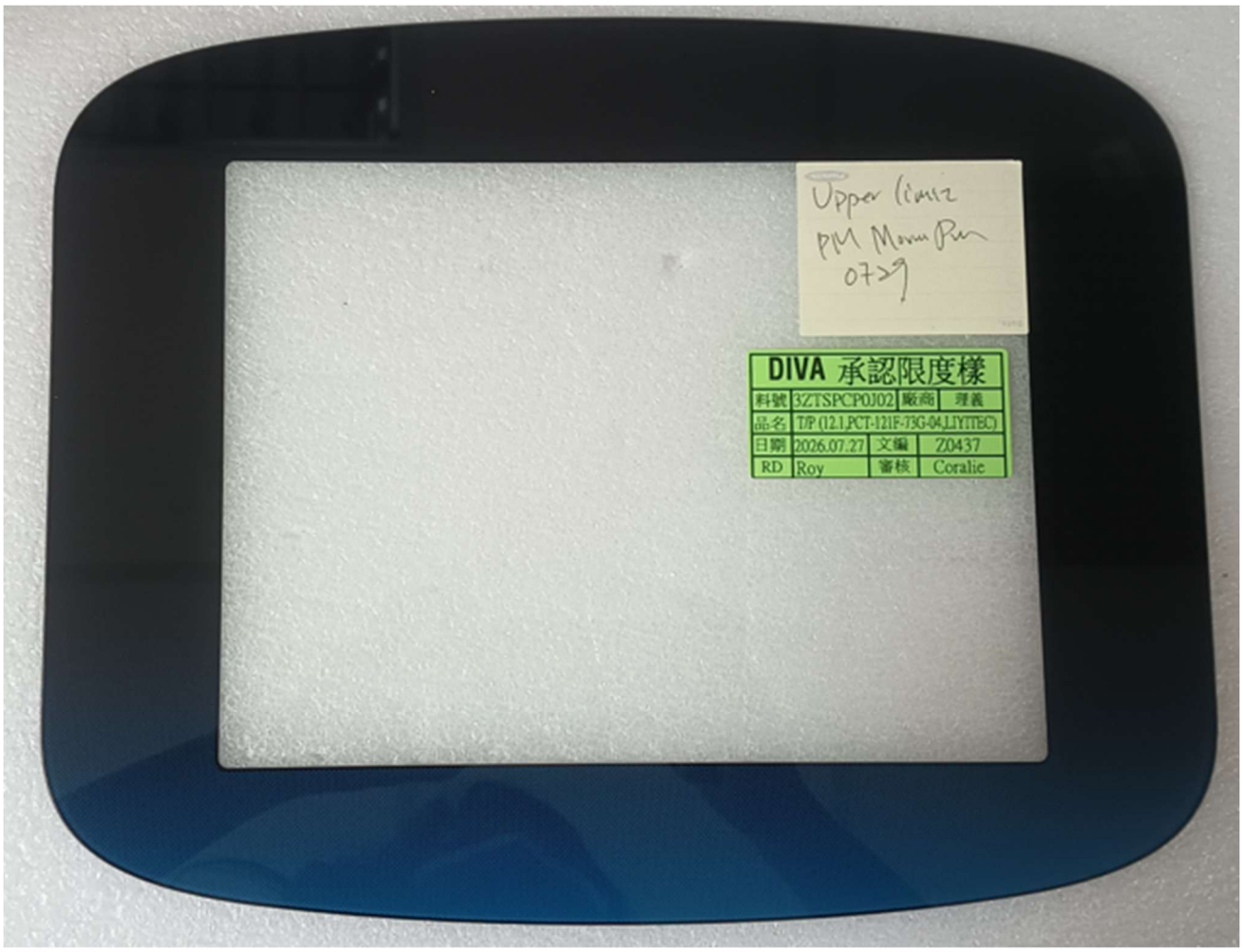

ThermoFisher
SCIENTIFIC
Standard
DM. MsPan.
07-27
DIVA 承認限度樣
料號 3ZTSPCP0J02 廠商 理義
品名 T/P (12.1,PCT-121F-73G-04,LIYITEC)
日期 2026.07.27 文編 Z0437
RD Roy 審核 Coralie


CLF121BB445A0-V1 YG
設計驗證工程課
2026 -08- 10
發行


Upper limit
PM Mom Pan
0729
DIVA 承認限度樣
料號 3ZTSPCP0J02 廠商 理義
品名 T/P (12.1,PCT-121F-73G-04,LIYITEC)
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CLF121BB445A0-V0 YG
設計驗證工程課
2026 -08- 10
發行

理義科技股份有限公司
**LIYITEC INCORPORATED**

# Engineering Specification

## 工程規格書

Conform to HSF

Customer (客戶代號) : 2018

Product(產品名稱) : Projected Capacitive Touch Panel
: 投射式電容觸控面板

Model (型號) : PCT-121F-73G-04

Customer Model(客戶型號) : A40002755

Version (版次) : DIM-F

Date (日期) : Aug-04-2026

料號及文編:3ZTSPCP0J02 (Z0437)

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| Customer Approval<br>客戶承認欄 |
| --- |
| Date of Signature 承認日期 : 設計驗證工程課 2026 -08- 10 發行 |

| Approved<br>核准 | Reviewed<br>核對 | Prepared<br>製作 |
| --- | --- | --- |
| 林金生 | 曹 茵 | 何素端 |

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| Version<br>版次 | Revision Date<br>變更日期 | Page<br>頁碼 | Content<br>內容 |
|---|---|---|---|
| 1 | Mar-19-2019 | | First version 第一版 |
| 2 | Jan-20-2020 | | Second version 第二版:change protect film |
| 3 | Mar-19-2020 | | Add packaging 增加包裝方式 |
| 4 | July-21-2020 | | Third 第三版:change TP structure |
| 5 | Sep-08-2025 | | Fourth 第四版:change CG Printing |
| 6 | Mar-09-2026 | | Add Customer Model 增加客戶型號 |
| 7 | Jul-30-2026 | 14 | Add gradient color definition 增加漸層色定義 |
| 8 | Aug-04-2026 | | Modify packing 變更包裝數量 |
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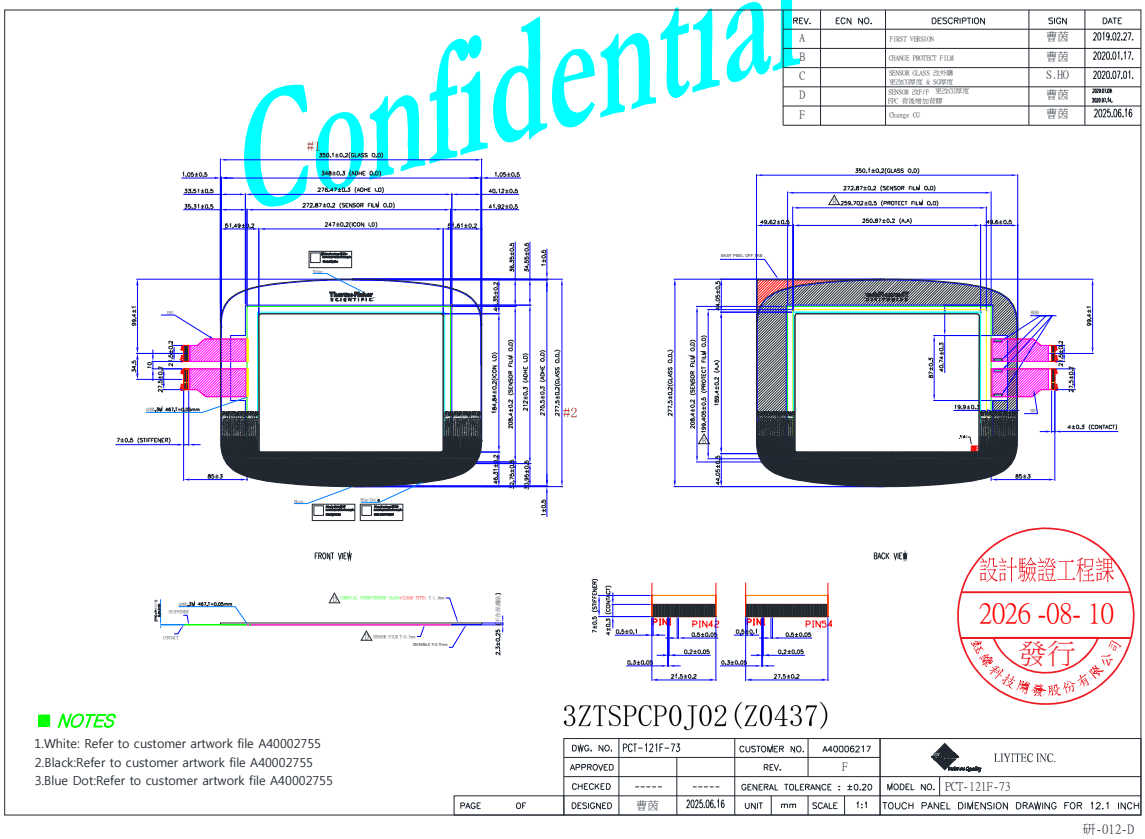
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## 1. STRUCTURE
結構

| Type<br>類型 | Projected Capacitive Touch Panel<br>投射式電容觸控面板 **(RoHS)** | | |
|---|---|---|---|
| Part name<br>品名 | Supplier& Spec.<br>供應商&規格 | Thickness<br>厚度 | Dimension<br>尺寸 |
| 1.Cover Glass | Chemical Strengthened Glass | 1.8mm | 350.1*277.5mm |
| 2.ICON Printing | Black & Blue Dot | | |
| 3.Glue | OCA | 0.125mm | |
| 4.UP Sensor Film | | 0.125mm | 272.87*208.4mm |
| 5.Glue | OCA | 0.125mm | |
| 6.DN Sensor Film | | 0.125mm | 272.87*208.4mm |
| 7.FPC | | | 85±3mm |
| 8.COB | 4141-2F02-12173 | | |

## 2.Touch panel Drawing 觸控面板圖



## 3. ENVIRONMENTAL CHARACTERISTICS
環境特性

| Status 狀態 | | Temperature 溫度 | Humidity(Non Condensing) 溼度(未凝結) |
|---|---|---|---|
| (1) | Operation 操作溫度 | -20~70℃ | 20%~90% RH at max 50℃ |
| (2) | Storage 儲存溫度 | -30~80℃ | 20%~90% RH at max 35℃ |

*Note: The environment is of normal atmosphere pressure.*

*註:在正常氣壓的環境*

* Optical test machine[光學測試儀器]:

(1) Transmission: BYK-Gardner

## 4. OPTICAL CHARACTERISTICS
光學特性

| Item 項目 | | Specification 規格 |
|---|---|---|
| (1) | Transparency 透光度 | ≧82% |

*Note: Transparency is measured by using BYK-Gardner instrument.*

*註:透光度用 BYK-Gardner 儀器量測。*

## 5. ELECTRICAL CHARACTERISTICS
電氣特性

| Item 項目 | | Specification 規格 |
|---|---|---|
| (1) | Number of Touch 觸控數量 | 1~10 Point<br>1~10 點 |
| (2) | Interface 介面 | According to Customer<br>依客戶 |
| (3) | Power Supply Voltage 電源電壓 | USB: 5V |
| (4) | Chattering 反應時間 | 25ms |
| (5) | Linearity Tolerance (Positional Accuracy) 線性誤差 | Test method reference on Page 8<br>測試方式參看第 8 頁 |
| (6) | Operation System 作業系統 | According to Customer<br>依客戶 |
| (7) | Firmware Revision 分位版本 | PCAP81X84_A1NV_v00_T2_12p1_Liyitec_URI_DThqa.X84 |
| (8) | Electro Static Discharge 靜電 | Contact: ±8KV, 3times/1point, 1time/1sec, Total 3 point<br>Air: ±15KV, 3times/1point, 1time/1sec, Total 3 point<br>While the Device encounter ESD fail, also need to refer to the Whole machine protection to isolate the impact of ESD |
| (9) | Touch Panel Controller IC 觸控面板控制 IC | EXC81H84 |

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## 6. MECHANICAL CHARACTERISTICS
機械特性

| Item 項目 | | Condition 條件 | Specification 規格 |
|---|---|---|---|
| (1) | Impact 落球測試 | Steel Ball,250g, Height=30cm | 1 time, no damage (Impact at center area) |
| (2) | Static Load 靜置荷重 | 500g ,9points,Φ9mm area for 30sec | Satisfy items 5 |
| (3) | Hardness 表面硬度 | Hardness 6H pencil, 750g, 45° | ≧6H |
| (4) | Tail Peeling 排線拉力強度 | 300g by 90 degree | Satisfy items 5 |
| (5) | Tail Bending 排線繞折強度 | 10 times by radius R:1mm 180° ~ 90°(figure1) | Satisfy items 5(figure1) |

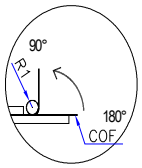


figure1

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## 7. RELIABILITY
信賴性特性

| Item 項目 | | Condition 條件 | Specification 規格 |
|---|---|---|---|
| (1) | Constant Temperature and Humidity 恆溫恆濕測試 | 60℃, 90%RH, 240 hrs and normalized for 24 hrs 溫度 60℃濕度 90%, 240 小時回常溫 24 小時後測試 | characteristics still satisfy (1) of item 4 and items 5 經信賴性測試後,電氣功能仍符合 4 項的(1)和第 5 項。 |
| (2) | Heat Cycle 高溫測試 | 80℃, 240 hrs and normalized for 24 hrs 溫度 80℃, 240 小時回常溫 24 小時後測試 | |
| (3) | Cold Cycle 低溫測試 | -30℃,240 hrs and normalized for 24 hrs 溫度-30℃, 240 小時回常溫 24 小時後測試 | |
| (4) | Thermal Cycle 冷熱循環 | -30~80℃, 30mins each, 50 cycles and normalized for 24 hrs 溫度-30~80℃, 各 30 分鐘, 共 50 個循環, 回常溫 24 小時後測試 | Figure2 |

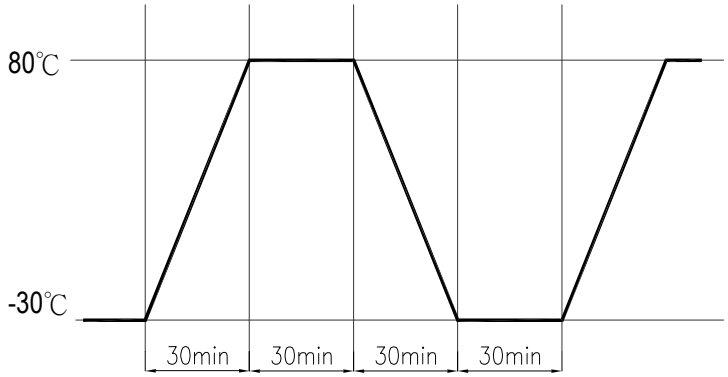



figure2

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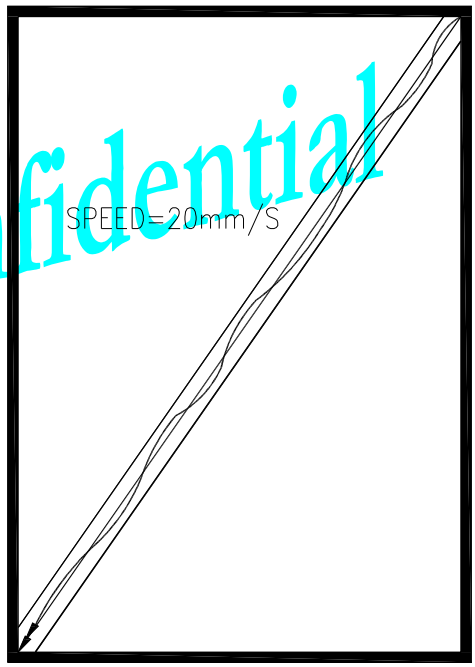
**8. LINEARITY INSPECTION METHOD**
(Positional Accuracy)
線性測試方式

Using finger or simulated finger draw a straight line from corner to corner with speed 20mm/sec, and check variation is within 2mm.

用手指或模擬手指的筆,以每秒 20mm 的速度在對角畫一條線,並檢驗誤差是否在 2mm 以內.

**Note 1**:Touch area:7.8mm
註(一):接觸面積大小: 7.8mm
**Note 2**: The distance between the two fingers: 15mm
註(二):兩指距離: 15mm
**Note 3**: Touch force: <30g
註(三):接觸力道: <30g

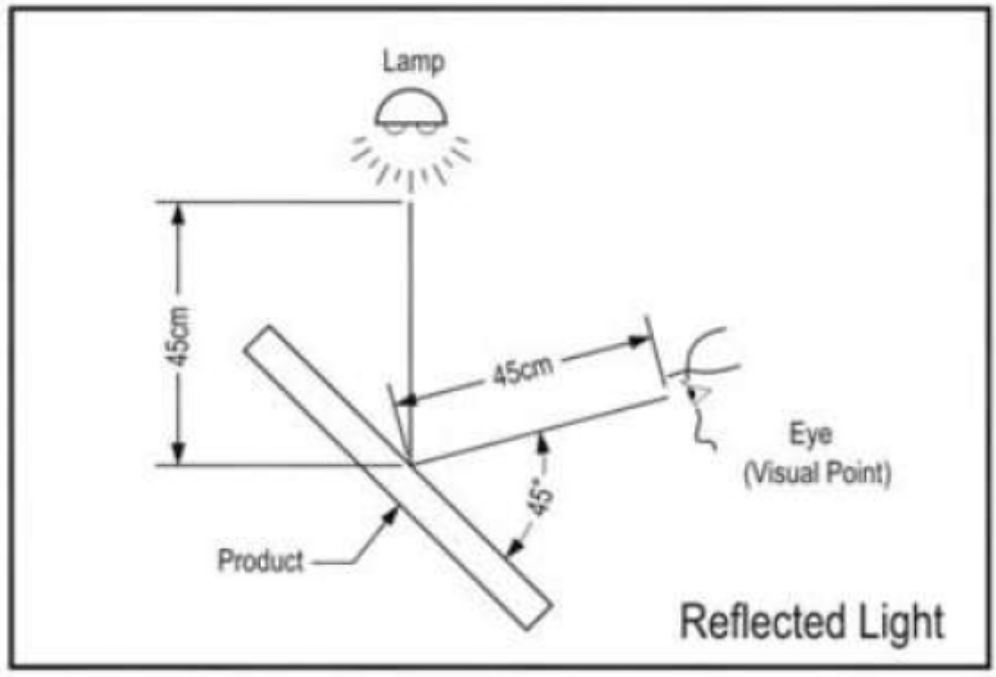
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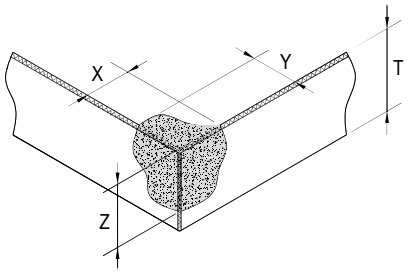
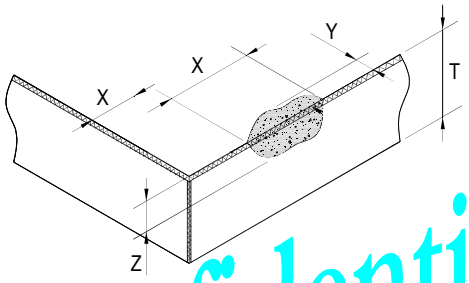
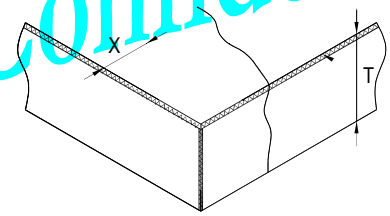

Linearity Test Method (Positional Accuracy)
線性測試方式

## 9. APPEARANCE INSPECTIONS METHOD 外觀檢驗方式

| | | |
|---|---|---|
| (1) | 視力 Eyesigh | 裸視(含矯正後)0.8~1.2，無色盲等視力問題。<br>Optometry must be 0.8~1.2(with or without glasses) and no achromatopsia or the other eye diseases. |
| (2) | 光源 Light Source | 自然光,太陽光,一般日光燈為準，需排除 PL 燈強烈光源照明檢測。<br>Natural light, sunlight, general fluorescent lamp prevail, need to rule out the PL light intense lighting detection. |
| (3) | 顏色色差判定<br>Color difference udgment | 光學儀器:CM2500d D65 10°被測物置於不透光黑色箱體測試位置。<br>Optical Instruments: CM2500d D65 10° The test object is placed in the opaque black box test position. |
| (4) | 照明度 Illumination | Fluorescent Light: 1000±200 LUX |
| (5) | 目視時間 Time | 15 秒/面 15 seconds/per face |
| (6) | 目視檢測距離<br>Distance | 45cm |



(6) Glass flaw 玻璃裂傷

| | | |
|---|---|---|
| Corner flaw<br>角裂傷 |  | X＜1mm, Y＜1mm, Z＜1/2T<br>(註 1)走線太靠邊角不允許<br>(Note1)Conductive wires cannot be too close to the edge. |
| Edge flaw<br>邊緣裂傷 |  | X≦1mm, Y≦1mm, Z≦1/2T |
| Progressive flaw<br>逐漸裂傷 |  | Not allowed<br>不允許 |

T=Glass thickness
T:玻璃厚度

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## 10. ATTENTION 注意事項

(一)Please pay attention to the following items when you received this product.
收到本產品時需注意事項如下

| | | |
|---|---|---|
| Storage<br>儲存 | (1) | Optical products must be stored in a controlled area of ambient temperature and humidity as recommended in the datasheet.<br>Do not expose products to direct sunlight or stress such as that caused by piling.<br>光學產品<br>必須被儲存放置在一如規格書所建議的環境溫度和濕度控制區域內,<br>勿將產品直接曝曬在陽光下及禁止產品堆疊。 |
| Unpacking<br>拆卸 | (1) | Check for the correct vertical direction of the package before unpacking.<br>拆包裝之前先確認包裝的拆封方向。 |
| Handling<br>拿取 | (1) | Clean finger sacks or gloves and mask are required during handling to prevent finger-prints or stain on the products and damages to the products caused by sharp edges.<br>拿取時請將手清洗乾淨、帶手套和口罩, 防止指紋和異物污染到產品。 |
| | (2) | Do not handle the viewing area of the panel.<br>拿取時勿觸可視區。 |
| | (3) | Do not handle the panel at the tail (connector) to prevent detachment of the tail to the panel. Hold a touch panel body instead of the FPC/COF all the time。<br>不可從排線拉起, 以免排線受損。任何時候都必須優先拿取觸控面板本體。 |
| Cleaning<br>清潔 | (1) | Use soft and clean cloth to clean.<br>使用乾淨的軟布擦拭。 |
| | (2) | The product can not be immersed in any liquid.<br>產品不可浸泡任何溶液。 |
| | (3) | Wipe strength to be controlled below 100g.<br>擦拭力道需控制在 100g 以下。 |
| | (4) | It is recommended to use a clean neutral or alcohol cleaning solution.<br>建議使用中性清潔液或酒精。 |
| Operating<br>操作 | (1) | During the operation of the touch panel, please do not plug or unplug the cable, FPC, COF, COB and system-side interface connector.<br>觸控面板操作過程中，請勿任意插拔排線、FPC 、COF、COB 與系統端的介面連接器。 |
| | (2) | Touch panel power transmission operation, we must prevent metal objects, conductive body contact, touch, cross, placed on the product.<br>觸控面板送電操作過程中，必須防止金屬物,導電體接觸,碰觸,跨越,擺放在產品上。 |
| | (3) | Touch panel in the process of operation, be sure to prohibit and avoid the use of any sharp or hard objects to hit the touch.<br>觸控面板在操作的過程中,請禁止與避免使用任何尖銳或硬質物體去敲擊碰觸韌體。 |

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(二) Please pay attention to the following matters before start assembling this product.
本產品組裝時需注意事項：

| | | |
|---|---|---|
| Assembly<br>組裝 | (1) | When assembling this product, please do not touch any FPC or COF materials to prevent damage to the electronic components.<br>產品組裝過程中，如 FPC 有零件，COF 零件區，要避免接觸，防電子元件破壞。 |
| | (2) | Avoid over bending of the FPC and IC Component Area, or it may cause the damage of the soldering point.<br>避免 FPC 及 IC 零件區過度折彎而造成焊錫點斷裂。 |
| | (3) | Excessive force or strain to the panel or FPC/COF is prohibited<br>對 FPC 或 COF 作業時，過度的拉力或是緊繃作業是必須完全禁止 |
| | (4) | Excessive force or strain to the tail or IC Component Area is prohibited, or it may cause damage of the components mounted.<br>禁止在排線和 IC 零件區上施加壓力造成零件破裂。 |
| | (5) | Do not apply rough force such as bending or twisting to the touch panel.<br>請不要過度施力導致玻璃表面發生變形或扭曲等型變現象 |
| | (6) | Avoid direct bezel contact with edges of the Touch Panel after mounting.<br>組裝之後應避免外框直接碰觸到面板的外側邊緣。 |
| | (7) | Elastic materials are recommended as supports to fix the Touch Panel.<br>建議使用彈性材質來固定觸控面板。 |
| | (8) | Keep the surface clean. No adhesives should be applied.<br>表面不可塗抹粘著劑並保持清潔。 |
| | (9) | Avoid high voltage and static charge.<br>避免高壓和靜電。 |

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**11. WARRANTY**

With the exceptions listed below, all Liyitec's products are guaranteed free of manufacturing defects for a period of up to one year. All defected products will be repaired or exchanged free of charge if determined to be sole responsibility of Liyitec. Liyitec reserves the sole discretion in determining the causes and the responsibilities of any defects or damages. .

產品保固

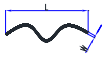
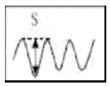
本產品除了以下**例外條件**之外其保固時間為一年，凡屬本公司責任之出廠不良,會提供免費維修或換新品服務。

List of Exceptions:
例外條件:

1. Damages caused by improper handling of clients, including and not limited to, during shipping or manufacturing processes.
   客戶操作不當(含製程和運送)造成的損傷。
2. Damages caused by disasters, either by natural causes or human factors, after the delivery of products.
   出貨後天災(或)不可抗拒的因素(或)其他人為因素造成的損傷。
3. Any repairs, modifications or disassembling of Liyitec's products without prior notification to and the consent of Liyitec.
   未經本公司同意，客戶自行拆卸、維修和更改造成的損傷.

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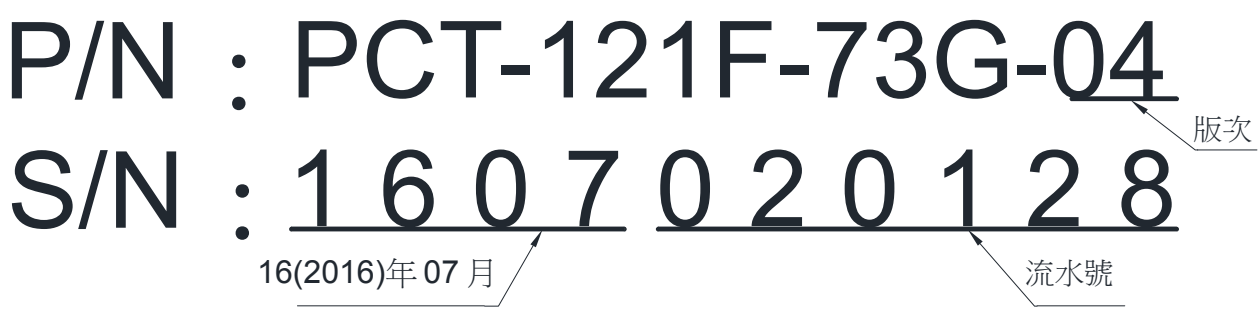
## 12. APPEARANCE SPECIFICATIONS 外觀檢驗規範

| Front side AA area(including black ink area).<br>正面 AA 區( 包含黑色油墨印刷區),該產品不接受背面檢。 | | |
|---|---|---|
| Defect Name<br>缺陷 | Criteria<br>規範 | Judgment<br>判定 |
| Particle& Bubble<br>異物 & 氣泡  | D≦0.3mm | OK |
| | 0.3mm＜D≦0.6mm | n≦6 |
| | D＞0.6mm | Not allowed |
| Black/White Spot/<br>Spot Chipping/Dent<br>黑白點/點缺/凹凸點  | D≦0.3mm | OK |
| | 0.3mm＜D≦0.6mm | n≦6 |
| | D＞0.6mm | Not allowed |
| Linear Object <br>外來線狀異物<br>(含毛屑) | W≦0.1 | OK |
| | 0.1mm＜W≦0.25mm and L≦25mm | n≦6 |
| | W＞0.25mm or L＞25mm | Not allowed |
| Scratch <br>刮傷 | W≦0.12 | OK |
| | 0.12mm＜W≦0.25mm and L≦25mm | n≦6 |
| | W＞0.25mm or L＞25mm | Not allowed |
| Pin Hole<br>透光 | D≦0.25mm , n≦5 | Allow |
| | D＞0.25mm , 線狀不允許 | Not allowed, Linear shapes are not allowed |
| Touch-up paint specifications<br>(Snowman brand)<br>補漆規格<br>(雪人牌)  | D≦0.6mm<br>0.1mm＜W≦0.25mm and L≦25mm | n≦3 |
| | W＞0.25mm or L＞25mm | Not allowed |
| Ink defect <br>油墨鋸齒 | S≦0.2mm | Allow |
| Metal Discoloration<br>異色、透光 | 不允許可視之異色、透光<br>Visible defects is unacceptable. | NG |
| Mura | Judged base on Limit sample<br>(renew per 6 months) | Condition Approve |
| Color<br>漸層色 | 黑/白色: ΔE＜2<br>藍色:依樣品上下限判定   | |
| Damage to Glass<br>玻璃的裂傷<br>A: corner flaw 角裂傷<br>B: Edge flaw 邊緣裂傷 | X≦1mm, Y≦1mm, Z＜1/2T<br>Please refer to the figures in page 10 | Total≦5, OK<br>Damages with possible worsening are not allowed. Please refer to page 10 figure<br>不允許有可能會繼續裂的裂痕。<br>請參閱第 10 頁的圖 |

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**Note 1**: Particle, Stain or Linear Object that can be clean out easily within 3 times is disregarded.
註(一):異物、髒污、條狀物正常擦拭 3 次可去除,即可允收。
**Note 2**: All dimensions are in mm unless otherwise specified.
註(二):尺寸單位為 mm, 除非另有標示。

## 13. THE READING OF SERIAL NUMBER 產品序號編碼原則與版次管控識別方式

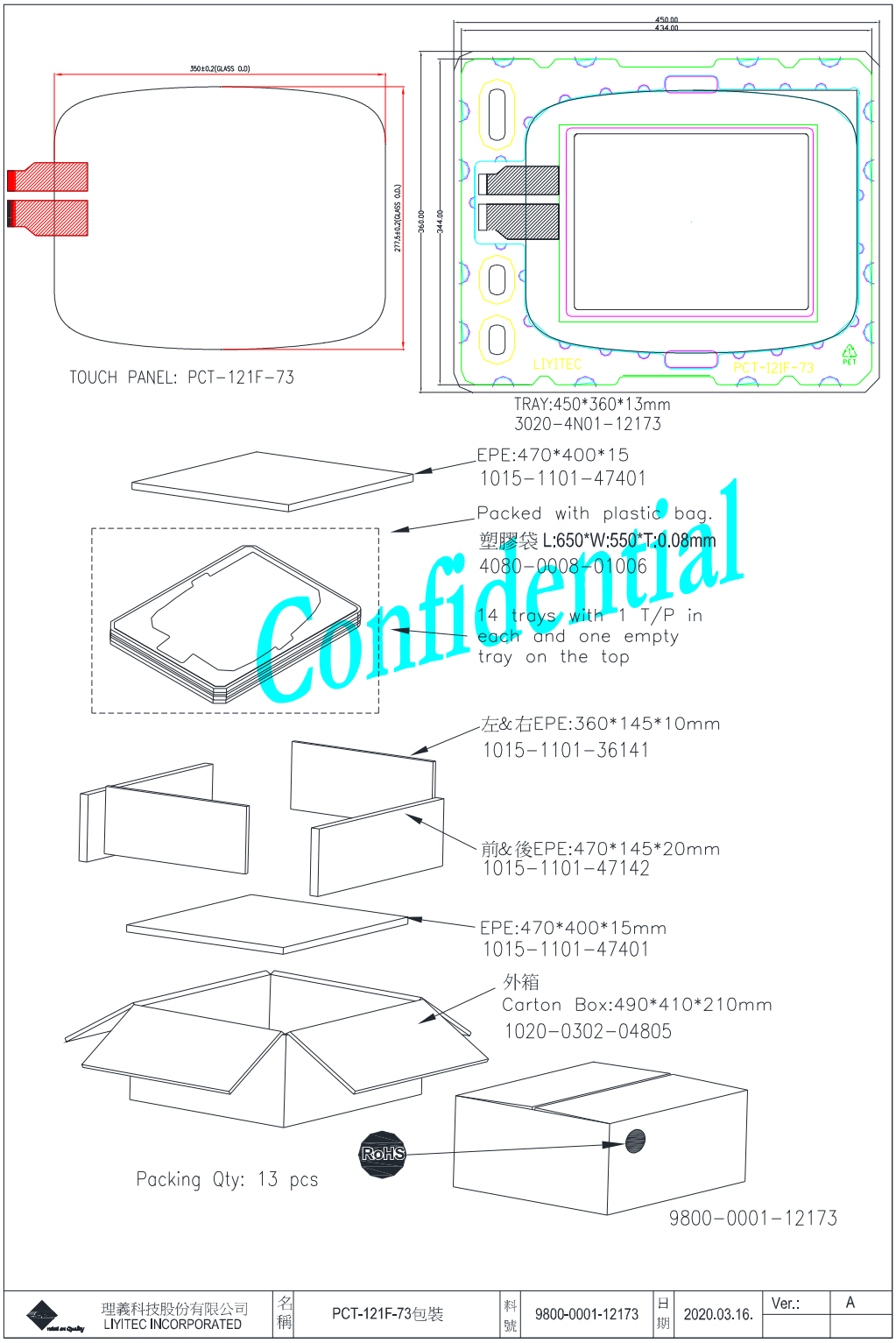



First 4 digits: year and month. For example, 1607 represents July 2016.
前 4 碼是代表 16(2016)年 07 月
Later 6 digits: serial number.
後 6 碼是代表流水號

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## 14. PACKING METHOD

包裝方式




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