



## Production Specification

|                     |            |
|---------------------|------------|
| 客戶 Customer :       |            |
| 品名 Product No. :    | ST-097C03A |
| 編號 Version number : |            |
| 發出日期 Deliver date:  | 2019.10.03 |

| Dep.           | Approved | Date |
|----------------|----------|------|
| Quality Dep.   |          |      |
| Technical Dep. |          |      |
| Marketing Dep. |          |      |

| Customer | Confirmation | Date |
|----------|--------------|------|
|          |              |      |

## Projected Capacitive 投射式電容規格書

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**2. RevisionHistory(修訂履歷)**

| Version    | Date              | Content              | Sig         |
|------------|-------------------|----------------------|-------------|
| <b>V01</b> | <b>2019.10.03</b> | <b>First Release</b> | <b>Bill</b> |
|            |                   |                      |             |
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**3. Application (應用範圍)**

The specifications are applicable for projected capacitive touch module  
此規格說明可應用在電容式觸控模組。

**4. Product Features (產品說明)**

| Item   | Specifications               | Unit |
|--|------------------------------|------|
| 面板外形尺寸<br>Outline Dimension of Glass         | 226.60 (L) × 185.46 (W) ±0.3 | mm   |
| 感應層外形尺寸<br>Outline Dimension of Sensor Layer | 214.05 (L) × 162.36 (W) ±0.3 | mm   |
| 可視區<br>Viewing Area                          | 198.50 (L) × 149.36 (W) ±0.3 | mm   |
| 驅動區<br>Active Area                           | 200.50 (L) × 151.36 (W) ±0.3 | mm   |
| 總厚度<br>Total Thickness                       | 1.50± 0.3                    | mm   |

**5. Pin define(pin 定義)**

| Pin | FPC50L   |
|-----|----------|
| 1   | SCL      |
| 2   | GND      |
| 3   | SDA      |
| 4   | GND      |
| 5   | INT      |
| 6   | GND      |
| 7   | WAKE/RST |
| 8   | GND      |
| 9   | VDD      |
| 10  | GND      |

| Pin | MOLEX |
|-----|-------|
| 1   | TX    |
| 2   | RX    |
| 3   | D+    |
| 4   | D-    |
| 5   | VDD   |
| 6   | GND   |
| 7   | INT   |
| 8   | SDA   |
| 9   | SCL   |
| 10  | NC    |

**(此產品需配置 EXC3147 搭配 SENSE FW)**

**兩指畫線間距為 TP 設計 pitch 的 3 倍**

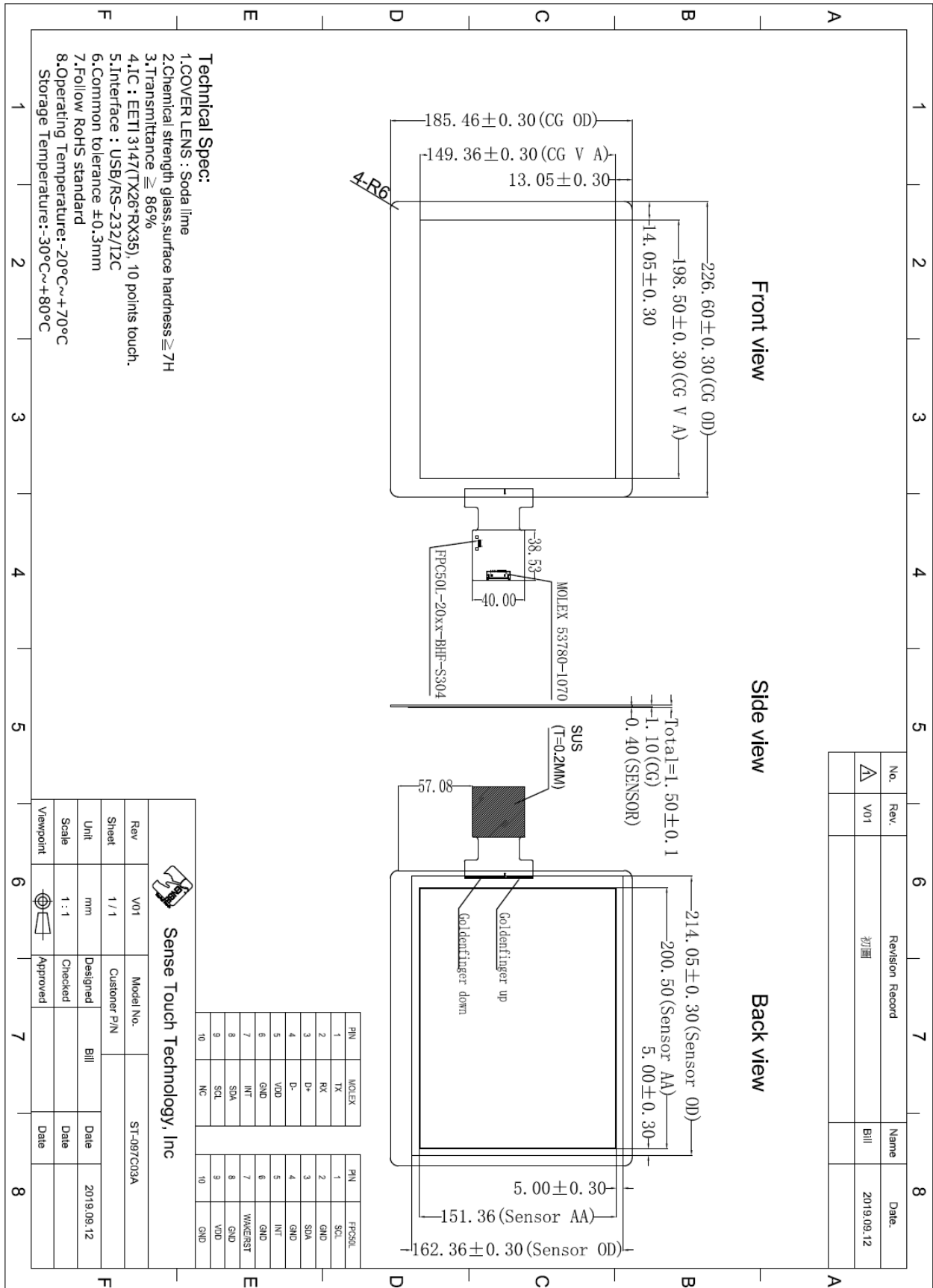
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6. Engineering drawing (工程圖面)



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## 7. Environmental Characteristic (環境特性)

| Item 項目        | Temperature 溫度 | Humidity 濕度 |
|----------------|----------------|-------------|
| Operating 工作環境 | -20°C~70°C     | 0~90%RH     |
| Storage 保存環境   | -30°C~80°C     | 0~90%RH     |

## 8. Optical Characteristics (光學特性)

觸控式螢幕的透過率測試方法及透過率如圖 1 所示。其平均透過率如表 1 所示。

The optical testing method and transmittance of the touch panel is shown in Figure 1. The average transmittance of the touch panel is shown in table 1.

圖 1 觸控式螢幕的透過率及測試方法

Figure 1 The transmittance of the touch panel and testing method

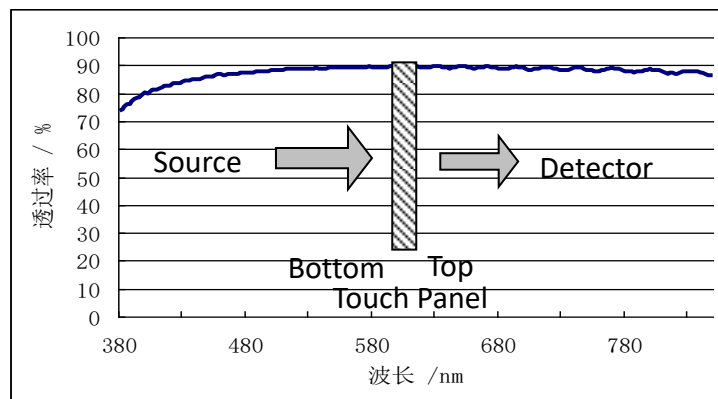


表 1 平均透過率 (Tavg)

Table 1 The average transmittance (Tavg)

| Item 項目                       | Specifications 規格            |
|-------------------------------|------------------------------|
| Tavg<br>Average transmittance | >85.00 %<br>(85% at present) |

The calculation method of average transmittance is as following 平均透過率的計算方法為：

$$T_{avg} = \sum (T_i) / 401, \quad i \text{ 為波長 (從 380 到 780)}$$

$$T_{avg} = \sum (T_i) / 401, \quad i \text{ is wavelength (from 380 to 780)}$$

## 9. Appearance Inspection (外觀檢驗標準)

觸控式螢幕在出貨之前，觸控式螢幕及觸控式螢幕的任一結構需要進行外觀檢驗。外觀檢驗標準詳細如下。

Prior to the shipment, touch panel and any element of touch panel need undergo appearance testing. Appearance limit standard is as following.

### 9.1 Scope 適用範圍

適用於我司 4.3"~11.6"寸電容式觸控式螢幕的出貨檢驗。

抽樣方法：MIL-STD-105E，正常水準 II 級。

This standard is applicable to shipment inspection for 4.3" inch to 11.6 inch CTP in our company.

Sampling method is MIL-STD-105E, level II of normal levels.

### 9.2 Testing Method and Condition 檢驗方法及條件

#### 9.2.1 檢驗人員所具備的條件 The Qualifications Required of inspectors

產品的外觀必須經一個視力良好的人員進行檢驗。

The appearance of products must be approved by a inspector with good eyesight.

#### 9.2.2 檢驗方法 Testing Method

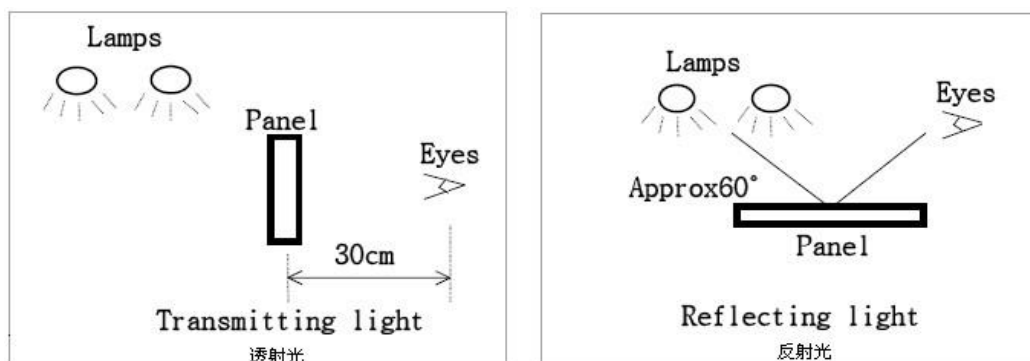
檢驗人員距離產品的距離應為 300mm,使用 700±300Lux 的螢光燈。

圖 6 為檢驗示意圖。需要透過和反射兩種方式檢測

The distance between the Inspectors and the products is 300 mm, and the brightness of the fluorescent lamp is 700±300Lux fluorescent lamp. The sketch drawing is as shown in Figure 6. The testing bases on transmissive mode and reflective mode.

圖 6 產品外觀檢驗方法示意圖

Fig. 6 The sketch drawing of products appearance testing method



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## 9.2.3 檢驗注意事項 Inspection Notes

A：檢驗人員必須佩帶丁氰手套指套或手套

A: Inspectors must wear butadiene-acrylonitrile Gloves for all process, and need butadiene-acrylonitrile finger cover in some process.

B：將檢驗的產品置於檢驗員前方的位置，雙手小心托住產品邊緣，不能使產品彎曲。

B: During the testing, the product is placed in front the inspector, and two edges of it is hold by the inspector to keep the flat of product.

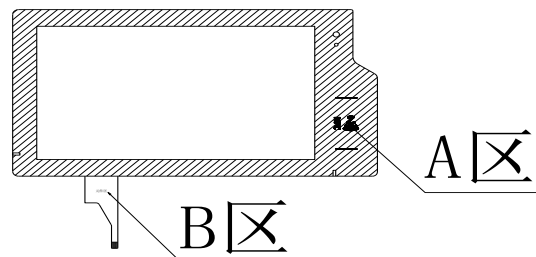
C：檢驗者的眼神應持續的覆看而不是具體的盯住某一點看。

C: The inspector should approve all the surface of the product, not only check one point.

## 9.3. Inspection equipment/ tool 檢驗設備/工具

檢驗過程所用檢測治工具有：檯燈、10X 放大鏡、點規、酒精/石油醚、黑白背景

## 9.4. Inspection area partition 檢驗區域劃分



A 區：即包括 CG 油墨印刷區，可視區

B 區：即 FPC 區域



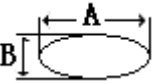
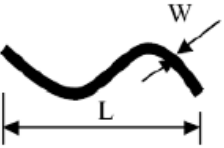
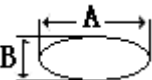
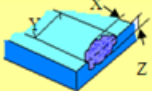
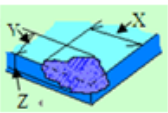
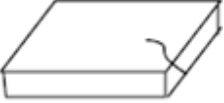
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## 9.5 Appearance Testing Content(檢驗標準)

| Item 品項                                  | Calculate Method 計算方式   | The standard of determination 判定標準  |  |
|--|---|---|--|
| Spot defect (White/Black) (黑/白/污點、粒子雜物點) | 大小: $\Phi=(A+B)/2$<br>   | 大小  | 允許數量   |
|  |   | $0 \leq \Phi \leq 0.3\text{mm}$   | 不計   |
|  |   | $0.3\text{mm} < \Phi \leq 0.4\text{mm}$   | $N \leq 5$   |
|  |   | $0.4\text{mm} < \Phi \leq 0.5\text{mm}$   | $N \leq 4$   |
|  |   | $\Phi > 0.5$  | $N = 0$  |
| Linear defect<br>刮傷/毛屑/線狀異物              |                          | 寬 W   | 長 L  |
|  |   | $W \leq 0.05\text{mm}$  | 不計   |
|  |   | $0.05\text{mm} < W \leq 0.15\text{mm}$  | $L \leq 10\text{mm}$ , $N \leq 5$  |
|  |   | $0.10\text{mm} < W \leq 0.15\text{mm}$  | $L \leq 10\text{mm}$ , $N \leq 2$  |
|  |   | $0.15 < W$  | $N = 0$  |
| Bump point<br>(魚眼、凹凸點)                   | 大小: $\Phi=(A+B)/2$<br> | 大小  | 允許數量   |
|  |   | $0 \leq \Phi \leq 0.3\text{mm}$   | 不計   |
|  |   | $0.3\text{mm} < \Phi \leq 0.4\text{mm}$   | $N \leq 5$   |
|  |   | $0.4\text{mm} < \Phi \leq 0.5\text{mm}$   | $N \leq 4$   |
|  |   | $\Phi > 0.5$  | $N = 0$  |
| CG chipping/crack<br>(CG 崩邊, 裂紋)         |                        | 正面:<br>$\Phi \leq 0.15\text{mm}$ , $Z \leq T/2$<br>$DS \geq 25\text{mm}$ , $N \leq 2$               | 背面:<br>1. 從正面看不影響外觀;<br>2. $\Phi \leq 0.5\text{mm}$ , $Z \leq T/2$ , 不計                        |
|  |                        | 正面:<br>$X \leq 0.15\text{mm}$ , $Y \leq 0.15\text{mm}$<br>$Z \leq T/2$ , $N \leq 2$                 | 背面:<br>1. 從正面看不影響外觀<br>2. $X \leq 2\text{mm}$ , $Y \leq 2\text{mm}$<br>$Z \leq T$ , $N \leq 2$ |
|  |                        | Crack is not allowed 裂紋不允許  |  |
| Dirty 髒汙                                 |   | Wipe the dirt acceptance, cannot be wiped follow the bad liner calculation<br>可擦拭髒汙允收, 不可擦拭按點線狀不良計算 |  |
| Light leak 漏光                            |   | Flat test is not visible is OK<br>平光檢驗不可見為 OK   |  |
| Other not be defined<br>其他未定義缺陷          |   | See sample limitation<br>參見限度樣品   |  |

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## 10. Reliability Test (可靠性測試)

| Item[項目]                                | Condition [測試條件]  | Judge[判定標準]  |
|---|---|--|
| High temperature 高溫測試                   | 70°C /240 hrs allow panel stays in normal environment for 24 hrs  | Reliability test may cause the film puffed yet the electric characteristic stays intact.<br><br>可靠度測試可能導致外觀不在規範內，但電性功能性能不受影響 |
|   | 溫度 70°C 放置 240 小時後，室溫放置 24 小時，檢查模組的外觀和性能。   |  |
| Low temperature 低溫測試                    | -30°C /240 hrs allow panel stays in normal environment for 24 hrs   |  |
|   | 試驗方法：溫度 -30°C 放置 240 小時後，室溫放置 24 小時，檢查模組的外觀和性能。   |  |
| High temperature / High humidity 高溫高溼測試 | 70°C / 95%RH, 240 hrs, allow panel stays in normal environment for 24 hrs   |  |
|   | 試驗方法：溫度 70°C 95%RH 放置 240 小時後，室溫放置 24 小時，檢查模組的外觀和性能。  |  |
| Thermal Cycle 冷熱循環測試                    | 40°C ~80°C [30 min/cycle] *50 cycles allow panel stays in normal environment for 12 hrs                           |  |
|   | 使用高低溫衝擊箱，先放置於高溫箱內 30 分鐘，在 5 分鐘內移入低溫箱持續 30 分鐘，再在 5 分鐘內放入高溫箱，此為一個迴圈，共做 12 個小時 50 個迴圈試驗，結束後取出樣品。                     |  |
| Impact Test 衝擊測試                        | the steel ball falls with begining 50 centimetres which drops the center of the sample 3times , CG have no break. |  |
|   | 試驗方法：直徑 $\phi$ 25mm 重量 64g 鋼球，在 50cm 高度試驗架上自由跌落 2 次，檢查模組的外觀和性能。   |  |

## 11. Cautions (注意事項)

### 11.1 Cautions for Storage (儲存注意事項)

Avoid direct sunlight or force is applied on the products, the storage environment requires a temperature  $23 \pm 3$  °C, humidity of  $60 \pm 10\%$ , storage time of less than three months.

請避免陽光直射或施加外力於產品上，儲存環境要求為溫度  $23 \pm 3$  °C，濕度  $60 \pm 10\%$ ，儲存時間小於 3 個月。

### 11.2 Cautions for Operation (操作過程注意事項)

1) 請勿以銳利刀刃或其它尖銳製品在本製品上磨擦。

Don't scratch or rub with knives or other sharp substances.

2) 請勿任意拉扯或彎折本製品。

Don't stretch or bend.

3) 請勿將產品堆疊放置以免引起表面刮花造成外觀不良

To avoid scratch surface of product, so don't pile product.

4) 請避免將本製品靠近或暴露於有機溶劑，酸性氣體的環境下使用及存放。

Keep away from organic solvent or acidic environment.

5) 請勿任意剝離或扯解本製品。

Don't detach the surface or disassemble the product.

6) 請勿拉其尾端(FPC)以提起本製品，應以提起製品本體為正確的方式。

Do not lift the product by the FPC. Lift by the product body instead.

7) 製品上有汙沾時，請以柔質綿布或沾有中性洗劑，酒精的布料輕拭。若不慎有刺激性藥品附著於製品上時，在不影響人體健康狀態下，請迅速擦拭。

To remove dirt or smear on the surface, use soft cotton or cloth with ethanol wipe off gently. For irritating substances, immediately wipe off if it doesn't affect personal health.

8) 請注意在玻璃端四周邊角處，易因留有尖角而造成刮傷的危險。

Take caution to the four corners of the glass, which may cause injury when scratched.

- 9) 由於長期使用，點擊按鍵的位置很可能會有略微的上下偏移，因此建議最好使用電流和軟體的形式進行歸零操作。

The input position may be fluctuated a little through long-time use. It is desirable to provide a zero-adjustment function by using a circuit and software.

- 10) 我司不保證驅動區外側的操作原因是：此操作對導電膜會有嚴重的損壞。

Operation at the out of Active Area is out of our guarantee. Because it causes a serious damage of a transparent electrode.

### 11.3 Cautions for handling 搬運注意事項

- 1) 須保持產品的透明清晰度，因而請在接觸產品之前戴上清潔的指套、手套和面罩以免留下指紋或汙點，並且握拿產品時請握住產品的四周

Transparency is an important factor for the product. So, please wear clean finger sacks, gloves and mask to protect the products from fingerprint or stain attach, and also hold the portion outside the view area when handling the panel.

### 11.4 組裝上機注意事項 Cautions for installing and assembling

- 1) 不要對產品施加額外的拉力。

Do not give excessive strain to the product.

- 2) T/P若有通氣槽，請在設計產品結構時,注意產品附近不能有液體物和粉狀物。

The transparent touch panel is provided with an air groove. Therefore please design the structure not to store any liquid nor any fine particles near it.

- 3) 當使用雙面膠等將產品與 LCD 或其它機器組合時，請使用充分的力按壓 T/P 的非動作區從而使 T/P 與 LCD 或其它機器粘合既無脫落又無空隙。當組合時，請平衡壓合 T/P 角落和四周，由於 T/P 與機殼組合時起初粘合需一定的時間，所以當產品起初粘合好後，請勿接觸產品。

When this product is attached on LCD or other target by using a double-sided tape etc., put an enough pressure onto the non-active area (Frame) of a touch panel so that neither exfoliation nor gap may take place between a touch panel and LCD or other target. As attachment, please apply pressure equally onto the corner part and four sides of a touch panel. There is a case to take a time being for conducting an original adhesion, therefore, please do not move the product after attachment.

**11.5 其它注意事項 Other cautions**

- 1) 由於環境溫濕狀態易發生變化，因此請保持產品勿結露，因為產品結露會引起產品的性能嚴重劣化。

Please note that dew gathering in the panel due to abrupt temperature or humidity change, etc. It may cause deterioration of performance.

- 2) 當產品組合上機時，若有硫性材料如硫化橡膠，這種材料在機殼附近可能會引起硫化反應，正因為這種異常現象的出現從而導致產品的線性紊亂，功能下降，請務必謹慎。

When this product was built into the set, if there is vulcanization material such as vulcanized rubber which has a possibility of generating the sulfuration gas near the set, since abnormalities will be caused to wiring of the product and it will become the cause of functional degradation, please give a constitutional cautions.

- 3) 雖然我司很謹慎地保證產品的品質，但是還會有像功能下降、斷路、短路現象出現的可能。因此，貴方在設計產品裝置的同時，請預先要研究引起產品功能不良的因素，並且要考慮產品的配置安全性。

Although full care is taken to ensure product quality, failure modes such as degradation, short circuits, or open circuits might be caused. Therefore, to design a product set, please study the affects of any single failure of the panel in advance and consider the safety of product configuration