

3.2" TFT LCD Single Module With Touch Panel

Customer's No. : _____

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| Approved By |
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ISSUE DATE : 2008-01-15

MODEL No. T32QT7690

This document is preliminary Spec. All information in this document is subject to change without prior notice.

| Approved | Reviewed | Submitted |
|--------------|----------|--------------|
| 陳靜菱 1/16 '08 | 李全達 1/16 | 黃文君 1/16 '08 |

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Record of Revision

| Version | Revise Date | Content |
|---------|-------------|----------------------------|
| 01 | 2008/1/15 | Preliminary specification. |
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1. General Description

* Description

The T32QT7690 is a transmissive type's TFT (Thin Film Transistor) active matrix color liquid crystal display (LCD) comprising an amorphous silicon TFT attached to each signal electrode. This model is consisting of TFT-LCD module with Touch Panel, a driver circuit and a back-light unit. The resolution of a 3.2" contains 240×320 pixels and display 65K colors.

* Features

- Transmissive type and back-light with five LEDs (Light Emitting Diodes)
- 80-system, 16-bit bus interface
- Source and Gate Driver IC: HX8347
- Full, Sleep & Stand-by modes are available
- Line inversion mode
- Low Power consumption

* Applications

Display terminals for mobile phone application products.

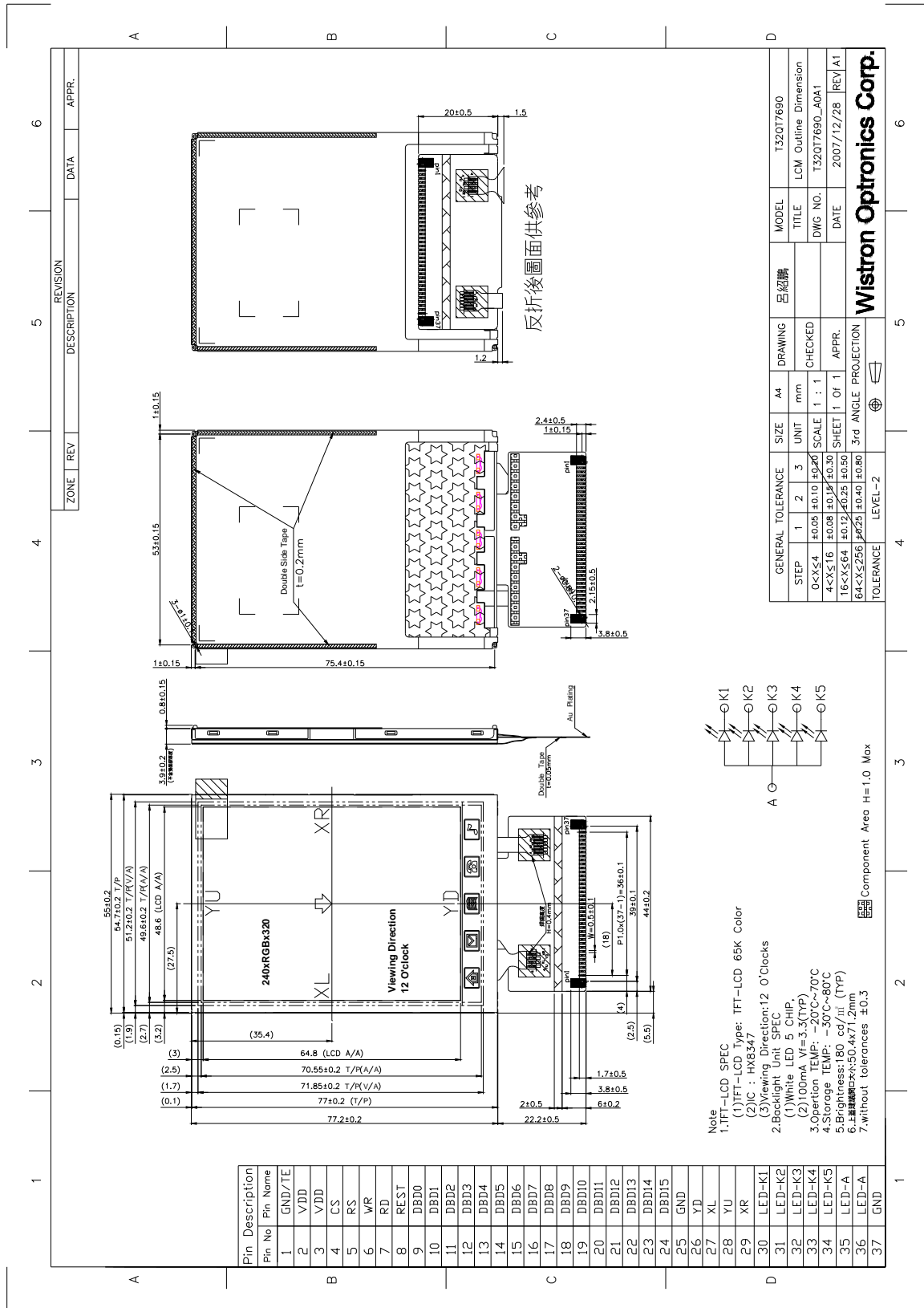
* General Information

| Items | Main-Panel | Unit |
|-------------------|---------------------|---------|
| LCD type | 3.2" TFT-LCD | |
| Active Area | 48.6(H)*64.8(V) | mm |
| Display mode | Transmissive type | |
| Driving IC | HX8347 | |
| Display Color | 65K | color |
| Number of Pixel | 240(H)*RGB*320(V) | pixel |
| Pixel Pitch | 0.2025(H)*0.2025(V) | mm |
| Display mode | Normally White | |
| Viewing direction | 12 | o'clock |

*** Mechanical Information**

| Items | | Min. | Typ. | Max. | Unit | Note |
|-------------|---------------|------|------|------|------|-------|
| Module size | Horizontal(H) | 54.8 | 55 | 55.2 | mm | - |
| | Vertical(V) | 77.0 | 77.2 | 77.4 | mm | - |
| | Depth(D) | - | - | 4.1 | mm | 不含雙面膠 |
| Weight | | - | 31.5 | - | g | - |

2. Module Outline Dimension



3. Absolute Maximum Ratings

3.1. Absolute Ratings of Environment

| Item | Symbol | Value | Unit | Note |
|-----------------------|--------|-----------|------|------|
| Operating temperature | Topr | -20 to 70 | °C | - |
| Storage temperature | Tstg | -30 to 80 | °C | - |

 $T_a = 25 \pm 2^\circ\text{C}$

3.2. Electrical Absolute Ratings

3.2.1. TFT-LCD Module

| Item | Symbol | Value | Unit |
|--------------------------|-------------------|-------------------------------|------|
| Power supply voltage (1) | IOV _{cc} | -0.3 to 3.3 | V |
| Power supply voltage (2) | V _{ci} | -0.3 to 4.6 | V |
| Power supply voltage (3) | DDVDH | -0.3 to 9 | V |
| Power supply voltage (4) | VCL | -4.6 to 0.3 | V |
| Power supply voltage (5) | VGH | -0.3 to 18.5 | V |
| Power supply voltage (6) | VGL | -18.5 to 0.3 | V |
| Input voltage range | V _{IN} | -0.3 to V _{ci} + 0.3 | V |

 $T_a = 25 \pm 2^\circ\text{C}$

3.2.2 Back-Light Unit

| Item | Symbol | Min. | Max. | Unit | Note |
|---------|----------------|------|------|------|------|
| Current | I _F | - | 20 | mA | (1) |

Note:

(1) One LED current maximum absolute ratings.

4. LCM Optical Characteristics

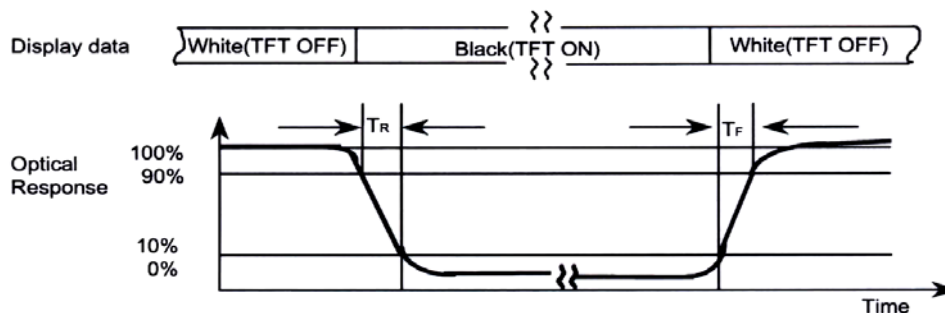
| Item | Symbol | Condition | Min. | Typ. | Max. | Unit | Note | |
|--------------------------------------|----------------|----------------|--|-------|-------|---------------------|-----------|--------------|
| Contrast ratio (center point) | CR | | - | 250 | - | - | (1) BM-7f | |
| Luminance of white (Center point) | YL | | - | 180 | - | cd / m ² | (4)BM-7f | |
| Response time | T _R | $\theta = 0$ | - | 15 | 30 | ms | (2) | |
| | T _F | $\phi = 0$ | - | 35 | 50 | | | |
| Color chromaticity (CIE 1931) | White | W _X | (Normal Viewing Angle) B / L on | 0.261 | 0.291 | 0.321 | - | (4) BM-7f |
| | | W _Y | | 0.291 | 0.321 | 0.351 | | |
| | Red | R _X | | 0.591 | 0.621 | 0.651 | | |
| | | R _Y | | 0.303 | 0.333 | 0.363 | | |
| | Green | G _X | | 0.301 | 0.331 | 0.361 | | |
| | | G _Y | | 0.560 | 0.590 | 0.620 | | |
| | Blue | B _X | | 0.112 | 0.142 | 0.172 | | |
| | | B _Y | | 0.056 | 0.086 | 0.116 | | |
| Viewing angle | Hor. | θ_L | CR ≥ 10 B / L on | - | 70 | - | Degrees | (3) |
| | | θ_R | | - | 70 | - | | |
| | Ver | ϕ_H | | - | 65 | - | | |
| | | ϕ_L | | - | 35 | - | | |

T_a = 25 ± 2°C, V_{CC} = V_{CI} = 2.8V

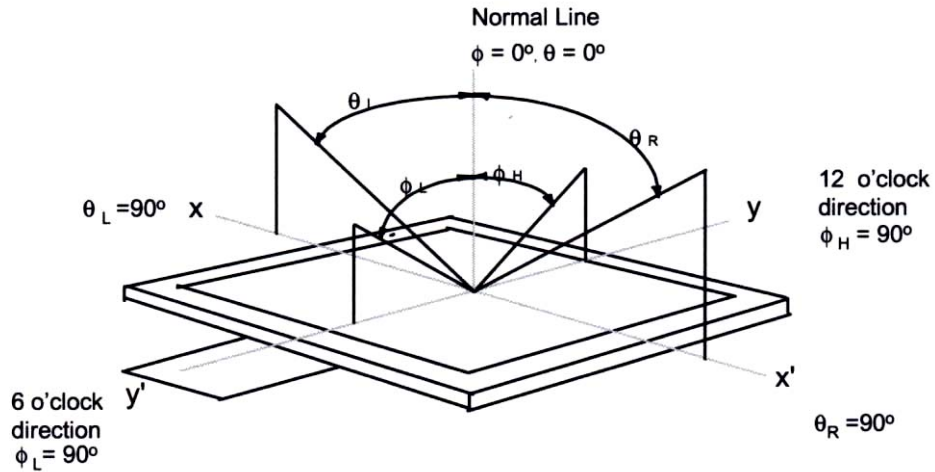
Note (1) Contrast ratio is defined as follows

$$CR = \frac{\text{Luminance (brightness) all pixels "White"}}{\text{Luminance (brightness) all pixels "dark"}}$$

(2) Response time is defined as follows

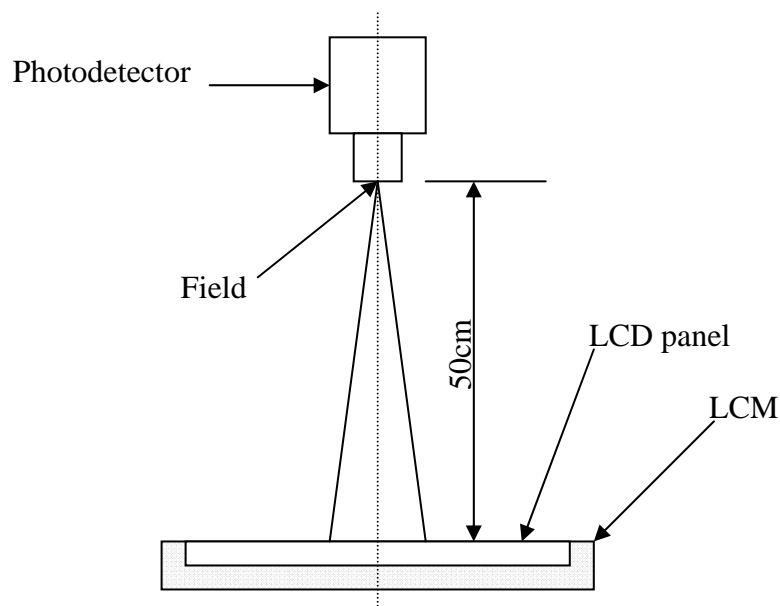


(3) Definition of Viewing Angle



(4) Optical measurement equipment setup

- Measurement should be executed in a stable, windless, and dark room. After lighting the backlight for 30mins.
- Environment condition : Common air conditioner cleanness 、 Ta=23±5℃ 、 Humidity=60±15%
- Distance : 50cm
- Photodetector : BM-7f (Field 1°)



5. Electrical Characteristics

5.1. TFT-LCD Module

| Items | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------|-------------|-------------------------|------|------|------|---------|
| Logic supply voltage | V_{DD} | 2.3 | 2.8 | 3.0 | V | |
| DC/DC supply voltage | V_{DD} | 2.3 | 2.8 | 3.0 | V | |
| Dissipation current | Stand-by | $(I_{CC}+I_{CI})_{STB}$ | - | - | TBD | (1) |
| | Sleep | $(I_{CC}+I_{CI})_{SLP}$ | - | - | TBD | (2) |
| | Full | $(I_{CC}+I_{CI})_F$ | - | - | TBD | (3),(4) |
| Frame frequency | f_{Frame} | - | 60 | - | Hz | |

$T_a = 25 \pm 2^\circ\text{C}$

- Note (1) $V_{CC}=V_{CI}=2.8\text{V}$, Stand-by mode & No input signals
 (2) $V_{CC}=V_{CI}=2.8\text{V}$, Sleep mode & No input signals
 (3) $V_{CC}=V_{CI}=2.8\text{V}$, $f_{Vsync}=60\text{Hz}$, $R_{frame}=15\text{Frame}$
 (4)Dissipation current check pattern

Black Pattern 

5.2. Back-Light unit

Back-Light Unit Electrical Characteristics ($T_a = 25 \pm 2^\circ\text{C}$)

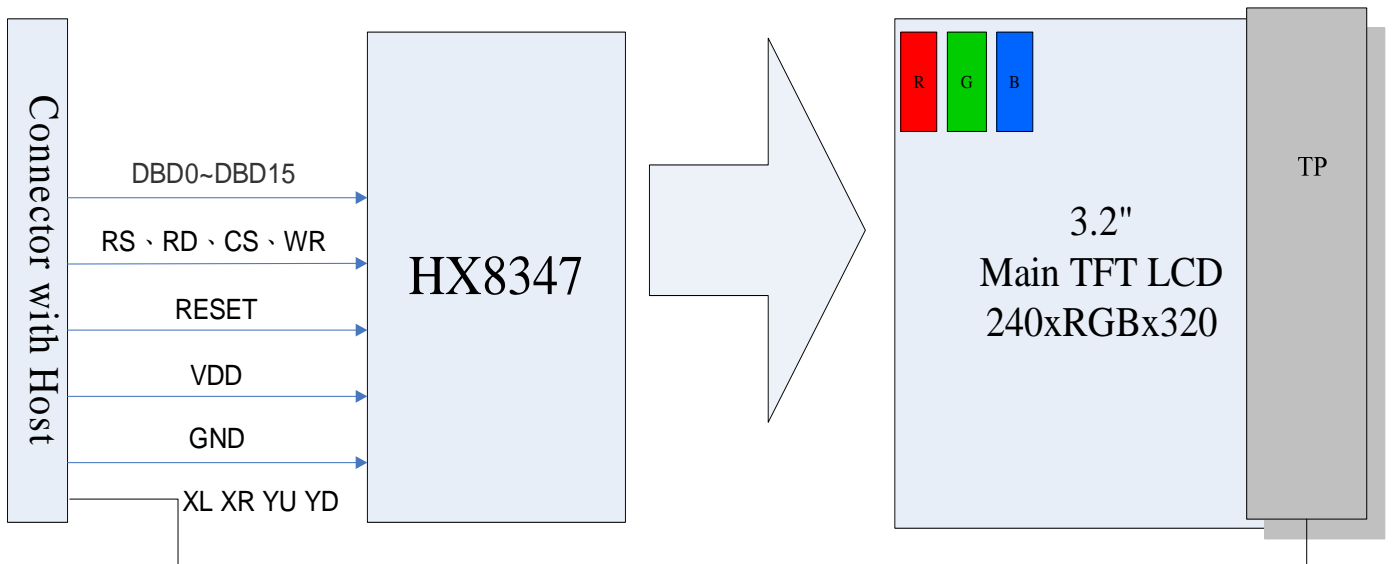
| Item | Symbol | Min. | Typ. | Max. | Unit | Condition |
|-------------------|----------|------|------|------|------|--------------------|
| Forward Voltage | V_F | - | 3.3 | - | V | $I_F=100\text{mA}$ |
| Power Consumption | P_{WF} | - | 330 | - | mW | - |

5.3. Driving Touch Panel (Analog resistance type)

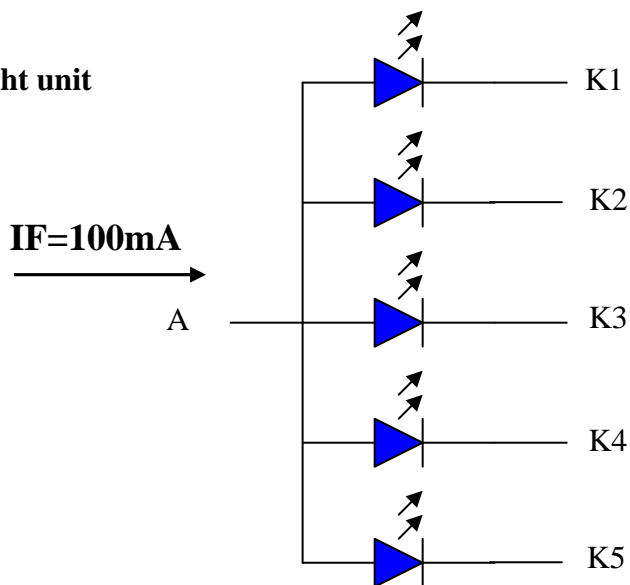
| Item | Symbol | Min. | Typ. | Max. | Unit | Remark |
|--|-------------|------|------|------|-----------|-----------|
| Resistor between terminals(Glass side) | R_x | 200 | - | 900 | Ω | - |
| Resistor between terminals(Film side) | R_y | 200 | - | 900 | Ω | - |
| Operation Voltage | V_{touch} | - | TBD | - | V | DC |
| Linearity | - | -1.5 | - | 1.5 | % | - |
| Chattering | - | - | TBD | - | ms | - |
| Surface Hardness | - | 3 | - | - | H | JIS K5600 |
| Light Transparency | - | 80 | - | - | % | - |
| Insulation Resistance | R_i | - | TBD | - | $M\Omega$ | At DC 25V |

6. Block diagram

6.1. 3.2" TFT (Interface System Structure)



6.2. Back-Light unit



7. Input Terminal Pin Assignment

7.1 TFT LCD module :

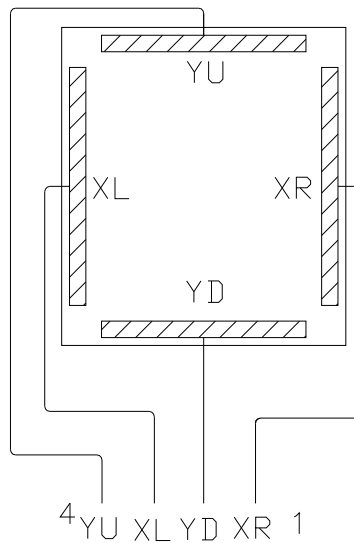
| NO. | pin name | Description | Input / Output | Note |
|-----|----------|--|----------------|-------|
| 1 | GND/TE | Default (Contact 2 connect Contact 3 FOR J1) : Ground, | G | |
| | | TE function: Contact 1 connect Contact 2 for J1 | O | |
| 2 | VDD | Voltage: 2.3~3.0 | I | POWER |
| 3 | VDD | Voltage: 2.3~3.0 | I | POWER |
| 4 | CS | chip select signal. | I | |
| 5 | RS | register select signal. | I | |
| 6 | WR | write strobe signal | I | |
| 7 | RD | read strobe signal | O | |
| 8 | REST | Reset | I | |
| 9 | DBD0 | Data (LSB) | I / O | |
| 10 | DBD1 | Data | I / O | |
| 11 | DBD 2 | Data | I / O | |
| 12 | DBD 3 | Data | I / O | |
| 13 | DBD 4 | Data | I / O | |
| 14 | DBD 5 | Data | I / O | |
| 15 | DBD 6 | Data | I / O | |
| 16 | DBD 7 | Data | I / O | |
| 17 | DBD 8 | Data | I / O | |
| 18 | DBD 9 | Data | I / O | |
| 19 | DBD 10 | Data | I / O | |
| 20 | DBD 11 | Data | I / O | |
| 21 | DBD 12 | Data | I / O | |
| 22 | DBD 13 | Data | I / O | |
| 23 | DBD 14 | Data | I / O | |
| 24 | DBD 15 | Data(MSB) | I / O | |

| | | | | |
|----|--------|-------------|---|--|
| 25 | GND | Ground | G | |
| 26 | YD | T/P Down | I | |
| 27 | XL | T/P Left | I | |
| 28 | YU | T/P Up | I | |
| 29 | XR | T/P Right | I | |
| 30 | LED-K1 | B/L Cathode | I | |
| 31 | LED-K2 | B/L Cathode | I | |
| 32 | LED-K3 | B/L Cathode | I | |
| 33 | LED-K4 | B/L Cathode | I | |
| 34 | LED-K5 | B/L Cathode | I | |
| 35 | LED-A | B/L Anode | I | |
| 36 | LED-A | B/L Anode | I | |
| 37 | GND | Ground | G | |

7.2 Touch Panel Pin Delimiter

| TP Pin No. | Symbol | Module Pin No. | Module Pin Name | Description |
|------------|--------|----------------|-----------------|-------------|
| 1 | XR | 29 | (XR) | Right Side |
| 2 | YD | 26 | (YD) | Lower Side |
| 3 | XL | 27 | (XL) | Left Side |
| 4 | YU | 28 | (YU) | Upper Side |

Touch Panel Pin Assignment:



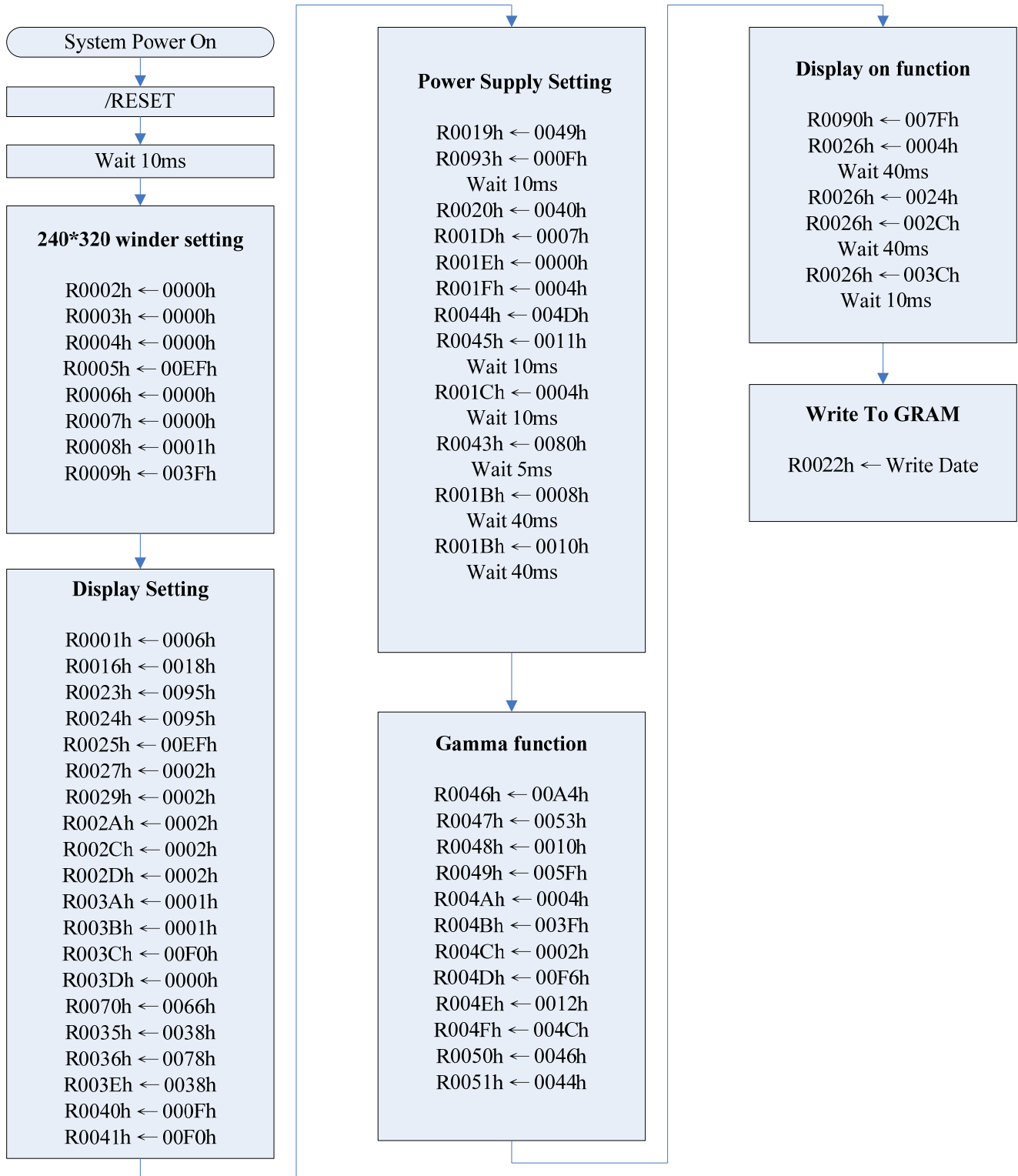
8. Interface specifications

8.1. System Interface

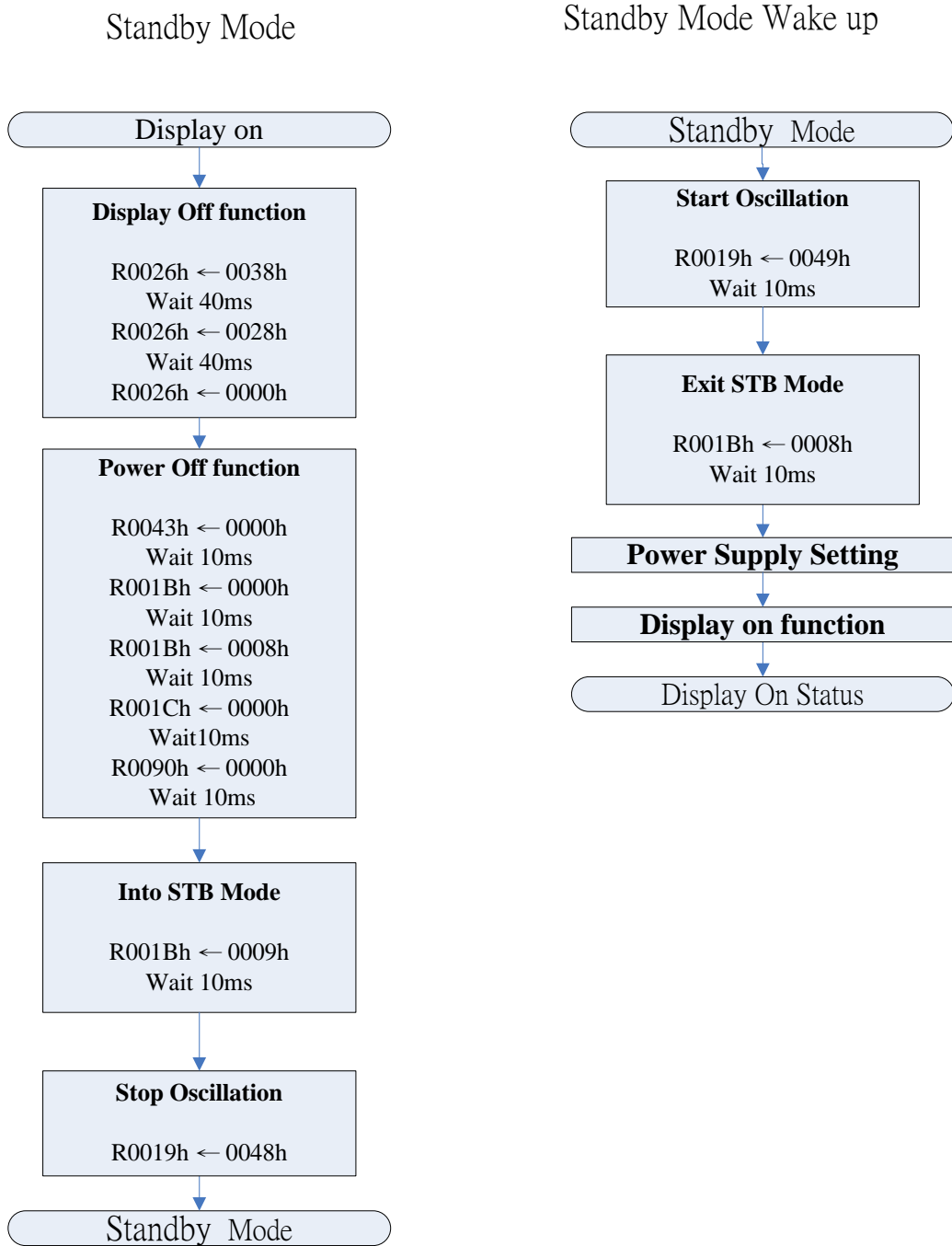
Please refer to **HX8347** datasheet for more details.

9. Initial code

9.1. Initial code



9.2. Sleep Mode Setting / Wake up Sequence



10. Reliability

Contents of Reliability Tests

| Item | | Purpose | S/S | Conditions | Criterion |
|--------------------|-------------------------------------|--|--------|--|--|
| Environment Stress | High Temperature Storage | To check the product capability after long time high temperature environment stress. | ≧ 5pcs | Ta = 80 ± 2°C 240 hours | Brightness should be within 70% of initial value Operational function is work |
| | High Temperature / Humidity Storage | To check the product capability after long time high temperature & high humidity environment stress. | ≧ 5pcs | Ta = 60 ± 2°C RH = 90 ± 2% 240 hours | |
| | Thermal Shock | To check the product capability after rapidly stress of different high/low temperature environment change. | ≧ 5pcs | -20°C /30 mins ⇔ 25°C /5 mins ⇔ 80°C /30 mins , 10 Cycles | |

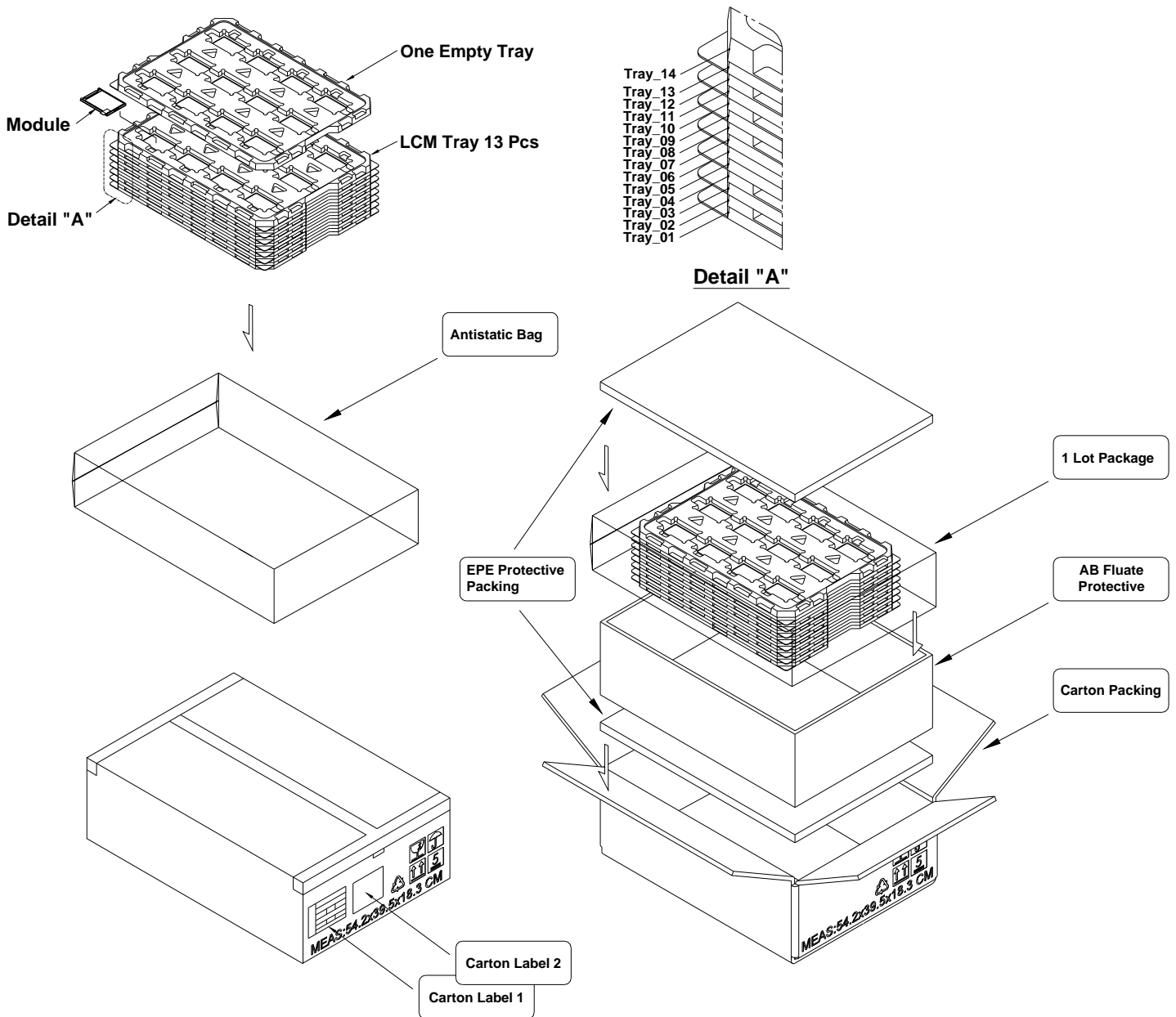
11. Packing

Package Quantity (Thick Model) :

One Tray Include : TBD Pcs Module ;

One Package (1 Lot) : 14 Pcs Tray(13 Tray + 1 Empty Tray) ; TBD Pcs Module ;

One Carton Include : 1 Lot ; 14 Pcs Tray ; TBD Pcs Module;



12. General Precautions

12.1. Handling

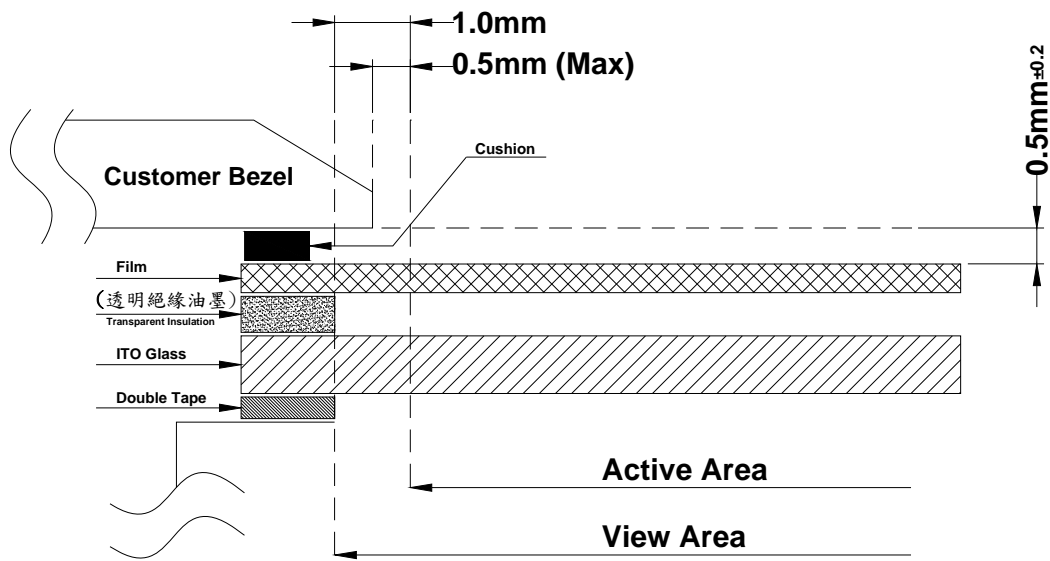
- (a) When the module is assembled, it should be attached to the system firmly. Be careful not to twist and bend the module.
- (b) Refrain from strong mechanical shock and / or any force to the module. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
- (c) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch the surface harder than a HB pencil lead.
- (d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, Staining and discoloration may occur.
- (e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
- (f) The desirable cleaners are water, Isopropyl Alcohol or Hexane.
- (g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.
- (h) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (i) Do not disassemble the module.
- (j) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

12.2. Storage

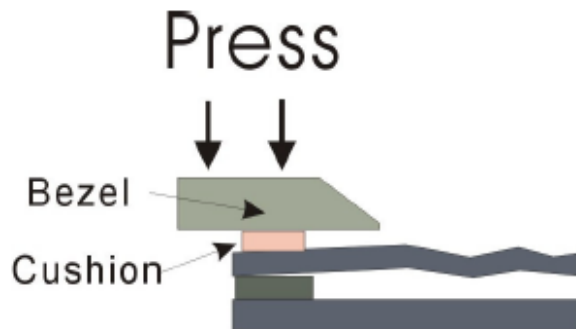
- (a) Do not leave the Panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35°C and relative humidity of less than 70%.
- (b) Do not store the TFT-LCD module in direct sunlight.
- (c) The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.

12.3. Touch panel notes

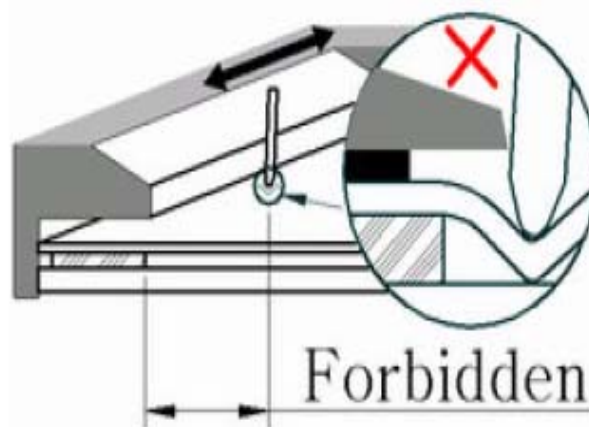
- (a). We suggest your Bezel design at least keep 0.5mm(Max) outside the inner edge of View Area. Please see the attached drawing of cross-section construction.



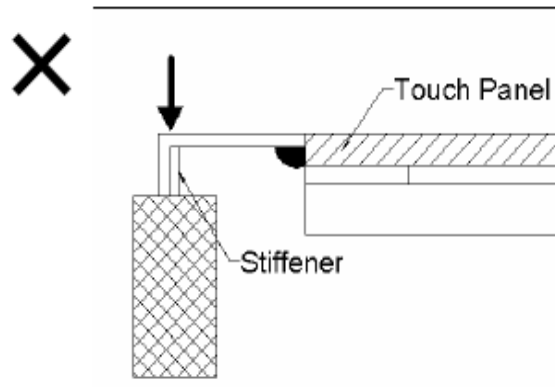
(b). If cushion is used between bezel and film must be choose as free as enough to absorb the expansion and contraction to avoid the distortion of film.



(c). The area from Viewing Area 2mm is structurally weak for pressure, especially for pen use, the film may be forcibly bent and cause defection. This area must be protected by the bezel and input must be avoided.



- (d). Most of the touch screens have air vent to equalize the inside air pressure to the outside one. the air vent must be open and liquid contact must be avoided as the liquid may be absorbed if the liquid accumulated near the air vent.
- (e). Don't insert cable line like follow drawing could cause the tail broken.



12.4. Others

- (a) When in operations, do not connect; disconnect the module in the “Power on” condition.
- (b) The liquid crystal is deteriorated by ultraviolet; do not leave it in direct sunlight and strong ultraviolet ray for hours.
- (c) Avoid condensation of water. It may result in improper operation or disconnection of electrode.
- (d) Do not exceed the absolute maximum rating value. Otherwise the panel may be damaged.
- (e) If the panel displays the same pattern continuously for a long period of time, it can be the situation when the image “Stick” to the screen
- (f) The max temperature / continuous time of FPC soldering are 320°C / 5 seconds.

| | | |
|--------------------------------------|-------------------|---------------|
| Document Title : 2.4" 以上(含) 成品出貨檢驗規格 | Doc. No : SQ-0004 | |
| | Rev. : D | Page : 1 of 6 |

| 版本 Version | 生效日 Date | 變更內容 Description | 建立者 Initiation |
|---------------|-------------|--|-------------------|
| A | 08/21/06 | 新制定。 | 彭世邦 |
| B | 01/25/07 | 新增 Cell (with polarizer & without polarizer) 出貨檢驗規範。 | 彭世邦 |
| C | 07/13/07 | 變更公司頁首 Logo 及頁尾。 | 彭世邦 |
| D | 09/04/07 | 1. 5.3.3 : AQL 0.65 修訂為 AQL 1.0。 2. 5.7 B/L、5.8 TP 及 B/L 外觀檢測之「黑點、白點、異物」SPEC 由：0.2mm < D ≤ 0.8mm 修訂為 0.5mm < D ≤ 0.8mm。 | 彭世邦 |

| | | |
|--------------------------------------|-------------------|---------------|
| Document Title : 2.4" 以上(含) 成品出貨檢驗規格 | Doc. No : SQ-0004 | |
| | Rev. : D | Page : 2 of 6 |

1.0 目的 Purpose

訂定 2.4" 以上(含) 成品出貨檢驗規格。

Define above 2.4" (including 2.4") product outgoing inspection criteria.

2.0 範圍 Range

適用於 2.4" 以上(含) 產品。

Apply to above 2.4" (including 2.4") product.

3.0 權責

3.1 製程整合部門負責成品出貨檢驗規範訂定與維護，完成後交由品保部門將電子檔及書面紙本送 DCC 生效。

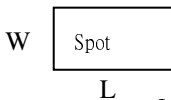
3.2 產品管理部門將成品出貨檢驗規範列入客戶承認書中並請客戶端簽回。

4.0 定義 Definition

4.1 Dot : 單一畫素 Single pixel

4.2 異物大小定義 Defect size definition : $D=(長徑(L)+短徑(W))/2$

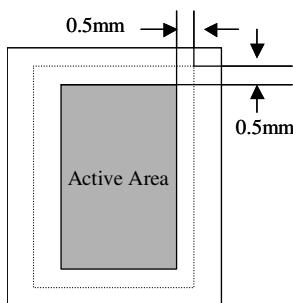
4.3 點狀異物定義 Spot definition :



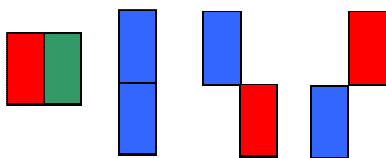
4.4 線狀異物定義 Line defect definition :



4.5 外觀檢視區 Outside active area definition : 從畫面顯示往外 0.5mm 區域。 0.5mm extended from active area。



4.6 連續點定義 Nearby dot definition



| | | |
|--------------------------------------|-------------------|---------------|
| Document Title : 2.4" 以上(含) 成品出貨檢驗規格 | Doc. No : SQ-0004 | |
| | Rev. : D | Page : 3 of 6 |

5.0 程序/內容 Procedure/content

5.1 設備及材料 Equipment and material :

| | |
|------------------------------|--|
| 檢查樣品 check samples | 限度樣本 limit sample |
| 檢查工具 check tools | 放大鏡 magnifier、放大燈 magnification lamp、 治具 tool、背光燈 B/L lamp、離子風扇 air ionizer |
| 檢查尺規 check rulers | 點線規 wire gauges、游標卡尺 caliper rules |
| 擦拭布 Wiper | 無塵布 Clean Cloth |
| 溶劑 Solvent(適用於 Cell、COG、OLB) | 乙醇 ethanol (for Cell、COG、OLB) |
| 電源供應器 Power Supply | |

5.2 成品檢驗環境 Inspection Environment :

5.2.1 溫度 Temperature : 15°C ~25°C ; 溼度 Humidity : 55 ±15% 。

5.2.2 外觀檢驗：眼睛距Panel 約20~30cm，其照度範圍在大於500Lux下執行產品的檢驗。
Visual Inspection : Distance between the panel and eyes is about 20~30cm, and the illumination is larger than 500Lux for product inspection.

5.2.3 電測檢驗：眼睛距Panel 約20~30cm，其照度範圍在小於300Lux、背光源 2500~2800cd/m² 下執行產品的檢驗。
Electrical Characteristic : Distance between the panel and eyes is about 20~30cm, and the illumination is smaller than 300Lux, B/L illumination is between 2500~2800 cd/m² for product inspection.

5.3 抽樣方式 Sampling Method :

5.3.1 外觀尺寸 Outline Size Specification : 5pcs/Lot , 0Ac/1Re 。

5.3.2 電性檢驗：抽樣數依據 ANSI/ASQC Z1.4，採用 Level II 檢驗水準、單次抽樣、AQL 0.65 檢查。

Electrical Inspection : Sampling of Inspection ANSI/ASQC Z1.4(AQL 0.65) Normal Inspection Level II, Single Sampling 。

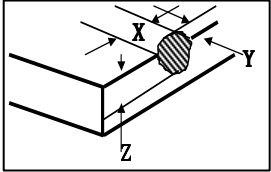
5.3.3 外觀檢驗：抽樣數依據 ANSI/ASQC Z1.4，採用 Level II 檢驗水準、單次抽樣、AQL 1.0 檢查。

Visual Inspection : Sampling of Inspection ANSI/ASQC Z1.4(AQL 1.0) Normal Inspection Level II, Single Sampling 。

| | | |
|--------------------------------------|-------------------|---------------|
| Document Title : 2.4" 以上(含) 成品出貨檢驗規格 | Doc. No : SQ-0004 | |
| | Rev. : D | Page : 4 of 6 |

5.4 T/P 出貨檢驗規範 (T/P outgoing inspection criteria)

| 分類 Category | 項目 Item | 規格敘述 Specification description | 檢驗方式 Method | SPEC | Criteria | Note | |
|---|---|--|---|--------------------|---|--|--|
| 電性 檢測 Electric Inspection | 動作缺陷 Display | 無畫面 No display | 目視 Visual | 不可有 Not allow | | | |
| | 線缺陷 Line defect | 任何線缺陷 Any line defect | 目視 Visual | 不可有 Not allow | | | |
| | Mura | Mura/gap/rubbing | 限度樣本 limit sample | | 不可比限度樣本差 Can not worse than limit sample | | |
| | | White/black spot | | | | | |
| | | Flicker、noise | 目視 Visual | | 不可有 Not allow | | |
| | 亮點 Bright dot | RGB 亮點, CF 刮傷 RGB bright dot、 color filter scratch | 放大鏡 Magnifier | D ≤ 1/2 Dot | | 不計 Ignore | 等級不計者,點與點距離限制予以忽略 Ignore the spot distance while bright dot is in spec. |
| | | | | 1/2 Dot < D ≤ 1Dot | | 2 | |
| | | AA 區 Active area | 放大鏡 Magnifier | D ≤ 0.1mm | | 不計 Ignore | |
| | | | | 0.1mm < D ≤ 0.15mm | | 2 | |
| | | 非 AA 區 Outside active area | 放大鏡 Magnifier | D ≤ 0.3mm | | 不計 Ignore | |
| | | | | 0.3mm < D ≤ 0.5mm | | 1 | |
| | | 合於規格 BM 破洞之間距離需大於 5mm The distance between two spot should be larger than 5mm | | | | | |
| | 連續亮點 Nearby bright dot | | | 不可有 Not allow | | | |
| | 亮點總合 Total bright dot | | | | 3 | | |
| | 暗點 Dark dot | RGB 畫素暗點 RGB dark dot | 放大鏡 Magnifier | D ≤ 1 Dot | | 2 | |
| 兩連續暗點 Nearby dark dot | | 1 Dot ≤ D ≤ 2 Dot | | 1Pair | | | |
| 異物暗點 Dark points | | D ≤ 1Dot | | 2 | | | |
| 異物暗點 Dark points | | 1 Dot ≤ D ≤ 2 Dot | | 1 | | | |
| 暗點總和 Total dark dot | | | | 3 | 兩連續暗點算二點 2 nearby dark points counted as 2 dark points | | |
| 偏光片異物 Polarizer defect | 點、線狀異物 Dot/line defect | 放大鏡 Magnifier | D ≤ 0.1 mm | | 不計 Ignore | 等級不計者,點與點距離限制予以忽略 Ignore the spot distance while bright dot is in spec. | |
| | | | 0.1mm < D ≤ 0.25mm | | 3 | | |
| 合於規格異物點與點之間距離須大於 5mm The distance between two spot should be larger than 5mm | | | | | | | |
| 亮暗點總合 Total dot (dark + bright) | | | | | 4 | 含亮點、暗點、CF 刮傷亮點、BM 破洞亮點、偏光片異物亮點 Include bright dot, dark dot, CF bright dot, BM hole, polarizer bright dot | |
| 距離 Distance | 亮點、亮暗點、暗點距離 Distance between 2 bright dot、bright and dark dot、2 dark dot | 檢查尺規 check rulers | 合於規格異物點與點之間距離須大於 5mm . The distance between two spot should be larger than 5mm | | | | |

| | | | | | | | |
|--------------------------------------|-------------------------------|--|---|--|--|--|--|
| 外觀 檢測 Visual Inspe ction | T/P | 邊緣缺角 Edge breach | 放大鏡 Magnifier | Fig 1 | $X \leq 3\text{mm}$; $Y \leq 3\text{mm}$; $Z \leq t$ | 不計 Ignore |  <p>Fig 1</p> |
| | | 表面缺角 Surface breach | | Fig 2 | $X \leq 3\text{mm}$; $Y \leq 3\text{mm}$; $Z \leq t$ | 不計 Ignore | |
| | | 魚眼 Fish eye | | $D \leq 0.2\text{ mm}$ | 不計 Ignore | <p>合於規格魚眼點與點之間距須大於 5mm The distance between two fish eye should be larger than 5mm</p> | |
| | | | | $0.2\text{mm} < D \leq 0.4\text{mm}$ | 4 | | |
| | | | | $0.4\text{mm} < D \leq 0.5\text{mm}$ | 1 | | |
| | | | | $D > 0.5\text{mm}$ | 0 | | |
| | | 裂痕 crack | | 任何裂痕：不允許 Any crack: not allow | | <p>除 FPC 端，任一邊偏移量 < 0.3mm Assembly shift should < 0.3mm (exclude FPC side)</p> | |
| | | 組立偏移 Assembly shift | | 除 FPC 端，任一邊偏移量 < 0.3mm Assembly shift should < 0.3mm (exclude FPC side) | | | |
| | | 黑點、白點、異物 Black/white spot, other defect | | $D \leq 0.2\text{mm}$ | 不計 Ignore | | <p>等級不計者點與點距離限制予以忽略 Ignore the spot distance while bright dot is in spec. 合於規格二刮痕、點線異物之間距需大於 5mm The distance between two scratch, line defect should be larger than 5mm</p> |
| | | | | $0.2\text{mm} < D \leq 0.5\text{mm}$ | 2 | | |
| | | | | $0.5\text{mm} < D \leq 0.8\text{mm}$ | 1 | | |
| | | | | $D > 0.8\text{mm}$ | 0 | | |
| | | 刮痕、線狀異物 Scratch, line defect | | $W \leq 0.03\text{mm}$ | L 忽略; L ignore | 不計 Ignore | |
| | | | | $0.03\text{mm} < W \leq 0.05\text{mm}$ | $L \leq 5\text{mm}$ | 3 | |
| | | | | $W > 0.05\text{mm}$ | $L > 5\text{mm}$ | 0 | |
| 牛頓環 Newton ring | 目視 Visual | a. SWENC&洋華: $a+b/2 \leq 8\text{mm}$ b. Eelyecw/泰山: Newton ring' s out line diminution $\leq 1/3$ AA length (long distance direction) | a,b:牛頓環長邊及短邊 a,b: Newton ring' s long and short diameter | | | | |
| 偏光片 Polarizer | 刺傷、刮傷、壓傷 Stab、scratch、dent | 目視 Visual | AA 區: Active area : | 不可有 Not allow | | | |
| | | | 非 AA 區: Outside active area : | 不計 Ignore | | | |
| | 氣泡 Bubble | | AA 區: Active area : | 不可有 Not allow | | | |
| | | | 非 AA 區 Outside active area | $D < 0.25\text{ mm}$ $0.25\text{mm} < D \leq 0.5\text{mm}$ | 不計 Ignore 1 | | |
| FPC | 折痕 bend | 目視 Visual | 不可有死折或銳角之折痕 Scar bend are not allow | | | | |
| | 刮傷 scratch | | 線路區: PAD area: | 不可有 Not allow | | | |
| | | | 非線路區：不可破壞保膠傷及內層 Non PAD area: can not damage protection film | | | | |

| | | | | | | | |
|-------------------------------|---|------------------|--|----------------|-----------|---|--|
| | 髒污、破損、缺件、補強板脫落 dirty、broken、lack parts、plate peeling | | 不可有 Not allow | | | | |
| B/L | 黑點、白點、異物 Black spot, white spot, other defect | 放大鏡 Magnifier | D ≤ 0.2mm | 不計 Ignore | | 合於規格二刮痕、點線異物之間距需大於 5mm The distance between two spot should be larger than 5mm | |
| | | | 0.2mm < D ≤ 0.5mm | 2 | | | |
| | | | 0.5mm < D ≤ 0.8mm | 1 | | | |
| | | | D > 0.8mm | 0 | | | |
| | 刮痕、線狀異物 Scratch, line defect | 目視 Visual | W ≤ 0.03mm | L 忽略; L ignore | 不計 Ignore | | |
| | | | 0.03mm < W ≤ 0.08mm | L ≤ 4mm | 4 | | |
| W > 0.08mm | L > 4mm | 0 | | | | | |
| 鐵件 Bezel | 髒污、油漬、氧化生鏽 Dirty, oil sludge, corrosion | 目視 Visual | 不可有 Not allow | | | | |
| | 刮傷 scratch | | W > 0.1mm | L > 10mm | 3 | | |
| 線狀外觀異物總合 Total line defect | | | W ≤ 0.1mm | L ≤ 10mm | | | |
| 線狀外觀異物總合 Total line defect | | | 含 B/L 及 T/P 及偏光板之線狀異物 Including B/L, T/P and polarizer line defect. | | 4 | | |
| 點狀外觀異物總合 Total dot defect | | | 含 B/L 及 T/P 及偏光板之點狀異物 Including B/L, T/P and polarizer line defect | | 4 | | |

6.0 參考文件 Reference document

N/A

7.0 使用表單 Sheet

N/A

8.0 附件 Attachment

N/A