POWERTIP TECH. CORP.

# SPECIFICATIONS

| | | |
|---|---|---|
| CUSTOMER | : | PTC |
| SAMPLE CODE | : | SH128800T004-ZZA01 |
| MASS PRODUCTION CODE | : | PH128800T004-ZZA01 |
| SAMPLE VERSION | : | 03 |
| SPECIFICATIONS EDITION | : | 010 |
| DRAWING NO. (Ver.) | : | JLMD-PH128800T004-ZZA01_005 |
| PACKAGING NO. (Ver.) | : | JPKG-PH128800T004-ZZA01_001 |

## Customer Approved

Date:

| Approved | Checked | Designer |
|---|---|---|
| 李昀 | 劉進 | 陳璐 |

☐ Preliminary specification for design input

■ Specification for sample approval


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## History of Version

| Date | Ver. | Edi. | Description | Page | Design by |
|---|---|---|---|---|---|
| 01/30/2018 | 01 | 001 | New Drawing. | - | 陳璐 |
| 06/07/2018 | 01 | 002 | New Sample | - | 陳璐 |
| 06/28/2018 | 01 | 003 | Add Power Consumption | 5 | 陳璐 |
| 02/22/2019 | 01 | 004 | Modify RELIABILITY TEST | 27 | 陳璐 |
| 06/14/2019 | 01 | 005 | Modify Inspection Specification | 20~21 | 陳璐 |
| 06/26/2019 | 01 | 006 | Modify Interface Timings | 16 | 陳璐 |
| 07/03/2019 | 01 | 007 | Modify Interface Timings | 16 | 陳璐 |
| 07/12/2019 | 01 | 008 | Modify Interface Timings | 16 | 陳璐 |
| 11/29/2019 | 02 | 009 | Modify LCM Drawing | Appendix | 陳璐 |
| 04/03/2020 | 03 | 010 | Add TAPE | Appendix | 陳璐 |
| | | | | | |
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| | | | | | |

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## Contents



POWERTIP

# 1. SPECIFICATIONS

## 1.1 Features

| Item | Standard Value |
|---|---|
| Screen size(Inch) | 10.1(Diagonal) |
| Resolution | 1280* (R、G、B) * 800 Dots |
| Display mode | Transmissive, Normally Black |
| Color | 16.7M |
| Interface | 8 bit LVDS |
| ROHS | THIS PRODUCT CONFORMS THE ROHS OF PTC<br>Detail information please refer web site :<br>http://www.powertip.com.tw/news.php?area_id_view=1085560481/ |

## 1.2 Mechanical Specifications

| Item | Standard Value | Unit |
|---|---|---|
| Outline Dimension | 229.8(W) * 149 (L) * 10.0 (H)Max | mm |

**LCD panel**

| Item | Standard Value | Unit |
|---|---|---|
| Active Area | 216.96 (W) * 135.60 (L) | mm |

Note : For detailed information please refer to LCM drawing.

## 1.3 Absolute Maximum Ratings

| Item | Symbol | Condition | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Power Supply Voltage | VDD | - | -0.3 | +4.0 | V |
| Power Supply Voltage | LED_VCC | - | -0.3 | +50 | V |
| Operating Temperature | $T_{OP}$ | - | -30 | +80 | ℃ |
| Storage Temperature | $T_{ST}$ | - | -30 | +80 | ℃ |
| Storage Humidity | $H_D$ | Ta＜60 ℃ | - | 90 | %RH |

## 1.4 DC Electrical Characteristics

| Item | | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Power Supply Voltage for LCD Driver | | VDD | - | 2.75 | 3.3 | 3.6 | V |
| Power Supply Voltage for LED Driver | | LED_VCC | - | 9.0 | 12.0 | 15.0 | V |
| Power Supply Current | | IDD*1 | VDD=3.3V | - | 230 | 280 | mA |
| Power Supply Current For LED Driver | | ILED_VCC | LED_VCC =12V | - | 600 | 660 | mA |
| Power Consumption (non-Touch Panel) | | Pd | VDD=3.3V LED_VCC =12V | - | - | 0.93+7.92 | W |
| PWM Signal Voltage | High | VPWM | - | 0.8*VLED_EN | - | VLED_EN | V |
| | Low | | - | 0 | - | 0.2* VLED_EN | V |
| LED Enable Voltage | High | VLED_EN | - | 1.65 | - | 5.25 | V |
| | Low | | - | 0 | - | 0.4 | V |
| LED PWM Frequency | | $F_{PWM}$ | - | 100 | - | 20000 | Hz |

Note1: Maximum current display.

## 1.5 Optical Characteristics

**TFT LCD Panel** Ta=25°C

| Item | | Symbol | Condition | Min. | Typ. | Max. | Unit | - |
|---|---|---|---|---|---|---|---|---|
| Response time | | Tr + Tf | - | - | 25 | 50 | ms | Note2 |
| Viewing angle | Top | ΘY+ | CR ≥ 10 | - | 85 | - | Deg. | Note4 |
| | Bottom | ΘY- | | - | 85 | - | | |
| | Left | ΘX- | | - | 85 | - | | |
| | Right | ΘX+ | | - | 85 | - | | |
| Contrast ratio | | CR | If=200mA | 600 | 800 | - | - | Note3 |
| Color of CIE Coordinate (With B/L ) | White | X | | 0.26 | 0.31 | 0.36 | - | Note1 |
| | | Y | | 0.30 | 0.35 | 0.40 | | |
| | Red | X | | 0.56 | 0.61 | 0.66 | | |
| | | Y | | 0.29 | 0.34 | 0.39 | | |
| | Green | X | | 0.28 | 0.33 | 0.38 | | |
| | | Y | | 0.53 | 0.58 | 0.63 | | |
| | Blue | X | | 0.10 | 0.15 | 0.20 | | |
| | | Y | | 0.11 | 0.16 | 0.21 | | |
| Average Brightness Pattern=white display (With B/L) | | IV | If=200mA | 800 | 1000 | - | cd/m2 | Note1 |
| Luminance uniformity | | YU | - | 70 | - | - | % | Note1 |

Note1:

1：△B=B(min) / B(max) × 100%

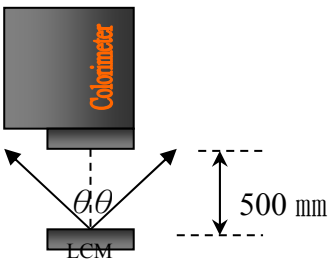
2：Measurement Condition for Optical Characteristics:

a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%

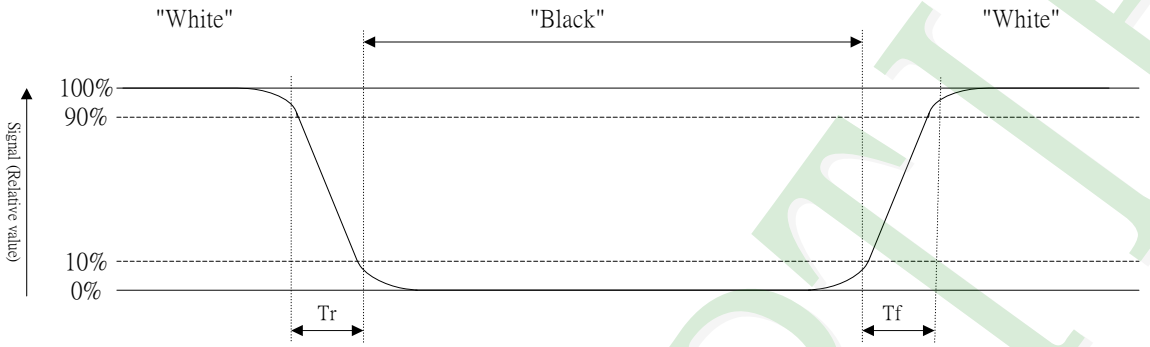




Colorimeter=BM-7 fast

Note2: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:



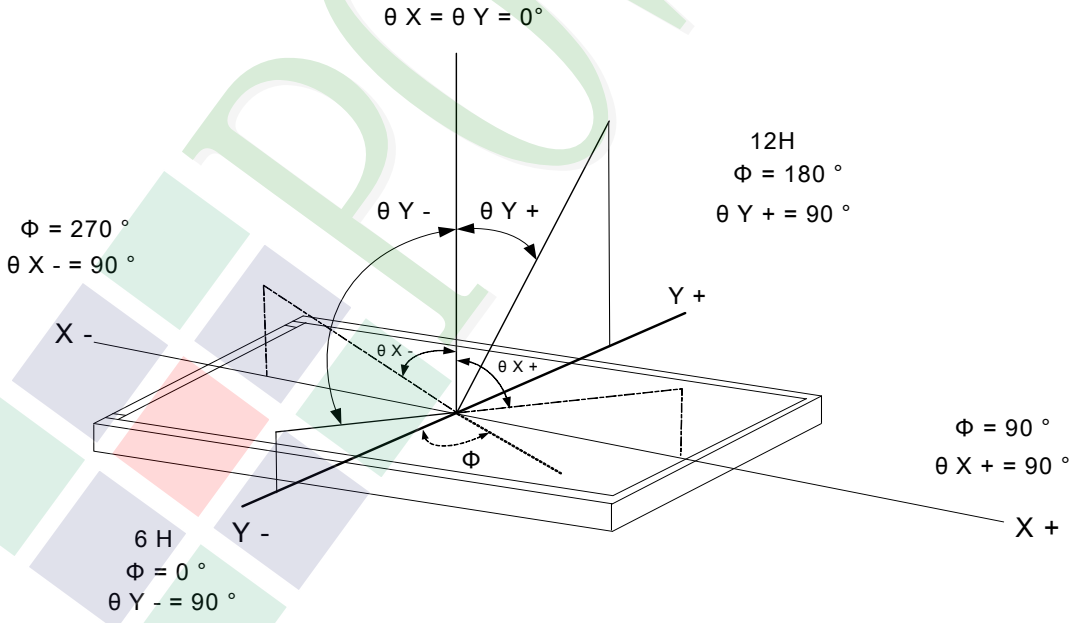

Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at “White” state}}{\text{Photo detector output when LCD is at “Black” state}}$$

Note4: Definition of viewing angle:

Refer to figure as below:



## 1.6 Backlight Characteristics

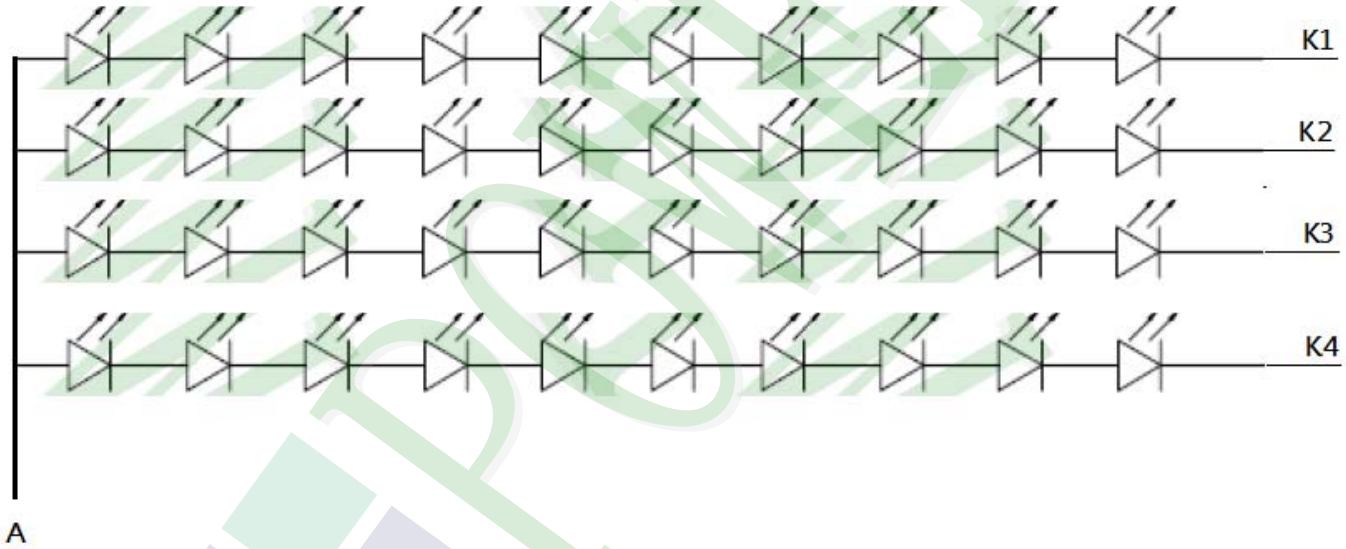
Maximum Ratings

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Power Dissipation | Pd | 1 LED | - | - | 260 | mW |
| LED Forward Current | IF | | - | - | 80 | mA |
| LED Reverse Voltage | VR | | - | - | 1.2 | V |

Electrical / Optical Characteristics

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Voltage for LED Backlight | VF | If=200mA | 26 | 28 | 30 | V |
| Current for LED Backlight | IF | | - | 200 | - | mA |
| Color | White | | | | | |

Internal Circuit Diagram




Other Description

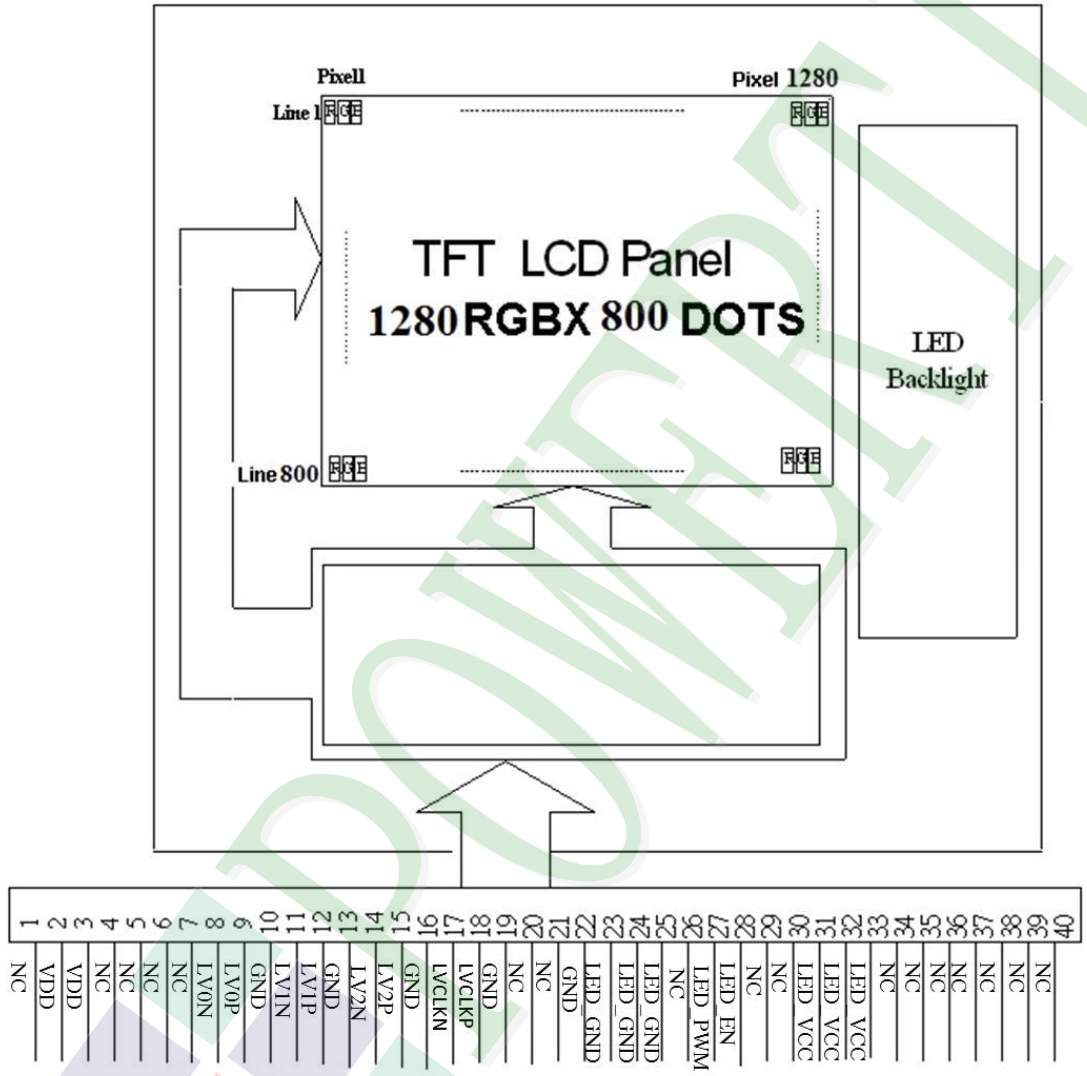
| Item | Conditions | Description |
|---|---|---|
| Life Time | Ta =25℃<br>IF= 200mA | 70000 hrs |

# 2. MODULE STRUCTURE

## 2.1 Counter Drawing

### 2.1.1 LCM Mechanical Diagram

* See Appendix



## 2.2 Interface Pin Description

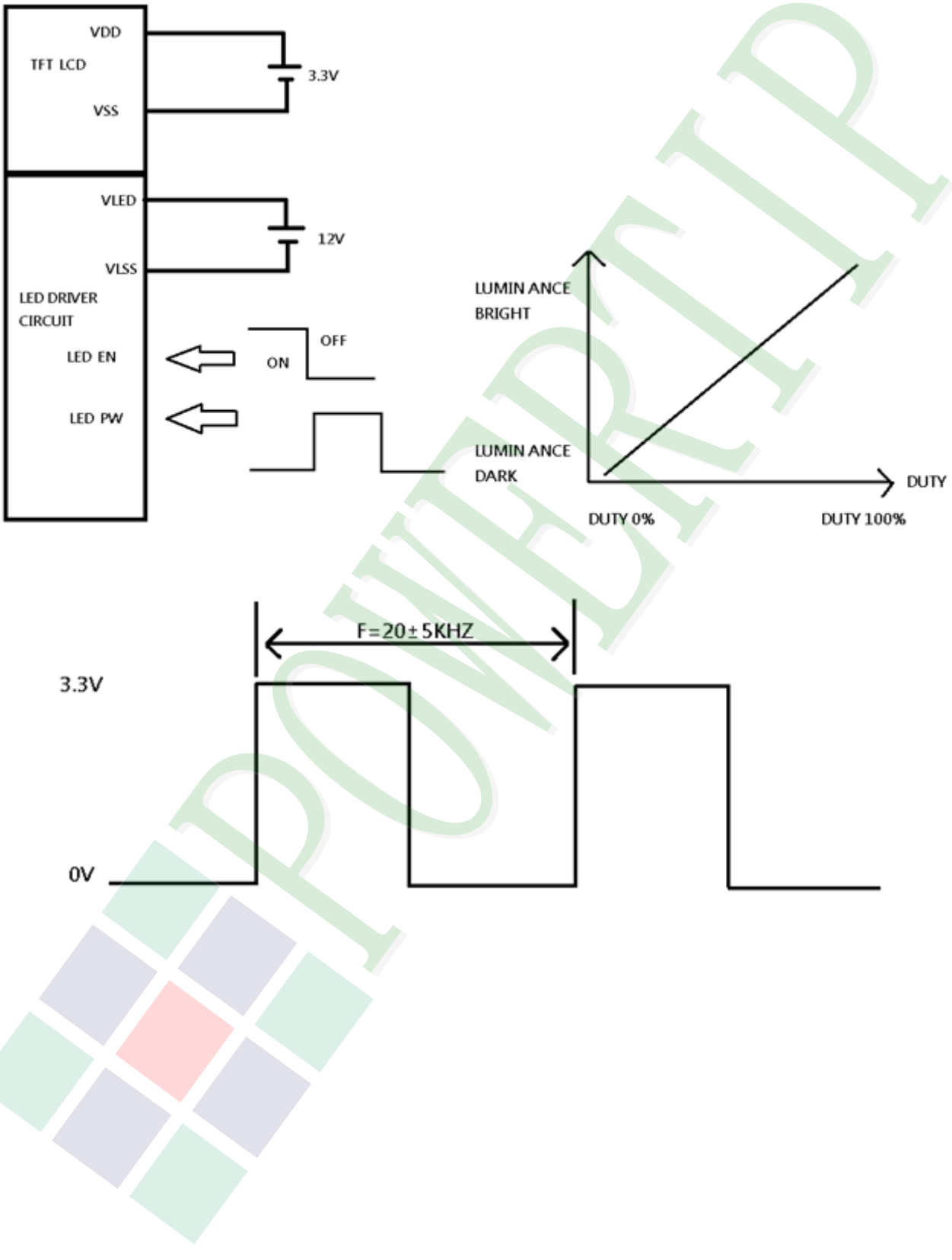
| Pin No. | Symbol | Description |
|---|---|---|
| 1 | NC | No Connection. |
| 2 | VDD | Power Supply. |
| 3 | VDD | Power Supply. |
| 4 | NC | No Connection. |
| 5 | NC | No Connection. |
| 6 | NC | No Connection. |
| 7 | NC | No Connection. |
| 8 | LV0N | -LVDS Differential Data Input. |
| 9 | LV0P | +LVDS Differential Data Input. |
| 10 | GND | Ground. |
| 11 | LV1N | -LVDS Differential Data Input. |
| 12 | LV1P | +LVDS Differential Data Input. |
| 13 | GND | Ground. |
| 14 | LV2N | -LVDS Differential Data Input. |
| 15 | LV2P | +LVDS Differential Data Input. |
| 16 | GND | Ground. |
| 17 | LVCLKN | -LVDS Differential Clock Input. |
| 18 | LVCLKP | +LVDS Differential Clock Input. |
| 19 | GND | Ground. |
| 20 | LV3N | -LVDS Differential Data Input. |
| 21 | LV3P | +LVDS Differential Data Input. |
| 22 | GND | Ground. |
| 23 | LED_GND | Ground for LED Driving |
| 24 | LED_GND | Ground for LED Driving |
| 25 | LED_GND | Ground for LED Driving |
| 26 | NC | No Connection. |
| 27 | LED_PWN | LED Backlight PWM control signal for dimming. |

| Pin No. | Symbol | Description |
|---|---|---|
| 28 | LED_EN | LED Backlight Enable Input. |
| 29 | NC | No Connection. |
| 30 | NC | No Connection. |
| 31 | LED_VCC | Power Supply for LED Backlight driving. |
| 32 | LED_VCC | Power Supply for LED Backlight driving. |
| 33 | LED_VCC | Power Supply for LED Backlight driving. |
| 34 | NC | No Connection. |
| 35 | NC | No Connection. |
| 36 | NC | No Connection. |
| 37 | NC | No Connection. |
| 38 | NC | No Connection. |
| 39 | NC | No Connection. |
| 40 | NC | No Connection. |

POWERTIP

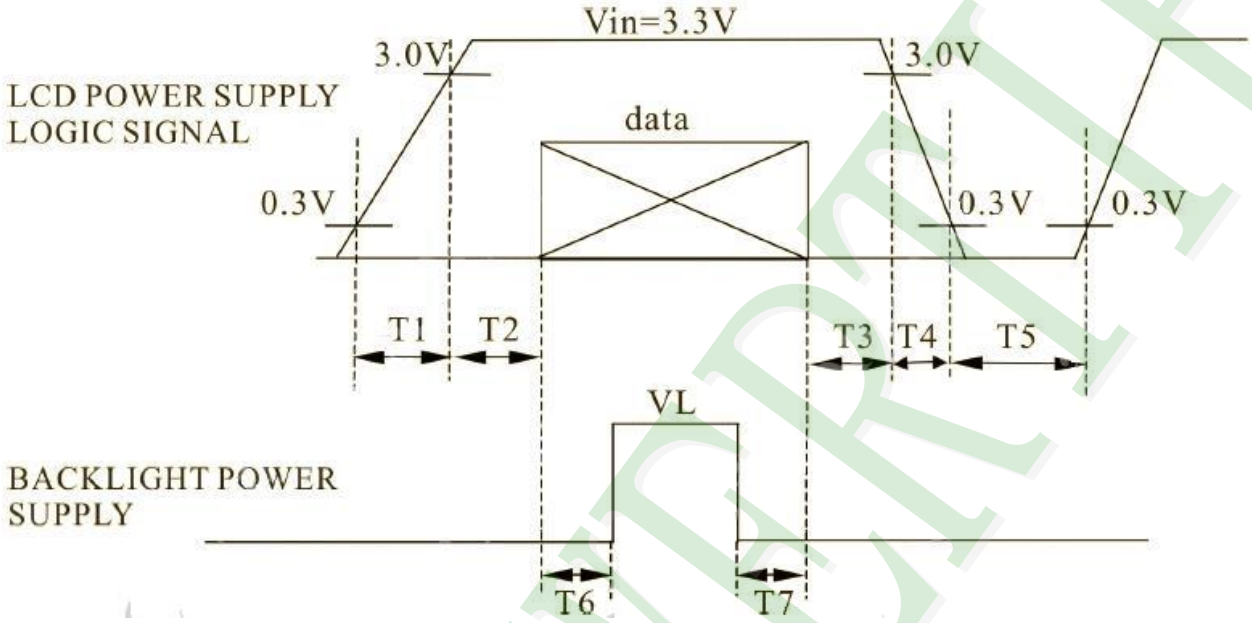
## 2.3 Power Supply Characteristics

### 2.3.1 POWER SUPPLY FOR LCM



## 2.3.2 POWER ,SIGNAL SEQUENCE

0.5<t1≤10ms 200ms≤t5
0<t2≤50ms 200ms≤t6
0<t3≤50ms 200ms≤t7
0<t4≤10ms

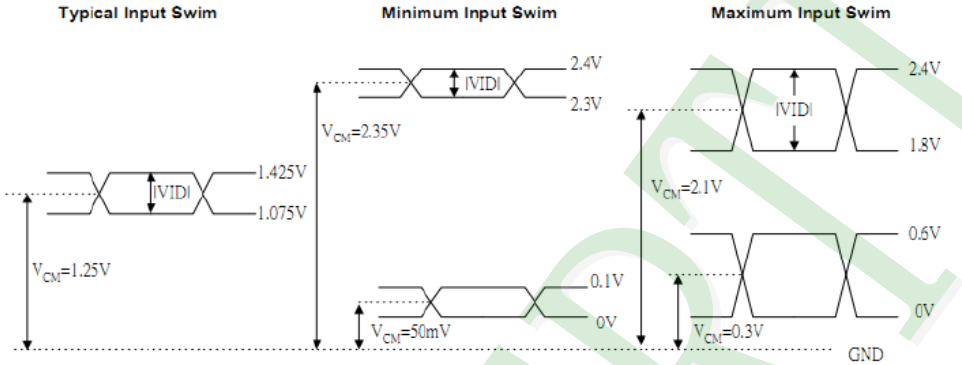


## 2.4 Timing Characteristics

### 2.4.1 LVDS Signal Timing Characteristics

#### DC Characteristics

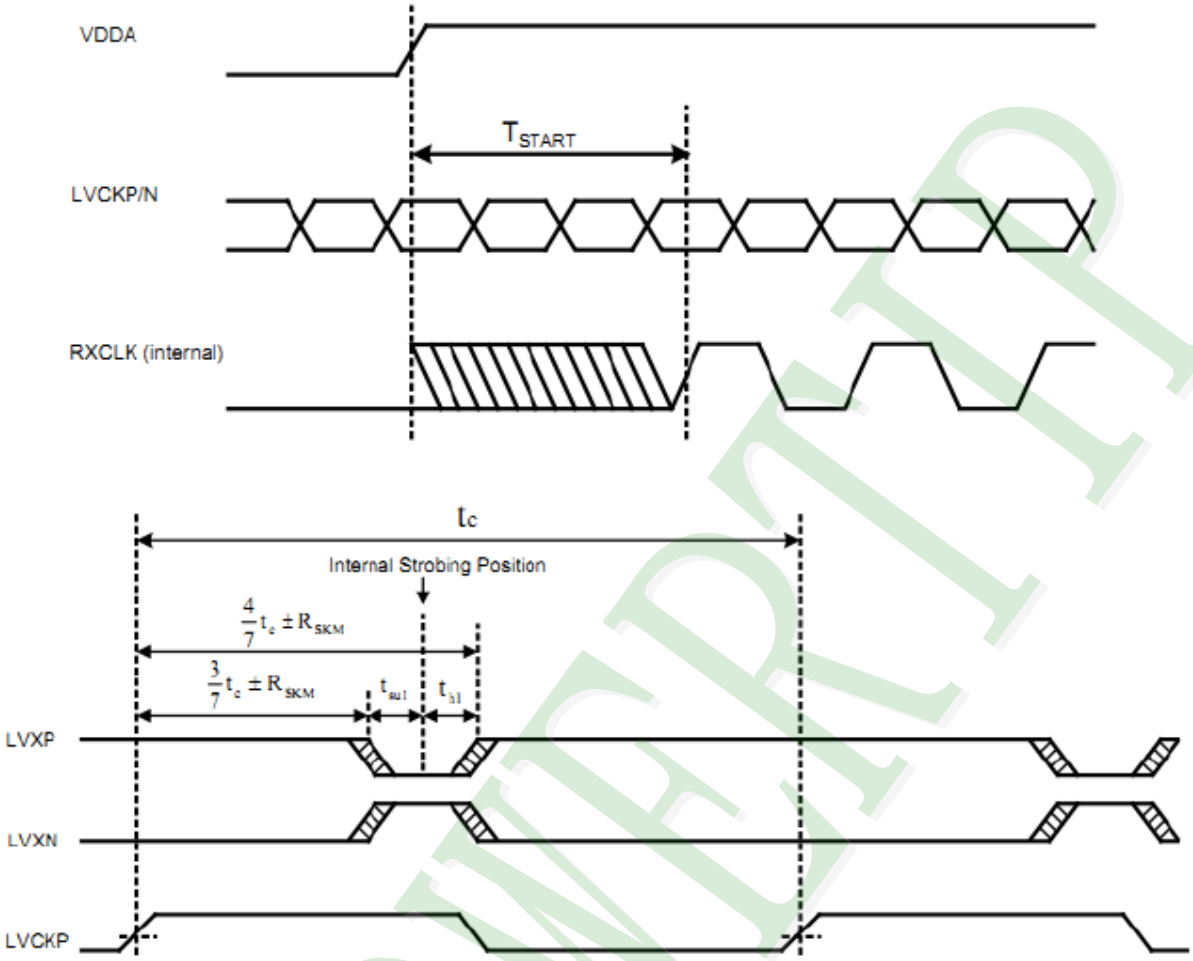
| Symbol | Parameter | Conditions | Min. | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{TH}$ | Differential Input High Threshold | $V_{CM}$ =+1.2V | - | - | 100 | mV |
| $V_{TL}$ | Differential Input Low Threshold | | -100 | - | - | mV |
| $I_{CC}$ | Average Supply Current | | - | TBD | - | mA |




LVDS Receiver Input Signal Operation Range

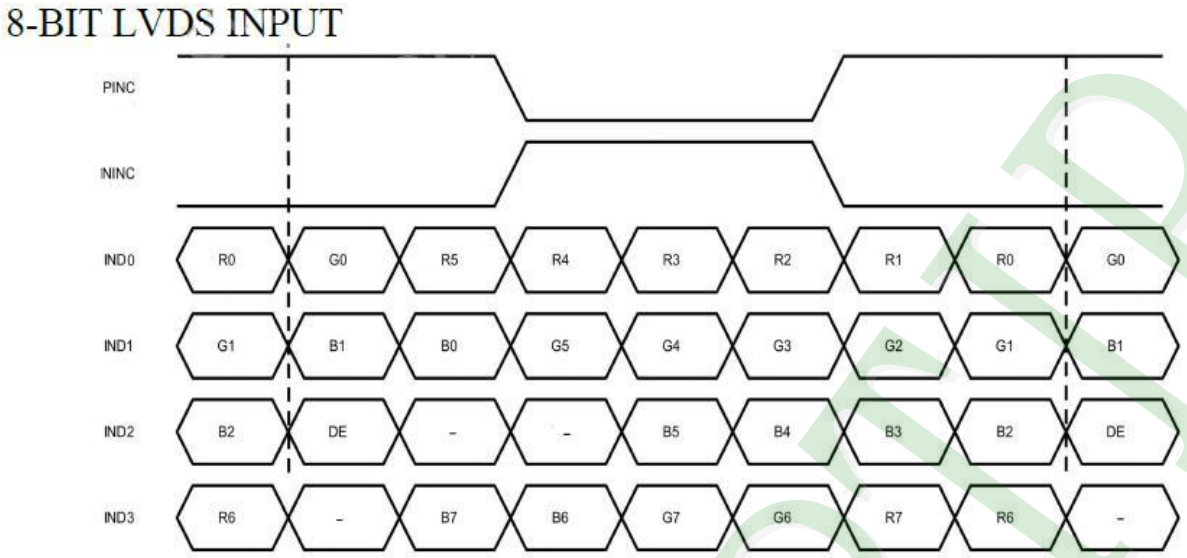
#### AC Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| $F_{OP}$ | Input Operating Frequency range | RX_HF=0 | 25 | - | 100 | MHz |
| | | RX_HF=1 | 100 | - | 170 | MHz |
| $R_{SKM}$ | Receiver Skew Margin | 85MHz, \|VID\|=400mV, $V_{CM}$=1.2V | 450 | - | - | pS |
| | | 150MHz, \|VID\|=400mV, $V_{CM}$=1.2V | 267 | - | - | pS |
| $T_{STRAT}$ | Receiver startup time (after a valid LVDS clock is applied) | | - | - | 10 | mS |




NOTE: LVCK is advanced or delayed with respect to data until errors are observed at the receiver outputs. The advance or delay is then reduced until there are no data errors observed. The magnitude of the advance or delay is RSKM.

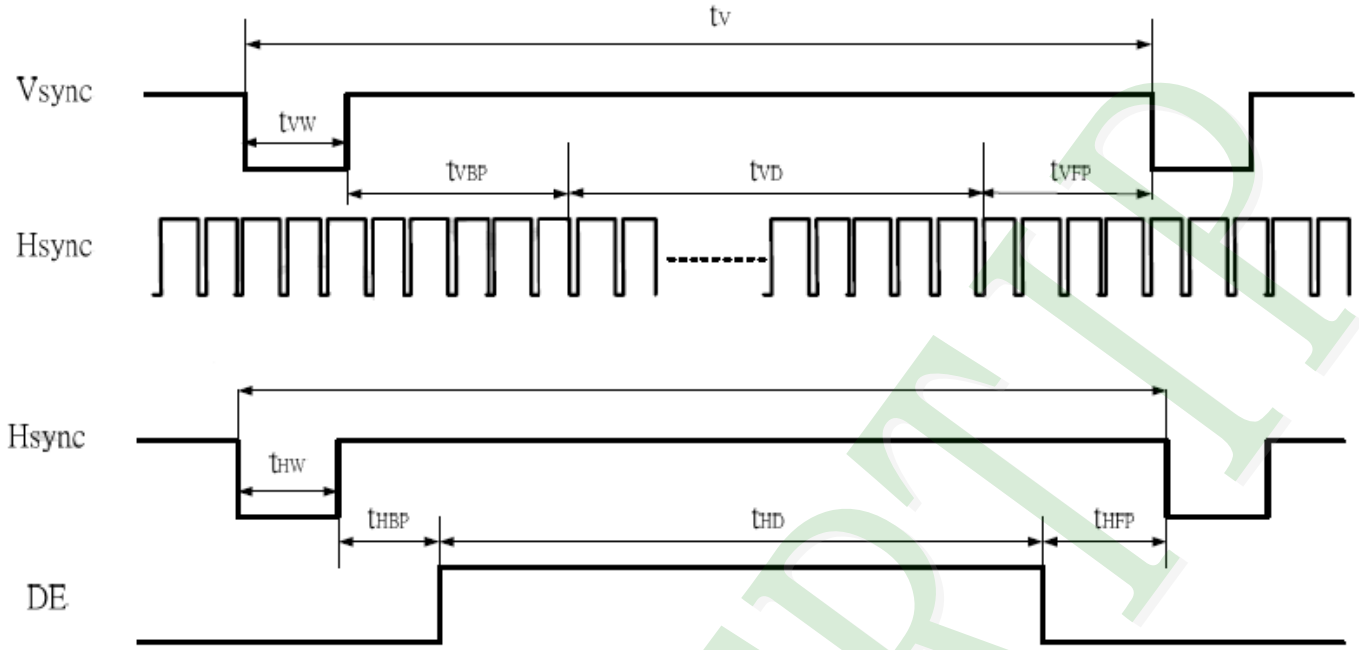
### 2.4.2 LVDS Data Input Format




### 2.4.3 Interface Timings

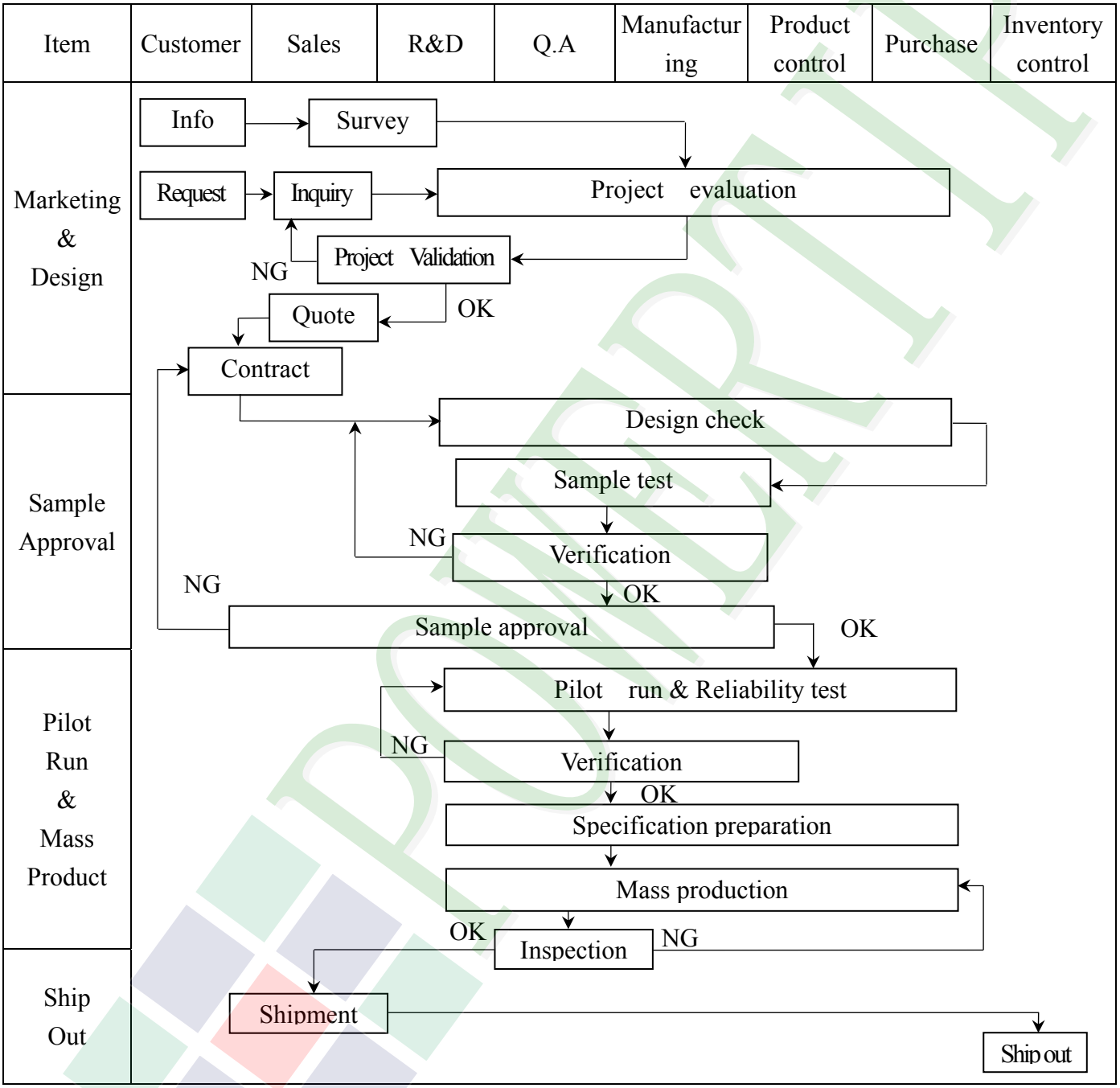
| Parameter | Symbol | Unit | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| Frame Rate | - | Hz | 55 | 60 | 65 |
| Frame Period | tv | line | 815 | 823 | 833 |
| Vertical Display Time | tvD | line | | 800 | |
| Vertical Blanking Time | tVW +tVBP+tVFP | line | 15 | 23 | 33 |
| 1 Line Scanning Time | tH | clock | 1440 | - | 1470 |
| Horizontal Display Time | tHD | clock | | 1280 | |
| Horizontal Blanking Time | tHW+tHBP+tHFP | clock | 160 | - | 190 |
| Clock Rate | 1/Tc | MHz | 64.5 | - | 79.6 |

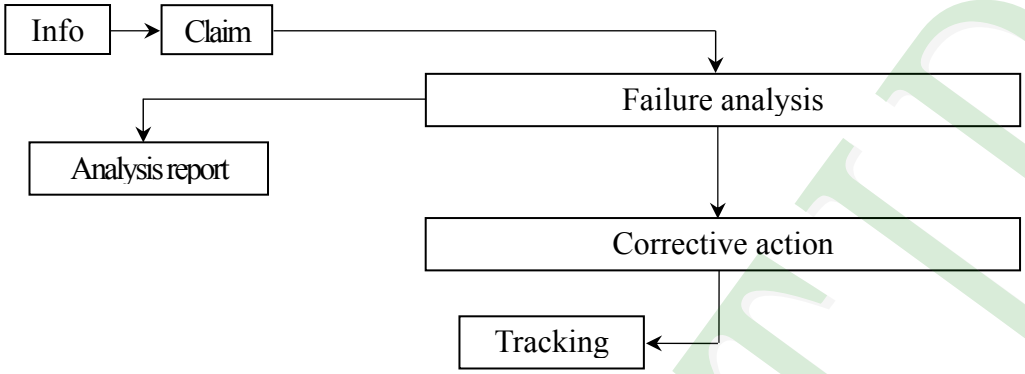
### 2.4.4 Timing Diagram of Interface Signal (DE mode)



# 3. QUALITY ASSURANCE SYSTEM

## 3.1 Quality Assurance Flow Chart



| Item | Customer | Sales | R&D | Q.A | Manufactu ring | Product control | Purchase | Inventory control |
|---|---|---|---|---|---|---|---|---|
| Sales Service |  | | | | | | | |
| Q.A Activity | 1. ISO 9001 Maintenance Activities<br>2. Process improvement proposal<br>3. Equipment calibration<br>4. Education And Training Activities<br>5. Standardization Management | | | | | | | |

## 3.2. Inspection Specification

◆Scope：The document shall be applied to TFT-LCD Module for 3.5″ ~15″ (Ver.B01).

◆Inspection Standard：MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ.

◆Equipment：Gauge、MIL-STD、Powertip Tester、Sample

◆Defect Level：Major Defect AQL： 0.4 ； Minor Defect AQL： 1.5

◆OUT Going Defect Level：Sampling.

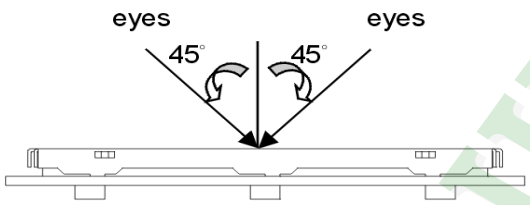
◆Standard of the product appearance test：

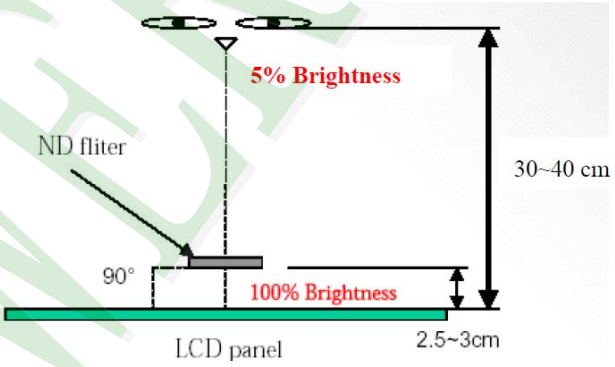
a. Manner of appearance test：

(1). The test best be under 20W×2 fluorescent light(about 300lux ～500lux)

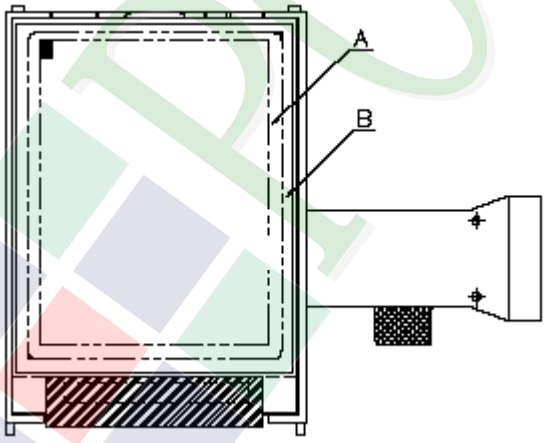
，and distance of view must be at 30~40 cm.

(2). The test direction is base on about around 45° of vertical line.




(3). Definition of area.




*A* area : viewing area

*B* area : Outside of viewing area

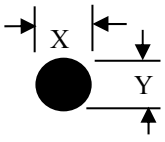
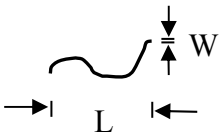
(4). Standard of inspection： (Unit：mm)

◆Specification For TFT-LCD Module 3.5″ ~15″： (Ver.B01)

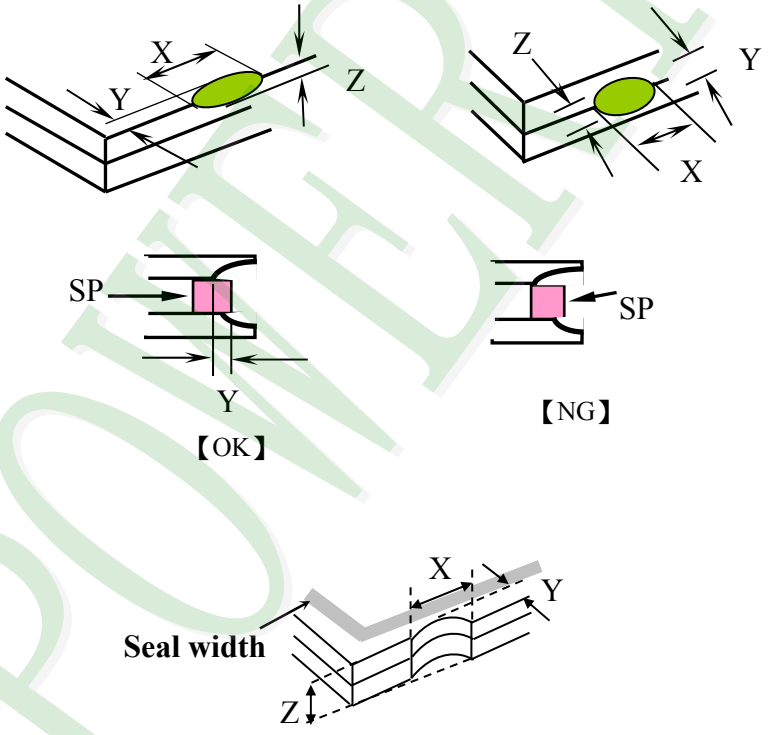
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1.1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1.2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1.3 Assembled in inverse direction.</td><td>Major</td></tr>
<tr><td>02</td><td>Quantity</td><td>2.1The quantity is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>03</td><td>Outline dimension</td><td>3.1 Product dimension and structure must conform to structure diagram.</td><td>Major</td></tr>
<tr><td rowspan="6">04</td><td rowspan="6">Electrical Testing</td><td>4.1 Missing line character and icon.</td><td>Major</td></tr>
<tr><td>4.2 No function or no display.</td><td>Major</td></tr>
<tr><td>4.3 Display malfunction.</td><td>Major</td></tr>
<tr><td>4.4 LCD viewing angle defect.</td><td>Major</td></tr>
<tr><td>4.5 Current consumption exceeds product specifications.</td><td>Major</td></tr>
<tr><td>4.6 Mura can not be seen through 5% ND filter at 50% Gray screen , should be judged by the viewing angle of 90 degree.</td><td>Minor</td></tr>
<tr><td>05</td><td>Dot defect<br><br>(Bright dot、Dark dot)<br><br>On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q’ty)</th></tr>
<tr><td rowspan="4">Dot Defect</td><td>Bright Dot</td><td>≦ 4</td></tr>
<tr><td>Dark Dot</td><td>≦ 5</td></tr>
<tr><td>Joint Dot</td><td>≦ 3</td></tr>
<tr><td>Total</td><td>≦ 7</td></tr>
</table>
5.1 Inspection pattern：full white , full black , Red , Green and blue screens.<br>
5.2 It is defined as dot defect if defect area ＞1/2 dot.<br>
5.3 The distance between two dot defect ≧5 mm.<br>
5.4 Bright dot that can not be seen through 5% ND filter.
</td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~15″：

(Ver.B01)

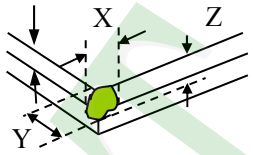
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>06</td><td>Black or white dot、scratch、contamination<br><br>Round type<br>  <br><br>Φ＝(x＋y) / 2<br><br>Line type<br>  <br></td><td>6.1 Round type ( Non-display or display)：<br><table><tr><th rowspan="2">Dimension (diameter：Φ)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ ≦ 0.25</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>0.25 ＜ Φ ≦ 0.50</td><td>5</td></tr><tr><td>Φ ＞ 0.50</td><td>0</td></tr><tr><td>Total</td><td>5</td></tr></table>6.2 Line type( Non-display or display)：<br><table><tr><th rowspan="2">module size</th><th>Length (L)</th><th rowspan="2">Width (W)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td rowspan="5">3.5” to less 9”</td><td>---</td><td>W ≦ 0.03</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>L ≦10.0</td><td>0.03 ＜W ≦ 0.05</td><td>4</td></tr><tr><td>L ≦5.0</td><td>0.05 ＜W ≦ 0.10</td><td>2</td></tr><tr><td>---</td><td>W ＞0.10</td><td>As round type</td></tr><tr><td colspan="2">Total</td><td>5</td></tr><tr><td rowspan="4">9” to 15”</td><td>---</td><td>W ≦ 0.05</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>L ≦10.0</td><td>0.05 ＜W ≦ 0.10</td><td>5</td></tr><tr><td>---</td><td>W ＞0.10</td><td>As round type</td></tr><tr><td colspan="2">Total</td><td>5</td></tr></table></td><td>Minor</td></tr>
<tr><td>07</td><td>Polarizer Bubble</td><td><table><tr><th rowspan="2">Dimension (diameter：Φ)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ ≦ 0.25</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>0.25 ＜ Φ ≦ 0.50</td><td>4</td></tr><tr><td>0.50 ＜ Φ ≦ 0.80</td><td>1</td></tr><tr><td>Φ ＞ 0.80</td><td>0</td></tr><tr><td>Total</td><td>5</td></tr></table></td><td>Minor</td></tr>
</table>

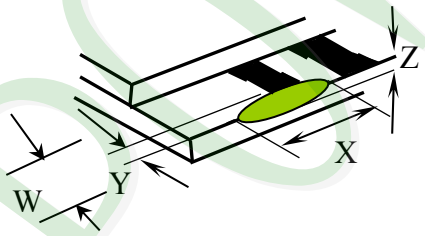
◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

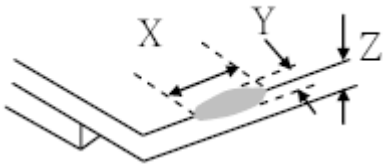
| NO | Item | Criterion | Level |
|---|---|---|---|
| 08 | The crack of glass | Symbols :<br>X : The length of crack<br>Y : The width of crack.<br>Z : The thickness of crack<br>W : terminal length<br>t : The thickness of glass<br>a : LCD side length<br><br>8.1 General glass chip :<br>8.1.1 Chip on panel surface and crack between panels:<br>  <br> | Minor |

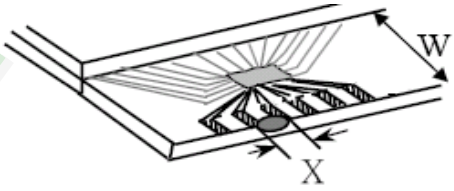
| X | Y | Z |
|---|---|---|
| ≦ a | Crack can't enter viewing area | ≦1/2 t |
| ≦ a | Crack can't exceed the half of SP width. | 1/2 t < Z ≦2 t |

◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="2">08</td><td rowspan="2">The crack of glass</td><td>
Symbols :<br><br>
X : The length of crack　　Y : The width of crack.<br>
Z : The thickness of crack　　W : terminal length<br>
t : The thickness of glass　　a : LCD side length<br><br>
8.1.2 Corner crack :<br>


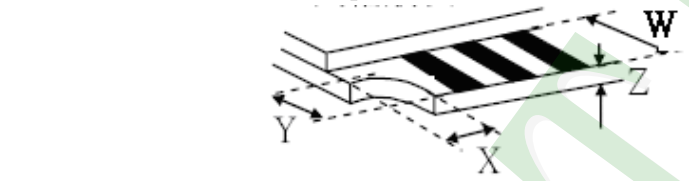
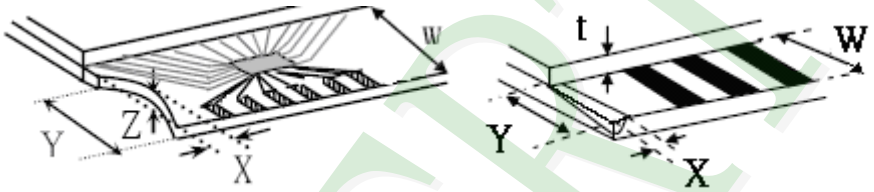
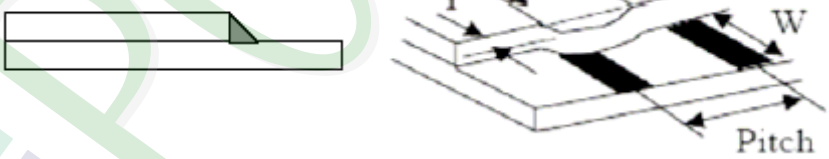
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/5 a</td><td>Crack can’t enter viewing area</td><td>Z ≦ 1/2 t</td></tr>
<tr><td>≦1/5 a</td><td>Crack can’t exceed the half of SP width.</td><td>1/2 t < Z ≦ 2 t</td></tr>
</table>
</td><td></td></tr>
<tr><td>
8.2 Protrusion over terminal :<br>
8.2.1 Chip on electrode pad :<br>






<table>
<tr><th></th><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>Front</td><td>≦ a</td><td>≦ 1/2 W</td><td>≦ t</td></tr>
<tr><td>Back</td><td>≦ a</td><td>≦ W</td><td>≦ 1/2 t</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

| NO | Item | Criterion | Level |
|---|---|---|---|
| 08 | The crack of glass | Symbols :<br>X : The length of crack Y : The width of crack.<br>Z : The thickness of crack W : terminal length<br>t : The thickness of glass a : LCD side length<br>8.2.2 Non-conductive portion :<br>  <br><br>  <br><br>X ≦ 1/3 a; Y ≦ W; Z ≦t<br>⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.<br>8.2.3 Glass remain :<br>  <br><br>X ≦ a; Y ≦ 1/3 W; Z ≦t<br>8.2.4 Cracking<br>  Not Allowed | Minor |

◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

| NO | Item | Criterion | Level |
|---|---|---|---|
| 09 | Backlight elements | 9.1 Backlight can't work normally. | Major |
| | | 9.2 Backlight doesn't light or color is wrong. | Major |
| | | 9.3 Illumination source flickers when lit. | Major |
| 10 | General appearance | 10.1 Pin type、quantity、dimension must match type in structure diagram. | Major |
| | | 10.2 No short circuits in components on PCB or FPC . | Major |
| | | 10.3 Parts on PCB or FPC must be the same as on the production characteristic chart .There should be no wrong parts , missing parts or excess parts. | Major |
| | | 10.4 Product packaging must the same as specified on packaging specification sheet. | Minor |
| | | 10.5 The folding and peeled off in polarizer are not acceptable. | Minor |
| | | 10.6 The PCB or FPC between B/L assembled distance(PCB or FPC ) is ≦1.5 mm. | Minor |

# 4. RELIABILITY TEST

## 4.1 Reliability Test Condition (Ver.B01)

<table>
<tr><th>NO.</th><th>TEST ITEM</th><th>TEST CONDITION</th></tr>
<tr><td>1</td><td>High Temperature Operation Test</td><td>Keep in +80 ±2℃ 240 hrs ,Display ON<br>Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>2</td><td>Low Temperature Operation Test</td><td>Keep in -30 ±2℃ 240 hrs ,Display ON<br>Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>3</td><td>High Temperature Storage Test</td><td>Keep in +80 ±2℃ 240 hrs<br>Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>4</td><td>Low Temperature Storage Test</td><td>Keep in -30 ±2℃ 240 hrs<br>Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>5</td><td>High Temperature / High Humidity Storage Test</td><td>Keep in +60℃ / 90% R.H duration for 240 hrs<br>Surrounding temperature, then storage at normal condition 4hrs.<br>(Excluding the polarizer)</td></tr>
<tr><td>6</td><td>Temperature Cycling Storage Test</td><td>-30℃ → +25℃ → +80℃ → +25℃<br>(30mins) (5mins) (30mins) (5mins)<br>20 Cycle<br>Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>7</td><td>ESD Test</td><td>Air Discharge:<br>Apply 2 KV with 5 times<br>Discharge for each polarity +/-<br>Contact Discharge:<br>Apply 250 V with 5 times<br>discharge for each polarity +/-<br>1. Temperature ambiance : 15℃～35℃<br>2. Humidity relative : 30%～60%<br>3. Energy Storage Capacitance(Cs+Cd) : 150pF±10%<br>4. Discharge Resistance(Rd) : 330Ω±10%<br>5. Discharge, mode of operation :<br>Single Discharge (time between successive discharges at least 1 sec)<br>(Tolerance if the output voltage indication : ±5%)</td></tr>
<tr><td>8</td><td>Vibration Test (Packaged)</td><td>1. Sine wave 10～55 Hz frequency (1 min)<br>2. The amplitude of vibration :1.5 mm<br>3. Each direction (X、Y、Z) duration for 2 Hrs</td></tr>
<tr><td>9</td><td>Drop Test (Packaged)</td><td><table><tr><th>Packing Weight (Kg)</th><th>Drop Height (cm)</th></tr><tr><td>0 ~ 45.4</td><td>122</td></tr><tr><td>45.4 ~ 90.8</td><td>76</td></tr><tr><td>90.8 ~ 454</td><td>61</td></tr><tr><td>Over 454</td><td>46</td></tr></table>Drop direction :※1 corner / 3 edges / 6 sides each 1times</td></tr>
</table>

# 5. PRECAUTION RELATING PRODUCT HANDLING

## 5.1 SAFETY

5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

## 5.2 HANDLING

5.2.1 Avoid any strong mechanical shock which can break the glass.

5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.

5.2.3 Do not remove the panel or frame from the module.

5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.

5.2.6 Do not touch the display area with bare hands , this will stain the display area.

5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8 To control temperature and time of soldering is 320±10℃and 3-5 sec.

5.2.9 To avoid liquid (include organic solvent) stained on LCM .

5.2.10 Caution!( LCM products with Capacitive Touch Panel)

Strong EMI-sources such as switch-mode power supplies (SMPS) can lead to touch malfunction (e.g. ghost-touches).

Therefore, the touch needs to be thoroughly tested inside the target application.

## 5.3 STORAGE

5.3.1 Store the panel or module in a dark place where the temperature is 25℃ ±5℃ and the humidity is below 65% RH.

5.3.2 Do not place the module near organics solvents or corrosive gases.

5.3.3 Do not crush , shake , or jolt the module.

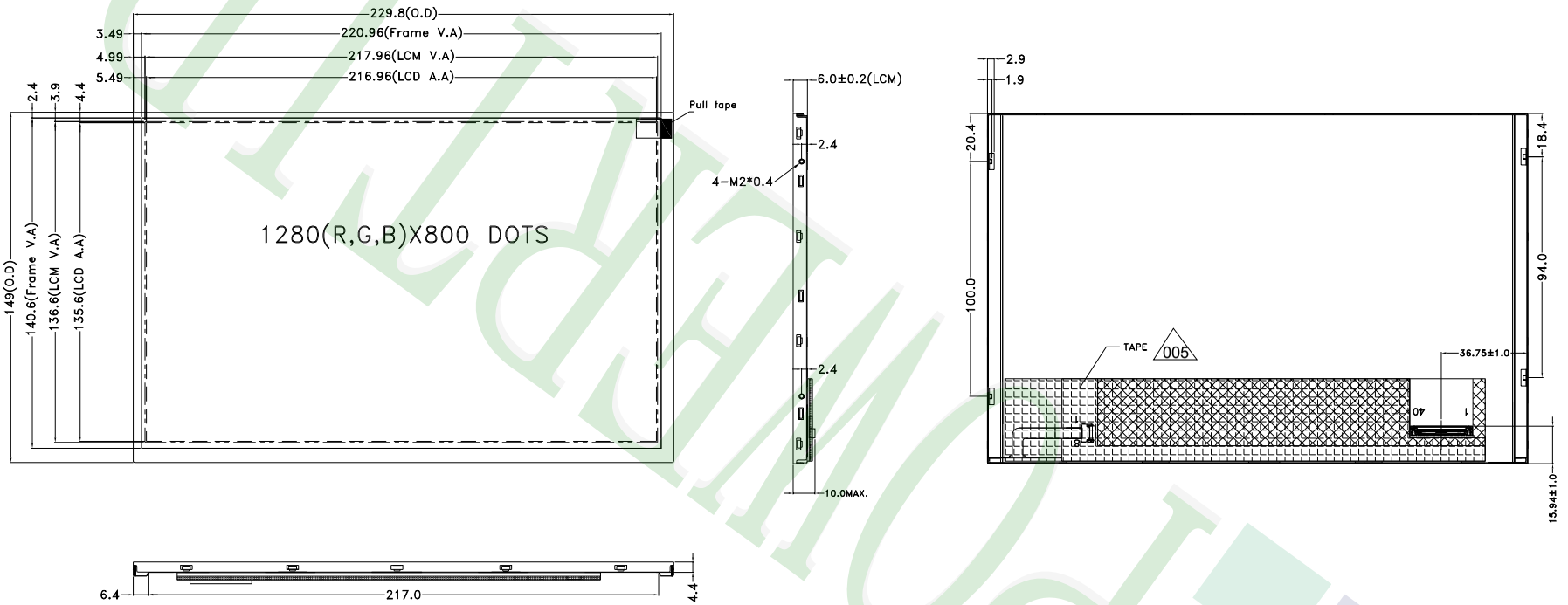
## 5.4 TERMS OF WARRANTY

5.4.1 Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

5.4.2 Unaccepted responsibility

This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.




NOTES:

1. LCD TYPE: TFT LCD
2. LCD DISPLAY: POSITIVE/TRANSMISSIVE
3. The tolerance unless classified ±0.3mm
4. Manufacturer/Type :Starconn/300E40-0010RA-G3
5. Mating Receptacle/Type (Reference) :111B40-1211TA-G3 or Compatible

| REV | REV BY | REVISER | DATE |
|---|---|---|---|
| 007 | | | |
| 006 | | | |
| 005 | ADD TAPE | Air | 2020/04/02 |
| 004 | ADD DIM. | Air | 2019/11/29 |
| 003 | UPDATE BL&FC | Air | 2019/11/22 |
| 002 | UPDATE DRAWING | Air | 2018/05/15 |
| 001 | NEW DRAWING | Air | 2018/01/31 |

PART NO: PH128800T004-ZZA01

DRAWING NAME : JLMD-PH128800T004-ZZA01

TITLE: LCD MODULE DRAWING

久正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

| | | | | | |
|---|---|---|---|---|---|
| Design | Air | (3) | Surface | | |
| Check | Terry | Unit | MM | Material | |
| Scale | 1:1 | | | Thickness | |
| Approve | Ryan | Page | 1/1 | Quantity | |

| Length(Min) (mm) / Tolerance / Precision | Precision Level |
|---|---|
| 1 ~ 4 | - |
| 4 ~ 16 | - |
| 16 ~ 63 | - |
| 63 ~ 250 | - |
| 250 ~ 1000 | - |

PT-A-054-01

Ver.001

| Documents NO. | JPKG-PH128800T004-ZZA01 |
|---|---|

# LCM包裝規格書
## LCM Packaging Specifications (For Tray)

| Approve | Check | Contact |
|---|---|---|
| Ryan | Terry | Air |

1.包裝材料規格表 (Packaging Material) : (per carton)

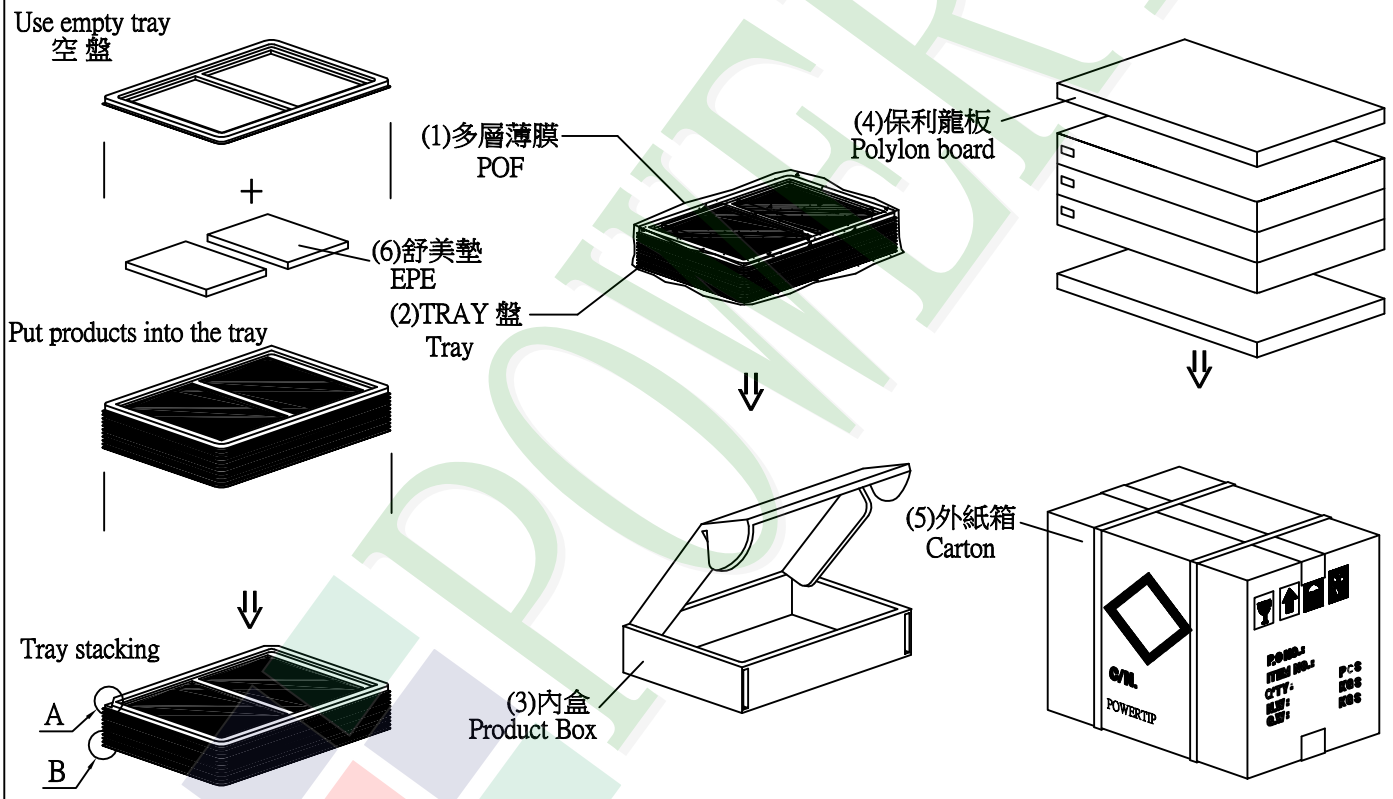
| No. | Item | Model | Dimensions (mm) | 1Pcs Weight | Quantity | Total Weight |
|---|---|---|---|---|---|---|
| 1 | 成品 (LCD) | PH128800T004-ZZA01 | 229.8 X 149 X 6.0 | 0.2271 | 18 | 4.0878 |
| 2 | 多層薄膜(1)POF | OTFILM0BA03ABA | ———— | —— | 3 | —— |
| 3 | TRAY 盤 (2)Tray | TY00000000394 | 517 X 377 X 18.8 | 0.2 | 12 | 2.4 |
| 4 | 內盒(3)Product Box | BX00000000071 | 558 X 393 X 68 | 0.6 | 3 | 1.8 |
| 5 | 保利龍板(4)Polylon board | OTPLB00PL08ABA | 550 X 393 X 20 | 0.0284 | 2 | 0.0568 |
| 6 | 外紙箱(5)Carton | BX57041027CCBA | 570 X 410 X 265 | 1.0 | 1 | 1.0 |
| 7 | 舒美墊(6)EPE | OTFOAMEP0001BA | 333X 218 X 2.0 | 0.0032 | 14 | 0.0448 |
| 8 | | | | | | |
| 9 | | | | | | |

2.一 整箱總重量 (Total LCD Weight in carton ) : 9.39 Kg±10%

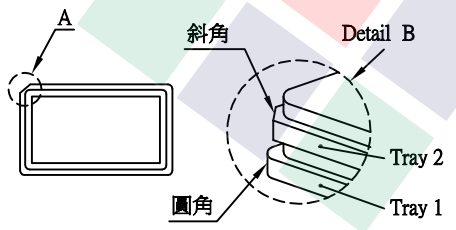
3.單箱數量規格表 (Packaging Specifications and Quantity) :

(1)LCD quantity per box : no per tray 2 x no of tray 3 = 6

(2)Total LCD quantity in carton : quantity per box 6 x no of boxes 3 = 18

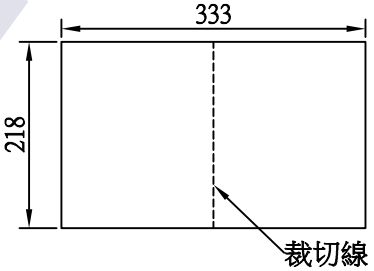



## 特 記 事 項 (REMARK)




4. TRAY盤相疊時,需旋轉180度,請詳見B視圖
Rotate tray 180 degrees and place on top of stack.
Check the tray stack using Fig. B.

5. LCM上面放置2.0t EPE(舒美墊)




6. LCM下方放置1pcs，2.0t EPE(舒美墊)
1pcs(裁切後尺寸109x166.5)