



晶采光電科技股份有限公司  
AMPIRE CO., LTD.

## SPECIFICATIONS FOR LCD MODULE

|                          |                            |
|--------------------------|----------------------------|
| <b>CUSTOMER</b>          |                            |
| <b>CUSTOMER PART NO.</b> |                            |
| <b>AMPIRE PART NO.</b>   | <b>AM-800600P1TMQW-A1H</b> |
| <b>APPROVED BY</b>       |                            |
| <b>DATE</b>              |                            |

☒ Approved For Specifications

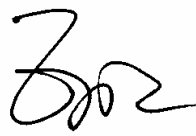
☐ Approved For Specifications & Sample

**AMPIRE CO., LTD.**

**2F., No.88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei  
City221, Taiwan (R.O.C.)**

**新北市汐止區新台五路一段 88 號 2 樓(東方科學園區 D 棟)**

**TEL:886-2-26967269 , FAX:886-2-26967196 or 26967270**

| APPROVED BY                                                                         | CHECKED BY                                                                          | ORGANIZED BY                                                                          |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |

## RECORD OF REVISION

| Revision Date | Page | Contents    | Editor |
|---------------|------|-------------|--------|
| 2011/5/6      | --   | New Release | Eric   |

## 1. Features

8 inch Amorphous-TFT-LCD (Thin Film Transistor Liquid Crystal Display) module.  
This module is composed of a 8" TFT-LCD panel, LED backlight and power circuit unit.

- (1) Construction: 8" a-Si TFT active matrix, White LED Backlight and power circuit board.
- (2) Resolution (pixel): 800(R.G.B) X600
- (3) Number of the Colors : 262K colors ( R , G , B 6 bit digital each)
- (4) LCD type : Transmissive , normally White
- (5) Interface: 20 Pin (LVDS interface)
- (6) Power Supply Voltage: 3.3V for logic voltage, 5.0V for LED driver power voltage.
- (6) Viewing Direction: 6 O'clock ( The direction it's hard to be discolored )

## 2. PHYSICAL SPECIFICATIONS

| Item              | Specifications                 | unit |
|-------------------|--------------------------------|------|
| LCD size          | 8 inch (Diagonal)              |      |
| Resolution        | 800 x 3(RGB) x 600             | dot  |
| Dot pitch         | 0.0675(W) x 0.2025(H)          | mm   |
| Active area       | 162.0(W) x 121.5(H)            | mm   |
| Module size       | 183.0(W) x 141.0(H) x 10.35(D) | mm   |
| Surface treatment | Anti-Glare                     |      |
| Color arrangement | RGB-stripe                     |      |
| interface         | Digital                        |      |
| Weight            | 270                            | g    |

### 3. ABSOLUTE MAX. RATINGS

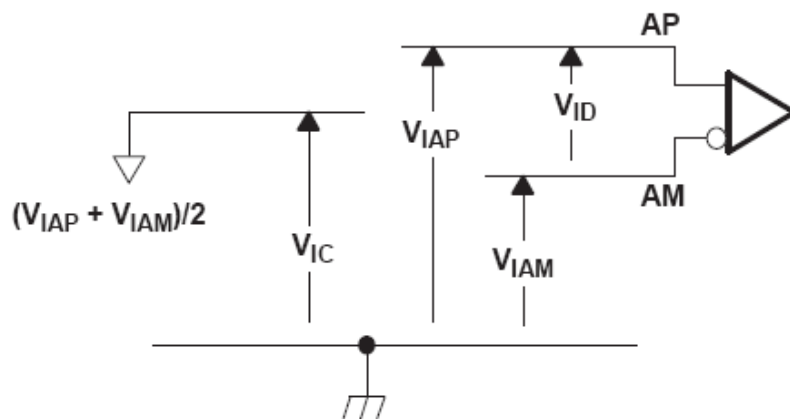
| Item                  | Symbol | Values |         | UNIT | Note   |
|-----------------------|--------|--------|---------|------|--------|
|                       |        | Min.   | Max.    |      |        |
| Power voltage         | VCC    | -0.5   | 5       | V    |        |
|                       | VLED   | -0.5   | 6.0     |      |        |
| Input signal voltage  | Vi     | -0.3   | VCC+0.3 | V    | Note 1 |
| Operation temperature | TOP    | -20    | 70      | °C   |        |
| Storage temperature   | TST    | -30    | 80      | °C   |        |

Note 1: The product is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

## 4. ELECTRICAL CHARACTERISTICS

### 4-1 TFT LCD Module

|            |                                      | MIN                  | NOM                        | MAX | UNIT |
|------------|--------------------------------------|----------------------|----------------------------|-----|------|
| $V_{CC}$   | Supply voltage                       | 3                    | 3.3                        | 3.6 | V    |
| $V_{IH}$   | High-level input voltage (SHTDN)     | 2                    |                            |     | V    |
| $V_{IL}$   | Low-level input voltage (SHTDN)      |                      |                            | 0.8 | V    |
| $ V_{ID} $ | Magnitude differential input voltage | 0.1                  |                            | 0.6 | V    |
| $V_{IC}$   | Common-mode input voltage            | $\frac{ V_{ID} }{2}$ | $2.4 - \frac{ V_{ID} }{2}$ |     | V    |

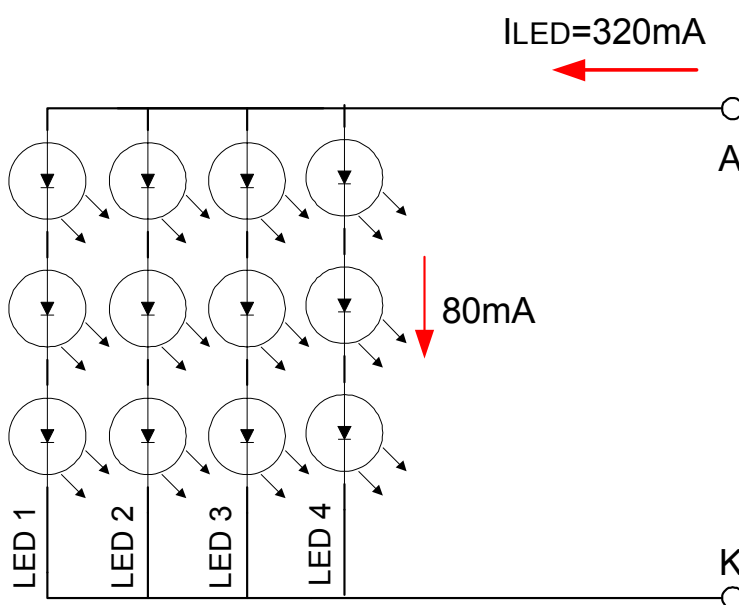


## 4-2 Backlight Driving Conditions

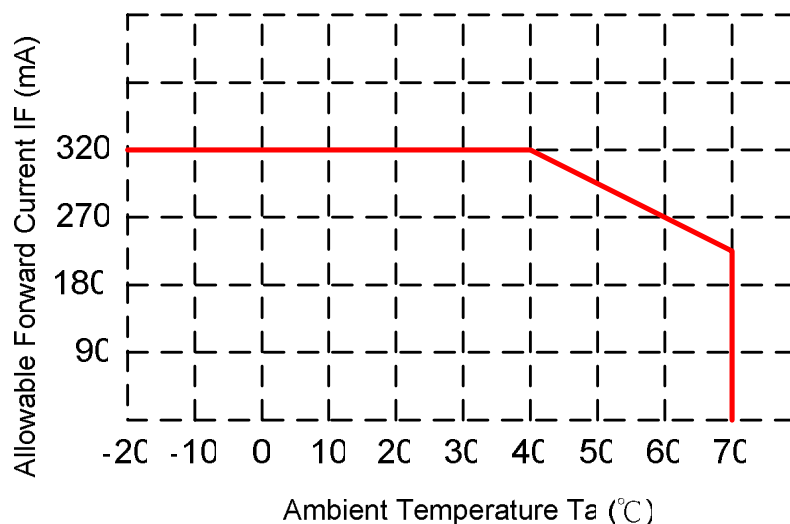
| Item                                | Symbol           | Values |      |      | Unit | Note                                |
|-------------------------------------|------------------|--------|------|------|------|-------------------------------------|
|                                     |                  | Min.   | Typ. | Max. |      |                                     |
| LED Driver voltage                  | VLED             | --     | 5    | --   | V    |                                     |
| Power Supply Current For LED Driver | ILED             | -      | 830  | -    | mA   | VLED=5V<br>VADJ=3.3V<br>(duty 100%) |
| ADJ Input Voltage                   | V <sub>ADJ</sub> | -      | 3.3  | --   | V    | duty=100%<br>Note(3)                |
| LED voltage                         | V <sub>AK</sub>  | --     | 9.9  | --   | V    | I <sub>L</sub> =160mA<br>Ta=25°C    |
| LED current                         | I <sub>L</sub>   | 324    | 320  | 396  | mA   | Ta=25°C                             |
|                                     |                  | --     | 270  | --   | mA   | Ta=60°C                             |
| LED Life Time                       | -                | --     | 50K  | --   | Hour | Note (2)                            |

Note (1) The constant current source is needed for white LED back-light driving. When LCM is operated over 60 deg.C ambient temperature, the I<sub>L</sub> of the LED back-light should be adjusted to 270mA max

Note (2) Brightness to be decreased to 50% of the initial value.

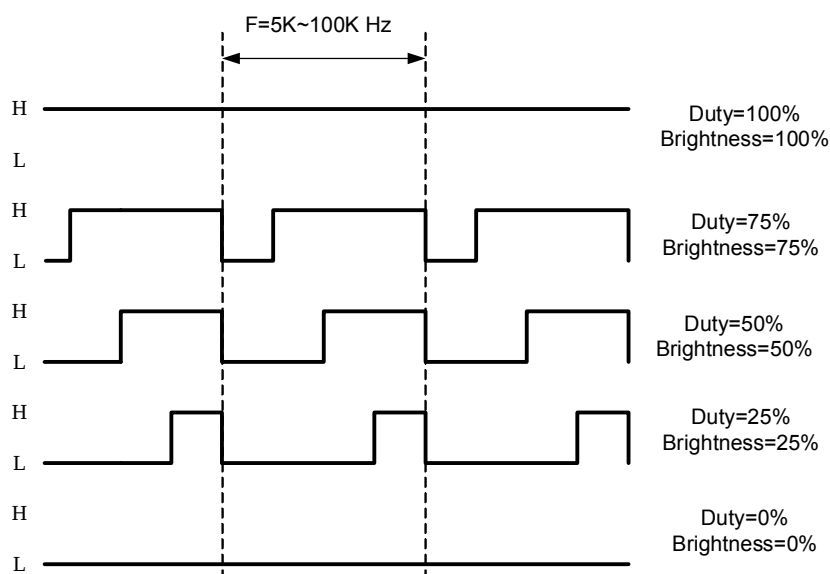


When LCM is operated over 40°C ambient temperature, the ILED should be follow :

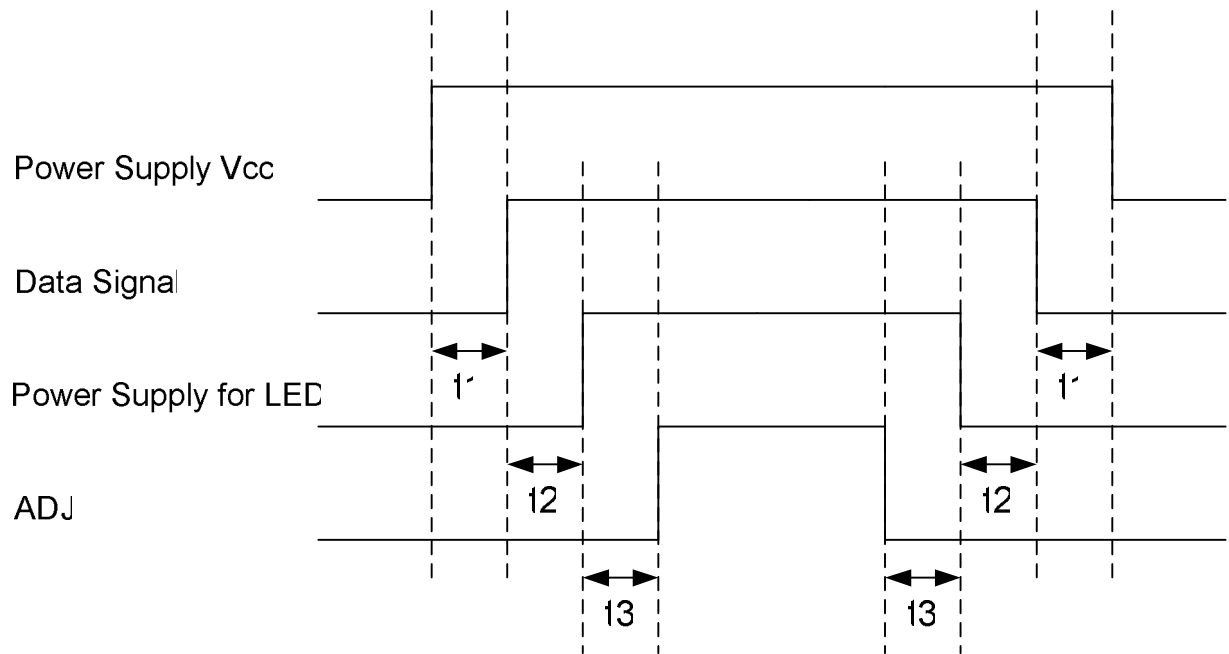


Note(3) VLEDADJ is PWM signal input. It is for brightness control.

| ITEM                        | SYMBOL           | MIN  | TYP | MAX         | UNIT |
|-----------------------------|------------------|------|-----|-------------|------|
| ADJ signal frequency        | f <sub>PWM</sub> | 5K   | 20K | 100K        | Hz   |
| ADJ signal logic level High | VIH              | 2.4V | --  | VLED (5.0V) | V    |
| ADJ signal logic level Low  | VIL              | 0    | --  | 0.8         | V    |

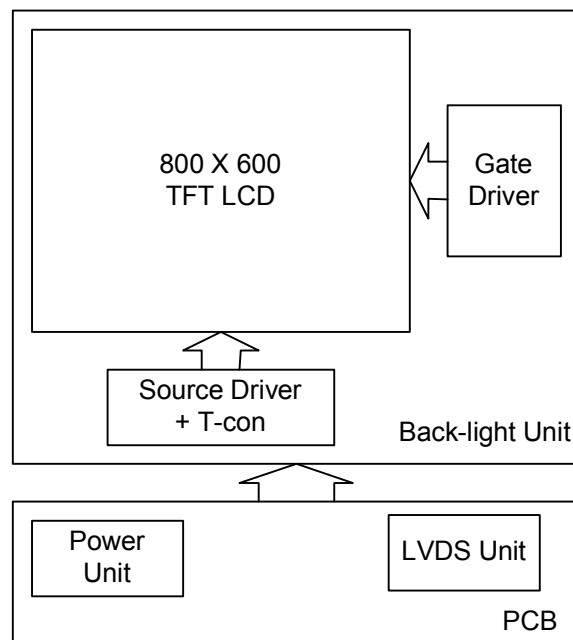


### 4-3 Power Sequence



$t_1' > 50 \text{ mSec}$   
 $t_2 \geq 200 \text{ mSec}$   
 $t_3 \geq 50 \text{ mSec}$

#### 4-4 Block Diagram



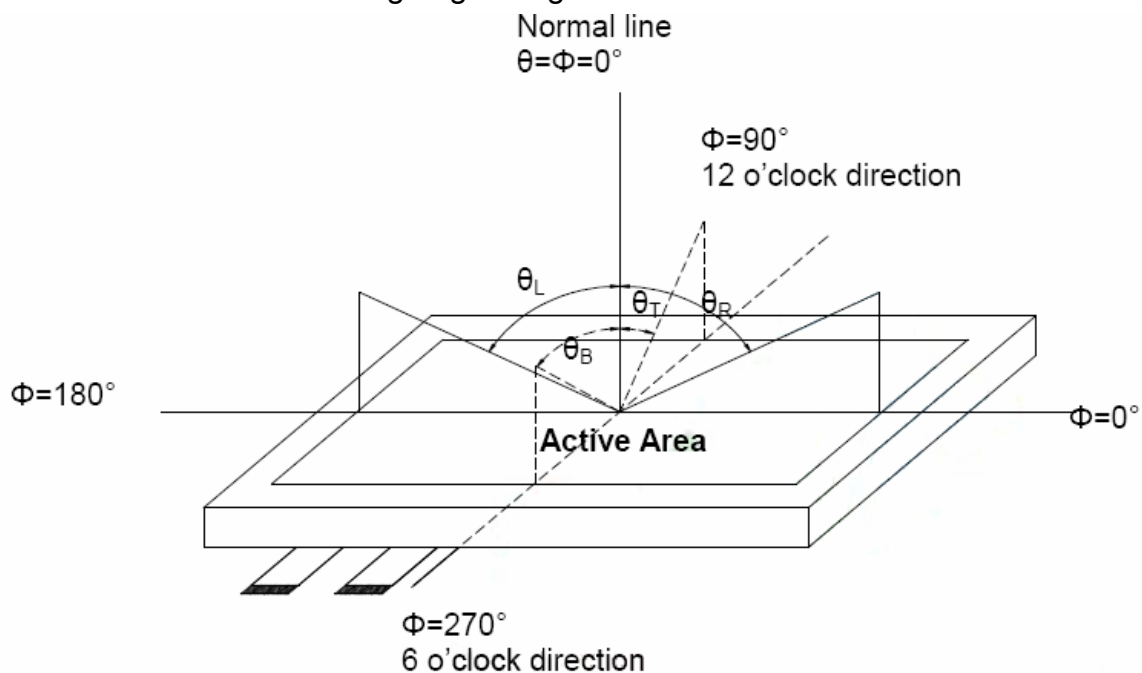
## 5. Optical Specifications

| Item                            | Symbol     | Condition                           | Values |       |       | Unit              | Note           |
|---------------------------------|------------|-------------------------------------|--------|-------|-------|-------------------|----------------|
|                                 |            |                                     | Min.   | Typ.  | Max.  |                   |                |
| Viewing angle<br>(CR $\geq$ 10) | $\theta$ L | $\Phi = 180^\circ$<br>(9 o'clock)   | 60     | 70    | --    | degree            | Note1          |
|                                 | $\theta$ R | $\Phi = 0^\circ$<br>(3 o'clock)     | 60     | 70    | --    |                   |                |
|                                 | $\theta$ T | $\Phi = 90^\circ$<br>(12 o'clock)   | 40     | 50    | --    |                   |                |
|                                 | $\theta$ B | $\Phi = 270^\circ$<br>(6 o'clock)   | 60     | 70    | --    |                   |                |
| Response time                   | TON        | Normal<br>$\theta = \Phi = 0^\circ$ | --     | 10    | 20    | msec              | Note3          |
|                                 | TOFF       |                                     | --     | 15    | 30    | msec              |                |
| Contrast ratio                  | CR         |                                     | 400    | 500   | --    | --                | Note4          |
| Color<br>chromaticity           | Rx         |                                     | 0.578  | 0.628 | 0.678 | --                | Note5<br>Note6 |
|                                 | Ry         |                                     | 0.294  | 0.344 | 0.394 |                   |                |
|                                 | Gx         |                                     | 0.289  | 0.339 | 0.389 |                   |                |
|                                 | Gy         |                                     | 0.538  | 0.588 | 0.538 |                   |                |
|                                 | Bx         |                                     | 0.104  | 0.154 | 0.204 |                   |                |
|                                 | By         |                                     | 0.081  | 0.131 | 0.181 |                   |                |
|                                 | Wx         |                                     | 0.26   | 0.31  | 0.36  |                   |                |
|                                 | Wy         |                                     | 0.28   | 0.33  | 0.38  | --                |                |
| Luminance                       | L          |                                     | 400    | 500   | --    | cd/m <sup>2</sup> | Note6          |
| Luminance<br>uniformity         | YU         |                                     | 70     | 75    | --    | %                 | Note7          |

Test Conditions :

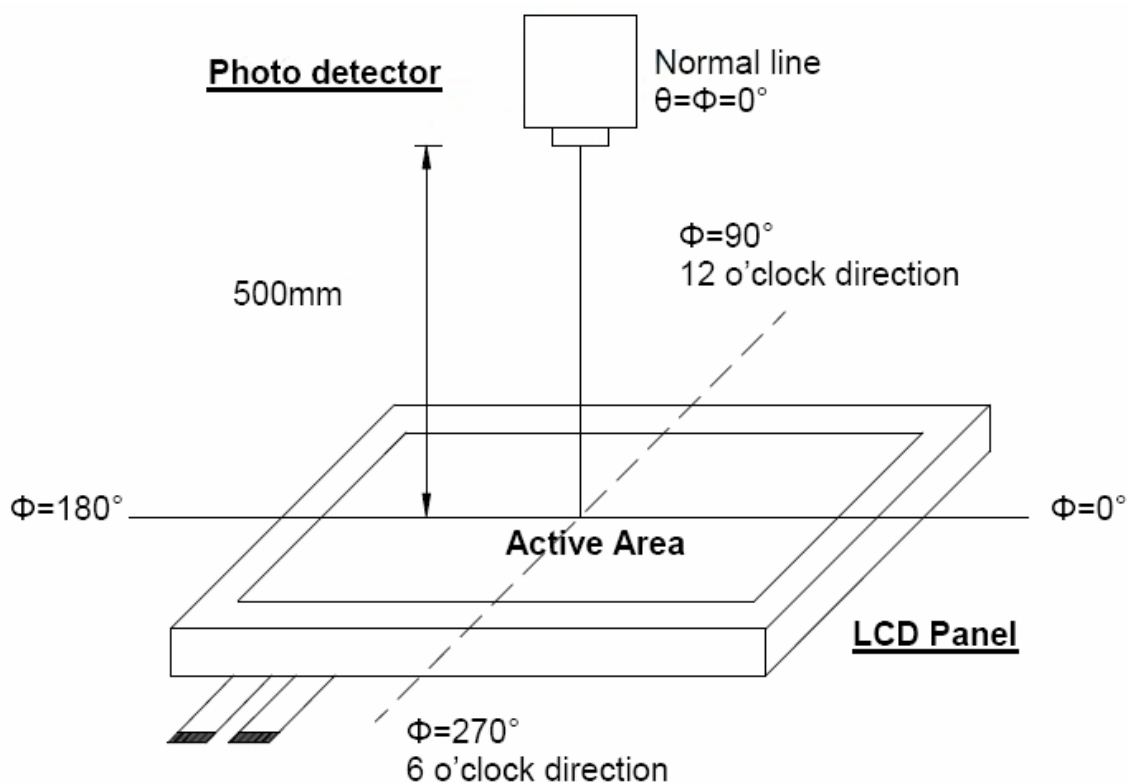
1.  $V_{LED} = 5V$ ,  $I_L = 160mA$  (Backlight current), the ambient temperature is 25°C.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



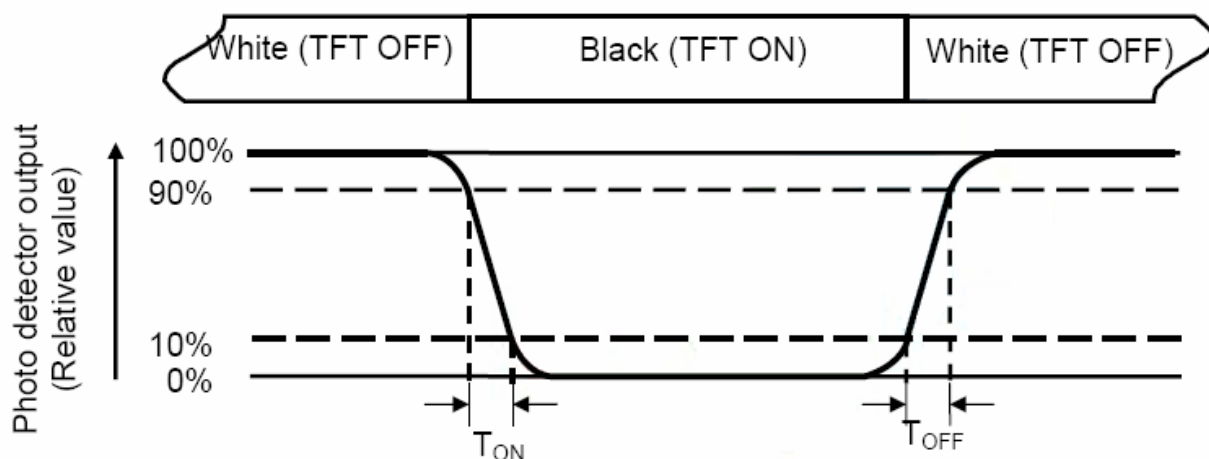
Note 2 : Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view :  $1^\circ$  / Height : 500mm.)



Note 3 : Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time ( $T_{ON}$ ) is the time between photo detector output intensity changed from 90% to 10%. And fall time ( $T_{OFF}$ ) is the time between photo detector output intensity changed from 10% to 90%.



Note 4 : Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5 : Definition of color chromaticity (CIE1931)

Color coordinated measured at center point of LCD.

Note 6 : All input terminals LCD panel must be ground when measuring the center area of the panel.

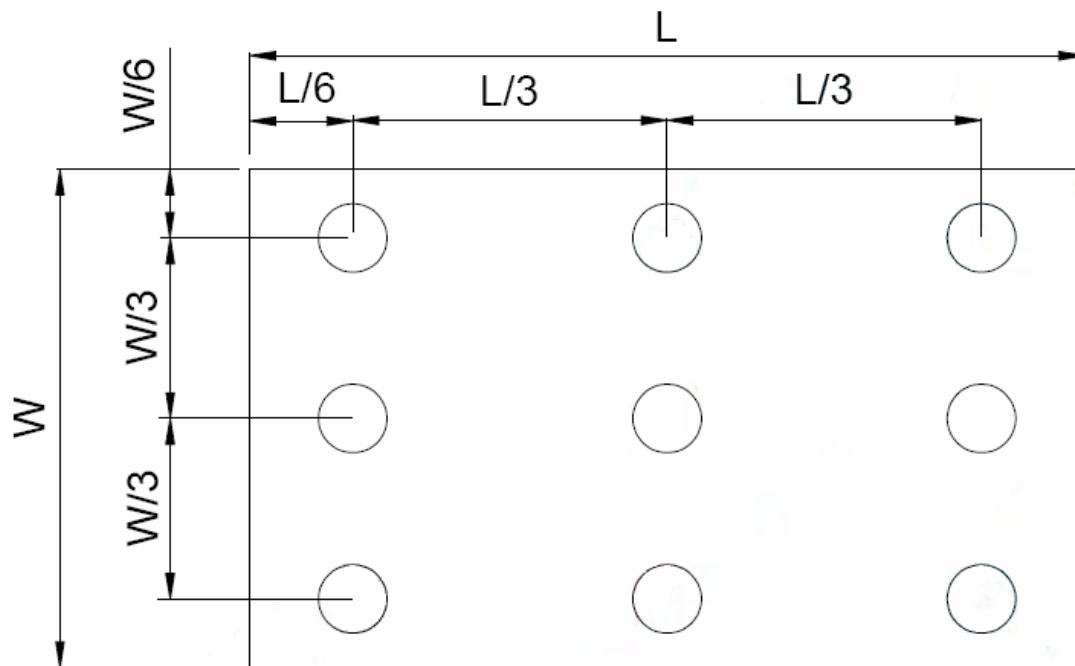
Note 7 : Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to bellow figure). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{\min}}{B_{\max}}$$

L ----- Active area length

W ----- Active area width



$B_{\max}$  : The measured maximum luminance of all measurement position.

$B_{\min}$  : The measured minimum luminance of all measurement position.

## 6. INTERFACE

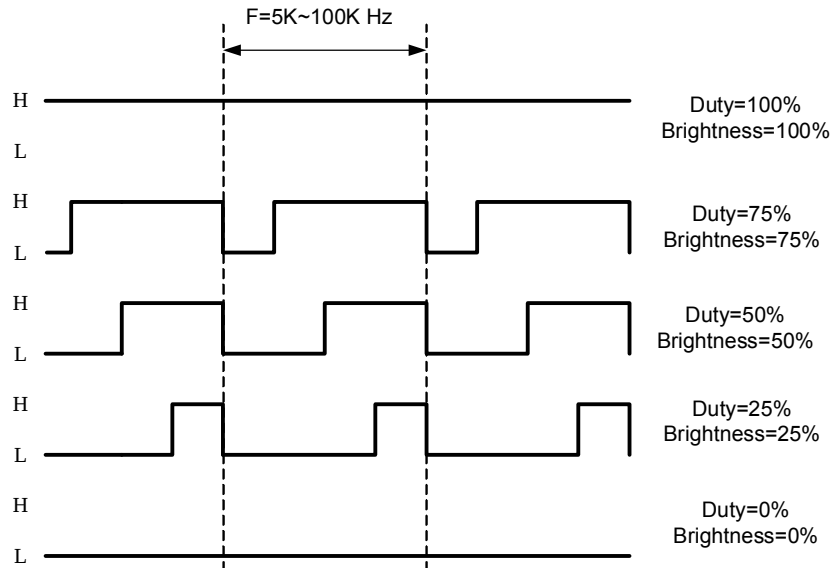
### TFT LCD Panel Driving Section

| Pin No. | Symbol | Description                     | Note |
|---------|--------|---------------------------------|------|
| 1       | VDD    | POWER SUPPLY:3.3V               |      |
| 2       | VDD    | POWER SUPPLY:3.3V               |      |
| 3       | GND    | Power Ground                    |      |
| 4       | GND    | Power Ground                    |      |
| 5       | IN0-   | Transmission Data               |      |
| 6       | IN0+   | Transmission Data               |      |
| 7       | GND    | Power Ground                    |      |
| 8       | IN1-   | Transmission Data               |      |
| 9       | IN1+   | Transmission Data               |      |
| 10      | GND    | Power Ground                    |      |
| 11      | IN2-   | Transmission Data               |      |
| 12      | IN2+   | Transmission Data               |      |
| 13      | GND    | Power Ground                    |      |
| 14      | CLK-   | Sampling Clock                  |      |
| 15      | CLK+   | Sampling Clock                  |      |
| 16      | GND    | Power Ground                    |      |
| 17      | VLED   | POWER SUPPLY for Backlight : 5V |      |
| 18      | VLED   | POWER SUPPLY for Backlight : 5V |      |
| 19      | GND    | Power Ground                    |      |
| 20      | ADJ    | Adjust the LED brightness       |      |

NOTE :

(1) Pin19: ADJ is PWM signal input. It is for brightness control.

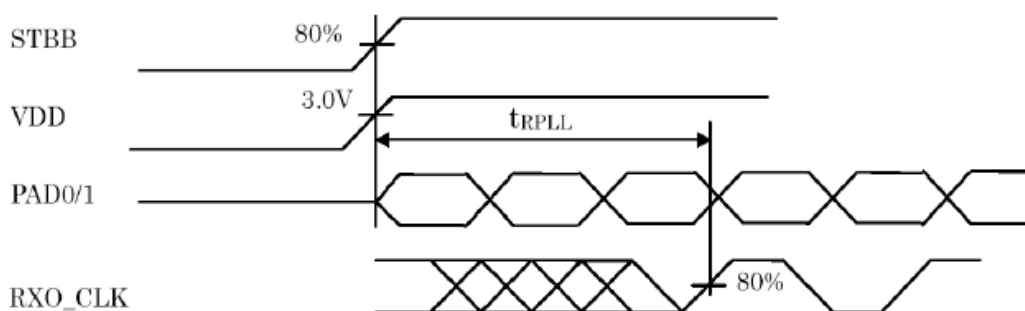
| ITEM                        | SYMBOL    | MIN  | TYP | MAX                 | UNIT |
|-----------------------------|-----------|------|-----|---------------------|------|
| ADJ signal frequency        | $f_{PWM}$ | 5K   | 20K | 100K                | Hz   |
| ADJ signal logic level High | $V_{IH}$  | 2.4V | --  | $V_{LED}$<br>(5.0V) | V    |
| ADJ signal logic level Low  | $V_{IL}$  | 0    | --  | 0.8                 | V    |



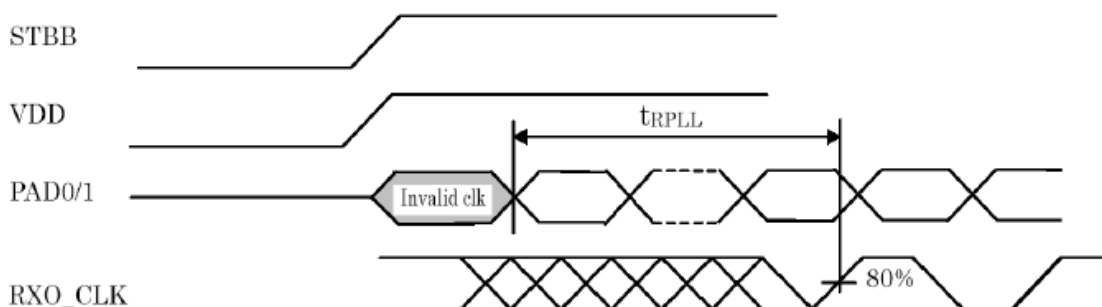


### 7-3 Phase Lock Loop Set Time :

(Case1)



(Case2)

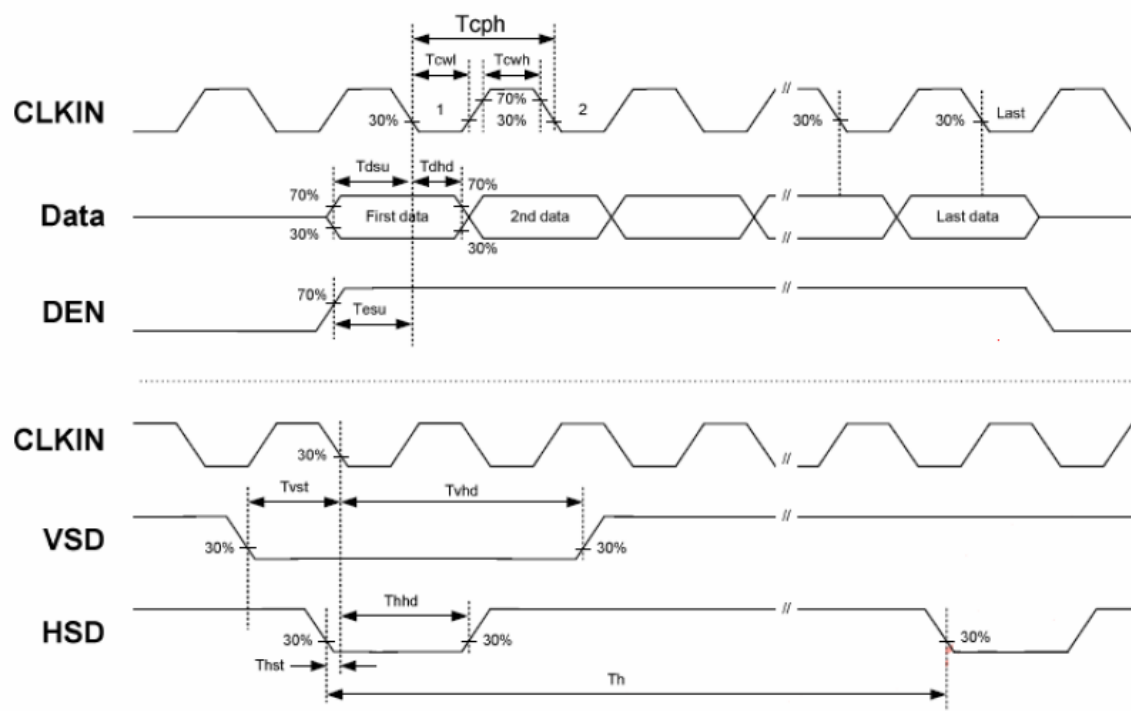


### 7-4 Switching Characteristics :

< recommended operating condition (unless otherwise noted) >

| Parameter                                 | Symbol     | min        | typ    | max        | Unit |
|-------------------------------------------|------------|------------|--------|------------|------|
| RXO_CLK Period                            | $t_{RCP}$  | 11.76      | T      | 50         | ns   |
| RXO_CLK High Time                         | $t_{RCH}$  | -          | $T/2$  | -          | ns   |
| RXO_CLK Low Time                          | $t_{RCL}$  | -          | $T/2$  | -          | ns   |
| PAD0/1 to RXO_CLK Delay                   | $t_{RCD}$  | -          | $3T/7$ | -          | ns   |
| Data Setup to RXO_CLK                     | $t_{RS}$   | 1.9        | -      | -          | ns   |
| Data Hold from RXO_CLK                    | $t_{RH}$   | 3.0        | -      | -          | ns   |
| Input Data Position 0 (T=11.76ns) (note1) | $t_{RIP1}$ | -0.4       | 0      | 0.4        | ns   |
| Input Data Position 1 (T=11.76ns) (note1) | $t_{RIP0}$ | $T/7-0.4$  | $T/7$  | $T/7+0.4$  | ns   |
| Input Data Position 2 (T=11.76ns) (note1) | $t_{RIP6}$ | $2T/7-0.4$ | $2T/7$ | $2T/7+0.4$ | ns   |
| Input Data Position 3 (T=11.76ns) (note1) | $t_{RIP5}$ | $3T/7-0.4$ | $3T/7$ | $3T/7+0.4$ | ns   |
| Input Data Position 4 (T=11.76ns) (note1) | $t_{RIP4}$ | $4T/7-0.4$ | $4T/7$ | $4T/7+0.4$ | ns   |
| Input Data Position 5 (T=11.76ns) (note1) | $t_{RIP3}$ | $5T/7-0.4$ | $5T/7$ | $5T/7+0.4$ | ns   |
| Input Data Position 6 (T=11.76ns) (note1) | $t_{RIP2}$ | $6T/7-0.4$ | $6T/7$ | $6T/7+0.4$ | ns   |
| Phase Lock Loop Set                       | $t_{RPLL}$ | -          | -      | 10         | ms   |

note1 : VDD=3.3V, Ta=25°C



## 8. RELIABILITY TEST CONDITIONS

(Note 3)

| Item                                     | Test Conditions                                                                                                                              | Note     |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|
| High Temperature Storage                 | Ta = 80℃ 240 hrs                                                                                                                             | Note 1,4 |
| Low Temperature Storage                  | Ta = -30℃ 240 hrs                                                                                                                            | Note 1,4 |
| High Temperature Operation               | Ts = 70℃ 240 hrs                                                                                                                             | Note 2,4 |
| Low Temperature Operation                | Ta = -20℃ 240 hrs                                                                                                                            | Note1,4  |
| Operate at High Temperature and Humidity | +60℃, 90%RH 240 hrs                                                                                                                          |          |
| Thermal Shock                            | -30℃ /30 min ~ +80℃ /30 min for a total 100 cycles, Start with cold temperature and end with high temperature                                |          |
| Vibration Test                           | Frequency range : 10 ~ 55Hz<br>Stroke : 1.5mm<br>Sweep : 10Hz ~ 55Hz ~ 10Hz<br>2 hours for each direction of X. Y. Z.<br>(6 hours for total) |          |
| Mechanical Shock                         | 100G 6ms, ±X, ±Y, ±Z 3 times for each direction                                                                                              |          |
| Package Vibration Test                   | Random Vibration :<br>0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500Hz<br>2 hours for each direction of X. Y. Z.<br>(6 hours for total)  |          |
| Package Drop Test                        | Height : 60 cm<br>1 comer, 3 edges, 6 surfaces                                                                                               |          |
| Electro Static Discharge                 | ±2KV, Human Body Mode, 100pF/1500Ω                                                                                                           |          |

Note 1 : Ta is the ambient temperature of samples.

Note 2 : Ts is the temperature of panel's surface.

Note 3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 4 : Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

## Display Quality

### 1. Function Related :

The function defects of line defect, abnormal display, and no display are considered Major defects.

### 2. Bright / Dark Dots :

| Defect Type | Specification | Major | Minor |
|-------------|---------------|-------|-------|
| Bright Dots | $N \leq 3$    |       | ●     |
| Dark Dots   | $N \leq 4$    |       | ●     |
| Total       | $N \leq 6$    |       |       |

Note : The definition of dot : The size of a defective dot over 1/2 of whole dot is regarded as one defective dot.

Bright dot : Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.

Dark dot : Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue pattern.

### 3. Pixel Definition :

|                                                                                     |                                                                                     |                                                                                     |   |                                                                                     |                                                                                     |   |   |   |  |                                                                                       |                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|---|--|---------------------------------------------------------------------------------------|---------------------|
| R                                                                                   |  | B                                                                                   | R | G                                                                                   | B                                                                                   | R | G | B |  |  | Dot Defect          |
| R                                                                                   | G                                                                                   | B                                                                                   | R |  | B                                                                                   | R | G | B |  |  | Adjacent Dot Defect |
|  |  |  | R | G                                                                                   |  | R | G | B |  |  | Cluster             |

Note 1: If pixel or partial sub-pixel defects exceed 50% of the affected pixel or sub-pixel area, it shall be considered as 1 defect.

Note 2: Extraneous substance and scratch not affecting the display of image, for instance, extraneous substance under polarizer film but outside the display area, or scratch on metal bezel and backlight module or polarizer film outside the display area, shall not be considered as defective or non-conforming.

## **9. General Precautions**

### **9-1 Safety**

Liquid crystal is poisonous. Do not put it your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

### **9-2 Handling**

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

### **9-3 Static Electricity**

1. Be sure to ground module before turning on power or operation module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

### **9-4 Storage**

1. Store the module in a dark room where must keep at  $+25\pm 10^{\circ}\text{C}$  and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

### **9-5 Cleaning**

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft cloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

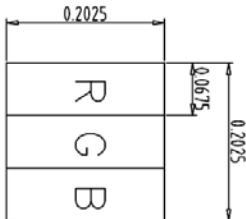
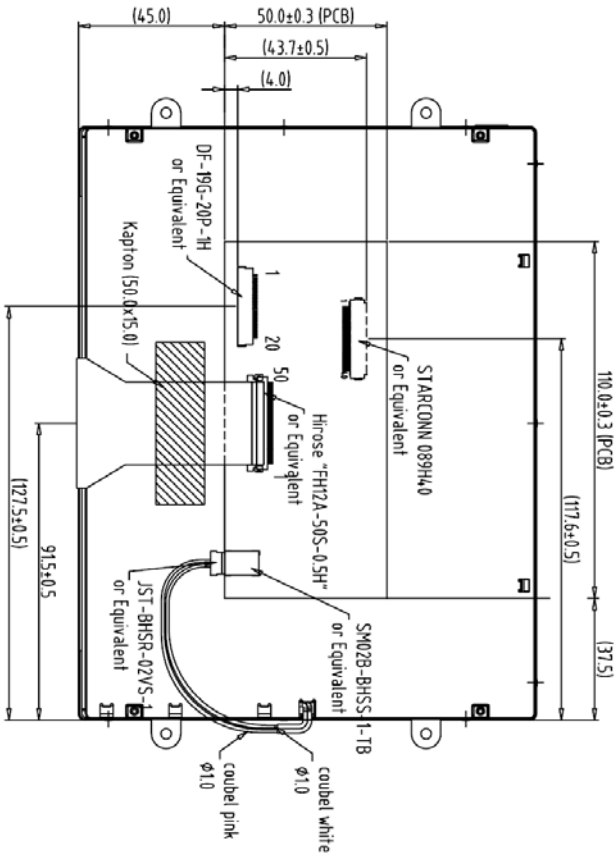
### **9-5 Others**

1. AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.



| REV | REVISION RECORD                        | DATE     | NAME  |
|-----|----------------------------------------|----------|-------|
| 0   | NEW RELEASE                            | 01-14-11 | EMILY |
| 1   | TFT-800600-85A-0 Rename to 800600P1-A0 | 05-07-11 | EMILY |

|    |      |    |      |
|----|------|----|------|
| 1  | VDD  | 11 | IN2- |
| 2  | VDD  | 12 | IN2+ |
| 3  | GND  | 13 | GND  |
| 4  | GND  | 14 | CLK- |
| 5  | INO- | 15 | CLK+ |
| 6  | INO+ | 16 | GND  |
| 7  | GND  | 17 | ADJ  |
| 8  | IN1- | 18 | NC   |
| 9  | IN1+ | 19 | GND  |
| 10 | GND  | 20 | GND  |



A Block

- Note:
1. Unless indicated, Tolerance Grade "B" is adopted.
  2. UV Glue For OLB Protection.
  3. CN1:BHSR-02VS-1
  4. CN2:P0.5 50Pin Connector:Hirose "FH12A-50S-0.5H" or Equivalent
  5. CN4:P1.0 20Pin Connector:HIROSE DF19G-20P-1H or Equivalent

Back View

適用機種:  
800600P1-A0  
800600P1-A1

|   |                  |    |  |                    |      |      |             |       |       |       |          |                   |
|---|------------------|----|--|--------------------|------|------|-------------|-------|-------|-------|----------|-------------------|
| 1 | TFT-800600-85A-0 | 7  |  | TOLERANCE GRADE(%) | A    | B    | DIM.        | MM    | DWN.  | EMILY | DATE     | TITLE             |
| 2 |                  | 8  |  | ~6                 | 0.05 | 0.1  |             |       |       |       | 01-14-11 | 800600P1-A0       |
| 3 |                  | 9  |  | 6~18               | 0.06 | 0.18 | TE NO.      |       |       |       | DATE     | (8.0"+LED Driver) |
| 4 |                  | 10 |  | 18~50              | 0.1  | 0.25 |             |       |       |       |          | DWG. NO.          |
| 5 |                  | 11 |  | 50~180             | 0.2  | 0.4  | PARTS NO.   | LCM-1 | APPD. |       | DATE     | *1 O116MA         |
| 6 |                  | 12 |  | 180~               | 0.3  | 0.5  | 800600P1-A0 |       |       |       |          | SHEET 1 OF 1      |

AMPIRE 晶采光电科技