



晶采光電科技股份有限公司
AMPIRE CO., LTD.

SPECIFICATIONS FOR LCD MODULE

| | |
|--------------------------|---------------------------|
| CUSTOMER | |
| CUSTOMER PART NO. | |
| AMPIRE PART NO. | AM-800480STMQW-A1H |
| APPROVED BY | |
| DATE | |

- Approved For Specifications
 Approved For Specifications & Sample

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|-------------|------------|--------------|
| | | |

RECORD OF REVISION

| Revision Date | Page | Contents | Editor |
|---------------|-------|------------------------------|--------|
| 2009/09/08 | -- | New Release | JOHN |
| 2012/04/24 | 14,15 | Added DE mode timing. | Eric |
| 2012/10/4 | 24 | Update the outline dimension | Rober |

1. Features

7 inch module is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 7.0 (16:9) inch diagonally measured active display area with WVGA (800 horizontal by 480 vertical pixel) resolution.

- (1) Construction: 7" a-Si TFT active matrix, White LED Backlight.
- (2) Resolution (pixel): 800(R.G.B) X 480
- (3) Number of the Colors : 262K colors (R , G , B 6 bit digital each)
- (4) LCD type : Transmissive , normally White
- (5) Viewing Direction: 6 O'clock (The direction it's hard to be discolored)
- (6) Interface : LVDS interface

2. PHYSICAL SPECIFICATIONS

| Item | Specifications | unit |
|--|--|--------|
| LCD size | 7 inch (Diagonal) | |
| Outline Dimension (Include connecter) | 165.0 x 104.44 x 7.96 (typ.) | mm |
| Number of Pixel | 800 RGB (H) x 480 (V) | pixels |
| Pixel pitch | 0.1905 (H) x 0.1905 (V) | mm |
| Pixel arrangement | RGB Vertical stripe | |
| Display mode | Normally white | |
| Surface treatment | Antiglare, Hard-Coating (3H) with EWV film | |
| Weight | T.B.D (typ.) | g |
| Back-light | Single LED (Side-Light type) | |
| Power consumption (B/L system) | T.B.D (max.) | W |

3. ABSOLUTE MAX. RATINGS

3-1 Electrical Absolute Rating

3-1-1 TFT LCD Module

| Item | Symbol | Values | | UNIT | Note |
|-------------------------------|--------|--------|---------|------|--------|
| | | Min. | Max. | | |
| Power voltage | VCC | -0.5 | 4.0 | V | GND=0V |
| Voltage range at any terminal | | -0.5 | VCC+0.3 | V | |

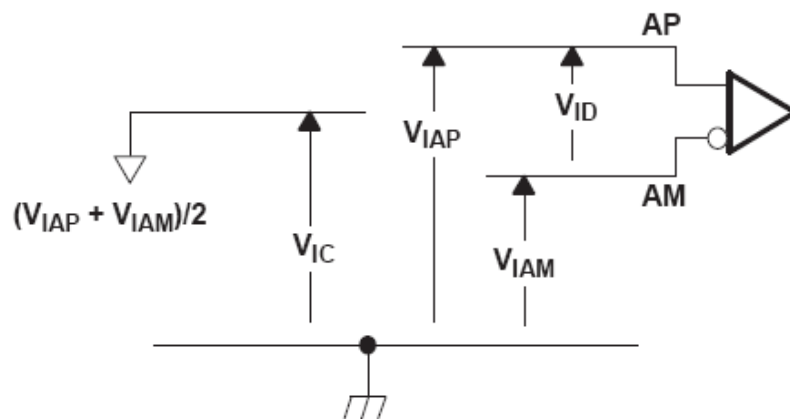
3-2 Environment Absolute Rating

| Item | Symbol | Min. | Max. | Unit | Note |
|-----------------------|--------|------|------|------|------|
| Operating Temperature | Topa | -20 | 70 | °C | |
| Storage Temperature | Tstg | -30 | 80 | °C | |

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 (\overline{SHTDN}) | 2 | | | V |
| V_{IL} | Low-level input voltage (\overline{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 |



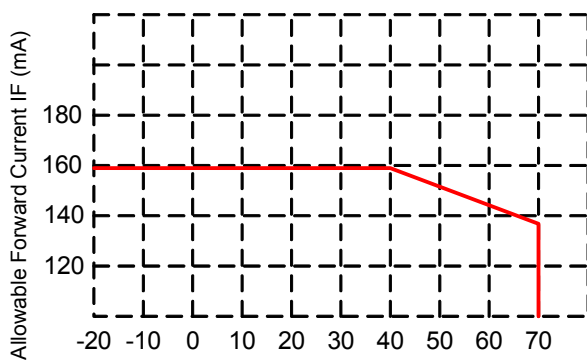
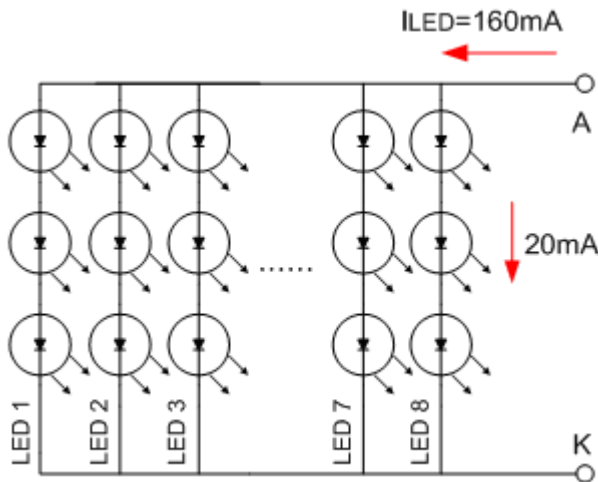
4-2 Backlight Unit

| Item | Symbol | Min. | Typ. | Max. | Unit | Note |
|-------------------------------------|------------------|------|-------|------|------|-------------------------------------|
| LED Driver Voltage | VLED | - | 5 | - | V | |
| Power Supply Current For LED Driver | ILED | - | T.B.D | - | mA | VLED=5V VADJ=3.3V (duty 100%) |
| ADJ Input Voltage | V _{ADJ} | - | 3.3 | - | V | duty=100% Note(3) |
| LED voltage | VAK | -- | 9.9 | -- | V | I _{LED} =160mA Ta=25°C |
| LED current | ILED | -- | 160 | -- | mA | Ta=25°C |
| | | -- | 145 | -- | mA | Ta=60°C |
| LED Life Time | - | 10K | 20K | -- | 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_{LED} of the LED back-light should be adjusted to 135mA max

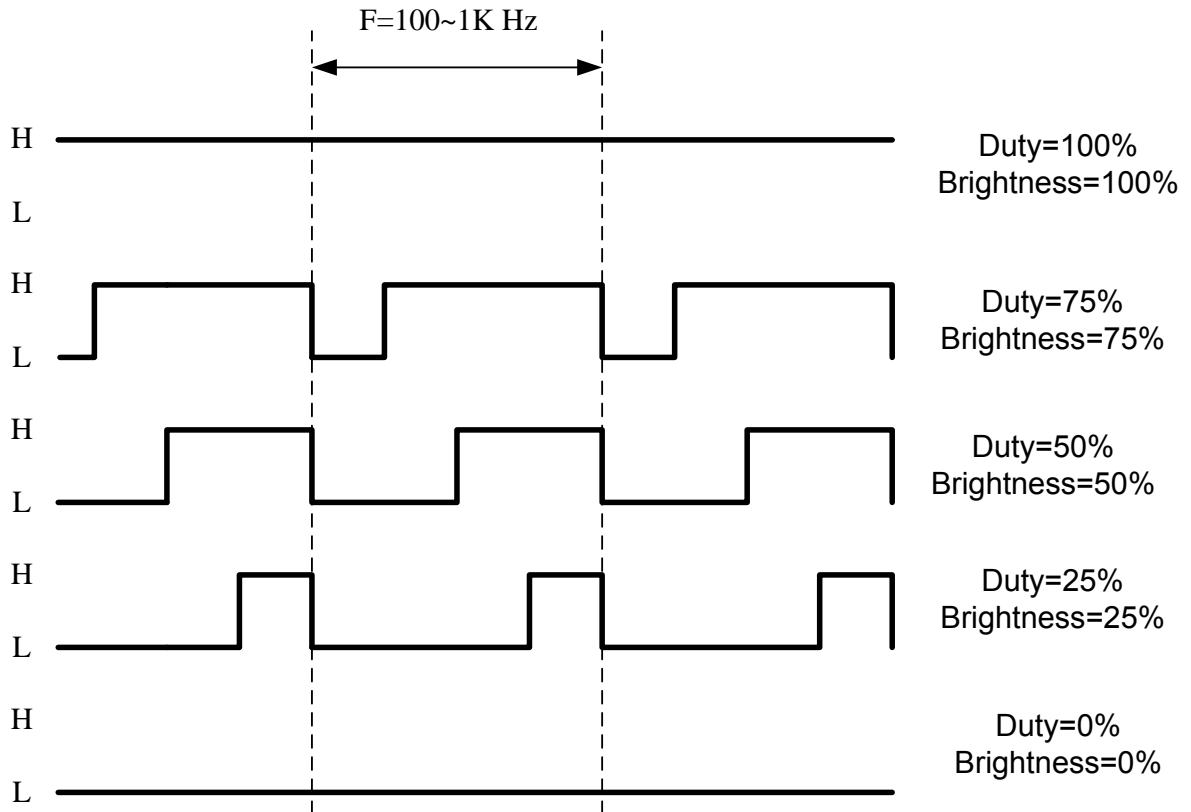
Note (2) Brightness to be decreased to 50% of the initial value.



LED Light Bar Circuit

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

| ITEM | SYMBOL | MIN | TYP | MAX | UNIT |
|-----------------------------|-----------|-----|-----|----------------|------|
| ADJ signal frequency | f_{PWM} | 100 | -- | 1K | Hz |
| ADJ signal logic level High | V_{IH} | 2V | -- | VLED (5.0V) | V |
| ADJ signal logic level Low | V_{IL} | 0 | -- | 0.5 | V |



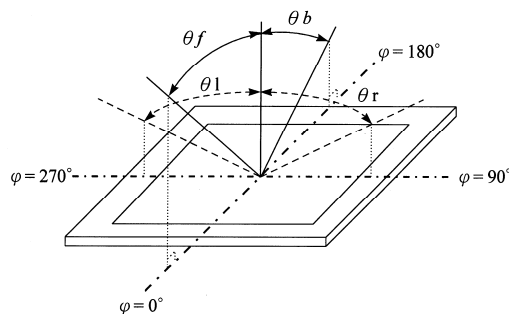
5. Optical Specifications

5-1 Optical specification

| Item | | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|----------------------|-------|------------|---------------------------|--------|--------|--------|-------------------|-----------|
| Viewing Angle | Front | θf | $CR \geq 10$ | 50 | 60 | -- | deg. | (1)(2)(3) |
| | Back | θb | | 60 | 70 | -- | | |
| | Left | θl | | 60 | 70 | -- | | |
| | Right | θr | | 60 | 70 | -- | | |
| Contrast ratio | | CR | $\Theta = \Phi = 0^\circ$ | 250 | 400 | -- | -- | (1)(3) |
| Response Time | | T_r | $\Theta = \Phi = 0^\circ$ | -- | 5 | 10 | ms | (1)(4) |
| | | T_f | | -- | 11 | 16 | ms | (1)(4) |
| Color chromaticity | White | W_x | $\Theta = \Phi = 0^\circ$ | 0.249 | 0.299 | 0.349 | -- | (1) |
| | | W_y | | 0.278 | 0.328 | 0.378 | | |
| | Red | R_x | | T.B.D. | T.B.D. | T.B.D. | | |
| | | R_y | | T.B.D. | T.B.D. | T.B.D. | | |
| | Green | G_x | | T.B.D. | T.B.D. | T.B.D. | | |
| | | G_y | | T.B.D. | T.B.D. | T.B.D. | | |
| | Blue | B_x | | T.B.D. | T.B.D. | T.B.D. | | |
| | | B_y | | T.B.D. | T.B.D. | T.B.D. | | |
| Luminance | | L | $\Theta = \Phi = 0^\circ$ | 300 | 350 | -- | cd/m ² | (1)(5) |
| Luminance Uniformity | | ΔL | $\Theta = \Phi = 0^\circ$ | 70 | -- | -- | % | (1)(5)(6) |

Note 1: $T_a = 25^\circ\text{C}$. To be measured on the center area of panel after 10 minutes operation.

Note 2: Definition of Viewing Angle



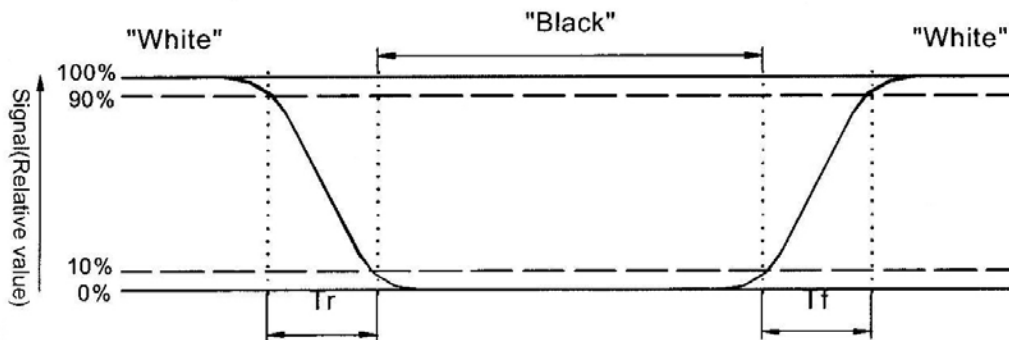
Note 3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

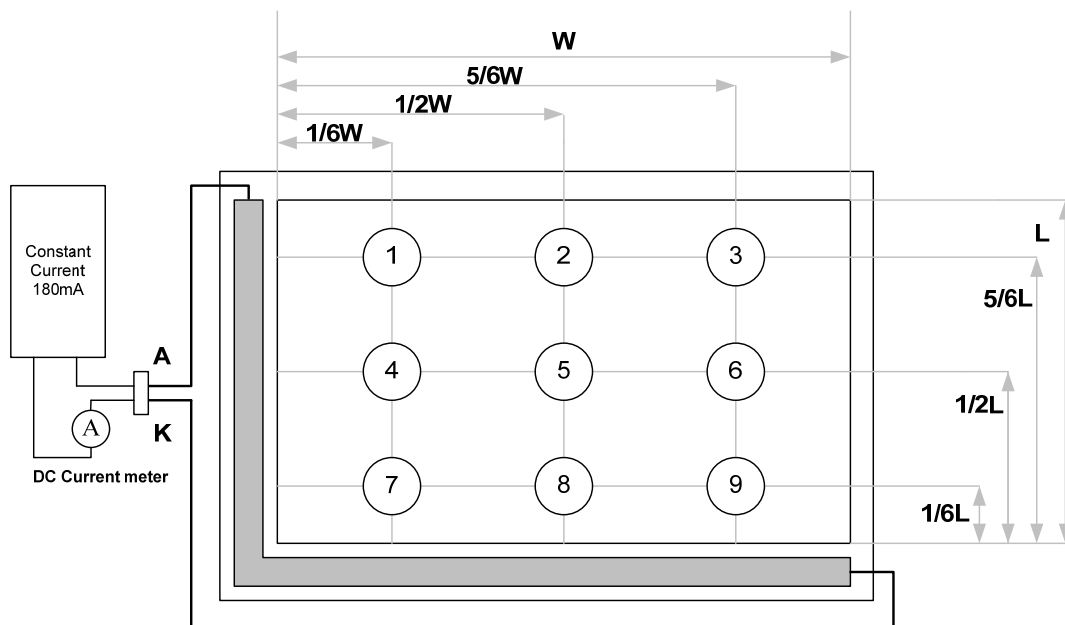
$$\text{Contrast ratio(CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector Output when LCD is at "Black" state}}$$

Note 4: 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.



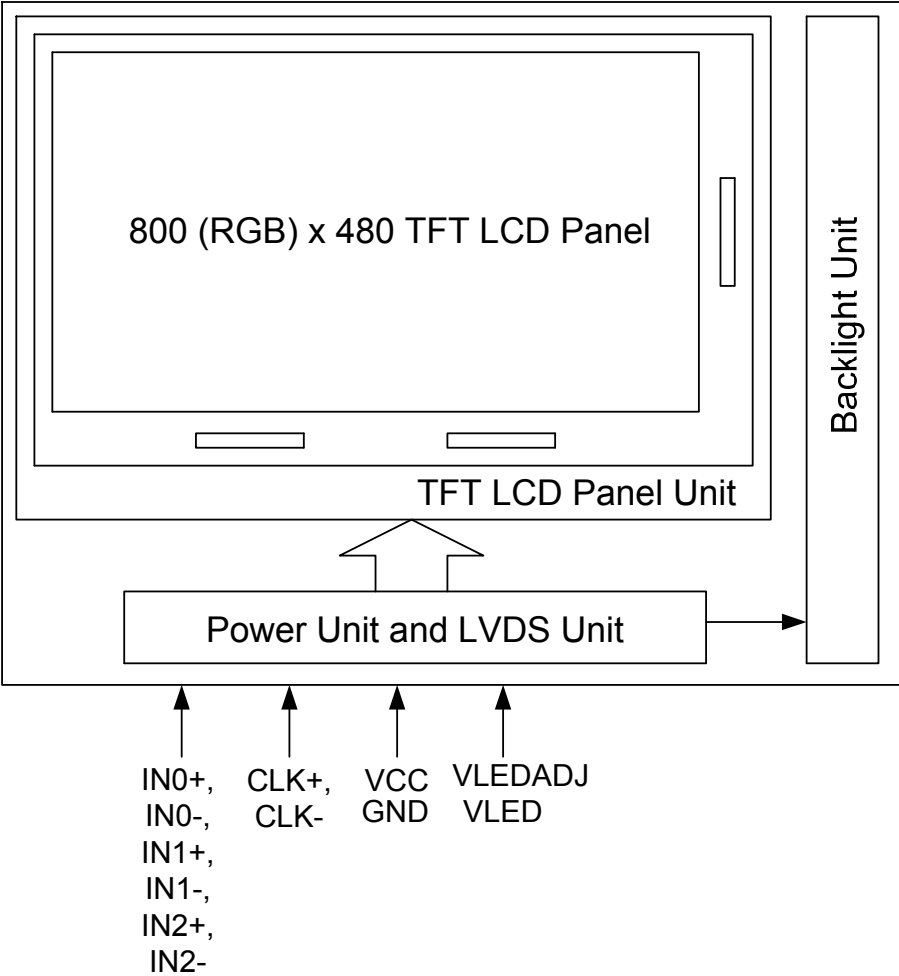
Note 5 : Luminance is measured at point 5 of the display.



Note 6 : Definition of Luminance Uniformity

$$\Delta L = [L(\text{min.}) \text{ of 9 points} / L(\text{max.}) \text{ of 9 points}] \times 100\%$$

6. Block Diagram



7. INTERFACE

| Pin No. | Symbol | Function |
|---------|--------|---------------------------------|
| 1 | VDD | POWER SUPPLY:3.3V |
| 2 | VDD | POWER SUPPLY:3.3V |
| 3 | Gnd | Power Ground |
| 4 | Gnd | Power Ground |
| 5 | IN0- | Transmission Data of Pixels |
| 6 | IN0+ | Transmission Data of Pixels |
| 7 | Gnd | Power Ground |
| 8 | IN1- | Transmission Data of Pixels 1 |
| 9 | IN1+ | Transmission Data of Pixels 1 |
| 10 | Gnd | Power Ground |
| 11 | IN2- | Transmission Data of Pixels 2 |
| 12 | IN2+ | Transmission Data of Pixels 2 |
| 13 | Gnd | Power Ground |
| 14 | CLK- | Sampling Clock |
| 15 | CLK+ | Sampling Clock |
| 16 | Gnd | Power Ground |
| 17 | LEDADJ | LED PWM SIGNAL |
| 18 | VLED | POWER SUPPLY for Backlight : 5V |
| 19 | Gnd | Power Ground |
| 20 | Gnd | Power Ground |

8. INPUT SIGNAL :

8-1 LVDS Signal

switching characteristics over recommended operating conditions (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | MIN | TYP† | MAX | UNIT | | |
|--------------|---|--|------|------------|------|----|----|
| t_{su} | Setup time, D0–D20 to CLKOUT↓ | 5 | | | ns | | |
| t_h | Data hold time, CLKOUT↓ to D0–D20 | 5 | | | ns | | |
| $t_{(RSKM)}$ | Receiver input skew margin§ (see Figure 7) | $t_c = 15.38 \text{ ns } (\pm 0.2\%),$ $ \text{Input clock jitter} < 50 \text{ ps}^{\dagger\dagger}$ | | 550 | 700 | ps | |
| t_d | Delay time, CLKIN↑ to CLKOUT↓ (see Figure 7) | $V_{CC} = 3.3 \text{ V},$ $t_c = 15.38 \text{ ns } (\pm 0.2\%), T_A = 25^\circ\text{C}$ | | 3 | 5 | 7 | ns |
| t_{en} | Enable time, $\overline{\text{SHTDN}}$ to phase lock | See Figure 7 | | 1 | | ms | |
| t_{dis} | Disable time, $\overline{\text{SHTDN}}$ to off state | See Figure 8 | | 400 | | ns | |
| t_t | Transition time, output (10% to 90% t_r or t_f) (data only) | $C_L = 8 \text{ pF}$ | | 3 | | ns | |
| t_t | Transition time, output (10% to 90% t_r or t_f) (clock only) | $C_L = 8 \text{ pF}$ | | 1.5 | | ns | |
| t_w | Pulse duration, output clock | | | $0.50 t_c$ | | ns | |

† All typical values are at $V_{CC} = 3.3 \text{ V}, T_A = 25^\circ\text{C}$.

§ The parameter $t_{(RSKM)}$ is the timing margin available to allocate to the transmitter and interconnection skews and clock jitter. The value of this parameter at clock periods other than 15.38 ns can be calculated from $t_{(RSKM)} = t_c/14 - 550 \text{ ps}$.

†† $|\text{Input clock jitter}|$ is the magnitude of the change in input clock period.

PARAMETER MEASUREMENT INFORMATION

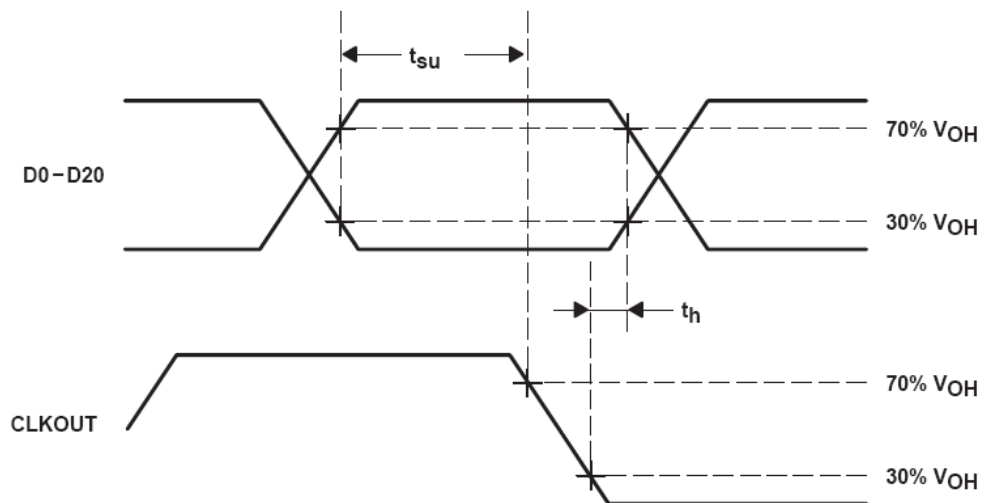


Figure 5. Setup and Hold Time Waveforms

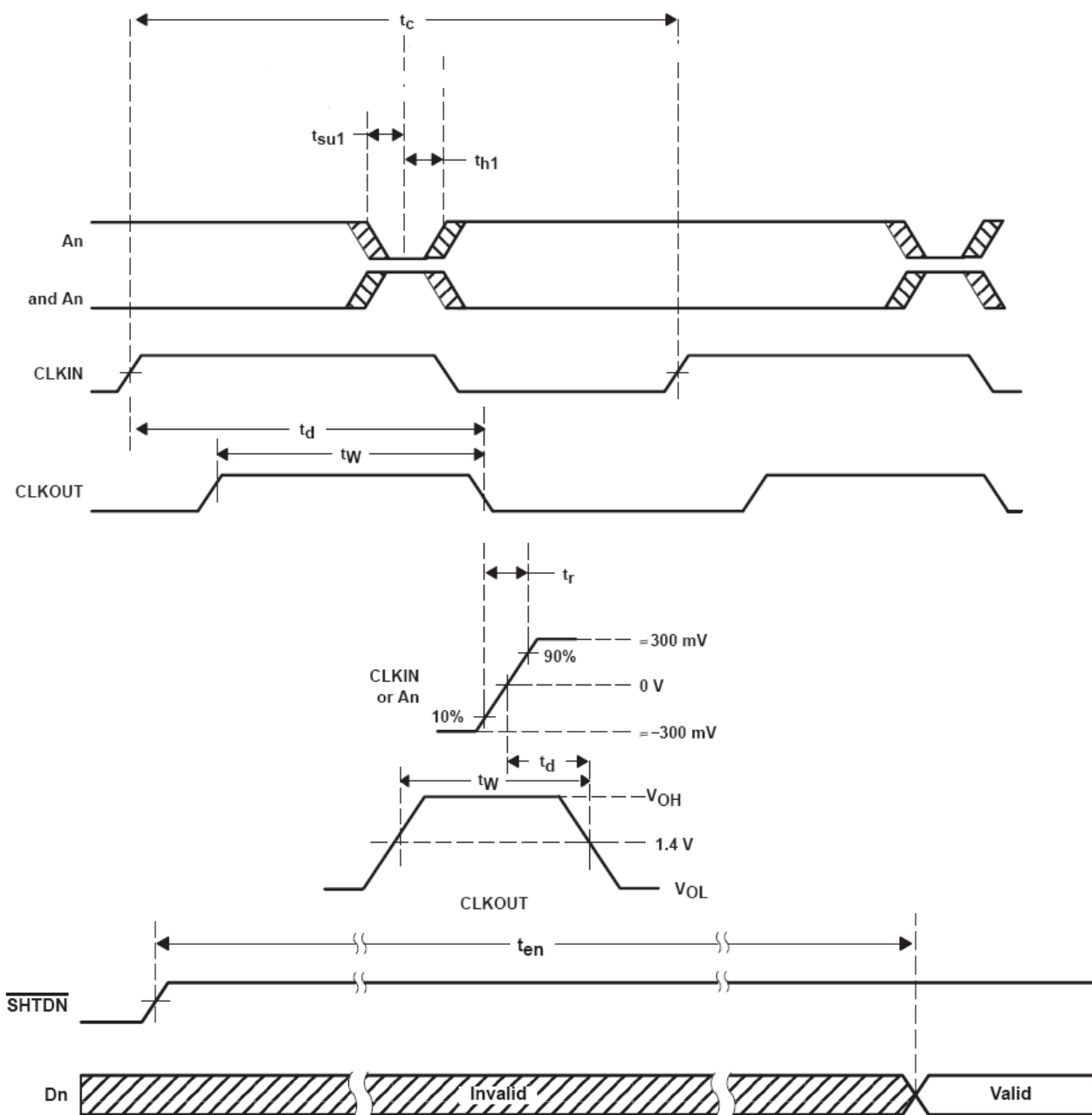


Figure 7. Enable Time Waveforms

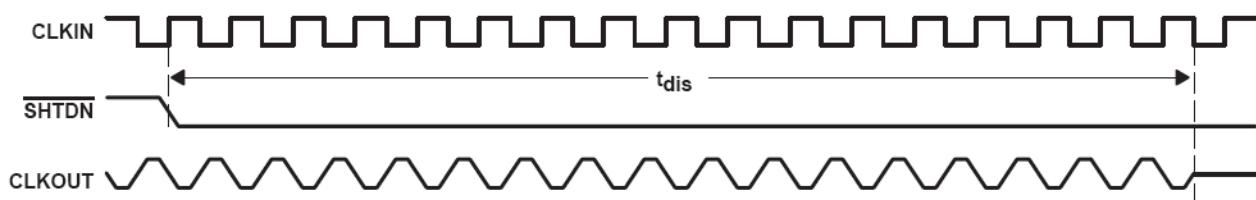
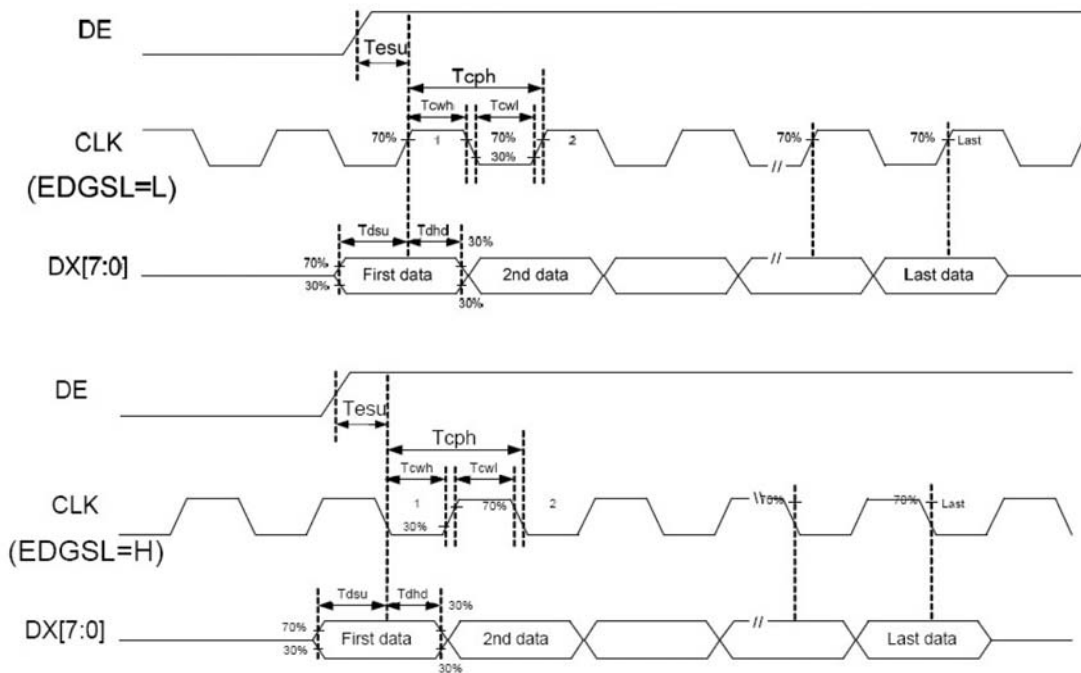


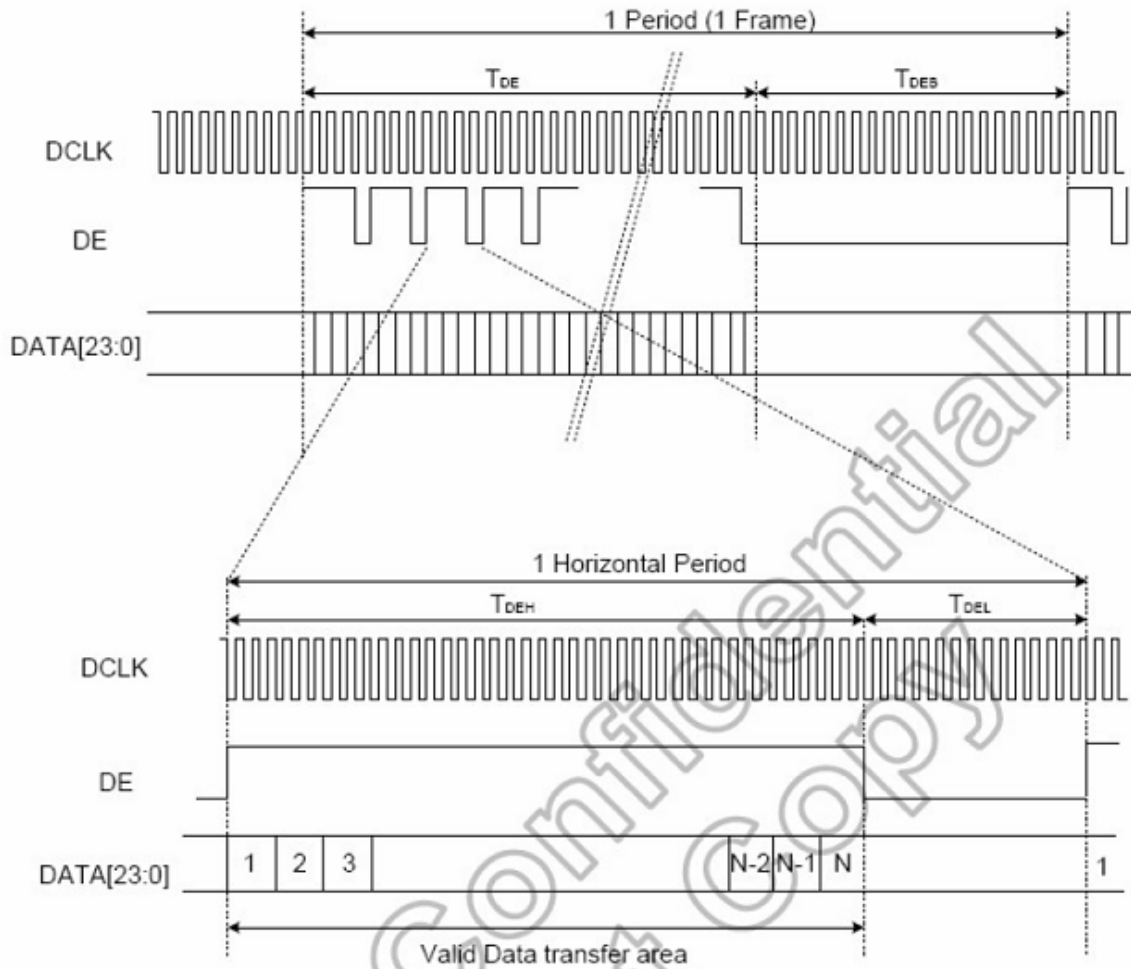
Figure 8. Disable Time Waveforms

8-2 TTL Signal (DE Only Mode)

| Parameter | Symbol | | | | Unit |
|-------------------|-----------------------|------|-------|------|-----------------------|
| | | Min. | Typ. | Max. | |
| Data setup time | Tdsu | 6 | - | - | ns |
| Data hold time | Tdhd | 6 | - | - | Tcph |
| DE setup time | Tesu | 6 | - | - | Tcph |
| CLK frequency | F _{CPH} | | 33.26 | | MHz |
| CLK period | T _{CPH} | | 30.06 | | ns |
| CLK pulse duty | T _{CWH} | 40 | 50 | 60 | % |
| DE period | T _{DEH+TDEL} | 1000 | 1056 | 1200 | T _{CPH} |
| DE pulse width | T _{DEH} | - | 800 | - | T _{CPH} |
| DE frame blanking | T _{DEB} | 10 | 45 | 110 | T _{DEH+TDEL} |
| DE frame width | T _{DE} | - | 480 | - | T _{DEH+TDEL} |

Note : We suggest using the typical value, so it can have better performance.





9. DISPLAYED COLOR AND INPUT DATA

| | Color & Gray Scale | DATA SIGNAL | | | | | | | | | | | | | | | | | |
|-------------|--------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 |
| Basic Color | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red(63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green(63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blue(63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cyan | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Magenta | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Yellow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | White | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Red | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red(1) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red(2) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Red(31) | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Red(62) | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red(63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Green | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Green(31) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Green(62) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green(63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blue(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Blue(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Blue(31) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | Blue(62) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| | Blue(63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

10. RELIABILITY TEST CONDITIONS

10.1. Test Conditions

Tests should be conducted under the following conditions :

Ambient temperature : $25 \pm 5^{\circ}\text{C}$

Humidity : $60 \pm 25\% \text{ RH}$.

10.2. Sampling Plan

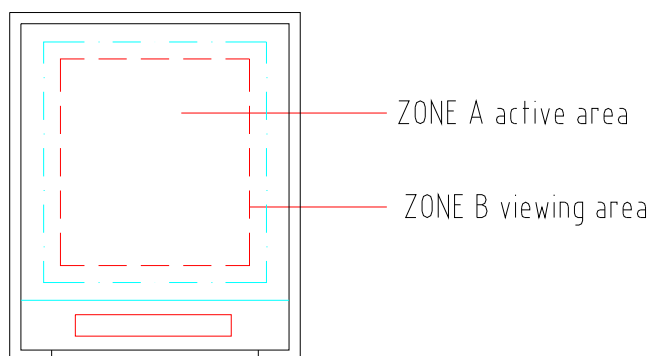
Sampling method shall be in accordance with MIL-STD-105E , level II, normal single sampling plan .

10.3. Acceptable Quality Level

A major defect is defined as one that could cause failure to or materially reduce the usability of the unit for its intended purpose. A minor defect is one that does not materially reduce the usability of the unit for its intended purpose or is an infringement from established standards and has no significant bearing on its effective use or operation.

10.4. Appearance

An appearance test should be conducted by human sight at approximately 30 cm distance from the LCD module under florescent light. The inspection area of LCD panel shall be within the range of following limits.



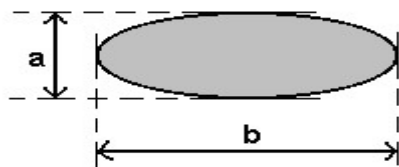
10.5. Incoming Inspection Standard

| Defect Type | | | Limit | | | Note | | |
|-----------------------|--|------------------|--|--------------------|--------------------|--------------------|--------------------|-----|
| Visual Defect | Internal | Spot | $\phi < 0.15\text{mm}$ | | Ignore | (1) | | |
| | | | $0.15\text{mm} \leq \phi \leq 0.5\text{mm}$ | | $N \leq 4$ | | | |
| | | | $0.5\text{mm} < \phi$ | | $N=0$ | | | |
| | | Fiber | $0.1\text{mm} < W \leq 0.5\text{mm},$ $L \leq 1.5\text{mm}$ | | $N \leq 4$ | (1) | | |
| | | | $1.0\text{mm} < W, 1.5\text{mm} < L$ | | $N=0$ | | | |
| | | Polarizer Bubble | $\phi < 0.15\text{mm}$ | | Ignore | | (1) | |
| | $0.15\text{mm} \leq \phi \leq 0.5\text{mm}$ | | $N \leq 4$ | | | | | |
| $0.5\text{mm} < \phi$ | | | $N=0$ | | | | | |
| Mura | It' OK if mura is slight visible through 6%ND filter | | | | | | | |
| Electrical Defect | Bright Dot | A Grade | | | B Grade | | | |
| | | C Area | O Area | Total | C Area | O Area | Total | (3) |
| | | $N \leq 0$ | $N \leq 2$ | $N \leq 2$ | $N \leq 2$ | $N \leq 3$ | $N \leq 5$ | (2) |
| | Dark Dot | $N \leq 2$ | $N \leq 4$ | $N \leq 4$ | $N \leq 3$ | $N \leq 5$ | $N \leq 8$ | |
| | Total Dot | $N \leq 4$ | | | $N \leq 5$ | $N \leq 6$ | $N \leq 8$ | (2) |
| | Two Adjacent Dot | $N \leq 0$ | $N \leq 1$ pair | $N \leq 1$ pair | $N \leq 1$ pair | $N \leq 1$ pair | $N \leq 1$ pair | (4) |
| | Three or More Adjacent Dot | Not Allowed | | | | | | |
| | Line Defect | Not Allowed | | | | | | |

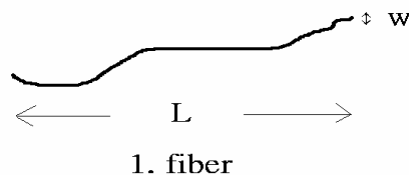
(1) One pixel consists of 3 sub-pixels, including R,G, and B dot.(Sub-pixel = Dot)

(2) LITTLE BRIGHT DOT acceptable under 6% ND-Filter

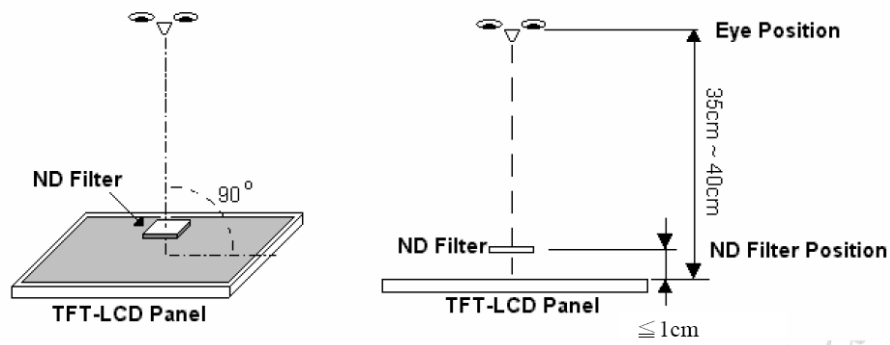
[Note1] W : Width[mm], L : Length[mm], N : Number, ϕ : Average Diameter



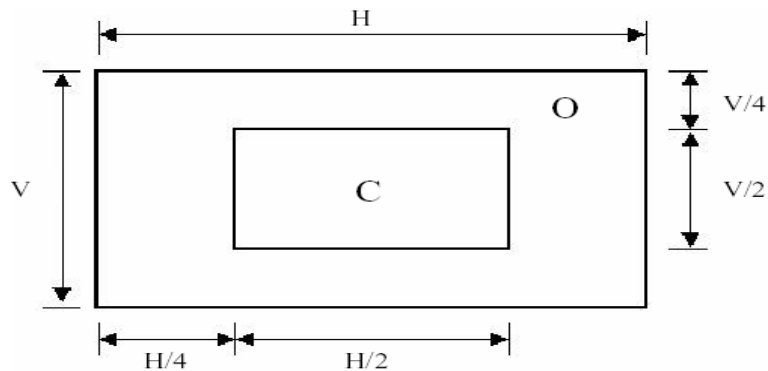
1. (White, black) Spot
2. Polarizer Bubble



[Note2] Bright dot is defined through 6% transmission ND Filter as following.



[Note3]

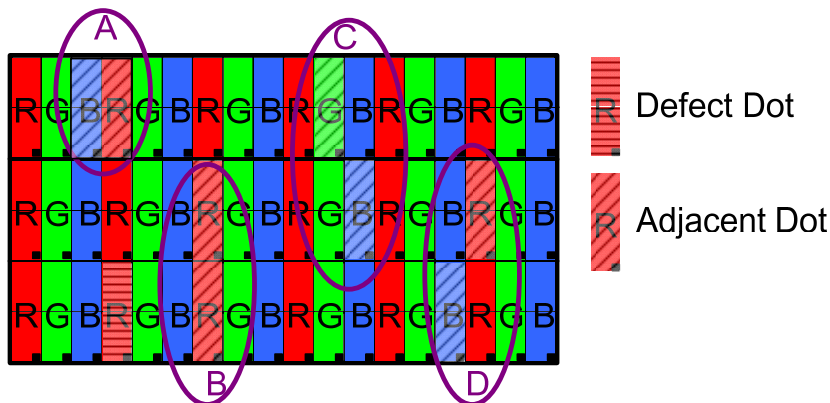


C Area: Center of display area

C Area: Outer of display area

[Note4]

Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dark adjacent dot. And they will be counted 2defect dots in total quantity.



- (1) The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.
- (2) Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

10.6. Reliability Test

| Test Item | Test Conditions | Note |
|----------------------------|--|------|
| High Temperature Operation | 70±3°C , t=96 hrs | |
| Low Temperature Operation | -20±3°C , t=96 hrs | |
| High Temperature Storage | 80±3°C , t=96 hrs | 1,2 |
| Low Temperature Storage | -30±3°C , t=96 hrs | 1,2 |
| Thermal Shock Test | -20°C ~ 70°C 30 m in. ~ 30 min. (1 cycle) Total 100cycle | 1,2 |
| Humidity Test | 60 °C, Humidity 90%, 240 hrs | 1,2 |
| Vibration Test (Packing) | Sweep frequency : 10 ~ 500 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis | 2 |

Note 1 : Condensation of water is not permitted on the module.

Note 2 : The module should be inspected after 1 hour storage in normal conditions

(15-35°C , 45-65%RH).

Definitions of life end point :

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of the initial value.

11. USE PRECAUTIONS

11.1. Handling precautions

- 1) The polarizing plate may break easily so be careful when handling it. Do not touch, press or rub it with a hard-material tool like tweezers.
- 2) Do not touch the polarizing plate surface with bare hands so as not to make it dirty. If the surface or other related part of the polarizing plate is dirty, soak a soft cotton cloth or chamois leather in benzine and wipe off with it. Do not use chemical liquids such as acetone, toluene and isopropyl alcohol. Failure to do so may bring chemical reaction phenomena and deteriorations.
- 3) Remove any spit or water immediately. If it is left for hours, the suffered part may deform or decolorize.
- 4) If the LCD element breaks and any LC stuff leaks, do not suck or lick it. Also if LC stuff is stuck on your skin or clothing, wash thoroughly with soap and water immediately.

11.2. Installing precautions

- 1) The PCB has many ICs that may be damaged easily by static electricity. To prevent breaking by static electricity from the human body and clothing, earth the human body properly using the high resistance and discharge static electricity during the operation. In this case, however, the resistance value should be approx. 1M Ω and the resistance should be placed near the human body rather than the ground surface. When the indoor space is dry, static electricity may occur easily so be careful. We recommend the indoor space should be kept with humidity of 60% or more. When a soldering iron or other similar tool is used for assembly, be sure to earth it.
- 2) When installing the module and ICs, do not bend or twist them. Failure to do so may crack LC element and cause circuit failure.
- 3) To protect LC element, especially polarizing plate, use a transparent protective plate (e.g., acrylic plate, glass etc) for the product case.
- 4) Do not use an adhesive like a both-side adhesive tape to make LCD surface (polarizing plate) and product case stick together. Failure to do so may cause the polarizing plate to peel off.

11.3. Storage precautions

- 1) Avoid a high temperature and humidity area. Keep the temperature between 0°C and 35°C and also the humidity under 60%.
- 2) Choose the dark spaces where the product is not exposed to direct sunlight or fluorescent light.
- 3) Store the products as they are put in the boxes provided from us or in the same conditions as we recommend.

11.4. Operating precautions

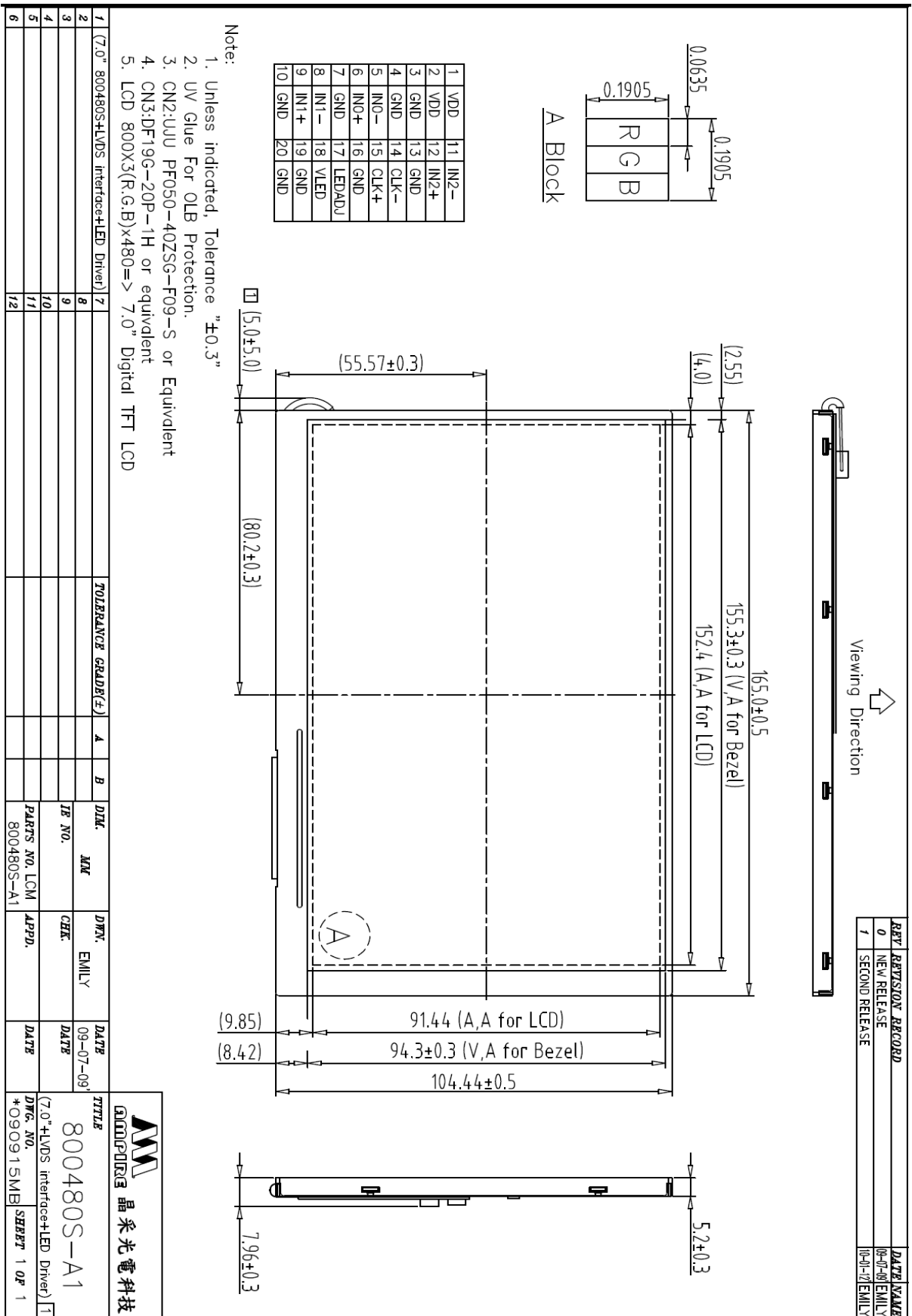
- 1) Do not boost the applied drive voltage abnormally. Failure to do so may break ICs. When applying power voltage, check the electrical features beforehand and be careful. Always turn off the power to the LC module controller before removing or inserting the LC module input connector. If the input connector is removed or inserted while the power is turned on, the LC module internal circuit may break.
- 2) The display response may be late if the operating temperature is under the normal standard, and the display may be out of order if it is above the normal standard. But this is not a failure; this will be restored if it is within the normal standard.
- 3) The LCD contrast varies depending on the visual angle, ambient temperature, power voltage etc. Obtain the optimum contrast by adjusting the LC drive voltage.
- 4) When carrying out the test, do not take the module out of the low-temperature space suddenly. Failure to do so will cause the module condensing, leading to malfunctions.
- 5) Make certain that each signal noise level is within the standard (L level: 0.2V_{dd} or less and H level: 0.8V_{dd} or more) even if the module has functioned properly. If it is beyond the standard, the module may often malfunction. In addition, always connect the module when making noise level measurements.
- 6) The CMOS ICs are incorporated in the module and the pull-up and pull-down function is not adopted for the input so avoid putting the input signal open while the power is ON.
- 7) The characteristic of the semiconductor element changes when it is exposed to light emissions, therefore ICs on the LCD may malfunction if they receive light emissions. To prevent these malfunctions, design and assemble ICs so that they are shielded from light emissions.

8) Crosstalk occurs because of characteristics of the LCD. In general, crosstalk occurs when the regularized display is maintained. Also, crosstalk is affected by the LC drive voltage. Design the contents of the display, considering crosstalk.

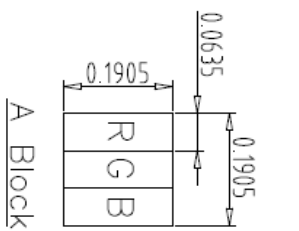
11.5. Other

- 1) Do not disassemble or take the LC module into pieces. The LC modules once disassembled or taken into pieces are not the guarantee articles.
- 2) The residual image may exist if the same display pattern is shown for hours. This residual image, however, disappears when another display pattern is shown or the drive is interrupted and left for a while. But this is not a problem on reliability.
- 3) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

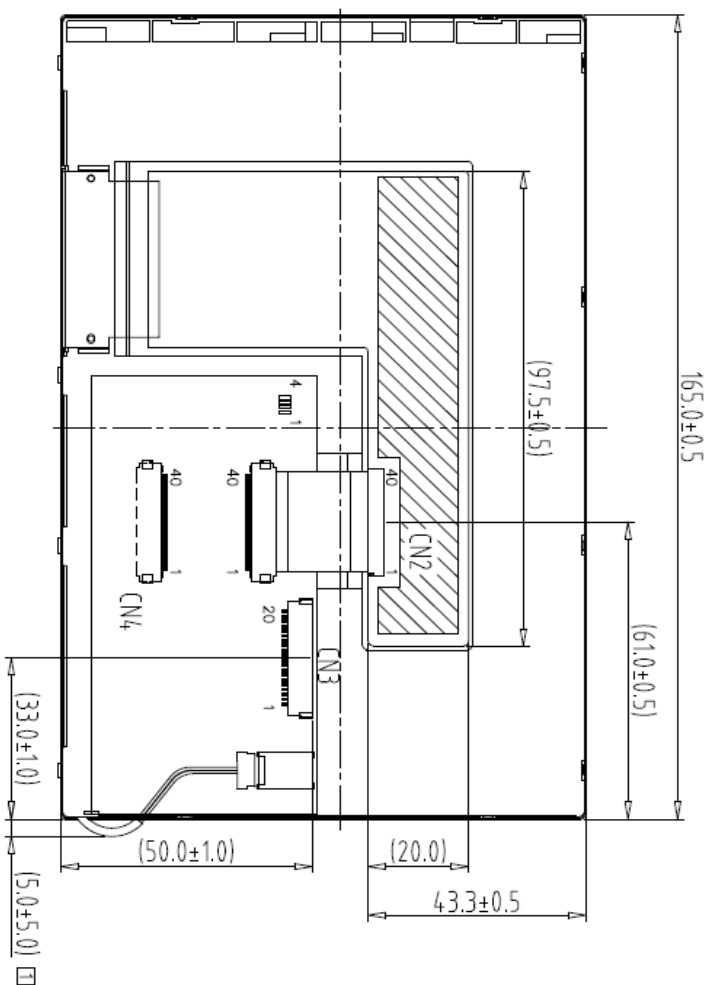
12. OUTLINE DIMENSION



| REV | REVISION RECORD | DATE | NAME |
|-----|-----------------|----------|-------|
| 0 | NEW RELEASE | 08-31-09 | EMILY |
| 1 | SECOND RELEASE | 10-31-12 | EMILY |



| | | | |
|----|------|----|--------|
| 1 | VDD | 11 | IN2- |
| 2 | VDD | 12 | IN2+ |
| 3 | GND | 13 | GND |
| 4 | GND | 14 | CLK- |
| 5 | IN0- | 15 | CLK+ |
| 6 | IN0+ | 16 | GND |
| 7 | GND | 17 | LEDADJ |
| 8 | IN1- | 18 | VLED |
| 9 | IN1+ | 19 | GND |
| 10 | GND | 20 | GND |



Back View

- Note:
1. Unless indicated, Tolerance "±0.3"
 2. UV Glue For OLB Protection.
 3. CN2:UUU PF050-40ZSG-F09-S or Equivalent
 4. CN3:DF19G-20P-1H or equivalent
 5. LCD 800X3(R,G,B)x480=> 7.0" Digital TFT LCD

| REV | DESCRIPTION | DATE | NAME |
|-----|---|----------|-------|
| 1 | (7.0" 800x480S+LVDS Interface+LED Driver) | 09-07-09 | EMILY |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |

| TOLERANCE | GRADE | A | B | DIM. | MM | DRAWN | EMILY | DATE |
|-----------|-------|---|---|------------|-------|-------|-------|------|
| | | | | IE NO. | | CHEK. | | DATE |
| | | | | PARTS NO. | LCM-1 | APPD. | | DATE |
| | | | | 800480S-A1 | | | | |

| | |
|----------------------------------|--------------|
| 7777B | 晶采光電科技 |
| 800480S-A1 | |
| (7.0"+LVDS Interface+LED Driver) | 1 |
| DWG. NO. | SHEET 1 OF 1 |
| *090916MB | |