

| <b>Specification</b> |                      |                  |             |
|----------------------|----------------------|------------------|-------------|
| Part Number:         | MCT050ACA0W800480LML |                  |             |
| Version:             | 1                    |                  |             |
| Date:                | 27/07/2016           |                  |             |
| <b>Revision</b>      |                      |                  |             |
| VERSION              | DATE                 | REVISED PAGE NO. | Note        |
| 0                    | 2016/07/26           |                  | First issue |

design • manufacture • supply

|                       |                          |
|-----------------------|--------------------------|
| Display Size          | 5.0"                     |
| Resolution            | 800 X 480                |
| VGA Size              | WVGA                     |
| Orientation           | Landscape                |
| Appearance            | RGB                      |
| Logic Voltage         | 3.1                      |
| Interface             | Parallel                 |
| Brightness            | 400 cd/m <sup>2</sup>    |
| Touchscreen           | N/A                      |
| Module Size           | 120.70 x 75.80 x 8.00 mm |
| Operating Temperature | -20°C ~ +70°C            |
| Pinout                | 36 – Way                 |



# Contents

1. Module Classification Information

2. Summary

3. General Specification

4. Interface

5. Contour Drawing

6. Block Diagram

7. Absolute Maximum Ratings

8. Electrical Characteristics

9. DC Characteristics

10. Interface Timing Characteristics

11. Optical Characteristics

12. Reliability

13. Other

MIDAS

design • manufacture • supply



## 2.Summary

This technical specification applies to 5.0' color TFT-LCD panel. The 5.0' color TFT-LCD panel is designed for camcorder, digital camera application and other electronic products which require high quality flat panel displays. This module follows RoHS.



### 3. General Specifications

- Size: 5.0 inch
- Dot Matrix: 800 × 3(RGB) × 480 dots
- Module dimension: 120.7 x 75.8 x 8.0 mm
- Active area: 108.0 x 64.8 mm
- Dot pitch: 0.045 x 0.135 mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Backlight Type: LED, Normally White
- Controller IC: SSD1963
- Interface: Digital 8080 family MPU 8bit/16bit
- With /Without TP: Without TP
- Surface: Anti-Glare

\*Color tone slight changed by temperature and driving voltage.



# Midas Active Matrix Display Part Number System

**MC T 057 A 6 \* W 320240 L M L \* \***  
**1 2 3 4 5 6 7 8 9 10 11 12 13**

- 1 = **MC:** Midas Components
- 2 = **T:** TFTA: Active Matrix OLED **M:** Monitor
- 3 = **Size**
- 4 = **Series**
- 5 = **Viewing Angle:** 6: 6 O'clock 12: 12 O'clock O: All Round Viewing Angle
- 6 = **Blank:** No Touch **T:** Resistive Touchscreen **C:** Capacitive Touchscreen
- 7 = **Operating Temp Range:** **S:** 0+50Deg C **B:** -20+60Deg C  
**W:** -20+70Deg C **E:** -30+85Deg C  
**X:** -30+80Deg C
- 8 = **No of Pixels**
- 9 = **Orientation:** **P:** Portrait **L:** Landscape
- 10 = **Mode:** **R:** Reflective **M:** Transmissive **T:** Transflective  
**S:** Sunlight Readable (Transmissive) **W:** White on Black (Monochrome)
- 11 = **Backlight:** **Blank:** None **L:** LED **C:** CCFL
- 12 = **Blank:** No Module/board **C:** Controller board module (E-Tech)
- 13 = **Blank:** None **OB:** Optically Bonded **IPS:** In-plane switching



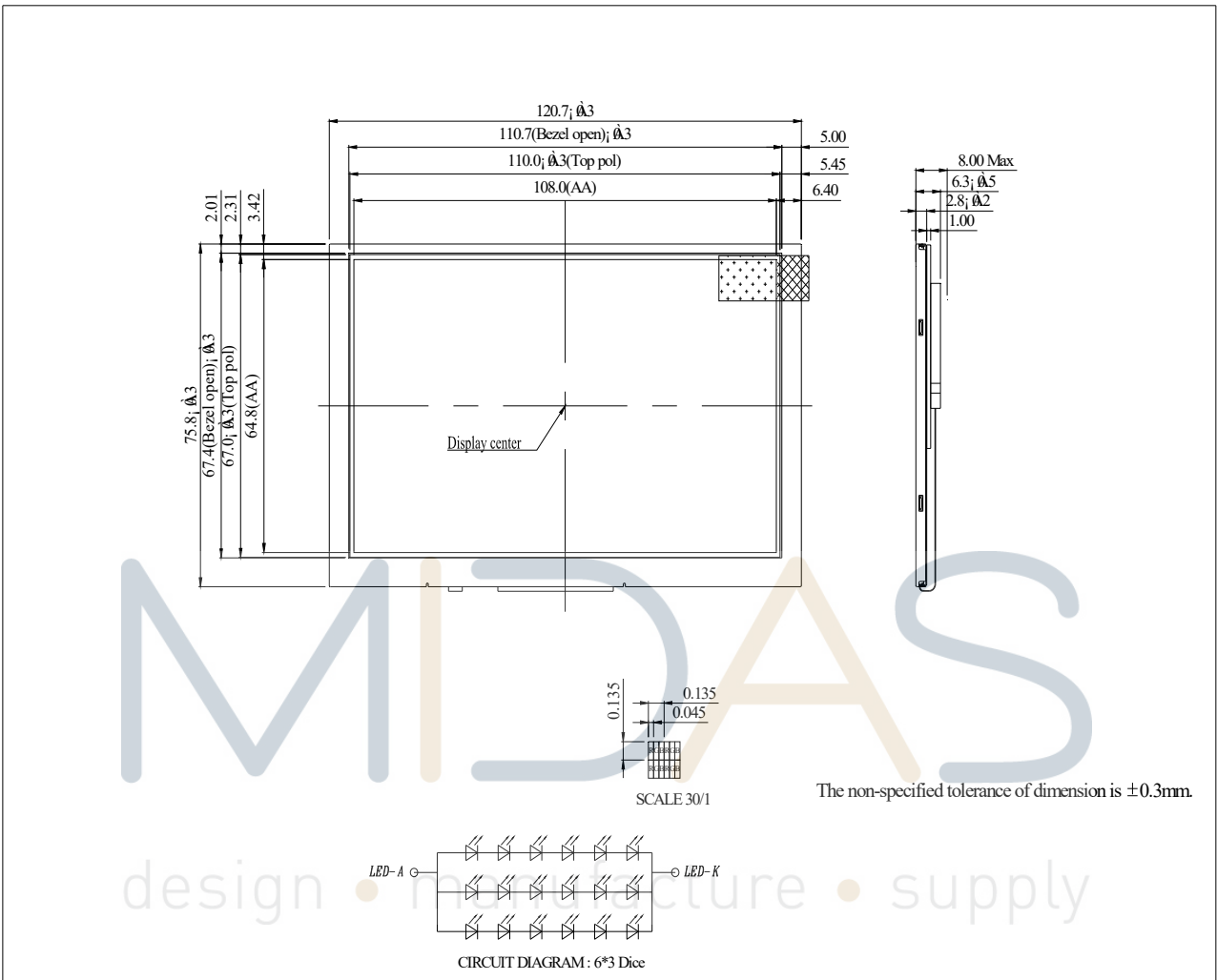
## 4.Interface

### 4.1. LCM PIN Definition (CON3)

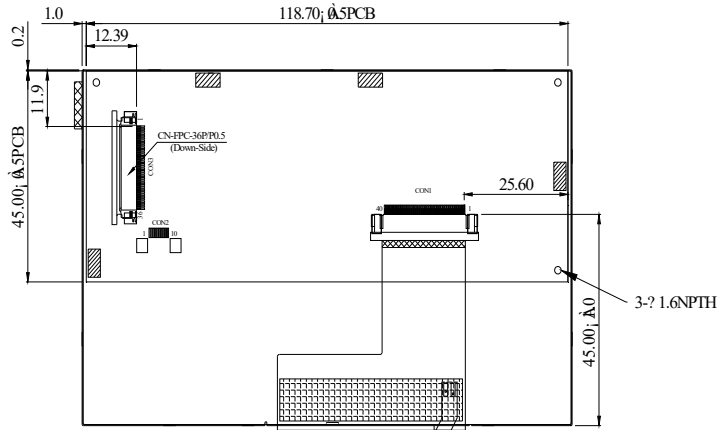
| Pin | Symbol | Function   | Remark |
|-----|--------|--|--------|
| 1   | GND    | System round pin of the IC.<br>Connect to system ground. |        |
| 2   | VDD    | Power Supply : +3.3V                                     |        |
| 3   | BL_E   | Backlight control signal , H: On \ L: Off                |        |
| 4   | D/C    | Data/Command select                                      |        |
| 5   | WR     | Write strobe signal                                      |        |
| 6   | RD     | Read strobe signal                                       |        |
| 7   | DB0    | Data bus   |        |
| 8   | DB1    | Data bus   |        |
| 9   | DB2    | Data bus   |        |
| 10  | DB3    | Data bus   |        |
| 11  | DB4    | Data bus   |        |
| 12  | DB5    | Data bus   |        |
| 13  | DB6    | Data bus   |        |
| 14  | DB7    | Data bus   |        |
| 15  | DB8    | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 16  | DB9    | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 17  | DB10   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 18  | DB11   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 19  | DB12   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 20  | DB13   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 21  | DB14   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 22  | DB15   | Data bus (When select 8bits mode, this pin is NC)        | Note1  |
| 23  | NC     | No connection  |        |
| 24  | NC     | No connection  |        |
| 25  | CS     | Chip select  |        |
| 26  | RST    | Hardware reset   |        |
| 27  | NC     | No connection  |        |
| 28  | NC     | No connection  |        |
| 29  | NC     | No connection  |        |
| 30  | NC     | No connection  |        |
| 31  | NC     | No connection  |        |
| 32  | NC     | No connection  |        |
| 33  | VLED-  | VLED- for B/L LED inverter (GND)                         |        |
| 34  | VLED-  | VLED- for B/L LED inverter (GND)                         |        |
| 35  | VLED+  | VLED+ for B/L LED inverter (+5V)                         |        |
| 36  | VLED+  | VLED+ for B/L LED inverter (+5V)                         |        |

Note1: When select 8bit mode, DB0~DB7 be used, DB8~DB15 no connect  
When select 16bit mode, DB0~DB15 be used

# 5. Contour Drawing



| Pin | Symbol |
|-----|--------|
| 1   | GND    |
| 2   | VDD    |
| 3   | BLE    |
| 4   | D/C    |
| 5   | WR     |
| 6   | RD     |
| 7   | DB0    |
| 8   | DB1    |
| 9   | DB2    |
| 10  | DB3    |
| 11  | DB4    |
| 12  | DB5    |
| 13  | DB6    |
| 14  | DB7    |
| 15  | DB8    |
| 16  | DB9    |
| 17  | DB10   |
| 18  | DB11   |
| 19  | DB12   |
| 20  | DB13   |
| 21  | DB14   |
| 22  | DB15   |
| 23  | NC     |
| 24  | NC     |
| 25  | CS     |
| 26  | RST    |
| 27  | NC     |
| 28  | NC     |
| 29  | NC     |
| 30  | NC     |
| 31  | NC     |
| 32  | NC     |
| 33  | VLED-  |
| 34  | VLED-  |
| 35  | VLED+  |
| 36  | VLED+  |



# MIDAS

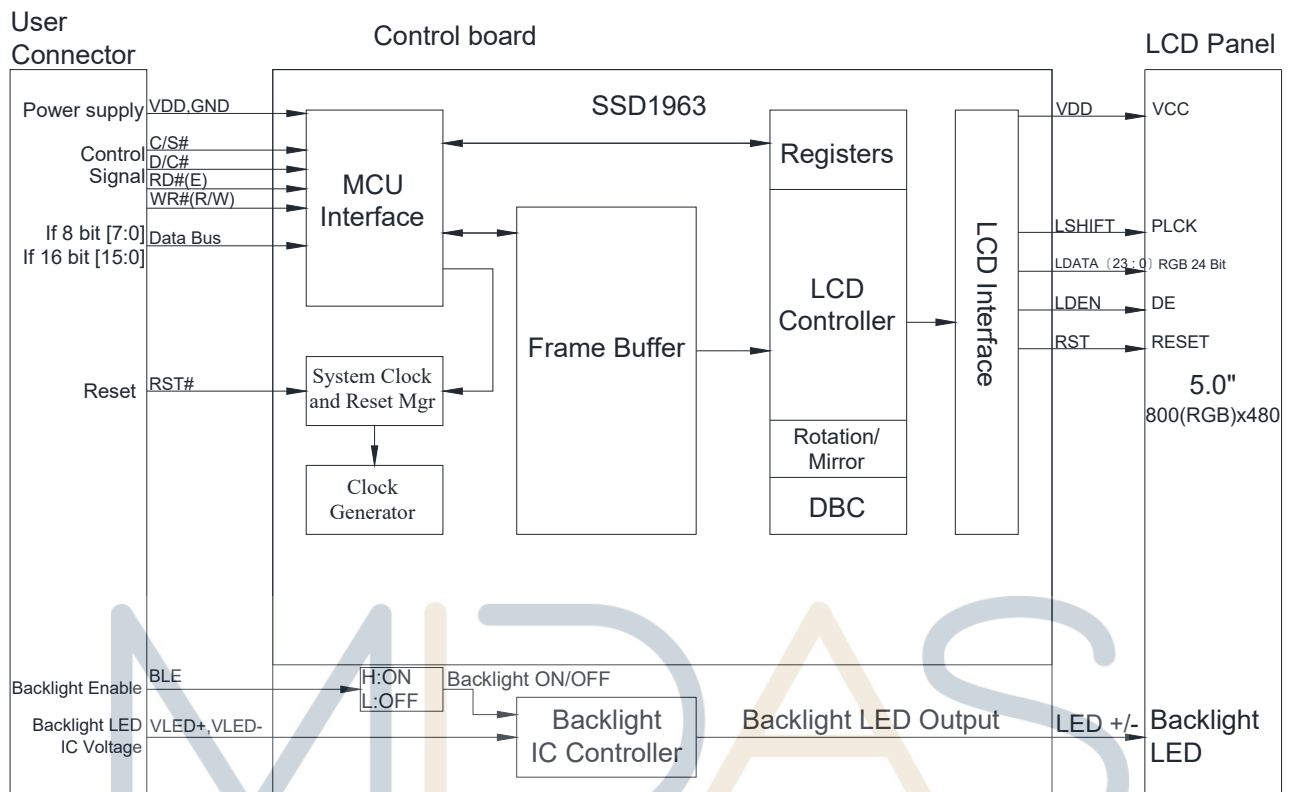
The non-specified tolerance of dimension is ±0.3mm.

design • manufacture • supply





## 6. Block Diagram



design • manufacture • supply

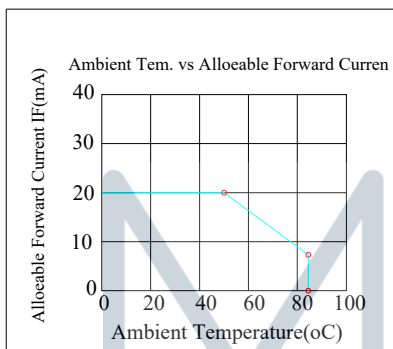


## 7. Absolute Maximum Ratings

| Item                  | Symbol | Min | Typ | Max | Unit |
|-----------------------|--------|-----|-----|-----|------|
| Operating Temperature | TOP    | -20 | -   | +70 | □    |
| Storage Temperature   | TST    | -30 | -   | +80 | □    |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

- Temp.  $\leq 60^\circ\text{C}$ , 90% RH MAX. Temp.  $> 60^\circ\text{C}$ , Absolute humidity shall be less than 90% RH at  $60^\circ\text{C}$



MIDAS

design • manufacture • supply



## 8. Electrical Characteristics

### 8.1. Operating conditions: (CON3.Pin1=GND, Pin2=VDD)

| Item                   | Symbol | Condition | Min | Typ | Max | Unit | Remark |
|------------------------|--------|-----------|-----|-----|-----|------|--------|
| Supply Voltage For LCM | VDD    | -         | 3.0 | 3.1 | 3.3 | V    | -      |
| Supply Current For LCM | IDD    | —         | —   | 150 | 230 | mA   | Note1  |

Note 1 : This value is test for VDD =3.3V , Ta=25°C only

### 8.2. Backlight driving conditions (CON3.Pin33,34=VLED-, Pin35,36=VLED+)

| Parameter                        | Symbol  | Min. | Typ.   | Max. | Unit | Remark     |
|----------------------------------|---------|------|--------|------|------|------------|
| Operation Current For LED Driver | VLED=5V | 200  | -      | 300  | mA   | Note 1,2   |
| Supply Voltage For LED Driver    | VLED+   | -    | 5      | -    | V    |            |
| LED Life Time                    |         | -    | 50,000 | -    | Hr   | Note 2,3,4 |

Note 1 : Base on VLED=5.0V for the back light driver IC specification

Note 2 : Ta = 25 °C

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

design • manufacture • supply



## 9.DC CHARATERISTICS

| Parameter                | Symbol   | Rating |     |        | Unit | Condition |
|--------------------------|----------|--------|-----|--------|------|-----------|
|                          |          | Min    | Typ | Max    |      |           |
| Low level input voltage  | $V_{IL}$ | 0      | -   | 0.3VDD | V    |           |
| High level input voltage | $V_{IH}$ | 0.7VDD | -   | VDD    | V    |           |

MIDAS

design • manufacture • supply



## 10. Interface timing

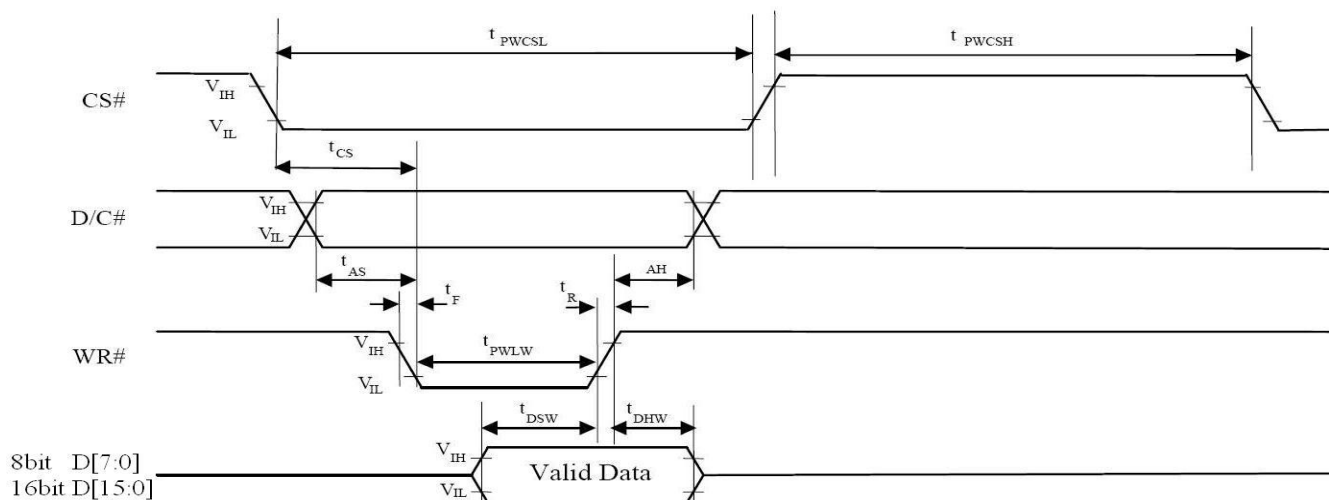
### 10.1. 8080 Mode 8bit/16bit

The 8080 mode MCU interface consist of CS#, D/C#, RD#, WR#, Data Bus signals. This interface use WR# to define a write cycle and RD# for read cycle. If the WR# goes low when the CS# signal is low, the data or command will be latched into the system at the rising edge of WR#. Similarly, the read cycle will start when RD# goes low and end at the rising edge of RD#.

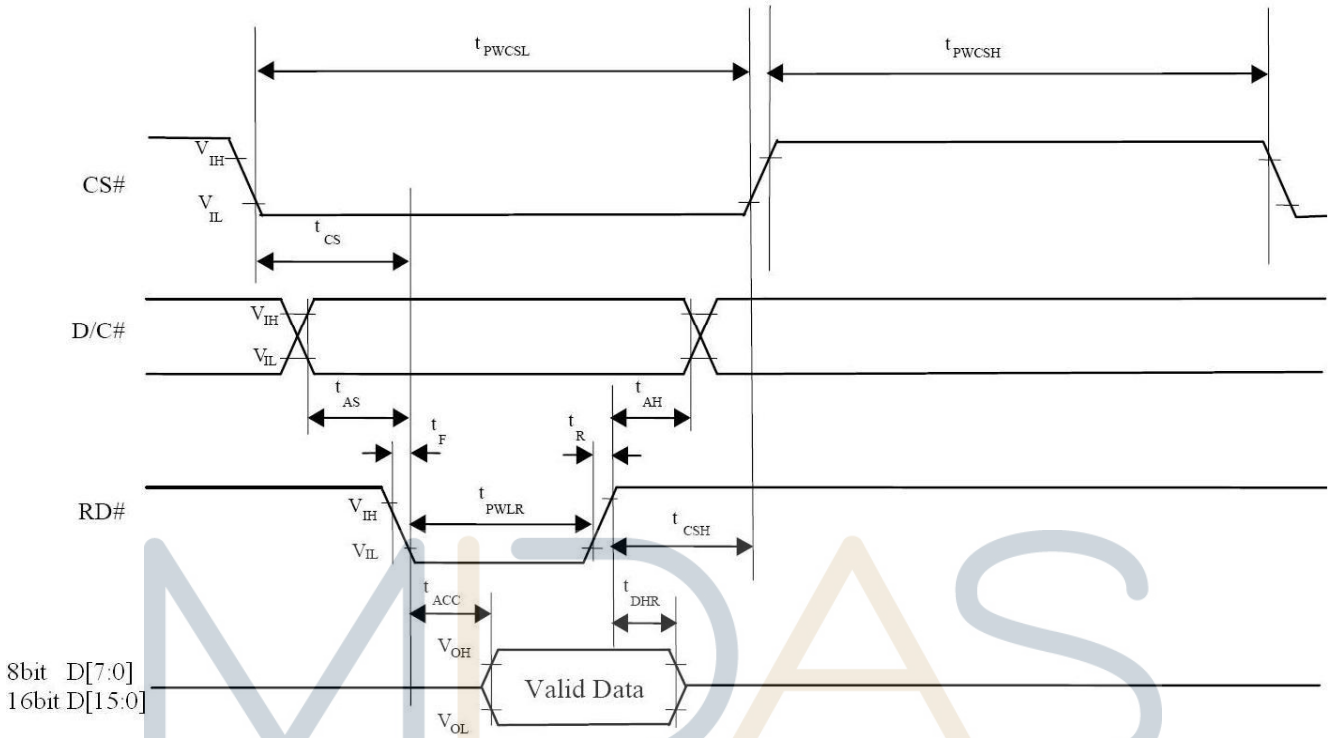
### 10.2. 8080 Mode Write Cycle

| Symbol | Parameter   | Min            | Typ                                | Max | Unit |
|--------|---|----------------|------------------------------------|-----|------|
| fMCLK  | System Clock Frequency  | 1              | -                                  | 110 | MHz  |
| tMCLK  | System Clock Period   | 1/ fMCLK       | -                                  | -   | ns   |
| tPWCSH | Control Pulse High Width Write<br>Read  | 13<br>30       | 1.5* tMCLK<br>3.5* tMCLK           | -   | ns   |
| tPWCSL | Control Pulse Low Width Write (next write cycle)<br>Write (next read cycle)<br>Read | 13<br>80<br>80 | 1.5* tMCLK<br>9* tMCLK<br>9* tMCLK | -   | ns   |
| tAS    | Address Setup Time  | 1              | -                                  | -   | ns   |
| tAH    | Address Hold Time   | 2              | -                                  | -   | ns   |
| tDSW   | Write Data Setup Time   | 4              | -                                  | -   | ns   |
| tDHW   | Write Data Hold Time  | 1              | -                                  | -   | ns   |
| tPWLW  | Write Low Time  | 12             | -                                  | -   | ns   |
| tDHR   | Read Data Hold Time   | 1              | -                                  | -   | ns   |
| tACC   | Access Time   | 32             | -                                  | -   | ns   |
| tPWLR  | Read Low Time   | 36             | -                                  | -   | ns   |
| tR     | Rise Time   | -              | -                                  | 0.5 | ns   |
| tF     | Fall Time   | -              | -                                  | 0.5 | ns   |
| tCS    | Chip select setup time  | 2              | -                                  | -   | ns   |
| tCSH   | Chip select hold time to read signal  | 3              | -                                  | -   | ns   |

### 10.3. Parallel 8080-series Interface Timing Diagram(Write Cycle)



### 10.4. Parallel 8080-series Interface Timing Diagram(Read Cycle)



### 10.5. Pixel Data Format

| Interface            | Cycle           | D[15] | D[14] | D[13] | D[12] | D[11] | D[10] | D[9] | D[8] | D[7] | D[6] | D[5] | D[4] | D[3] | D[2] | D[1] | D[0] |
|----------------------|-----------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 16 bits (565 format) | 1 <sup>st</sup> | R5    | R4    | R3    | R2    | R1    | G5    | G4   | G3   | G2   | G1   | G0   | B5   | B4   | B3   | B2   | B1   |
| 16 bits              | 1 <sup>st</sup> | R7    | R6    | R5    | R4    | R3    | R2    | R1   | R0   | G7   | G6   | G5   | G4   | G3   | G2   | G1   | G0   |
|                      | 2 <sup>nd</sup> | B7    | B6    | B5    | B4    | B3    | B2    | B1   | B0   | R7   | R6   | R5   | R4   | R3   | R2   | R1   | R0   |
|                      | 3 <sup>rd</sup> | G7    | G6    | G5    | G4    | G3    | G2    | G1   | G0   | B7   | B6   | B5   | B4   | B3   | B2   | B1   | B0   |
| 8 bits               | 1 <sup>st</sup> |       |       |       |       |       |       |      |      | R7   | R6   | R5   | R4   | R3   | R2   | R1   | R0   |
|                      | 2 <sup>nd</sup> |       |       |       |       |       |       |      |      | G7   | G6   | G5   | G4   | G3   | G2   | G1   | G0   |
|                      | 3 <sup>rd</sup> |       |       |       |       |       |       |      |      | B7   | B6   | B5   | B4   | B3   | B2   | B1   | B0   |

## 11. Optical Characteristics

| Item               | Symbol | Condition.                        | Min                               | Typ. | Max. | Unit                  | Remark            |        |
|--------------------|--------|-----------------------------------|-----------------------------------|------|------|-----------------------|-------------------|--------|
| Response time      | Tr     | $\theta=0^\circ$ 、 $\phi=0^\circ$ | -                                 | 10   | 20   | .ms                   | Note 3,5          |        |
|                    | Tf     |                                   | -                                 | 15   | 30   | .ms                   |                   |        |
| Contrast ratio     | CR     | At optimized viewing angle        | 400                               | 500  | -    | -                     | Note 4,5          |        |
| Color Chromaticity | White  | Wx                                | $\theta=0^\circ$ 、 $\phi=0^\circ$ | 0.26 | 0.31 | 0.36                  | Note 2,6,7        |        |
|                    |        | Wy                                |                                   | 0.28 | 0.33 | 0.38                  |                   |        |
| Viewing angle      | Hor.   | $\Theta_R$                        | $CR \geq 10$                      | -    | 75   | -                     | Deg.              | Note 1 |
|                    |        | $\Theta_L$                        |                                   | -    | 75   | -                     |                   |        |
|                    | Ver.   | $\Phi_T$                          |                                   | -    | 75   | -                     |                   |        |
|                    |        | $\Phi_B$                          |                                   | -    | 75   | -                     |                   |        |
| Brightness         | -      | -                                 | 300                               | 400  | -    | cd/<br>m <sup>2</sup> | Center of display |        |

Ta=25±2°C,

Note 1: Definition of viewing angle range

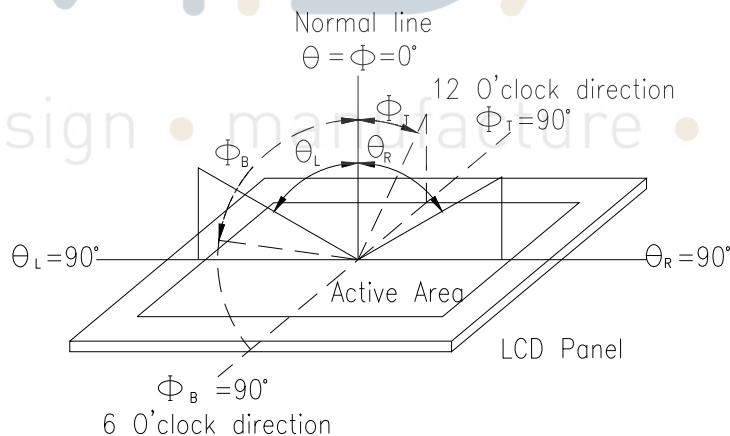


Fig. 11.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

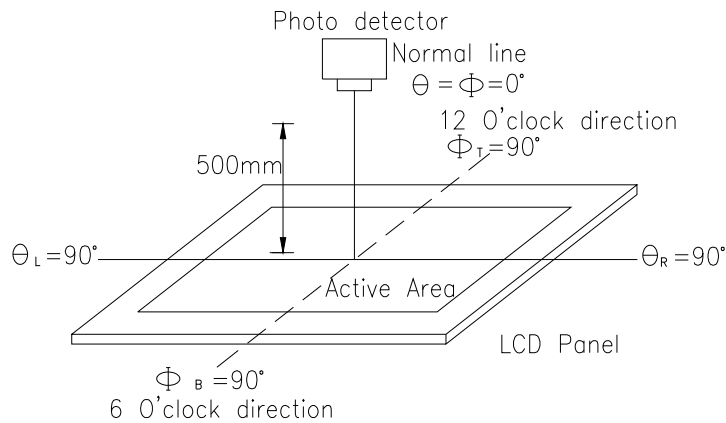
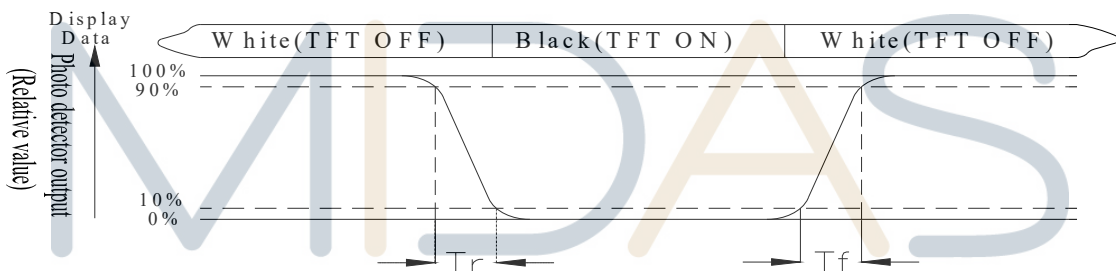


Fig. 11.2. Optical measurement system setup

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,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%. And fall time,  $T_f$ , is the time between photo detector output intensity changed from 10% to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

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

Note 5: White  $V_i = V_{i50} \pm 1.5V$

Black  $V_i = V_{i50} \pm 2.0V$

“±” means that the analog input signal swings in phase with VCOM signal.

“±” means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.



## 12. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

| Environmental Test                   |  |   |      |
|--------------------------------------|--|---|------|
| Test Item                            | Content of Test  | Test Condition  | Note |
| High Temperature storage             | Endurance test applying the high storage temperature for a long time.  | 80°C<br>200hrs  | 2    |
| Low Temperature storage              | Endurance test applying the low storage temperature for a long time.   | -30°C<br>200hrs   | 1,2  |
| High Temperature Operation           | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.   | 70°C<br>200hrs  | —    |
| Low Temperature Operation            | Endurance test applying the electric stress under low temperature for a long time.   | -20°C<br>200hrs   | 1    |
| High Temperature/ Humidity Operation | The module should be allowed to stand at 60°C, 90%RH max   | 60°C, 90%RH<br>96hrs  | 1,2  |
| Thermal shock resistance             | The sample should be allowed stand the following 10 cycles of operation<br><br><div style="text-align: center;"> <p style="margin: 0;">-20°C    25°C    70°C</p> <p style="margin: 0;">30min    5min    30min</p> <p style="margin: 0;">1 cycle</p> </div> | -20°C/70°C<br>10 cycles   | —    |
| Vibration test                       | Endurance test applying the vibration during transportation and using.   | Total fixed amplitude : 3<br>15mm<br>Vibration Frequency :<br>10~55Hz<br>One cycle 60<br>seconds to 3<br>directions of X,Y,Z for<br>Each 15 minutes | 3    |
| Static electricity test              | Endurance test applying the electric stress to the terminal.   | VS=±600V(contact)<br>,±800v(air),<br>RS=330Ω<br>CS=150pF<br>10 times  | —    |

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.