# CUSTOMER' S APPROVAL SPECIFICATIONS

## MODEL: CH070OLFL-006

## (Complied with RoHS)



**ISSUE:APR.11.2013**

**Spec Condition: preliminary**



| CUSTOMER | CHEFREE | | |
|---|---|---|---|
| APPROVAL | APPROVAL | CHECKER | PREPARE |
| | ch lee | ch lee | kevin |

# 2.RECORD OF REVISION

| Rev | DATE | PAGE | SUMMARY |
|---|---|---|---|
| 0.1 | 2013.04.11 | ALL | Preliminary specification was first issued. |

# 3.MECHANICAL SPECIFICATIONS

| | | |
|---|---|---|
| (1) | Number Of Dots (Dots) | 1024(R.G.B) X 600 |
| (2) | Module Size(mm) | 165.75(W) X 105.39(H) X 5.0(D) |
| (3) | Active Area(mm) | 153.6(H) X 90.0(V) |
| (4) | Pixel Pitch(mm) | 0.15 (H) X 0.15(V) |
| (5) | LCD Model | TFT , Transmissive, Normally/White |
| (6) | Polarizer Model | Glare |
| (7) | LED Backlight Color | White |
| (8) | Viewing Direction | 12 O'clock |
| (9) | Gray Scale Inversion Direction | 6 O'clock |
| (10) | Color Configuration | R.G.B Stripe |
| (11) | Module Weight(g) | TBD |

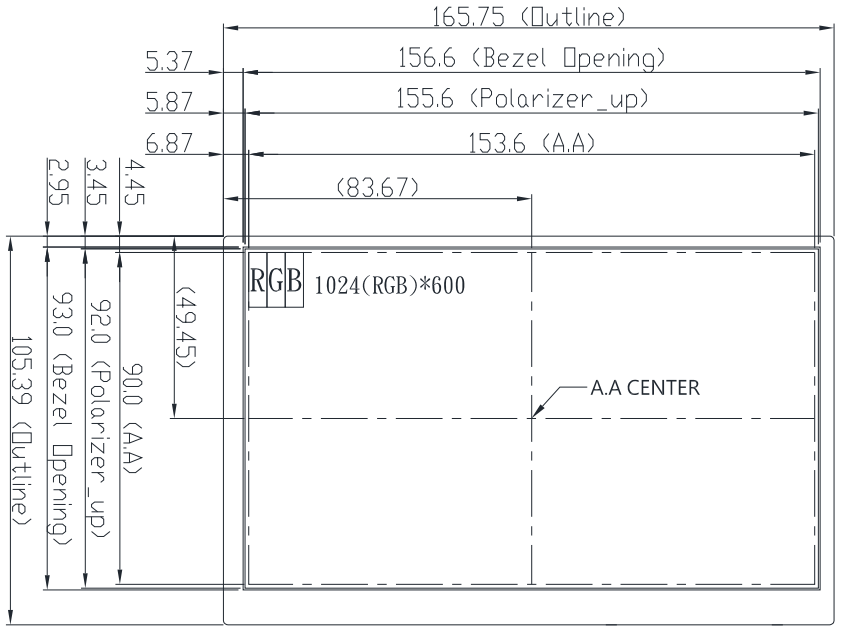
**Viewing direction for best image quality is different from TFT definition, there is the 180 degrees shift.

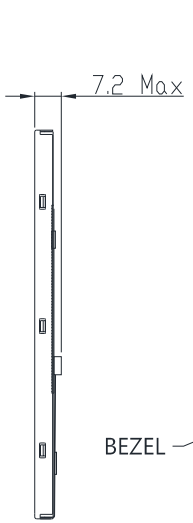
| 文件題目 | 圖號 | 頁 | 次頁 |
|---|---|---|---|
| 發行日 | 舊版日 | 登入號碼 | 機密等級 |

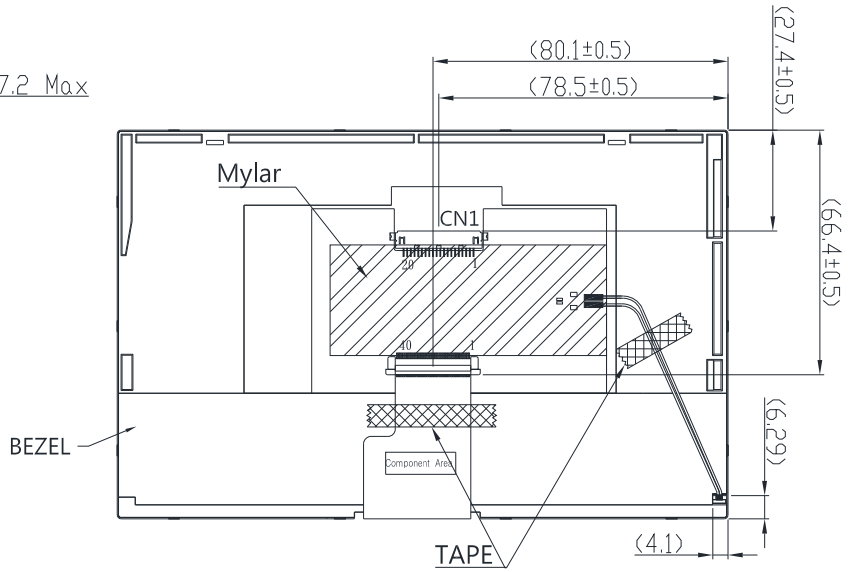
8 樣式 QT2-RD02-008

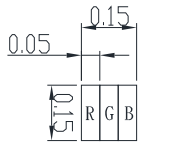
| No. | 修定區塊 | 修 訂 內 容 | 作 成 | 修訂日期 |
|---|---|---|---|---|
| | | 新版 | Swallow | 2013.04.02 |
| | | | | |
| | | | | |

# 4. OUTLINE DIMENSIONS




Detail DOT
Scale 100:1

NOTE:
1. Unit: mm
2. Tolerance is ±0.3 mm unless noted。
3. CN1: MSB24013P20HA or Equivalent .

| | 備考 | | | 單位: | 投影法: | 比例尺: |
|---|---|---|---|---|---|---|
| 入庫 | 製圖 | Swallow | 130402 | mm | | |
| | 審查 | | | 名稱: 7" LCM | | 圖號 |
| | 承認 | | | | | |

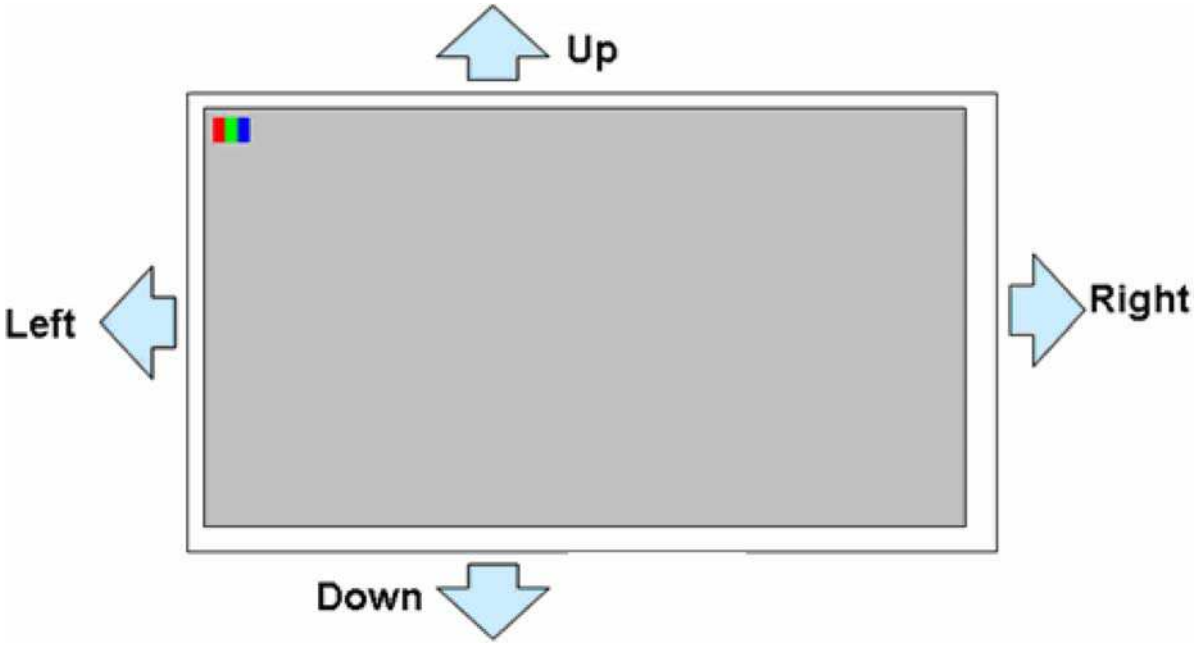
# 5. INTERFACE PIN CONNECTION

## 5.1 LCM PANEL DRIVING SECTION (CN1: MSB24013P20HA or Equivalent)

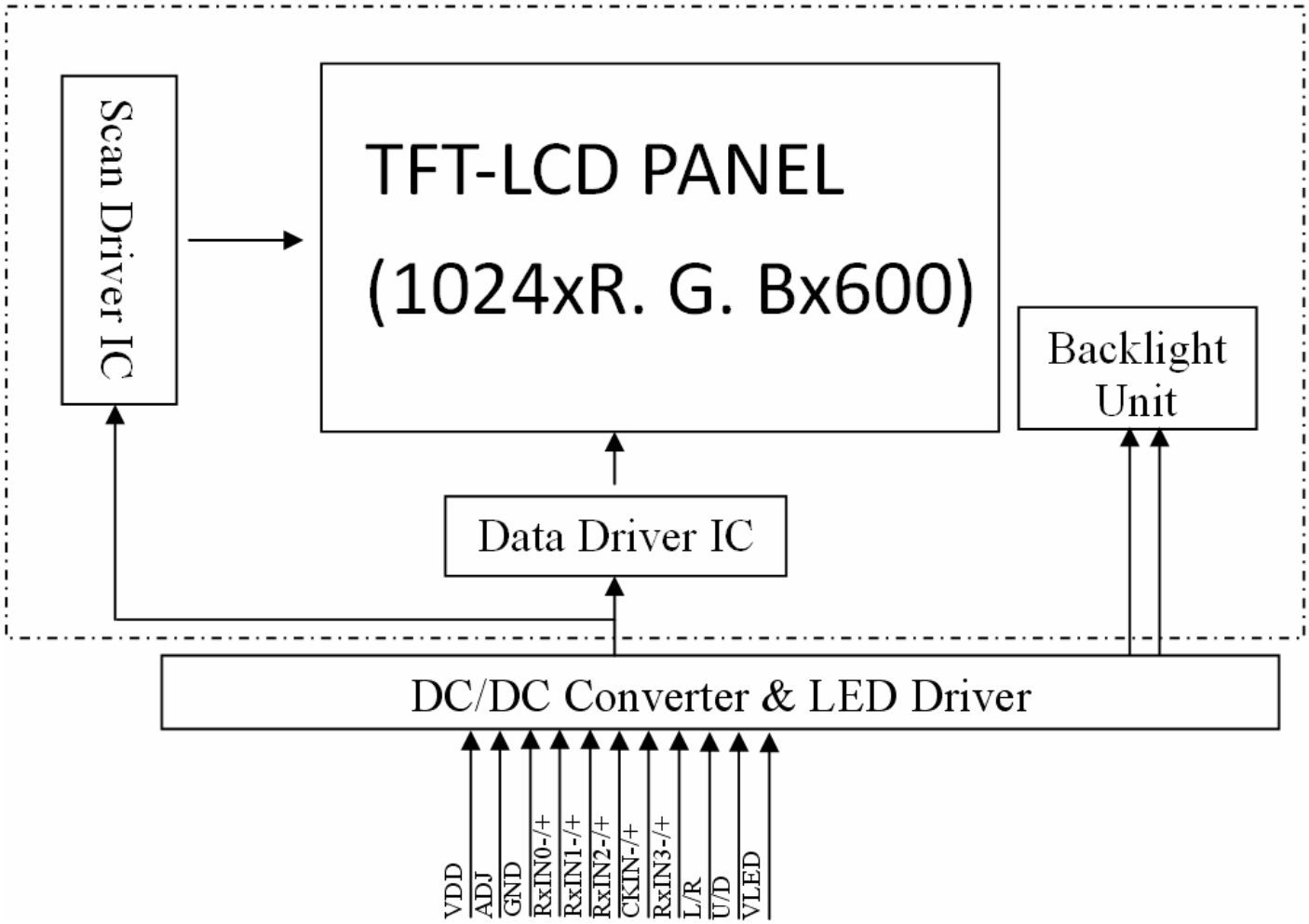
| PIN NO. | SIGNAL | FUNCTION | REMARK |
|---|---|---|---|
| 1 | VDD | Power Voltage for digital circuit | |
| 2 | VDD | Power Voltage for digital circuit | |
| 3 | U/D | Up/Down Scan | Note 1 |
| 4 | L/R | Left/Right Scan | Note 1 |
| 5 | RXIN0- | Differential data Input,CH0(G0,R0~R5) | |
| 6 | RXIN0+ | Differential data Input,CH0(G0,R0~R5) | |
| 7 | GND | Ground | |
| 8 | RXIN1- | Differential data Input,CH1(B0,B1,G1~G5) | |
| 9 | RXIN1+ | Differential data Input,CH1(B0,B1,G1~G5) | |
| 10 | GND | Ground | |
| 11 | RXIN2- | Differential data Input,CH2(DE,B2~B5) | |
| 12 | RXIN2+ | Differential data Input,CH2(DE,B2~B5) | |
| 13 | GND | Ground | |
| 14 | RXCLKIN- | Differential Clock Input | |
| 15 | RXCLKIN+ | Differential Clock Input | |
| 16 | GND | Ground | |
| 17 | RXIN3- | Differential data Input,CH3(B6,B7,G6,G7,R6,R7) | |
| 18 | RXIN3+ | Differential data Input,CH3(B6,B7,G6,G7,R6,R7) | |
| 19 | VLED | LED Driving Voltage | |
| 20 | ADJ | LED ADJ dimming | |

Note1:

| U/D | L/R | FUNCTION |
|---|---|---|
| 0 | 1 | Normal display |
| 0 | 0 | Inverse Left and Right |
| 1 | 1 | Inverse Up and Down |
| 1 | 0 | Inverse Left and Right<br>Inverse Up and Down |



# 6. BLOCK DIAGRAM




# 7.ABSOLUTE MAXIMUM RATINGS

## 7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

| ITEM | SYMBOL | MIN. | MAX. | UNIT | COMMENT |
|---|---|---|---|---|---|
| Power Supply Voltage For Digital | VDD | -0.3 | 5.0 | V | |
| Logic Output Voltage | $V_I$ | -0.5 | 5.0 | V | |

## 7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

| ITEM | OPERATING | | STORAGE | | COMMENT |
|---|---|---|---|---|---|
| | MIN | MAX | MIN | MAX | |
| Ambient Temperature(℃) | -20 | 60 | -30 | 70 | Note 1,2,3 |
| Humidity(% RH) | - | 90 | - | 90 | Note 4 |

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation Ta=60℃ & -20℃ ≦ 240Hrs.

Note 4 : Storage Ta=40℃ & H=90% ≦ 240Hrs.

# 8. ELECTRICAL CHARACTERISTICS

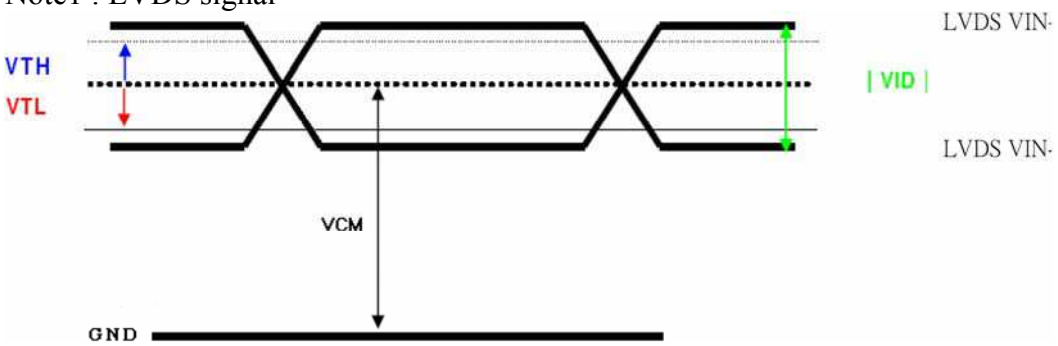
## 8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25℃

| ITEM | SYMBOL | MIN. | TYP. | MAX. | UNIT | REMARK |
|---|---|---|---|---|---|---|
| Power Voltage For Digital | VDD | 3.0 | 3.3 | 3.6 | V | |
| | IDD* | - | 150 | 180 | mA | VDD=3.3V |
| Input High Voltage | $V_{IH}$ | 0.7 x VDD | - | VDD | V | |
| Input Low Voltage | $V_{IL}$ | GND | - | 0.3 x VDD | V | |
| Logic Input Voltage (LVDS: IN+, IN-) | VCM | \|VID\|/2 | - | 2.4-\|VID\|/2 | V | Note1 |
| | \|VID\| | 200 | - | 600 | mV | Note1 |
| | VTH | - | - | 100 | mV | VCM=1.2V |
| | VTL | -100 | - | - | mV | |

*Test pattern Black.

Note1 : LVDS signal



8.2 BACKLIGHT UNITS

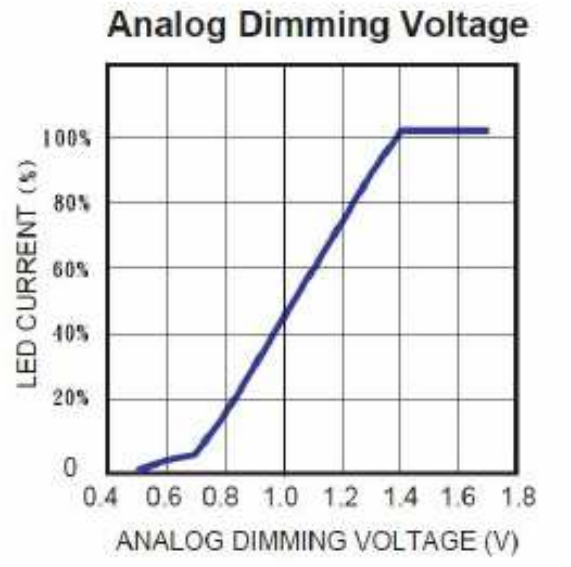
Ta=25℃

| ITEM | | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| LED Driving Voltage | | VLED | 11.7 | 12 | 12.3 | V |
| LED Driving Current | | ILED | - | TBD | TBD | mA |
| Brightness Control | Analog dimming | ADJ | 0.7 | - | 1.4 | $V_{DC}$ |
| | PWM dimming | | 1.4 | - | 5.0 | $V_{P-P}$ |
| ADJ Frequency | | - | 100 | - | 1000 | Hz |
| LED Life Time | | - | 50000 | - | - | Hr |

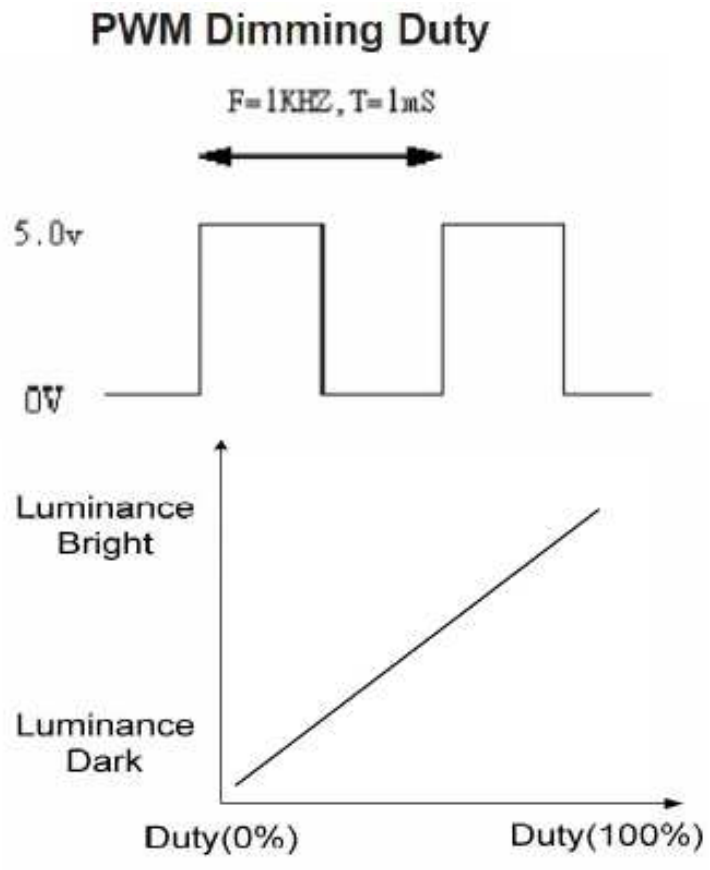
Note 1: If the module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

Note 2: Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

Note 3: When the ADJ pin voltage rises from 0.7VDC to 1.4VDC, the LED current will change from 0% to 100% of the maximum LED current.



Note 4: ADJ signal Vp-p =1.4~5.0V, operation frequency: 100Hz ~ 1 kHz



# 9. OPTICAL CHARACTERISTICS

Ta=25℃

| ITEM | | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNIT | REMARK |
|---|---|---|---|---|---|---|---|---|
| Contrast Ratio | | CR | Viewing Normal Angle $\Theta x=\Theta y=0^\circ$ CR≧10 | 500 | 700 | - | - | Note (1) |
| Response Time | | TR+TF | | - | 25 | 50 | ms | Note (2) |
| Chromaticity | White | x | | (0.249) | (0.299) | (0.349) | - | Note (4) |
| | | y | | (0.273) | (0.323) | (0.373) | - | |
| Viewing Angle | Hor. | $\Theta x+$ | Viewing Angle $\Theta x=\Theta y=0°$ CR≧10 | 65 | 75 | - | Deg. | Note (3) |
| | | $\Theta x-$ | | 65 | 75 | - | | |
| | Ver. | $\Theta Y+$ | | 60 | 70 | - | | |
| | | $\Theta Y-$ | | 65 | 75 | - | | |
| Luminance | | L | PWM=100% | (900) | (1000) | - | cd/m2 | |
| Luminance uniformity | | YU | | 70 | - | - | % | Note (5) |

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

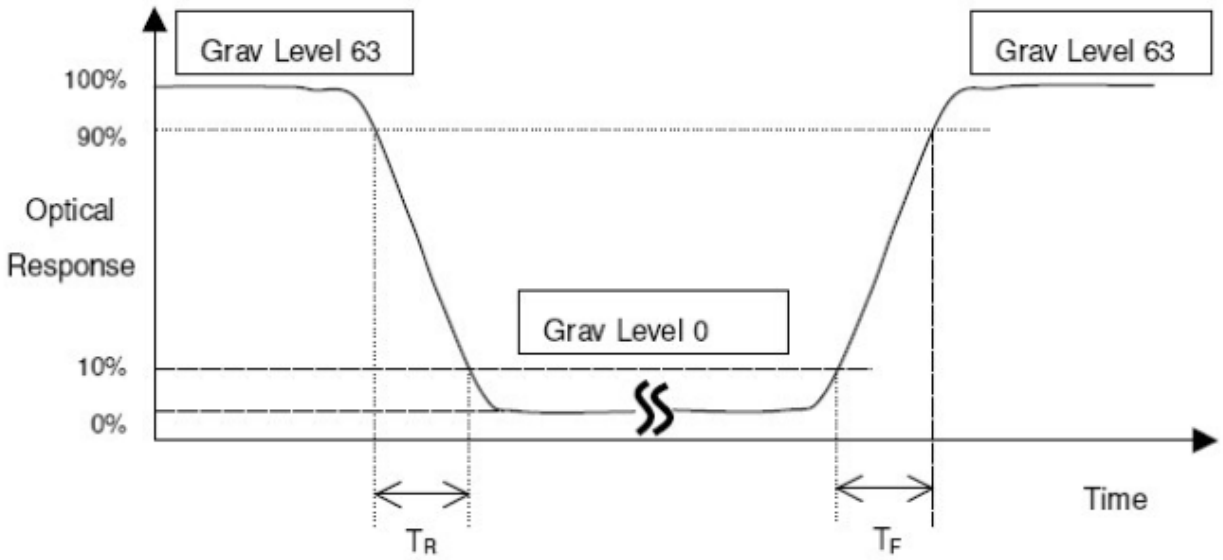
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

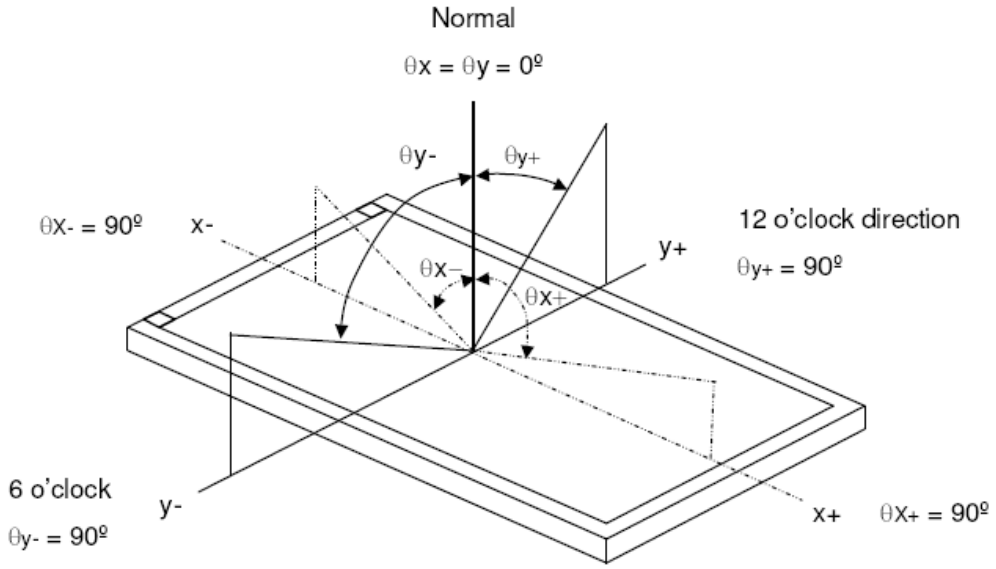
CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time ($T_R$, $T_F$):

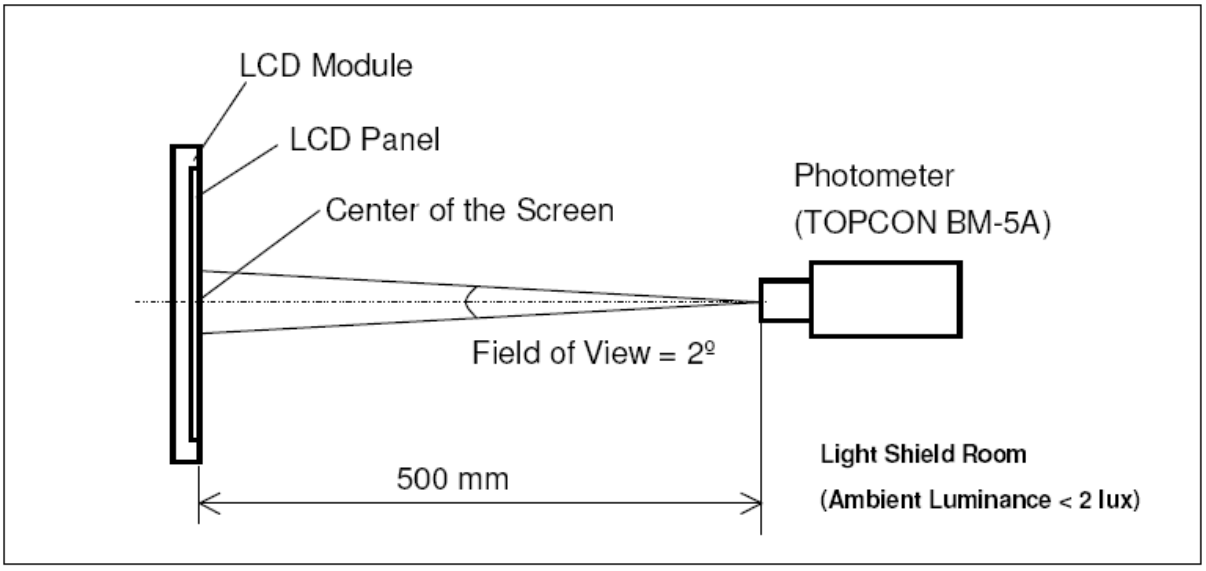


*Note(3) Definition of Viewing Angle

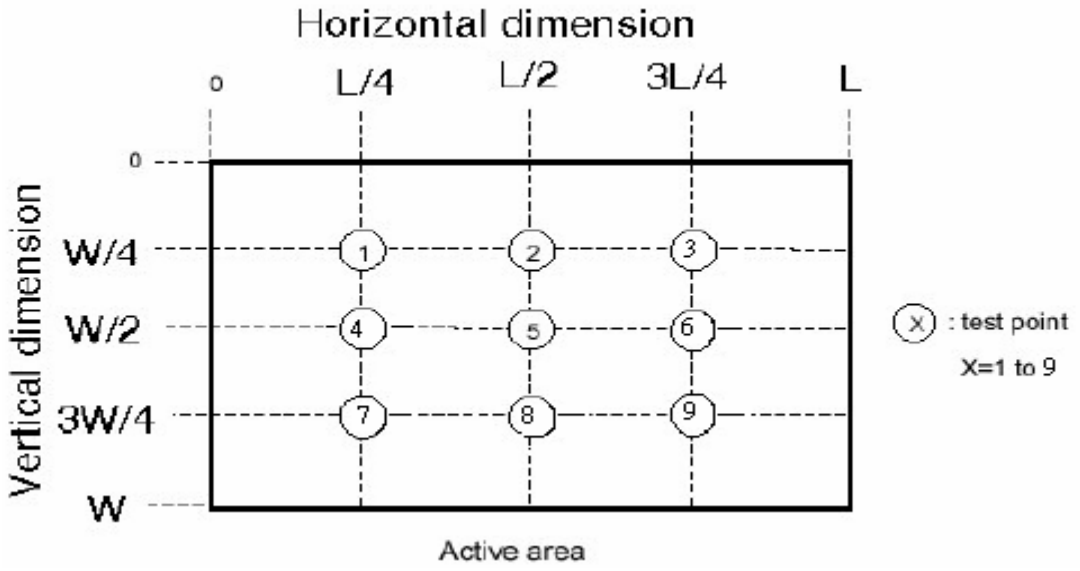



*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)

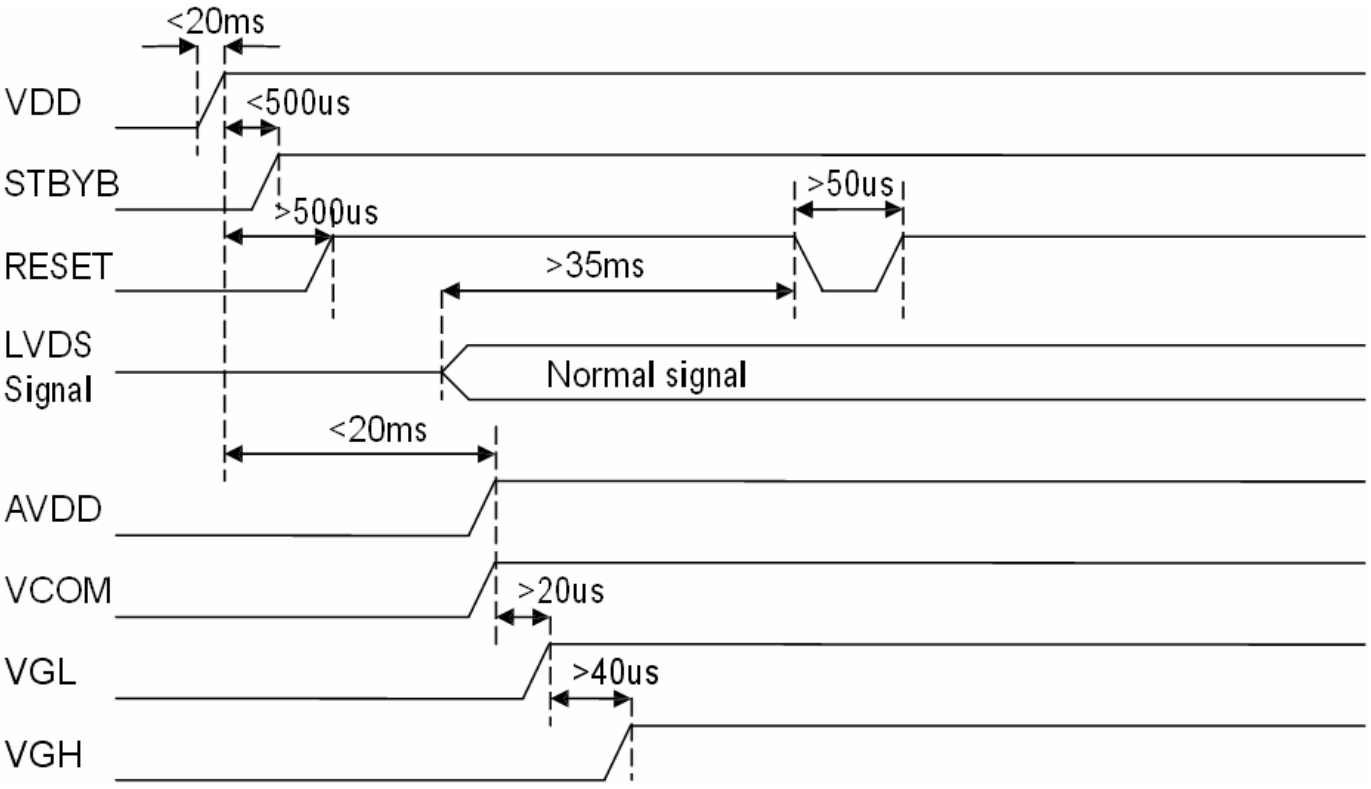



$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}}\right) \times 100\% > 70\%$$

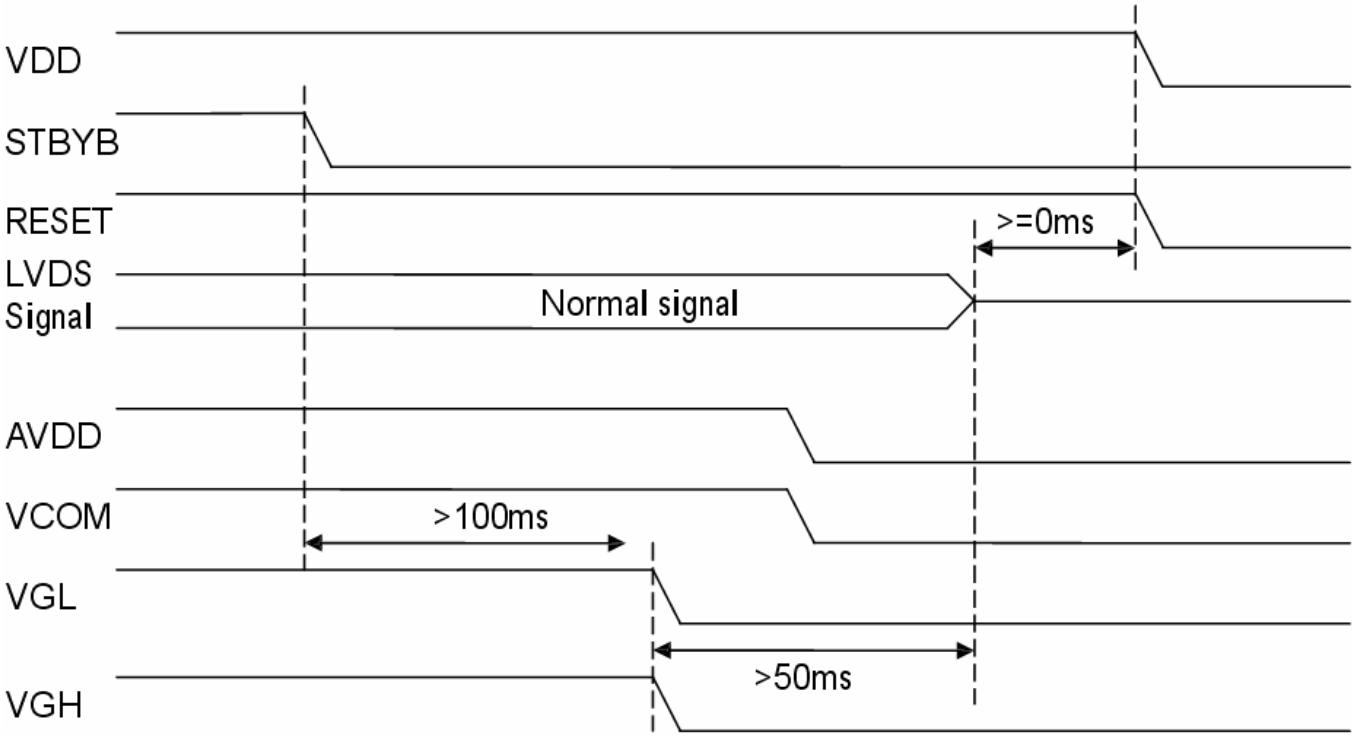
# 10. TIMING SPECIFICATIONS

## 10.1 POWER SIGNAL SEQUENCE

### 10.1.1 Power on:




### 10.1.2 Power off:

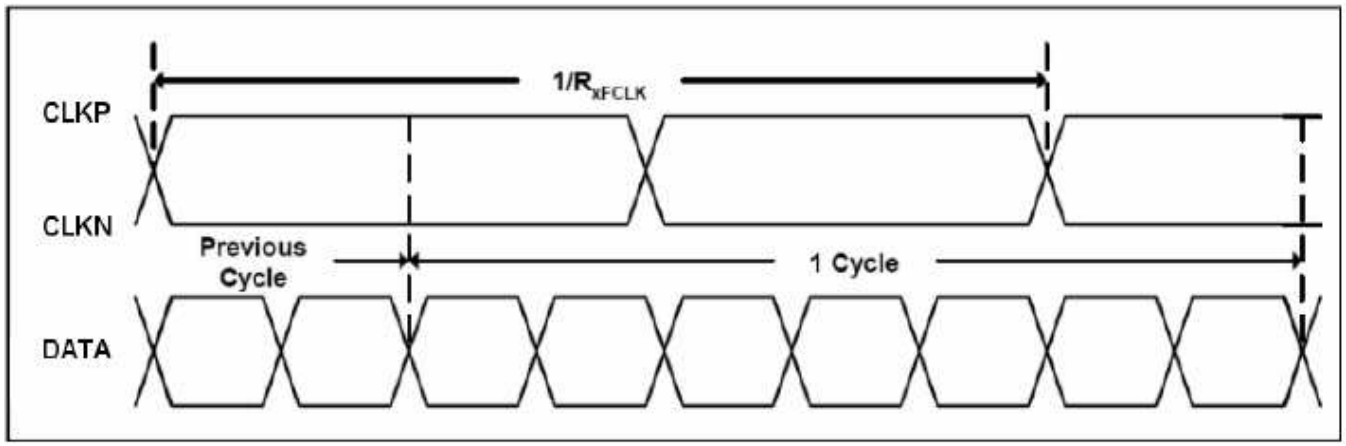


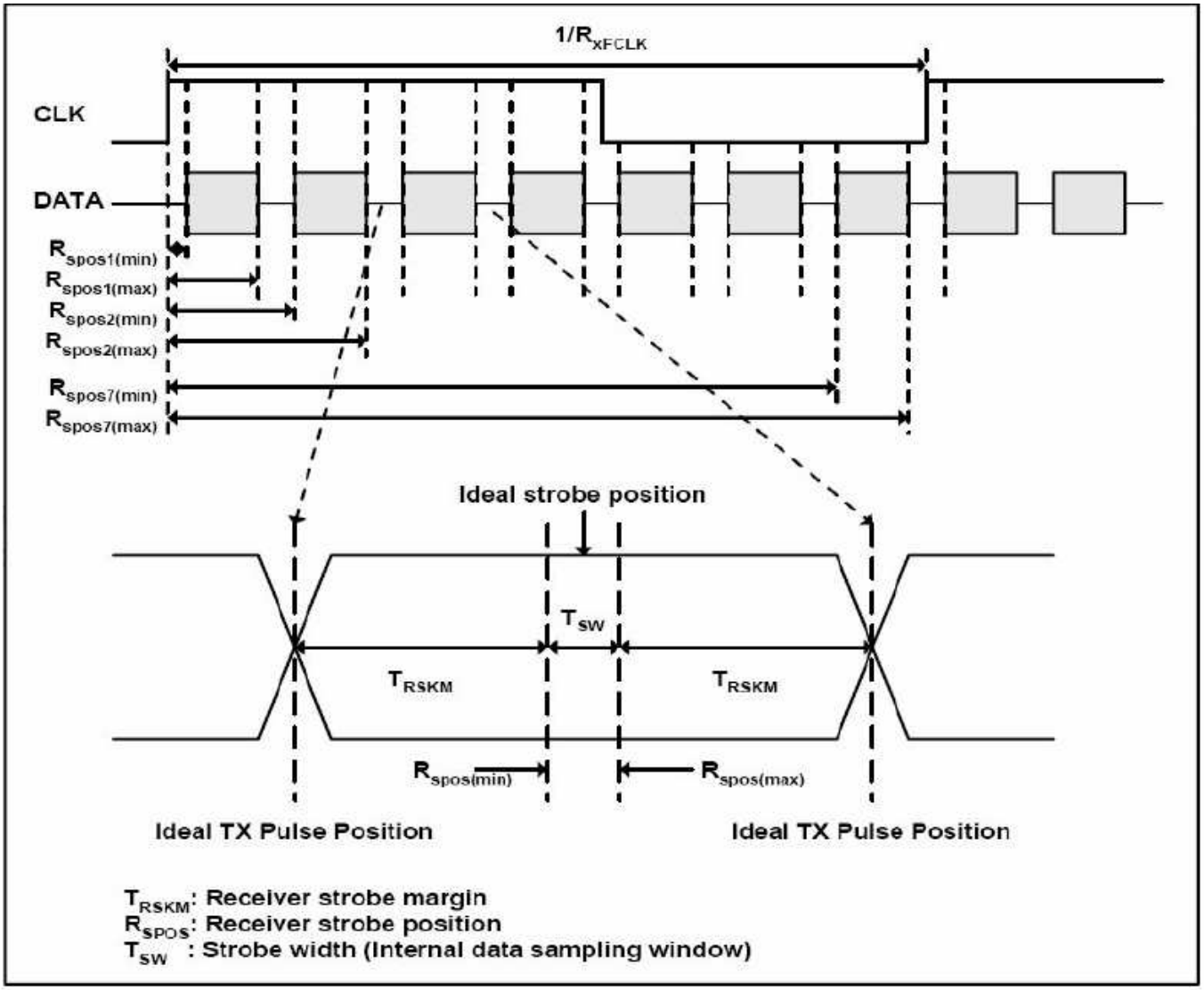
10.2 TIMING CHARACTERISTICS OF INPUT SIGNALS

| ITEM | | | | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|---|
| LVDS input signal sequence | CLK Frequency** | | | tclk | 40.8 | 51.2 | 67.2 | MHz |
| LCD input signal sequence(Input LVSD Transmitter | DENA | Horizontal | Horizontal total Time | $t_H$ | 1114 | 1344 | 1400 | tCLK |
| | | | Horizontal effective Time | $t_{HA}$ | 1024 | | | tCLK |
| | | | Horizontal Blank Time | tHB | 90 | 320 | 376 | tCLK |
| | | Vertical | Vertical total Time | $t_V$ | 610 | 635 | 800 | $t_H$ |
| | | | Vertical effective Time | $t_{VA}$ | 600 | | | $t_H$ |
| | | | Vertical Blank Time | $t_{VB}$ | 10 | 35 | 200 | $t_H$ |

**Frame rate = 60Hz

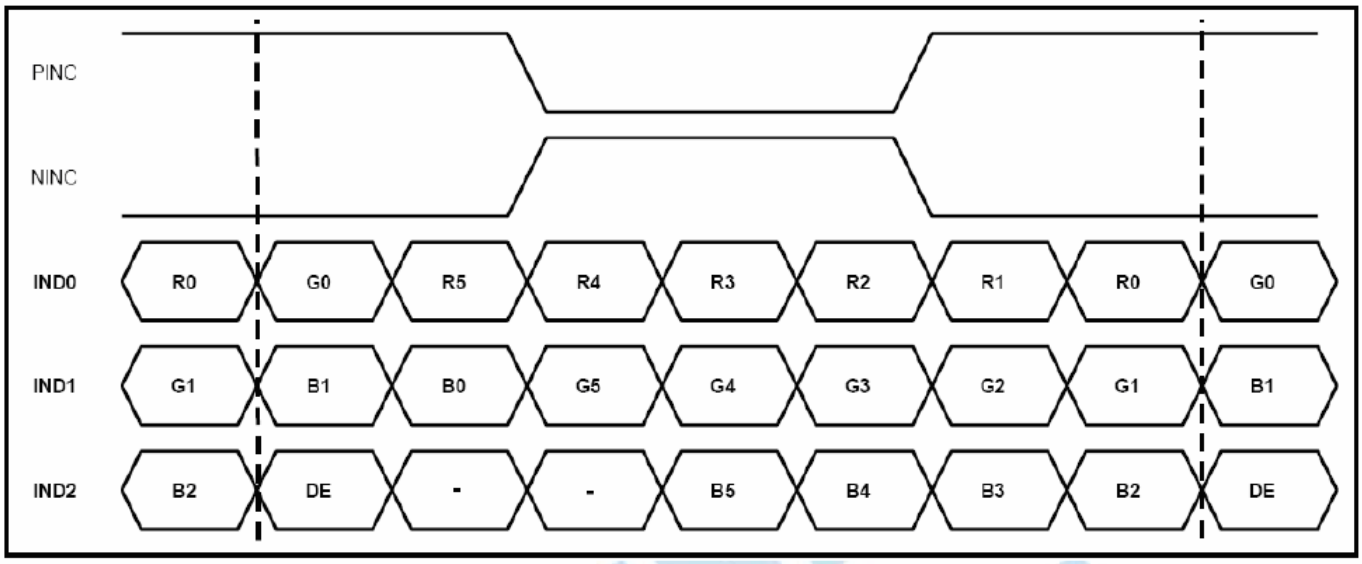
10.3 TIMING SEQUENCE(TIMING CHART)



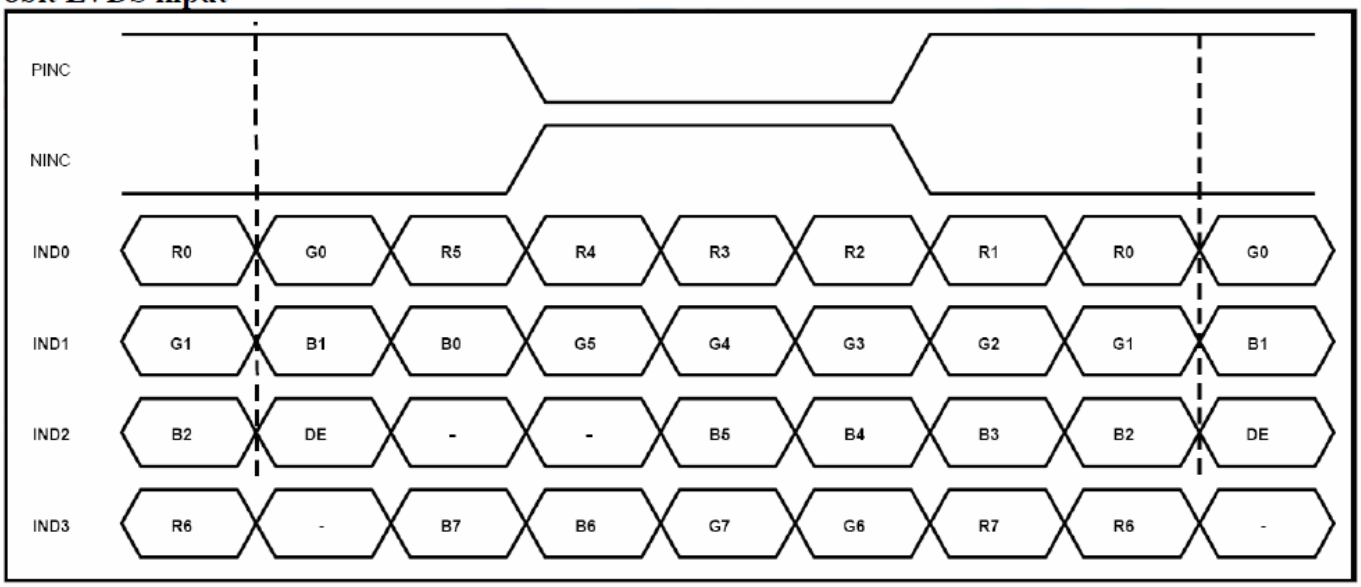



10.4 LVDS INPUT DATA MAPPING

**6bit LVDS input**




**8bit LVDS input**




Note: Support DE timing mode only, SYNC mode not supported.

# 11. RELIABILITY TEST

Ta = 25℃

| Environmental Test | | | | |
|---|---|---|---|---|
| NO. | ITEM | CONDITIONS | TIME PERIOD | REMARK |
| 1 | High Temperature Storage | 70℃ | 240HRS | |
| 2 | Low Temperature Storage | -30℃ | 240HRS | |
| 3 | High Temperature Humidity Storage | 40℃ 90%RH | 240HRS | NOTE(2) |
| 4 | High Temperature Operation | 60℃ | 240HRS | NOTE(2) |
| 5 | Low Temperature Operation | -20℃ | 240HRS | NOTE(2) |
| 6 | Temperature Cycle | -30℃←25℃→70℃ (30min) (5min) (30min) | 10CYCLE | NOTE(2) |

NOTE (1): a. THE MODULE SHOULD WORK PROPERLY.
b. BEFORE AND AFTER FUNCTION TEST, THE DIFFERENCE OF CONSUMPTIVE CURRENT.SHOULD BE WITHIN 10%

NOTE (2): a. THE MODULE SHOULD WORK PROPERLY.
b. THE MODLUE WON'T BE DEFORMATIVE, COLOR CHANGEABLE OR BROKEN.
c. THE MODULES CAN'T BE APART.

NOTE (3): BEFORE COSMETIC AND FUNCTION TEST, THE PRODUCT MUST HAVE ENOUGH RECOVERY TIME, AT LEAST 2 HOURS AT ROOM TEMPERATURE.

# 12. PACKAGE METHOD

TBD

# Contact details

## The Netherlands

Elektrostraat 17
NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33
F: +31 (0)53 573 33 30
E: nl@texim-europe.com

## Belgium

Zuiderlaan 14 bus 10
B-1731 Zellik

T: +32 (0)2 462 01 00
F: +32 (0)2 462 01 25
E: belgium@texim-europe.com

## UK & Ireland

St. Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS

T: +44 (0)1522 789 555
F: +44 (0)845 299 22 26
E: uk@texim-europe.com

## Germany North

Bahnhofstrasse 92
D-25451 Quickborn

T: +49 (0)4106 627 07-0
F: +49 (0)4106 627 07-20
E: germany@texim-europe.com

## Germany South

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
F: +49 (0)89 436 086-19
E: germany@texim-europe.com

## Austria

Warwitzstrasse 9
A-5020 Salzburg

T: +43 (0)662 216 026
F: +43 (0)662 216 026-66
E: austria@texim-europe.com

## Nordic region

Sdr. Jagtvej 12
DK-2970 Hørsholm

T: +45 88 20 26 30
F: +45 88 20 26 39
E: nordic@texim-europe.com

## General information

**info@texim-europe.com**
**www.texim-europe.com**