

CUSTOMER APPROVAL SHEET

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APPROVAL FOR SPECIFICATIONS ONLY (Spec. Ver.)

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Product Specification

10.1" COLOR TFT-LCD MODULE

< >Preliminary Specification

< >Final Specification

Note: The content of this specification is subject to change.

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Record of Revision

| Version | Revise Date | Page | Content |
|---------|--------------|---------------|--|
| 0 | 06/Jun./2008 | 0 | First draft. |
| 1 | 25/Jul/2008 | 8 | Updated LED Current 160mA->220mA & LED lift time 10,000hr->20,000hr |
| 1.1 | 2/Oct/2008 | 14 | Module Brightness specification changed |
| | 2/Oct/2008 | 14 | Module Contrast ratio specification change |
| | 2/Oct/2008 | 15 | Edit 9 point Graph. |
| | | 17 | Edit Vibration Specs. |
| 1.2 | 3/Feb/2009 | Cover Page | Add product life time & EOL plan |
| | | 7 | Correct absolute maximum ratings |
| | | 7 | Operating Temperature:-10 ~60 |
| | | 7 | Storage Temperature:-20 ~70 |
| | | 14 | Updated optical test note1. |
| | | 17 | Explain panel function confirmed in reliability test(Note3). |
| 1.3 | 08/Apr/2010 | 9 | Update the absolute maximum ratings |
| | | 11 | Update the condition of current consumption |
| | | 28 | Update the recommend resister value |
| 1.4 | 25/Jun/2010 | 3 | Modified Color Depth |
| | | 9 | Correct absolute maximum ratings |
| | | 9 | Operating Temperature:-10 ~60 |
| | | 9 | Storage Temperature:-20 ~70 |
| 1.5 | 09/Jul/2010 | 20 | Updated Response Time Rise:12ms,Fall:18ms |
| 1.6 | 11/Aug/2010 | Cover page | Modified EOL schedule in 2011/Jun. |
| 1.7 | 5/Oct/2010 | 3 | Modify figure that shows dot stripe arrangement |
| 1.8 | 22/Nov/2011 | 4 | Note 3: The full color display depends on 18-bit data signal |

| | | | |
|-----|-------------|------|---|
| 1.9 | 1/Dec/2011 | 5,10 | Updated BLU connector type:E&T H201K-P02N-02B (It's compatible with original original connector) |
| 2.0 | 13/Aug/2013 | 24 | Optical Specification: Added response time_max. value |
| 2.1 | 15/Jan/2014 | 7 | Revise Pin2 / 3 / 5 information |

Contents

| | |
|---|-----------|
| A. General Information | 4 |
| B. Outline Dimension | 5 |
| 1. TFT-LCD Module – Front View | 5 |
| 2. TFT-LCD Module – Rear View | 6 |
| C. Electrical Specifications | 7 |
| 1. TFT LCD Panel Pin Assignment | 7 |
| 2. Backlight Pin Assignment | 10 |
| 3. Absolute Maximum Ratings | 10 |
| 3. Electrical DC Characteristics | 11 |
| 4. Electrical AC Characteristics | 13 |
| 5. Power On/Off Characteristics | 19 |
| D. Optical Specification | 20 |
| E. Reliability Test Items | 23 |
| F. Packing and Marking | 26 |
| 1. Packing Form | 26 |
| 2. Module/Panel Label Information | 27 |
| 3. Carton Label Information | 27 |
| G. Application Note | 28 |
| 1. Recommended Gamma Voltage | 28 |
| H. Precautions | 29 |

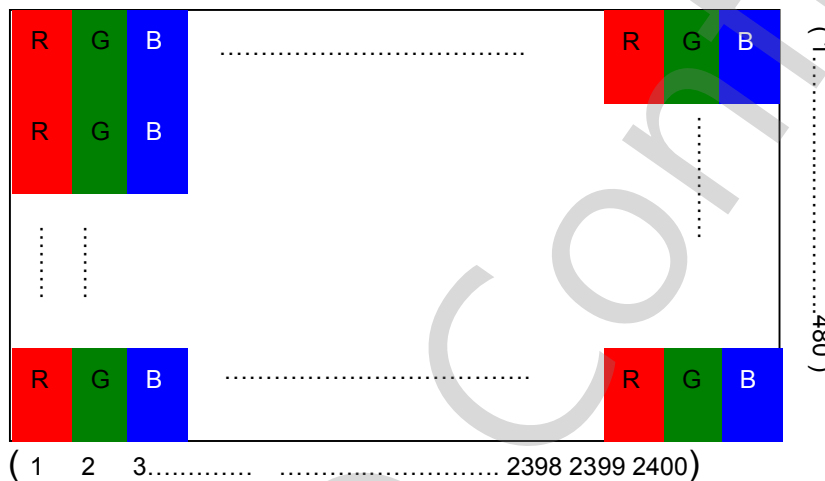
A. General Information

This product is for portable DVD and digital photo frame application.

| NO. | Item | Unit | Specification | Remark |
|-----|------------------------------|------|-----------------------------------|--------|
| 1 | Screen Size | inch | 10.1(Diagonal) | |
| 2 | Display Resolution | dot | 800 RGB (W) x 480(H) | |
| 3 | Overall Dimension | mm | 235(W) x 145.9(H) x 5.4(D) | Note 1 |
| 4 | Active Area | mm | 219.6(W) x 131.76(H) | |
| 5 | Pixel Pitch | mm | 0.2745(W) x 0.2745(H) | |
| 6 | Color Configuration | -- | R. G. B. stripe | Note 2 |
| 7 | Color Depth | -- | 262k Colors | Note 3 |
| 8 | NTSC Ratio | % | 48% | |
| 9 | Display Mode | -- | Normally White | |
| 10 | Panel surface Treatment | -- | Anti-Glare | |
| 11 | Weight | g | 315g | |
| 12 | LCD Module Power Consumption | W | 2.64W | |
| 13 | Viewing direction | | 6 o'clock (gray inversion) | |

Note 1: Not include backlight cable and FPC. Refer next page to get further information.

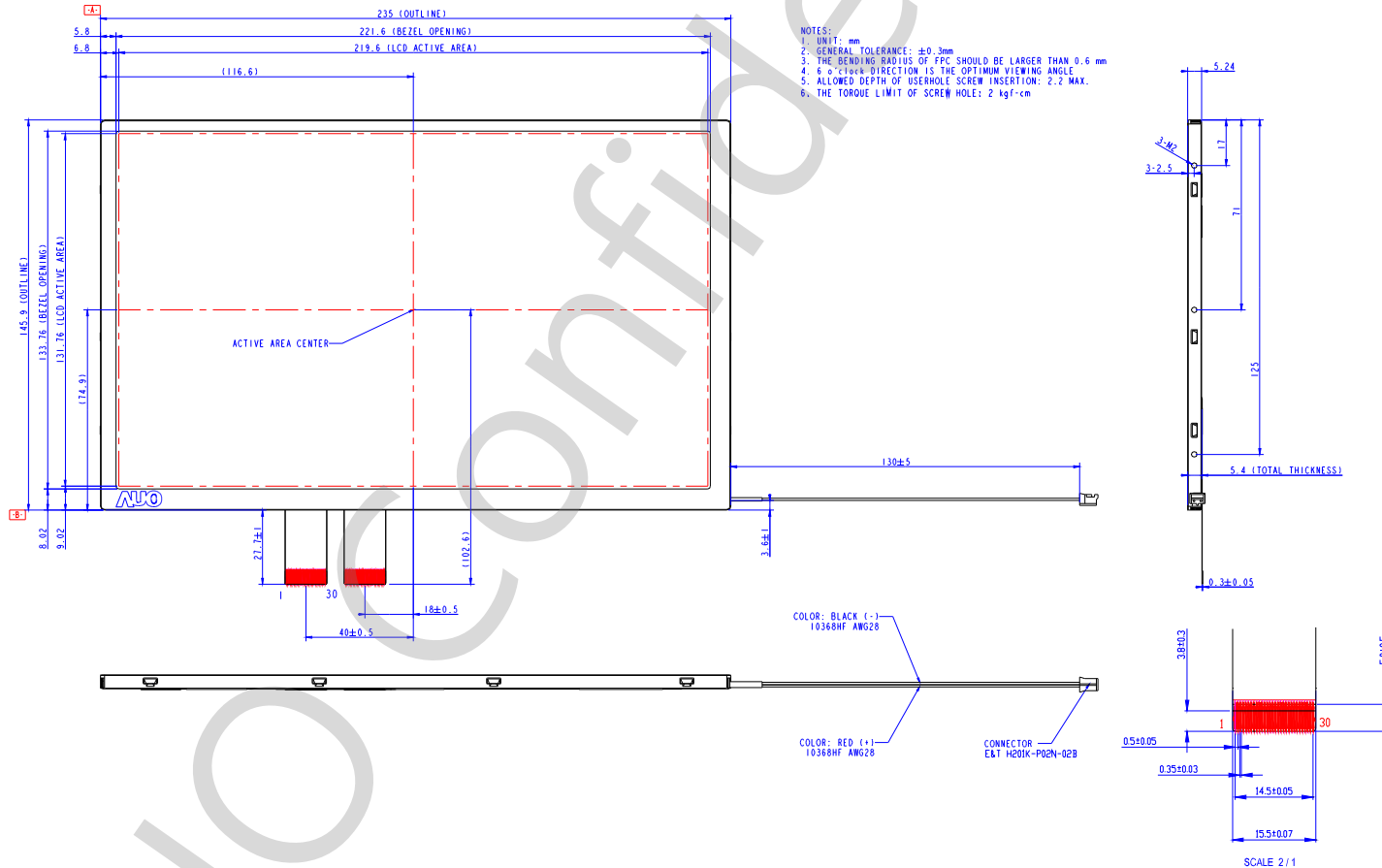
Note 2: Below figure shows dot stripe arrangement.



Note 3: The full color display depends on **18-bit** data signal (pin 44~67).

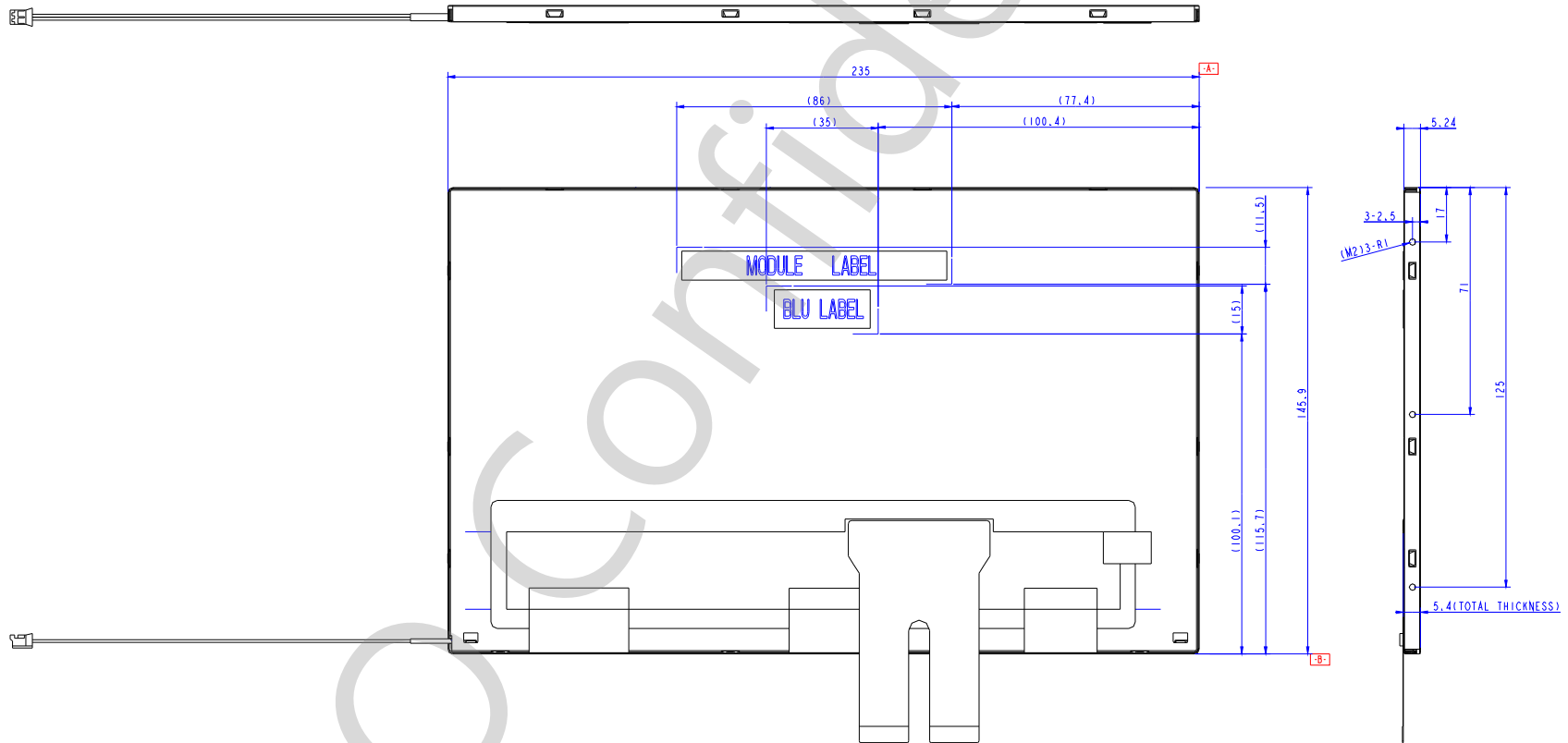


B. Outline Dimension 1. TFT-LCD Module – Front View



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2. TFT-LCD Module – Rear View



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C. Electrical Specifications

1. TFT LCD Panel Pin Assignment

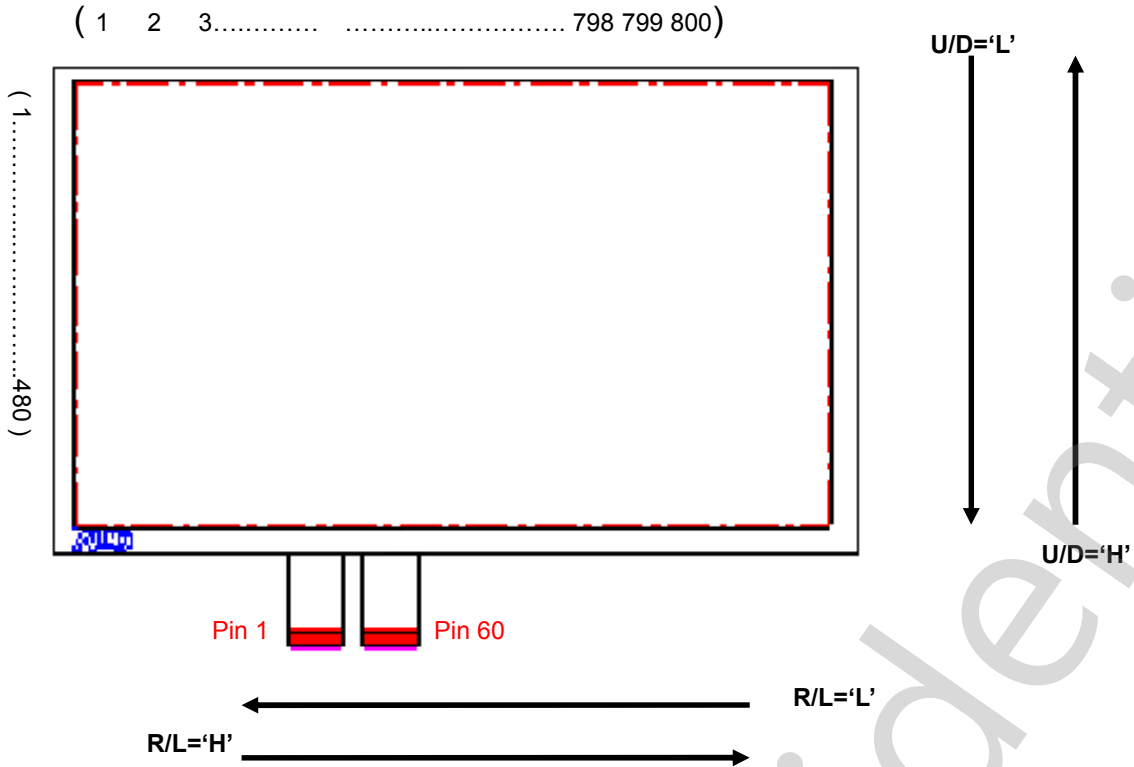
Recommended connector :

| Pin no | Symbol | I/O | Description | Remark |
|--------|--------|-----|--|--------|
| 1 | POL | I | Polarity selection | |
| 2 | STVD | I/O | Vertical start pulse signal input or output | Note 1 |
| 3 | OE | I | Output enable. active low. The gate driver outputs are disable when OE = "H". | |
| 4 | CKV | I | Vertical clock | |
| 5 | STVU | I/O | Vertical start pulse signal input or output | Note 1 |
| 6 | GND | P | Power ground | |
| 7 | EDGSL | I | Select raising edge or raising/falling edge When EDGSL = "0", Latching source data onto the line latches at the rising edge. When EDGSL = "1", Latching source data onto the line latches at the rising edge and falling edge. | |
| 8 | VCC | P | Digital voltage for source driver | |
| 9 | V9 | I | Gamma voltage level 9 | |
| 10 | VGL | P | TFT low voltage | |
| 11 | V2 | I | Gamma voltage level 2 | |
| 12 | VGH | P | TFT high voltage | |
| 13 | V6 | I | Gamma voltage level 6 | |
| 14 | U/D | I | Up/down selection | |
| 15 | VCOM | I | Common voltage | |
| 16 | GND | P | Power ground | |
| 17 | AVDD | P | Analog voltage | |
| 18 | V14 | I | Gamma voltage level 14 | |
| 19 | V11 | I | Gamma voltage level 11 | |
| 20 | V8 | I | Gamma voltage level 8 | |
| 21 | V5 | I | Gamma voltage level 5 | |
| 22 | V3 | I | Gamma voltage level 3 | |
| 23 | GND | P | Power ground | |
| 24 | R5 | I | Red data(MSB) | |
| 25 | R4 | I | Red data | |
| 26 | R3 | I | Red data | |
| 27 | R2 | I | Red data | |
| 28 | R1 | I | Red data | |
| 29 | R0 | I | Red data(LSB) | |

| | | | |
|----|------|-----|--|
| 30 | GND | P | Power ground |
| 31 | GND | P | Power ground |
| 32 | G5 | I | Green data (MSB) |
| 33 | G4 | I | Green data |
| 34 | G3 | I | Green data |
| 35 | G2 | I | Green data |
| 36 | G1 | I | Green data |
| 37 | G0 | I | Green data (LSB) |
| 38 | DIO2 | I/O | Horizontal start pulse signal input or output |
| 39 | INV | I | Control Whether RGB data are inverted or not When "INV" = 1 these data will be inverted. Ex. "00"→"3F", "07"→"38", and so on. |
| 40 | GND | P | Power ground |
| 41 | DCLK | I | Pixel clock |
| 42 | VCC | P | Voltage for digital circuit |
| 43 | DIO1 | I/O | Horizontal start pulse signal input or output |
| 44 | LD | I | Latches the polarity of outputs and switches the new data to outputs |
| 45 | B5 | I | Blue data (MSB) |
| 46 | B4 | I | Blue data |
| 47 | B3 | I | Blue data |
| 48 | B2 | I | Blue data |
| 49 | B1 | I | Blue data |
| 50 | B0 | I | Blue data (LSB) |
| 51 | R/L | I | Right/ left selection |
| 52 | V1 | I | Gamma voltage level 1 |
| 53 | V4 | I | Gamma voltage level 4 |
| 54 | V7 | I | Gamma voltage level 7 |
| 55 | V10 | I | Gamma voltage level 10 |
| 56 | V12 | I | Gamma voltage level 12 |
| 57 | V13 | I | Gamma voltage level 13 |
| 58 | AVDD | P | Analog voltage |
| 59 | GND | P | Power ground |
| 60 | VCOM | I | Common voltage |

I: Input pin; P: Power pin; G: Ground pin; C: capacitor pin

Note 1:



| U/D | STVU | STVD | Direction |
|-----|--------|--------|-----------|
| L | Input | Output | U→D |
| H | Output | Input | D→U |

| R/L | DIO1 | DIO2 | Direction |
|-----|--------|--------|-----------|
| H | Input | Output | L→R |
| L | Output | Input | R→L |

Note 2: LD

Latches the polarity of outputs and switches the new data to outputs.

1. At the rising edge, latches the "POL" signal to control the polarity of the outputs.
2. The pin also controls the switch of the line registers that switches the new incoming data to outputs.

Note 3: POL

"POL" value is latched at the rising edge of "LD" to control the polarity of the even or odd outputs.

POL=1: Even outputs range from V1 ~ V7, and Odd outputs range from V8 ~ V14

POL=0: Even outputs range from V8 ~ V14, and Odd outputs range from V1 ~ V7

2. Backlight Pin Assignment

Recommended connector : 3802K-E02N-01R (90°) or 3801K-E02N-01R (0°)

| Pin no | Symbol | I/O | Description | Remark |
|--------|--------|-----|------------------|--------|
| 1 | VLED | P | LED power supply | |
| 2 | GNDLED | P | LED ground | |

3. Absolute Maximum Ratings

| Item | Symbol | Condition | Min. | Max. | Unit | Remark |
|-----------------------|--------------|-----------|---------|----------|------|----------|
| Power voltage | VCC | GND=0 | -0.5 | 5 | V | Pin8.42 |
| | AVDD | GND=0 | -0.5 | 12 | V | Pin17.58 |
| | VGH | GND=0 | -0.3 | 18 | V | Pin12 |
| | VGL | GND=0 | -15 | +0.3 | V | Pin10 |
| | VGH - VGL | GND=0 | | 33 | V | |
| Input signal voltage | Vi | GND=0 | -0.3 | VCC+0.3 | V | Note 2 |
| | Vref(V1~V7) | GND=0 | 0.4AVDD | AVDD+0.3 | V | |
| | Vref(V8~V14) | GND=0 | -0.3 | 0.6AVDD | V | |
| | VCOM | GND=0 | 3.2 | 4.2 | V | Pin15.60 |
| Operating Temperature | Topa | GND=0 | -10 | 60 | | |
| Storage Temperature | Tstg | GND=0 | -20 | 70 | | |

Note 1: Functional operation should be restricted under ambient temperature (25).

Note 2: Vi denotes digital input signal voltage (Pins 1~5, 7, 14, 24~29, 32~37, 38, 39, 41, 43, 44, and 45~51).

Note 3: Maximum ratings are those values beyond which damages to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics chapter.

3. Electrical DC Characteristics

a. Typical Operation Condition (AGND =GND = 0V)

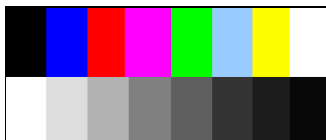
| Item | | Symbol | Min. | Typ. | Max. | Unit | Remark | |
|----------------------------|---------|--------|---------|------|---------|------|---|---------------|
| Power Voltage | | VCC | 3.0 | 3.3 | 3.6 | V | Pin8.42 | |
| | | AVDD | 8.4 | 8.8 | 9.2 | V | Pin17.58 | |
| | | VGH | 14 | 15 | 16 | V | Pin12 | |
| | | VGL | -6.8 | -7.0 | -7.2 | V | Pin10 | |
| Output Signal Voltage | H Level | VOH | VCCx0.8 | -- | VCC | V | Detail Gamma voltage please refer to page 27. | |
| | L Level | VOL | GND | -- | GNDx0.2 | V | | |
| Input Signal Voltage | H Level | VIH | 0.7xVCC | -- | VCC | V | | |
| | L Level | VIL | GND | -- | 0.3xVCC | V | | |
| Gamma reference voltage | | VCOM | 3.5 | 3.7 | 3.9 | V | | Note,Pin15.60 |
| | | V1 | -- | 8.60 | -- | | | |
| | | V2 | -- | 8.48 | -- | | | |
| | | V3 | -- | 7.32 | -- | | | |
| | | V4 | -- | 6.72 | -- | | | |
| | | V5 | -- | 6.27 | -- | | | |
| | | V6 | -- | 5.73 | -- | | | |
| | | V7 | -- | 5.15 | -- | | | |
| | | V8 | -- | 4.29 | -- | | | |
| | | V9 | -- | 3.35 | -- | | | |
| | | V10 | -- | 2.50 | -- | | | |
| | | V11 | -- | 2.03 | -- | | | |
| | | V12 | -- | 1.57 | -- | | | |
| | | V13 | -- | 0.36 | -- | | | |
| V14 | -- | 0.15 | -- | | | | | |

Note : The VCOM voltage is determined based on gamma 2.2. VCOM should be adjusted to minimize LCM display flicker.

b. Current Consumption (AGND=GND=0V)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit | Remark |
|------------------------|-----------|-----------|------|------|------|------|--------|
| Input current for VCC | I_{VDD} | VCC=3.3V | - | 3.0 | 5.0 | mA | |
| Input current for VGH | I_{VGH} | VGH=14V | - | 231 | 242 | uA | |
| Input current for VGL | I_{VGL} | VGL= -7V | | -244 | -256 | uA | |
| Input current for AVDD | I_{VDD} | AVDD=8.8V | | 32.5 | 35.0 | mA | |

Note : Test pattern is the following picture.

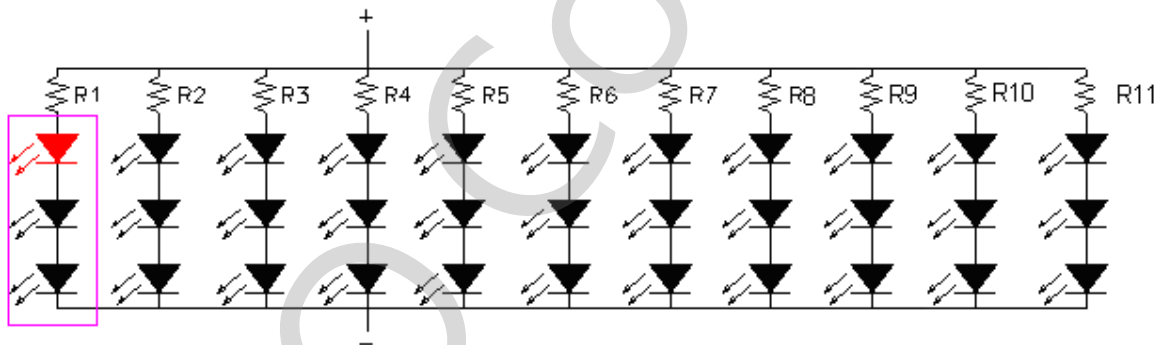


c. Backlight Driving Conditions

The backlight (LED module, Note 1) is suggested to drive by **constant Voltage** with typical value.

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|-----------------------|----------|--------|------|------|------|--------------------------|
| LED light bar Voltage | V_f | -- | 12 | -- | Volt | Typ. $I_f=220\text{ mA}$ |
| BL Power Consumption | P_{BL} | -- | 2.64 | -- | W | Note 1 |
| LED Life Time | L_L | 20.000 | -- | -- | Hr | Note 2, 3 |

Note 1: The LED driving condition is defined for LED module (33 LED). The current range will be 198 to 242mA based on suggested driving voltage set as 12V.



Note 2: Define "LED Lifetime": brightness is decreased to 50% of the initial value. LED Lifetime is restricted under normal condition, ambient temperature = 25 and LED lightbar voltage = 12V.

Note 3: If it uses larger LED lightbar voltage more than 12V, it maybe decreases the LED lifetime.

4. Electrical AC Characteristics

a. Signal AC Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|--------|------|------|------|-------|
| DCLK cycle time | Tcph | 22.8 | 30 | - | ns |
| DCLK pulse width | Tcw | 40% | | 60% | Tcph |
| Data set-up time | Tsu | 4 | | | ns |
| Data hold time | Thd | 2 | | | ns |
| Propagation delay of DIO2/1 | Tphl | 6 | 10 | 15 | ns |
| Time that the last data to LD | Tld | 1 | | | Tcph |
| Pulse width of LD | Twld | 2 | | | Tcph |
| Time that LD to DIO1/2 | Tlds | 5 | | | Tcph |
| POL set-up time | Tpsu | 6 | | | ns |
| POL hold time | Tphd | 6 | | | ns |
| STV setup time | Tsuv | 200 | | | ns |
| STV hold time | Thdv | 300 | | | ns |
| CKV pulse width | Tckv | 500 | | | ns |
| Output stable time | Tst | | | 15 | us |
| STV(R/L) width (Note.2) | Tstv | - | 1 | - | Tpckv |
| Charging time1 (Note.3) | Tch1 | 20 | | | us |
| Charging time2 (Note.3) | Tch2 | 20 | | | us |
| OEV cover CKV time1 | TOEV1 | 1 | | | Tcph |
| OEV cover CKV time2 | TOEV2 | 1 | | | Tcph |
| Time CKV rising to LD falling | TCTL | 2 | | | us |
| Time OEV rising to LD falling | TOTL | 2 | | | us |

Note 1: Due to panel is a passive component and no leakage current allowed for better performance, it may need extra circuit to make sure the TFT LCD panel storage capacitor's shorter discharge time when system power off. Customers should study the discharge circuit according to system design.

Note.2: Pulse width of STV(R/L) should be set 1 Tpckv (Time period of CKV).

Note.3: If OEV is used, charging time must be followed to Tch1 setting, at least 20 us. Otherwise, if OEV is unused, charging time must be followed to Tch2 setting, at least 20 us.

Note.4: If OEV is used, TOTL(time from OEV rising edge to LD falling edge) should be set more than 2us to prevent panel from displaying wrong data.

If OEV is unused, TCTL(time from CKV rising edge to LD falling edge) should be set more than 2us to prevent panel from displaying wrong data.

Note.5: If OEV is used, pulse of OEV must cover the rising area of CKV. Therefore, TOEV1 and TOEV2 must be more than 1 Tcph.

Figure : Operation Mode

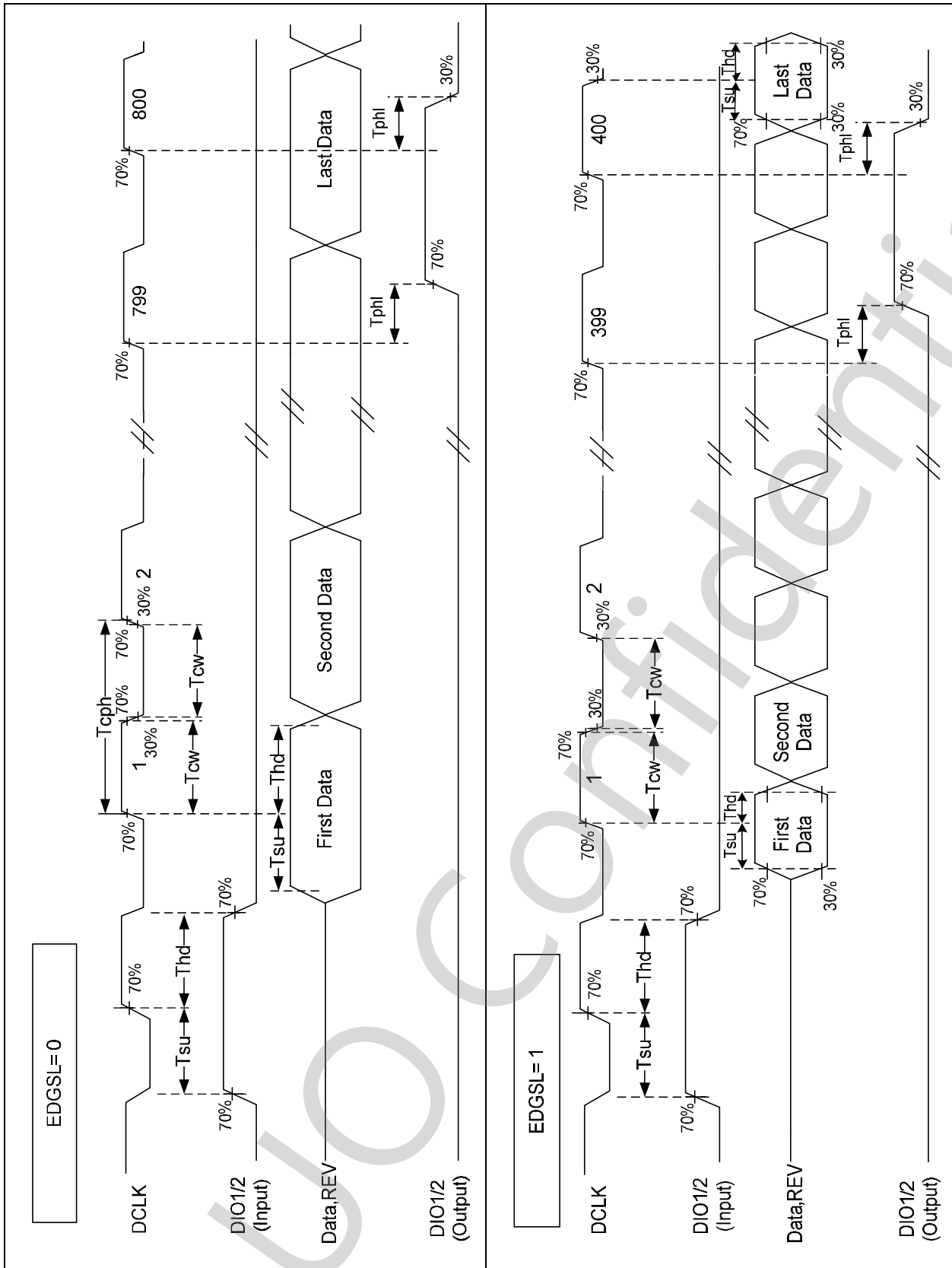
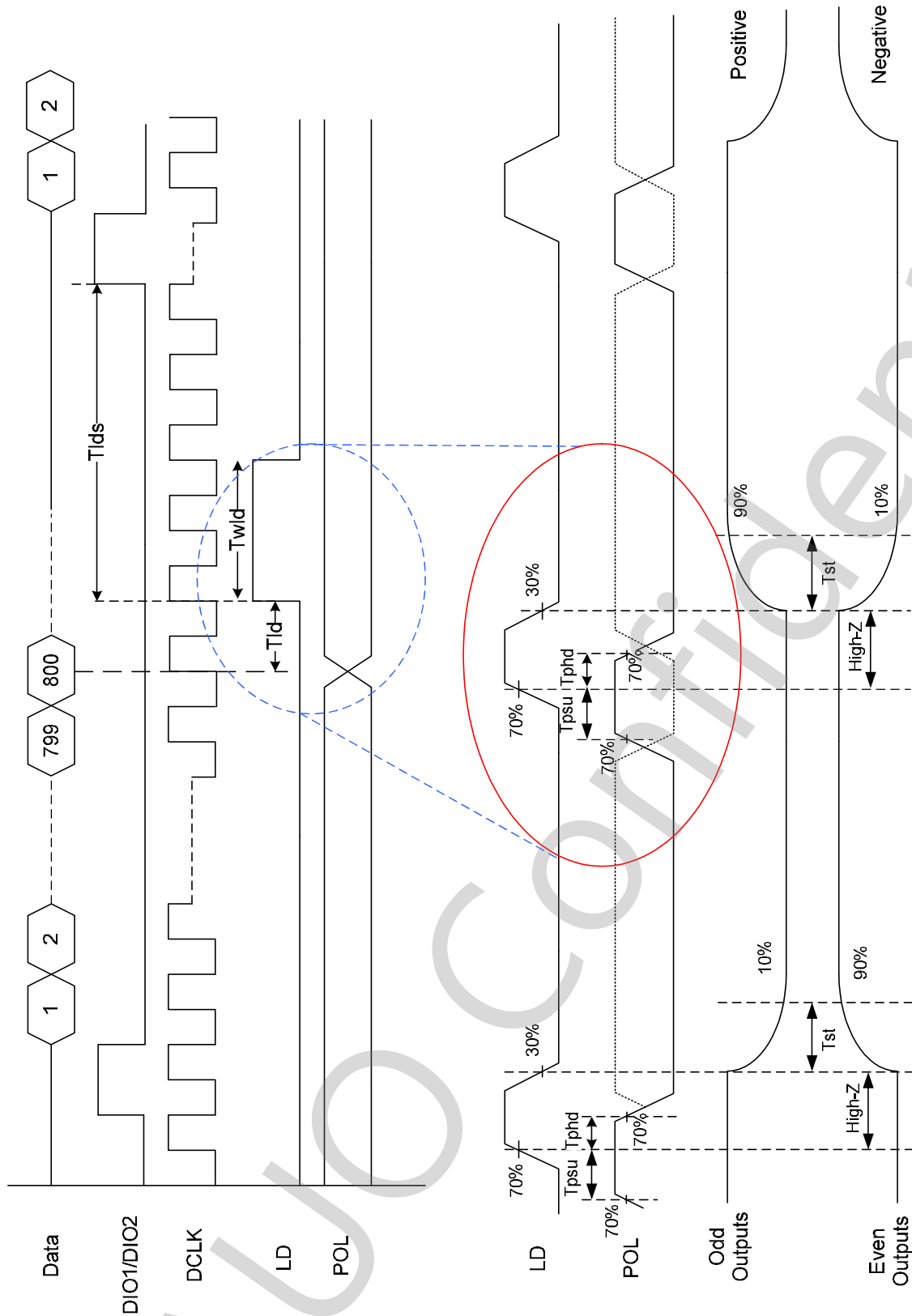


Figure : Horizontal timing



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Figure : Vertical timing

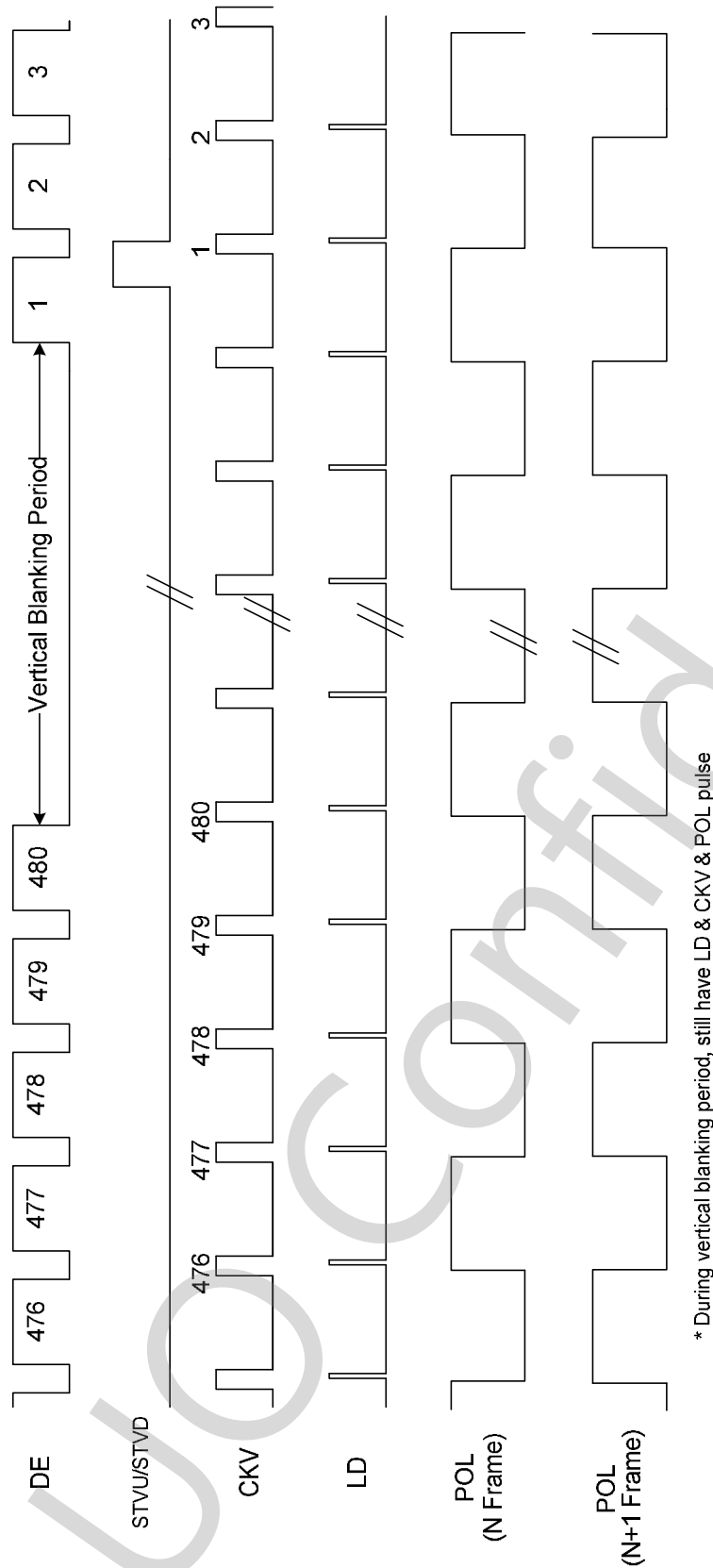


Figure : Vertical shift clock timing

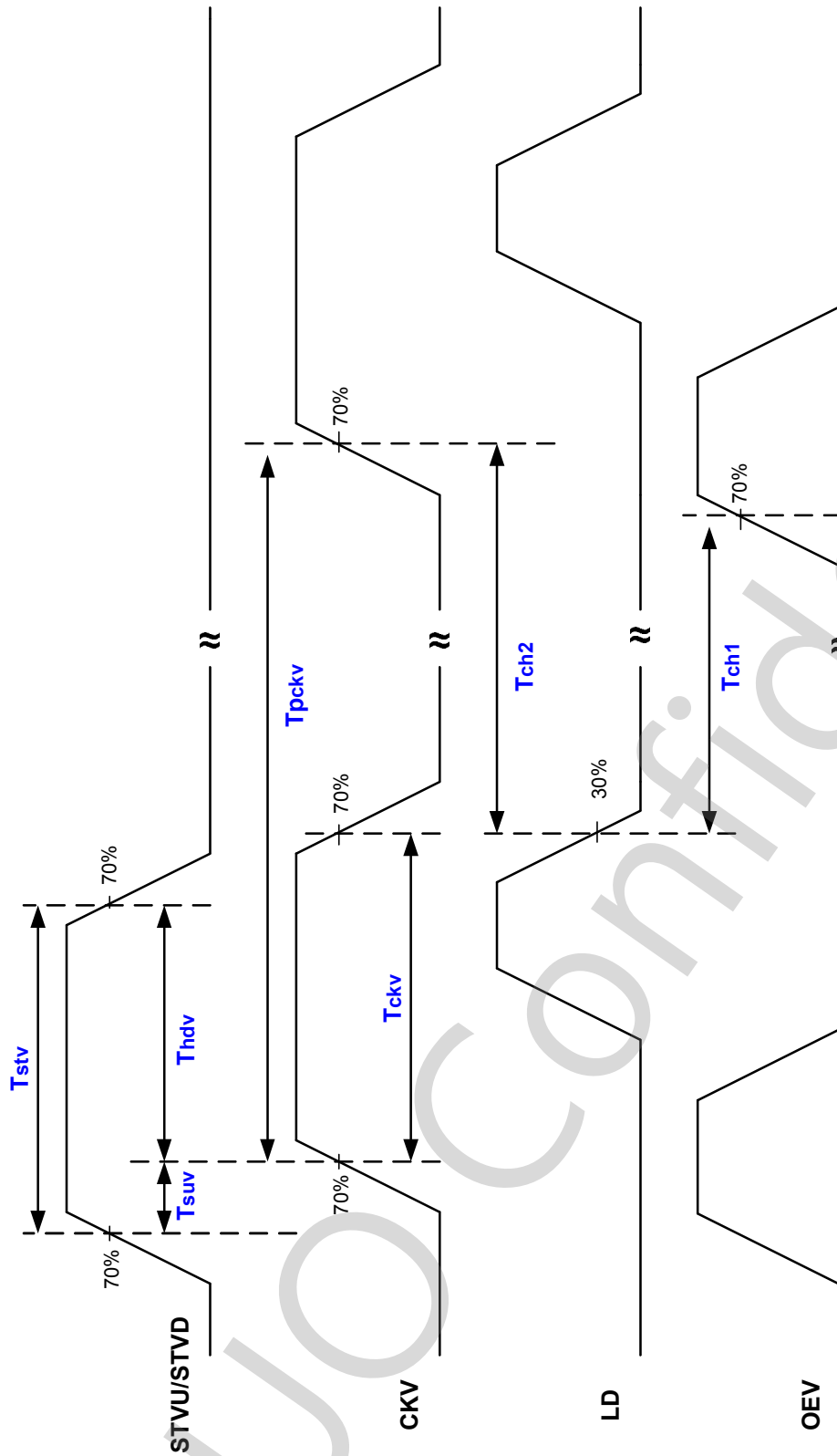
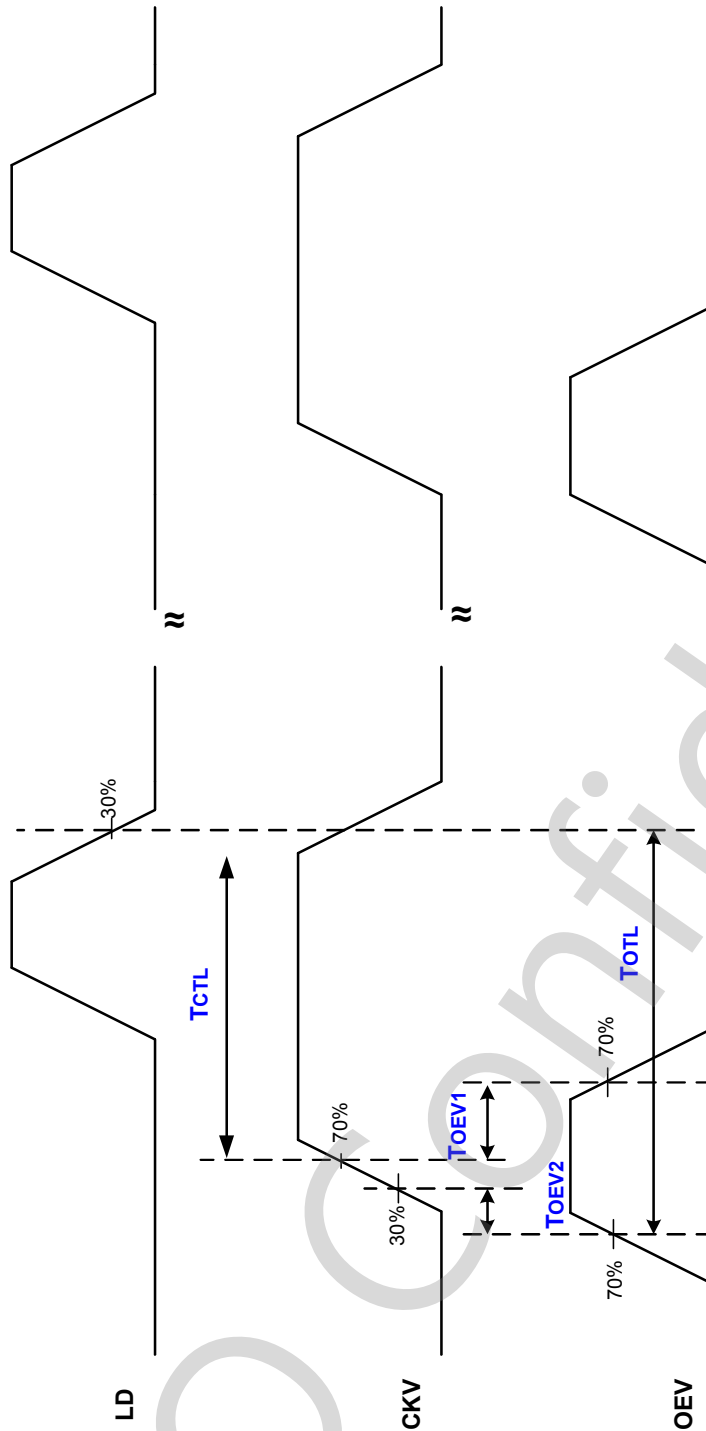
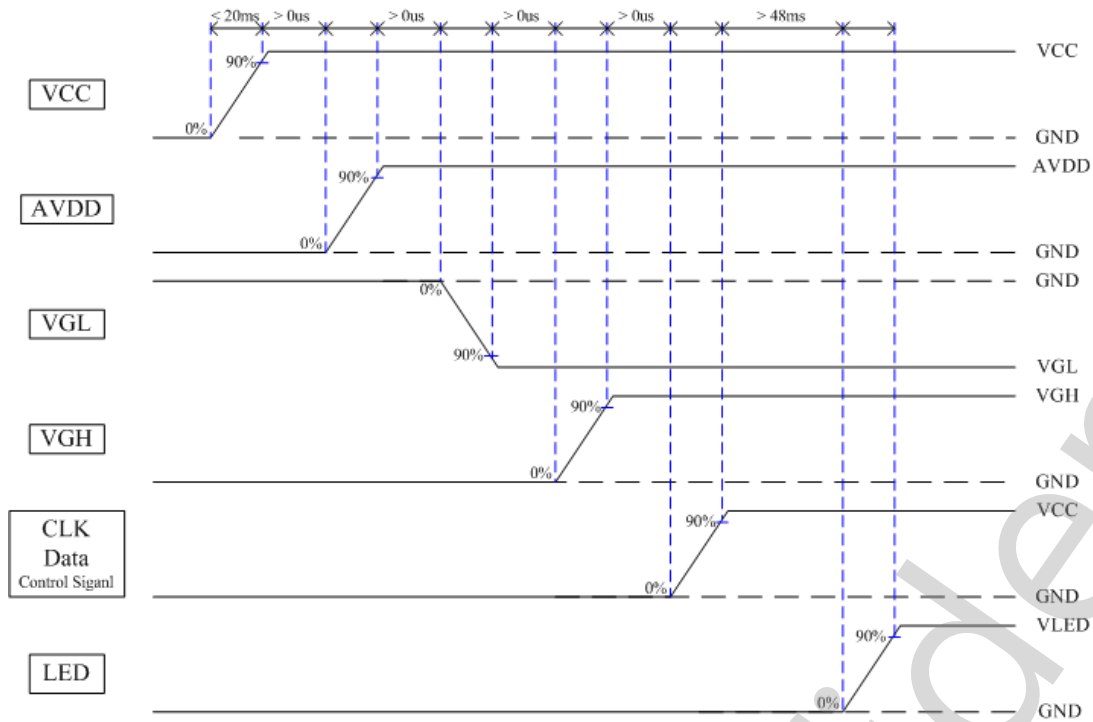


Figure : Vertical shift clock timing

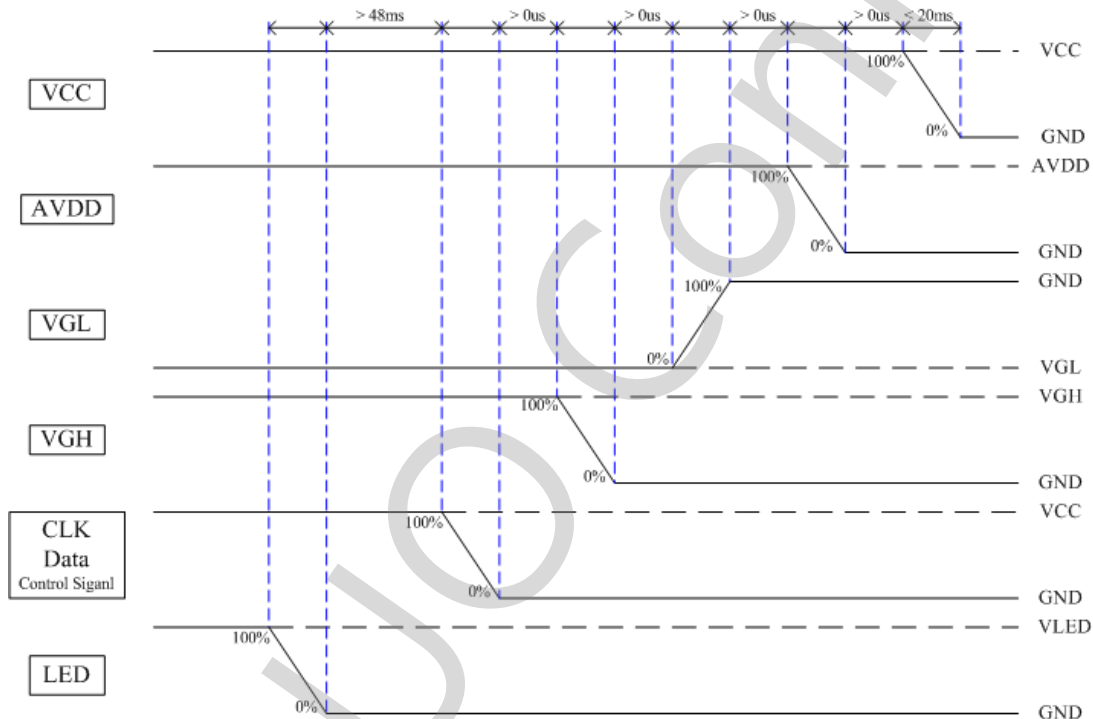


5. Power On/Off Characteristics

a. Recommended Power On Sequence



b. Recommended Power Off Sequence



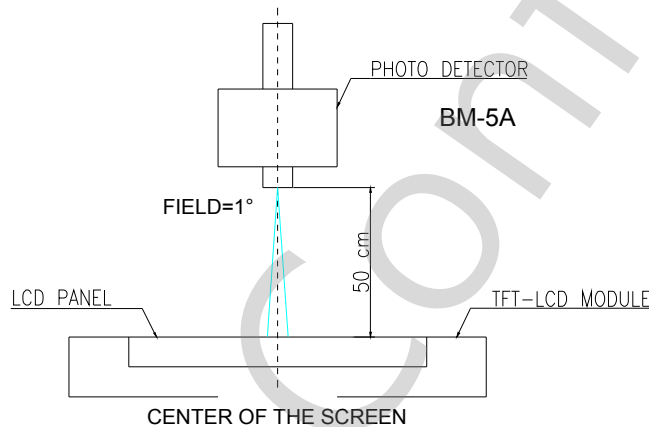
D. Optical Specification

All optical specification is measured under typical condition (Note 1, 2)

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit | Remark |
|----------------|--------|----------------------------|------------------|------|------|-------------------|----------------|
| Response Time | | | | | | | |
| Rise | Tr | $\theta=0^\circ$ | -- | 12 | 24 | ms | Note 3 |
| Fall | Tf | | -- | 18 | 36 | ms | |
| Contrast ratio | CR | At optimized viewing angle | 300 | 500 | -- | | Note 4 |
| Viewing Angle | | CR 10 | | | | | deg. Note 5 |
| Top | | | 40 | 45 | -- | | |
| Bottom | | | 55 | 65 | -- | | |
| Left | | | 55 | 65 | -- | | |
| Right | | | 55 | 65 | -- | | |
| Brightness | Y_L | $\theta=0^\circ$ | 270 | 300 | -- | cd/m ² | Note 6 |
| Chromaticity | White | X | $\theta=0^\circ$ | 0.26 | 0.31 | 0.36 | |
| | | Y | $\theta=0^\circ$ | 0.28 | 0.33 | 0.38 | |
| Uniformity | Y_L | % | 70 | 75 | -- | % | Note 7 |

Note 1: Ambient temperature =25 , and LED lightbar voltage = 12 V. To be measured in the dark room.

Note 2: To be measured on the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-5A, after 15 minutes operation.

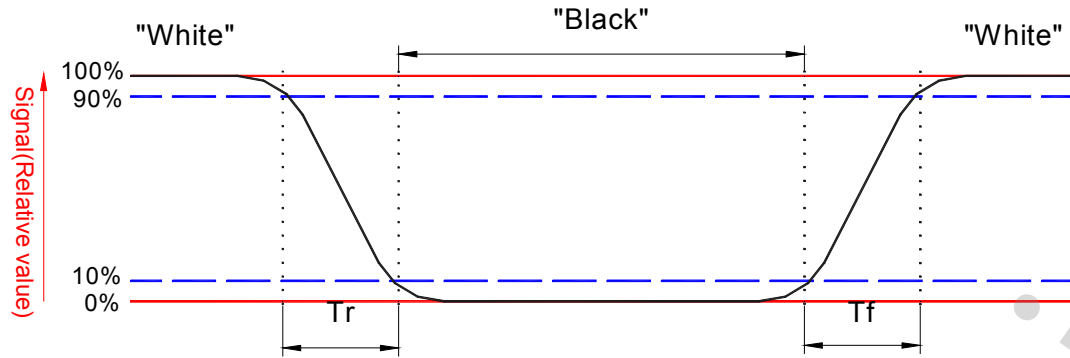


Note 3: Definition of response time:

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.

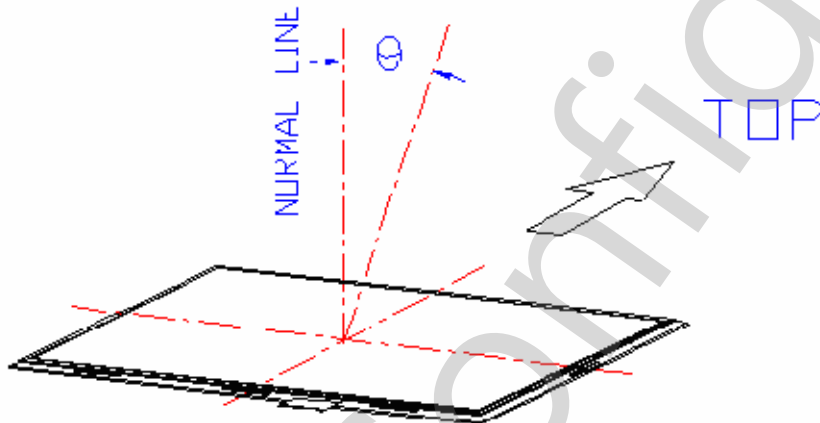


Note 4. Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

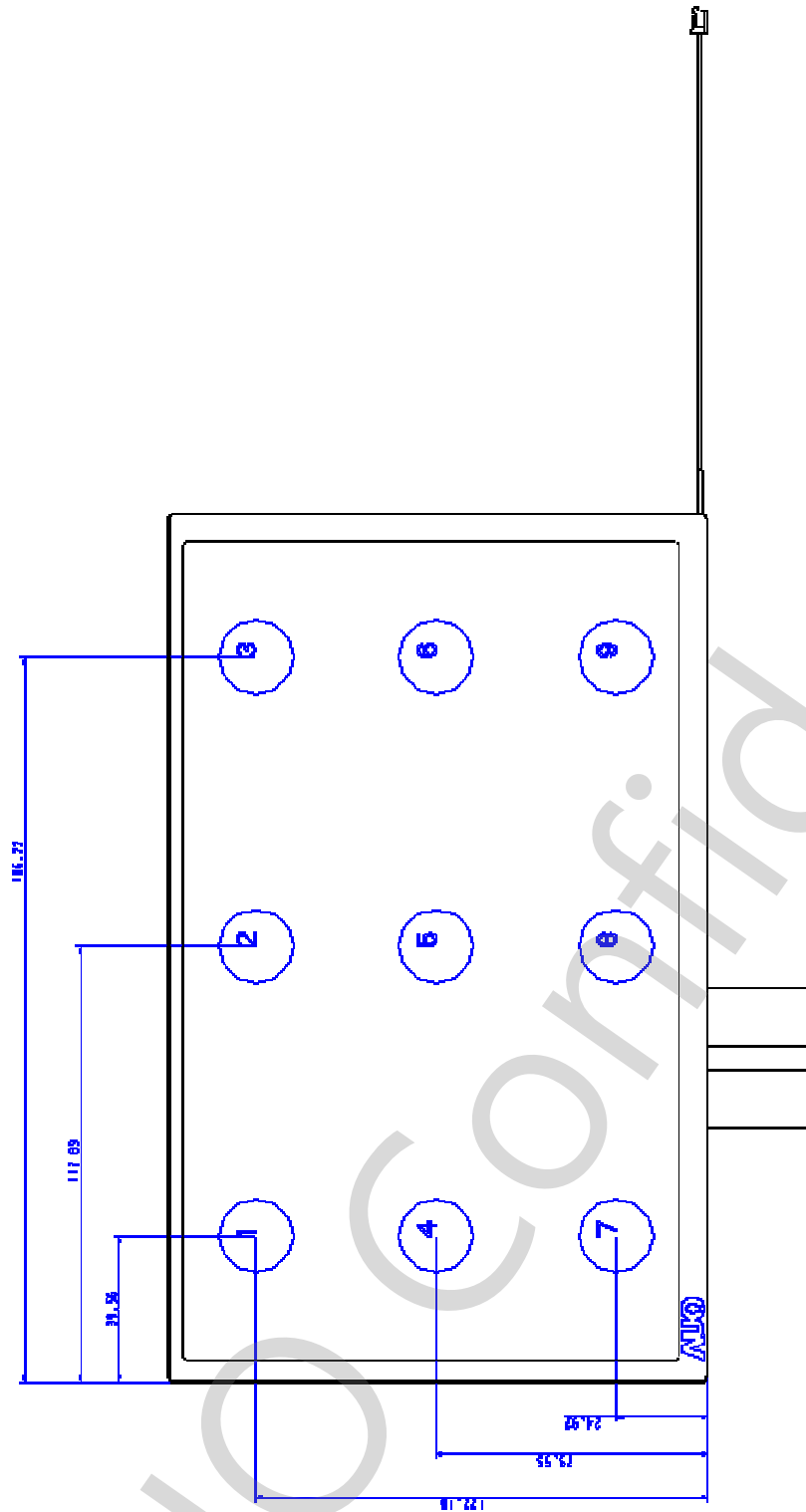
$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" status}}{\text{Photo detector output when LCD is at "Black" status}}$$

Note 5. Definition of viewing angle, θ , Refer to figure as below.



Note 6. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 7: Luminance Uniformity of these 9 points is defined as below:



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

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E. Reliability Test Items


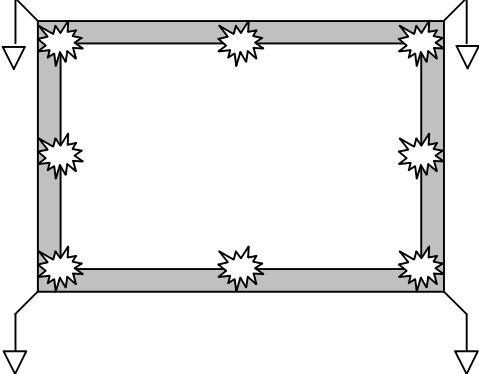
| No. | Test items | Conditions | Remark |
|-----|----------------------------------|--|---|
| 1 | High Temperature Storage | Ta= 70 240Hrs | |
| 2 | Low Temperature Storage | Ta= -20 240Hrs | |
| 3 | High Temperature Operation | Tp= 60 240Hrs | |
| 4 | Low Temperature Operation | Ta= -10 240Hrs | |
| 5 | High Temperature & High Humidity | Tp= 50 . 80% RH 240Hrs | Operation |
| 6 | Heat Shock | -30 /0.5hr~70 /0.5hr, 50 cycle | Non-operation |
| 7 | Electrostatic Discharge | Contact = ± 4 kV, class B Air = ± 8 kV, class B | Note 4 |
| 8 | Image Sticking | 25 , 24hrs | Note 5 |
| 9 | Vibration | Frequency range : 10~55Hz Stoke : 1.5mm Sweep : 10 Hz ~55 Hz 2 hours for each direction of X,Y,Z 4 hours for Y direction | Non-operation JIS C7021, A-10 condition A : 15 minutes |
| 10 | Mechanical Shock | 100G . 6ms, ±X,±Y,±Z 3 times for each direction | Non-operation JIS C7021, A-7 condition C |
| 11 | Vibration (With Carton) | Random vibration: 0.015G ² /Hz from 5~200Hz -6dB/Octave from 200~500Hz | IEC 68-34 |
| 12 | Drop (With Carton) | Height: 100cm 1 corner, 3 edges, 6 surfaces | |
| 13 | Pressure | 5kg, 5sec | Note 6 |

Note 1: Ta: Ambient Temperature. Tp: Panel Surface Temperature

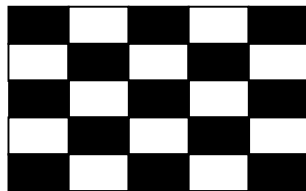
Note 2: In the standard conditions, there is not display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.

Note 3: All the cosmetic specification is judged before the reliability stress.

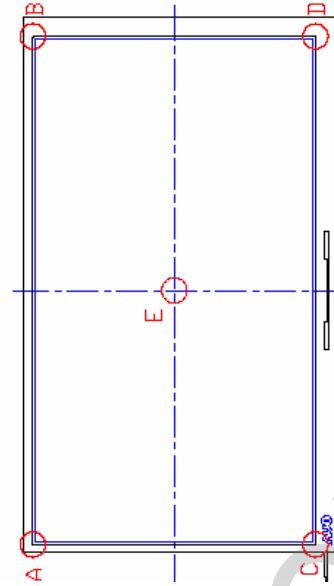
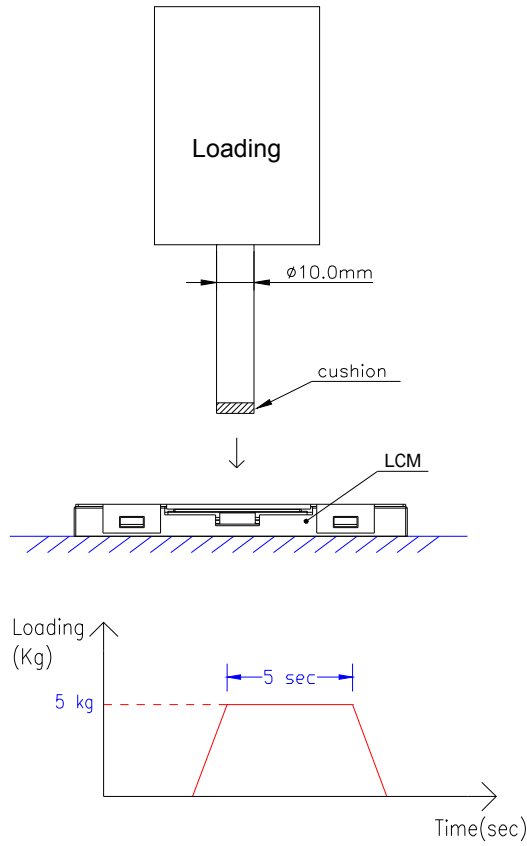
Note 4 : All test techniques follow IEC6100-4-2 standard.

| Test Condition | | Note |
|-----------------------------|--|------|
| Pattern |  | |
| Procedure And Set-up | <p> <u>Contact Discharge</u> : 330Ω, 150pF, 1sec, 8 point, 25times/point <u>Air Discharge</u> : 330Ω, 150pF, 1sec, 8 point, 25times/point </p>  | |
| Criteria | B – Some performance degradation allowed. No data lost. Self-recoverable hardware failure. | |
| Others | 1. Gun to Panel Distance 2. No SPI command, keep default register settings. | |

Note 5: Operate with 5 x 5 chess board pattern as figure and light on 24 hrs. Then modify to 32 degree gray pattern. After 20 minutes, the mura is less than JND 2.5

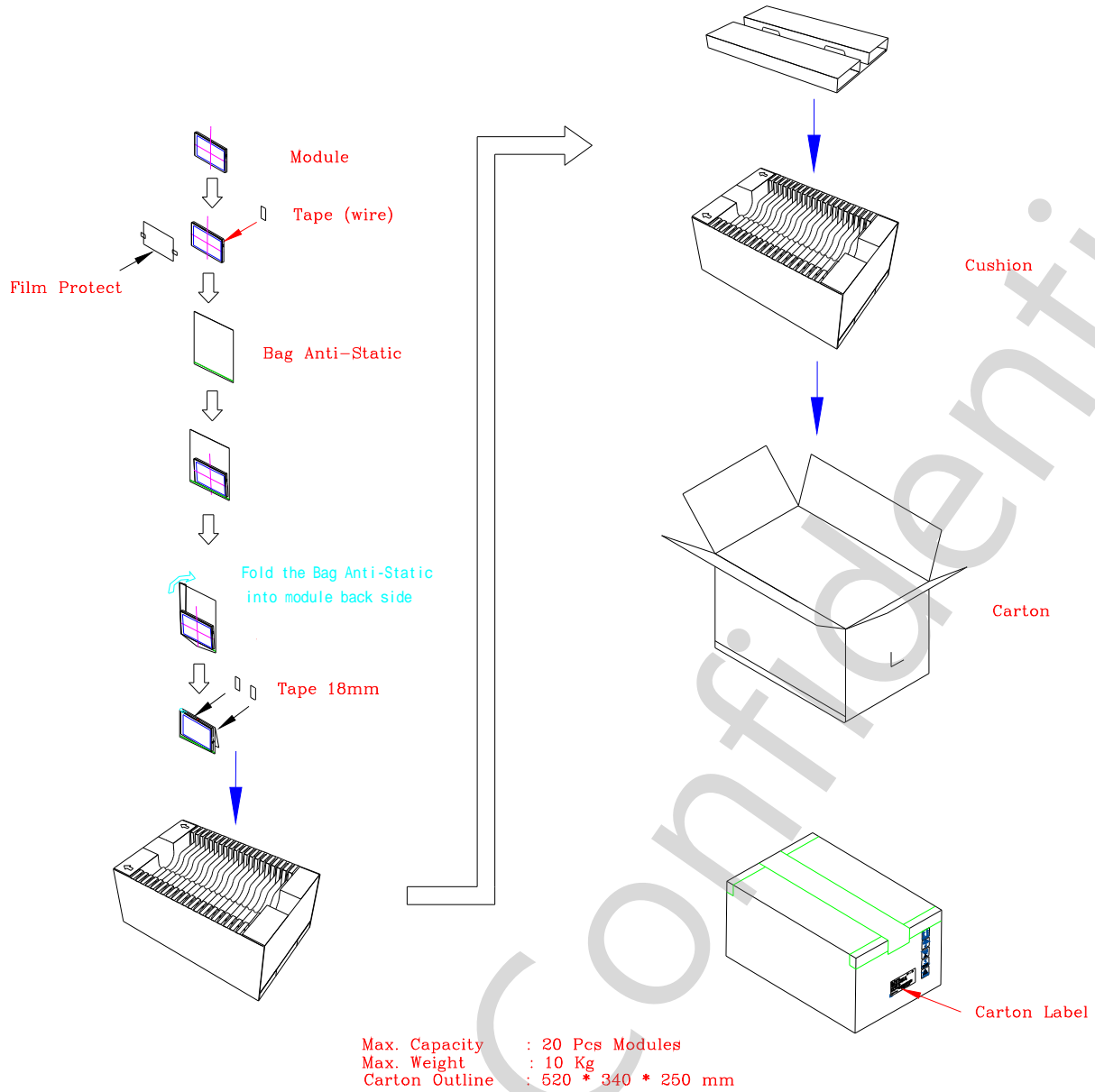


Note 6: The panel is tested as figure. The jig is 10 mm made by Cu with rubber and the loading speed is 3mm/min on position A~E. After the condition, no glass crack will be found and panel function check is OK.(no guarantee LC mura, LC bubble)



F. Packing and Marking

1. Packing Form



2. Module/Panel Label Information

The module/panel (collectively called as the "Product") will be attached with a label of Shipping Number which represents the identification of the Product at a specific location. Refer to the Product outline drawing for detailed location and size of the label. The label is composed of a 22-digit serial number and printed with code 128 with the following definition:

ABCDEFGHIJKLMNQRSTUV

- For internal system usage and production serial numbers.
- AUO Module or Panel factory code, represents the final production factory to complete the Product
- Product version code, ranging from 0~9 or A~Z (for Version after 9)
- Week Code, the production week when the product is finished at its production process

Example:

501M06ZL06123456781Z05:

Product Manufacturing Week Code: WK50

Product Version: Version 1

Product Manufacturing Factory: M06

3. Carton Label Information

The packing carton will be attached with a carton label where packing Q'ty, AUO Model Name, AUO Part Number, Customer Part Number (Optional) and a series of Carton Number in 13 or 14 digits are printed. The Carton Number is appearing in the following format:

ABC-DEFG-HIJK-LMN

- DEFG appear after first "-" represents the packing date of the carton
- Date from 01 to 31
- Month, ranging from 1~9, A~C. A for Oct, B for Nov and C for Dec.
- A.D. year, ranging from 1~9 and 0. The single digit code represents the last number of the year

Refer to the drawing of packing format for the location and size of the carton label.

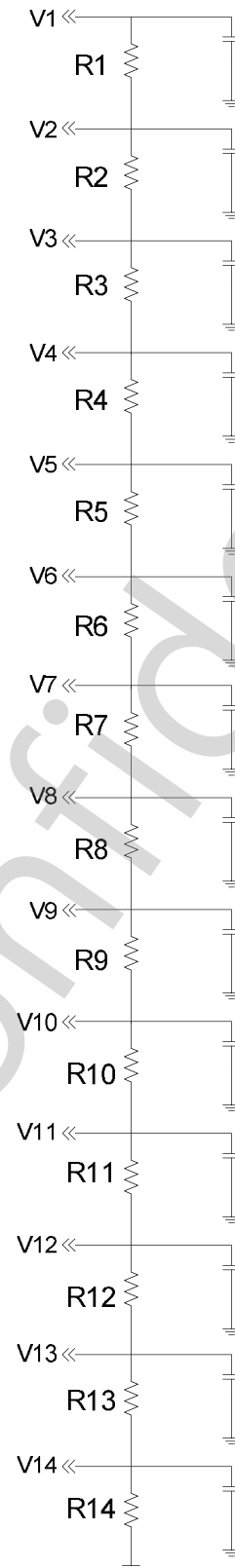
G. Application Note

1. Recommended Gamma Voltage

| Symbol | Value (V) |
|--------|-----------|
| V1 | 8.60 |
| V2 | 8.48 |
| V3 | 7.32 |
| V4 | 6.72 |
| V5 | 6.27 |
| V6 | 5.73 |
| V7 | 5.15 |
| V8 | 4.29 |
| V9 | 3.35 |
| V10 | 2.50 |
| V11 | 2.03 |
| V12 | 1.57 |
| V13 | 0.36 |
| V14 | 0.15 |
| AVDD | 8.8 |
| VCOM | 3.7 |

Recommend resister value:

| Symbol | Value (Ohm) |
|--------|-------------|
| R1 | 16 |
| R2 | 158 |
| R3 | 82.5 |
| R4 | 64.9 |
| R5 | 75 |
| R6 | 102 |
| R7 | 110 |
| R8 | 220 |
| R9 | 124 |
| R10 | 68 |
| R11 | 62 |
| R12 | 165 |
| R13 | 30 |
| R14 | 19.1 |



H. Precautions

1. Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
2. Adopt measures for good heat radiation. Be sure to use the module with in the specified temperature.
3. Avoid dust or oil mist during assembly.
4. Follow the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
5. Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
6. Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image sticking.
7. Be sure to turn off the power when connecting or disconnecting the circuit.
8. Polarizer scratches easily, please handle it carefully.
9. Display surface never likes dirt or stains.
10. A dewdrop may lead to destruction. Please wipe off any moisture before using module.
11. Sudden temperature changes cause condensation, and it will cause polarizer damaged.
12. High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
13. Acetic acid or chlorine compounds are not friends with TFT display module.
14. Static electricity will damage the module, please do not touch the module without any grounded device.
15. Do not disassemble and reassemble the module by self.
16. Be careful do not touch the rear side directly.
17. No strong vibration or shock. It will cause module broken.
18. Storage the modules in suitable environment with regular packing.
19. Be careful of injury from a broken display module.
20. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the display non-uniformity or other function issue.