**( ) Preliminary Specification**
**( V ) Final Specification**

| | |
|---|---|
| **Module** | **27" Color TFT-LCD** |
| **Model Name** | **M270HW01 V0** |

| **Customer** | **Date** | **Approved by** | **Date** |
|---|---|---|---|
| | | *Sean Chen* | 2009/09/15 |
| **Approved by** | | **Prepared by** | |
| | | *Boris Chu* | 2009/09/15 |
| Note: This Specification is subject to change without notice. | | Desktop Display Business Group / AU Optronics corporation | |

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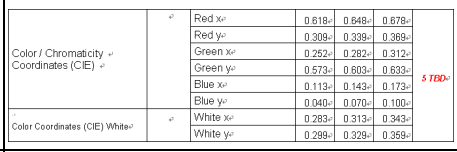
# Record of Revision

| Version and Date | Page | Old description | New Description | Remark |
|---|---|---|---|---|
| 0.1 2009/04/7 | All | First Edition for Customer | - | |
| 0.2 2009/05/07 | 5、25 | Physical Size：624(W) × 364(H) × 15.9(D) typ | Physical Size：630(W) × 368.2(H) × 15.9(D) typ | Revised |
| 0.3 2009/07/16 | 5 | White Luminance ( Center )：300 | White Luminance ( Center )：400 | Revised |
| 0.3 2009/07/16 | 5、25 | Physical Size：624(W) × 364(H) × 15.9(D) typ | Physical Size：630(W) × 368.2(H) × 16.2(D) typ | Revised |
| 0.3 2009/07/16 | 5 | Power Consumption (VDD line + CCFL line)：33.48W | Power Consumption (VDD line + CCFL line)：29.5W | Revised |
| 0.3 2009/07/16 | 6 |  | | Revised |
| 0.3 2009/07/16 | 6 | Central Luminance<br>Min Typ Max<br>240 300 - | Central Luminance<br>Min Typ Max<br>320 400 - | Revised |
| 0.3 2009/07/16 | 12 | IDD Input Current<br>Min Typ Max<br>0.9 1.17 | IDD Input Current<br>Min Typ Max<br>0.7 0.85 | Revised |
| 0.3 2009/07/16 | 12 | PDD VDD Power<br>Min Typ Max<br>4.5 5.0 | PDD VDD Power<br>Min Typ Max<br>3.5 3.8 | Revised |
| 0.3 2009/07/16 | 12 | IRush Inrush Current<br>Min Typ Max<br>2.5 | IRush Inrush Current<br>Min Typ Max<br>2.0 | Revised |
| 0.3 2009/07/16 | 14 | CCFL Standard Current (ISCFL)<br>Min Typ Max<br>6.0 7.0 8.0 | CCFL Standard Current (ISCFL)<br>Min Typ Max<br>5.5 6.5 7.5 | Revised |
| 0.3 2009/07/16 | 14 | CCFL Operation Current (IRCFL)<br>Min Typ Max<br>3.0 7.0 8.0 | CCFL Operation Current (IRCFL)<br>Min Typ Max<br>3.0 6.5 8.0 | Revised |
| 0.3 2009/07/16 | 14 | CCFL Ignition Voltage (ViCFL, Ta= 0℃)<br>Min Typ Max<br>2120 - - | CCFL Ignition Voltage (ViCFL, Ta= 0℃)<br>Min Typ Max<br>2140 - - | Revised |
| 0.3 2009/07/16 | 14 | CCFL Ignition Voltage (ViCF, Ta= 25℃)<br>Min Typ Max<br>1650 - - | CCFL Ignition Voltage (ViCF, Ta= 25℃)<br>Min Typ Max<br>1640 - - | Revised |
| 0.3 2009/07/16 | 14 | CCFL Operation Voltage (VCFL)<br>Min Typ Max<br>- 1002(@ 7.0mA) 952 | CCFL Operation Voltage (VCFL)<br>Min Typ Max<br>- 993 (@ 6.5mA) - | Revised |
| 0.3 2009/07/16 | 14 | CCFL Power Consumption (PCFL)<br>Min Typ Max<br>- 28.24 30.7 | CCFL Power Consumption (PCFL)<br>Min Typ Max<br>- 25.8 30.7 | Revised |
| 1.0 2009/09/14 | 11 | 4.2 Backlight Unit<br>CCFL Current<br>Min Max | 4.2 Backlight Unit<br>CCFL Current<br>Min Max | |

| | | | |
|---|---|---|---|
| | | 3.0 8.0 | 3.0 7.5 | |
| 1.0 2009/09/14 | 15 | 5.2 Backlight Unit<br>CCFL Operation Current (IRCFL)<br>Min Typ Max<br>3.0 6.5 8.0 | 5.2 Backlight Unit<br>CCFL Operation Current (IRCFL)<br>Min Typ Max<br>3.0 6.5 7.5 | Revised |

## 1.0 Handling Precautions

1) Since front polarizer is easily damaged, pay attention not to scratch it.
2) Be sure to turn off power supply when inserting or disconnecting from input connector.
3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
7) Do not open or modify the Module Assembly.
8) Do not press the reflector sheet at the back of the module to any directions.
9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the CCFL reflector edge. Instead, press at the far ends of the CCFL Reflector edge softly. Otherwise the TFT Module may be damaged.
10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
12) Cold cathode fluorescent lamp in LCD contains a small amount of mercury. Please follow local ordinances or regulations for disposal.
13) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
14) The LCD module is designed so that the CCFL in it is supplied by Limited Current Circuit (IEC60950 or UL1950). Do not connect the CCFL in Hazardous Voltage Circuit.

## 2.0 General Description

This specification applies to the 27 inch-wide Color a-Si TFT-LCD Module M270HW01.The display supports the Full HD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 6-bits + Hi-FRC data). All input signals are 2-channel LVDS interface and this module doesn't contain an inverter board for backlight.

## 2.1 Display Characteristics

The following items are characteristics summary on the table under 25℃ condition:

| ITEMS | Unit | SPECIFICATIONS |
|---|---|---|
| Screen Diagonal | [mm] | 685.65(27") |
| Active Area | [mm] | 597.6 (H) x 336.15 (V) |
| Pixels H x V | | 1920(x3) x 1080 |
| Pixel Pitch | [um] | 311.25 (per one triad) ×311.25 |
| Pixel Arrangement | | R.G.B. Vertical Stripe |
| Display Mode | | TN Mode, Normally White |
| White Luminance ( Center ) | [cd/m$^2$] | 400 cd/m$^2$ (Typ.) |
| Contrast Ratio | | 1000 (Typ.) |
| Optical Response Time | [msec] | 5ms (Typ., on/off) |
| Nominal Input Voltage VDD | [Volt] | +5.0 V |
| Power Consumption<br>(VDD line + CCFL line) | [Watt] | 29.5W (Typ.)<br>(without inverter, all black pattern) |
| Weight | [Grams] | 3800 (Typ.) |
| Physical Size | [mm] | 630(W) × 368.2(H) × 16.2(D) typ |
| Electrical Interface | | Dual channel LVDS |
| Support Color | | 16.7M colors (RGB 6-bit + Hi_FRC ) |
| Surface Treatment | | Anti-Glare, 3H |
| Temperature Range<br>Operating<br>Storage (Shipping) | <br>[°C]<br>[°C] | <br>0 to +50<br>-20 to +60 |
| RoHS Compliance | | RoHS Compliance |
| TC0'03 Compliance | | TC0'03 Compliance |

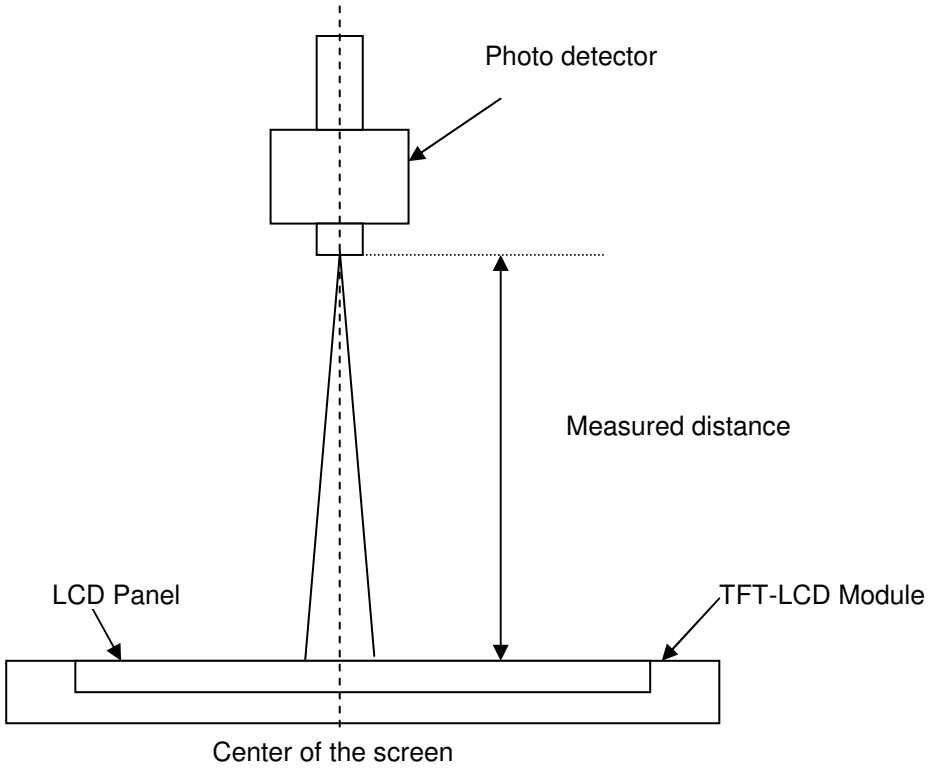
## 2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25℃:

| Item | Unit | Conditions | Min. | Typ. | Max. | Note |
|---|---|---|---|---|---|---|
| Viewing Angle | [degree] | Horizontal (Right)<br>CR = 10 (Left) | 150 | 170 | -<br>- | *2* |
| | | Vertical (Up)<br>CR = 10 (Down) | 140 | 160 | -<br>- | |
| Contrast ratio | | Normal Direction | 600 | 1000 | - | *3* |
| Response Time | [msec] | Raising Time ($T_{rR}$) | - | 3.8 | 5.5 | *4* |
| | | Falling Time ($T_{rF}$) | - | 1.2 | 2.5 | |
| | | Raising + Falling | - | 5 | 8 | |
| Color / Chromaticity Coordinates (CIE) | | Red x | 0.616 | 0.646 | 0.676 | *5* |
| | | Red y | 0.308 | 0.338 | 0.368 | |
| | | Green x | 0.260 | 0.290 | 0.320 | |
| | | Green y | 0.576 | 0.606 | 0.636 | |
| | | Blue x | 0.115 | 0.145 | 0.175 | |
| | | Blue y | 0.041 | 0.071 | 0.101 | |
| Color Coordinates (CIE) White | | White x | 0.283 | 0.313 | 0.343 | |
| | | White y | 0.299 | 0.329 | 0.359 | |
| Central Luminance | [cd/m$^2$] | | 320 | 400 | - | *6* |
| Luminance Uniformity | [%] | | 75 | 80 | - | *7* |
| Crosstalk (in 60Hz) | [%] | | | | 1.5 | *8* |
| Flicker | dB | | | | -20 | *9* |

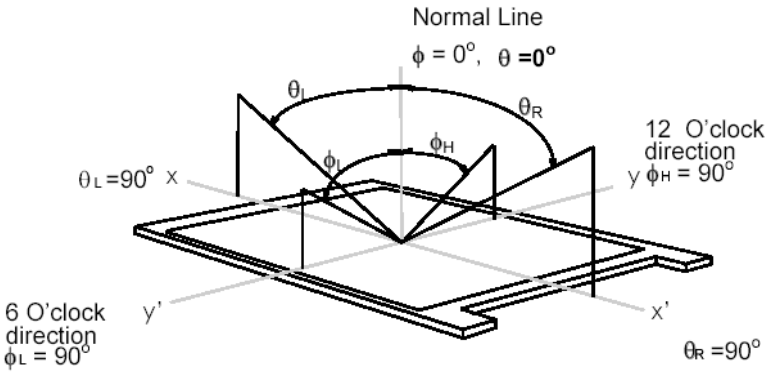
***Note 1:*** **Measurement method**

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35℃). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.




***Note 2:*** **Definition of viewing angle** measured by ELDIM (EZContrast 88)

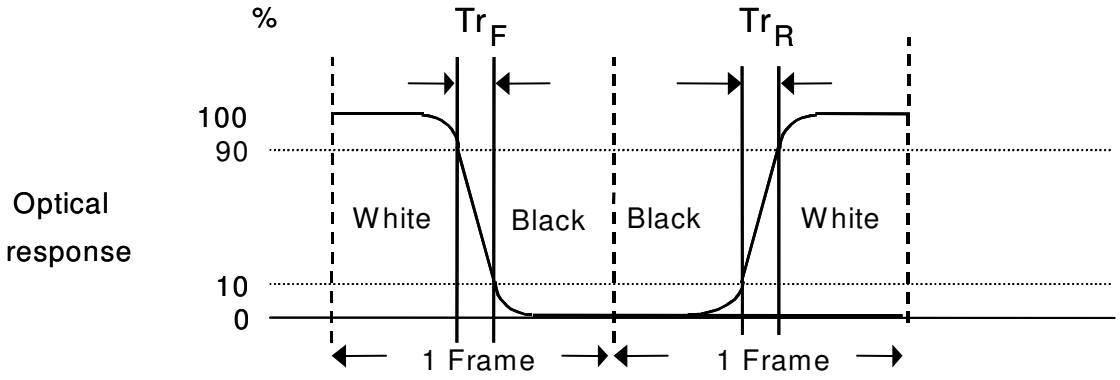
Viewing angle is the measurement of contrast ratio ≧10, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (Φ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



***Note 3:*** **Contrast ratio is** measured by TOPCON SR-3

***Note 4:*** **Definition of Response time** measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time, $Tr_R$), and from "Full White" to "Full Black" (falling time, $Tf_F$), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.

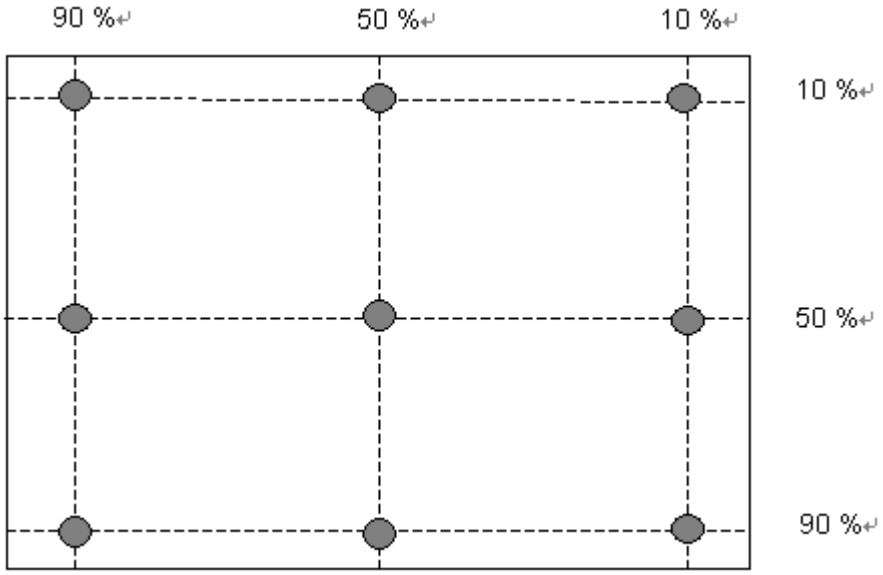



$Tr_R + Tf_F$ = 5 msec (typ.).

***Note 5:*** **Color chromaticity and coordinates (CIE) is** measured by TOPCON SR-3

***Note 6*****: Central luminance is** measured by TOPCON SR-3

***Note 7:*** **Luminance uniformity of these 9 points is defined as below and** measured by TOPCON SR-3




$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1 - 9)}}{\text{Maximum Luminance in 9 Points (1 - 9)}}$$

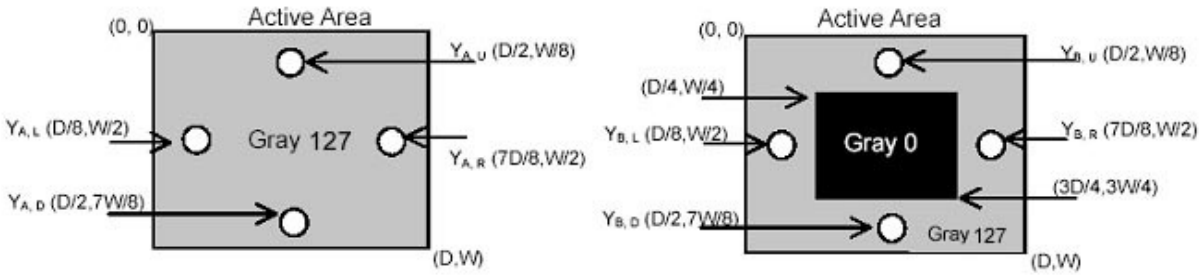
***Note 8:*** **Crosstalk is defined as below and** measured by TOPCON SR-3

CT = | YB – YA | / YA × 100 (%)

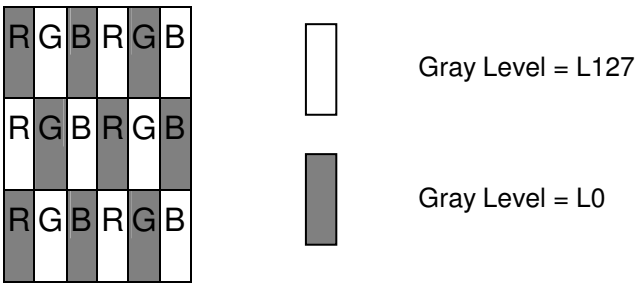
Where

YA = Luminance of measured location without gray level 0 pattern (cd/m2)

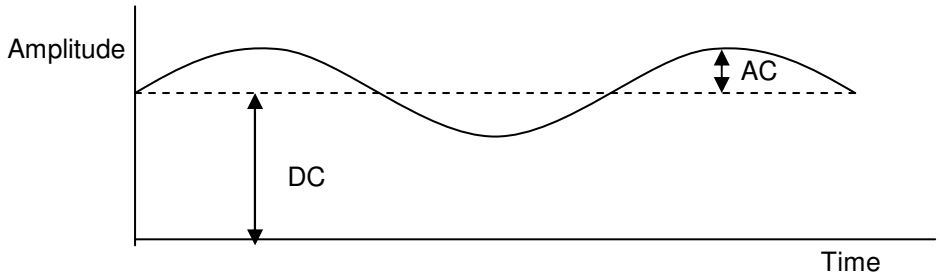
YB = Luminance of measured location with gray level 0 pattern (cd/m2)




***Note 9:*** **Test Patern: Subchecker Pattern** measured by TOPCON SR-3



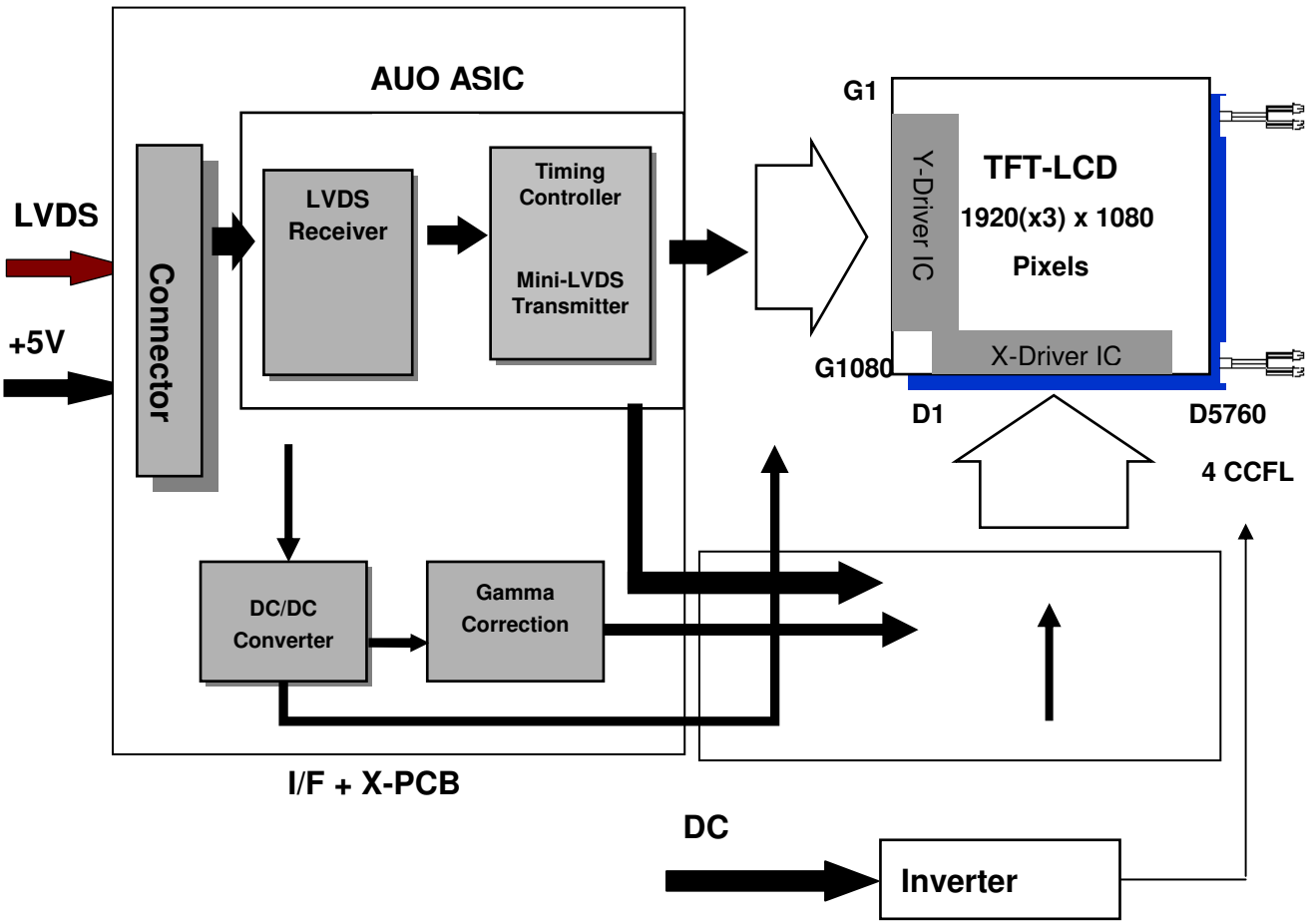

Method: Record dBV & DC value with TRD-100




$$\text{Flicker (dB)} = 20\log\frac{\text{AC Level(at 30 Hz)}}{\text{DC Level}}$$

### 3.0 Functional Block Diagram

The following diagram shows the functional block of the 21.5 inch Color TFT-LCD Module:




**I/F PCB Interface:**
FI-XB30SSL-HF15 (JAE)
or MSBKT2407P30HB (STM)

**Mating Type:**
FI-X30HL (Locked Type)

## 4.0 Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

### 4.1 TFT LCD Module

| Item | Symbol | Min | Max | Unit | Conditions |
|---|---|---|---|---|---|
| Logic/LCD Drive Voltage | VDD | 0 | 5.5 | [Volt] | ***Note 1,2*** |

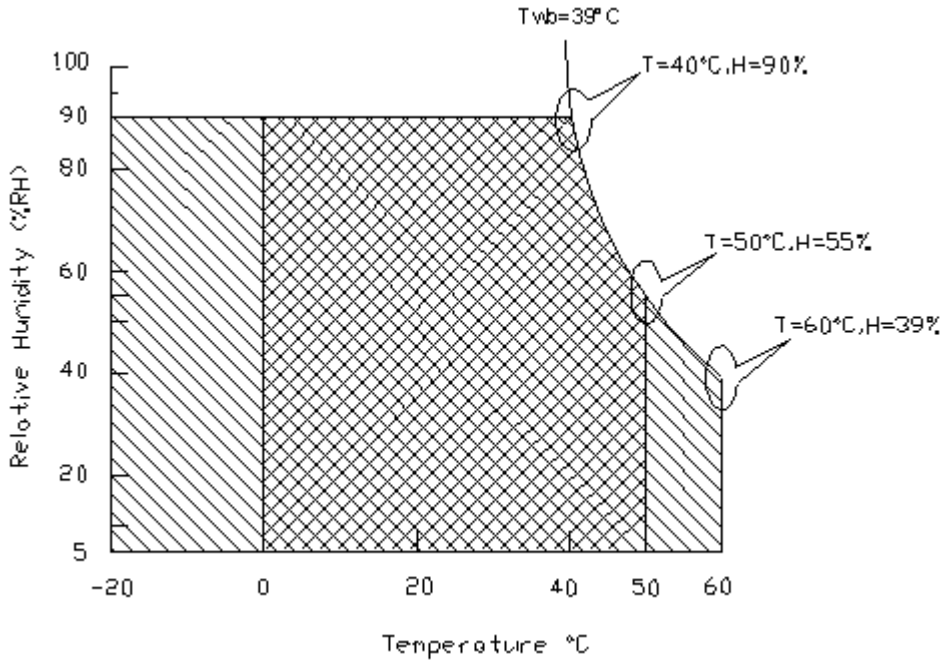
### 4.2 Backlight Unit

| Item | Symbol | Min | Max | Unit | Conditions |
|---|---|---|---|---|---|
| CCFL Current | ICFL | 3.0 | 7.5 | [mA] rms | ***Note 1,2*** |

### 4.3 Absolute Ratings of Environment

| Item | Symbol | Min. | Max. | Unit | Conditions |
|---|---|---|---|---|---|
| Operating Temperature | TOP | 0 | +50 | [°C] | ***Note 3*** |
| Operation Humidity | HOP | 5 | 90 | [%RH] | |
| Storage Temperature | TST | -20 | +60 | [°C] | |
| Storage Humidity | HST | 5 | 90 | [%RH] | |

***Note 1:*** With in Ta (25℃)
***Note 2:*** Permanent damage to the device may occur if exceeding maximum values
***Note 3:*** For quality perfermance, please refer to AUO IIS(Incoming Inspection Standard).




Operating Range Storage Range

## 5.0 Electrical characteristics

## 5.1 TFT LCD Module

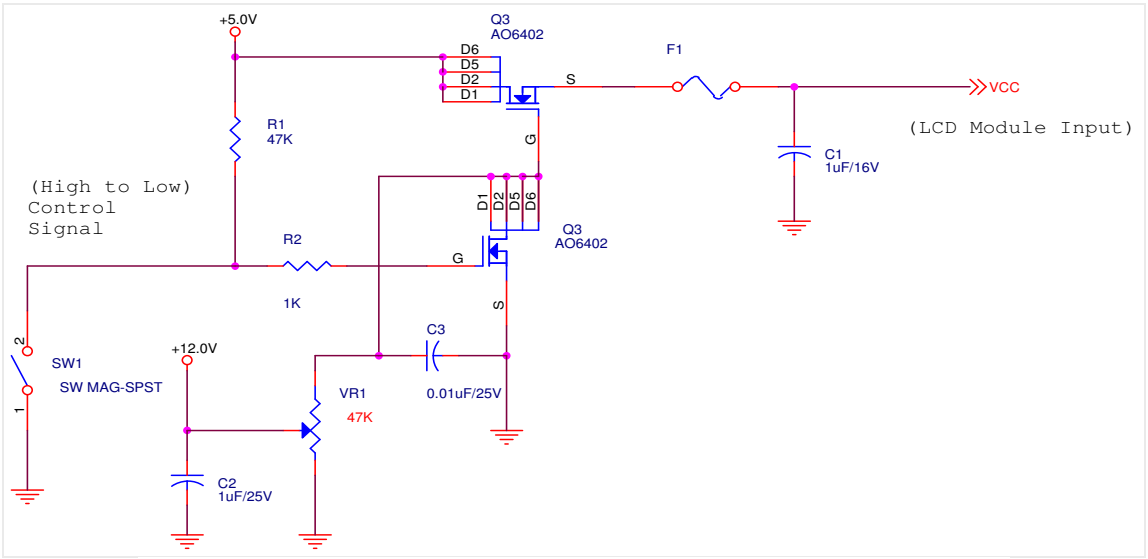
### 5.1.1 Power Specification

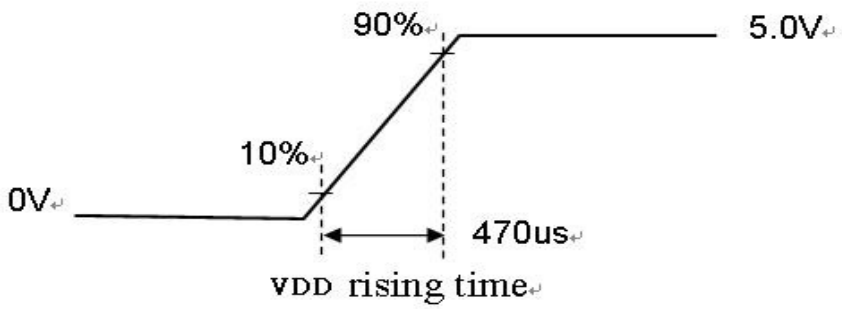
Input power specifications are as following:

| Symbol | Parameter | Min | Typ | Max | Unit | Conditions |
|---|---|---|---|---|---|---|
| VDD | Logic/LCD Drive Voltage | 4.5 | 5.0 | 5.5 | [Volt] | +/-10% |
| IDD | Input Current | - | 0.7 | 0.85 | [A] | VDD= 5.0V, All Black Pattern At 60Hz |
| PDD | VDD Power | - | 3.5 | 3.8 | [Watt] | VDD= 5.0V, All Black Pattern At 60Hz |
| IRush | Inrush Current | - | - | 2.0 | [A] | **Note 1** |
| VDDrp | Allowable Logic/LCD Drive Ripple Voltage | - | - | 300 | [mV] p-p | VDD= 5.0V, All Black Pattern At 75Hz |

***Note 1:*** Measurement conditions:

The duration of rising time of power input is 470us.



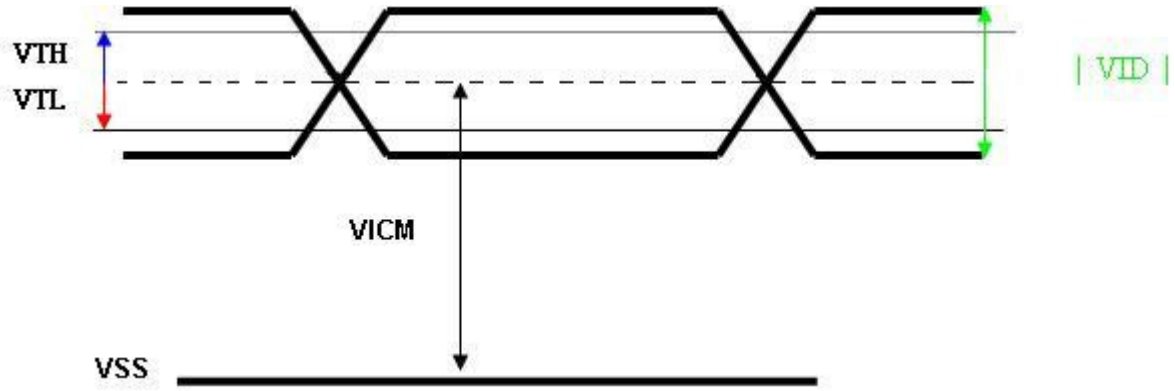
### 5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Characteristics of each signal are as following:

| Symbol | Parameter | Min | Typ | Max | Units | Condition |
|---|---|---|---|---|---|---|
| VTH | Differential Input High Threshold | - | +50 | +100 | [mV] | VICM = 1.2V<br>***Note 1*** |
| VTL | Differential Input Low Threshold | -100 | -50 | - | [mV] | VICM = 1.2V<br>***Note 1*** |
| \| VID \| | Input Differential Voltage | 100 | - | 600 | [mV] | ***Note 1*** |
| VICM | Differential Input Common Mode Voltage | +1.0 | +1.2 | +1.5 | [V] | VTH-VTL = 200MV (max)<br>***Note 1*** |

***Note 1:*** LVDS Signal Waveform



## 5.2 Backlight Unit

Parameter guideline for CCFL Inverter is under stable conditions at 25℃ (Room Temperature):

| Parameter | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|
| CCFL Standard Current (ISCFL) | 5.5 | 6.5 | 7.5 | [mA] rms | |
| CCFL Operation Current (IRCFL) | 3.0 | 6.5 | 7.5 | [mA] rms | ***2*** |
| CCFL Frequency (FCFL) | 40 | 55 | 60 | [KHz] | ***3, 4*** |
| CCFL Ignition Voltage (ViCFL, Ta= 0℃) | 2140 | - | - | [Volt] rms | ***5*** |
| CCFL Ignition Voltage (ViCF, Ta= 25℃) | 1640 | - | - | [Volt] rms | |
| CCFL Operation Voltage (VCFL) | - | 993 (@ 6.5mA) | - | [Volt] rms | ***6*** |
| CCFL Power Consumption (PCFL) | - | 25.8 | 30.7 | [Watt] | |
| CCFL Life Time (LTCFL) | 40,000 | 50,000 | - | [Hour] | ***7*** |

***Note 1:*** Typ. values are AUO recommended design values.

*1 All of characteristics listed are measured under the condition using the AUO test inverter.

*2 It is recommended to check the inverter carefully. Sometimes, interfering noise stripes appear on the screen, and substandard luminance or flicker at low power may happen.

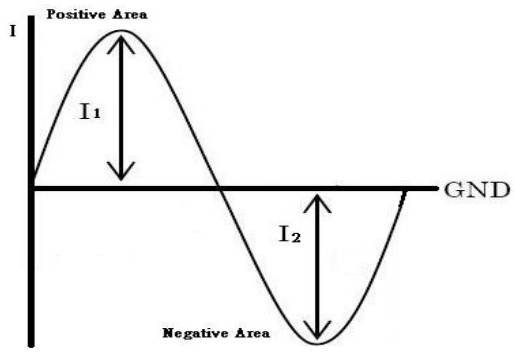
*3 While designing an inverter, it is suggested to check safety circuit very carefully. Impedance of CCFL, for instance, becomes more than 1 [M ohm] when CCFL is damaged.

*4 Generally, CCFL has certain delay time after applying kick-off voltage. It is recommended to keep on applying kick-off voltage for 1 [Sec] until discharge.

*5 Reducing CCFL current will increase CCFL discharge voltage and generally increases CCFL discharge frequency. So all the parameters of the inverter should be carefully designed so the inverter will not produce too much leakage current from high-voltage output.

*6 Both CCFLs in the CCFL set (2 CCFL lamps on each side of a panel) is designed for identical phase driving. Reversed phase driving of CCFL set is not encouraged.

*7 For designing CCFL current, it is highly recommanded to use symmetric and consistent sinusoidal wave for each CCFL input current with asymmetric ration of 10% or less in both postive area and negative area (ie. $0.9*\sqrt{2}*I_{rms} < I_1$ & $I_2 < 1.1*\sqrt{2}*I_{rms}$) as refer to the following diagram, otherwise proper CCFL functionality cannot be guarantied.



***Note 2:*** CCFL standard current is measured at 25±2℃.

***Note 3:*** CCFL discharge frequency should be carefully determined to avoid interference between inverter and TFT LCD.

***Note 4:*** The frequency range will not affect lamp life and reliability characteristics.

***Note 5:*** CCFL inverter should be able to release power that has generating capacity exceeding 1780 volt. Lamp units need minimum voltage, 1780 Volt, for ignition.

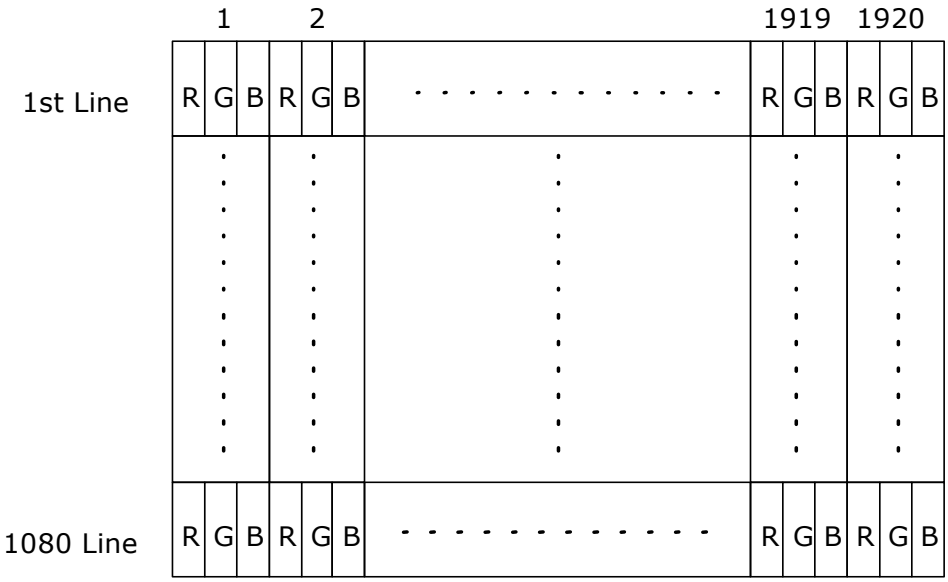
***Note 6:*** The variance of CCFL power consumption is ±10%. (IRCFL × VCFL × 4 = PCFL)

***Note 7:*** Definition of life time: brightness becomes 50%. The minimum life time of CCFL unit is on the condition of 7.5mA CCFL current and 25±2℃.

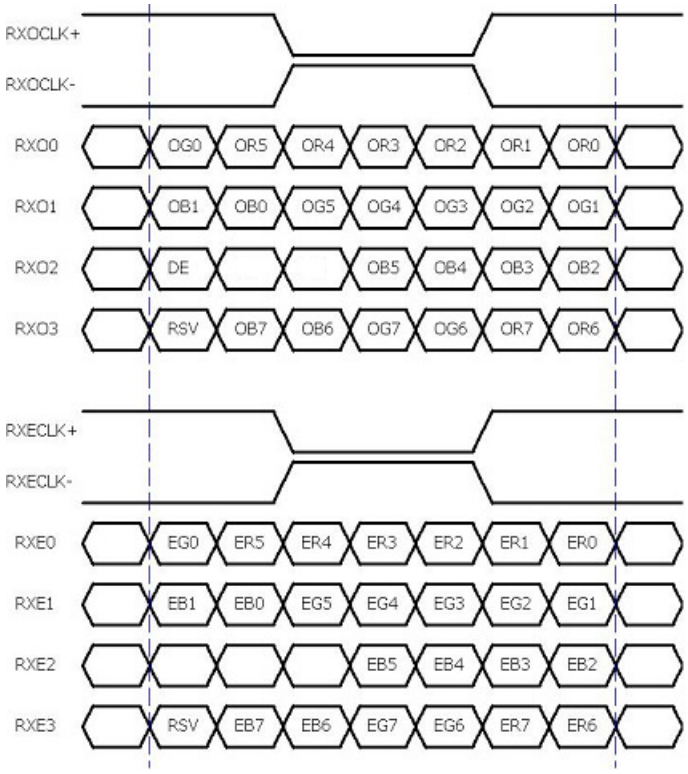
## 6.0 Signal Characteristic

### 6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.




### 6.2 The input data format



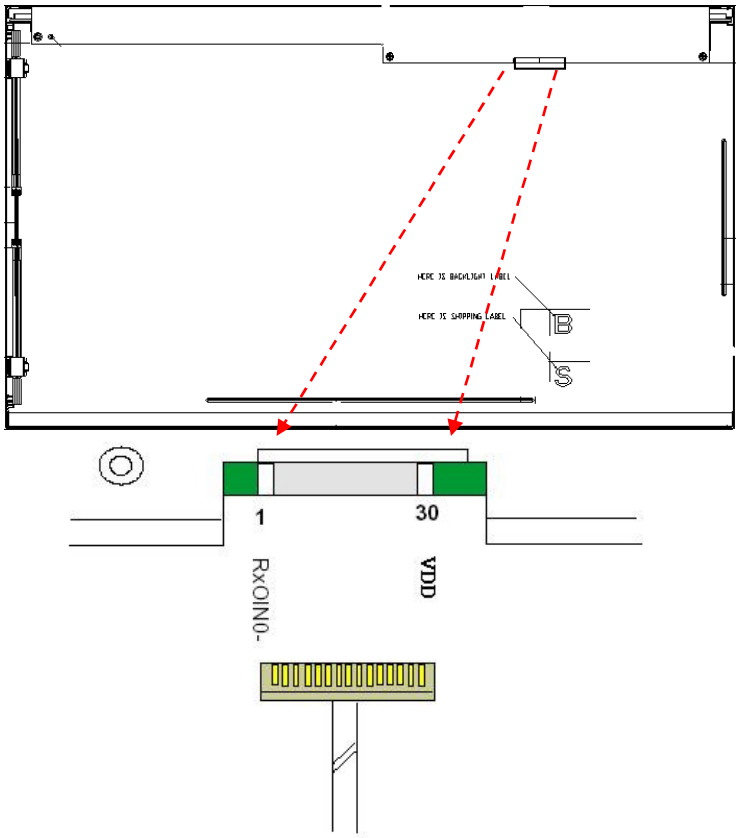

***Note 1:*** R/G/B data 7:MSB, R/G/B data 0:LSB O = "First Pixel Data" E = "Second Pixel Data"

### 6.3 Signal Description

The module using one LVDS receiver SN75LVDS82(Texas Instruments). LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitters shall be SN75LVDS83(negative edge sampling). The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

| PIN # | SIGNAL NAME | DESCRIPTION |
|---|---|---|
| 1 | RxOIN0- | Negative LVDS differential data input (Odd data) |
| 2 | RxOIN0+ | Positive LVDS differential data input (Odd data) |
| 3 | RxOIN1- | Negative LVDS differential data input (Odd data) |
| 4 | RxOIN1+ | Positive LVDS differential data input (Odd data) |
| 5 | RxOIN2- | Negative LVDS differential data input (Odd data,DSPTMG) |
| 6 | RxOIN2+ | Positive LVDS differential data input (Odd data,DSPTMG) |
| 7 | GND | Power Ground |
| 8 | RxOCLK- | Negative LVDS differential clock input (Odd clock) |
| 9 | RxOCLK+ | Positive LVDS differential clock input (Odd clock) |
| 10 | RxOIN3- | Negative LVDS differential data input (Odd data) |
| 11 | RxOIN3+ | Positive LVDS differential data input (Odd data) |
| 12 | RxEIN0- | Negative LVDS differential data input (Even data) |
| 13 | RxEIN0+ | Positive LVDS differential data input (Even data) |
| 14 | GND | Power Ground |
| 15 | RxEIN1- | Positive LVDS differential data input (Even data) |
| 16 | RxEIN1+ | Negative LVDS differential data input (Even data) |
| 17 | GND | Power Ground |
| 18 | RxEIN2- | Negative LVDS differential data input (Even data) |
| 19 | RxEIN2+ | Positive LVDS differential data input (Even data) |
| 20 | RxECLK- | Negative LVDS differential clock input (Even clock) |
| 21 | RxECLK+ | Positive LVDS differential clock input (Even clock) |
| 22 | RxEIN3- | Negative LVDS differential data input (Even data) |
| 23 | RxEIN3+ | Positive LVDS differential data input (Even data) |
| 24 | GND | Power Ground |
| 25 | NC | No connection (for AUO test only. Do not connect) |
| 26 | NC | No connection (for AUO test only. Do not connect) |
| 27 | NC | No connection (for AUO test only. Do not connect) |
| 28 | VDD | Power +5V |
| 29 | VDD | Power +5V |
| 30 | VDD | Power +5V |

***Note1:*** Start from left side




***Note2:*** Input signals of odd and even clock shall be the same timing.

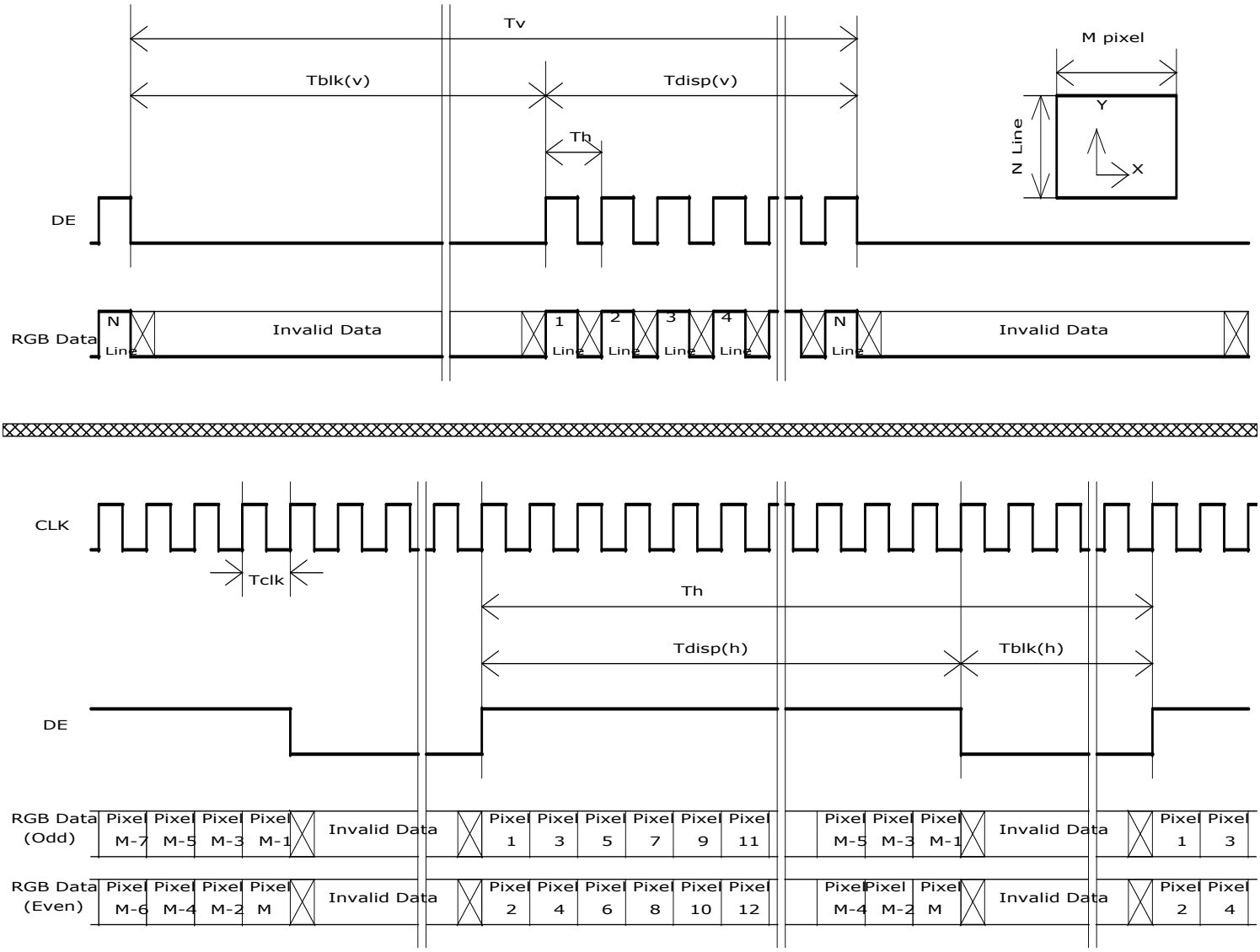
### 6.4 Timing Characteristics

Basically, interface timing described here is not actual input timing of LCD module but close to output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

| Item | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Data CLK | | Tclk | 40 | 75 | 90 | [MHz] |
| H-section | Period | Th | 1034 | 1060 | 2047 | [Tclk] |
| | Display Area | Tdisp(h) | 960 | 960 | 960 | [Tclk] |
| | Blanking | Tblk(h) | 74 | 100 | 1087 | [Tclk] |
| V-section | Period | Tv | 1088 | 1120 | 2047 | [Th] |
| | Display Area | Tdisp(h) | 1080 | 1080 | 1080 | [Th] |
| | Blanking | Tblk(h) | 8 | 40 | 967 | [Th] |
| Frame Rate | | F | 50 | 60 | 75 | [Hz] |

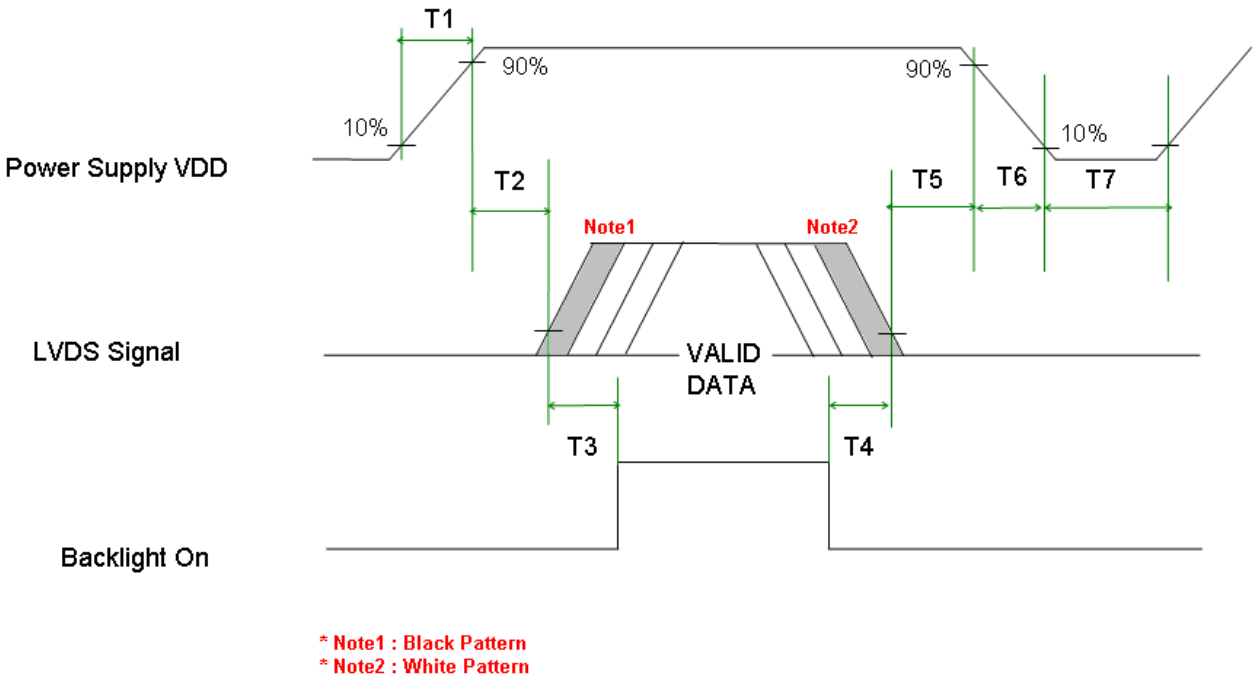
***Note :*** DE mode only

## 6.5 Timing diagram



### 6.6 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.




* Note1 : Black Pattern
* Note2 : White Pattern

| Parameter | Value | | | Unit |
|---|---|---|---|---|
| | Min. | Typ. | Max. | |
| T1 | 0.5 | - | 10 | [msec] |
| T2 | 10 | - | 50 | [msec] |
| T3 | 200 | - | - | [msec] |
| T4 | 200 | - | - | [msec] |
| T5 | 0 | 16 | 50 | [msec] |
| T6 | - | - | 100 | [msec] |
| T7 | 1000 | - | - | [msec] |

Note：Without panel

## 7.0 Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

### 7.1 TFT LCD Module

| Connector Name / Designation | Interface Connector / Interface card |
|---|---|
| Manufacturer | JAE / STM |
| Type Part Number | FI-XB30SSRL-HF15 / MSBKT2407P30HB |
| Mating Housing Part Number | FI-X30HL (Locked Type) |

#### 7.1.1 Pin Assignment

| Pin# | Signal Name | Pin# | Signal Name |
|---|---|---|---|
| 1 | RxOIN0- | 2 | RxOIN0+ |
| 3 | RxOIN1- | 4 | RxOIN1+ |
| 5 | RxOIN2- | 6 | RxOIN2+ |
| 7 | GND | 8 | RxOCLKIN- |
| 9 | RxOCLKIN+ | 10 | RxOIN3- |
| 11 | RxOIN3+ | 12 | RxEIN0- |
| 13 | RxEIN0+ | 14 | GND |
| 15 | RxEIN1- | 16 | RxEIN1+ |
| 17 | GND | 18 | RxEIN2- |
| 19 | RxEIN2+ | 20 | RxECLKIN- |
| 21 | RxECLKIN+ | 22 | RxEIN3- |
| 23 | RxEIN3+ | 24 | GND |
| 25 | NC (for AUO test only. Do not connect) | 26 | NC (for AUO test only. Do not connect) |
| 27 | NC (for AUO test only. Do not connect) | 28 | VDD |
| 29 | VDD | 30 | VDD |

### 7.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

| | |
|---|---|
| Connector Name / Designation | Lamp Connector / Backlight lamp |
| Manufacturer | CVILUX / YEONHO |
| Type Part Number | CP0502SL090/ 35001 HS-02L |
| Mating Type Part Number | CP0502P1ML0/ 35001 WR-02L |

#### 7.2.1 Signal for Lamp connector

| | Connector No. | Pin No. | Input | Color | Function |
|---|---|---|---|---|---|
| Upper | CN1 | 1 | Hot1 | Pink | High Voltage |
| | | 2 | Cold1 | White | Low Voltage |
| | CN2 | 1 | Hot2 | Blue | High Voltage |
| | | 2 | Cold2 | Black | Low Voltage |

| | Connector No. | Pin No. | Input | Color | Function |
|---|---|---|---|---|---|
| Lower | CN3 | 1 | Hot1 | Pink | High Voltage |
| | | 2 | Cold1 | White | Low Voltage |
| | CN4 | 1 | Hot2 | Blue | High Voltage |
| | | 2 | Cold2 | Black | Low Voltage |

## 8.0 Reliability Test

Environment test conditions are listed as following table.

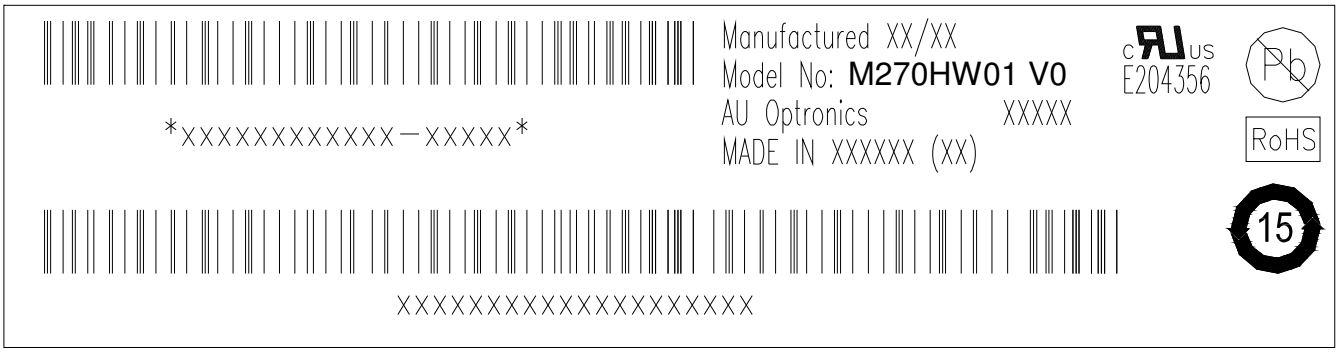
| Items | Required Condition | Note |
|---|---|---|
| Temperature Humidity Bias (THB) | Ta= 50℃, 80%RH, 300hours | |
| High Temperature Operation (HTO) | Ta= 50℃, 50%RH, 300hours | |
| Low Temperature Operation (LTO) | Ta= 0℃, 300hours | |
| High Temperature Storage (HTS) | Ta= 60℃, 300hours | |
| Low Temperature Storage (LTS) | Ta= -20℃, 300hours | |
| Vibration Test<br>(Non-operation) | Acceleration: 1.5 Grms<br>Wave: Random<br>Frequency: 10 - 200 Hz<br>Sweep: 30 Minutes each Axis (X, Y, Z) | |
| Shock Test<br>(Non-operation) | Acceleration: 50 G<br>Wave: Half-sine<br>Active Time: 20 ms<br>Direction: ±X, ±Y, ±Z (one time for each Axis) | |
| Drop Test | Height: 60 cm, package test | |
| Thermal Shock Test (TST) | -20℃/30min, 60℃/30min, 100 cycles | ***1*** |
| On/Off Test | On/10sec, Off/10sec, 30,000 cycles | |
| ESD (Electro Static Discharge) | Contact Discharge: ± 8KV, 150pF(330Ω ) 1sec,<br>8 points, 25 times/ point. | ***2*** |
| | Air Discharge: ± 15KV, 150pF(330Ω ) 1sec<br>8 points, 25 times/ point. | |
| Altitude Test | Operation:10,000 ft<br>Non-Operation:30,000 ft | |

***Note 1***: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20℃ to 60℃, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

***Note 2***: EN61000-4-2, ESD class B: Certain performance degradation allowed
No data lost
Self-recoverable
No hardware failures.

## 9.0 Shipping Label

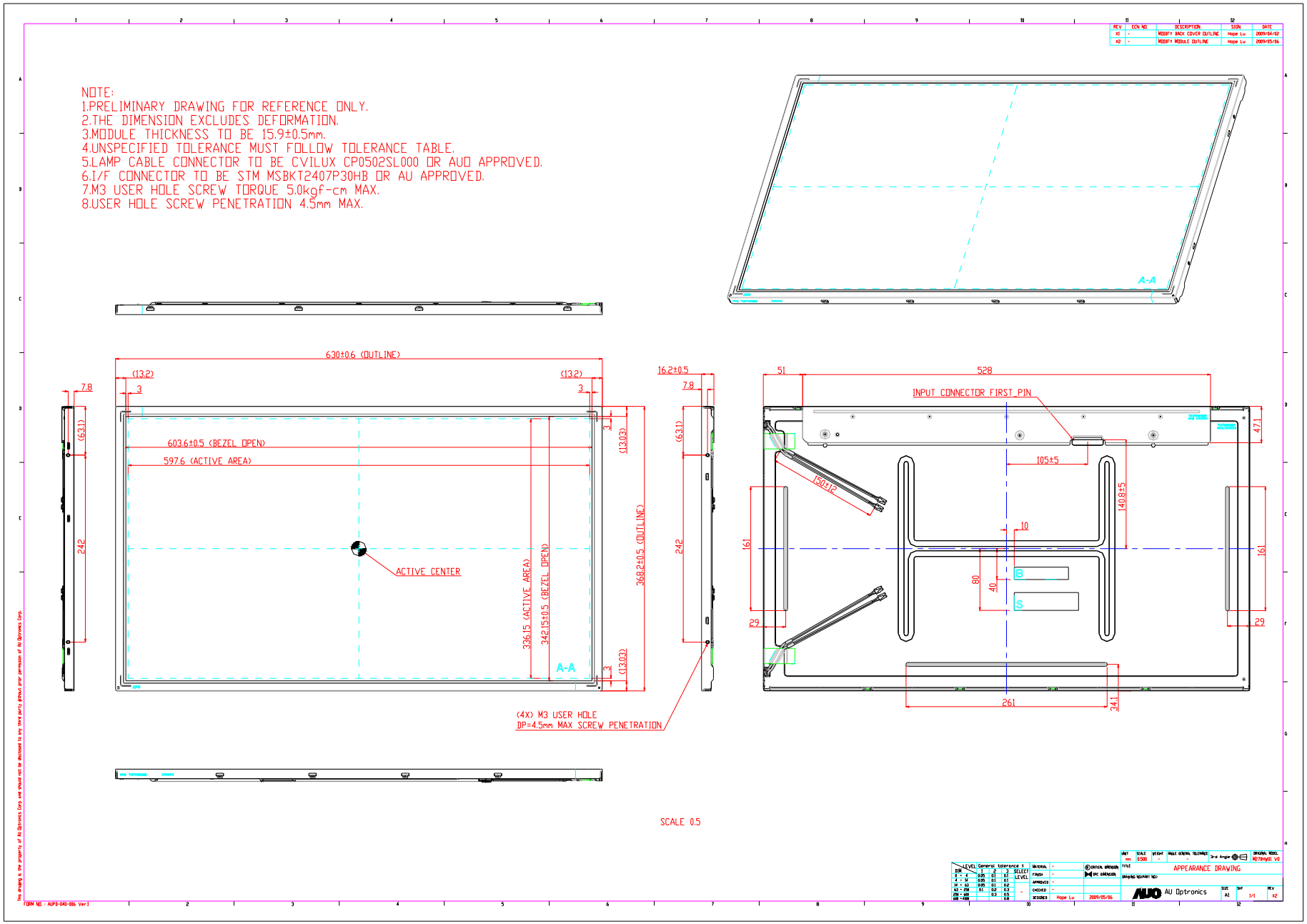
The label is on the panel as shown below:




***Note 1:*** For Pb Free products, AUO will add for identification.

***Note 2:*** For RoHS compatible products, AUO will add for identification.

***Note 3:*** For China RoHS compatible products, AUO will add for identification.

***Note 4:*** The Green Mark will be presented only when the green documents have been ready by AUO Internal Green Team.

## 10.0 Mechanical Characteristics