
Datasheet

AUO

G215HVN01.0 (S11) / (S03)

UP-02-086 (P/N 97.21G01.000-S11, before EC) valid till 30.07.2014

UP-02-086R1.1 (P/N 97. 21G01.001-S03, after EC) valid from 31.07.2014

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Preliminary Specification
Final Specification

| | |
|-------------------|---------------------|
| Module | 21.5" Color TFT-LCD |
| Model Name | G215HVN01.0 |

| Customer | Date |
|----------------------------------|-------|
| _____ | _____ |
| Checked & Approved by | |
| _____ | _____ |

| Approved by | Date |
|----------------------|-------------------|
| <u>Crystal Hsieh</u> | <u>2014/09/05</u> |
| Prepared by | |
| <u>Jimmy Tsai</u> | <u>2014/09/05</u> |

Note: This Specification is subject to change without notice.

General Display Business Division / AU Optronics corporation



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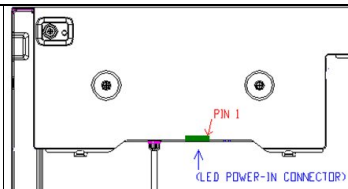
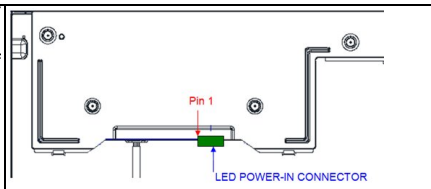
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Record of Revision

| Version and Date | Page | Old description | New Description | Remark |
|------------------|-------|--|---|--------|
| 0.1 2011/11/03 | All | First Edition | All | |
| 0.2 2012/02/03 | 26 | | | |
| 1.0 2012/11/23 | 5, 15 | [Watt], VDD: 4.4 + LED: 22 = 26.4 (Typ.) (with LED driver board, all white pattern). | Power Consumption [Watt]: 23 W (Typ. Cell 3.5 + LED 19.2). (with LED driver board, all white pattern). | |
| | 6, 11 | Operating Temp: 0 to +50C | Operating Temp: 0 to +60C | |
| | 15 | | | |
| 1.1 2013/12/03 | 15 | | | |
| | 20 | | | |
| | 22 | Back light dimming, 3.3V | Back light dimming | |
| 1.2 2014/06/24 | 6 | Contrast ratio: 5,000 (typ.) | Contrast ratio: 3,000 (typ.) | |
| | 17 | | | |
| 1.3 2014/07/31 | 6 | | | |
| | 6 | | | |
| | 24 | Thickness = 16.85 mm (typ.) | Update drawing (t=12.7 mm) | |
| 1.4 2014/08/08 | 5 | 23 W (Typ. Cell 3.5 + LED 19.2). (with LED driver board, all white pattern). | 19.82 W (Typ. Cell 3.5 + LED 16.32). (with LED driver board, all white pattern). | |
| | 15 | | | |
| | 15 | LED q'ty= 60 pcs | LED q'ty= 65 pcs | |
| | 25 | 10.2 Carton Package Max capacity: 21.5' TFT-LCD module per carton (3,855 * 1 layers) Max weight: 20.3 kg per carton. Outside dimension of carton: 564 mm x 273mmx 373 mm. | Max capacity : 9 TFT-LCD module per carton. Max weight: 20.7 kg per carton. Outside dimension of carton: 570mm*275mm*385mm. | |
| 1.5 2014/09/05 | 6, 7 | Contrast ratio: 3,000 (typ.) | Contrast ratio: 5,000 (typ.) | |
| | 20 | | | |

| | | | | |
|--|----|---|--|--|
| | 23 |  <p>(components face up)</p> |  <p>(components face down)</p> | |
| | | | | |

1. Operating 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) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, take it easily, or the TFT Module may be damaged.
- 9) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 10) 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.
- 11) 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.
- 12) Severe temperature condition may result in different luminance, response time and LED life time.
- 13) The data on this specification sheet is applicable when LCD module is placed in landscape position.
- 14) Continuous displaying fixed pattern may induce image sticking. It is recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.

2. General Description

This specification applies to the 21.5 inch-wide Color TFT-LCD Module G215HVN01.0. The display supports the Full HD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 8-bits data). All input signals are dual channel LVDS interface.

LED driver board is included. G215HVN01.0 is designed for industrial display applications.

2.1 Display Characteristics

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

| ITEMS | Unit | SPECIFICATIONS |
|----------------------------|----------------------|---|
| Screen Diagonal | [mm] | 546.86(21.53") |
| Active Area | [mm] | 476.64 (H) x 268.11 (V) |
| Pixels H x V | | 1920(x3) x 1080 |
| Pixel Pitch | [um] | 248.25 (per one triad) ×248.25 |
| Pixel Arrangement | | R.G.B. Vertical Stripe |
| Display Mode | | VA Mode, Normally Black |
| White Luminance (Center) | [cd/m ²] | 300 (Typ.) |
| Contrast Ratio | | 5000 (Typ.) |
| Optical Response Time | [msec] | 25 ms (Typ., on/off) |
| Nominal Input Voltage | [Volt] | +5.0 V |
| Backlight Input Voltage | [Volt] | +12.0 V |
| Power Consumption | [Watt] | 19.82 W (Typ. Cell 3.5 + LED 16.32) (with LED driver board, all white pattern) |
| Weight | [Grams] | 2300 (max.) |
| Physical Size | [mm] | 495.6(W) × 292.2(H) × 12.7(D) |
| Electrical Interface | | Dual channel LVDS |
| Support Color | | 16.7M colors (RGB 8 bits) |
| Surface Treatment | | Anti-Glare, 3H |
| Temperature Range | | |
| Operating | [°C] | 0 to +60 |
| Storage (Non-Operating) | [°C] | -20 to +60 |
| RoHS Compliance | | RoHS Compliance |
| TCO Compliance | | TCO 5.1 Compliance |

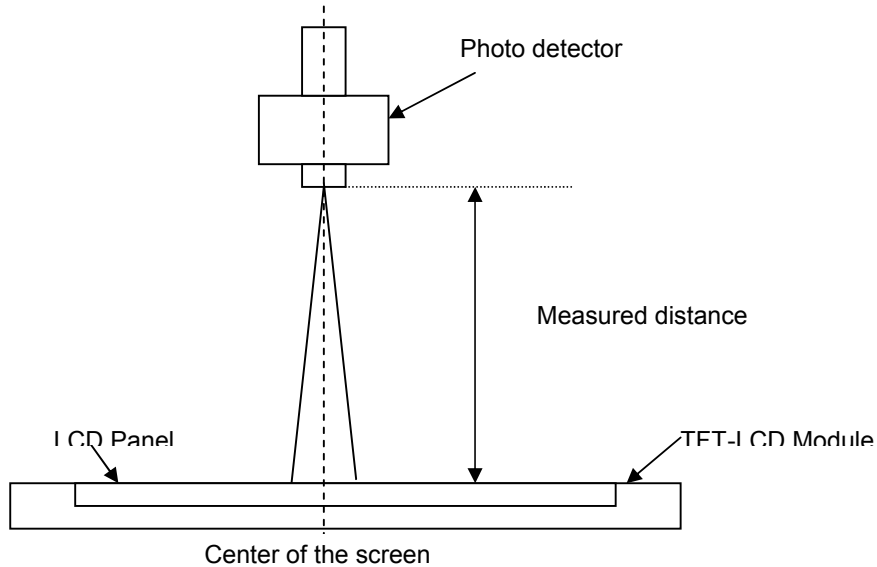
2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25 °C :

| Item | Unit | Conditions | Min. | Typ. | Max. | Note |
|---|----------------------|--------------------------------------|----------|----------|--------|------|
| Viewing Angle | [degree] | Horizontal (Right) CR = 10 (Left) | 75 75 | 89 89 | - - | 1, 2 |
| | [degree] | Vertical (Upper) CR = 10 (Lower) | 75 75 | 89 89 | - - | |
| Contrast ratio | | Normal Direction | 3000 | 5000 | - | 3 |
| Response Time | [msec] | Raising Time (T _{IR}) | - | 20 | 25 | 4 |
| | | Falling Time (T _{IF}) | - | 5 | 10 | |
| | | Raising + Falling | - | 25 | 35 | |
| Color / Chromaticity Coordinates (CIE) | | Red x | 0.589 | 0.639 | 0.689 | 5 |
| | | Red y | 0.283 | 0.333 | 0.383 | |
| | | Green x | 0.253 | 0.303 | 0.353 | |
| | | Green y | 0.573 | 0.623 | 0.673 | |
| | | Blue x | 0.105 | 0.155 | 0.205 | |
| Color Coordinates (CIE) White | | White x | 0.263 | 0.313 | 0.363 | |
| | | White y | 0.279 | 0.329 | 0.379 | |
| Central Luminance | [cd/m ²] | | 240 | 300 | - | 6 |
| Luminance Uniformity | [%] | | 75 | 80 | - | 7 |
| Crosstalk (in 60Hz) | [%] | | | | 1.5 | 8 |
| Flicker | dB | | | | -20 | 9 |

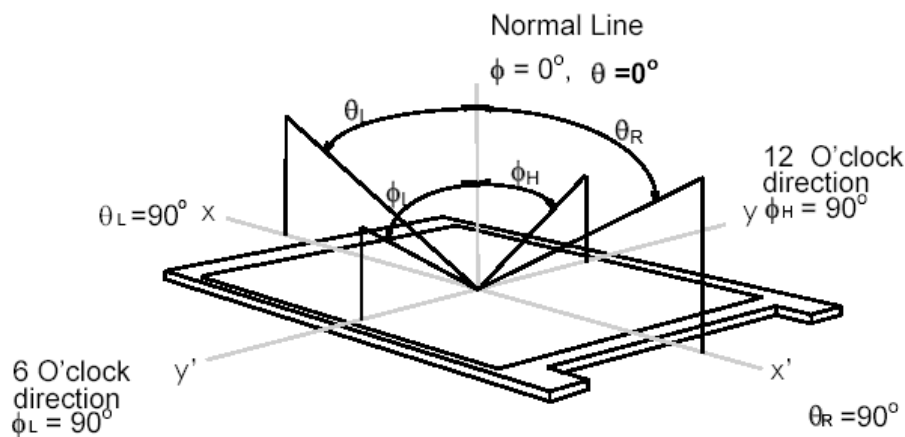
Note 1: Measurement method

Before measuring, the LCD module should be turn on 30 minutes at room temperature. 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)

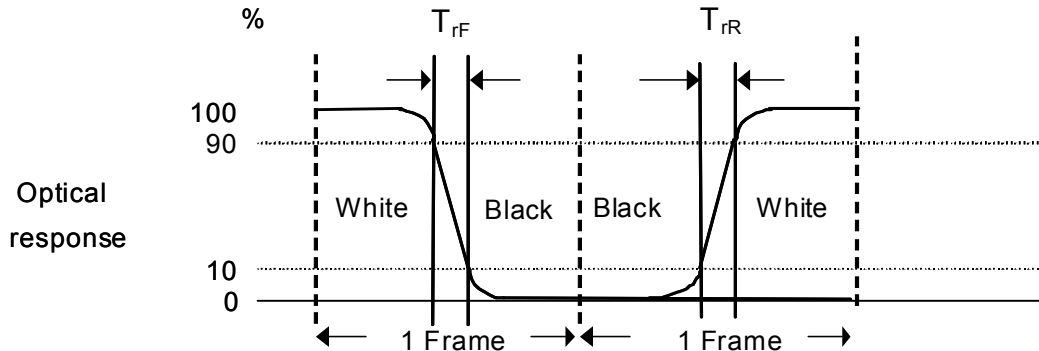
Viewing angle is the measurement of contrast ratio 10, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (ϕ) vertical, high (up) and low (down). The measurement 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

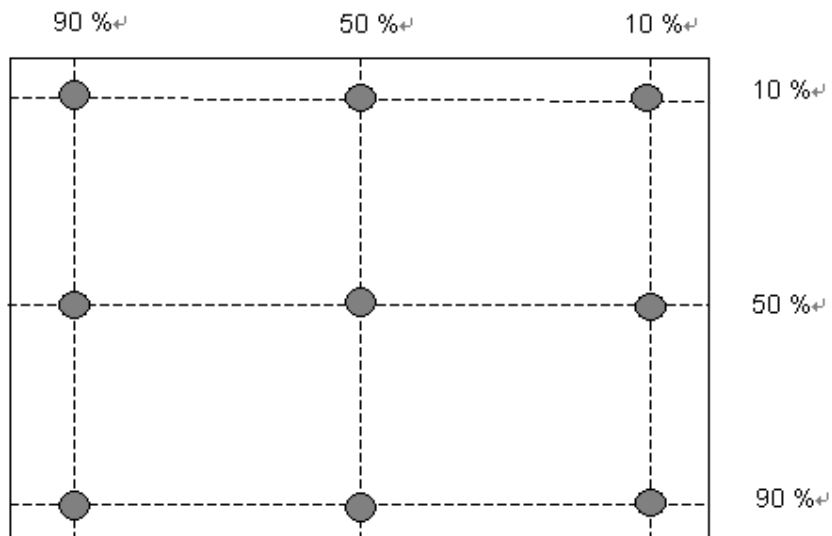
The output signals of photo detector are measured when the input signals are changed from “Full Black” to “Full White” (rising time, T_{rR}), and from “Full White” to “Full Black” (falling time, T_{rF}), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.



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



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

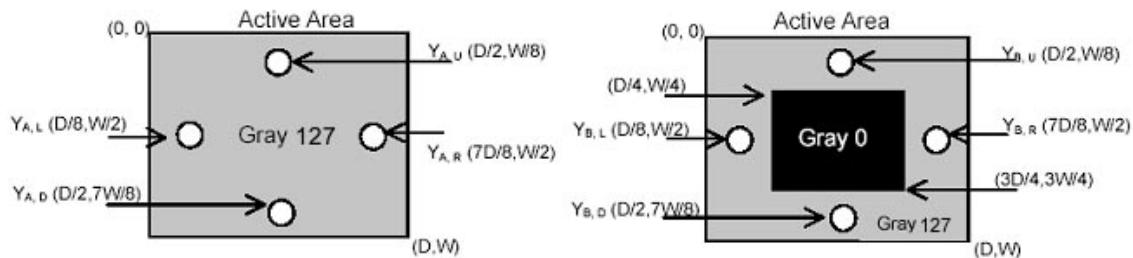
Note 8: Crosstalk is defined as below and measured by TOPCON SR-3

$$CT = |Y_B - Y_A| / Y_A \times 100 (\%)$$

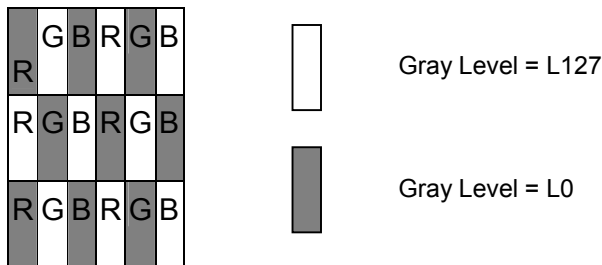
Where

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

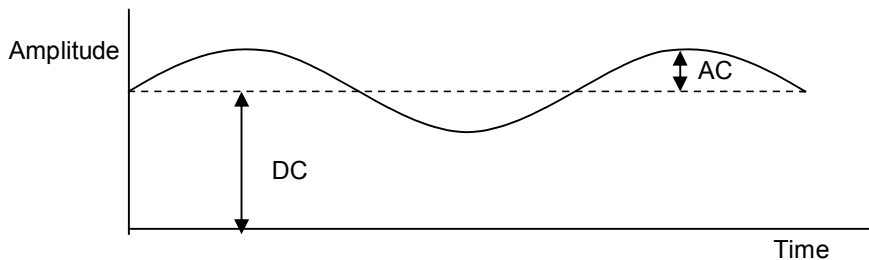
Y_B = Luminance of measured location with gray level 0 pattern (cd/m²)



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



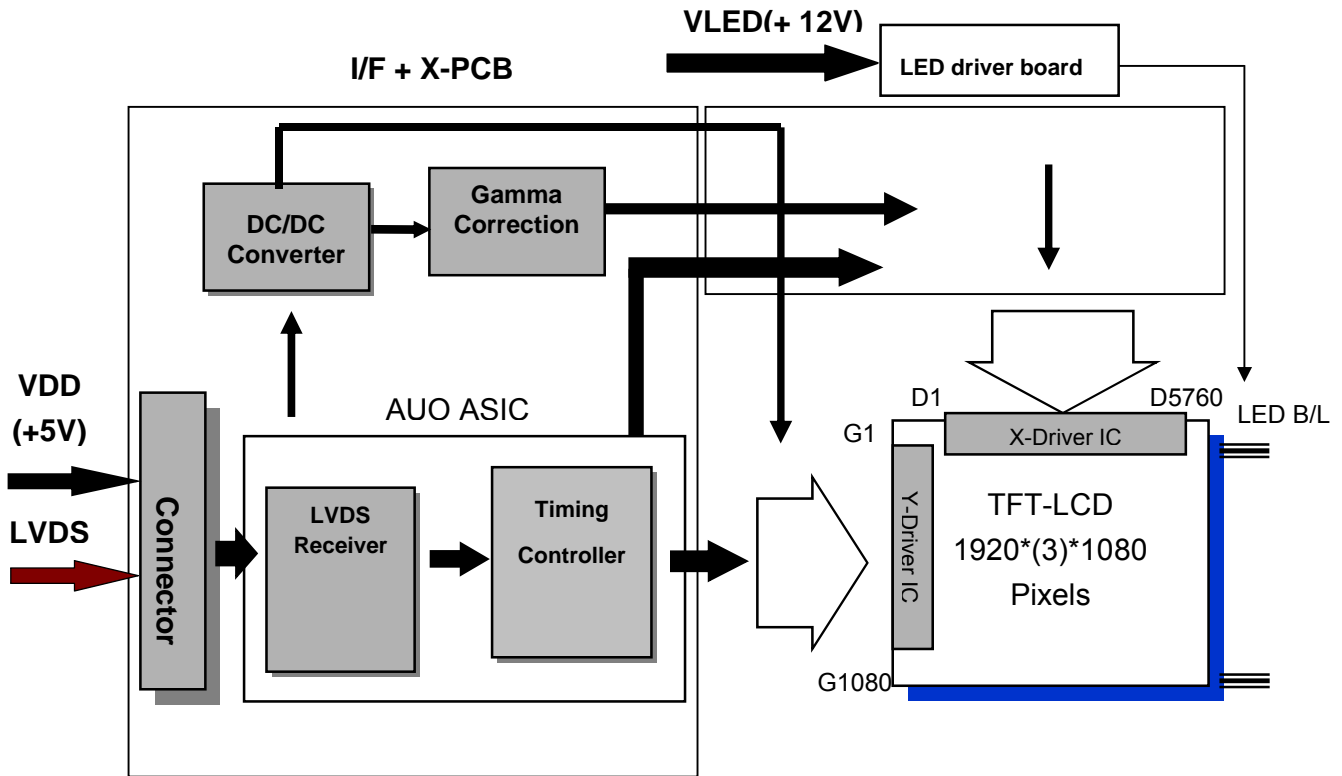
Method: Record dB value with TRD-100



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

3. Functional Block Diagram

The following diagram shows the functional block of this model.



LVDS Connector: JAE (FI-XB30SRL-HF11) or equivalent.
 LED Connector: Sin Sheng (MS24049HJ) or equivalent.

4. Absolute Maximum Ratings

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 |
|-------------------|--------|------|------|--------|------------|
| LED Input Voltage | VLED | 10.8 | 13.2 | [Volt] | Note 1,2 |

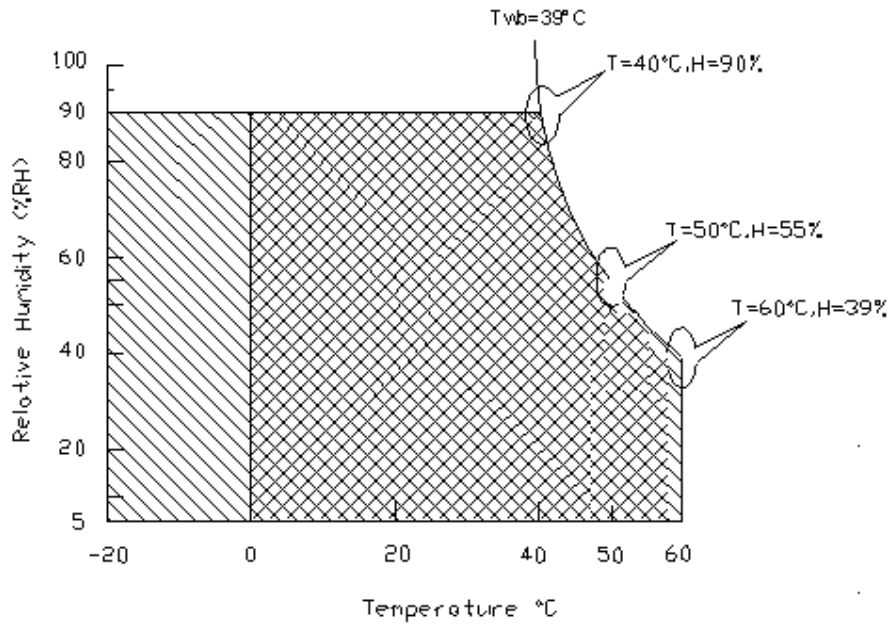
4.3 Absolute Ratings of Environment


| Item | Symbol | Min. | Max. | Unit | Conditions |
|-----------------------|--------|------|------|-------|------------|
| Operating Temperature | TOP | 0 | +60 | [°C] | Note 3 & 4 |
| 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 performance, please refer to AUO IIS (Incoming Inspection Standard).



Operating Range  Storage Range  + 

Note 4: Operation Temperature + 60°C is defined as panel surface temperature.

5. Electrical Characteristics

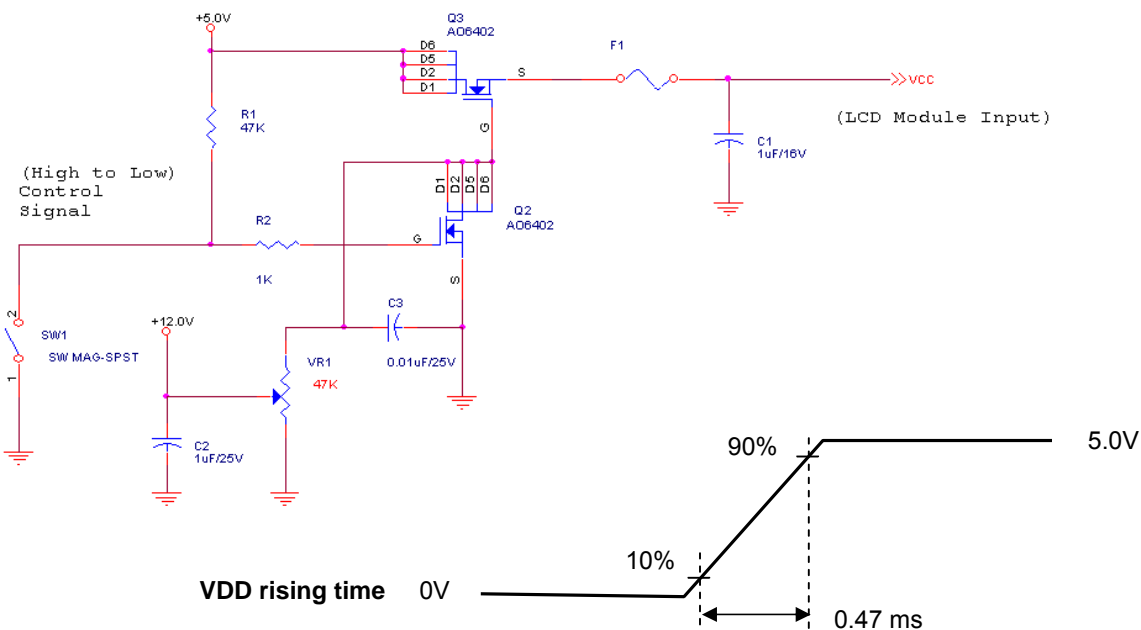
5.1 TFT LCD Module

5.1.1 Power Specification

| 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 | 0.8 | [A] | VDD= 5.0V, All white pattern, At 60Hz |
| | | - | 0.81 | 0.89 | [A] | VDD= 5.0V, All white pattern At 75Hz, |
| PDD | VDD Power | - | 3.5 | 4.4 | [Watt] | VDD= 5.0V, All white pattern, At 60Hz |
| | | - | 4.05 | 4.9 | [Watt] | VDD= 5.0V, All white pattern At 75Hz, |
| IRush | Inrush Current | - | - | 3 | [A] | Note 1 |
| VDDrp | Allowable Logic/LCD Drive Ripple Voltage | - | - | 500 | [mV] p-p | VDD= 5.0V, All white Pattern At 75Hz |

Note 1: Measurement conditions:

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

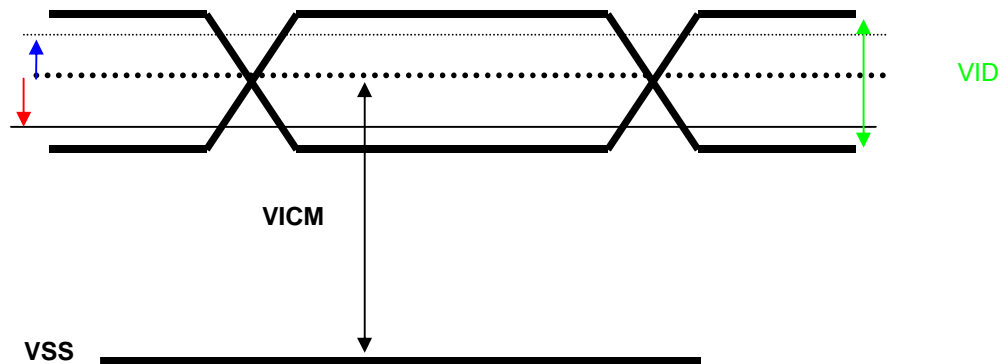


5.1.2 Signal Electrical Characteristics

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

| Symbol | Parameter | Min | Typ | Max | Units | Condition |
|------------|--|------|------|------|-------|--|
| V_{TH} | Differential Input High Threshold | - | - | +100 | [mV] | $V_{CM} = 1.2V$, <i>Note 1</i> |
| V_{TL} | Differential Input Low Threshold | -100 | - | - | [mV] | $V_{CM} = 1.2V$ <i>Note 1</i> |
| $ V_{ID} $ | Input Differential Voltage | 100 | - | 600 | [mV] | <i>Note 1</i> |
| V_{CM} | Differential Input Common Mode Voltage | +1.0 | +1.2 | +1.5 | [V] | $V_{TH}-V_{TL} = 200MV$ (max) <i>Note 1</i> |

Note 1: LVDS Signal Waveform



5.2 Backlight Unit

5.2.1 LED Driver

Following characteristics are measured under stable condition at 25 (Room Temperature).

| Symbol | Parameter | Min | Typ | Max | Unit | Remark |
|---------------------------------------|---------------------|-------|-------|-------|------|--------------------------|
| VLED | Input Voltage | 10.8 | 12 | 13.2 | Volt | |
| ILED | Input Current | - | 1.36 | - | A | 100% Dimming |
| PLED | Power Consumption | - | 16.32 | 19.95 | Watt | 100% Dimming |
| Backlight Dimming (PWM Mode) | Dimming Frequency | 200 | - | 20k | Hz | |
| | Swing Voltage | 4.8 | 5 | 5.5 | Volt | |
| | Dimming Duty Cycle | 10 | - | 100 | % | |
| Backlight Dimming (Analog Mode) | Dimming Voltage | 1.5 | - | 5 | Volt | Adjustable Dimming Range |
| Backlight on\off | On Control Voltage | 3 | - | 5.5 | Volt | |
| | Off Control Voltage | 0 | - | 0.8 | Volt | |
| I _F | LED Forward Current | - | 80 | - | mA | Ta = 25°C, Note1 |
| Operating Life | | 50000 | - | - | Hrs | Ta = 25°C, Note4 |

Note 1: Ta means ambient temperature.

Note 2: If module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 3: LED light bar structure: (5 strings x 13pcs / string =65pcs LED)

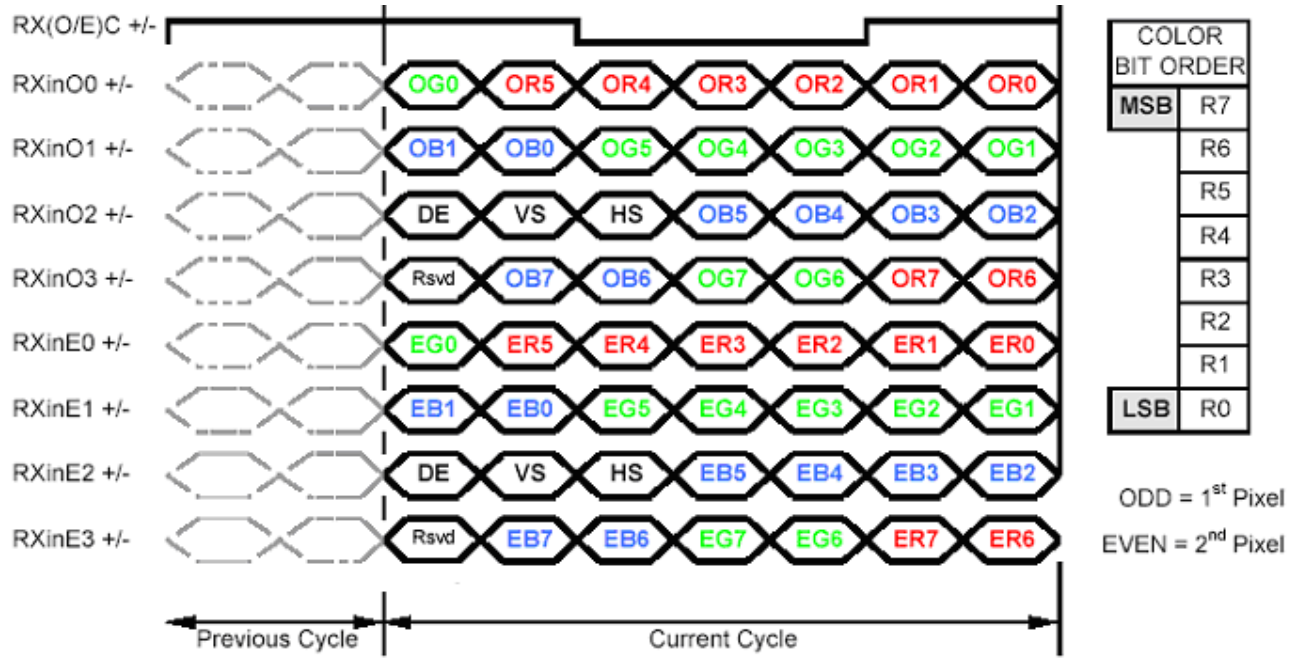
Note 4: Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

6.2 Signal Description

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

| PIN # | SIGNAL NAME | DESCRIPTION |
|-------|-------------|--|
| 1 | RXinO0- | Negative LVDS differential data input (Odd data) |
| 2 | RXinO0+ | Positive LVDS differential data input (Odd data) |
| 3 | RXinO1- | Negative LVDS differential data input (Odd data) |
| 4 | RXinO1+ | Positive LVDS differential data input (Odd data) |
| 5 | RXinO2- | Negative LVDS differential data input (Odd data, H-Sync, V-Sync, DSPTMG) |
| 6 | RXinO2+ | Positive LVDS differential data input (Odd data, H-Sync, V-Sync, DSPTMG) |
| 7 | GND | Power Ground |
| 8 | RxOCLKIN- | Negative LVDS differential clock input (Odd clock) |
| 9 | RxOCLKIN+ | Positive LVDS differential clock input (Odd clock) |
| 10 | RXinO3- | Negative LVDS differential data input (Odd data) |
| 11 | RXinO3+ | Positive LVDS differential data input (Odd data) |
| 12 | RXinE0- | Negative LVDS differential data input (Even data) |
| 13 | RXinE0+ | Positive LVDS differential data input (Even data) |
| 14 | GND | Power Ground |
| 15 | RXinE1- | Negative LVDS differential data input (Even data) |
| 16 | RXinE1+ | Positive LVDS differential data input (Even data) |
| 17 | GND | Power Ground |
| 18 | RXinE2- | Negative LVDS differential data input (Even data) |
| 19 | RXinE2+ | Positive LVDS differential data input (Even data) |
| 20 | RxECLKIN- | Negative LVDS differential clock input (Even clock) |
| 21 | RxECLKIN+ | Positive LVDS differential clock input (Even clock) |
| 22 | RXinE3- | Negative LVDS differential data input (Even data) |
| 23 | RXinE3+ | 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 |

6.3 The Input Data Format



Note1: 8-bits signal input.

Note2: L:NS alike H:Thine alike

6.4 Interface Timing

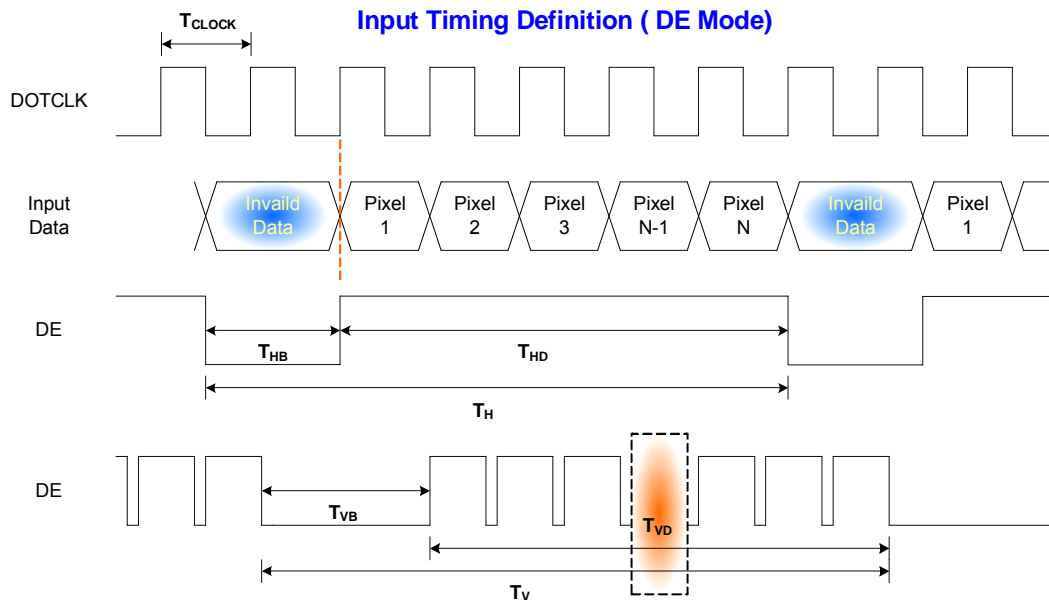
6.4.1 Timing Characteristics

| Signal | Item | Symbol | Min | Typ | Max | Unit |
|--------------------|-----------|----------------------|------|------|------|---------|
| Clock | Frequency | $1/T_{\text{Clock}}$ | 40 | 72 | 83 | MHz |
| Frame Rate | Frequency | F | 50 | 60 | 75 | Hz |
| Vertical Section | Period | T_V | 1092 | 1130 | 1653 | T_line |
| | Active | T_{VD} | 1080 | 1080 | 1080 | |
| | Blanking | T_{VB} | 12 | 50 | 573 | |
| Horizontal Section | Period | T_H | 1004 | 1050 | 1100 | T_clock |
| | Active | T_{HD} | 960 | 960 | 960 | |
| | Blanking | T_{HB} | 44 | 90 | 140 | |

Note: DE mode only.

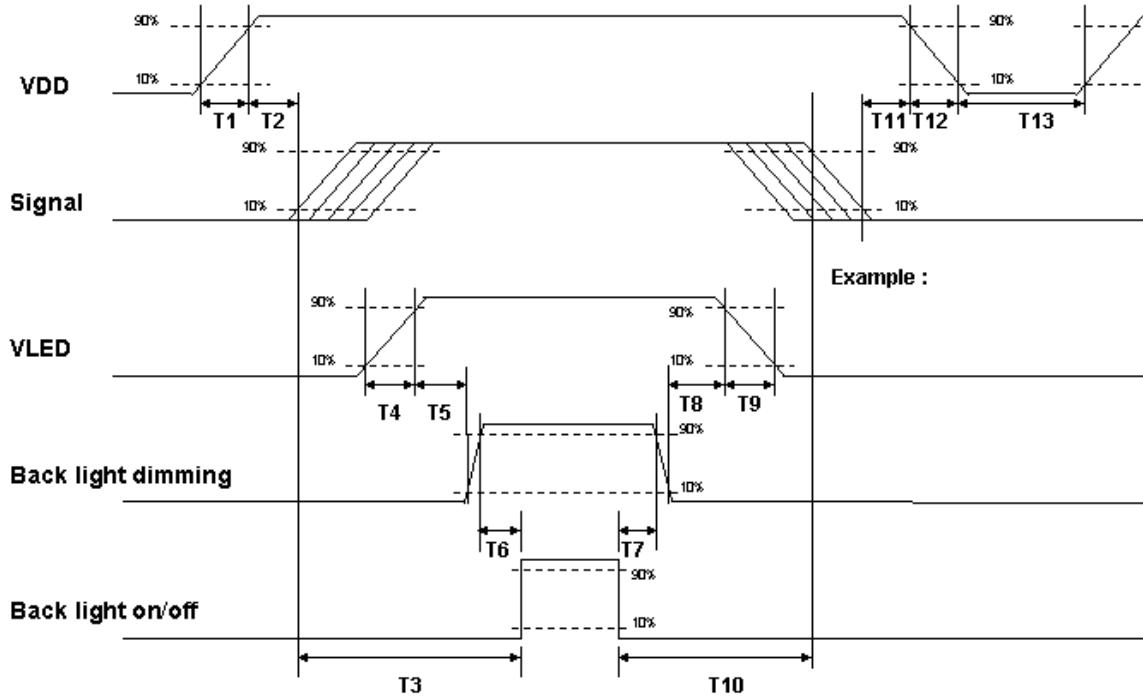
Note: Typical value refer to VESA STANDARD

6.4.2 Input Timing Diagram



6.5 Power ON/OFF Sequence

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



Power ON/OFF sequence timing

| Parameter | Value | | | Units |
|-----------|-------|------|------|-------|
| | Min. | Typ. | Max. | |
| T1 | 0.5 | -- | 10 | [ms] |
| T2 | 30 | 40 | 50 | [ms] |
| T3 | 200 | -- | -- | [ms] |
| T4 | 0.5 | -- | 10 | [ms] |
| T5 | 10 | -- | -- | [ms] |
| T6 | 10 | -- | -- | [ms] |
| T7 | 0 | -- | -- | [ms] |
| T8 | 10 | -- | -- | [ms] |
| T9 | -- | -- | 10 | [ms] |
| T10 | 110 | -- | -- | [ms] |
| T11 | 0 | 16 | 50 | [ms] |
| T12 | -- | -- | 10 | [ms] |
| T13 | 1000 | -- | -- | [ms] |

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

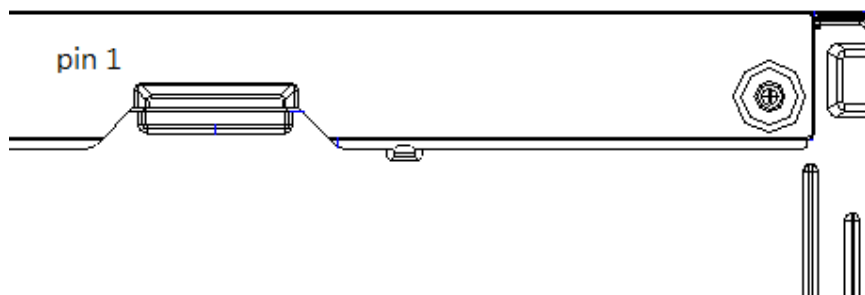
7. Connector & Pin Assignment

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: LVDS Connector

| Connector Name / Designation | Interface Connector / Interface card |
|------------------------------|--------------------------------------|
| Manufacturer | JAE or compatible |
| Type Part Number | JAE (FI-XB30SRL-HF11) or equivalent |
| Mating Housing Part Number | FI-X30HL (JAE) or compatible |

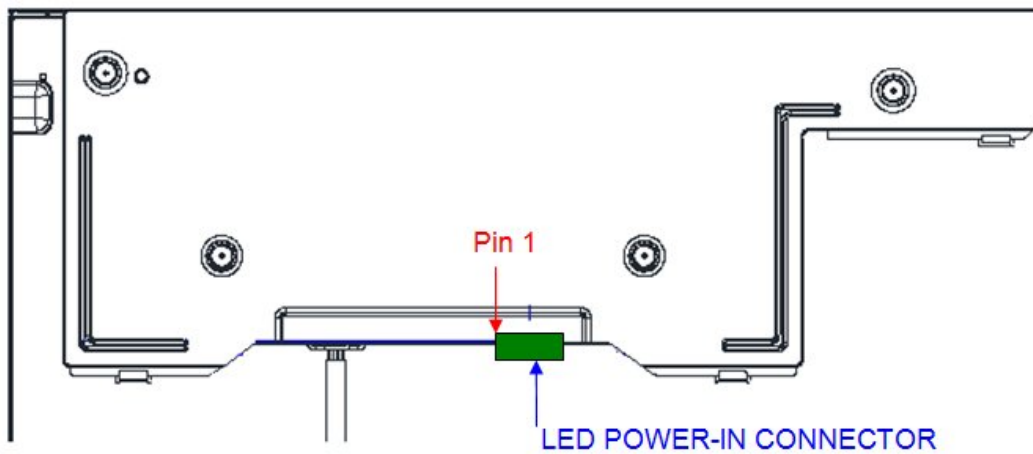
| Pin# | Signal Name | Pin# | Signal Name |
|------|-------------|------|-------------|
| 1 | RxOIN0- | 2 | RxOIN0+ |
| 3 | RxOIN1- | 4 | RxOIN1+ |
| 5 | RxOIN2- | 6 | RxOIN2+ |
| 7 | GND | 8 | RxOCLKIN- |
| 9 | RxOCLKIN+ | 10 | RxOIN3- |
| 11 | RxOIN3+ | 12 | RxEIN0- |
| 13 | RxEIN0+ | 14 | GND |
| 15 | RxEIN1- | 16 | RxEIN1+ |
| 17 | GND | 18 | RxEIN2- |
| 19 | RxEIN2+ | 20 | RxECLKIN- |
| 21 | RxECLKIN+ | 22 | RxEIN3- |
| 23 | RxEIN3+ | 24 | GND |
| 25 | NC | 26 | NC |
| 27 | NC | 28 | VDD |
| 29 | VDD | 30 | VDD |



7.2 Backlight Unit: LED Connector

| | |
|-------------------------------------|-------------------------|
| Connector Name / Designation | LED Connector |
| Manufacturer | Sin Sheng or compatible |
| Connector Model Number | MS24049HJ or equivalent |
| Mating Model Number | P24049 or compatible |

| PIN # | SIGNAL NAME | DESCRIPTION |
|-------|-------------|--------------------|
| 1 | GND | Ground |
| 2 | GND | Ground |
| 3 | GND | Ground |
| 4 | BL_DIM_P | Back light dimming |
| 5 | BL_EN | Back light enable |
| 6 | --- | NC |
| 7 | VLED | Input voltage, 12V |
| 8 | VLED | Input voltage, 12V |
| 9 | VLED | Input voltage, 12V |





8. Reliability Test

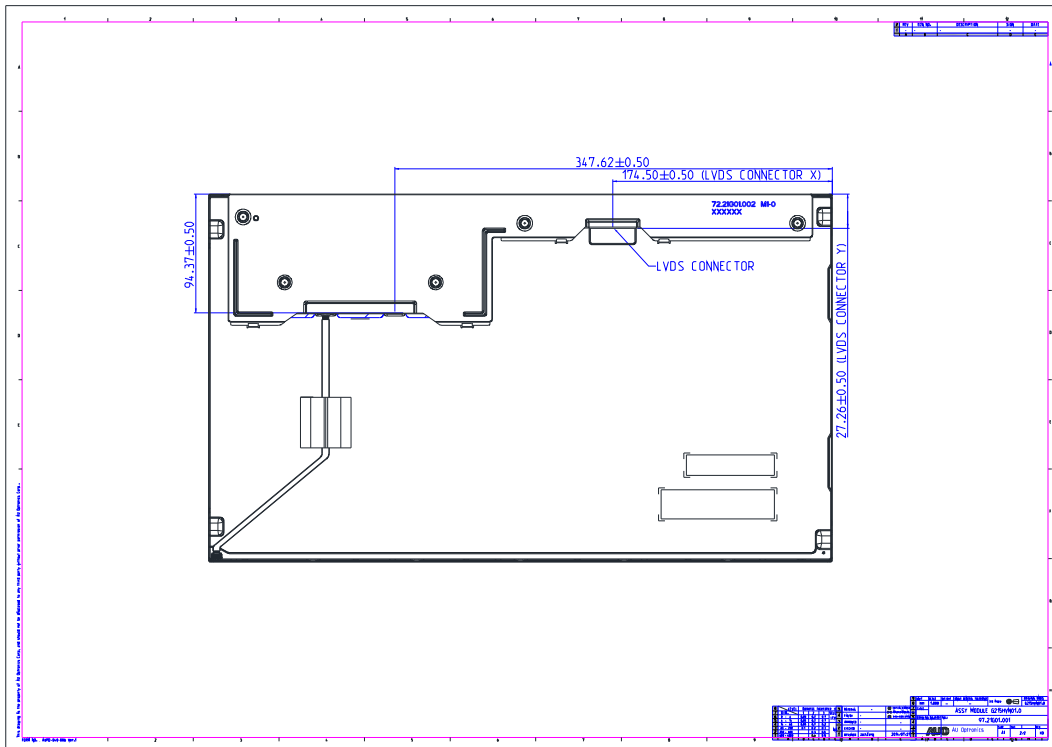
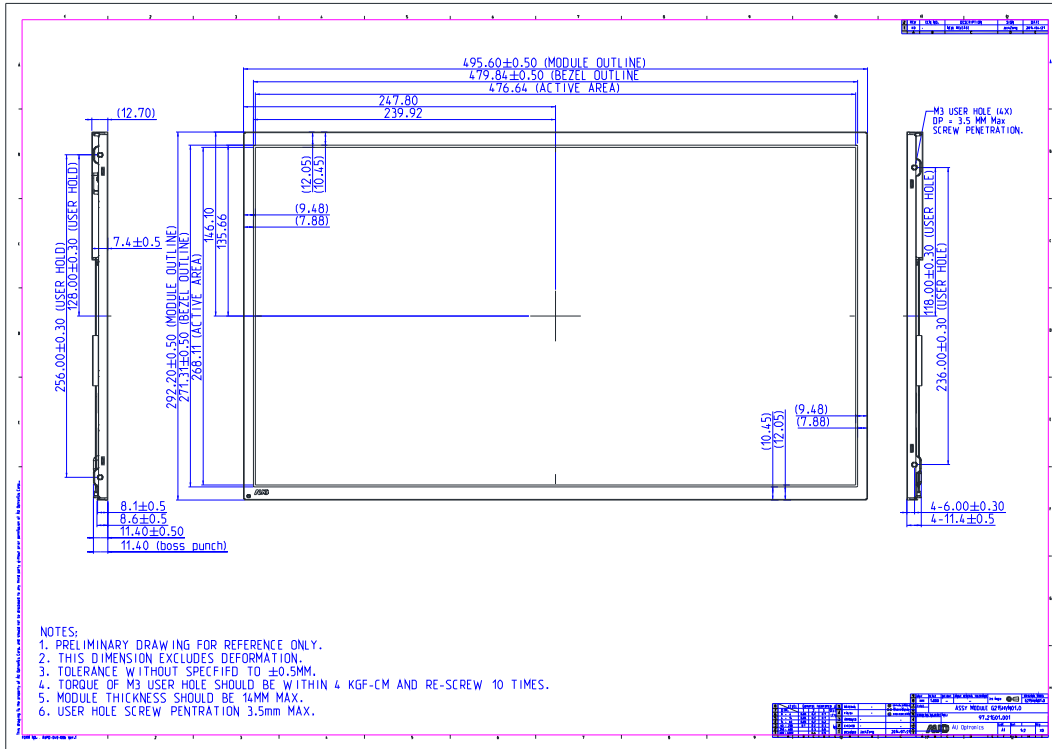
Environment test conditions are listed as following table.

| Items | Required Condition | Note |
|-----------------------------------|---|----------|
| Temperature Humidity Bias (THB) | Ta= 50 , 80%RH, 300hours | |
| High Temperature Operation (HTO) | Ta= 60 , 300hours | |
| Low Temperature Operation (LTO) | Ta= 0 , 300hours | |
| High Temperature Storage (HTS) | Ta= 60 , 300hours | |
| Low Temperature Storage (LTS) | Ta= -20 , 300hours | |
| Vibration Test (Non-operation) | Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Duration: 30 Minutes each Axis (X, Y, Z) | |
| Shock Test (Non-operation) | Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis) | |
| Drop Test | Height: 46 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, 15 points, 25 times/ point. | 2 |
| | Air Discharge: ± 15KV, 150pF(330Ω) 1sec 15 points, 25 times/ point. | |
| Altitude Test | Operation:10,000 ft 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.

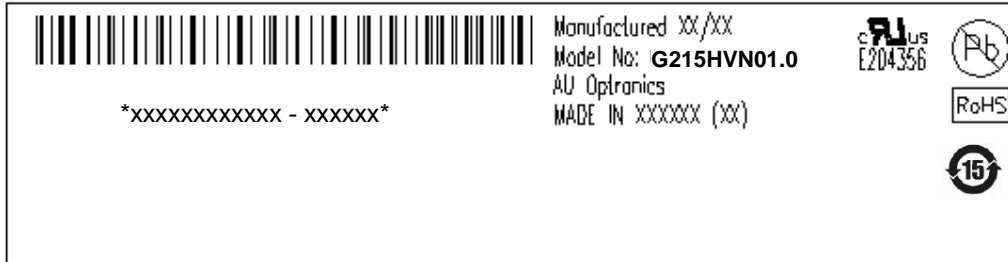
Note2: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost Self-recoverable. No hardware failures.

9. Mechanical Characteristics

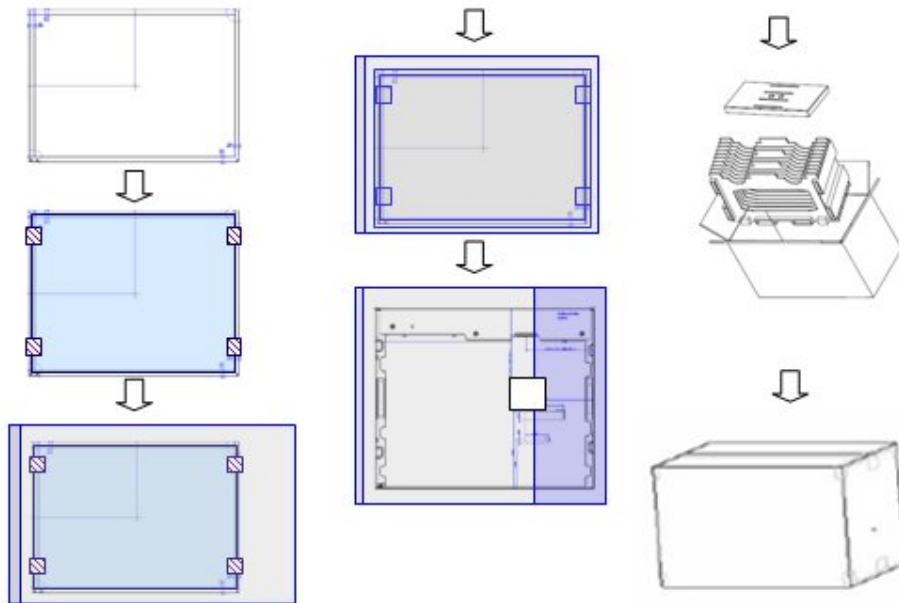


10. Label and Packaging

10.1 Shipping Label (on the rear side of TFT-LCD display)



10.2 Carton Package



Max capacity : 9 pcs per carton

Max weight: 20.7 kg per carton

Outside dimension of carton: 570mm*275mm*395mm

Pallet size : 1150mm*840mm*132mm

Box stacked:

Module by air : (2 *3) *3 layers , one pallet put 18 boxes , total 162pcs.

Module by sea (I) : One pallet (2 *3) *3 layers + One pallet (2 *3) *1 layers , total 216 pcs.

Module by sea (II) : One pallet (2 *3) *3 layers + One pallet (2 *3) *2 layers , Total 270 pcs.



11. Safety

11.1 Sharp Edge Requirements

There will be no sharp edges or comers on the display assembly that could cause injury.

11.2 Materials

11.2.1 Toxicity

There will be no carcinogenic materials used anywhere in the display module. If toxic materials are used, they will be reviewed and approved by the responsible AUO toxicologist.

11.2.2 Flammability

All components including electrical components that do not meet the flammability grade UL94-V1 in the module will complete the flammability rating exception approval process.

The printed circuit board will be made from material rated 94-V1 or better. The actual UL flammability rating will be printed on the printed circuit board.

11.3 Capacitors

If any polarized capacitors are used in the display assembly, provisions will be made to keep them from being inserted backwards.

11.4 National Test Lab Requirement

The display module will satisfy all requirements for compliance to:

UL 1950, First Edition

U.S.A. Information Technology Equipment

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