



() Preliminary Specification

(V) Final Specification

| | |
|------------|----------------------------|
| Module | 21.5" Color TFT-LCD |
| Model Name | G215HAN01.2 (97.21G03.201) |

| Customer | Date |
|-------------|-------|
| <hr/> | <hr/> |
| Approved by | |
| <hr/> | <hr/> |

Note: This Specification is subject to change without notice.

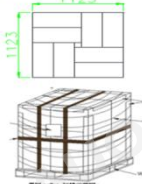

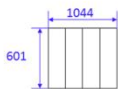
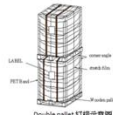
| Approved by | Date |
|-----------------------|------------------|
| <u>Floosie Chuang</u> | <u>2021/9/07</u> |
| Prepared by | |
| <u>Roxanne Lin</u> | <u>2021/9/07</u> |

General Display Business Division /
AU Optronics corporation

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Record of Revision

| Version | Date | Page | Old description | New Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---------------------|------|---|---|-------------------|--|---------------------------------|---------------------|-----------------------|------|---|-------|------|---|------|--------|---------|------|--|-----------------------|-----|-----|----|------|-----------|------|--|---------|--|--------------------|------|--|---------|--|
| 0.1 | 2018/8/8 | All | | First draft specification | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.0 | 2019/1/11 | 1 | First draft specification | Final Specification | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | 2019/2/18 | 5 | Operating 0~50 °C | Operating 0~60 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 25 | <p>Max capacity : 8 TFT-LCD module per carton.</p> <p>Max weight: 18.0 kg per carton.</p> <p>Outside dimension of carton: 580mm*275mm*385mm.</p> <p>Pallet size : 1200mm*800mm*132mm</p> <p>9.3 Palletizing.</p> <p>Box stacked</p> <p>Module by air : (2 *4) *3 layers + one pallet put 18 boxes + total 144pcs module.</p> <p>Module by sea : One pallet (2 *4 *3 layers) No Double Pallet + total 192 pcs module.</p> <p>Module by sea_HQ : One pallet (2 *4 *3 layers) No Double Pallet Total 192 pcs module.</p>   | <p>Max capacity : 8 TFT-LCD module per carton.</p> <p>Max weight: 18.0 kg per carton.</p> <p>Outside dimension of carton: 601mm*261mm*412mm.</p> <p>Pallet size : 1060mm*760mm*132mm</p> <p>9.3 Palletizing.</p> <p>Box stacked</p> <p>Module by air : (1 *4) *3 layers + one pallet put 12 boxes + total 96pcs module.</p> <p>Module by sea : Double pallet (1 *4) *3 layers + (1*4) * 1 layer + total 128 pcs module.</p> <p>Module by sea_HQ : Double pallet (1 *4) *3 layers + (1*4) * 2 layers + total 160 pcs module.</p>   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2 | 2021/907 | 5 | <div>2.1 Display Characteristics</div> <table><tr><td>Temperature Range</td><td></td><td></td><td></td><td></td></tr><tr><td>Operating</td><td>[°C]</td><td></td><td>0~ 60</td><td></td></tr><tr><td>Storage (Shipping)</td><td>[°C]</td><td></td><td>-20~ 60</td><td></td></tr></table> | Temperature Range | | | | | Operating | [°C] | | 0~ 60 | | Storage (Shipping) | [°C] | | -20~ 60 | | <div>2.1 Display Characteristics</div> <table><tr><td>Temperature Range</td><td></td><td></td><td></td><td></td></tr><tr><td>Operating</td><td>[°C]</td><td></td><td>-10~ 60</td><td></td></tr><tr><td>Storage (Shipping)</td><td>[°C]</td><td></td><td>-20~ 60</td><td></td></tr></table> | Temperature Range | | | | | Operating | [°C] | | -10~ 60 | | Storage (Shipping) | [°C] | | -20~ 60 | |
| Temperature Range | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating | [°C] | | 0~ 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage (Shipping) | [°C] | | -20~ 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Range | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating | [°C] | | -10~ 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage (Shipping) | [°C] | | -20~ 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2 | 2021/907 | 10 | <div>4.2 Absolute Ratings of Environment</div> <table><tr><td>Item</td><td>Symbol</td><td>Min.</td><td>Max.</td><td>Unit</td></tr><tr><td>Operating Temperature</td><td>TOP</td><td>0</td><td>60</td><td>[°C]</td></tr></table> | Item | Symbol | Min. | Max. | Unit | Operating Temperature | TOP | 0 | 60 | [°C] | <div>4.2 Absolute Ratings of Environment</div> <table><tr><td>Item</td><td>Symbol</td><td>Min.</td><td>Max.</td><td>Unit</td></tr><tr><td>Operating Temperature</td><td>TOP</td><td>-10</td><td>60</td><td>[°C]</td></tr></table> | Item | Symbol | Min. | Max. | Unit | Operating Temperature | TOP | -10 | 60 | [°C] | | | | | | | | | | |
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| 1.2 | 2021/907 | 10 | Note 4 drawing update | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2 | 2021/907 | 24 | <div>8.0 Reliability Test</div> <table><tr><td>Low Temperature Operation (LTO)</td><td>Ta= 0°C, 300hours</td></tr></table> | Low Temperature Operation (LTO) | Ta= 0°C, 300hours | <div>8.0 Reliability Test</div> <table><tr><td>Low Temperature Operation (LTO)</td><td>Ta= -10°C, 300hours</td></tr></table> | Low Temperature Operation (LTO) | Ta= -10°C, 300hours | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Low Temperature Operation (LTO) | Ta= -10°C, 300hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



1.0 Handling Precautions

- 1) Since front polarizer is easily damaged, please be cautious and 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 soft cloth.
- 5) Since the panel is made of glass, it may be broken or cracked if dropped or bumped on hard surface.
- 6) To avoid ESD (Electro Static Discharge) damage, be sure to ground yourself before handling TFT-LCD Module.
- 7) Do not open nor modify the module assembly.
- 8) Do not press the reflector sheet at the back of the module to any direction.
- 9) In case if a module has to be put back into the packing container slot after it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar 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) TFT-LCD Module is not allowed to be twisted & bent even force is added on module in a very short time. Please design your display product well to avoid external force applying to module by end-user directly.
- 12) 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 (IEC60950-1 or UL60950-1), or be applied exemption.
- 13) Severe temperature condition may result in different luminance, response time and lamp ignition voltage.
- 14) Continuous operating TFT-LCD display under low temperature environment may accelerate lamp exhaustion and reduce luminance dramatically.
- 15) The data on this specification sheet is applicable when LCD module is placed in landscape position.
- 16) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.



2.0 General Description

This specification applies to the 21.5 inch-wide Color AHVA (IPS-like) TFT-LCD Module G215HAN01.2. The display supports the FHD [1920(H) x 1080(V)] screen format and 16.7M colors. All input signals are LVDS interface compatible.

2.1 Display Characteristics

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

| ITEMS | Unit | SPECIFICATIONS |
|--|----------------------|---|
| Screen Diagonal | [mm] | 21.5" |
| Active Area | [mm] | 476.064 (H) x 267.786 (V) |
| Pixels H x V | | 1920(x3) x 1080 |
| Pixel Pitch | [um] | 247.95 (per one triad) x247.95 |
| Pixel Arrangement | | R.G.B. Vertical Stripe |
| Display Mode | | AHVA Mode, Normally Black |
| White Luminance (Center) | [cd/m ²] | 300 cd/m ² (Typ.) |
| Contrast Ratio | | 1000 (Typ.) |
| Optical Response Time | [msec] | 22 |
| Nominal Input Voltage VDD | [Volt] | 5 V (Typ) |
| Power Consumption (VDD line + LED line) | [Watt] | 11.35 (Typ.) LCD module: PDD (Typ.)= 2.3 @ White pattern, Fv=60Hz Backlight unit : PBLU (Typ.) =9.05W |
| Weight | [Grams] | 1740 (Typ) |
| Physical Size | [mm] | 497.6(H) x 292.2(V) x 10.5 (D)Typ |
| Electrical Interface | | Dual LVDS |
| Support Color | | 16.7M colors |
| Surface Treatment | | Anti-Glare, 3H |
| RoHS Compliance | | RoHS Compliance |
| Temperature Range | | |
| Operating | [°C] | -10~ 60 |
| Storage (Shipping) | [°C] | -20~ 60 |

2.2 Optical Characteristics

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

| Item | Unit | Conditions | Min. | Typ. | Max. | Note |
|---|-------------------|--------------------------------------|-------|----------|--------|------|
| Central Luminance | cd/m ² | I _{LED} =65mA(center point) | 240 | 300 | | 1 |
| Luminance Uniformity | % | 9 points | 75 | 80 | | 2,3 |
| Contrast ratio | | Normal Direction | 800 | 1000 | | 4 |
| Response Time | msec | Rising | | 12 | 22 | 5 |
| | | Falling | | 10 | 20 | |
| | | Rising + Falling | | 22 | 42 | |
| Viewing Angle | degree | Horizontal (Right) CR >10 (Left) | | 89 89 | - - | 6 |
| | | Vertical (Up) CR > 10 (Down) | | 89 89 | - - | |
| Color / Chromaticity Coordinates (CIE 1931) | | Red x | 0.616 | 0.646 | 0.676 | |
| | | Red y | 0.305 | 0.335 | 0.365 | |
| | | Green x | 0.274 | 0.304 | 0.334 | |
| | | Green y | 0.585 | 0.615 | 0.645 | |
| | | Blue x | 0.120 | 0.150 | 0.180 | |
| | | Blue y | 0.031 | 0.061 | 0.091 | |
| | | White x | 0.283 | 0.313 | 0.343 | |
| | | White y | 0.299 | 0.329 | 0.359 | |
| Color Gamut | % | | | 72 | | |

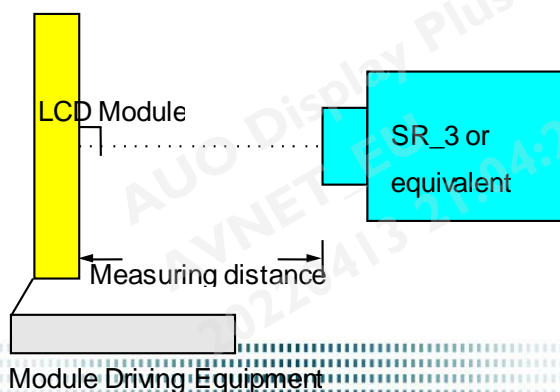
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR_3 or equivalent)

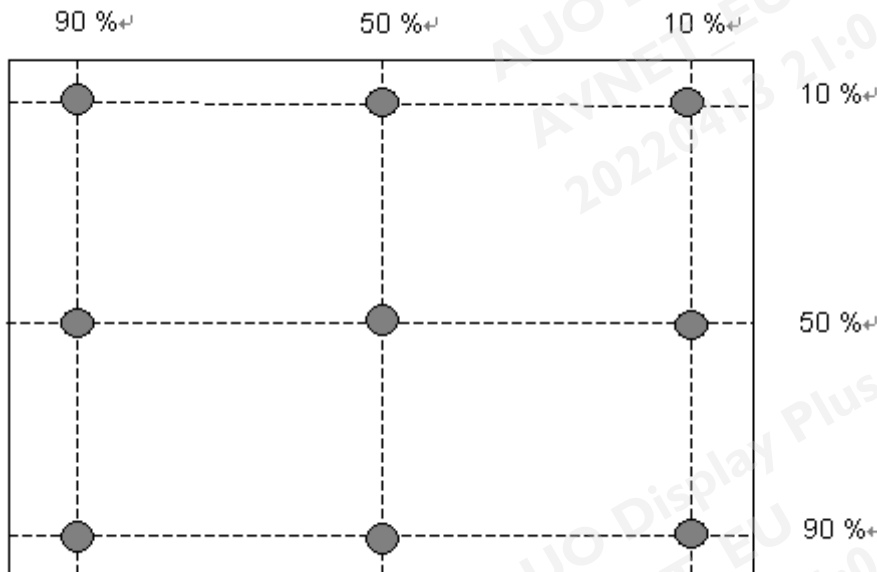
Aperture 1φ with 50cm viewing distance

Test Point Center

Environment < 1 lux



Note 2: Definition of 9 points position



Note 3: The luminance uniformity of 9 points is defined by dividing the minimum luminance values by the maximum test point luminance

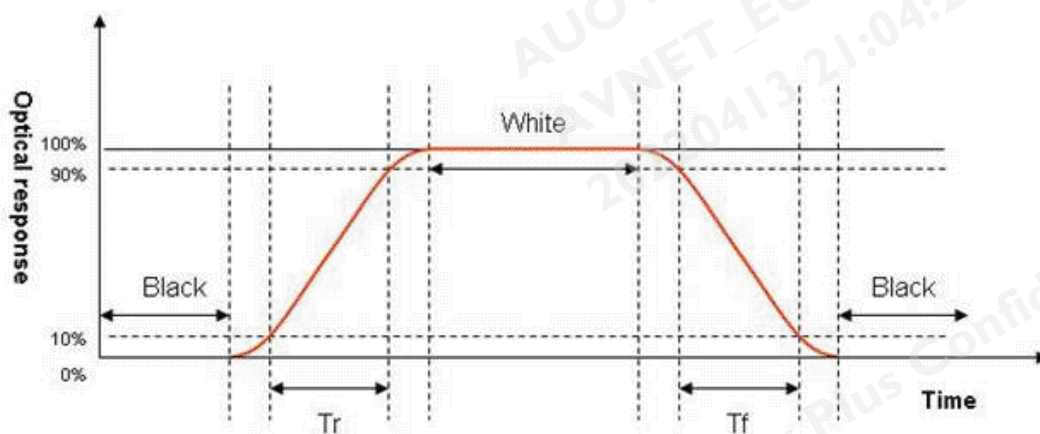
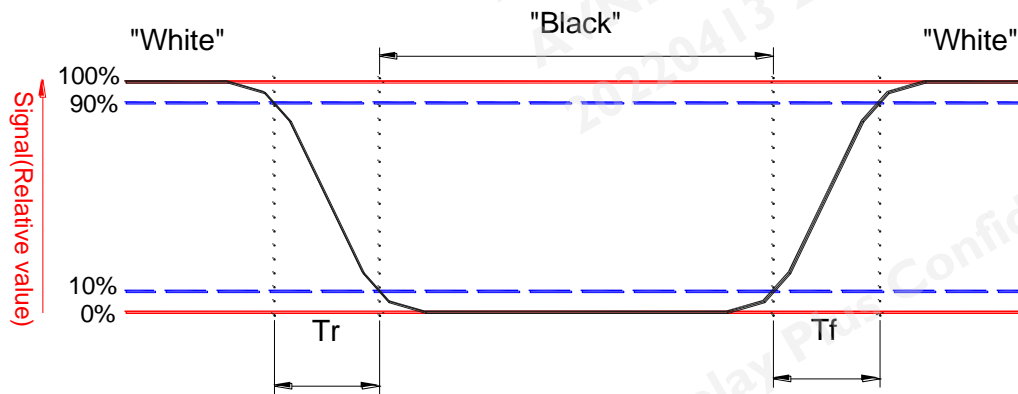
$$\delta_{w9} = \frac{\text{Minimum Brightness of 9 points}}{\text{Maximum Brightness of 9 points}}$$

Note 4: Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

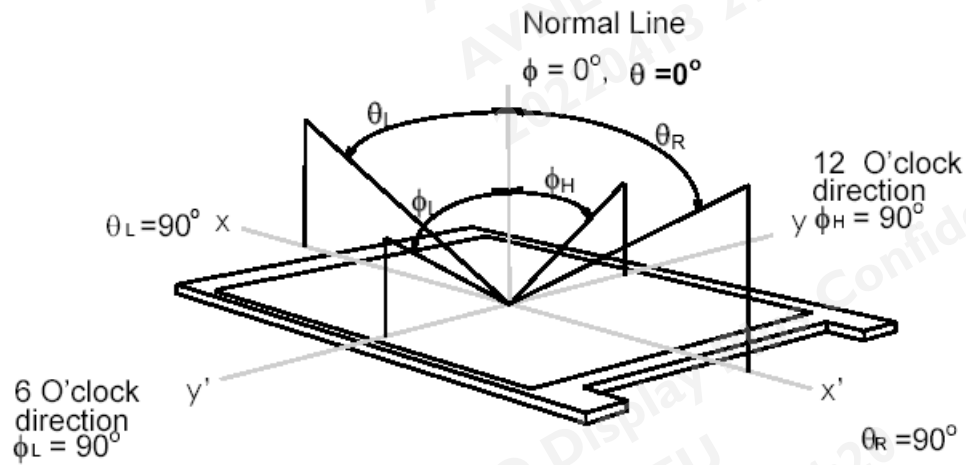
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.



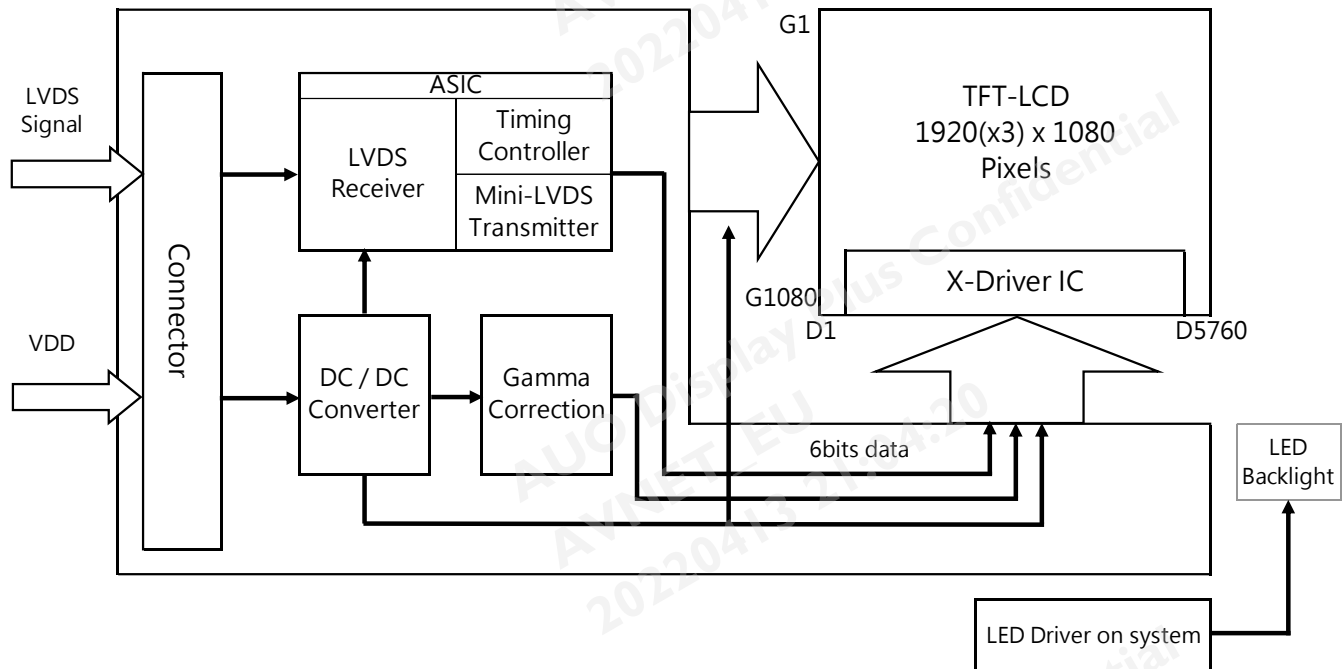
Note 6: Definition of viewing angle

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 below: 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 to its center to develop the desired measurement viewing angle.



3.0 Functional Block Diagram

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



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 | -0.3 | +5.5 | [Volt] | Note 1,2 |

4.2 Absolute Ratings of Environment

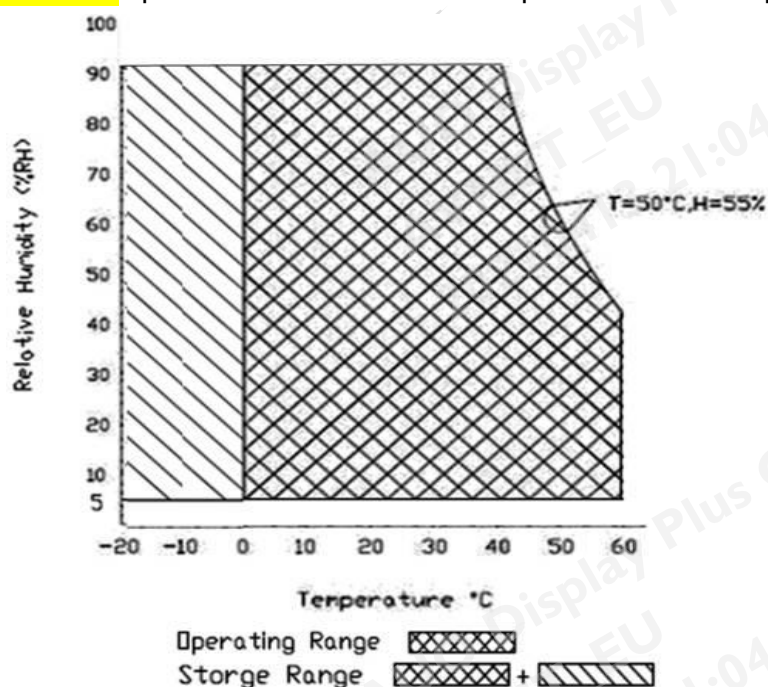
| Item | Symbol | Min. | Max. | Unit | Conditions |
|-----------------------|--------|------|------|-------|-----------------------|
| Operating Temperature | TOP | -10 | 60 | [°C] | Note 3 & 4 |
| Operation Humidity | HOP | 5 | 90 | [%RH] | |
| Storage Temperature | TST | -20 | 60 | [°C] | |
| Storage Humidity | HST | 5 | 90 | [%RH] | |

Note 1: With in Ta (25 °C)

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).

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



5.0 Electrical characteristics

5.1 TFT LCD Module

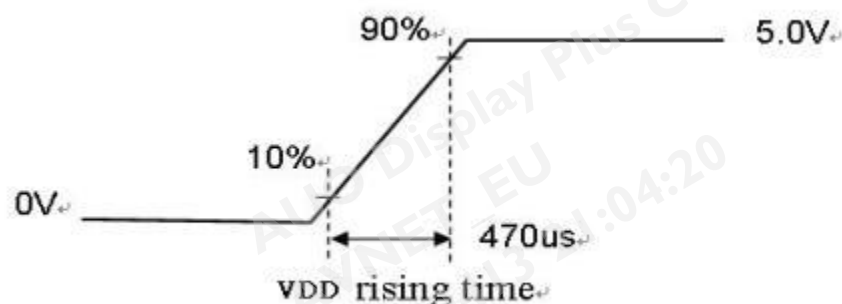
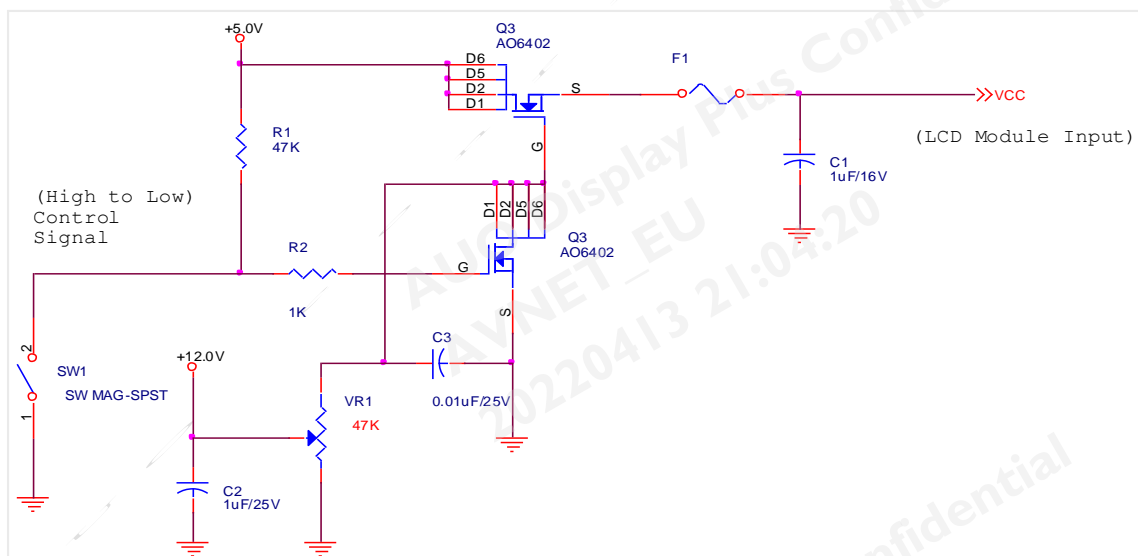
5.1.1 Power Specification

Input power specifications are as follows:

| Symbol | Parameter | Min | Typ | Max | Unit | Conditions |
|--------|--|-----|------|------|----------|---------------------------------------|
| VDD | Logic/LCD Drive Voltage | 4.5 | 5.0 | 5.5 | [Volt] | +/-10% |
| IDD | Input Current | - | 0.46 | 0.55 | [A] | VDD= 5.0V, All White Pattern At 60Hz, |
| PDD | VDD Power | - | 2.3 | 2.75 | [Watt] | VDD= 5.0V, All White Pattern At 60Hz |
| IRush | Inrush Current | - | | 3.0 | [A] | Note 1 |
| VDDrp | Allowable Logic/LCD Drive Ripple Voltage | - | - | 500 | [mV] p-p | VDD= 5.0V, All White Pattern At 60Hz |

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.

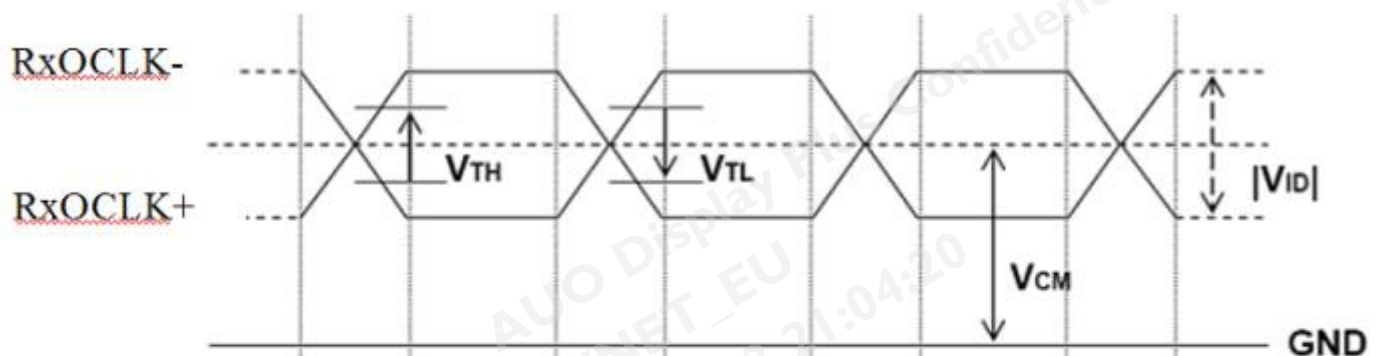
Characteristics of each signal are as follows:

| Symbol | Parameter | Min | Typ | Max | Units | Condition |
|------------------|--|------|-----|-----|-------|---|
| V _{TH} | Differential Input High Threshold | | | 100 | [mV] | V _{ICM} = 1.2V Note 1 |
| V _{TL} | Differential Input Low Threshold | -100 | | | [mV] | V _{ICM} = 1.2V Note 1 |
| V _{ID} | Input Differential Voltage | 100 | 400 | 600 | [mV] | Note 1 |
| V _{ICM} | Differential Input Common Mode Voltage | 1.0 | 1.2 | 1.5 | [V] | V _{TH} -V _{TL} = 200mV (max) Note 1 |

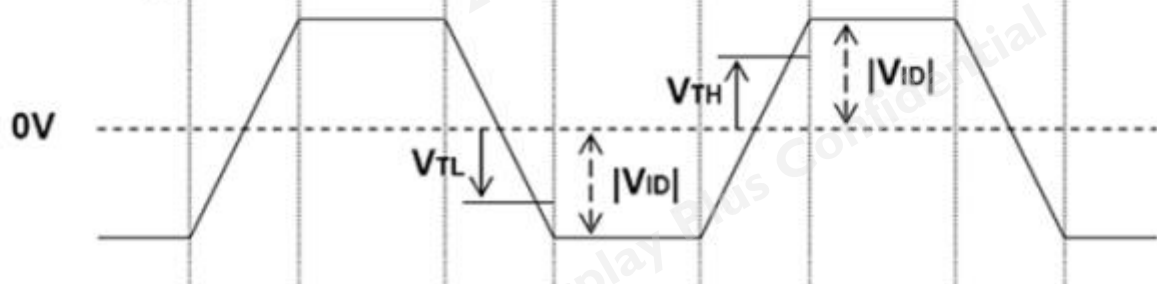
Note 1: LVDS Signal Waveform

Use RxOCLK- & RxOCLK+ as example.

Single-End



Differential Signal



5.2 Backlight Unit

Following characteristics are measured under a stable condition at 25 °C (Room Temperature):

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Remark |
|--------|-----------------------|--------|-------|------|------|----------------------------------|
| IL | LED Supply Current | | 65 | | mA | Ta = 25 °C |
| VL | LED Supply Voltage | - | 2.9 | 3.1 | Volt | I _F =65 mA, Ta = 25°C |
| PLED | LED Power Consumption | - | 0.189 | | Watt | I _F =65 mA, Ta = 25°C |
| LL | LED Life Time | 50,000 | | | Hrs | I _F =65 mA, Ta= 25°C |

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: I_F, V_F, P_{LED} are defined for single LED.

Note 3: If G215HAN01.2 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

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

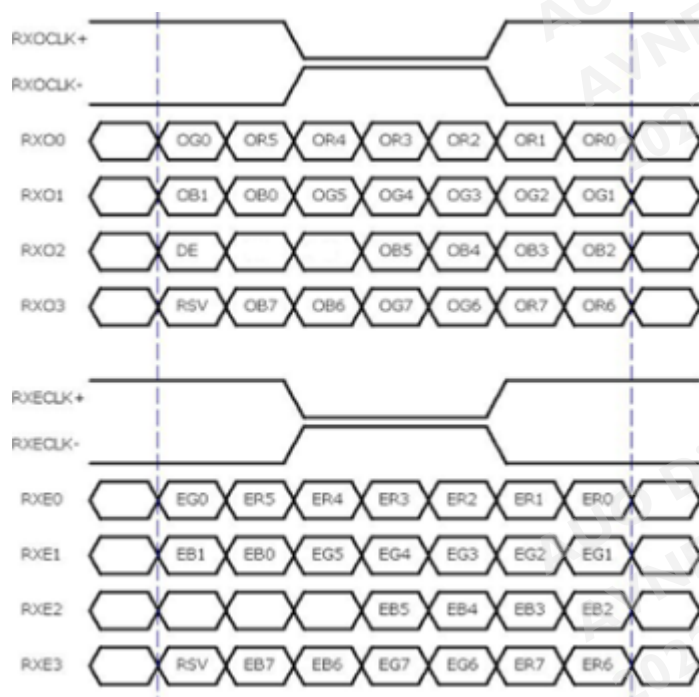
Note 4: Each LED light bar consists of 48 pcs LED package (4 strings x 12 pcs / string)

6.1 Pixel Format Image

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

| | 1 | | | 2 | | | | | | | | | 1919 | | | 1920 | | |
|-----------|--|---|---|--|---|---|--|--|--|--|--|--|--|---|---|--|---|---|
| 1st Line | R | G | B | R | G | B | · · · · · | | | | | | R | G | B | R | G | B |
| | · · · · · · · · · · | | | · · · · · · · · · · | | | · · · · · · · · · · | | | | | | · · · · · · · · · · | | | · · · · · · · · · · | | |
| 1080 Line | R | G | B | R | G | B | · · · · · | | | | | | R | G | B | R | G | B |

6.2 The input data format



| 8 Bit Color Bit Order | | | |
|-----------------------|----|----|----|
| MSB | R7 | G7 | B7 |
| | R6 | G6 | B6 |
| | R5 | G5 | B5 |
| | R4 | G4 | B4 |
| | R3 | G3 | B3 |
| | R2 | G2 | B2 |
| | R1 | G1 | B1 |
| LSB | R0 | G0 | B0 |

Note1: Normally DE mode only. VS and HS on EVEN channel are not used.

Note2: Please follow VESA.

Note3: 8-bits signal input.

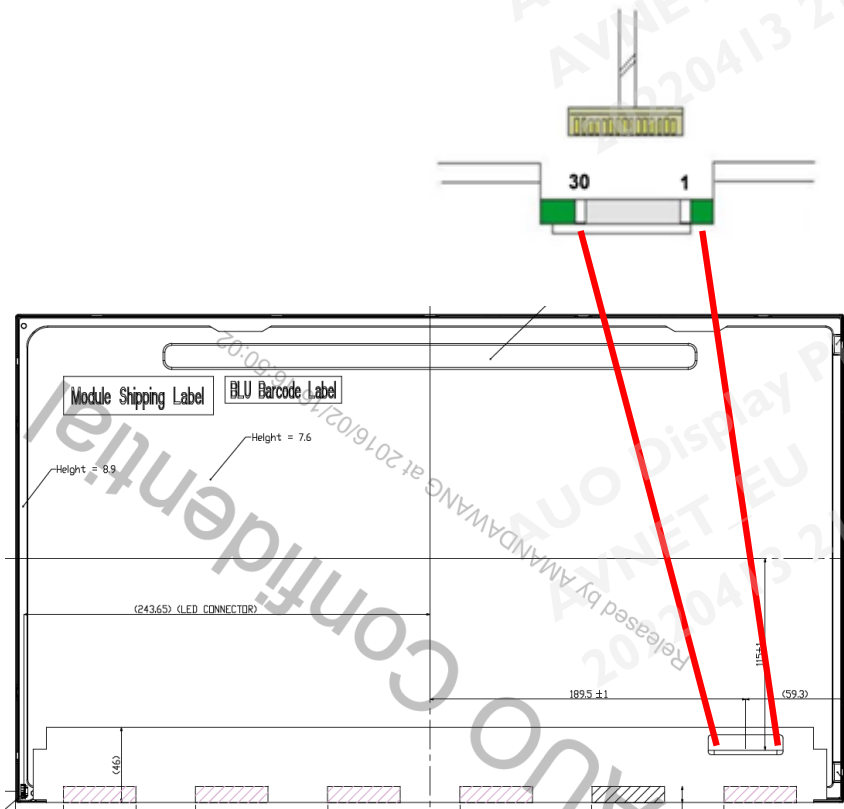
6.3 Signal Description

The module using a pair of LVDS receiver **SN75LVDS82 / SN75LVDS83**

(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 | RxO0- | Negative LVDS differential data input (Odd data) |
| 2 | RxO0+ | Positive LVDS differential data input (Odd data) |
| 3 | RxO1- | Negative LVDS differential data input (Odd data) |
| 4 | RxO1+ | Positive LVDS differential data input (Odd data) |
| 5 | RxO2- | Negative LVDS differential data input (Odd data) |
| 6 | RxO2+ | Positive LVDS differential data input (Odd data) |
| 7 | GND | Ground |
| 8 | RxOCLK- | Negative LVDS differential clock input (Odd clock) |
| 9 | RxOCLK+ | Positive LVDS differential clock input (Odd clock) |
| 10 | RxO3- | Negative LVDS differential data input (Odd data) |
| 11 | RxO3+ | Positive LVDS differential data input (Odd data) |
| 12 | RxE0- | Negative LVDS differential data input (Even data) |
| 13 | RxE0+ | Positive LVDS differential data input (Even data) |
| 14 | GND | Ground |
| 15 | RxE1- | Negative LVDS differential data input (Even data) |
| 16 | RxE1+ | Positive LVDS differential data input (Even data) |
| 17 | GND | Ground |
| 18 | RxE2- | Negative LVDS differential data input (Even data) |
| 19 | RxE2+ | 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 | RxE3- | Negative LVDS differential data input (Even data) |
| 23 | RxE3+ | Positive LVDS differential data input (Even data) |
| 24 | GND | 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 Supply Input Voltage |
| 29 | VDD | Power Supply Input Voltage |
| 30 | VDD | Power Supply Input Voltage |

Note1: Start from right side



Note2: Input signals of clock shall be the same timing.

Note3: Please follow TV VESA Pin Assignment



6.4 Timing Characteristics

| Signal | Item | Symbol | Min | Typ | Max | Unit |
|------------|------------|--------------------|------|------|------|------|
| V-section | Period | Tv | 1094 | 1130 | 1836 | Th |
| | Active | Tdisp(v) | 1080 | 1080 | 1080 | Th |
| | Blanking | Tbp(v)+Tfp(v)+PWvs | 14 | 50 | 756 | Th |
| H-section | Period | Th | 1000 | 1050 | 1678 | Tclk |
| | Active | Tdisp(h) | 960 | 960 | 960 | Tclk |
| | Blanking | Tbp(h)+Tfp(h)+PWhs | 40 | 90 | 718 | Tclk |
| Clock | Period | Tclk | 11.2 | 14 | 18.6 | ns |
| | Frequency | Freq. | 53.7 | 71.2 | 90 | MHz |
| Frame Rate | Frame Rate | 1/Tv | 49 | 60 | 76 | Hz |

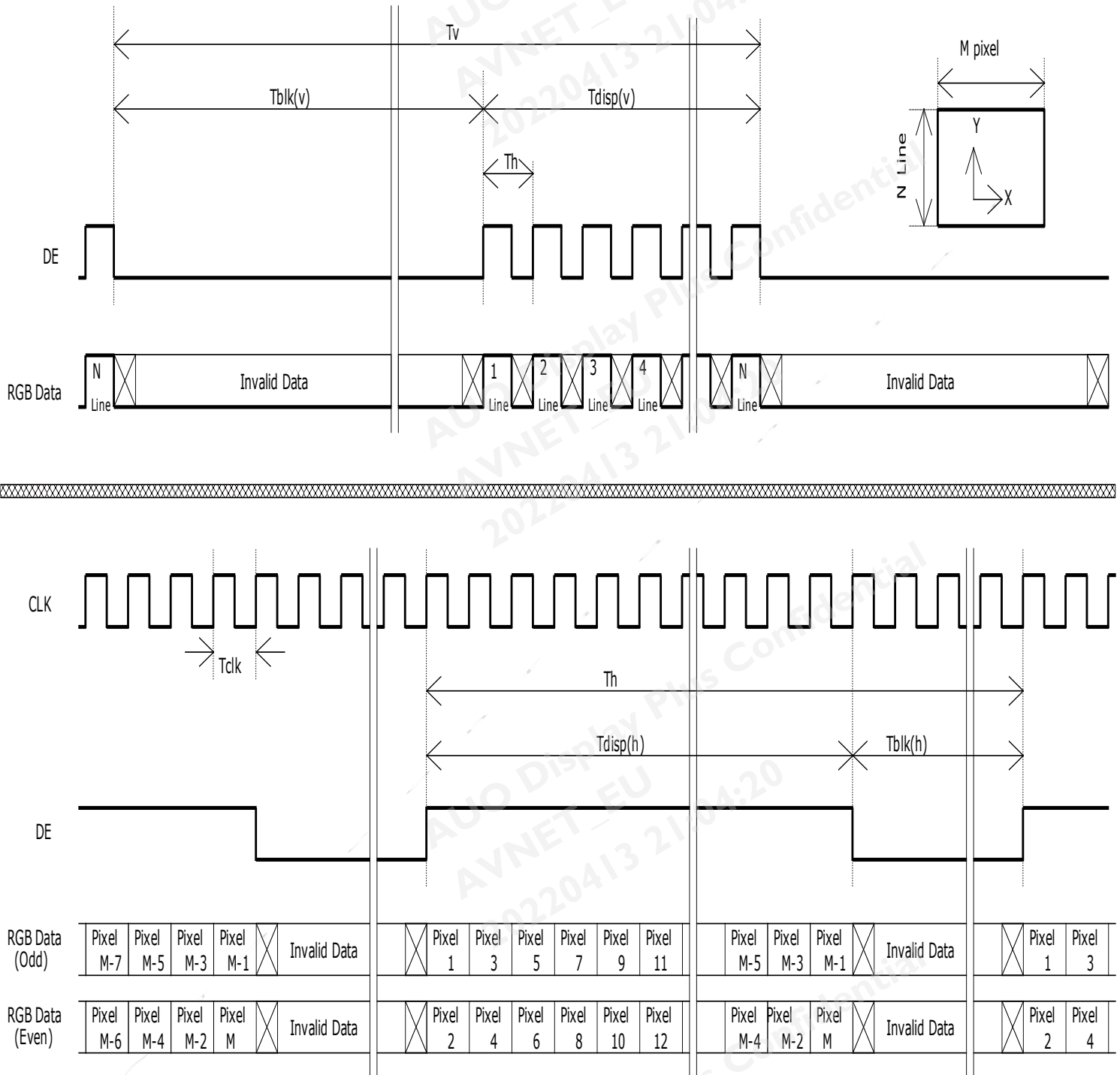
Note 1: Only DE mode operation.

The input of Hsync & Vsync signal does not have an effect upon the LCD normal operation.

Note 2: The performance of the electro-optical characteristics may be influenced by variance of the vertical refresh rates.

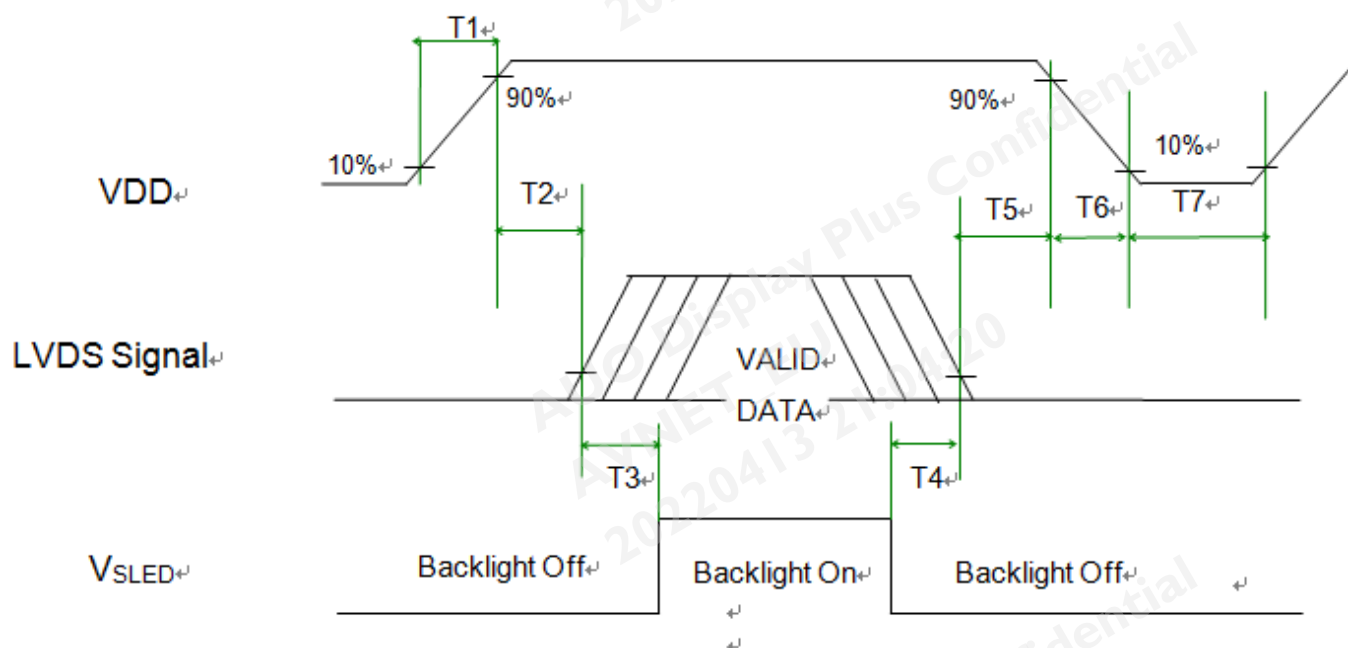
Note 3: Horizontal period should be even.

6.5 Timing diagram



6.6 Power ON/OFF Sequence

VDD power and LED 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.



Power ON/OFF sequence timing

| Parameter | Value | | | Units |
|-----------|-------|------|------|-------|
| | Min. | Typ. | Max. | |
| T1 | 0.5 | - | 10 | [ms] |
| T2 | 0 | - | 50 | [ms] |
| T3 | 500 | - | - | [ms] |
| T4 | 100 | - | - | [ms] |
| T5 | 0 | - | 50 | [ms] |
| T6 | 0 | - | 200 | [ms] |
| T7 | 1000 | - | - | [ms] |

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 | STM |
| Type Part Number | MSBKT2407P30HB |
| Mating Housing Part Number | FI-X30HL or FI-X30C2L-NPB |

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 | Aging | 26 | SCL For PVCOM |
| 27 | SDA For PVCOM | 28 | VDD |
| 29 | VDD | 30 | VDD |

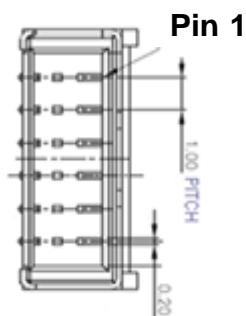
7.2 LED Backlight Unit: LED Connector

| | |
|-------------------------------|--|
| Connector Name / Designation | LED Connector |
| Manufacturer | ENTERY |
| Connector Model Number | 3707K-S06N-21R |
| Mating Connector Model Number | HI I2K-P06N-00B (Non-Locking type) HI I2K-P06N-13B (Locking type) |

7.3 LED Connector Pin Assignment

| Pin# | Symbol | Description |
|------|-------------------|---|
| 1 | Ch1 | LED Current Feedback Terminal (Channel 1) |
| 2 | Ch2 | LED Current Feedback Terminal (Channel 2) |
| 3 | V _{SLED} | LED Power Supply Voltage Input Terminal |
| 4 | V _{SLED} | LED Power Supply Voltage Input Terminal |
| 5 | Ch3 | LED Current Feedback Terminal (Channel 3) |
| 6 | Ch4 | LED Current Feedback Terminal (Channel 4) |

Drawing



8.0 Reliability Test

Environment test conditions are listed as following table.

| Items | Required Condition | Note |
|-----------------------------------|---|----------|
| Temperature Humidity Bias (THB) | Ta= 50°C, 80%RH, 300hours | |
| High Temperature Operation (HTO) | Ta= 60°C, 300hours | |
| Low Temperature Operation (LTO) | Ta= -10°C, 300hours | |
| High Temperature Storage (HTS) | Ta= 60°C, 300hours | |
| Low Temperature Storage (LTS) | Ta= -20°C, 300hours | |
| Vibration Test (Non-operation) | Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Sweep: 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) | |
| Thermal Shock Test (TST) | -20°C /30min, 60°C /30min, 100 cycles | 1 |
| On/Off Test | On/10sec, Off/10sec, 30,000 cycles | |
| ESD (Electro Static Discharge) | Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 8 points, 25 times/ point. | 2 |
| | Air Discharge: ± 15KV, 150pF(330Ω) 1sec 8 points, 25 times/ point. | |

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°C to 60°C, 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.

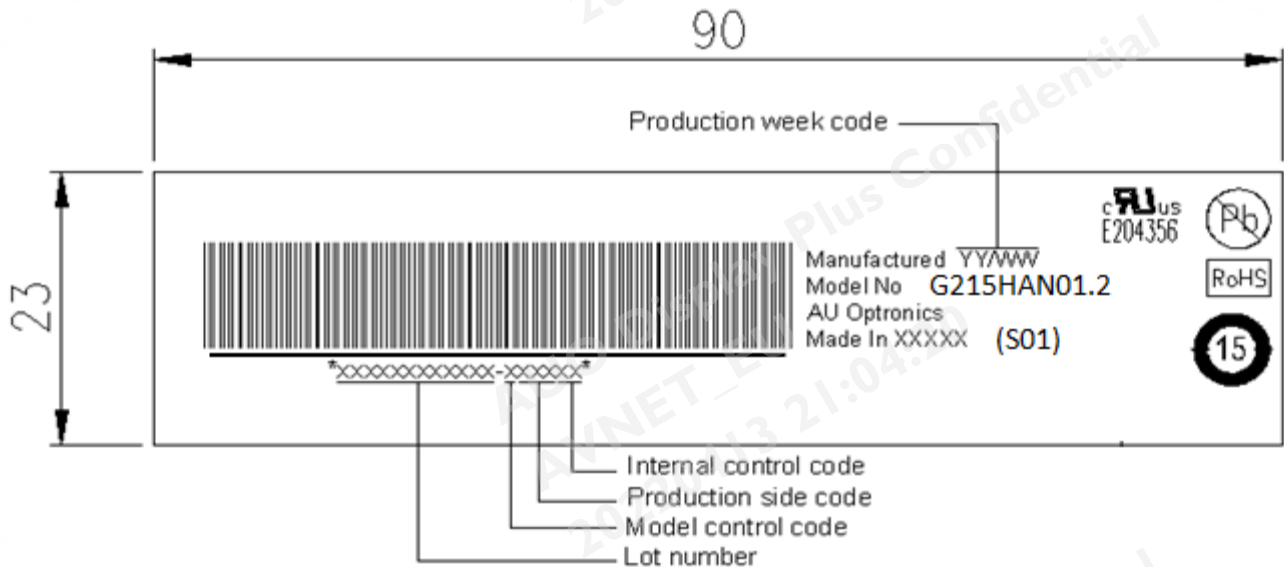
Note 2: According to EN61000-4-2 , ESD class B: Some performance degradation allowed. No data lost. Self-recoverable. No hardware failures.

Note 3 : Mura shall be ignored after high temperature reliability test.


9.0 Shipping Label & Packaging


9.1 Shipping Label

The label is on the panel as shown below:



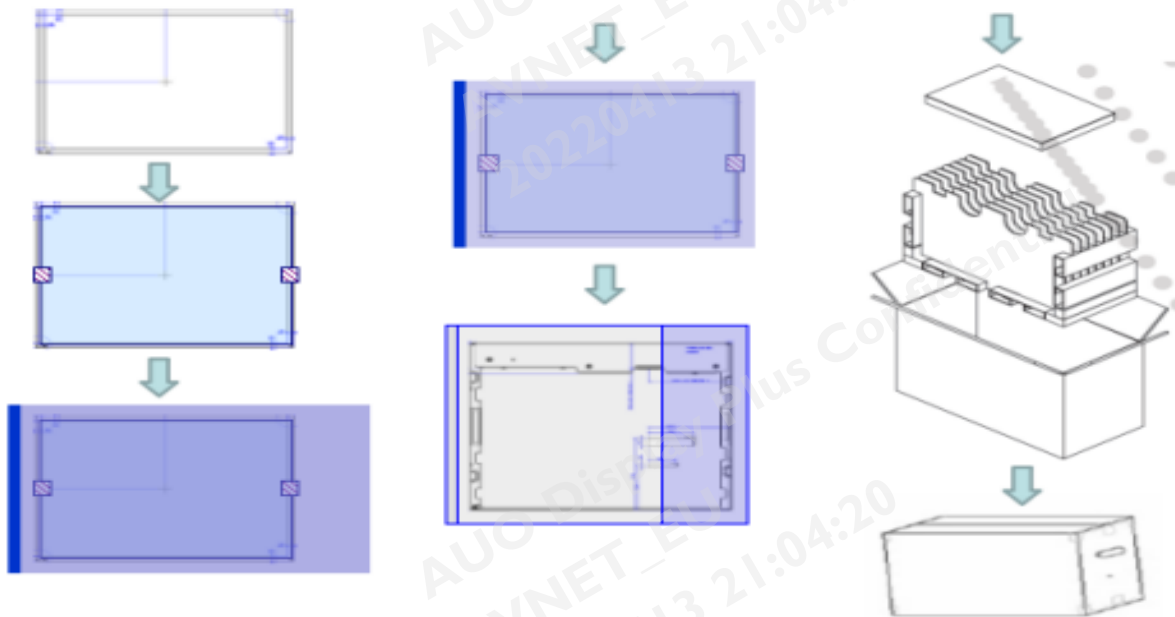
Note 1: For Pb Free products, AUO will add  for identification.

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.

9.2 Packaging



Max capacity : 8 TFT-LCD module per carton

Max weight: 18.0 kg per carton

Outside dimension of carton: 601mm*261mm*412mm

Pallet size : 1060mm*760mm*132mm

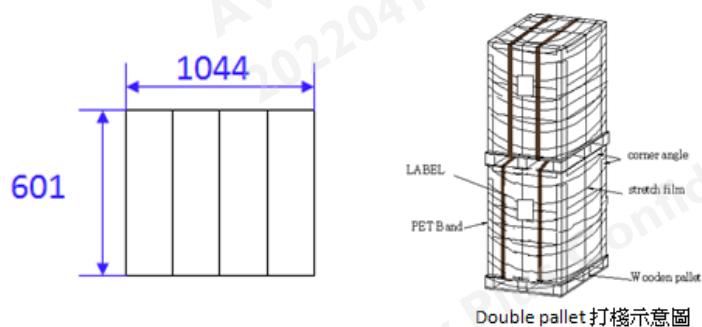
9.3 Palletizing

Box stacked

Module by air : (1 *4) *3 layers , one pallet put 12 boxes , total 96pcs module

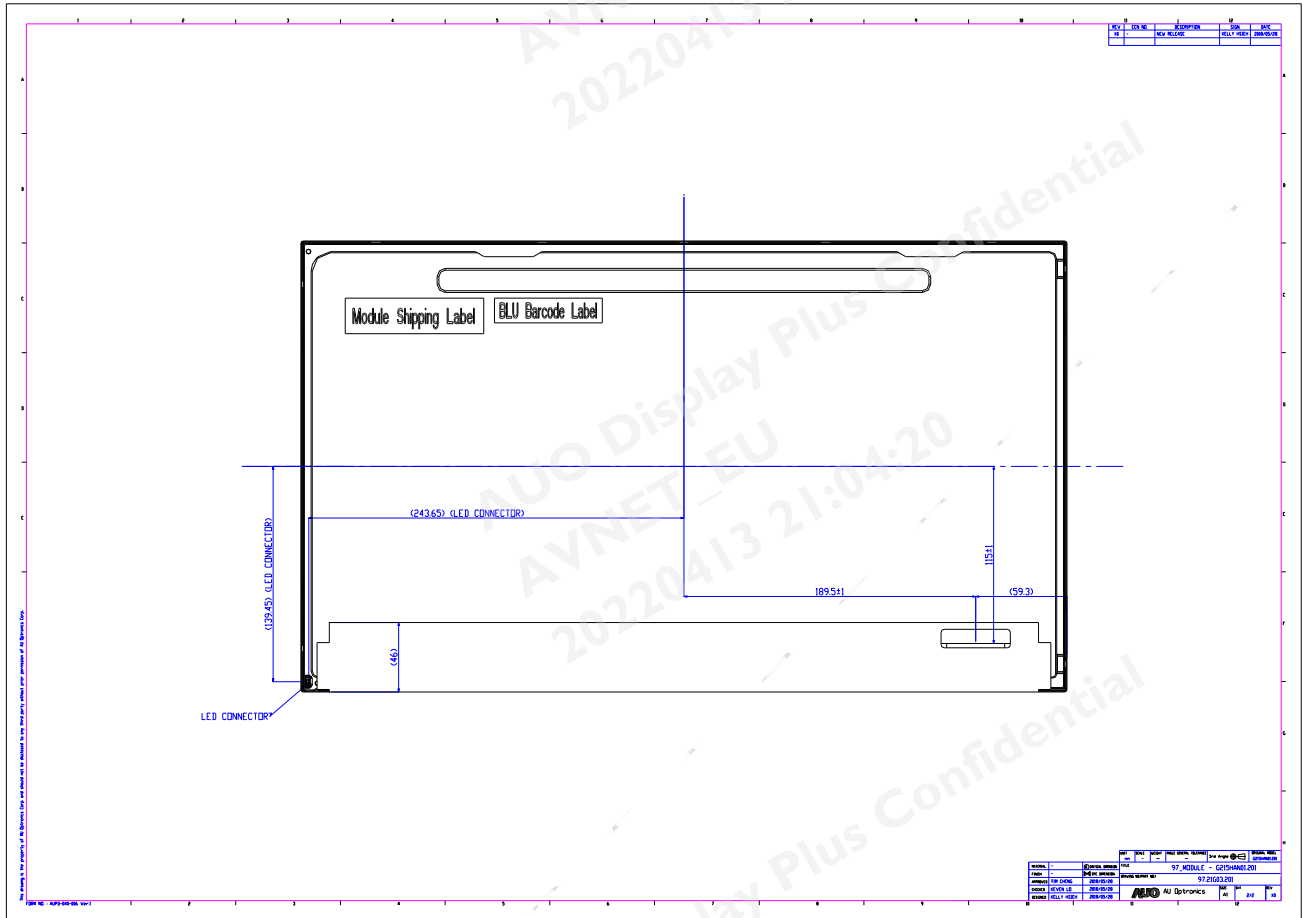
Module by sea : Double pallet (1 *4) *3 layers + (1*4) * 1 layer , total 128 pcs module

Module by sea_ HQ : Double pallet (1 *4) *3 layers + (1*4) * 2 layers , total 160 pcs module



By air : one pallet

By sea: double pallet





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 60950-1, Second Edition

U.S.A. Information Technology Equipment