



Product Specification

AU OPTRONICS CORPORATION

G101STN01.D

() Preliminary Specifications

(V) Final Specifications

| | |
|------------|-------------------------|
| Module | 10.1 Inch Color TFT-LCD |
| Model Name | G101STN01.D |

| | |
|---|-------|
| Customer | Date |
| _____ | _____ |
| Checked & Approved by | |
| _____ | _____ |
| Note: This Specification is subject to change without notice. | |

| | |
|--|------------|
| Approved by | Date |
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G101STN01.D rev.1.0

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1. Operating 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 or UL1950), 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. General Description

This specification applies to the Color Active Matrix Liquid Crystal Display G101STN01.D composed of a TFT-LCD display, a driver and power supply circuit, and a LED backlight system. The screen format is intended to support Wide SVGA (1024(H) x 600(V)) screen and 262k/16.7M colors (LVDS 6/8-bits). And LED driving circuit for backlight unit is included in G101STN01.D.

All input signals are LVDS interface.

G101STN01.D designed with wide viewing angle; wide temperature and long life LED backlight (50K hrs) is well suited for industrial applications.

G101STN01.D is a RoHS product.

2.1 Display Characteristics

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

| Items | Unit | Specifications |
|---|--------------|---|
| Screen Diagonal | [inch] | 10.1 |
| Active Area | [mm] | 222.72(H) x 125.28(V) |
| Pixels H x V | | 1024 (RGB)x 600 |
| Pixel Pitch | [mm] | 0.2175(H)×0.2088(V) |
| Pixel Arrangement | | R. G. B. Stripe |
| Display Mode | | TN, Normally White |
| Nominal Input Voltage VCCS | [Volt] | 3.3 (typ.) |
| LCD Power Consumption | [Watt] | 0.46 (Typ.), 0.53 (Max.) (all black pattern) |
| LED Power Consumption | [Watt] | 2.16(Typ.), 2.59 (Max.) (all black pattern) |
| Weight | [Grams] | 180(typ.) |
| Physical Size | [mm] | 235(H)x143(V)x4.9(T) (typ.) |
| Electrical Interface | | LVDS |
| Surface Treatment | | AG, (3H) |
| Color Gamut | % | 45 |
| Support Color | | 262K/16.7M colors |
| Temperature Range Operating Storage (Non-Operating) | [°C] [°C] | -10 to +60 -30 to +70 |
| RoHS Compliance | | RoHS Compliance |

2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25 °C (Room Temperature):

| Item | Unit | Conditions | Min. | Typ. | Max. | Note |
|--|----------------------|--------------------------------------|----------|----------|-------|------|
| White Luminance | [cd/m2] | ILED= 33.3 mA (center point) | 360 | 450 | - | 1 |
| Uniformity | % | 5 points | 80 | - | - | 2,3 |
| Contrast Ratio | | | 400 | 500 | - | 4 |
| Response Time | [msec] | Rising | - | 7 | 10 | 5 |
| | [msec] | Falling | - | 9 | 18 | |
| | [msec] | Rising + Falling | - | 16 | 28 | |
| Viewing Angle | [degree] [degree] | Horizontal (Right) CR = 10 (Left) | 60 60 | 70 70 | - | 6 |
| | [degree] [degree] | Vertical (Upper) CR = 10 (Lower) | 50 50 | 60 60 | - | |
| Color / Chromaticity Coordinates (CIE 1931) | - | Red x | 0.524 | 0.574 | 0.624 | - |
| | | Red y | 0.285 | 0.335 | 0.385 | |
| | | Green x | 0.280 | 0.330 | 0.380 | |
| | | Green y | 0.525 | 0.575 | 0.625 | |
| | | Blue x | 0.108 | 0.158 | 0.208 | |
| | | Blue y | 0.09 | 0.140 | 0.190 | |
| | | White x | 0.263 | 0.313 | 0.363 | |
| | | White y | 0.279 | 0.329 | 0.379 | |

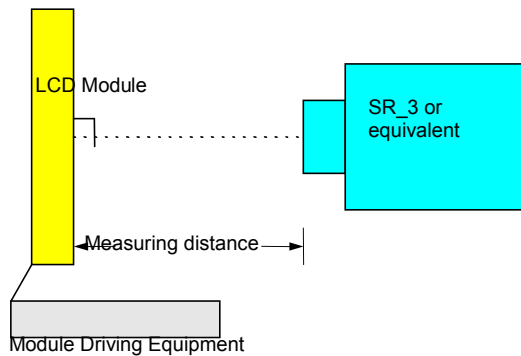
Note 1: Measurement method

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

Aperture 1° with 50cm viewing distance

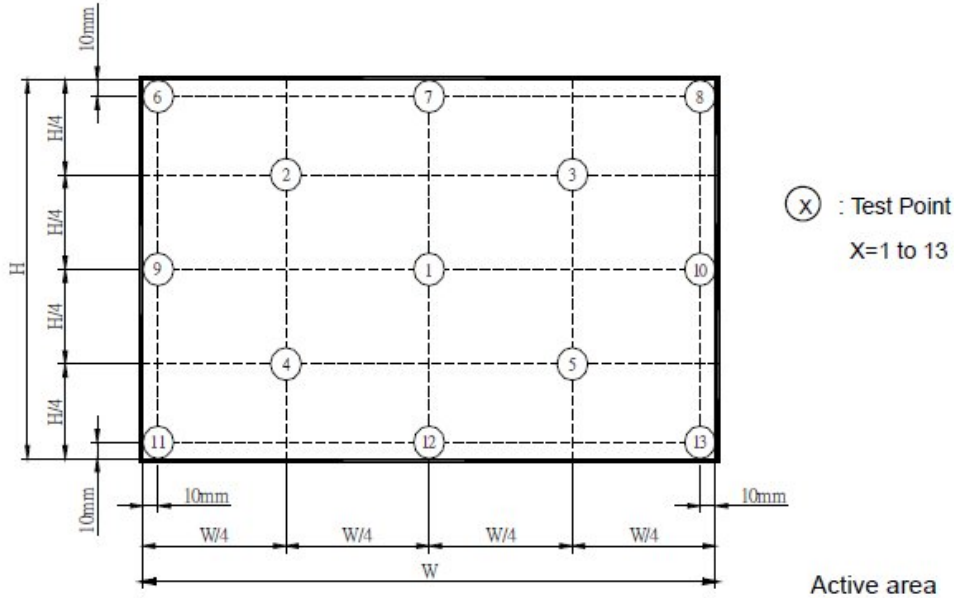
Test Point Center

Environment < 1 lux



Note 2: Definition of 5 points position (Display active area: 222.72(H) x 125.28(V))
Measure the luminance of gray level 63 at 5 points

$$\delta W_{5p} = \{ \text{Minimum } [L(1) \sim L(5)] / \text{Maximum } [L(1) \sim L(5)] \} * 100\%$$



Note 3: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

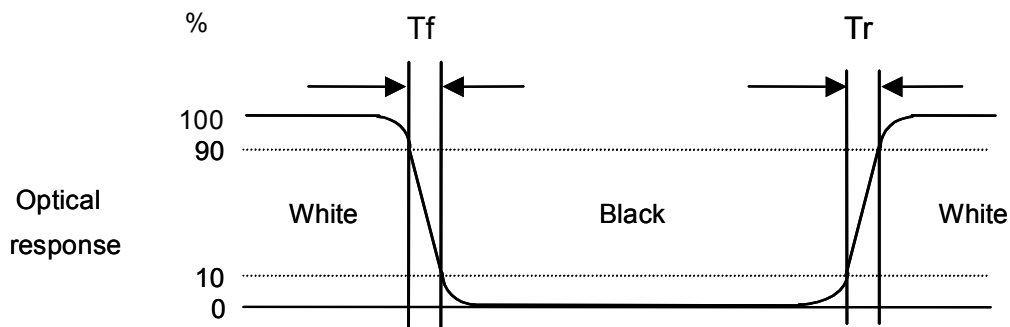
$$\delta W_5 = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

Note 4: Definition of contrast ratio (CR):

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

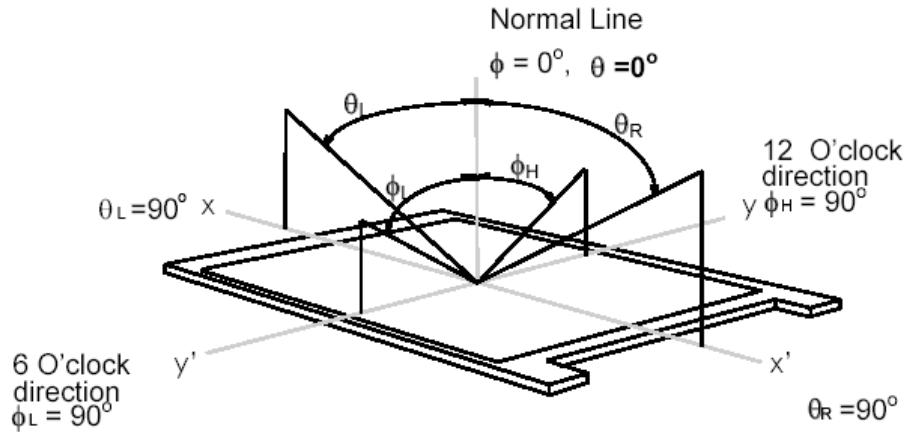
Note 5: Definition of response time:

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.



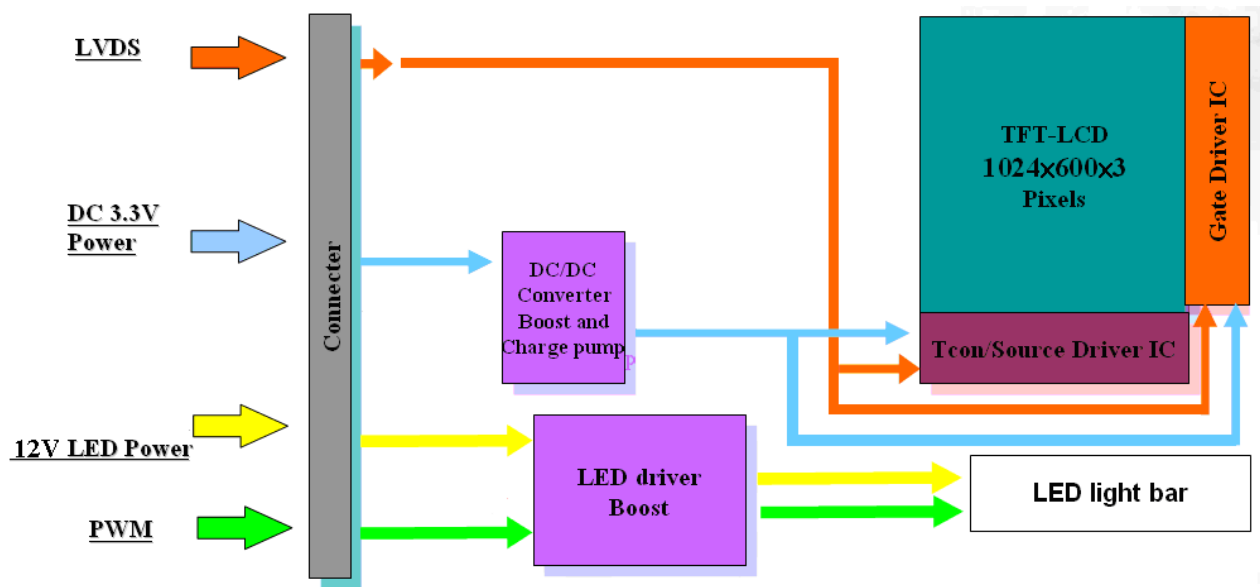
Note 6: Definition of viewing angle

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. Functional Block Diagram

The following diagram shows the functional block of the 10.1 inch color TFT/LCD module:





4. Absolute Maximum Ratings

4.1 Absolute Ratings of TFT LCD Module

| Item | Symbol | Min | Max | Unit |
|----------------------------------|----------|------|-----|--------|
| Logic/LCD drive Voltage | VCCS | -0.3 | 4 | [Volt] |
| EDID drive Voltage | VEDID | -0.3 | 4 | [Volt] |
| Converter Input Voltage | LED_VCCS | -0.3 | 24 | [Volt] |
| Converter Control Signal Voltage | LED_PWM | -0.3 | 24 | [Volt] |
| Converter Control Signal Voltage | LED_EN | -0.3 | 24 | [Volt] |

4.2 Absolute Ratings of Environment

| Item | Symbol | Min | Max | Unit |
|-----------------------|--------|-----|-----|------|
| Operating Temperature | TOP | -30 | 80 | [°C] |
| Storage Temperature | TST | -30 | 80 | [°C] |

Note: Maximum Wet-Bulb should be 39 °C and no condensation.

5. Electrical Characteristics

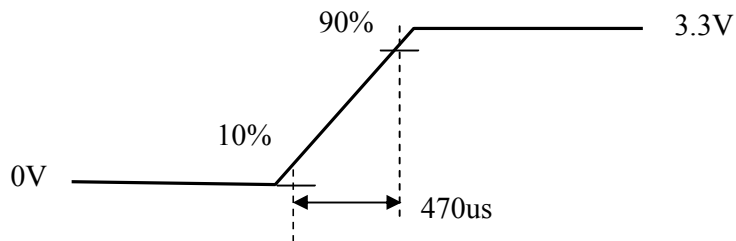
5.1 TFT LCD Module

5.1.1 Power Specification

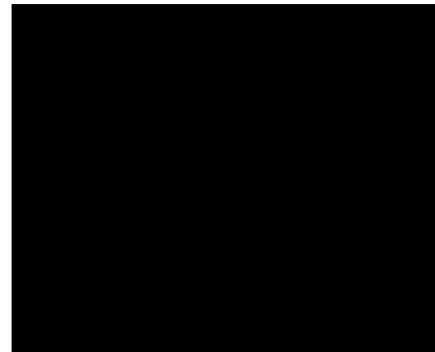
Input power specifications are shown as follows;

| Symbol | Parameter | Min | Typ | Max | Units | Remark |
|-------------------|--|-----|------|------|-------------|---------------------------------------|
| VCCS | Logic/LCD Drive Voltage | 3 | 3.3 | 3.6 | [Volt] | |
| I _{VCCS} | VCCS Current | - | 140 | 160 | [mA] | Black Pattern (VCCS=3.3V, at 60Hz) |
| I _{rush} | LCD Inrush Current | - | - | 1.5 | [A] | Note 1 |
| P _{VCCS} | VCCS Power | - | 0.46 | 0.53 | [Watt] | Black Pattern (VCCS=3.3V, at 60Hz) |
| VCCSRp | Allowable Logic/LCD Drive Ripple Voltage | | | 100 | [mV] p-p | |

Note 1: Measurement condition:



VCCS rising time



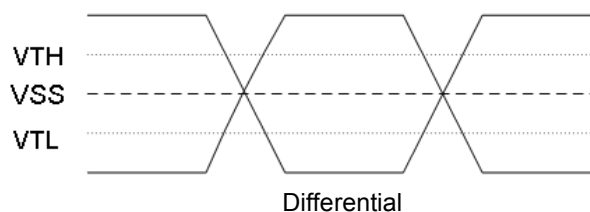
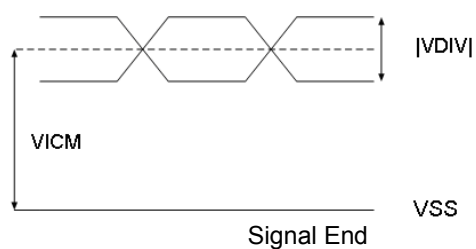
Black pattern

5.1.2 LVDS DC Electrical Characteristics

Input signals shall be low or Hi-Z state when VCCS is off.

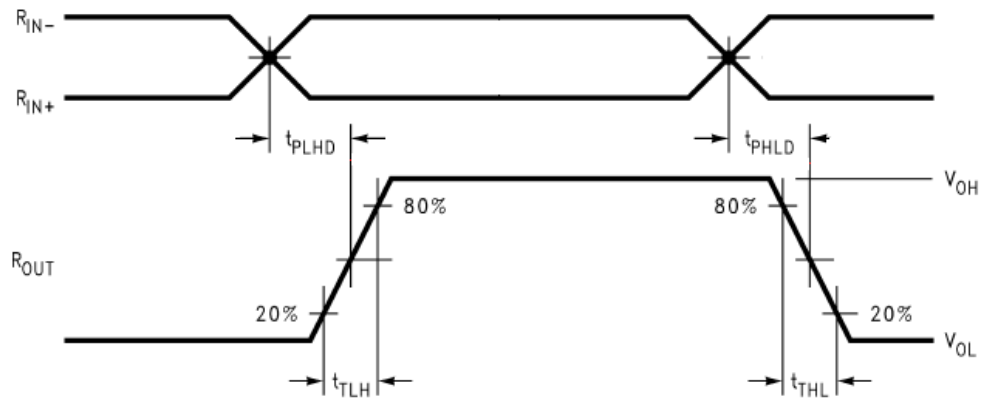
| Symbol | Item | Min. | Typ. | Max. | Unit | Remark |
|--------|--|-------|------|-------|----------|--|
| VTH | Differential Input High Threshold | - | - | 100 | [mV] | |
| VTL | Differential Input Low Threshold | -100 | - | - | [mV] | |
| VID | Input Differential Voltage | 100 | - | 600 | [mV] | |
| VICM | Differential Input Common Mode Voltage | 1.125 | - | 1.375 | [V] | |
| ICRTC | LVDS Terminating Resistor | - | 100 | - | Ω | LVDS terminating resistor is embedded in LCD |

Note: LVDS Signal Waveform.



5.1.3 LVDS AC Electrical Characteristics

| Symbol | Item | Min. | Typ. | Max. | Unit | Remark |
|--------|--|------|------|------|------|--------|
| tSKD | Differential Pulse Skew $ t_{PHLD} - t_{PLHD} $ | | | 0.5 | [ns] | |
| tTLH | Transition Low to High Time | | | 1 | [ns] | |
| tTHL | Transition High to Low Time | | | 1 | [ns] | |
| VOS | Offset Voltage imbalance | | | 200 | [mV] | |



5.2 Backlight Unit

5.2.1 Parameter guideline for LED

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

| Symbol | Parameter | | Min. | Typ. | Max. | Unit | Remark |
|-----------------------|------------------------|------------|--------|-------|-------|--------|---|
| LED_VCCS | Input Voltage | | 10.8 | 12.0 | 13.2 | [Volt] | |
| I _{LED RUSH} | Inrush Current | | - | - | 1.5 | [A] | |
| I _{LED} | Input Current | | - | 180 | 216 | [mA] | Note 2 |
| P _{LED} | Power Consumption | | - | 2.16 | 2.59 | [Watt] | Note 2 |
| LED_EN | EN Control | BL On | 2.5 | - | 5.5 | [Volt] | |
| | Level | BL Off | - | - | 0.7 | | |
| F _{PWM} | PWM Control Frequency | | 200 | 1K | 20K | [Hz] | PWM Control |
| D _{PWM} | PWM Control Duty Ratio | | 10 | - | 100 | [%] | |
| V _{PWM} | PWM Control | High Level | 2.5 | - | 5.5 | [Volt] | |
| | Level | Low Level | - | - | 0.7 | | |
| I _F | LED Forward Current | | - | 33.3 | - | [mA] | Ta = 25°C |
| V _F | LED Forward Voltage | | - | 31 | 34 | [Volt] | I _F = 33.3mA,Ta = 25°C |
| P _{LED} | LED Power Consumption | | - | 2.065 | 2.264 | [Watt] | I _F = 33.3mA,Ta = 25°C LED per string Power |
| Operation Life | | | 50,000 | - | - | Hrs | I _F =33.3mA, Ta = 25°C |

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

Note 2: I_{LED RUSH}, I_{LED}, P_{LED} are defined for LED backlight and tested when LED_VCCS = 12V and 100% duty of PWM dimming.

Note 3: I_F, V_F are defined for one channel LED. There are **two** LED channel in back light unit.

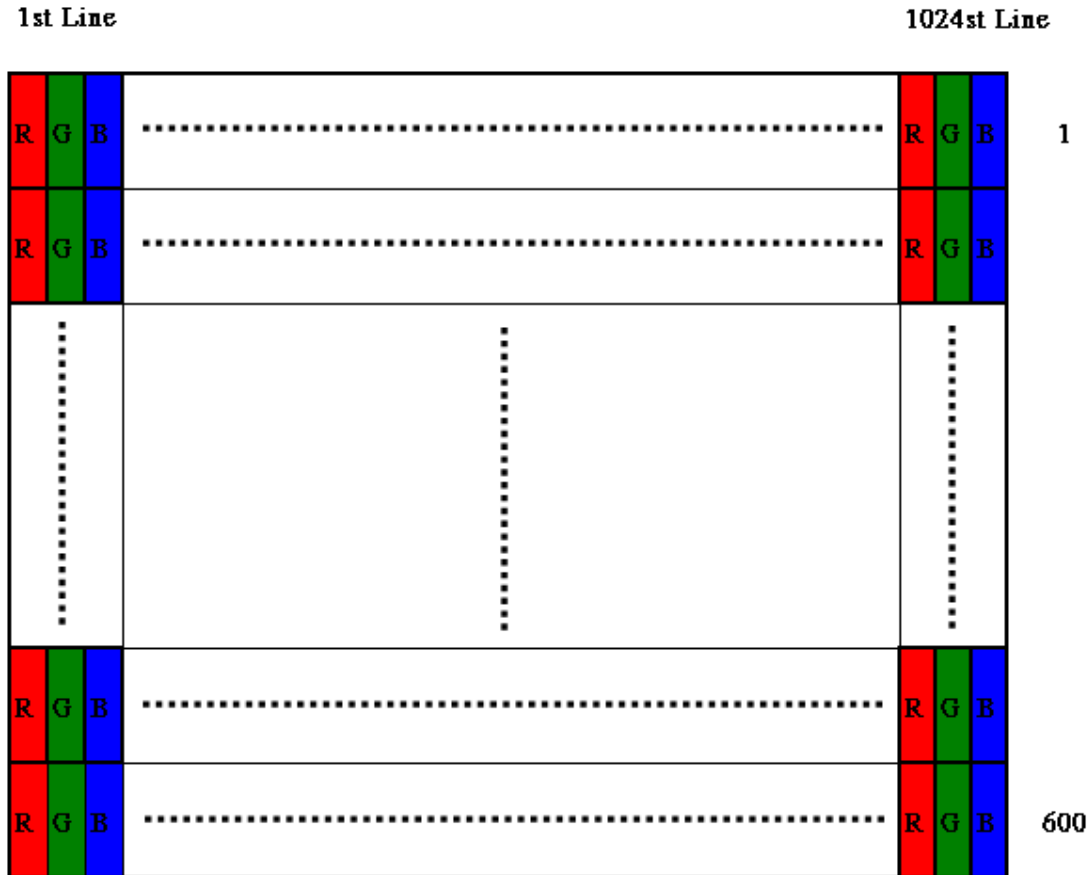
Note 4: If G101STN01.D module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 5: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship between input signal and LCD pixel format.



6.2 Scanning Direction

The following figures show the image seen from the front view. The arrow indicates the direction of scan.



6.3 Signal Description

The module uses a LVDS receiver embedded in AUO's ASIC. LVDS is a differential signal technology for LCD interface and a high-speed data transfer device.

| Pin no | Symbol | Function | Remark |
|--------|-----------|--|---|
| 1 | NC | No Connection (Reserve) | 1k pull-down resistance in LCM |
| 2 | VCCS | Power Supply (3.3V typ.) | |
| 3 | VCCS | Power Supply (3.3V typ.) | |
| 4 | VEDID | DDC 3.3V power | If EDID function is not used, please keep it floating.. |
| 5 | NC | No Connection (Reserved for AUO test) | 100k pull-down resistance in LCM |
| 6 | CLKEDID | DDC clock | If EDID function is not used, please keep it floating. |
| 7 | DATAEDID | DDC data | |
| 8 | Rxin0- | LVDS differential data input | |
| 9 | Rxin0+ | | |
| 10 | VSS | Ground | |
| 11 | Rxin1- | LVDS differential data input | |
| 12 | Rxin1+ | | |
| 13 | VSS | Ground | |
| 14 | Rxin2- | LVDS Differential Data Input | |
| 15 | Rxin2+ | | |
| 16 | VSS | Ground | |
| 17 | RxCLK- | LVDS differential clock input | |
| 18 | RxCLK+ | | |
| 19 | VSS | Ground | |
| 20 | Rxin3- | LVDS receiver signal channel 3 pin20 & pin21 connect to GND or NC for 6bit LVDS Input | |
| 21 | Rxin3+ | | |
| 22 | VSS | Ground | |
| 23 | NC | No Connection (Reserved for AUO test) | |
| 24 | NC | No Connection (Reserved for AUO test) | |
| 25 | VSS | Ground | |
| 26 | Order_SEL | LVDS format selection. Order_SEL = "H" : JEIDA / Order_SEL = "L" or NC : NS-Like | |
| 27 | SEL68 | 6/8bits LVDS data input selection SEL68 = "H": 8bits / SEL68 = "L" or NC: 6bit | |
| 28 | VSS | Ground | |



| Pin no | Symbol | Function | Remark |
|--------|----------|--|--------|
| 29 | NC | No Connection (Reserve) | |
| 30 | NC | No Connection (Reserve) | |
| 31 | LED_GND | LED Ground | |
| 32 | LED_GND | LED Ground | |
| 33 | LED_GND | LED Ground | |
| 34 | NC | No Connection (Reserve) | |
| 35 | LED_PWM | PWM Control Signal of LED Converter | |
| 36 | LED_EN | Enable Control Signal of LED Converter | |
| 37 | NC | No Connection (Reserve) | |
| 38 | LED_VCCS | LED Power Supply (12V typ.) | |
| 39 | LED_VCCS | LED Power Supply (12V typ.) | |
| 40 | LED_VCCS | LED Power Supply (12V typ.) | |

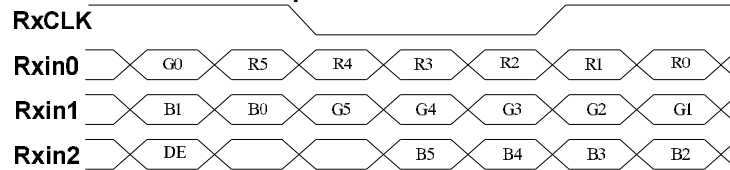
Note 1: Input Signals shall be in low status when VCCS is off.

Note 2: NC means "No Connection".

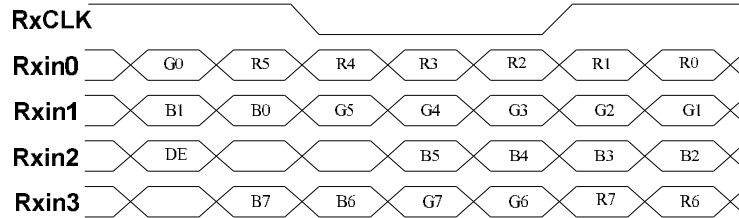
6.4 The Input Data Format

6.4.1 SEL68 and Order_SEL

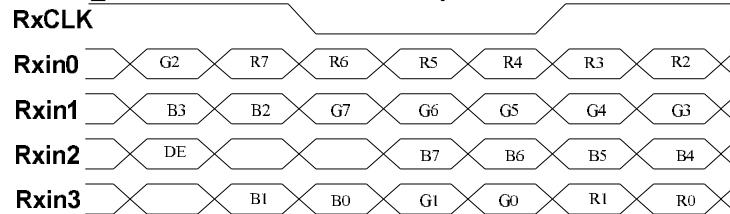
SEL68 = "Low" or "NC" for 6 bits NS-Like Input



SEL68 = "High" and Order_SEL = "Low" or "NC" for 8 bits NS-Like Input



SEL68 = "High" and Order_SEL = "H" for 8 bits JEIDA Input



| Signal Name | Description | Remark |
|--|--|--|
| R7 R6 R5 R4 R3 R2 R1 R0 | Red Data 7 Red Data 6 Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0 | Red-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0 For 6Bits LVDS input MSB: R5 ; LSB: R0 |
| G7 G6 G5 G4 G3 G2 G1 G0 | Green Data 7 Green Data 6 Green Data 5 Green Data 4 Green Data 3 Green Data 2 Green Data 1 Green Data 0 | Green-pixel Data For 8Bits LVDS input MSB: G7 ; LSB: G0 For 6Bits LVDS input MSB: G5 ; LSB: G0 |
| B7 B6 B5 B4 B3 B2 B1 B0 | Blue Data 7 Blue Data 6 Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0 | Blue-pixel Data For 8Bits LVDS input MSB: B7 ; LSB: B0 For 6Bits LVDS input MSB: B5 ; LSB: B0 |
| RxCLKIN | LVDS Data Clock | |
| DE | Data Enable Signal | When the signal is high, the pixel data shall be valid to be displayed. |

Note1: Please follow PSWG.

Note2: Output signals from any system shall be low or Hi-Z state when VCCS is off.

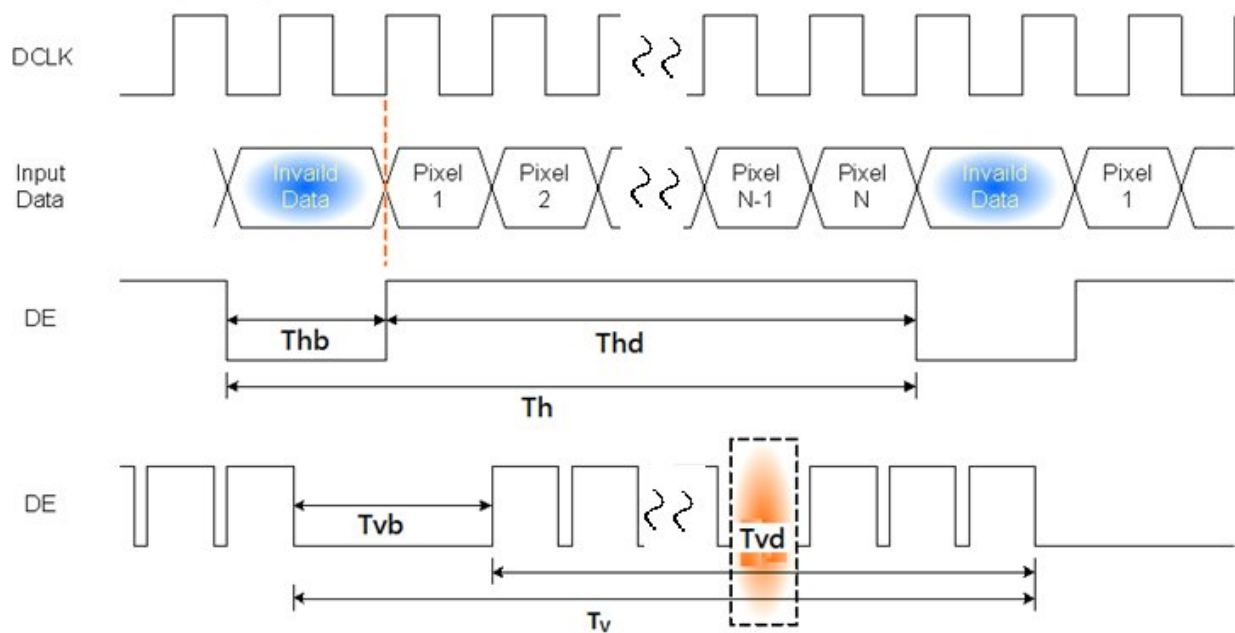
6.5 Interface Timing

6.5.1 Timing Characteristics

| Signal | | Symbol | Min. | Typ. | Max. | Unit |
|--------------------|----------|----------|------|------|------|------------|
| Clock Frequency | | Tdclk | 40.8 | 51.2 | 67.2 | MHz |
| Vertical Section | Period | T_V | 610 | 635 | 800 | T_{Line} |
| | Active | T_{VD} | 600 | 600 | 600 | |
| | Blanking | T_{VB} | 10 | 35 | 200 | |
| Horizontal Section | Period | T_H | 1114 | 1344 | 1400 | T_{dclk} |
| | Active | T_{HD} | 1024 | 1024 | 1024 | |
| | Blanking | T_{HB} | 90 | 320 | 376 | |
| Frame Rate | | F | 50 | 60 | 70 | Hz |

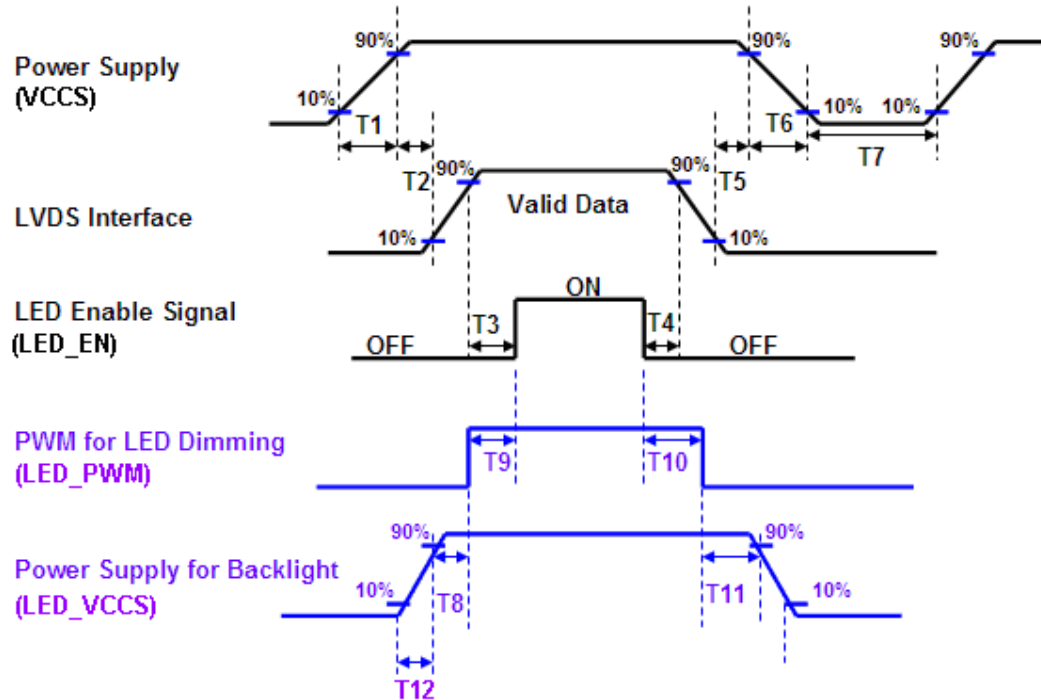
Note : DE mode.

6.5.2 Input Timing Diagram



6.6 Power ON/OFF Sequence

VCCS power and lamp 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 VCCS is off.



Power ON/OFF sequence timing

| Parameter | Value | | | Units |
|-----------|-------|------|------|-------|
| | Min. | Typ. | Max. | |
| T1 | 0.5 | - | 10 | [ms] |
| T2 | 0 | - | 50 | [ms] |
| T3 | 200 | - | - | [ms] |
| T4 | 200 | - | - | [ms] |
| T5 | 0 | - | 50 | [ms] |
| T6 | 0 | - | 10 | [ms] |
| T7 | 500 | - | - | [ms] |
| T8 | 10 | - | - | [ms] |
| T9 | 10 | - | - | [ms] |
| T10 | 10 | - | - | [ms] |
| T11 | 10 | - | - | [ms] |
| T12 | 0.5 | - | 10 | [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 | Signal Connector |
|------------------------------|-----------------------------------|
| Manufacturer | IPEX or compatible |
| Connector Model Number | IPEX 20455-040E-12R or compatible |
| Adaptable Plug | IPEX 20453-040T-01 or compatible |

| Pin No. | Symbol | Pin No. | Symbol |
|---------|----------|---------|-----------|
| 1 | NC | 21 | Rxin3+ |
| 2 | VCCS | 22 | VSS |
| 3 | VCCS | 23 | NC |
| 4 | VEDID | 24 | NC |
| 5 | NC | 25 | VSS |
| 6 | CLKEDID | 26 | Order_SEL |
| 7 | DATAEDID | 27 | SEL68 |
| 8 | Rxin0- | 28 | VSS |
| 9 | Rxin0+ | 29 | NC |
| 10 | VSS | 30 | NC |
| 11 | Rxin1- | 31 | LED_GND |
| 12 | Rxin1+ | 32 | LED_GND |
| 13 | VSS | 33 | LED_GND |
| 14 | Rxin2- | 34 | NC |
| 15 | Rxin2+ | 35 | LED_PWM |
| 16 | VSS | 36 | LED_EN |
| 17 | RxCLK- | 37 | NC |
| 18 | RxCLK+ | 38 | LED_VCCS |
| 19 | VSS | 39 | LED_VCCS |
| 20 | Rxin3- | 40 | LED_VCCS |



8. Reliability Test Criteria

| Items | Required Condition | Note |
|--------------------------------|---|-------|
| Temperature Humidity Bias | 40 °C /90%,300Hr | |
| High Temperature Operation | 80 °C, 300Hr | |
| Low Temperature Operation | -30 °C, 300Hr | |
| Hot Storage | 80 °C, 300 hours | |
| Cold Storage | -30 °C, 300 hours | |
| Thermal Shock Test | -30 °C /30 min ,80 °C /30 min ,100cycles | |
| Shock Test (Non-Operating) | 50G,20ms,Half-sine wave,(+X,+Y,+Z) | |
| Vibration Test (Non-Operating) | 1.5G, 10~200~10Hz, Sine wave 30mins/axis, 3 direction (X, Y, Z) | |
| ESD | Contact Discharge = ± 8 kV, class B (R=330,C=150pF) Air Discharge = ± 15 kV, class B (R=330,C=150pF) 1sec, 9 points, 25 times/point | Note1 |

Note 1: According to EN61000-4-2 , ESD Class B: Some performance degradation allowed. No data lost
Self-recoverable. No hardware failures.

Note 2: After reliability test, it is no function defect and occurrence of any new defective shall not be allowed.

Note 3:

- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.



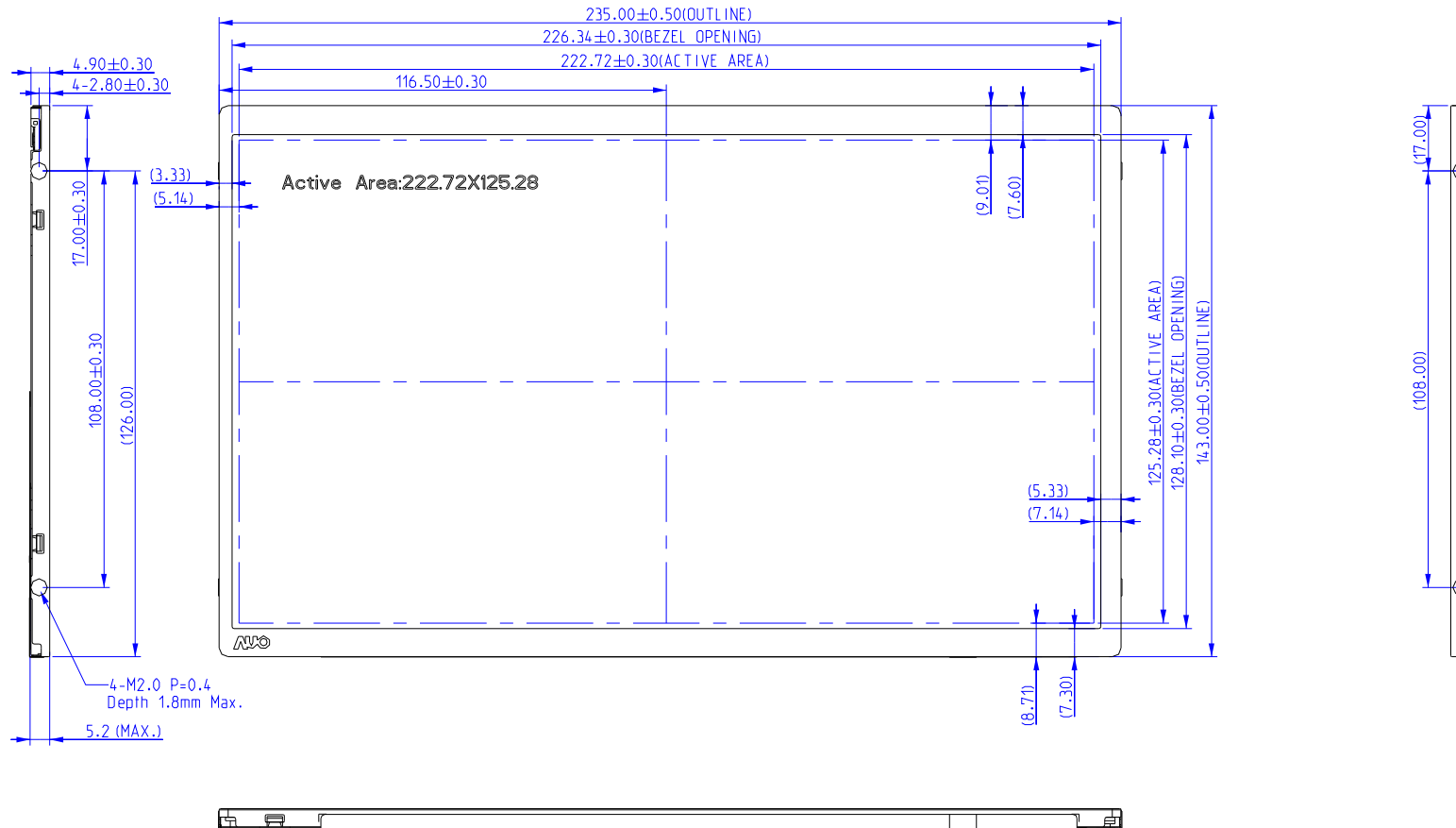
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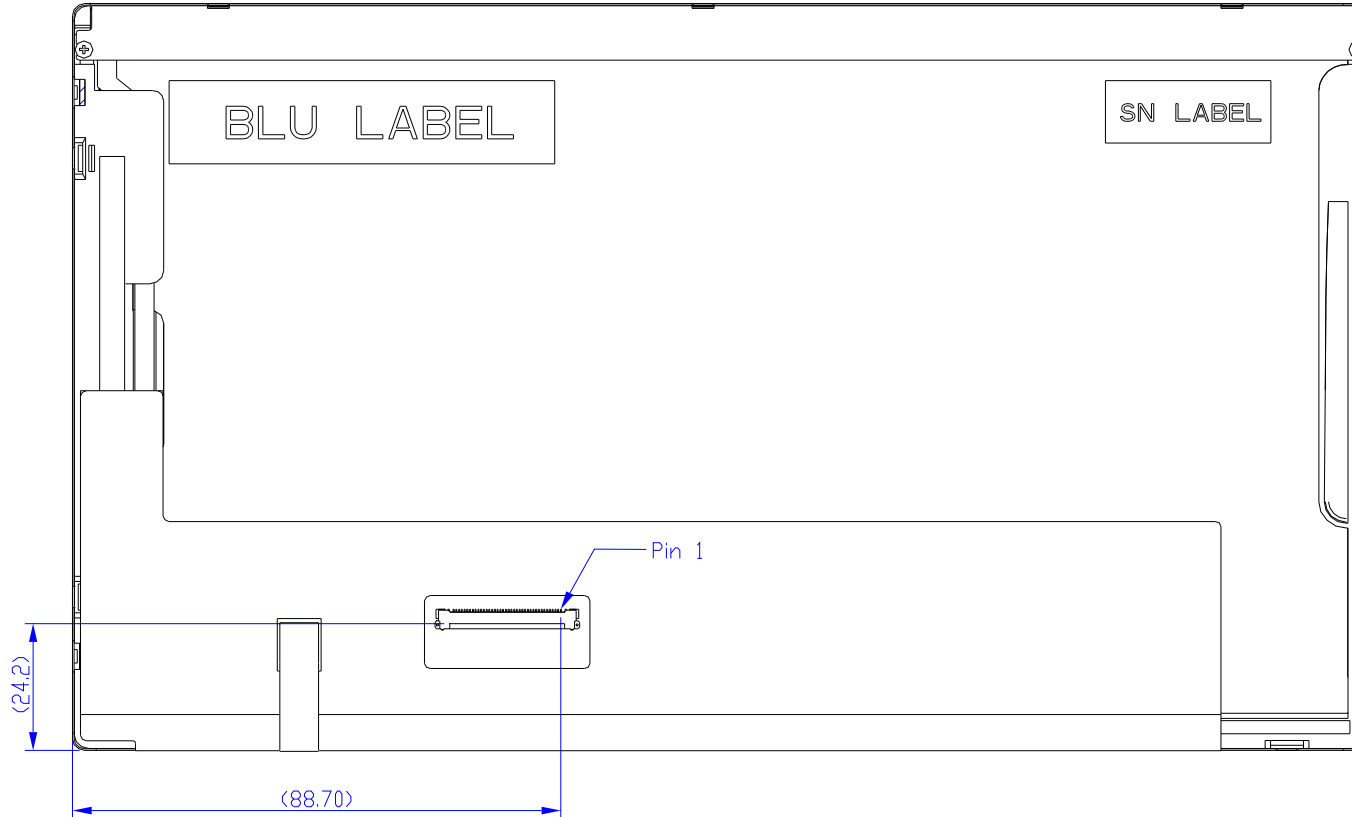
9. Mechanical Characteristics

9.1 LCM Outline Dimension (Front View)



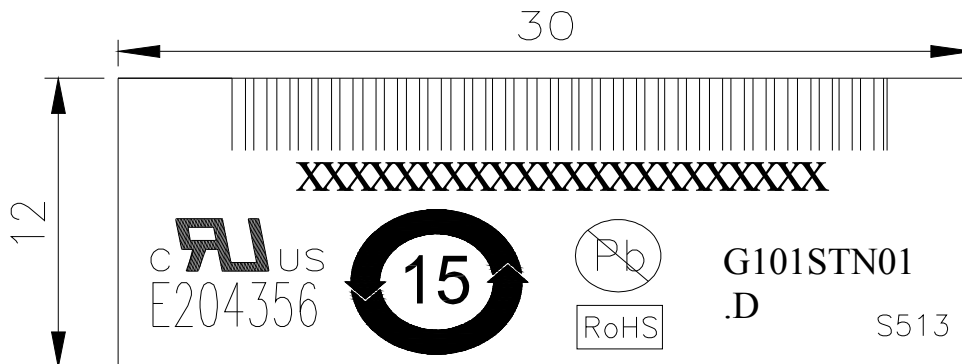


9.2 LCM Outline Dimension (Rear View)

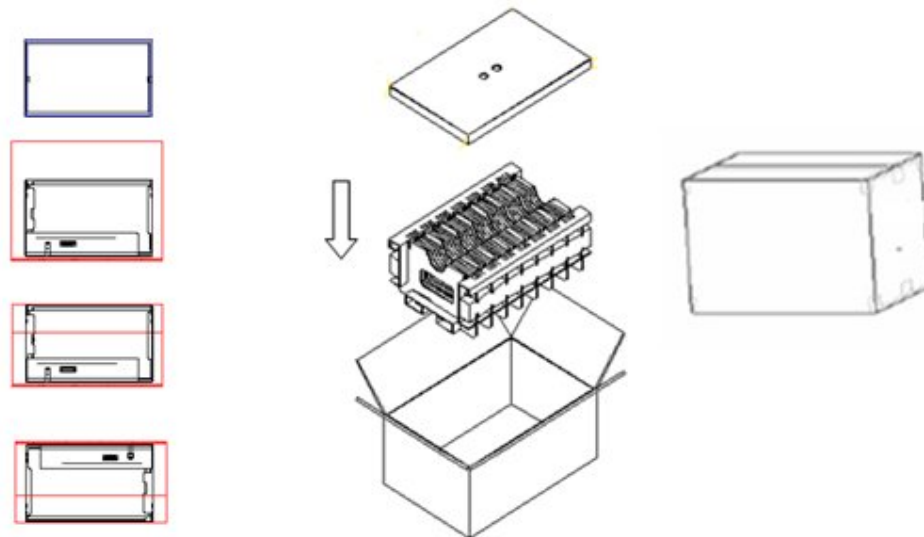


10. Label and Packaging

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



10.2 Carton Package



Max capacity: 35pcs TFT-LCD module per carton

Max weight: 9.9 kg per carton

Outside dimension of carton: 528*348*252mm

Pallet size: 1,070mm * 1,070mm * 135mm

Box stacked

ASRS_LAYERS: 5 layers

Module by air: (2 *3) *5 layers, one pallet put 30 boxes, total 1,050 pcs module

Module by sea: (2 *3) *5 layers + (2 *3) *2 layers, two pallet put 42 boxes, total 1,470 pcs module

Module by sea_HQ: (2 *3) *5 layers+(2 *3) *3 layers, two pallet put 48 boxes, total 1,680 pcs module



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



12. Appendix

| Address | FUNCTION | Value | Value | Value | Note |
|---------|--|-------|----------|-------|------|
| HEX | | HEX | BIN | DEC | |
| 00 | Header | 00 | 00000000 | 0 | |
| 01 | | FF | 11111111 | 255 | |
| 02 | | FF | 11111111 | 255 | |
| 03 | | FF | 11111111 | 255 | |
| 04 | | FF | 11111111 | 255 | |
| 05 | | FF | 11111111 | 255 | |
| 06 | | FF | 11111111 | 255 | |
| 07 | | 00 | 00000000 | 0 | |
| 08 | EISA Manuf. Code LSB | 06 | 00000110 | 6 | |
| 09 | Compressed ASCII | AF | 10101111 | 175 | |
| 0A | Product Code | D2 | 11010010 | 210 | |
| 0B | hex, LSB first | 10 | 00010000 | 16 | |
| 0C | 32-bit ser # | 00 | 00000000 | 0 | |
| 0D | | 00 | 00000000 | 0 | |
| 0E | | 00 | 00000000 | 0 | |
| 0F | | 00 | 00000000 | 0 | |
| 10 | Week of manufacture | 30 | 00110000 | 48 | |
| 11 | Year of manufacture | 17 | 00010111 | 23 | |
| 12 | EDID Structure Ver. | 01 | 00000001 | 1 | |
| 13 | EDID revision # | 00 | 00000000 | 0 | |
| 14 | Video input def. (digital I/P, non-TMDS, CRGB) | 80 | 10000000 | 128 | |
| 15 | Max H image size (rounded to cm) | 16 | 00010110 | 22 | |
| 16 | Max V image size (rounded to cm) | 0D | 00001101 | 13 | |
| 17 | Display Gamma $(=(\text{gamma} \times 100) - 100)$ | 78 | 01111000 | 120 | |
| 18 | Feature support (no DPMS, Active OFF, RGB, tmg Blk#1) | 0A | 00001010 | 10 | |
| 19 | Red/green low bits (Lower 2:2:2:2 bits) | 15 | 00010101 | 21 | |
| 1A | Blue/white low bits (Lower 2:2:2:2 bits) | 85 | 10000101 | 133 | |
| 1B | Red x (Upper 8 bits) | 97 | 10010111 | 151 | |
| 1C | Red y/ highER 8 bits | 58 | 01011000 | 88 | |
| 1D | Green x | 53 | 01010011 | 83 | |
| 1E | Green y | 8A | 10001010 | 138 | |
| 1F | Blue x | 26 | 00100110 | 38 | |
| 20 | Blue y | 25 | 00100101 | 37 | |
| 21 | White x | 50 | 01010000 | 80 | |
| 22 | White y | 54 | 01010100 | 84 | |
| 23 | Established timing 1 | 00 | 00000000 | 0 | |
| 24 | Established timing 2 | 00 | 00000000 | 0 | |
| 25 | Established timing 3 | 00 | 00000000 | 0 | |
| 26 | Standard timing #1 | 01 | 00000001 | 1 | |
| 27 | | 01 | 00000001 | 1 | |
| 28 | Standard timing #2 | 01 | 00000001 | 1 | |
| 29 | | 01 | 00000001 | 1 | |



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| | | | | | |
|----|---|----|----------|-----|--|
| 2A | Standard timing #3 | 01 | 00000001 | 1 | |
| 2B | | 01 | 00000001 | 1 | |
| 2C | Standard timing #4 | 01 | 00000001 | 1 | |
| 2D | | 01 | 00000001 | 1 | |
| 2E | Standard timing #5 | 01 | 00000001 | 1 | |
| 2F | | 01 | 00000001 | 1 | |
| 30 | Standard timing #6 | 01 | 00000001 | 1 | |
| 31 | | 01 | 00000001 | 1 | |
| 32 | Standard timing #7 | 01 | 00000001 | 1 | |
| 33 | | 01 | 00000001 | 1 | |
| 34 | Standard timing #8 | 01 | 00000001 | 1 | |
| 35 | | 01 | 00000001 | 1 | |
| 36 | Pixel Clock/10000 LSB | 2D | 00101101 | 45 | |
| 37 | Pixel Clock/10000 USB | 11 | 00010001 | 17 | |
| 38 | Horz active Lower 8bits | 00 | 00000000 | 0 | |
| 39 | Horz blanking Lower 8bits | A0 | 10100000 | 160 | |
| 3A | HorzAct:HorzBlnk Upper 4:4 bits | 40 | 01000000 | 64 | |
| 3B | Vertical Active Lower 8bits | 58 | 01011000 | 88 | |
| 3C | Vertical Blanking Lower 8bits | 13 | 00010011 | 19 | |
| 3D | Vert Act : Vertical Blanking (upper 4:4 bit) | 20 | 00100000 | 32 | |
| 3E | HorzSync. Offset | 32 | 00110010 | 50 | |
| 3F | HorzSync.Width | 20 | 00100000 | 32 | |
| 40 | VertSync.Offset : VertSync.Width | 26 | 00100110 | 38 | |
| 41 | Horz&Vert Sync Offset/Width Upper 2bits | 00 | 00000000 | 0 | |
| 42 | Horizontal Image Size Lower 8bits | DE | 11011110 | 222 | |
| 43 | Vertical Image Size Lower 8bits | 7D | 01111101 | 125 | |
| 44 | Horizontal & Vertical Image Size (upper 4:4 bits) | 00 | 00000000 | 0 | |
| 45 | Horizontal Border <i>(zero for internal LCD)</i> | 00 | 00000000 | 0 | |
| 46 | Vertical Border <i>(zero for internal LCD)</i> | 00 | 00000000 | 0 | |
| 47 | Signal <i>(non-intr, norm, no stero, sep sync, neg pol)</i> | 18 | 00011000 | 24 | |
| 48 | Detailed timing/monitor | 00 | 00000000 | 0 | |
| 49 | descriptor #2 | 00 | 00000000 | 0 | |
| 4A | | 00 | 00000000 | 0 | |
| 4B | | 0F | 00001111 | 15 | |
| 4C | | 00 | 00000000 | 0 | |
| 4D | | 00 | 00000000 | 0 | |
| 4E | | 00 | 00000000 | 0 | |
| 4F | | 00 | 00000000 | 0 | |
| 50 | | 00 | 00000000 | 0 | |
| 51 | | 00 | 00000000 | 0 | |
| 52 | | 00 | 00000000 | 0 | |
| 53 | | 00 | 00000000 | 0 | |
| 54 | | 00 | 00000000 | 0 | |
| 55 | | 00 | 00000000 | 0 | |
| 56 | | 00 | 00000000 | 0 | |



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| | | | | | |
|----|-------------------------|----|----------|-----|---|
| 57 | | 00 | 00000000 | 0 | |
| 58 | | 00 | 00000000 | 0 | |
| 59 | | 20 | 00100000 | 32 | |
| 5A | Detailed timing/monitor | 00 | 00000000 | 0 | |
| 5B | descriptor #3 | 00 | 00000000 | 0 | |
| 5C | | 00 | 00000000 | 0 | |
| 5D | | FE | 11111110 | 254 | |
| 5E | | 00 | 00000000 | 0 | |
| 5F | Manufacture | 41 | 01000001 | 65 | A |
| 60 | Manufacture | 55 | 01010101 | 85 | U |
| 61 | Manufacture | 4F | 01001111 | 79 | O |
| 62 | | 0A | 00001010 | 10 | |
| 63 | | 20 | 00100000 | 32 | |
| 64 | | 20 | 00100000 | 32 | |
| 65 | | 20 | 00100000 | 32 | |
| 66 | | 20 | 00100000 | 32 | |
| 67 | | 20 | 00100000 | 32 | |
| 68 | | 20 | 00100000 | 32 | |
| 69 | | 20 | 00100000 | 32 | |
| 6A | | 20 | 00100000 | 32 | |
| 6B | | 20 | 00100000 | 32 | |
| 6C | Detailed timing/monitor | 00 | 00000000 | 0 | |
| 6D | descriptor #4 | 00 | 00000000 | 0 | |
| 6E | | 00 | 00000000 | 0 | |
| 6F | | FE | 11111110 | 254 | |
| 70 | | 00 | 00000000 | 0 | |
| 71 | Manufacture P/N | 47 | 01000111 | 71 | G |
| 72 | Manufacture P/N | 31 | 00110001 | 49 | 1 |
| 73 | Manufacture P/N | 30 | 00110000 | 48 | 0 |
| 74 | Manufacture P/N | 31 | 00110001 | 49 | 1 |
| 75 | Manufacture P/N | 53 | 01010011 | 83 | S |
| 76 | Manufacture P/N | 54 | 01010100 | 84 | T |
| 77 | Manufacture P/N | 4E | 01001110 | 78 | N |
| 78 | Manufacture P/N | 30 | 00110000 | 48 | 0 |
| 79 | Manufacture P/N | 31 | 00110001 | 49 | 1 |
| 7A | Manufacture P/N | 2E | 00101110 | 46 | . |
| 7B | Manufacture P/N | 30 | 00110000 | 48 | 0 |
| 7C | | 0A | 00001010 | 10 | |
| 7D | | 20 | 00100000 | 32 | |
| 7E | Extension Flag | 00 | 00000000 | 0 | |
| 7F | Checksum | 18 | 00011000 | 24 | |