

Model Name: T546QB01 V0

Issue Date : 2011/12/06

() Preliminary Specifications

(*) Final Specifications

| Customer Signature | Date | AUO | Date |
|--------------------|------------|----------------------------|------------|
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| No | | |
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Record of Revision

| Version | Date | Page | Description |
|---------|------------|------------|---|
| 0.0 | 2011/08/12 | | First release |
| 1.0 | 2011/09/27 | P19 ~ P21 | Add 3D OPTICAL SPECIFICATION |
| 2.0 | 2011/11/01 | P4 | Modify General Information |
| | | P7 | Modify Interface Connections |
| | | P16 | Modify LED driver condition |
| | | P19 ~ P21 | Modify 3D optical |
| | | P26 | Modify the drawing of front view |
| 3.0 | 2011/11/07 | P6 | Modify 3.1.1: DC Characteristics |
| 4.0 | 2011/11/13 | P6~P52 | Modify Product Specification |
| 5.0 | 2011/12/03 | P30~P31 | Modify 3D optical |
| 6.0 | 2011/12/06 | P4 , P38 | Modify General Information and RA test |
| 7.0 | 2012/2/16 | | Power Sequence modification |
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1. General Description

This specification applies to the 55 inch Color TFT-LCD Module T546QB01 V0. This LCD module has a TFT active matrix type liquid crystal 3,840*2,160 panel pixels, and diagonal size of 55 inch. This module supports 3,840*2,160 mode. Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 10-bit gray scale signal for each dot.

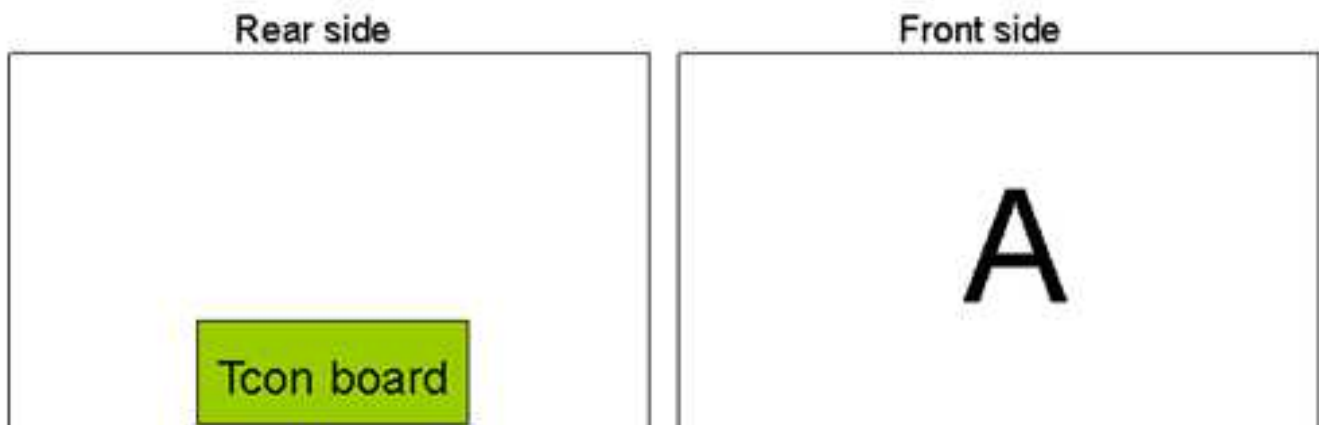
The T546QB01 V0 has been designed to apply the 10-bit , 16ch V by one interface method. It is intended to support displays where high brightness, wide viewing angle, high color saturation, and high color depth are very important. Also, 3D function is also embedded into front glass.

* General Information

| Items | Specification | Unit | Note |
|------------------------|------------------------------------|--------|-----------|
| Active Screen Size | 55 | inch | |
| Display Area | 1209.6(H) x 680.4(V) | mm | |
| Outline Dimension | 1,241.6 (H) x 724.4 (V) x 30.8 (D) | mm | w/o cover |
| Driver Element | a-Si TFT active matrix | | |
| Bezel Opening | 1217.6(H)X688.4(V) | mm | |
| Display Colors | 10 bit, | Colors | |
| Number of Pixels | 3840 x 2160 | Pixel | |
| Pixel Pitch | 0.315(H) x 0.315(W) | mm | |
| Pixel Arrangement | RGB vertical stripe | | |
| Display Operation Mode | Normally Black | | |
| Rotate Function | Unachievable | | Note 1 |
| Display Orientation | Signal input with "A" | | Note 2 |

Note 1: Rotate Function refers to LCD display could be able to rotate.

Note 2: LCD display as below illustrated when signal input with "A".



2. Absolute Maximum Ratings

The followings are maximum values which, if exceeded, may cause faulty operation or damage to the unit

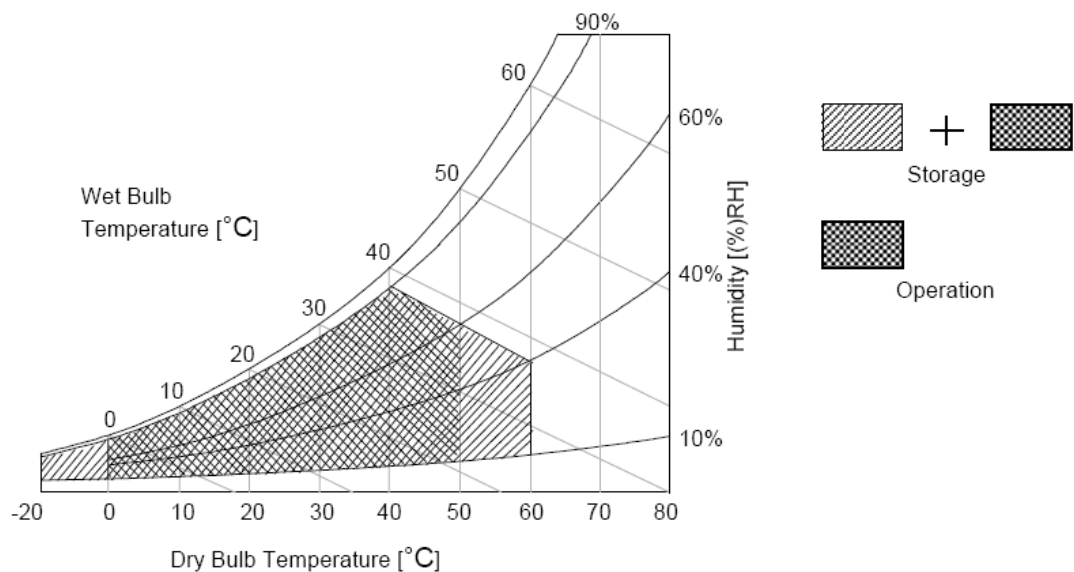
| Item | Symbol | Min | Max | Unit | Conditions |
|---|--------|------|-----|--------|------------|
| Logic/LCD Drive Voltage (for 12V input) | Vcc | -0.3 | 14 | [Volt] | Note 1 |
| Logic/LCD Drive Voltage (for 5V input) | Vcc | | | [Volt] | Note 1 |
| Input Voltage of Signal (for 12V input) | Vin | -0.3 | 3.6 | [Volt] | Note 1 |
| Input Voltage of Signal (for 5V input) | Vin | | | [Volt] | Note 1 |
| Operating Temperature | TOP | 0 | +50 | [°C] | Note 2 |
| Operating Humidity | HOP | 10 | 90 | [%RH] | Note 2 |
| Storage Temperature | TST | -20 | +60 | [°C] | Note 2 |
| Storage Humidity | HST | 10 | 90 | [%RH] | Note 2 |
| Panel Surface Temperature | PST | - | 65 | [°C] | Note 3 |

Note 1: Duration:50 msec.

Note 2 : Maximum Wet-Bulb should be 39°C and No condensation.

The relative humidity must not exceed 90% non-condensing at temperatures of 40°C or less. At temperatures greater than 40°C, the wet bulb temperature must not exceed 39°C.

Note 3: Surface temperature is measured at 50°C Dry condition



3. Electrical Specification

The T546QB01 V0 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The other is to power Back Light Unit.

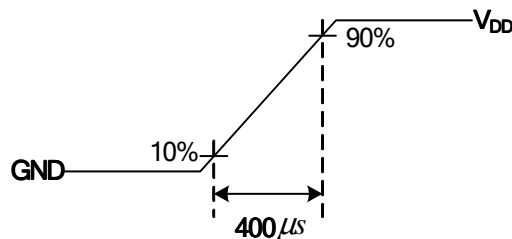
3.1 Electrical Characteristics

3.1.1: DC Characteristics

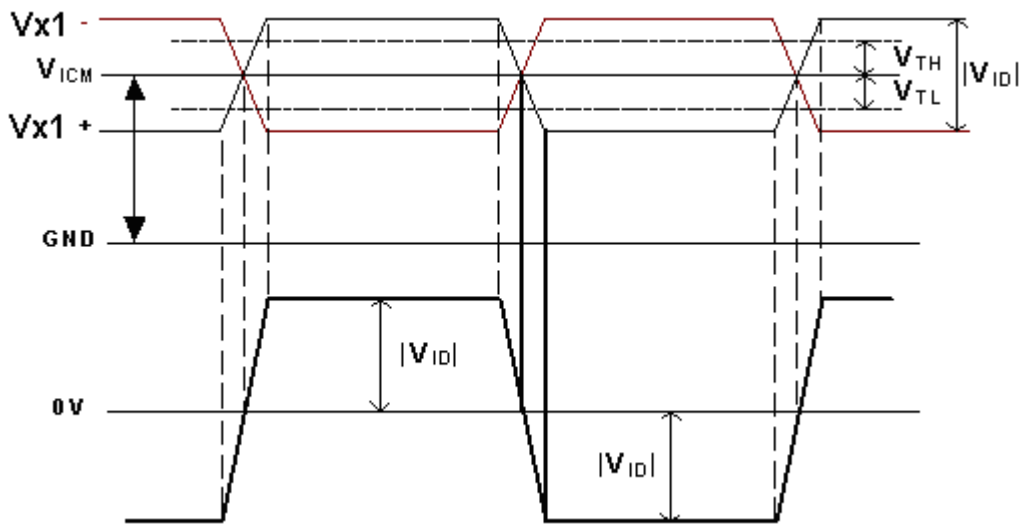
| Parameter | Symbol | Value | | | Unit | Note | |
|--|---|-----------------|------|------|-----------|-----------|---|
| | | Min. | Typ. | Max | | | |
| LCD | | | | | | | |
| Power Supply Input Voltage (for input power=12V) | V_{DD} | 10.8 | 12 | 13.2 | V_{DC} | | |
| Power Supply Input Current (Define to section:1.1) | I_{DD} | -- | 1.9 | 4.5 | A | 1 | |
| Power Consumption (Define to section:1.1) | P_C | -- | 22.8 | 54 | Watt | 1 | |
| Inrush Current (Define to section:1.1) | I_{RUSH} | -- | -- | 4 | A | 2 | |
| V by One Interface | Input Differential Voltage | $ V_{ID} $ | 100 | | mV_{DC} | 3 | |
| | Differential Input High Threshold Voltage | V_{TH} | +50 | | mV_{DC} | 3 | |
| | Differential Input Low Threshold Voltage | V_{TL} | | | -50 | mV_{DC} | 3 |
| | Input Common Mode Voltage | V_{ICM} | | 0.82 | | V_{DC} | 3 |
| CMOS Interface | Input High Threshold Voltage | V_{IH} (High) | 2.4 | -- | 3.3 | V_{DC} | 4 |
| | Input Low Threshold Voltage | V_{IL} (Low) | 0 | -- | 0.6 | V_{DC} | 4 |
| Backlight Power Consumption(Refer to Section: 3.7) | P_{BL} | | 150 | | Watt | | |
| Life time (MTTF) | | 30000 | | | Hour | 5,6 | |

Note :

- $V_{DD} = 12.0V$, $F_v = 120Hz$, $F_{clk} = 78.125MHz$, $25\text{ }^\circ C$, Test Pattern : White Pattern
>> refer to "Section:3.3 Signal Timing Specification, Typical timing"
- Measurement condition : Rising time = 400us



- $V_{ICM} = 0.82V$



4. The measure points of V_{IH} and V_{IL} are in LCM side after connecting the System Board and LCM.
5. The relative humidity must not exceed 80% non-condensing at temperatures of 40°C or less. At temperatures greater than 40°C , the wet bulb temperature must not exceed 39°C . When operate at low temperatures, the brightness of LED will drop and the life time of LED will be reduced.
6. The lifetime (MTTF) is defined as the time which luminance of LED is 50% compared to its original value.
[Operating condition: Continuous operating at $T_a = 25 \pm 2^{\circ}\text{C}$]

3.2 Interface Connections

- LCD V by One connector:

V by One CN (41Pin) : FI-RE41S-HF (JAE)

| PIN | Symbol | Description | PIN | Symbol | Description |
|-----|--------|--------------------------|-----|--------|--------------------------|
| 1 | GND | Ground | 21 | Rx11n | V-by-One HS Data Lane 11 |
| 2 | GND | Ground | 22 | Rx11p | V-by-One HS Data Lane 11 |
| 3 | GND | Ground | 23 | GND | CML Ground |
| 4 | GND | Ground | 24 | GND | CML Ground |
| 5 | GND | Ground | 25 | Rx12n | V-by-One HS Data Lane 12 |
| 6 | SCL | I2C CLK | 26 | Rx12p | V-by-One HS Data Lane 12 |
| 7 | SDA | I2C Data | 27 | GND | CML Ground |
| 8 | GND | CML Ground | 28 | GND | CML Ground |
| 9 | Rx8n | V-by-One HS Data Lane 8 | 29 | Rx13n | V-by-One HS Data Lane 13 |
| 10 | Rx8p | V-by-One HS Data Lane 8 | 30 | Rx13p | V-by-One HS Data Lane 13 |
| 11 | GND | CML Ground | 31 | GND | CML Ground |
| 12 | GND | CML Ground | 32 | GND | CML Ground |
| 13 | Rx9n | V-by-One HS Data Lane 9 | 33 | Rx14n | V-by-One HS Data Lane 14 |
| 14 | Rx9p | V-by-One HS Data Lane 9 | 34 | Rx14p | V-by-One HS Data Lane 14 |
| 15 | GND | CML Ground | 35 | GND | CML Ground |
| 16 | GND | CML Ground | 36 | GND | CML Ground |
| 17 | Rx10n | V-by-One HS Data Lane 10 | 37 | Rx15n | V-by-One HS Data Lane 15 |
| 18 | Rx10p | V-by-One HS Data Lane 10 | 38 | Rx15p | V-by-One HS Data Lane 15 |
| 19 | GND | CML Ground | 39 | GND | CML Ground |
| 20 | GND | CML Ground | 40 | NC | AUO Internal Use Only |
| | | | 41 | GND | Ground |

V by One CN (51Pin) : FI-RE51S-HF (JAE)

| PIN | Symbol | Description | PIN | Symbol | Description |
|-----|--------|-------------------------|-----|----------|---------------------------------|
| 1 | NC | NC PIN | 26 | GND | CML Ground |
| 2 | NC | NC PIN | 27 | Rx2n | V-by-One HS Data Lane 2 |
| 3 | NC | AUO Internal Use Only | 28 | Rx2p | V-by-One HS Data Lane 2 |
| 4 | NC | NC PIN | 29 | GND | CML Ground |
| 5 | NC | NC PIN | 30 | GND | CML Ground |
| 6 | NC | NC PIN | 31 | Rx3n | V-by-One HS Data Lane 3 |
| 7 | NC | NC PIN | 32 | Rx3p | V-by-One HS Data Lane 3 |
| 8 | NC | NC PIN | 33 | GND | CML Ground |
| 9 | NC | AUO Internal Use Only | 34 | GND | CML Ground |
| 10 | NC | NC PIN | 35 | Rx4n | V-by-One HS Data Lane 4 |
| 11 | GND | Ground | 36 | Rx4p | V-by-One HS Data Lane 4 |
| 12 | GND | Ground | 37 | GND | CML Ground |
| 13 | GND | Ground | 38 | GND | CML Ground |
| 14 | GND | Ground | 39 | Rx5n | V-by-One HS Data Lane 5 |
| 15 | GND | Ground | 40 | Rx5p | V-by-One HS Data Lane 5 |
| 16 | HTPDN | Hot plug detect | 41 | GND | CML Ground |
| 17 | LOCKN | Lock detect | 42 | GND | CML Ground |
| 18 | GND | CML Ground | 43 | Rx6n | V-by-One HS Data Lane 6 |
| 19 | Rx0n | V-by-One HS Data Lane 0 | 44 | Rx6p | V-by-One HS Data Lane 6 |
| 20 | Rx0p | V-by-One HS Data Lane 0 | 45 | GND | CML Ground |
| 21 | GND | CML Ground | 46 | GND | CML Ground |
| 22 | GND | CML Ground | 47 | Rx7n | V-by-One HS Data Lane 7 |
| 23 | Rx1n | V-by-One HS Data Lane 1 | 48 | Rx7p | V-by-One HS Data Lane 7 |
| 24 | Rx1p | V-by-One HS Data Lane 1 | 49 | GND | CML Ground |
| 25 | GND | CML Ground | 50 | NC | AUO Internal Use Only |
| | | | 51 | SYNC3D_I | 3D Sync. In Flag (Glasses type) |

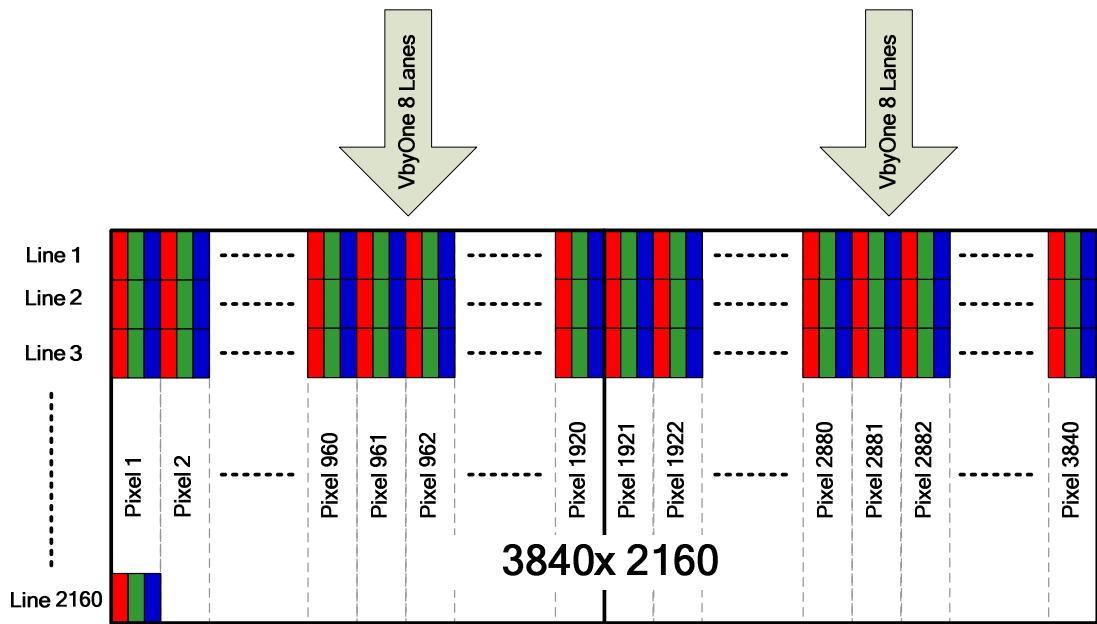
- LCD Power connector:

Power CN (12Pin) : A2010WR0-12PS-SHP (JWT)

| PIN | Symbol | Description |
|-----|------------------|------------------|
| 1 | PWR Power V12 IN | PWR Power V12 IN |
| 2 | PWR Power V12 IN | PWR Power V12 IN |
| 3 | PWR Power V12 IN | PWR Power V12 IN |
| 4 | PWR Power V12 IN | PWR Power V12 IN |
| 5 | PWR Power V12 IN | PWR Power V12 IN |
| 6 | NC | NC PIN |
| 7 | NC | NC PIN |
| 8 | GND Ground | GND Ground |
| 9 | GND Ground | GND Ground |
| 10 | GND Ground | GND Ground |
| 11 | GND Ground | GND Ground |
| 12 | GND Ground | GND Ground |

4K2K Input Data Format:

2D Mode:

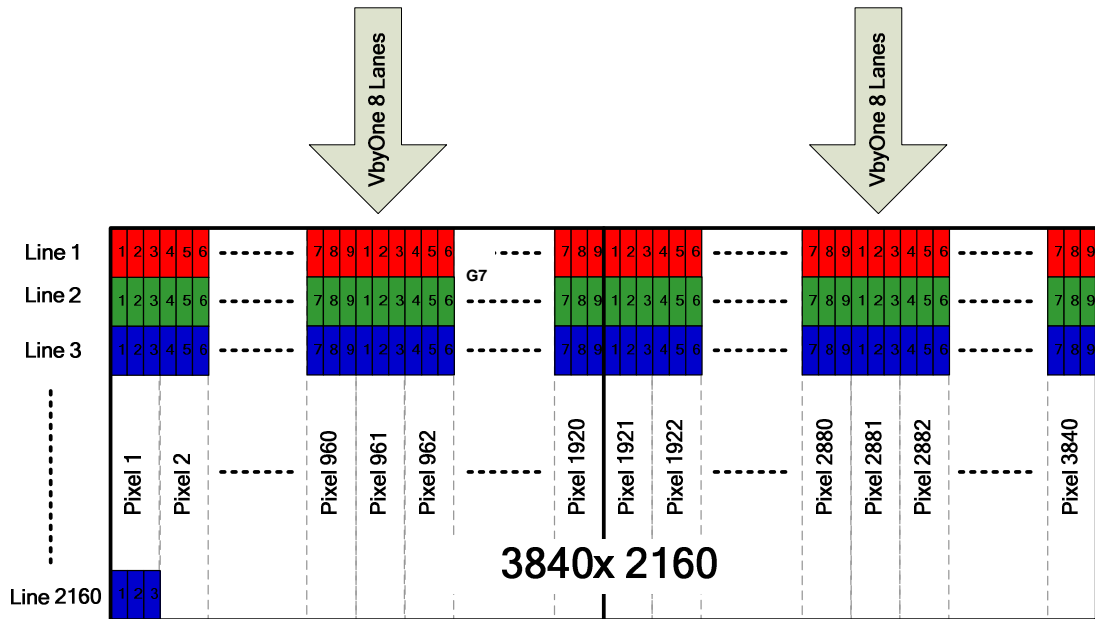


Note: Normal pixel data mapping

2D Mode Pixel Mapping:

| Pixel No | Pixel 1 | | | Pixel 2 | | | Pixel 3 | | | ~ | Pixel 3840 | | | |
|-----------|---------|----|----|---------|----|----|---------|----|----|----|------------|-------|-------|-------|
| Line 1 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 2 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 3 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 4 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 5 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 6 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| : | : | : | : | : | : | : | : | : | : | : | ~ | : | : | : |
| Line 2158 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 2159 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |
| Line 2160 | R1 | G1 | B1 | R2 | G2 | B2 | R3 | G3 | B3 | R4 | ~ | R3840 | G3840 | B3840 |

3D Mode (9-View)



Note: 3D multi-view data mapping (1,2,3,4,5,6,7,8,9 is the viewing number)

3D Mode Pixel Mapping:

| | Pixel No. | Pixel 1 | | | Pixel 2 | | | Pixel 3 | | | ~ | | Pixel 3840 | | |
|--------|----------------------|---------|----|----|---------|----|----|---------|----|----|----|----|------------|-------|-------|
| | View # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | ~ | 7 | 8 | 9 |
| Line 1 | Multi-view Line 1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R2 | ~ | R1280 | R1280 | R1280 |
| Line 2 | | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G2 | ~ | G1280 | G1280 | G1280 |
| Line 3 | | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B2 | ~ | B1280 | B1280 |
| Line 4 | Multi-view | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R2 | ~ | R1280 | R1280 | R1280 |

| | | | | | | | | | | | | | | | |
|------------------|--------------------------------|----|----|----|----|----|----|----|----|----|----|---|-------|-------|-------|
| Line 5 | Line 2 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G2 | ~ | G1280 | G1280 | G1280 |
| Line 6 | | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B2 | ~ | B1280 | B1280 | B1280 |
| : | : | : | : | : | : | : | : | : | : | : | : | ~ | : | : | : |
| Line 2158 | Multi-view Line 720 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R1 | R2 | ~ | R1280 | R1280 | R1280 |
| Line 2159 | | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G1 | G2 | ~ | G1280 | G1280 | G1280 |
| Line 2160 | | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B2 | ~ | B1280 | B1280 | B1280 |

V-by-One Lanes of Pixel Data :

| | Lane 0 | Lane 1 | Lane 2 | Lane 3 | Lane 4 | Lane 5 | Lane 6 | Lane 7 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Blank | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS |
| | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP |
| | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR |
| Line 1 | Pixel 1 | Pixel 2 | Pixel 3 | Pixel 4 | Pixel 5 | Pixel 6 | Pixel 7 | Pixel 8 |
| | Pixel 9 | Pixel 10 | Pixel 11 | Pixel 12 | Pixel 13 | Pixel 14 | Pixel 15 | Pixel 16 |
| | . | . | . | . | . | . | . | . |
| | Pixel 1913 | Pixel 1914 | Pixel 1915 | Pixel 1916 | Pixel 1917 | Pixel 1918 | Pixel 1919 | Pixel 1920 |
| Blank | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS |
| | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP |
| | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR |
| Line2 | Pixel 1 | Pixel 2 | Pixel 3 | Pixel 4 | Pixel 5 | Pixel 6 | Pixel 7 | Pixel 8 |
| | Pixel 8 | Pixel 10 | Pixel 11 | Pixel 12 | Pixel 13 | Pixel 14 | Pixel 15 | Pixel 16 |
| | . | . | . | . | . | . | . | . |
| | Pixel 1913 | Pixel 1914 | Pixel 1915 | Pixel 1916 | Pixel 1917 | Pixel 1918 | Pixel 1919 | Pixel 1920 |
| . | . | . | . | . | . | . | . | |
| . | . | . | . | . | . | . | . | |

| | Lane 8 | Lane 9 | Lane 10 | Lane 11 | Lane 12 | Lane 13 | Lane 14 | Lane 15 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Blank | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS |
| | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP |
| | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR |
| Line 1 | Pixel 1921 | Pixel 1922 | Pixel 1923 | Pixel 1924 | Pixel 1925 | Pixel 1926 | Pixel 1927 | Pixel 1928 |
| | Pixel 1929 | Pixel 1930 | Pixel 1931 | Pixel 1932 | Pixel 1933 | Pixel 1934 | Pixel 1935 | Pixel 1936 |
| | . | . | . | . | . | . | . | . |
| | Pixel 3833 | Pixel 3834 | Pixel 3835 | Pixel 3836 | Pixel 3837 | Pixel 3838 | Pixel 3839 | Pixel 3840 |
| Blank | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS | FSBS |
| | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP | FSBP |
| | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR | FSBE_SR |
| Line2 | Pixel 1921 | Pixel 1922 | Pixel 1923 | Pixel 1924 | Pixel 1925 | Pixel 1926 | Pixel 1927 | Pixel 1928 |
| | Pixel 1929 | Pixel 1930 | Pixel 1931 | Pixel 1932 | Pixel 1933 | Pixel 1934 | Pixel 1935 | Pixel 1936 |
| | . | . | . | . | . | . | . | . |
| | Pixel 3833 | Pixel 3834 | Pixel 3835 | Pixel 3836 | Pixel 3837 | Pixel 3838 | Pixel 3839 | Pixel 3840 |
| . | . | . | . | . | . | . | . | |
| . | . | . | . | . | . | . | . | |

3.3 Signal Timing Specification

This is the signal timing required at the input of the user connector. All of the interface signal timing should be satisfied with the following specifications for its proper operation.

4K2K (3840x2160) V-by-One Each Lane Timing Spec. (240x2160 @120Hz x16Lanes)

| Type | Item | Symbol | Min | Typ | Max | Unit |
|--------------------|----------|----------|------|-------|--------|------|
| Vertical Section | Period | Tv | 2172 | 2200 | 2244 | Th |
| | Active | Tdisp(v) | 2160 | | | Th |
| | Blanking | Tblk(v) | 12 | 40 | 84 | Th |
| Horizontal Section | Period | Th | 280 | 290 | 300 | Tclk |
| | Active | Tdisp(h) | 240 | | | Tclk |
| | Blanking | Tblk(h) | 40 | 50 | 60 | Tclk |
| Frequency | Clock | Tclk | | 76.48 | 78.125 | MHz |

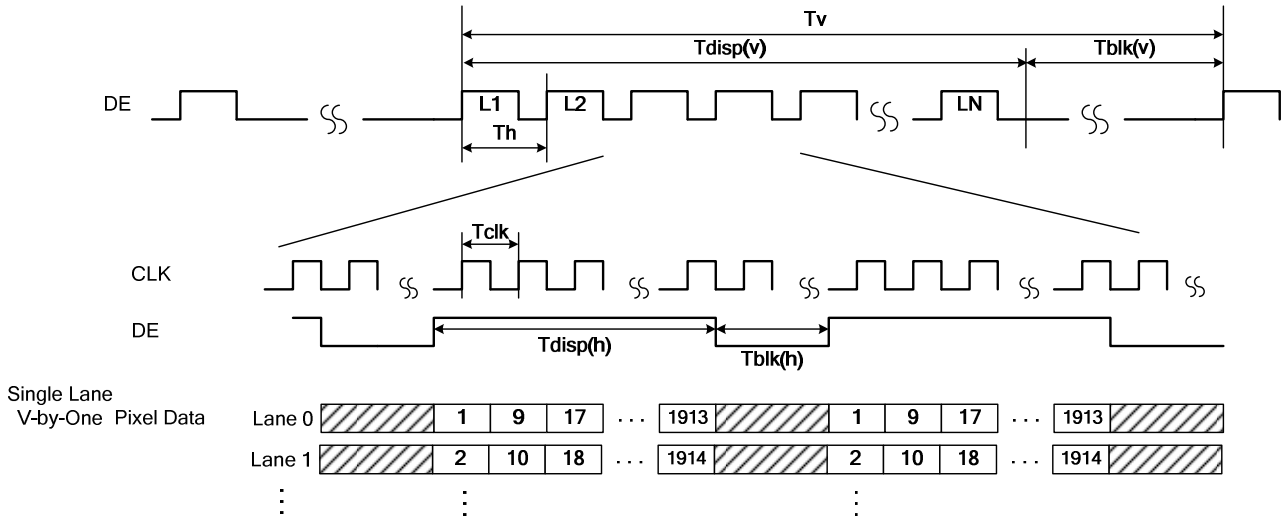
4K2K (3840x2160) V-by-One Each Lane Timing Spec. (240x2160 @100Hz x16Lanes)

| Type | Item | Symbol | Min | Typ | Max | Unit |
|--------------------|----------|----------|------|-------|--------|------|
| Vertical Section | Period | Tv | 2172 | 2200 | 2692 | Th |
| | Active | Tdisp(v) | 2160 | | | Th |
| | Blanking | Tblk(v) | 12 | 40 | 532 | Th |
| Horizontal Section | Period | Th | 280 | 290 | 354 | Tclk |
| | Active | Tdisp(h) | 240 | | | Tclk |
| | Blanking | Tblk(h) | 40 | 50 | 114 | Tclk |
| Frequency | Clock | Tclk | | 76.48 | 78.125 | MHz |

4K2K V-by-One 2area (1920x2160) Timing difference

| Type | Item | Symbol | Min | Typ | Max | Unit |
|---------------|------------|--------|-----|-----|-----|------|
| 2Area Latency | Difference | Tdiff | -1 | 0 | 1 | Th |

3.4 Signal Timing Waveforms



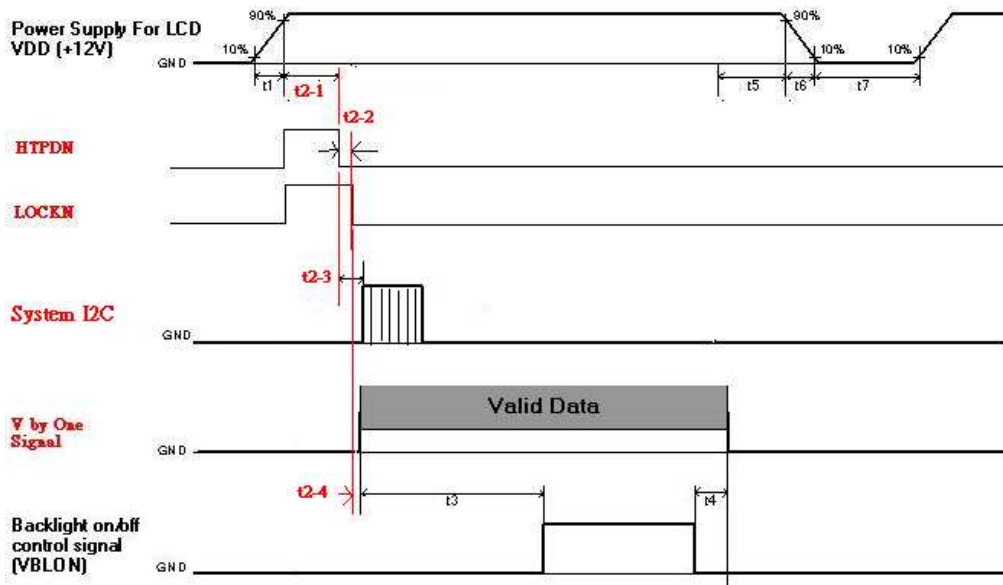
3.5 Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 10 bit gray scale data input for the color; the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

COLOR DATA REFERENCE

| Color | | Input Color Data | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|-------------|------------------|----|----|----|----|-----|----|----|----|----|-------|----|----|----|----|-----|----|----|----|----|------|----|----|----|-----|----|----|----|
| | | RED | | | | | | | | | | GREEN | | | | | | | | | | BLUE | | | | | | | |
| | | MSB | | | | | LSB | | | | | MSB | | | | | LSB | | | | | MSB | | | | LSB | | | |
| | | R9 | R8 | R7 | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G9 | G8 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | B9 | B8 | B7 | B6 | B5 | B4 | B3 | B2 |
| Basic Color | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red(1023) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green(1023) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blue(1023) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cyan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Magenta | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Yellow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | White | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| R | RED(000) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | RED(001) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | ---- | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | RED(1022) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

3.6 Power Sequence for LCD



| Parameter | Values | | | Unit |
|-----------|--------|-------|------|------|
| | Min. | Type. | Max. | |
| t1 | 0.4 | -- | 30 | ms |
| t2-1 | 1145 | -- | 3580 | ms |
| t2-2 | -- | -- | --*1 | ms |
| t2-3 | 60 | -- | -- | ms |
| t2-4 | -- | -- | 1 | ms |
| t3 | 1330 | -- | -- | ms |
| t4 | 0*2 | -- | -- | ms |
| t5 | 0 | -- | -- | ms |
| t6 | -- | -- | --*3 | ms |
| t7 | 500 | -- | -- | ms |

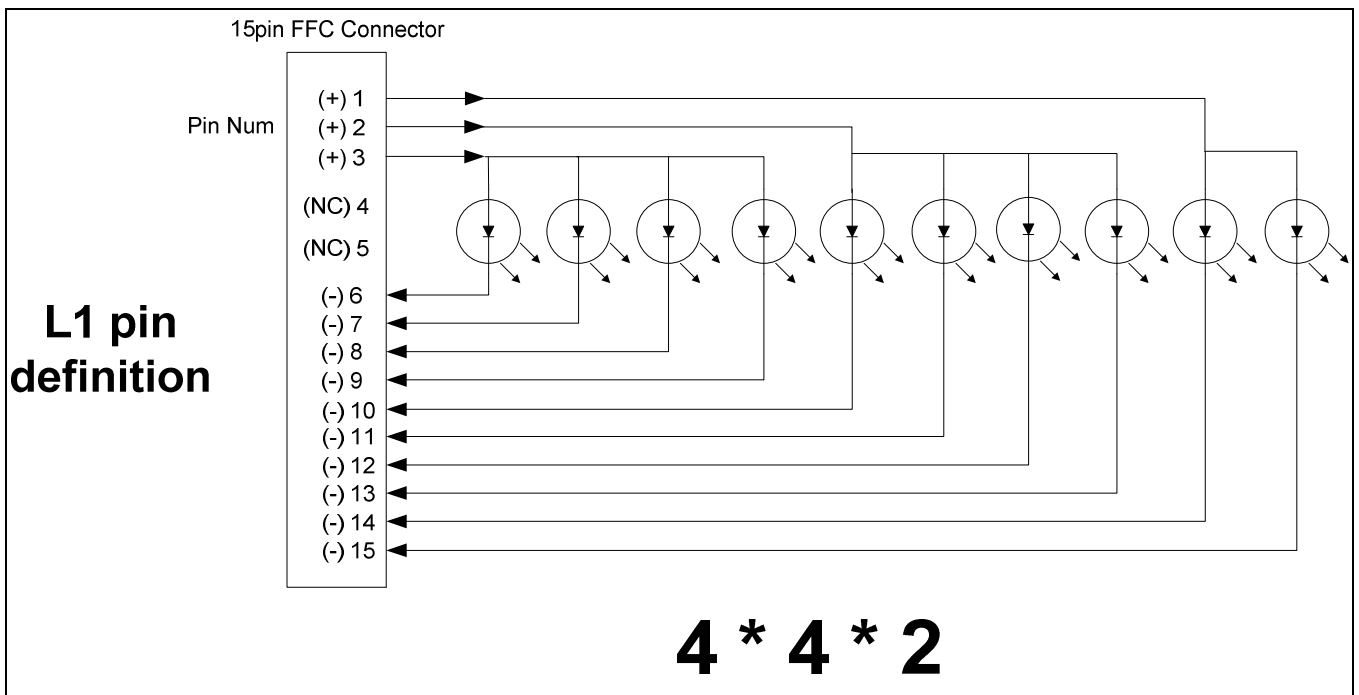
Note:

- (1) t_{2-1} : V by One training time after power-on. The timing of HTPDN falling edge to LOCKN falling edge decided by customer system.
- (2) $t_{4=0}$: concern for residual pattern before BLU turn off.
- (3) t_6 : voltage of VDD must decay smoothly after power-off. (Customer system decide this value)

3.7 Backlight Specification (without driver board)

3.7.1 Light bar Driven Condition

| Parameter | Symbol | Values | | | Unit | Note |
|--|---------|--------|-------|-------|------|--------------------|
| | | Min | Typ | Max | | |
| Forward Current (one light bar) | Anode | | 240 | 400 | mA | |
| | Cathode | | 60 | 100 | mA | |
| Peak Forward Current | IFP | | | 120 | mA | <1msec Per LED. |
| Forward Voltage | VF | 9.5 | 10.4 | 11.6 | V | |
| Forward Voltage Variation | ΔVF | | | 1.8 | V | |
| Total Power Consumption (4 light bars) | PBL | 136.8 | 149.8 | 167.0 | W | |



Note 1: Low dimming ratio operation

When PWM dimming duty ratio is operated lower than recommended value, feedback signal and all protection functions should be confirmed by LIPS design. Display performance should also be confirmed by customer's implement.

Note 2: Each LED string should be driven by independent current control/feedback circuit.

Note 3: Fuse protection should be added into LIPS circuit to have better LED driving protection.

3.7.2 Input Pin Assignment

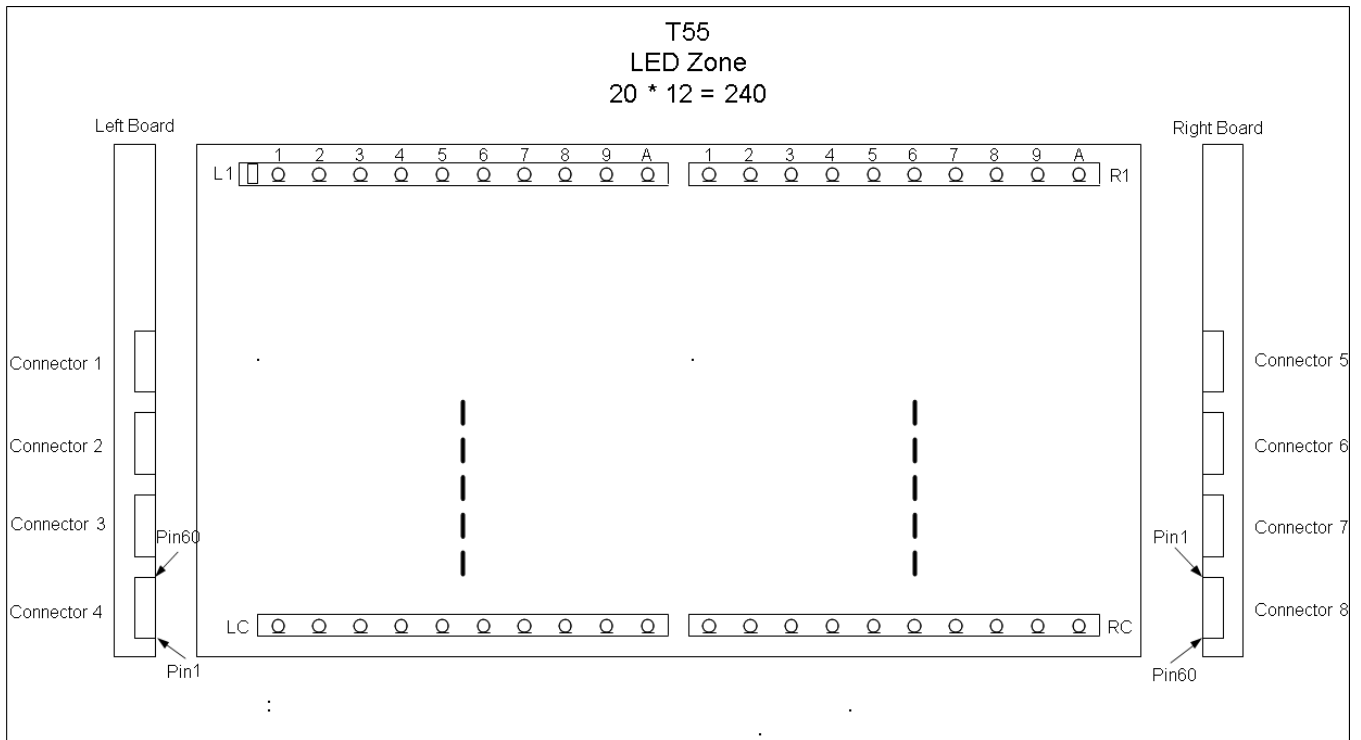
LED connector : P-two 196225-60041

Left Board

Right Board

| Pin Number | Connector 1 | Connector2 | Connector 3 | Connector 4 |
|------------|-------------|------------|-------------|-------------|
| 60 | NC | NC | NC | NC |
| 59 | L1_+1 | L4_+3 | L73- | LA7 |
| 58 | L1_+2 | NC | L74- | LA8 |
| 57 | L1_+2 | L41- | L75- | LA9 |
| 56 | L1_+3 | L42- | L76- | LAA |
| 55 | L1_+3 | L43- | L77- | NC |
| 54 | NC | L44- | L78- | NC |
| 53 | L11- | L45- | L79- | LB_+1 |
| 52 | L12- | L46- | L7A- | LB_+2 |
| 51 | L13- | L47- | NC | LB_+2 |
| 50 | L14- | L48- | NC | LB_+3 |
| 49 | L15- | L49- | L8_+1 | LB_+3 |
| 48 | L16- | L4A- | L8_+2 | NC |
| 47 | L17- | NC | L8_+2 | LB1 |
| 46 | L18- | NC | L8_+3 | LB2 |
| 45 | L19- | L5_+1 | L8_+3 | LB3 |
| 44 | L1A- | L5_+2 | NC | LB4 |
| 43 | NC | L5_+2 | L81- | LB5 |
| 42 | NC | L5_+3 | L82- | LB6 |
| 41 | L2_+1 | L5_+3 | L83- | LB7 |
| 40 | L2_+2 | NC | L84- | LB8 |
| 39 | L2_+2 | L51- | L85- | LB9 |
| 38 | L2_+3 | L52- | L86- | LBA |
| 37 | L2_+3 | L53- | L87- | NC |
| 36 | NC | L54- | L88- | NC |
| 35 | L21- | L55- | L89- | LC_+1 |
| 34 | L22- | L56- | L8A- | LC_+2 |
| 33 | L23- | L57- | NC | LC_+2 |
| 32 | L24- | L58- | NC | LC_+3 |
| 31 | L25- | L59- | L9_+1 | LC_+3 |
| 30 | L26- | L5A- | L9_+2 | NC |
| 29 | L27- | NC | L9_+2 | LC1 |
| 28 | L28- | NC | L9_+3 | LC2 |
| 27 | L29- | L6_+1 | L9_+3 | LC3 |
| 26 | L2A- | L6_+2 | NC | LC4 |
| 25 | NC | L6_+2 | L91- | LC5 |
| 24 | NC | L6_+3 | L92- | LC6 |
| 23 | L3_+1 | L6_+3 | L93- | LC7 |
| 22 | L3_+2 | NC | L94- | LC8 |
| 21 | L3_+2 | L61- | L95- | LC9 |
| 20 | L3_+3 | L62- | L96- | LCA |
| 19 | L3_+3 | L63- | L97- | NC |
| 18 | NC | L64- | L98- | NC |
| 17 | L31- | L65- | L99- | NC |
| 16 | L32- | L66- | L9A- | NC |
| 15 | L33- | L67- | NC | NC |
| 14 | L34- | L68- | NC | NC |
| 13 | L35- | L69- | LA_+1 | NC |
| 12 | L36- | L6A- | LA_+2 | NC |
| 11 | L37- | NC | LA_+2 | NC |
| 10 | L38- | NC | LA_+3 | NC |
| 9 | L39- | L7_+1 | LA_+3 | NC |
| 8 | L3A- | L7_+2 | NC | NC |
| 7 | NC | L7_+2 | LA1- | NC |
| 6 | NC | L7_+3 | LA2- | NC |
| 5 | L4_+1 | L7_+3 | LA3- | NC |
| 4 | L4_+2 | NC | LA4- | NC |
| 3 | L4_+2 | L71- | LA5- | NC |
| 2 | L4_+3 | L72- | LA6- | NC |
| 1 | NC | NC | NC | NC |

| Pin Number | Connector 5 | Connector 6 | Connector 7 | Connector 8 |
|------------|-------------|-------------|-------------|-------------|
| 1 | NC | NC | NC | NC |
| 2 | R1A- | R46- | R72- | RA_+3 |
| 3 | R19- | R45- | R71- | RA_+3 |
| 4 | R18- | R44- | NC | RA_+2 |
| 5 | R17- | R43- | R7_+3 | RA_+2 |
| 6 | R16- | R42- | R7_+3 | RA_+1 |
| 7 | R15- | R41- | R7_+2 | NC |
| 8 | R14- | NC | R7_+2 | NC |
| 9 | R13- | R4_+3 | R7_+1 | RBA- |
| 10 | R12- | R4_+3 | NC | RB9- |
| 11 | R11- | R4_+2 | NC | RB8- |
| 12 | NC | R4_+2 | R8A- | RB7- |
| 13 | R1_+3 | R4_+1 | R89- | RB6- |
| 14 | R1_+3 | NC | R88- | RB5- |
| 15 | R1_+2 | NC | R87- | RB4- |
| 16 | R1_+2 | R5A- | R86- | RB3- |
| 17 | R1_+1 | R59- | R85- | RB2- |
| 18 | NC | R58- | R84- | RB1- |
| 19 | NC | R57- | R83- | NC |
| 20 | R2A- | R56- | R82- | RB_+3 |
| 21 | R29- | R55- | R81- | RB_+3 |
| 22 | R28- | R54- | NC | RB_+2 |
| 23 | R27- | R53- | NC | RB_+2 |
| 24 | R26- | R52- | R8_+3 | RB_+1 |
| 25 | R25- | R51- | R8_+3 | NC |
| 26 | R24- | NC | R8_+2 | NC |
| 27 | R23- | R5_+3 | R8_+2 | RCA- |
| 28 | R22- | R5_+3 | R8_+1 | RC9- |
| 29 | R21- | R5_+2 | NC | RC8- |
| 30 | NC | R5_+2 | NC | RC7- |
| 31 | R2_+3 | R5_+1 | R9A- | RC6- |
| 32 | R2_+3 | NC | R99- | RC5- |
| 33 | R2_+2 | NC | R98- | RC4- |
| 34 | R2_+2 | R6A- | R97- | RC3- |
| 35 | R2_+1 | R69- | R96- | RC2- |
| 36 | NC | R68- | R95- | RC1- |
| 37 | NC | R67- | R94- | NC |
| 38 | R3A- | R66- | R93- | RC_+3 |
| 39 | R39- | R65- | R92- | RC_+3 |
| 40 | R38- | R64- | R91- | RC_+2 |
| 41 | R37- | R63- | NC | RC_+2 |
| 42 | R36- | R62- | R9_+3 | RC_+1 |
| 43 | R35- | R61- | R9_+3 | NC |
| 44 | R34- | NC | R9_+2 | NC |
| 45 | R33- | R6_+3 | R9_+2 | NC |
| 46 | R32- | R6_+3 | R9_+1 | NC |
| 47 | R31- | R6_+2 | NC | NC |
| 48 | NC | R6_+2 | NC | NC |
| 49 | R3_+3 | R6_+1 | RAA- | NC |
| 50 | R3_+3 | NC | RA9- | NC |
| 51 | R3_+2 | NC | RA8- | NC |
| 52 | R3_+2 | R7A- | RA7- | NC |
| 53 | R3_+1 | R79- | RA6- | NC |
| 54 | NC | R78- | RA5- | NC |
| 55 | NC | R77- | RA4- | NC |
| 56 | R4A- | R76- | RA3- | NC |
| 57 | R49- | R75- | RA2- | NC |
| 58 | R48- | R74- | RA1- | NC |
| 59 | R47- | R73- | NC | NC |
| 60 | NC | NC | NC | NC |

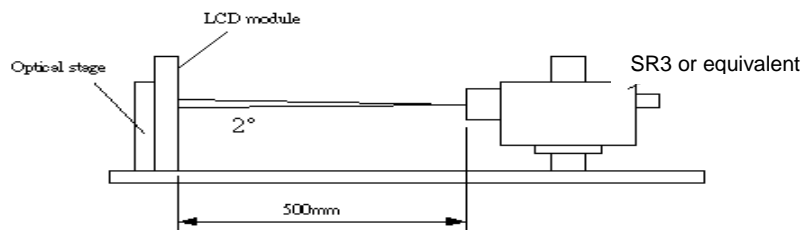


4. Optical Specification

4.1 2D Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of φ and θ equal to 0°.

Fig.1 presents additional information concerning the measurement equipment and method.



| Parameter | Symbol | Values | | | Unit | Notes |
|---------------------------|----------------------|--------|------|-----|-------------------|-------|
| | | Min. | Typ. | Max | | |
| Contrast Ratio | CR | 4000 | 5000 | -- | | 1 |
| Surface Luminance (White) | $L_{WH}(2D)$ | 360 | 450 | -- | cd/m ² | 2 |
| | $L_{WH}(3D)$ | | 450 | | | 6 |
| Luminance Variation | $\delta_{WHITE(9P)}$ | -- | -- | 1.3 | | 3 |
| Response Time (G to G) | T_{γ} | -- | 5.5 | -- | Ms | 4 |
| Color Gamut | NTSC | | 72 | | % | |
| Color Coordinates | | | | | | |

| | | | | | | | |
|---------------|--------------------------------------|------------|-----------|-------|-----------|--------|---|
| | Red | R_x | Typ.-0.03 | 0.640 | Typ.+0.03 | | |
| | | R_y | | 0.330 | | | |
| | Green | G_x | | 0.310 | | | |
| | | G_y | | 0.620 | | | |
| | Blue | B_x | | 0.150 | | | |
| | | B_y | | 0.050 | | | |
| | White | W_x | | 0.280 | | | |
| | | W_y | | 0.290 | | | |
| Viewing Angle | | | | | | | 5 |
| 2D | x axis, right($\varphi=0^\circ$) | θ_r | -- | 89 | -- | degree | |
| | x axis, left($\varphi=180^\circ$) | θ_l | -- | 89 | -- | degree | |
| | y axis, up($\varphi=90^\circ$) | θ_u | -- | 89 | -- | degree | |
| | y axis, down ($\varphi=270^\circ$) | θ_d | -- | 89 | -- | degree | |

Note:

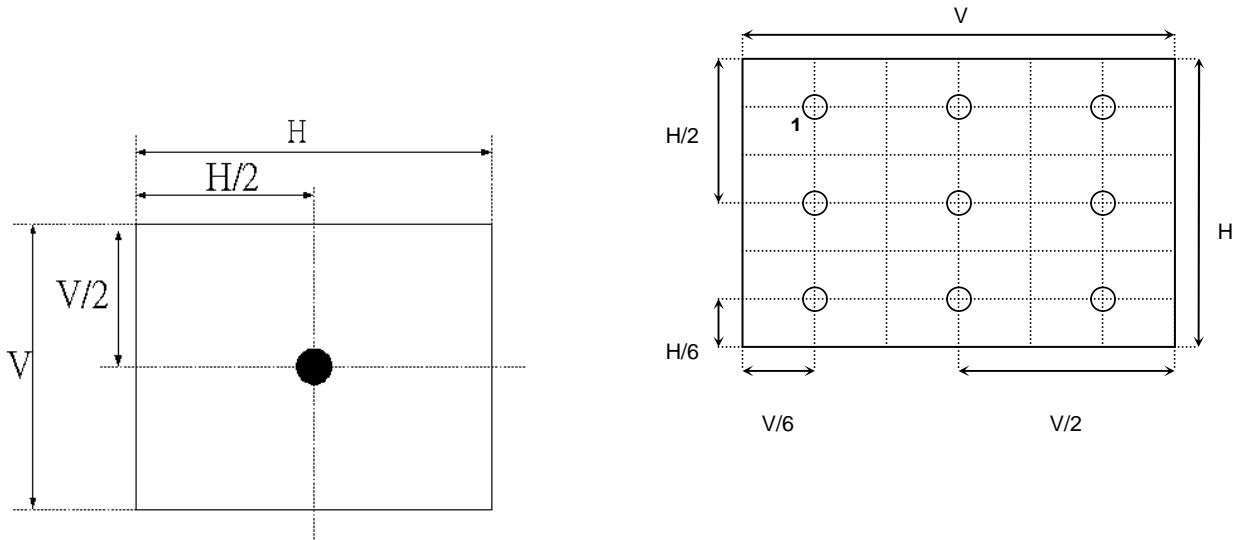
1. Contrast Ratio (CR) is defined mathematically as:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance of } L_{\text{on5}}}{\text{Surface Luminance of } L_{\text{off5}}}$$

2. Surface luminance is luminance value at point 5 across the LCD surface 50cm from the surface with all pixels displaying white. From more information see FIG 2. When LED current I_F = typical value (without driver board),

LED input $V_{DDB} = 24V$, I_{DDB} = Typical value (with driver board), $L_{WH} = L_{on5}$ where L_{on5} is the luminance with all pixels displaying white at center 5 location.

FIG. 2 Luminance



3. The variation in surface luminance, δ_{WHITE} is defined (center of Screen) as:

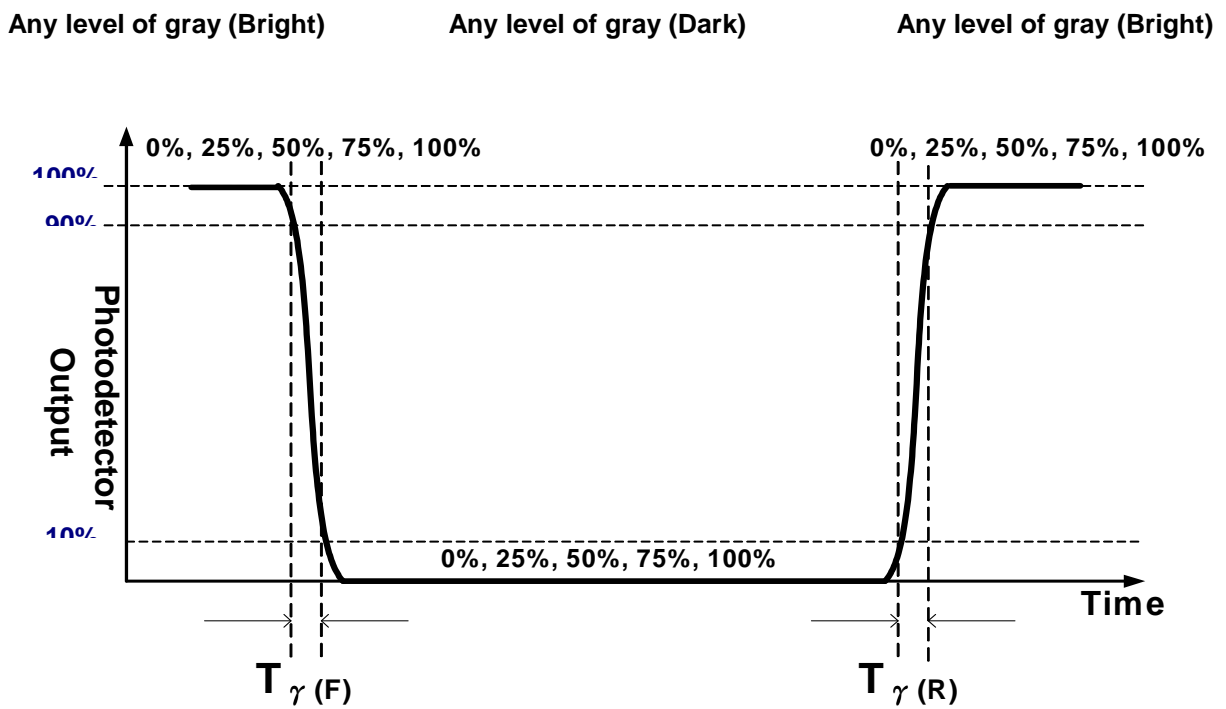
$$\delta_{WHITE(9P)} = \text{Maximum}(L_{on1}, L_{on2}, \dots, L_{on9}) / \text{Minimum}(L_{on1}, L_{on2}, \dots, L_{on9})$$

4. Response time T_{γ} is the average time required for display transition by switching the input signal for five luminance ratio (0%,25%,50%,75%,100% brightness matrix) and is based on $F_v=60\text{Hz}$ to optimize.

| Measured Response Time | | Target | | | | |
|------------------------|------|------------|-------------|-------------|-------------|-------------|
| | | 0% | 25% | 50% | 75% | 100% |
| Start | 0% | | 0% to 25% | 0% to 50% | 0% to 75% | 0% to 100% |
| | 25% | 25% to 0% | | 25% to 50% | 25% to 75% | 25% to 100% |
| | 50% | 50% to 0% | 50% to 25% | | 50% to 75% | 50% to 100% |
| | 75% | 75% to 0% | 75% to 25% | 75% to 50% | | 75% to 100% |
| | 100% | 100% to 0% | 100% to 25% | 100% to 50% | 100% to 75% | |

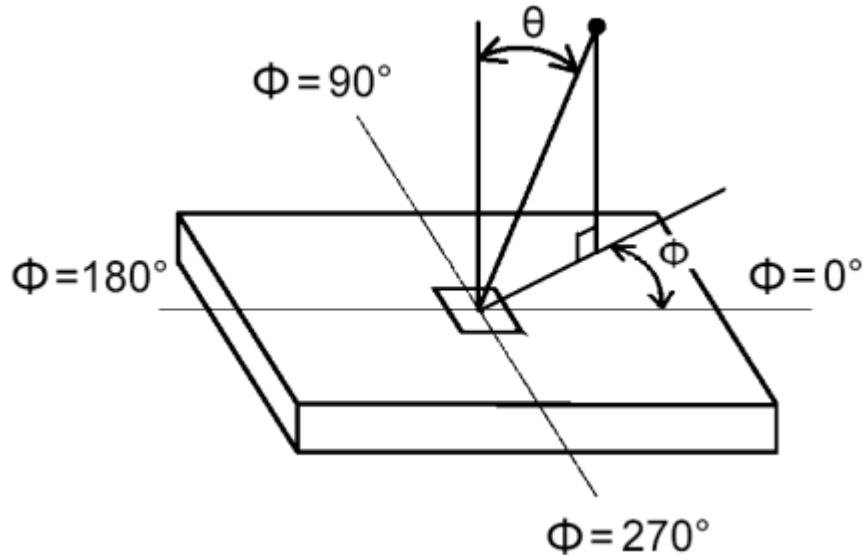
T_{γ} is determined by 10% to 90% brightness difference of rising or falling period. (As illustrated)

The response time is defined as the following figure and shall be measured by switching the input signal for “any level of grey(bright) “ and “any level of gray(dark)”.



5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG3.

FIG.3 Viewing Angle



4.2 3D Optical Specification

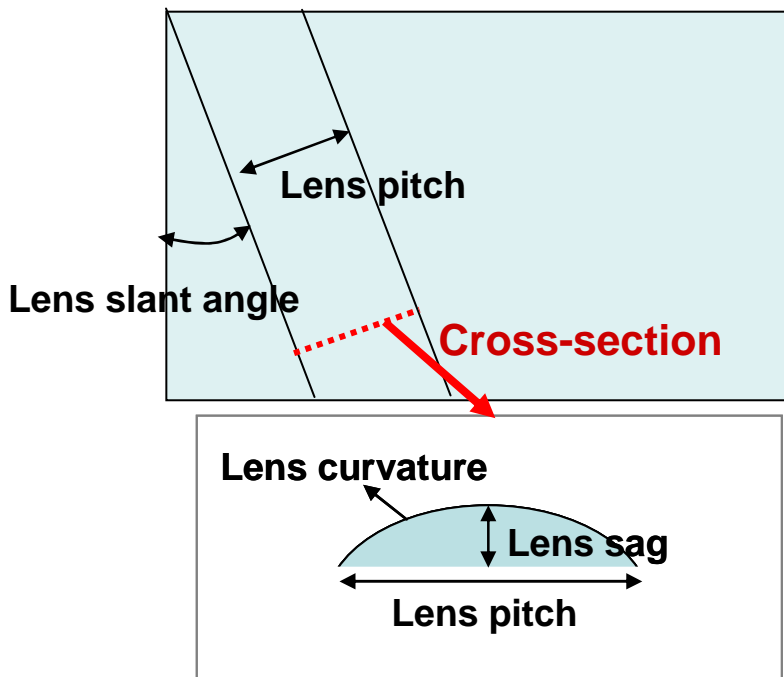
. 3D performance specification is expressed by 3D luminance, 3D Crosstalk and 3D viewing angle. 3D luminance which is defined by L255 in all 9 views and measured at panel center point. Also, 3D crosstalk is measured at panel center point

4-2-1 measurement items

| No. | Evaluation Items | Unit | Definition | 55" | | | Notes |
|-----|------------------|------|------------|---------|--------|---------|---------------------|
| | | | | Min | Typ | Max | |
| 1 | Lens pitch | um | Fig.1 | Typ-2.5 | 481.53 | Typ+2.5 | Incoming Inspection |
| 2 | Lens curvature | um | Fig.1 | -- | 301.8 | -- | Incoming Inspection |
| 3 | Lens sag | um | Fig.1 | Typ-2.0 | 119.8 | Typ+2.0 | Incoming Inspection |
| 4 | Lens slant angle | deg | Fig.1 | Typ-0.3 | 9.7824 | Typ+0.3 | Incoming Inspection |

| | | | | | | | |
|---|---------------------------------|---|--------------------------|----|-----|----|-------------|
| 5 | Converging distance Original | m | After AUO calibration | -- | 2.2 | -- | Calibration |
|---|---------------------------------|---|--------------------------|----|-----|----|-------------|

FIG.1 Lens structure

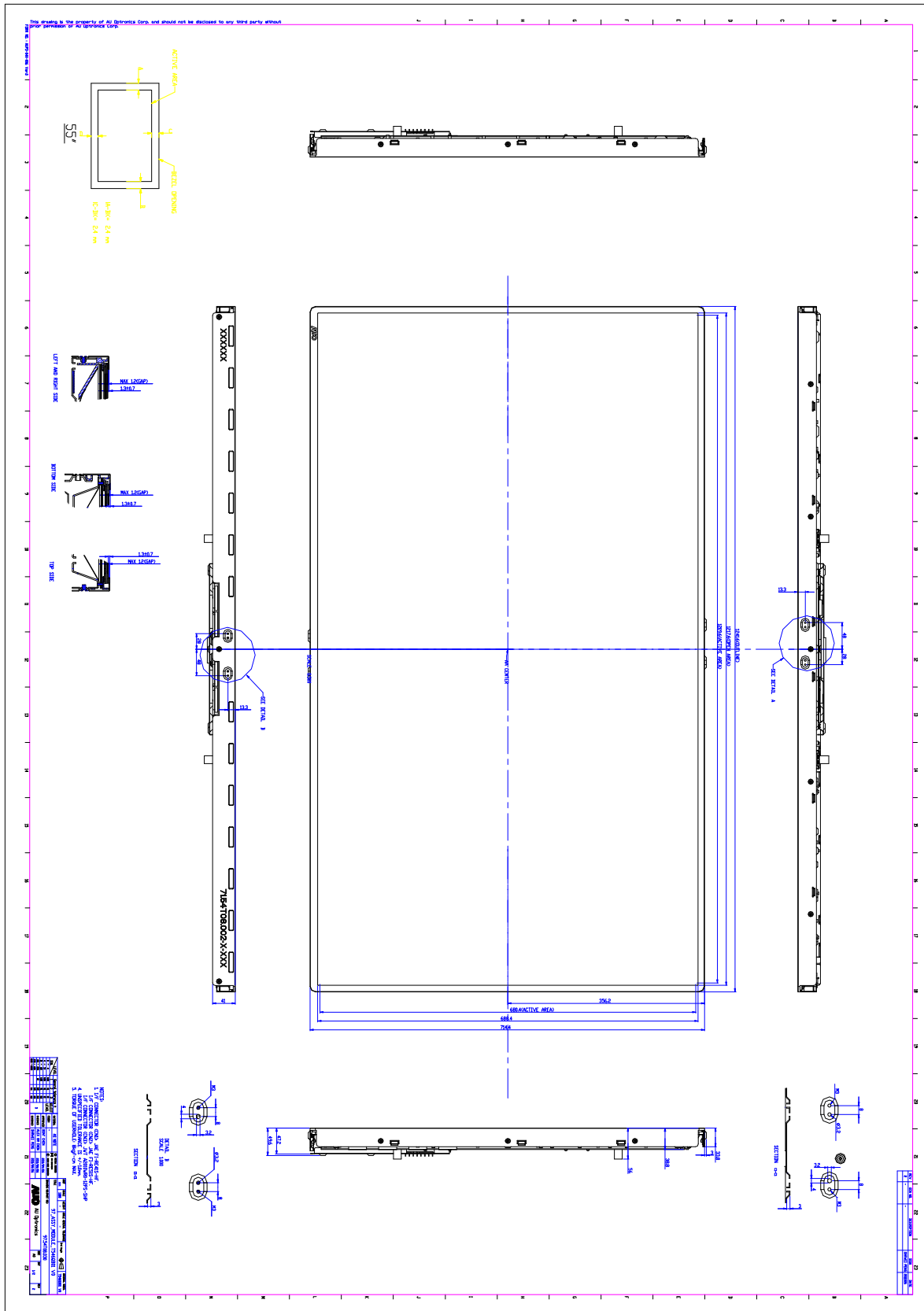


5. Mechanical Characteristics

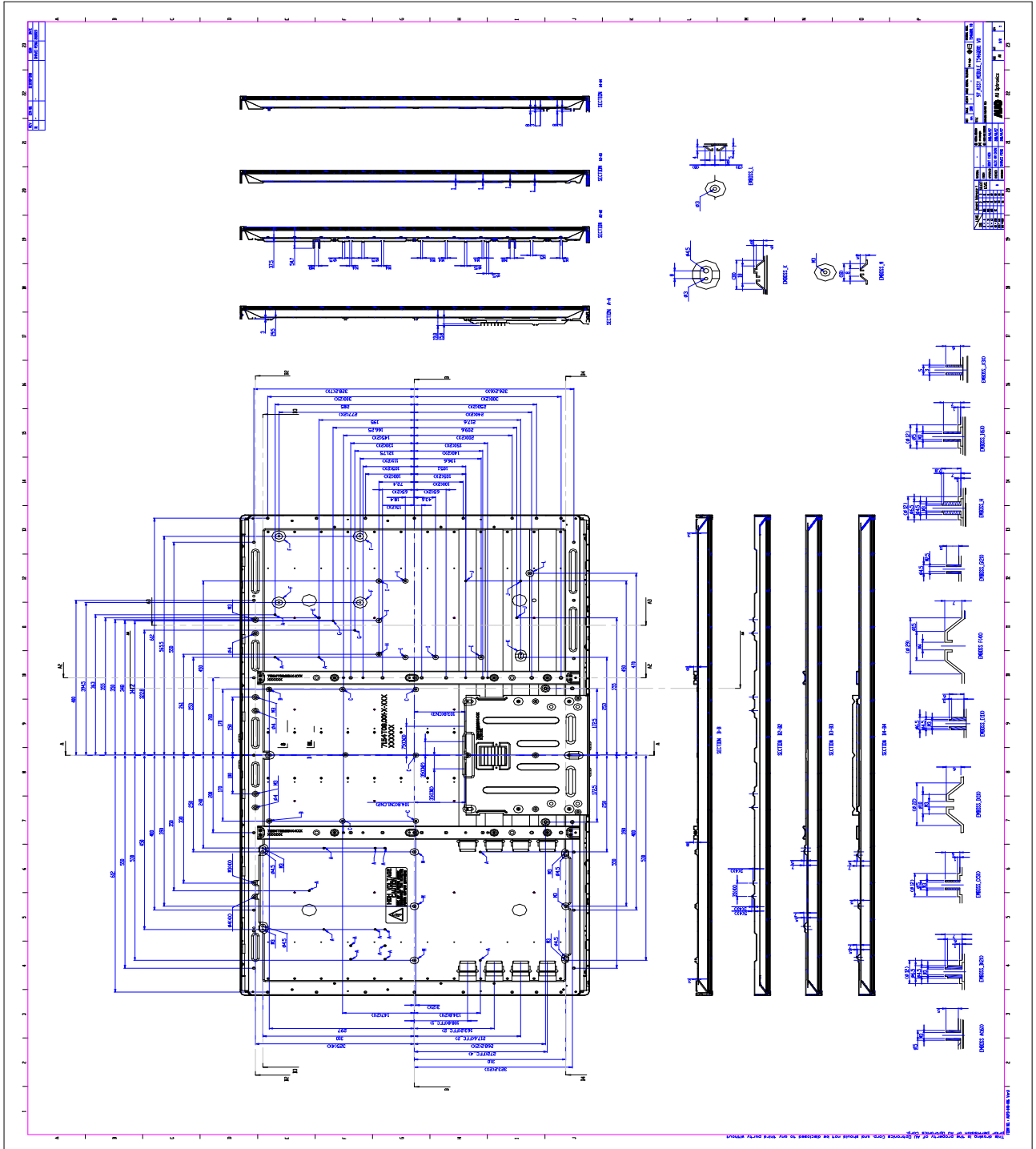
The contents provide general mechanical characteristics for the model T546QB01 V0. In addition the figures in the next page are detailed mechanical drawing of the LCD.

| Item | | Dimension | Unit | Note |
|-------------------|--------------|-----------|------|---------|
| Outline Dimension | Horizontal | 1241.6 | mm | |
| | Vertical | 714.4 | mm | |
| | Depth (Dmin) | 30.8 | mm | to rear |
| | Depth (Dmax) | 56 | mm | |
| Weight | 16642 | | g | |

Front View



Back View



6. Reliability Test Items

| | Test Item | Q'ty | Condition |
|---|---------------------------------|------|--|
| 1 | High temperature storage test | 3 | 60°C, 300hrs |
| 2 | Low temperature storage test | 3 | -20°C, 300hrs |
| 3 | High temperature operation test | 3 | 50°C, 300hrs |
| 4 | Low temperature operation test | 3 | -5°C, 300hrs |
| 5 | Vibration test (non-operation) | 3 | Wave form: random Vibration level : 1.0G RMS Bandwidth : 10-300Hz Duration : X,Y,Z 10min per axes X,Y,Z: Horizontal, face up |
| 6 | Shock test (non-operation) | 3 | Shock level 30G,11ms in ±X,Y,Z axis Waveform: half sine wave Direction: One time each direction |
| 7 | Vibration test (With carton) | 5 | Random wave (1.05Grms 10~200Hz) Duration : X,Y,Z 10min per axes |
| 8 | Drop test (With carton) | 5 | Height: 25.4cm (ASTMD4169-I) surround four flats, bottom flat two times (refer ASTM D 5276) |

7. International Standard

7.1 Safety

- (1) UL 60950-1, UL 60065; Standard for Safety of Information Technology Equipment Including electrical Business Equipment.
- (2) IEC 60950-1 : 2001, IEC 60065:2001 ; Standard for Safety of International Electrotechnical Commission
- (3) EN 60950 : 2001+A11, EN 60065:2002+A1:2006; European Committee for Electrotechnical Standardization (CENELEC), EUROPEAN STANDARD for Safety of Information Technology Equipment Including Electrical Business Equipment.

7.2 EMC

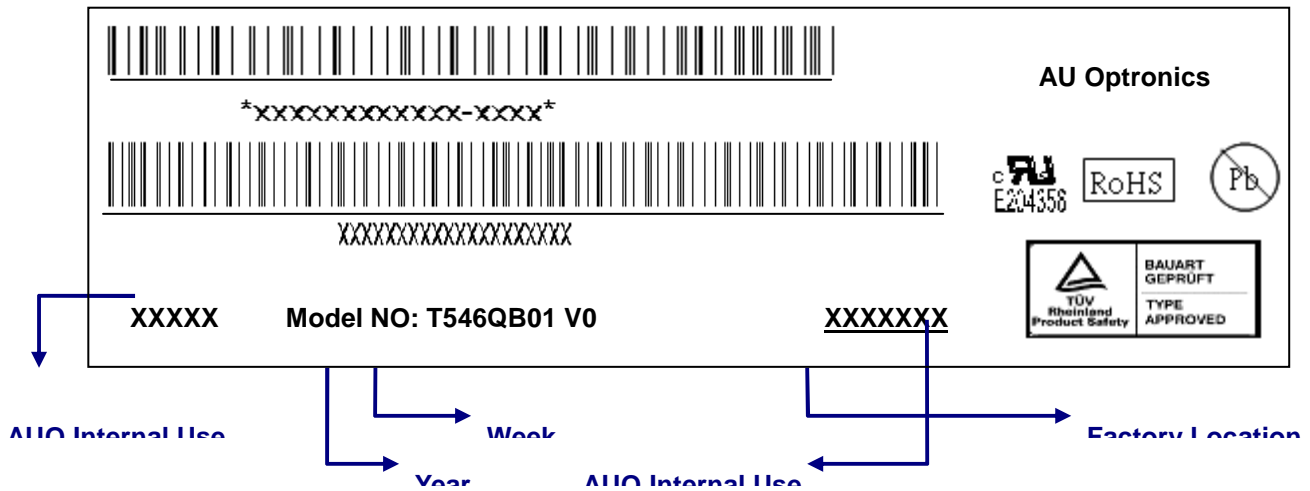
- (1) ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. "American National standards Institute(ANSI), 1992
- (2) C.I.S.P.R "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." International Special committee on Radio Interference.
- (3) EN 55022 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." European Committee for Electrotechnical Standardization. (CENELEC), 1998

8. Packing



8-1 DEFINITION OF LABEL:

A. Panel Label:

XXXXXXXXXXXX-XXXX



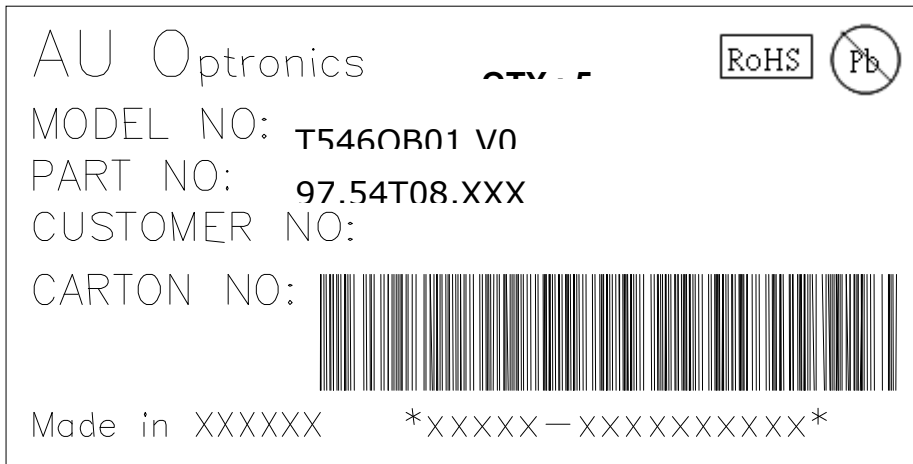
Green mark description

- (1) For Pb Free Product, AUO will add  for identification.
- (2) For RoHS compatible products, AUO will add  for identification.

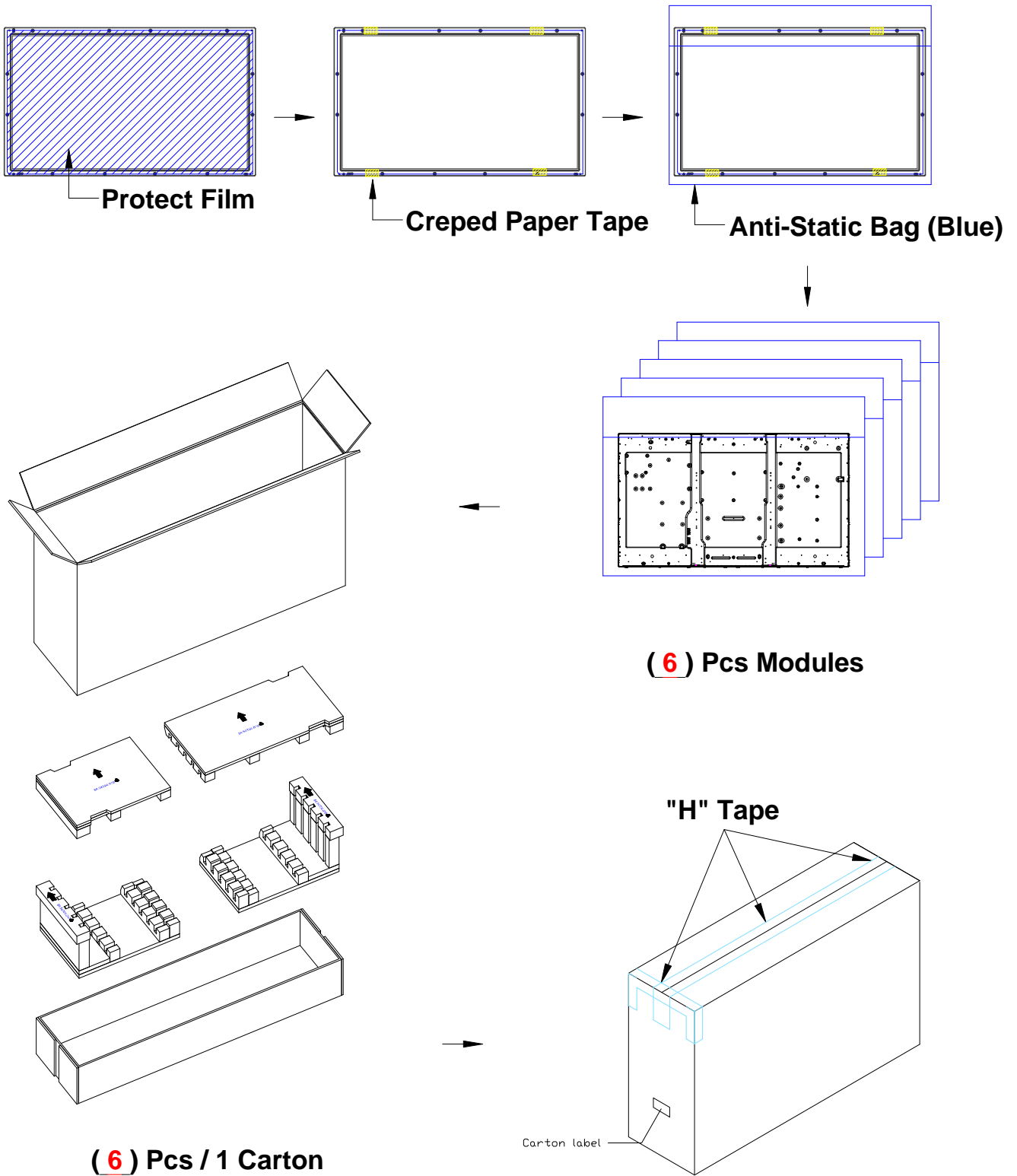
Note: The green Mark will be present only when the green documents have been ready by AUO internal green

team. (definition of green design follows the AUO green design checklist.)

B. Carton Label:

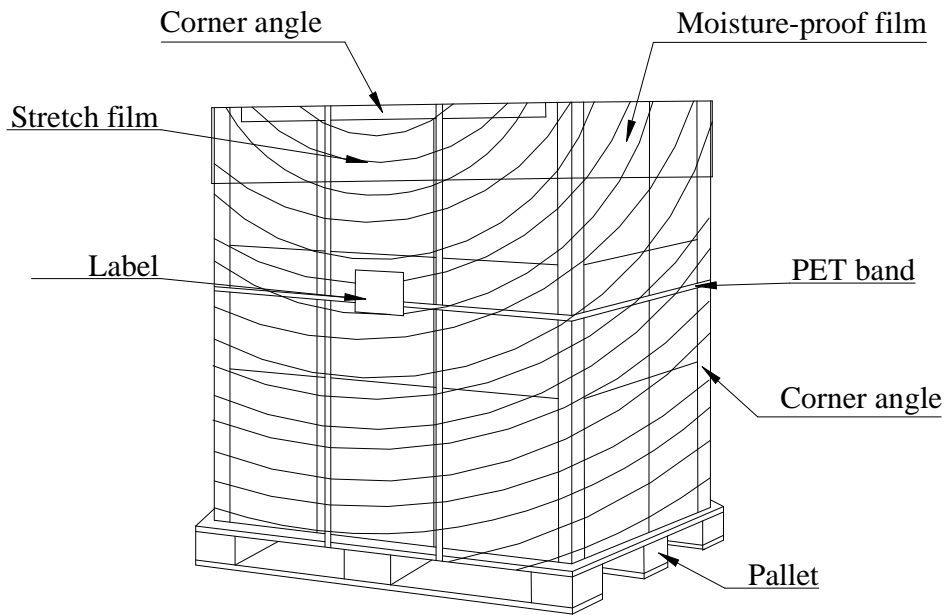


8-2 PACKING METHODS:



8-3 Pallet and Shipment Information

| | Item | Specification | | | Packing Remark |
|---|----------------------|----------------|------------------------|----------------------|-----------------|
| | | Qty. | Dimension | Total Weight (kg) | Qty. |
| 1 | Packing BOX | 6pcs/box | 1355(L)*565(W)*806(H) | Packing BOX | 6pcs/box |
| | | | | | Cushion = 3.6kg |
| 2 | Pallet | 1 | 1390(L)*1150(W)*138(H) | Pallet | 1 |
| 3 | Boxes per Pallet | 2 boxes/pallet | | | |
| 4 | Panels per Pallet | 12pcs/pallet | | | |
| | Pallet after packing | 32 | 1390(L)*1150(W)*944(H) | Pallet after packing | 32 |



9.PRECAUTIONS

Please pay attention to the followings when you use this TFT LCD module.

9-1 MOUNTING PRECAUTIONS

- (1) You must mount a module using holes arranged in four corners or four sides.
- (2) You should consider the mounting structure so that uneven force (ex. twisted stress) is not applied to module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- (3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to resist external force.
- (4) You should adopt radiation structure to satisfy the temperature specification.
- (5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter cause circuit broken by electro-chemical reaction.
- (6) Do not touch, push or rub the exposed polarizer with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)
- (7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front/ rear polarizer. Do not use acetone, toluene and alcohol because they cause

chemical damage to the polarizer.

- (8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (9) Do not open the case because inside circuits do not have sufficient strength.

9-2 OPERATING PRECAUTIONS

- (1) The device listed in the product specification sheets was designed and manufactured for TV application
- (2) The spike noise causes the mis-operation of circuits. It should be lower than following voltage:
 $V=\pm 200\text{mV}$ (Over and under shoot voltage)
- (3) Response time depends on the temperature. (In lower temperature, it becomes longer..)
- (4) Brightness of CCFL depends on the temperature. (In lower temperature, it becomes lower.) And in lower temperature, response time (required time that brightness is stable after turned on) becomes longer.
- (5) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (6) When fixed patterns are displayed for a long time, remnant image is likely to occur.
- (7) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interface.

9-3 ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wristband etc. And don't touch interface pin directly.

9-4 PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

9-5 STORAGE

When storing modules as spares for a long time, the following precautions are necessary.

- (1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- (2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

9-6 HANDLING PRECAUTIONS FOR PROTECTION FILM

- (1) The protection film is attached to the bezel with a small masking tape. When the protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
 - (2) When the module with protection film attached is stored for a long time, sometimes there remains a
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very small amount of glue still on the bezel after the protection film is peeled off.

- (3) You can remove the glue easily. When the glue remains on the bezel or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.