

TENTATIVE



FOR MESSRS : \_\_\_\_\_

DATE : Dec. 11<sup>th</sup>, 2023

## TECHNICAL DATA

# TX40D202VM0BAB

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ACCEPTED BY : \_\_\_\_\_

PROPOSED BY : *Alex Lee*

## 2. RECORD OF REVISION

| DATE | SHEET No. | SUMMARY |
|------|-----------|---------|
|      |           |         |

### 3. GENERAL DATA

#### 3.1 DISPLAY FEATURES

This module is a 15.6" FHD of 16:9 format amorphous silicon TFT. The pixel format is vertical stripe and sub pixels are arranged as R (red), G (green), B (blue) sequentially. This display is RoHS compliant, COG (chip on glass) technology and LED backlight are applied on this display.

|                         |  |
|-------------------------|--|
| Part Name               | TX40D202VM0BAB                             |
| Module Dimensions       | 367.86(W) mm x 219.51(H) mm x 14.71 (D) mm |
| LCD Active Area         | 344.16(W) mm x 193.59(H) mm                |
| Pixel Pitch             | 0.1792(W) mm x 0.1792 (H) mm               |
| Resolution              | 1920 x 3(RGB)(W) x 1080(H) dots            |
| Color Pixel Arrangement | R, G, B Vertical stripe                    |
| LCD Type                | Transmissive Color TFT; Normally Black     |
| Display Type            | Active Matrix                              |
| Number of Colors        | 16.7M Colors (8-bit RGB)                   |
| Backlight               | Light Emitting Diode (LED)                 |
| Weight                  | 668g                                       |
| Interface               | 2ch-LVDS; 50 pins                          |
| Power Supply Voltage    | 5.0V for LCD; 30V for Backlight            |
| Power Consumption       | 1.5W for LCD , 23.5W for Backlight         |
| Viewing Direction       | Super Wide Version                         |

## 4. ABSOLUTE MAXIMUM RATINGS

| Item                   | Symbol   | Min. | Max.           | Unit | Remarks |
|------------------------|----------|------|----------------|------|---------|
| Supply Voltage         | $V_{DD}$ | -0.3 | 6.0            | V    | -       |
| Input Voltage of Logic | $V_I$    | -0.3 | $V_{DD} + 0.3$ | V    | Note 1  |
| Operating Temperature  | $T_{op}$ | -30  | 85             | °C   | Note 2  |
| Storage Temperature    | $T_{st}$ | -40  | 90             | °C   | Note 2  |
| LED Forward Current    | $I_F$    | -    | 200            | mA   | -       |

Note 1: The rating is defined for the signal voltages of the interface such as CLK and data pairs.

Note 2: The maximum rating is defined as above based on the chamber temperature, which might be different from ambient temperature after assembling the panel into the application. Moreover, some temperature-related phenomenon as below needed to be noticed:

- Background color, contrast and response time would be different in temperatures other than 25°C.
- Operating under high temperature will shorten LED lifetime.

# 5. ELECTRICAL CHARACTERISTICS

## 5.1 OPERATING CONDITIONS

$T_a = 25\text{ }^\circ\text{C}$ ,  $V_{SS} = 0\text{V}$

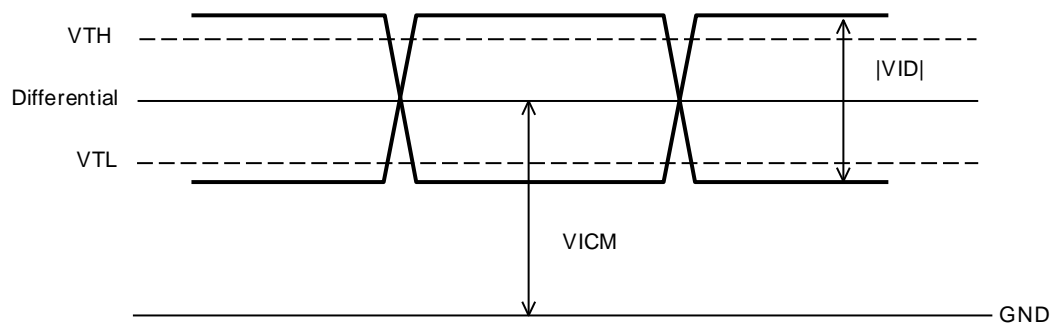
| Item                                   | Symbol     | Condition             | Standard Value |      |                   | Unit        | Remarks  |
|--|------------|-----------------------|----------------|------|-------------------|-------------|----------|
|  |            |                       | Min.           | Typ. | Max.              |             |          |
| Power Supply Voltage                   | $V_{DD}$   | -                     | 4.7            | 5.0  | 5.0               | V           | -        |
| Power Supply Current                   | $I_{DD}$   | Note 1                | -              | 313  | -                 | mA          | Note 1,4 |
| Allowable Ripple Voltage               | VRP        | -                     | -              | -    | 100               | mV<br>(p-p) | Note 2   |
| Differential Input High Threshold      | VTH        | $V_{ICM}=1.2\text{V}$ | -              | -    | 100               | mV          | Note 3   |
| Differential Input Low Threshold       | VTL        | $V_{ICM}=1.2\text{V}$ | -100           | -    | -                 | mV          |          |
| Input Differential Voltage             | $ V_{ID} $ | -                     | 200            | 400  | 600               | mV          |          |
| Differential Input Common Mode Voltage | $V_{ICM}$  | -                     | $V_{ID}/2$     | 1.2  | $2.25-(V_{ID}/2)$ | V           |          |

Note 1: Measurement pattern: All white.

Power supply voltage: Typ. voltage.

Note 2: Applied pin is  $\{V_{DD}\}$

Note 3: Signal of interest is LVDS.



Note 5: (TBD) fuse is applied in the module for  $I_{DD}$ . For display activation and protection purpose, power supply is recommended larger than (TBD) to start the display and break fuse once any short circuit occurred.

## 5.2 BACKLIGHT CHARACTERISTICS

$T_a = 25\text{ }^\circ\text{C}$

| Item                | Symbol    | Condition             | Min. | Typ. | Max. | Unit | Remarks |
|---------------------|-----------|-----------------------|------|------|------|------|---------|
| LED Input Voltage   | $V_{LED}$ | $I_{LED}=98\text{mA}$ | -    | 30   | -    | V    | Note 1  |
| LED Forward Current | $I_{LED}$ | Per string            | -    | 98   | -    | mA   | -       |
| LED Lifetime        | -         | $I_{LED}=98\text{mA}$ | -    | 70K  | -    | hrs  | Note 2  |

Note 1: Fig. 5.1 shows the LED backlight circuit.

Note 2: The estimated lifetime is specified as the time to reduce 50% brightness.

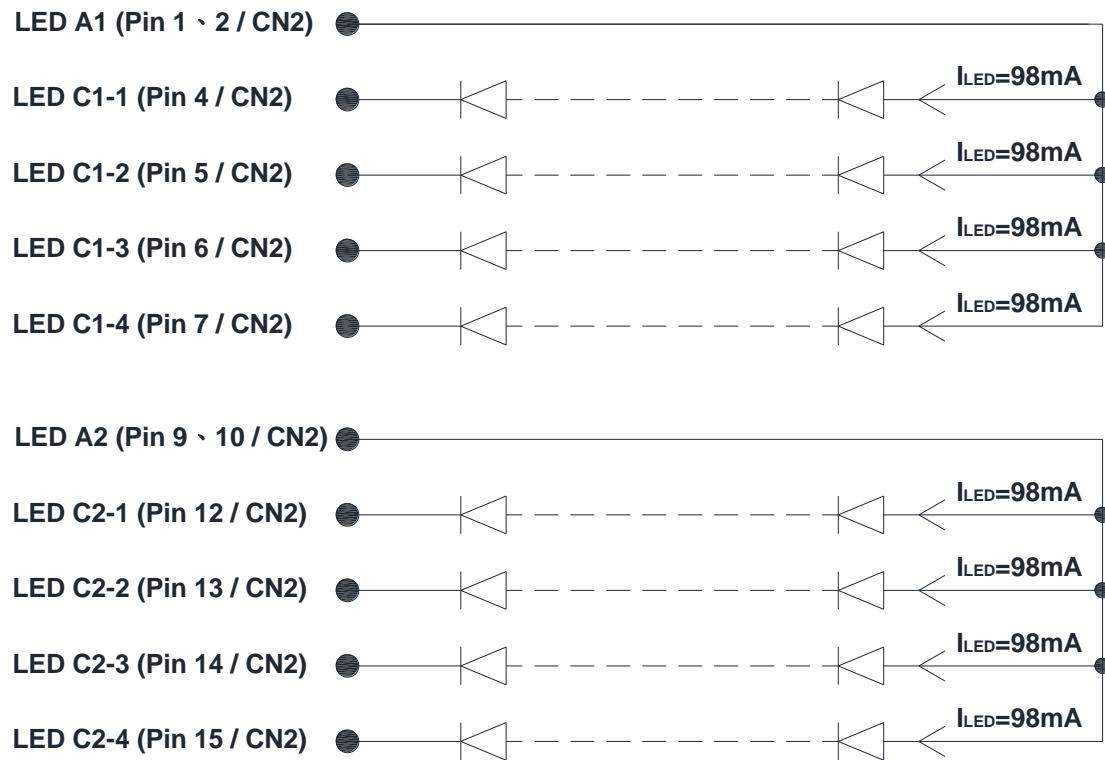


Fig 5.1

## 6. OPTICAL CHARACTERISTICS

The optical characteristics are measured based on the conditions as below:

- Supplying the signals and voltages defined in the section of electrical characteristics.
- The backlight unit needs to be turned on for 30 minutes.
- The ambient temperature is 25 °C .
- In the dark room around 100 lx, the equipment has been set for the measurements as shown in Fig 6.1.

$$T_a = 25 \text{ }^\circ\text{C}, f_{Frame} = 60 \text{ Hz}, V_{DD} = 3.3\text{V}$$

| Item                  | Symbol        | Condition  | Min. | Typ. | Max. | Unit              | Remarks |
|-----------------------|---------------|--|------|------|------|-------------------|---------|
| Brightness of White   | -             | $\phi = 0^\circ, \theta = 0^\circ,$<br>$I_{LED} = 98 \text{ mA}$ | 1200 | 1500 | -    | cd/m <sup>2</sup> | Note 1  |
| Brightness Uniformity | -             |  | 70   | -    | -    | %                 | Note 2  |
| Contrast Ratio        | CR            |  | 700  | 1200 | -    | -                 | Note 3  |
| Response Time         | $T_r + T_f$   | $\phi = 0^\circ, \theta = 0^\circ$                               | -    | 30   | -    | ms                | Note 4  |
| NTSC Ratio            | -             | $\phi = 0^\circ, \theta = 0^\circ$                               | -    | 80   | -    | %                 | -       |
| Viewing Angle         | $\theta_x$    | $\phi = 0^\circ, CR \geq 10$                                     | -    | 85   | -    | Degree            | Note 5  |
|                       | $\theta_{x'}$ | $\phi = 180^\circ, CR \geq 10$                                   | -    | 85   | -    |                   |         |
|                       | $\theta_y$    | $\phi = 90^\circ, CR \geq 10$                                    | -    | 85   | -    |                   |         |
|                       | $\theta_{y'}$ | $\phi = 270^\circ, CR \geq 10$                                   | -    | 85   | -    |                   |         |
| Color Chromaticity    | Red           | X  | 0.62 | 0.67 | 0.72 | -                 | Note 6  |
|                       |               | Y  | 0.26 | 0.31 | 0.36 |                   |         |
|                       | Green         | X  | 0.22 | 0.27 | 0.32 |                   |         |
|                       |               | Y  | 0.57 | 0.62 | 0.67 |                   |         |
|                       | Blue          | X  | 0.10 | 0.15 | 0.2  |                   |         |
|                       |               | Y  | 0.04 | 0.09 | 0.14 |                   |         |
|                       | White         | X  | 0.24 | 0.29 | 0.34 |                   |         |
|                       |               | Y  | 0.26 | 0.31 | 0.36 |                   |         |

Note 1: The brightness is measured from the panel center point, P5 in Fig. 6.2, for the typical value.

Note 2: The brightness uniformity is calculated by the equation as below:

$$\text{Brightness uniformity} = \frac{\text{Min. Brightness}}{\text{Max. Brightness}} \times 100\%$$

which is based on the brightness values of the 9 points measured by BM-5 as shown in Fig. 6.2.

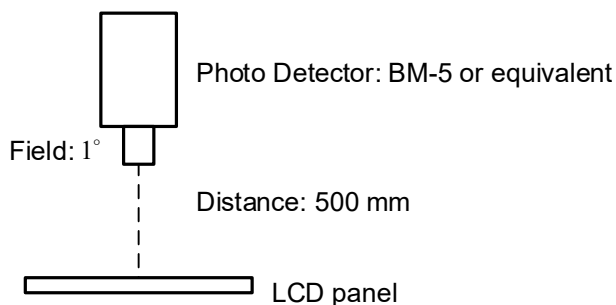


Fig. 6.1

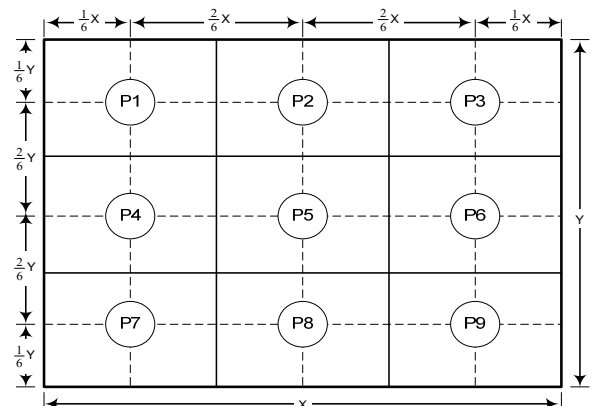


Fig. 6.2

Note 3: The Contrast Ratio is measured from the center point of the panel, P5, and defined as the following equation:

$$CR = \frac{\text{Brightness of White}}{\text{Brightness of Black}}$$

Note 4: The definition of response time is shown in Fig. 6.3. The rising time is the period from 10% brightness to 90% brightness when the data is from black to white. Oppositely, Falling time is the period from 90% brightness falling to 10% brightness.

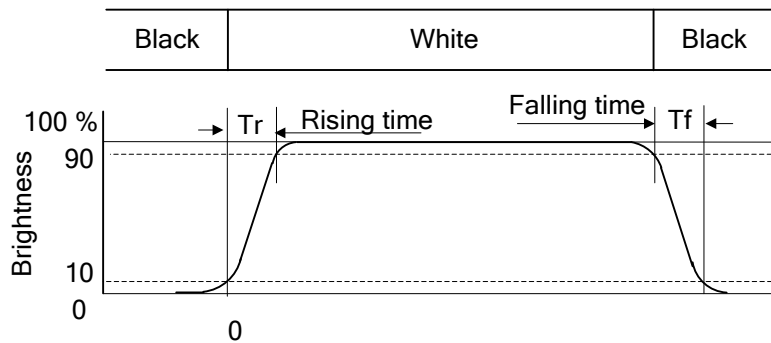


Fig 6.3

Note 5: The definition of viewing angle is shown in Fig. 6.4. Angle  $\phi$  is used to represent viewing directions, for instance,  $\phi = 270^\circ$  means 6 o'clock, and  $\phi = 0^\circ$  means 3 o'clock. Moreover, angle  $\theta$  is used to represent viewing angles from axis Z toward plane XY.

The display is super wide viewing angle version;  $85^\circ$  viewing angle can be obtained from each viewing direction.

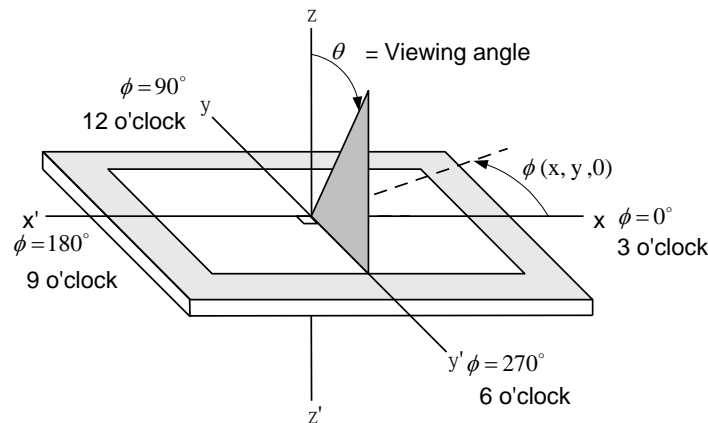
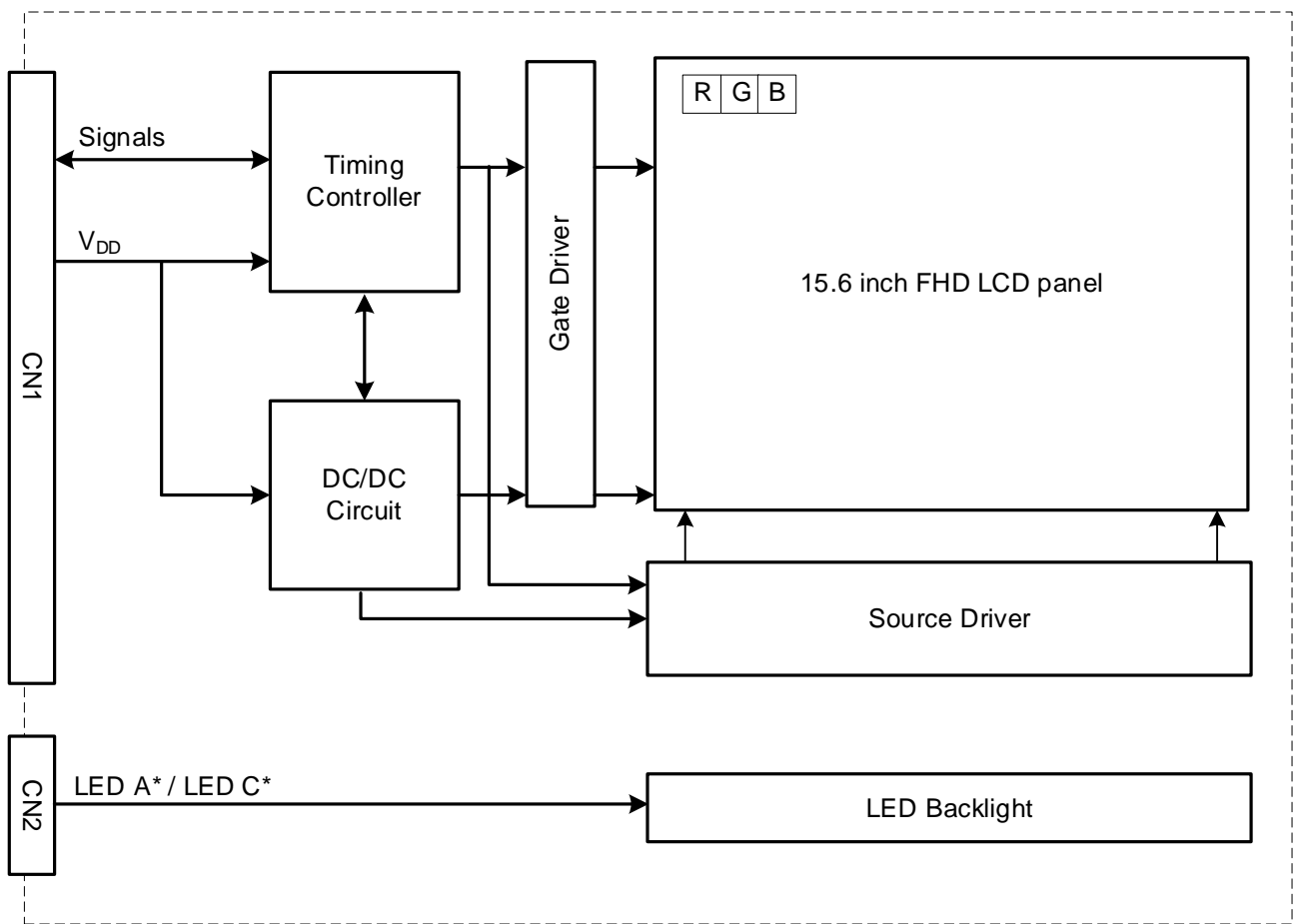


Fig 6.4

Note 6: The color chromaticity is measured from the center point of the panel, P5, as shown in Fig. 6.2.



## 7. BLOCK DIAGRAM



Note1: Signals are EN,CLK and pixel data pairs.

## 8. LCD INTERFACE

### 8.1 INTERFACE PIN CONNECTIONS

The display interface connector CN1 is FH28-50S-0.5SH (Hirose), and Pin assignment is as below:

| No | Symbol    | Function                                   | I/O |
|----|-----------|--|-----|
| 1  | GND       | GND (0V)                                   | I   |
| 2  | NC        | Not connected                              | -   |
| 3  | VDD       | +5.0V Power Supply for Logic               | I   |
| 4  | VDD       |  |     |
| 5  | VDD       |  |     |
| 6  | NC        | Not connected                              | -   |
| 7  | GND       | GND (0V)                                   | I   |
| 8  | GND       |  |     |
| 9  | GND       |  |     |
| 10 | ORXIN0 -  | -LVDS differential data input, Chan 0-odd  | I   |
| 11 | ORXIN0+   | +LVDS differential data input, Chan 0-odd  | I   |
| 12 | ORXIN1-   | -LVDS differential data input, Chan 1-odd  | I   |
| 13 | ORXIN1+   | +LVDS differential data input, Chan 1-odd  | I   |
| 14 | ORXIN2-   | -LVDS differential data input, Chan 2-odd  | I   |
| 15 | ORXIN2+   | +LVDS differential data input, Chan 2-odd  | I   |
| 16 | ORXCLKIN- | -LVDS clock input(odd)                     | I   |
| 17 | ORXCLKIN+ | +LVDS clock input(odd)                     | I   |
| 18 | ORXIN3 -  | -LVDS differential data input, Chan 3-odd  | I   |
| 19 | ORXIN3 +  | +LVDS differential data input, Chan 3-odd  | I   |
| 20 | ERXIN0-   | -LVDS differential data input, Chan 0-Even | I   |
| 21 | ERXIN0+   | +LVDS differential data input, Chan 0-Even | I   |
| 22 | ERXIN1-   | -LVDS differential data input, Chan 1-Even | I   |
| 23 | ERXIN1+   | +LVDS differential data input, Chan 1-Even | I   |
| 24 | ERXIN2-   | -LVDS differential data input, Chan 2-Even | I   |
| 25 | ERXIN2+   | +LVDS differential data input, Chan 2-Even | I   |
| 26 | ERXCLKIN- | -LVDS clock input(Even)                    | I   |
| 27 | ERXCLKIN+ | +LVDS clock input(Even)                    | I   |
| 28 | ERXIN3-   | -LVDS differential data input, Chan 3-Even | I   |
| 29 | ERXIN3+   | +LVDS differential data input, Chan 3-Even | I   |
| 30 | GND       | GND (0V)                                   | I   |

| No | Symbol | Function            | I/O |
|----|--------|---------------------|-----|
| 31 | NC     | Not connected       | -   |
| 32 | NC     |                     | -   |
| 33 | EN     | Enable input (3.3V) | I   |
| 34 | NC     | Not connected       | -   |
| 35 | NC     |                     |     |
| 36 | NC     |                     |     |
| 37 | NC     |                     |     |
| 38 | GND    | GND (0V)            | I   |
| 39 | GND    |                     |     |
| 40 | NC     | Not connected       | I   |
| 41 |        |                     |     |
| 42 |        |                     |     |
| 43 |        |                     |     |
| 44 |        |                     |     |
| 45 |        |                     |     |
| 46 |        |                     |     |
| 47 |        |                     |     |
| 48 |        |                     |     |
| 49 |        |                     |     |
| 50 |        |                     |     |

The interface CN2 is SM15B-SRSS-TB(LF)(SN) made by JST and pin assignment is as below:

| Connector Name        | Pin No. | Symbol              | Function                  |
|-----------------------|---------|---------------------|---------------------------|
| SM15B-SRSS-TB(LF)(SN) | 1       | V <sub>LED</sub> A1 | LED Anode Terminal (1)    |
|                       | 2       | V <sub>LED</sub> A1 | LED Anode Terminal (1)    |
|                       | 3       | NC                  | Not connected             |
|                       | 4       | VLED C1-1           | LED Cathode Terminal1 (1) |
|                       | 5       | VLED C1-2           | LED Cathode Terminal2 (1) |
|                       | 6       | VLED C1-3           | LED Cathode Terminal3 (1) |
|                       | 7       | VLED C1-4           | LED Cathode Terminal4 (1) |
|                       | 8       | NC                  | Not connected             |
|                       | 9       | V <sub>LED</sub> A2 | LED Anode Terminal (2)    |
|                       | 10      | V <sub>LED</sub> A2 | LED Anode Terminal (2)    |
|                       | 11      | NC                  | Not connected             |
|                       | 12      | VLED C2-1           | LED Cathode Terminal1 (2) |
|                       | 13      | VLED C2-2           | LED Cathode Terminal2 (2) |
|                       | 14      | VLED C2-3           | LED Cathode Terminal3 (2) |
|                       | 15      | VLED C2-4           | LED Cathode Terminal4 (2) |

## 8.2 TIMING CHART

### Horizontal timing

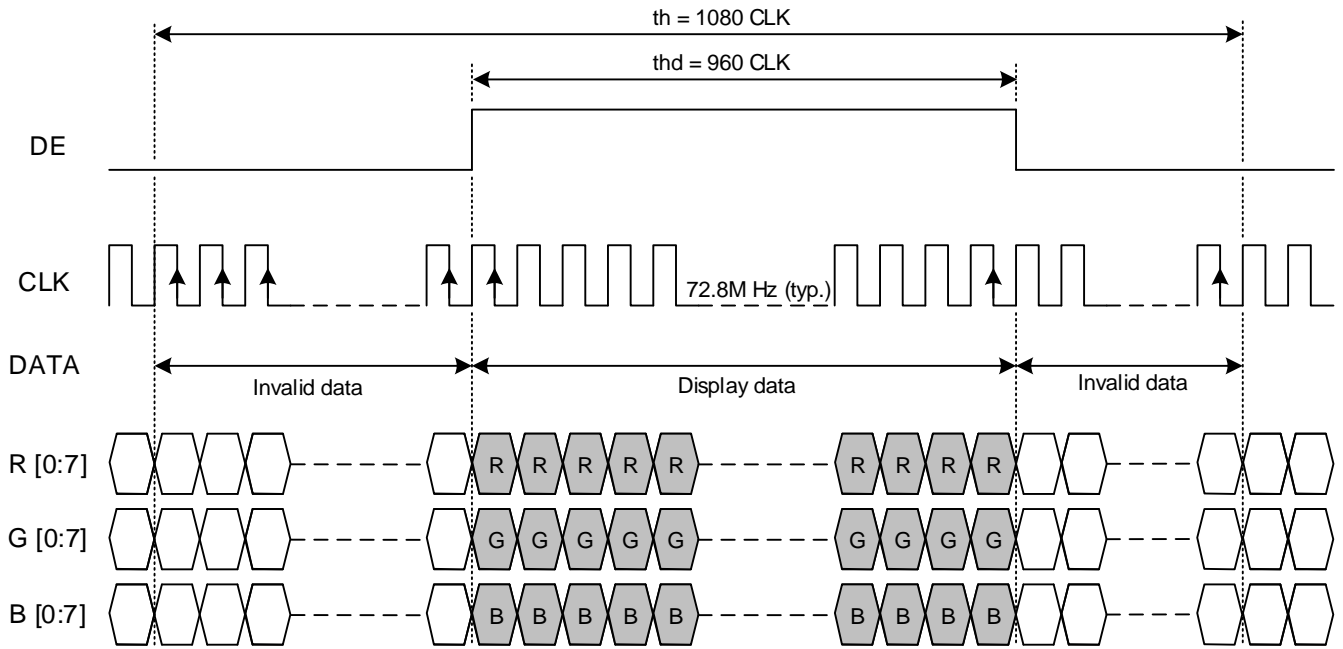


Fig. 8.1 Horizontal Timing of Synchronous Mode

### Vertical timing

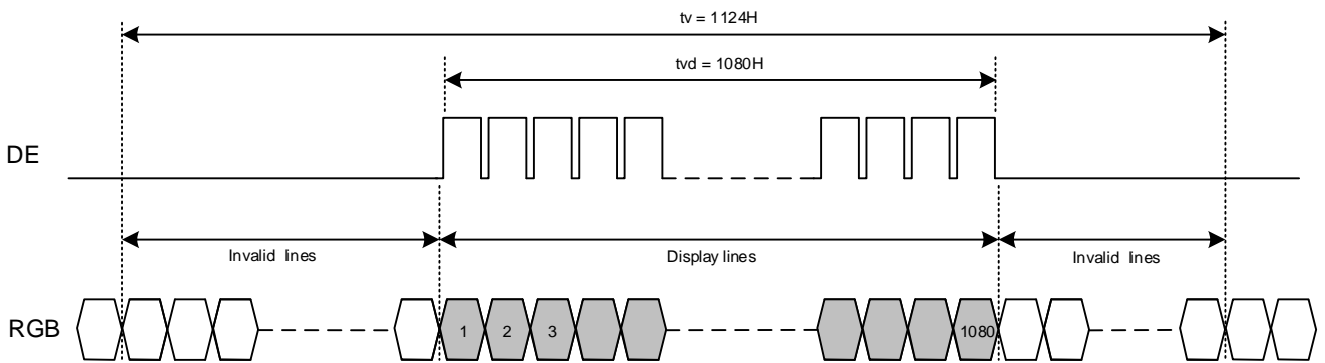


Fig. 8.2 Vertical Timing of Synchronous Mode

### 8.3 TIMING TABLE

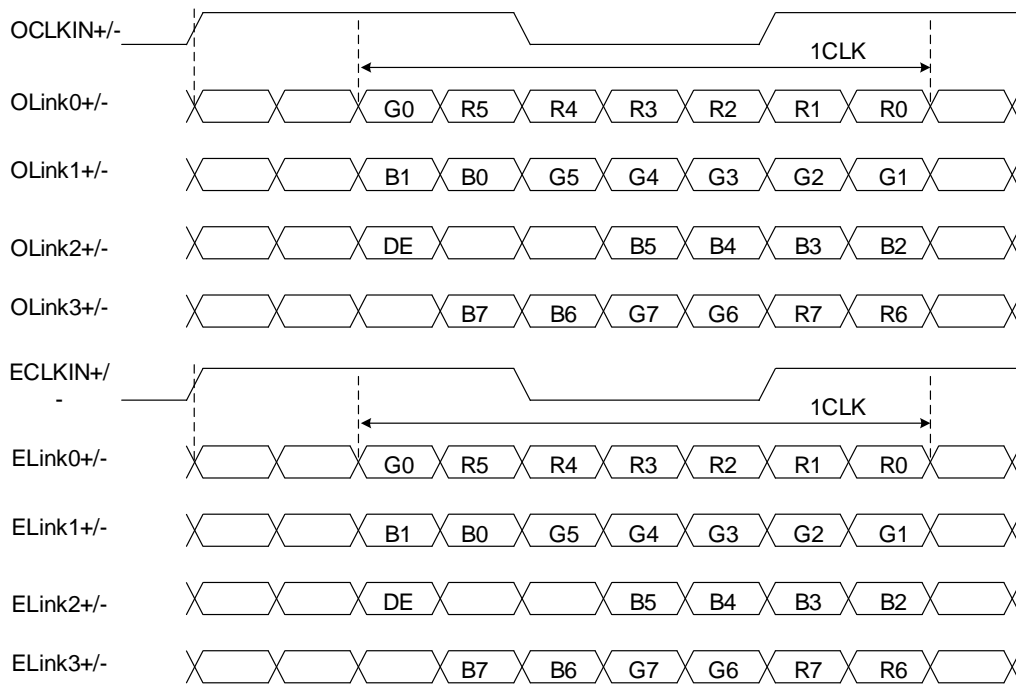
The column of timing sets including minimum, typical, and maximum as below are based on the best optical performance, frame frequency ( $f_{Frame}$ ) = 60 Hz to define.

| Item  |                 | Symbol      | Min. | Typ. | Max. | Unit |
|-------|-----------------|-------------|------|------|------|------|
| Clock | CLK Frequency   | fclk        | -    | 72.8 | -    | M Hz |
| Hsync | Display Data    | thd         | 1080 |      |      | DCLK |
|       | Cycle Time      | thp         | 120  |      |      |      |
|       | Display Line    | tvd         | 1080 |      |      |      |
|       | Cycle Time      | tvp         | 44   |      |      |      |
|       | Frame Frequency | $f_{Frame}$ | -    | 60   | -    | Hz   |

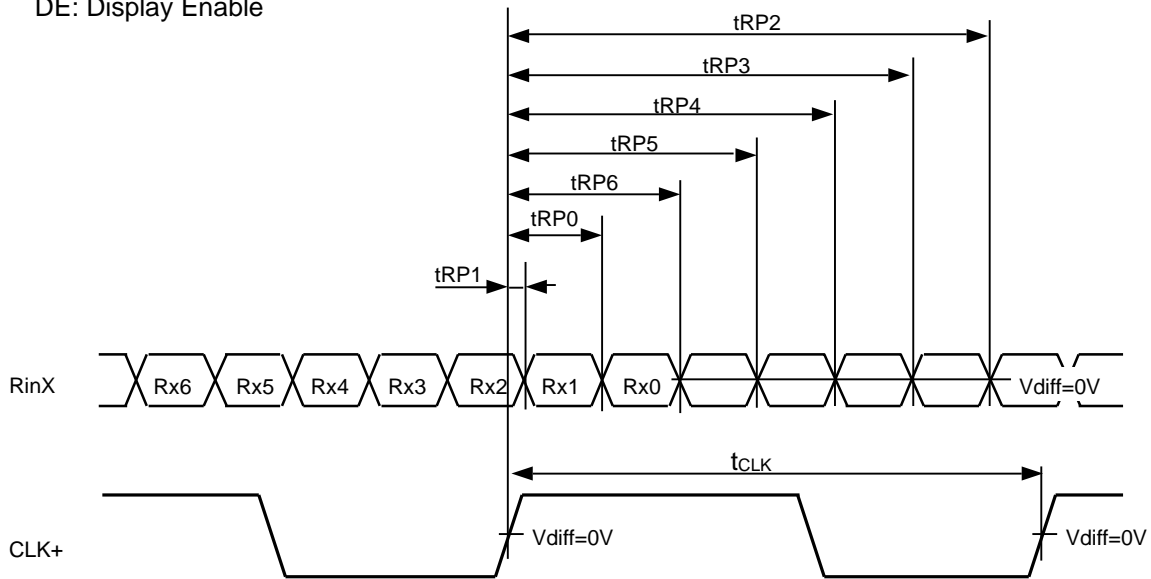
Note 1: For 2-port input, horizontal display period has the notation of the half of 1920.

## 8.4 LVDS Sequence

### LVDS data format (VESA format)



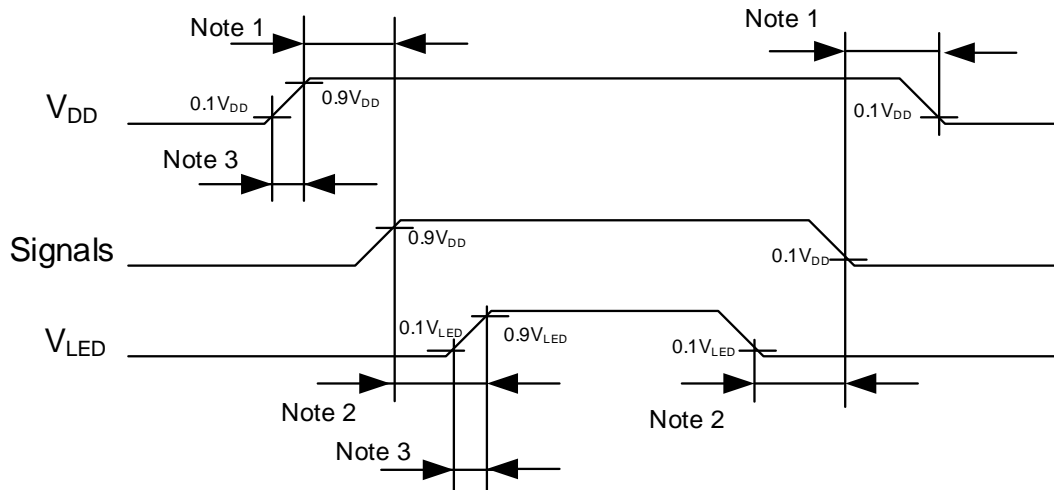
DE: Display Enable



$$RinX = (RinX+) - (RinX-) \quad (X=0, 1, 2, 3)$$

| Item                | Symbol            | Min.   | Typ.                  | Max.            | Unit                  |    |
|---------------------|-------------------|--------|-----------------------|-----------------|-----------------------|----|
| CLK                 | Cycle frequency   | 1/tCLK | -                     | 72.8            | MHz                   |    |
| RinX<br>(X=0,1,2,3) | 0 data position   | tRP0   | $1/7 * t_{CLK} - 0.3$ | $1/7 * t_{CLK}$ | $1/7 * t_{CLK} + 0.3$ | ns |
|                     | 1st data position | tRP1   | -0.3                  | 0               | +0.3                  |    |
|                     | 2nd data position | tRP2   | $6/7 * t_{CLK} - 0.3$ | $6/7 * t_{CLK}$ | $6/7 * t_{CLK} + 0.3$ |    |
|                     | 3rd data position | tRP3   | $5/7 * t_{CLK} - 0.3$ | $5/7 * t_{CLK}$ | $5/7 * t_{CLK} + 0.3$ |    |
|                     | 4th data position | tRP4   | $4/7 * t_{CLK} - 0.3$ | $4/7 * t_{CLK}$ | $4/7 * t_{CLK} + 0.3$ |    |
|                     | 5th data position | tRP5   | $3/7 * t_{CLK} - 0.3$ | $3/7 * t_{CLK}$ | $3/7 * t_{CLK} + 0.3$ |    |
|                     | 6th data position | tRP6   | $2/7 * t_{CLK} - 0.3$ | $2/7 * t_{CLK}$ | $2/7 * t_{CLK} + 0.3$ |    |

## 8.5 Power ON/OFF sequence



Note 1: In order to avoid any damages,  $V_{DD}$  has to be applied before all other signals. The opposite is true for power off where  $V_{DD}$  has to be remained on until all other signals have been switch off. The recommended time period is 1 second.

Note 2: In order to avoid showing uncompleted patterns in transient state. It is recommended that switching the backlight on is delayed for 1 second after the signals have been applied. The opposite is true for power off where the backlight has to be switched off 1 second before the signals are removed.

Note 3: In order to avoid high Inrush current,  $V_{DD}$  rising time need to set more than 0.5ms.



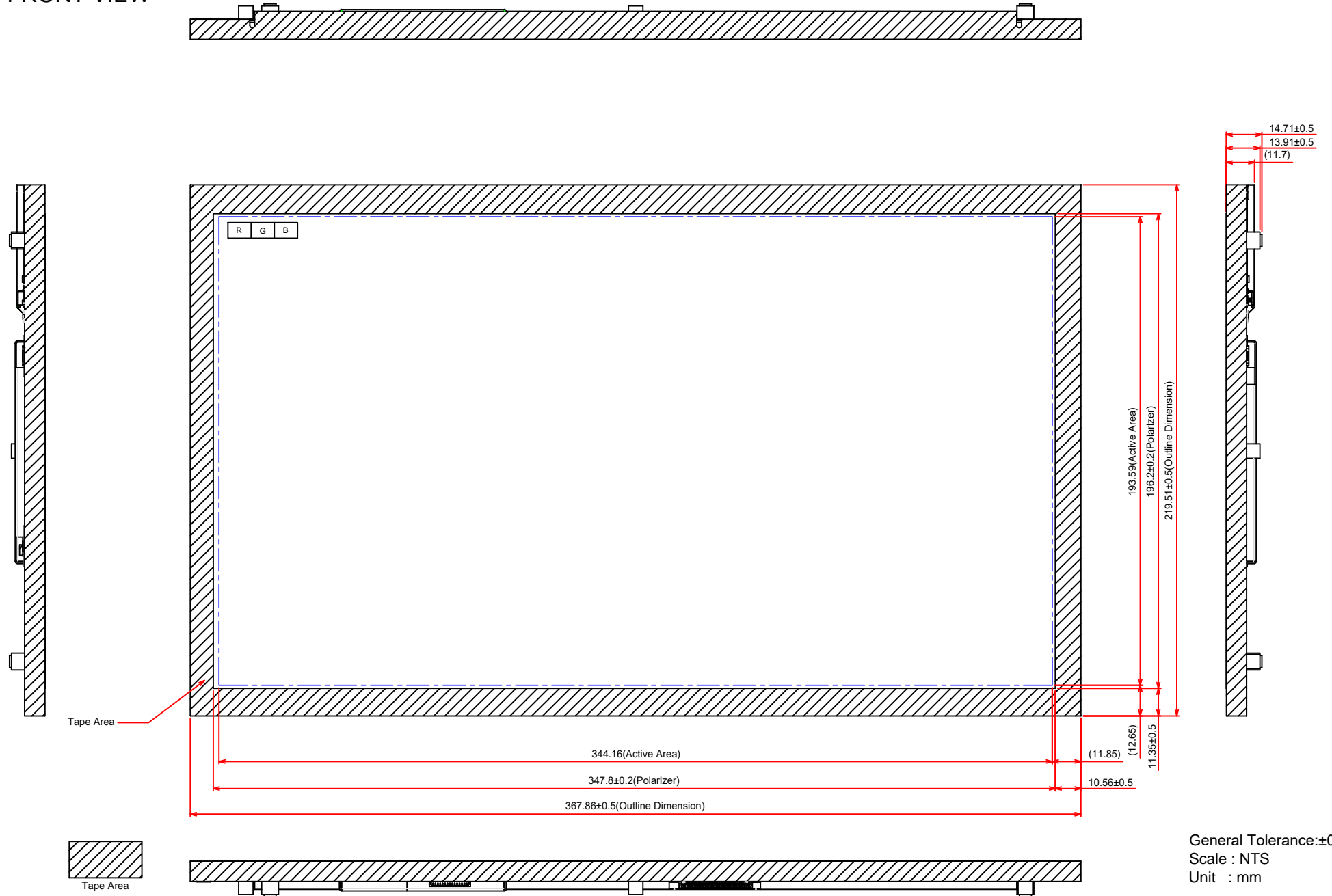
## 8.6 DATA INPUT for DISPLAY COLOR

| Input color |            | Red Data |    |    |    |    |    |    |    | Green Data |    |    |    |    |    |    |    | Blue Data |    |    |    |    |    |    |    |     |  |  |  |  |  |
|-------------|------------|----------|----|----|----|----|----|----|----|------------|----|----|----|----|----|----|----|-----------|----|----|----|----|----|----|----|-----|--|--|--|--|--|
|             |            | R7       | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7         | G6 | G5 | G4 | G3 | G2 | G1 | G0 | B7        | B6 | B5 | B4 | B3 | B2 | B1 | B0 |     |  |  |  |  |  |
|             |            | MSB      |    |    |    |    |    |    |    | LSB        |    |    |    |    |    |    |    | MSB       |    |    |    |    |    |    |    | LSB |  |  |  |  |  |
| Basic Color | Black      | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Red(255)   | H        | H  | H  | H  | H  | H  | H  | H  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Green(255) | L        | L  | L  | L  | L  | L  | L  | L  | H          | H  | H  | H  | H  | H  | H  | H  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Blue(255)  | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | H         | H  | H  | H  | H  | H  | H  | H  |     |  |  |  |  |  |
|             | Cyan       | L        | L  | L  | L  | L  | L  | L  | L  | H          | H  | H  | H  | H  | H  | H  | H  | H         | H  | H  | H  | H  | H  | H  | H  |     |  |  |  |  |  |
|             | Magenta    | H        | H  | H  | H  | H  | H  | H  | H  | L          | L  | L  | L  | L  | L  | L  | L  | H         | H  | H  | H  | H  | H  | H  | H  |     |  |  |  |  |  |
|             | Yellow     | H        | H  | H  | H  | H  | H  | H  | H  | H          | H  | H  | H  | H  | H  | H  | H  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | White      | H        | H  | H  | H  | H  | H  | H  | H  | H          | H  | H  | H  | H  | H  | H  | H  | H         | H  | H  | H  | H  | H  | H  | H  |     |  |  |  |  |  |
| Red         | Black      | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Red(1)     | L        | L  | L  | L  | L  | L  | L  | H  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Red(2)     | L        | L  | L  | L  | L  | L  | L  | H  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | :          | :        | :  | :  | :  | :  | :  | :  | :  | :          | :  | :  | :  | :  | :  | :  | :  | :         | :  | :  | :  | :  | :  | :  | :  |     |  |  |  |  |  |
|             | Red(253)   | H        | H  | H  | H  | H  | H  | L  | H  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Red(254)   | H        | H  | H  | H  | H  | H  | H  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Red(255)   | H        | H  | H  | H  | H  | H  | H  | H  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
| Green       | Black      | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Green(1)   | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | H  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Green(2)   | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | H  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | :          | :        | :  | :  | :  | :  | :  | :  | :  | :          | :  | :  | :  | :  | :  | :  | :  | :         | :  | :  | :  | :  | :  | :  | :  |     |  |  |  |  |  |
|             | Green(253) | L        | L  | L  | L  | L  | L  | L  | L  | H          | H  | H  | H  | H  | H  | L  | H  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Green(254) | L        | L  | L  | L  | L  | L  | L  | L  | H          | H  | H  | H  | H  | H  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Green(255) | L        | L  | L  | L  | L  | L  | L  | L  | H          | H  | H  | H  | H  | H  | H  | H  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
| Blue        | Black      | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | L  |     |  |  |  |  |  |
|             | Blue(1)    | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | L  | H  |     |  |  |  |  |  |
|             | Blue(2)    | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | L         | L  | L  | L  | L  | L  | H  | L  |     |  |  |  |  |  |
|             | :          | :        | :  | :  | :  | :  | :  | :  | :  | :          | :  | :  | :  | :  | :  | :  | :  | :         | :  | :  | :  | :  | :  | :  | :  |     |  |  |  |  |  |
|             | Blue(253)  | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | H         | H  | H  | H  | H  | H  | L  | H  |     |  |  |  |  |  |
|             | Blue(254)  | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | H         | H  | H  | H  | H  | H  | H  | L  |     |  |  |  |  |  |
|             | Blue(255)  | L        | L  | L  | L  | L  | L  | L  | L  | L          | L  | L  | L  | L  | L  | L  | L  | H         | H  | H  | H  | H  | H  | H  | H  |     |  |  |  |  |  |

Note 1: Color (n) --- 'n' indicates gray scale step.

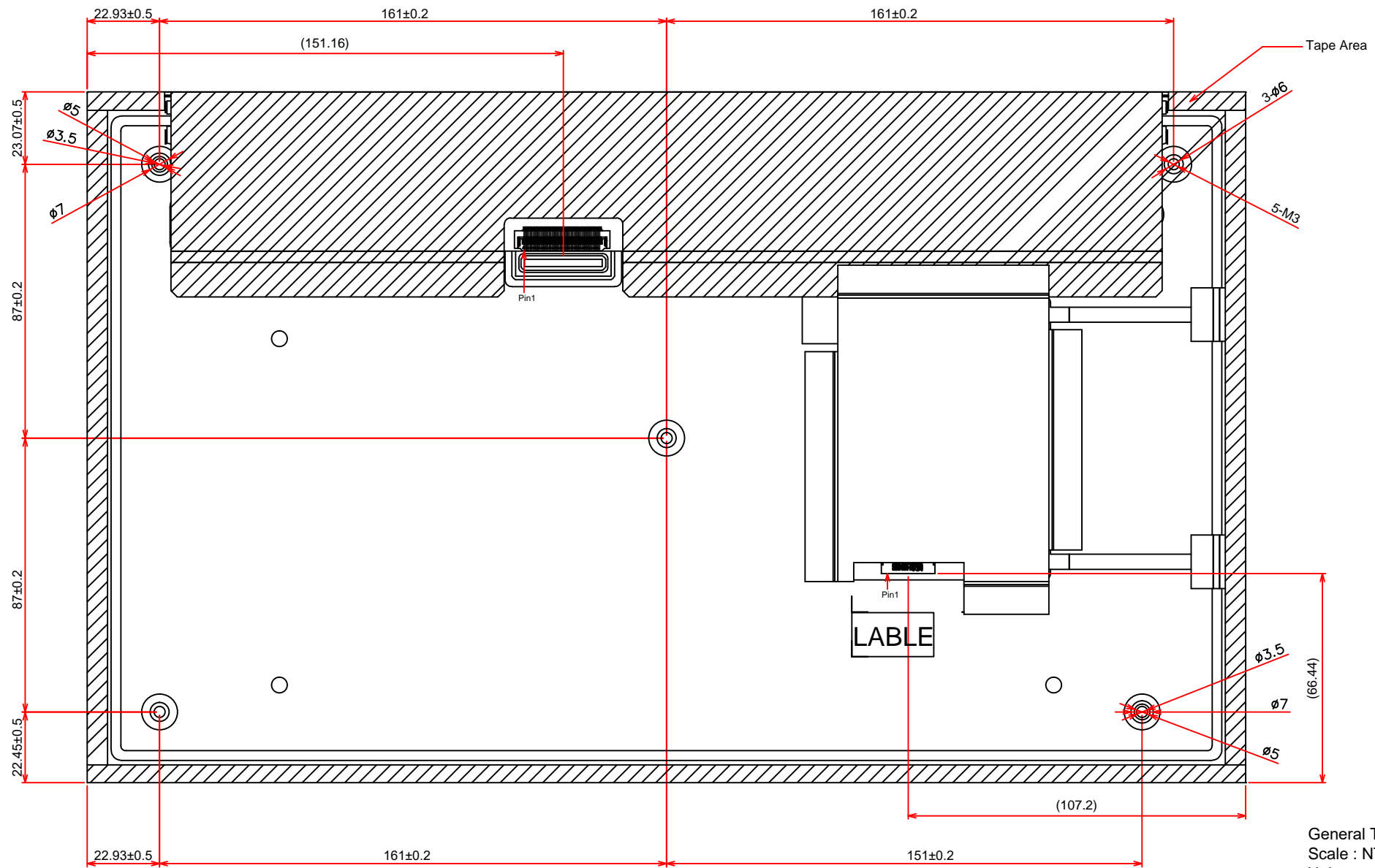
# 9. OUTLINE DIMENSIONS

## 9.1 FRONT VIEW



General Tolerance:±0.5mm  
 Scale : NTS  
 Unit : mm

# 9.2 REAR VIEW



General Tolerance:±0.5mm  
 Scale : NTS  
 Unit : mm