



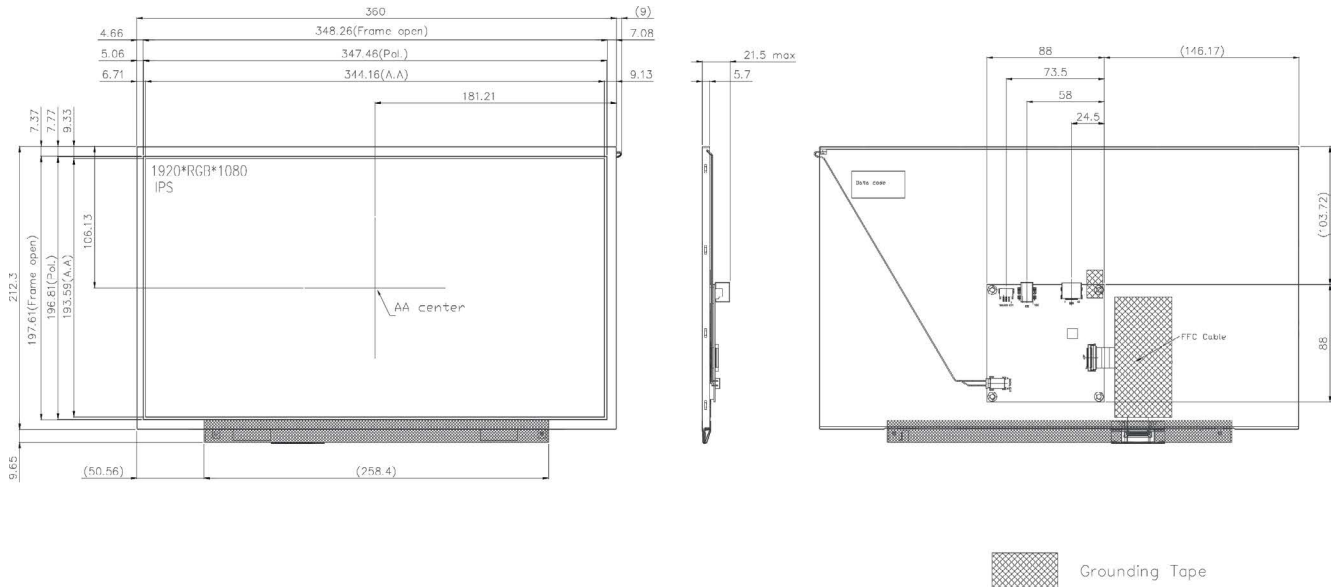
## Description

MP010841 is a 15.6 (16:9) inch diagonally measured active display with high resolution 1920 × 1080 display and high brightness. This model is composed of a TFT LCD panel, backlight system and HDMI input. It is designed to make Raspberry Pi usage easy. You can simply use this TFT display with your Raspberry Pi, or also you can use this as computer display with any device which has HDMI output. This 15.6" TFT model comes in 1920 × 1080 resolution that would be great for embedded computing usage too.

## Features

| No. | Item                           | Specification                   | Unit              |
|-----|--------------------------------|---------------------------------|-------------------|
| 1   | Panel Size                     | 15.6"                           | Inch              |
| 2   | Number of Pixels               | 1920 (W) x RGB x 1080 (H)       | Pixels            |
| 3   | Active Area                    | 344.16 (W) × 193.59 (H)         | mm                |
| 4   | Pixel Pitch                    | 0.17925 (W) x 0.17925 (H)       | mm                |
| 5   | Outline Dimension              | 360 (W) × 221.95 (H) × 21.5 (T) | mm                |
| 6   | Number of Colours              | 16.7M                           | --                |
| 7   | Display Mode                   | Normally Black                  | --                |
| 8   | View Direction                 | Free direction                  | --                |
| 9   | Display Format                 | RGB vertical stripe             | --                |
| 10  | Surface Treatment              | Anti-Glare (3H)                 | --                |
| 11  | Contrast Ratio                 | 1000 (Typ.)                     | --                |
| 12  | Luminance (cd/m <sup>2</sup> ) | 1000 (Typ.)                     | cd/m <sup>2</sup> |
| 13  | Video Input Interface          | HDMI (Compliance HDMI V1.4)     | --                |
| 14  | Backlight                      | White LED                       | --                |
| 15  | Operation Temperature          | -30 to 80                       | °C                |
| 16  | Storage Temperature            | -30 to 80                       | °C                |
| 17  | Weight                         | (570)                           | g                 |

## Mechanical Specification



## Pin Description

**Power Input(CN1) [DC JACK:SCD480CCS000B00GE or compatible]**

| Pin No. | Symbol | I/O | Function          | Note |
|---------|--------|-----|-------------------|------|
| 1       | 12V    | P   | Power Supply +12V | 12V  |
| 2       | GND    | P   | Ground            |      |

**Back-light Control(CN2) [WAFFER P2.0mm:2001S-03-RTE or compatible]**

| Pin No. | Symbol | I/O | Function                                              | Note |
|---------|--------|-----|-------------------------------------------------------|------|
| 1       | GND    | P   | Ground                                                |      |
| 2       | PWM    | I   | Back-light Dimming control (internal pull up to 3.3V) | *1   |
| 3       | NC     | --  | NC                                                    |      |

\*1: When PWM not connected, back-light default is typical brightness and normally turn on.

## HDMI (CN3) [HDMI A TYPE:PHD0911A2301E or compatible]

| Pin No. | Symbol    | I/O | Function            |
|---------|-----------|-----|---------------------|
| 1       | TMDS 2+   | I   | TMDS Data2+         |
| 2       | GND       | P   | TMDS Data2 Shield   |
| 3       | TMDS 2-   | I   | TMDS Data2-         |
| 4       | TMDS 1+   | I   | TMDS Data1+         |
| 5       | GND       | P   | TMDS Data1 Shield   |
| 6       | TMDS 1-   | I   | TMDS Data1-         |
| 7       | TMDS 0+   | I   | TMDS Data0+         |
| 8       | GND       | P   | TMDS Data0 Shield   |
| 9       | TMDS 0-   | I   | TMDS Data0-         |
| 10      | TMDS CLK+ | I   | TMDS Clock+         |
| 11      | GND       | P   | TMDS Clock Shield   |
| 12      | TMDS CLK- | I   | TMDS Clock-         |
| 13      | N.C.      | -   | N.C.                |
| 14      | N.C.      | -   | N.C.                |
| 15      | DDC_SCL   | I   | IIC SCL to EDID ROM |
| 16      | DDC_SDA   | I/O | IIC SDA to EDID ROM |
| 17      | GND       | P   | DDC/CEC Ground      |
| 18      | HD_5V     | P   | +5V Power           |
| 19      | HPD       | O   | Hot Plug Detect     |

## Absolute Maximum Ratings

### Electrical Absolute Rating

#### HDMI TFT LCD Module

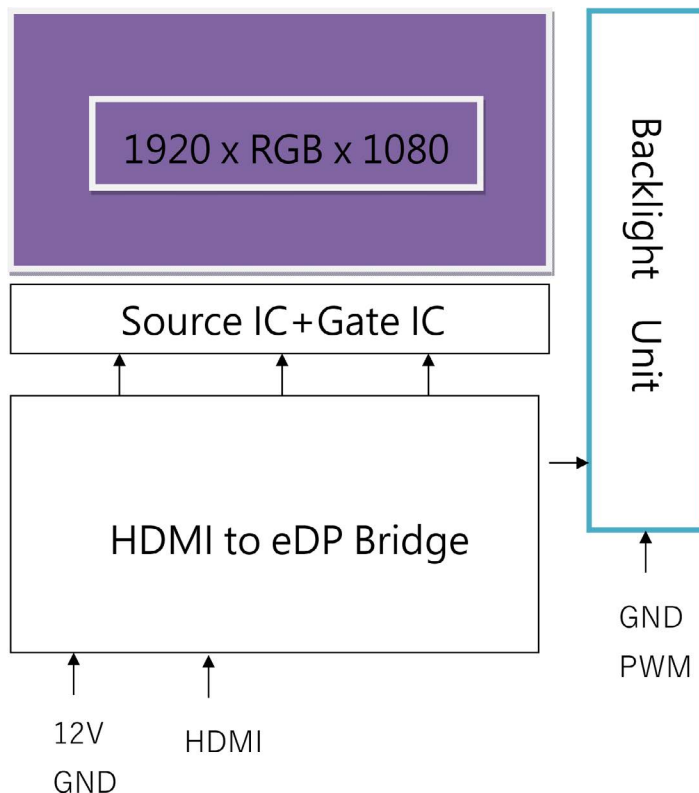
| Item                 | Symbol | Values |      | Unit |
|----------------------|--------|--------|------|------|
|                      |        | Min    | Max. |      |
| Power supply voltage | 12V    | 11     | 14   | V    |

## Environment Absolute Rating

| Item                  | Symbol | Values |      | Unit | Note                |
|-----------------------|--------|--------|------|------|---------------------|
|                       |        | Min    | Max. |      |                     |
| Operating Temperature | Top    | -30    | 80   | °C   | Ambient temperature |
| Storage Temperature   | Tst    |        |      |      |                     |

## Block Diagram

TFT LCD Module



## Electrical Characteristics

HDMI TFT LCD Module

| Item                | Symbol              | Values |       |      | Unit | Note     |
|---------------------|---------------------|--------|-------|------|------|----------|
|                     |                     | Min    | Typ.  | Max. |      |          |
| Supply Voltage      | 12V                 | 11     | 12    | 13   | V    |          |
| PWM frequency       |                     | 100    | -     | 10K  | Hz   |          |
| PWM Duty            |                     | 17     | -     | 100  | %    | <17%=OFF |
| PWM Dimming Voltage | V <sub>PWM-IH</sub> | 3.3    | -     | 8    | V    |          |
|                     | V <sub>PWM-IL</sub> | -      | 0.3   | -    |      |          |
| Supply Current      | ICC(12V)            | -      | 1400  | 1500 | mA   |          |
| LED life time       |                     | -      | 50000 | -    | Hr   | (1)      |

### Note

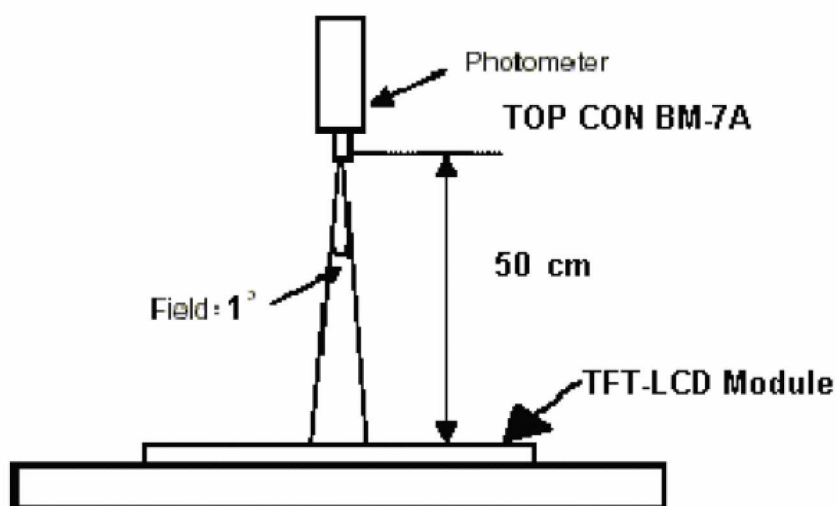
The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is 25°C 60% RH.

## Optical Characteristics

| Item                   |            | Symbol        | Condition                                                                  | Min.  | Typ.  | Max.  | Unit  |
|------------------------|------------|---------------|----------------------------------------------------------------------------|-------|-------|-------|-------|
| Brightness             |            | --            | Note1,<br>Note 3,<br>( $\theta = 0^\circ$ ,<br>Normal<br>Viewing<br>Angle) | 800   | 1000  | --    | cd/m2 |
| Uniformity             |            | B-uni         |                                                                            | --    | 70    | --    | --    |
| Contrast Ratio         |            | CR            |                                                                            | 800   | 1000  | --    | --    |
| Response Time          |            | Tr + Tf       |                                                                            | --    | 25    | 30    | ms    |
| Colour<br>Chromaticity | White      | Wx            |                                                                            | 0.24  | 0.29  | 0.34  | --    |
|                        |            | Wy            |                                                                            | 0.26  | 0.31  | 0.36  | --    |
|                        | Red        | Rx            |                                                                            | 0.542 | 0.592 | 0.642 |       |
|                        |            | Ry            |                                                                            | 0.31  | 0.36  | 0.41  |       |
|                        | Green      | Gx            |                                                                            | 0.292 | 0.342 | 0.392 |       |
|                        |            | Gy            |                                                                            | 0.507 | 0.557 | 0.607 |       |
|                        | Blue       | Bx            |                                                                            | 0.108 | 0.158 | 0.208 |       |
|                        |            | By            |                                                                            | 0.059 | 0.109 | 0.159 |       |
| View angle             | Horizontal | $\theta_{x+}$ | Center<br>CR $\geq 10$                                                     | 80    | --    | --    |       |
|                        |            | $\theta_{x-}$ |                                                                            |       |       |       |       |
|                        | Vertical   | $\theta_{Y+}$ |                                                                            |       |       |       |       |
|                        |            | $\theta_{Y-}$ |                                                                            |       |       |       |       |

Note: The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance  $\leq 1$  lux, and at room temperature). The operation temperature is  $25^\circ\text{C} \pm 2^\circ\text{C}$ . The measurement method is shown in Note1.

**Note1: The method of optical measurement:**

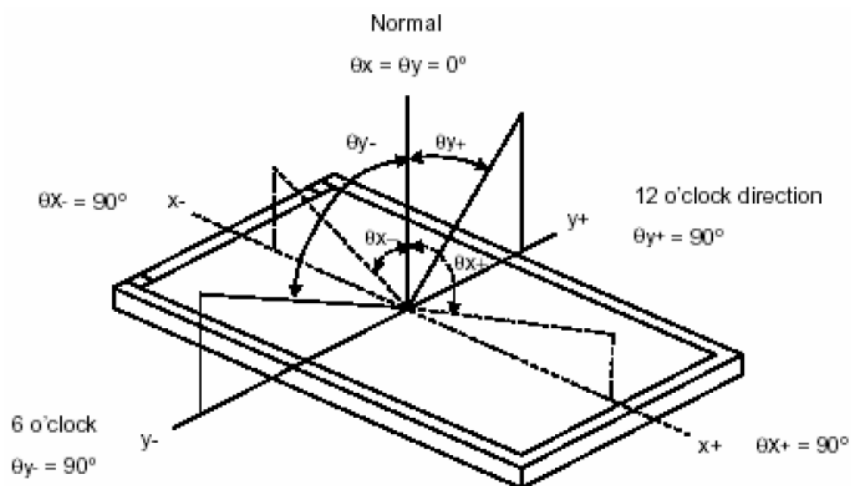


Note2: Measured at the center area of the panel and at the viewing angle of the  $\theta_x = \theta_y = 0^\circ$

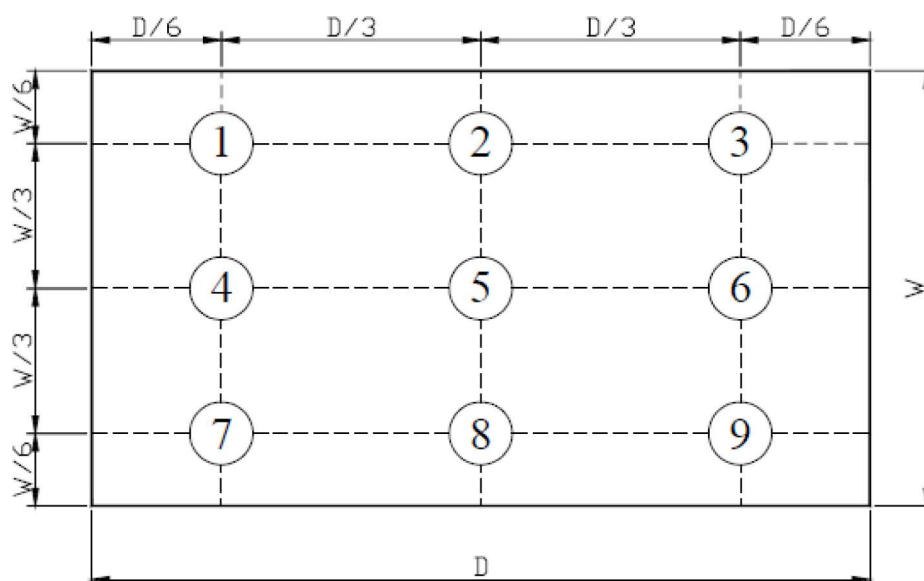
Note3: Definition of Contrast Ratio (CR):

CR = Luminance with all pixels in white state  $\div$  Luminance with all pixels in Black state

## Definition of Viewing Angle:



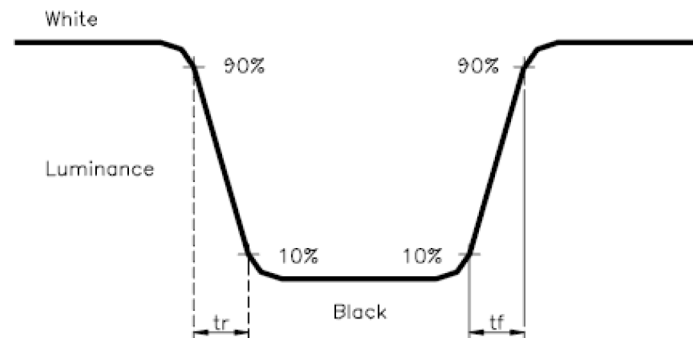
## Definition of Brightness Uniformity (B-uni):



B-uni = (Minimum luminance of 9 points ÷ Maximum luminance of 9 points) × 100%

## Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure



## Definition of Chromaticity:

The color coordinates (Wx,Wy),(Rx,Ry),(Gx,Gy),and (Bx,By) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

## Part Number Table

| Description                       | Part Number |
|-----------------------------------|-------------|
| TFT LCD, 15.6", HDMI, 1920 × 1080 | MP010841    |

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