# SPECIFICATIONS

| | | |
|---|---|---|
| CUSTOMER | : | |
| SAMPLE CODE | : | SH480272T017-ZBB01 |
| MASS PRODUCTION CODE | : | PH480272T017-ZBB01 |
| SAMPLE VERSION | : | 01 |
| SPECIFICATIONS EDITION | : | 001 |
| DRAWING NO. (Ver.) | : | LMD-PH480272T017-ZBB01 (Ver.001) |
| PACKAGING NO. (Ver.) | : | - |

**Customer Approved**

Date:

| Approved | Checked | Designer |
|---|---|---|
| 廖志豪<br>**Rex Liao** | 張慶源<br>**Yuan Chang** | 陳宗淇<br>**Howard Chen** |

POWERTIP
2024.07.19
TW RD APR

■ Preliminary specification for design input

☐ Specification for sample approval

**POWERTIP TECH. CORP.**

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# SPECIFICATIONS

## Features

| Item | Standard Value |
|---|---|
| Display Type | 480 * 3 (RGB) * 272 Dots |
| LCD Type | Full Viewing Angle , Normally Black , Transmissive type |
| Screen size(inch) | 4.3”(Diagonal) |
| Color configuration | R,G, B vertical stripe |
| Display Interface | 8080 8 Bit、9 Bit、16 Bit & 3/4 Line、Daul SPI & Quad SPI I/F |
| Driver IC | NV3041A-01 |
| ROHS | THIS PRODUCT CONFORMS THE ROHS OF PTC |

## Mechanical Specifications

| Item | Standard Value | Unit |
|---|---|---|
| Outline Dimension | 105.4(W) x 67.15 (L) x 4.0(H) | mm |

LCD panel

| Item | Standard Value | Unit |
|---|---|---|
| Viewing Area | 96.7 (W) * 55.49 (L) | mm |
| Active Area | 95.04 (W) x 53.86 (L) | mm |
| Pixel Size | 0.198(W) * 0.198(H) | mm |

Note : For detailed information please refer to LCM drawing

first components

## Absolute Maximum Ratings

| Item | Symbol | Condition | Min. | Max. | Unit |
|---|---|---|---|---|---|
| System Power Supply Voltage | VDD | GND=0 | -0.5 | +4.6 | V |
| Input Voltage Range | Vin | - | -0.5 | VDD+0.3 | V |
| Operating Temperature | $T_{OP}$ (Ts) | Note 1 | -20 | +70 | °C |
| Storage Temperature | $T_{ST}$ (Ta) | Note 2 | -30 | +80 | °C |
| Storage Humidity | $H_D$ | Ta ≦ 60 °C | - | 90 | %RH |

The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Note 1：Ts is the temperature of panel's surface.

Note 2：Ta is the ambient temperature of samples.

## DC Electrical Characteristics

GND = 0V, Ta = 25°C

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Power supply Voltage | VDD | - | 3.0 | 3.3 | 3.6 | V |
| "H" Input Voltage | $V_{IH}$ | - | 0.7*VDD | - | VDD | V |
| "L" Input Voltage | $V_{IL}$ | - | GND | - | 0.3* GND | V |
| "H" Output Voltage | $V_{OH}$ | - | VDD-0.4 | - | VDD | V |
| "L" Output Voltage | $V_{OL}$ | - | GND | - | GND +0.4 | V |
| Supply Current | IDD | VDD=3.3V | - | (35) | (50) | mA |

## Optical Characteristics

VDD =3.3V, Ta=25°C

| Item | | Symbol | Condition | Min. | Typ. | Max. | unit | |
|---|---|---|---|---|---|---|---|---|
| Response time | | Tr + Tf | Ta = 25°C<br>θX, θY = 0° | - | 30 | 35 | ms | Note2 |
| Viewing angle | Top | θY+ | CR ≥ 10 | - | 80 | - | Deg. | Note4 |
| | Bottom | θY- | | - | 80 | - | | |
| | Left | θX- | | - | 80 | - | | |
| | Right | θX+ | | - | 80 | - | | |
| Contrast ratio | | CR | Ta = 25°C<br>θX , θY = 0° | 500 | 600 | - | - | - |
| Color of CIE Coordinate | White | X | | - | (0.30) | - | - | Note1 |
| | | Y | | - | (0.36) | - | | |
| | Red | X | | - | (0.57) | - | | |
| | | Y | | - | (0.33) | - | | |
| | Green | X | | - | (0.34) | - | | |
| | | Y | | - | (0.61) | - | | |
| | Blue | X | | - | (0.13) | - | | |
| | | Y | | - | (0.12) | - | | |
| Average Brightness (With LCD & T/P ) *2 | | IV | IF= (40)mA | (320) | (350) | - | cd/m$^2$ | Note1 |
| Uniformity (With LCD & T/P ) *1 | | △ B | IF= (40)mA | 70 | - | - | % | Note1 |

Note1:

1：△ B=B(min) / B(max) × 100%

2：Measurement Condition for Optical Characteristics:

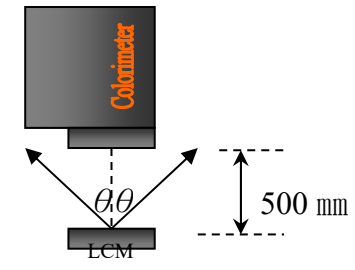
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%




Colorimeter=BM-7 fast

## Backlight Characteristics

Maximum Ratings

| Item | Symbol | Conditions | Min. | Max. | Unit |
|---|---|---|---|---|---|
| LED Forward Current | IF | Ta =25℃ | - | 60 | mA |
| LED Reverse Voltage | VR | Ta =25℃ | - | 5 | V |
| Power Dissipation | PD | Ta =25℃ | - | 990 | mW |

Electrical / Optical Characteristics

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | VF | IF=40mA | 13.5 | 15 | 16.5 | V |
| Average Brightness (Without LCD ) | IV | | 6300 | 6700 | - | cd/m$^2$ |
| CIE Color Coordinate (Without LCD ) | X | | 0.26 | 0.29 | 0.32 | - |
| | Y | | 0.26 | 0.29 | 0.32 | |
| Color | White | | | | | |

*1：The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and $I_L$ =20mA. The LED lifetime could be decreased if operating $I_L$ is lager than 20 mA.

**Internal Circuit Diagram**




Other Description

| Item | Conditions | Description |
|---|---|---|
| Life Time*1 | Ta =25℃<br>IF= 40mA | 30,000 hrs |

## Touch Panel Characteristics

Optical Characteristics

| Item | Specification |
|---|---|
| 1.Transparency | 80% Min |

Mechanical Characteristic

| Item | Specification |
|---|---|
| 1.Input Method | Finger or stylus pen |
| 2.Hardness of surface | 3H -pressure 1N,45deg. |
| 3.Activation Force | 80gf less individual point with stylus pen(R0.8)<br>Activation force guarantee area:3.0mm inside of Active Area. |
| 4.Linearity Force | 140gf less input with stylus pen(R0.8)<br>Activation force guarantee area:3.0mm inside of Active Area. |

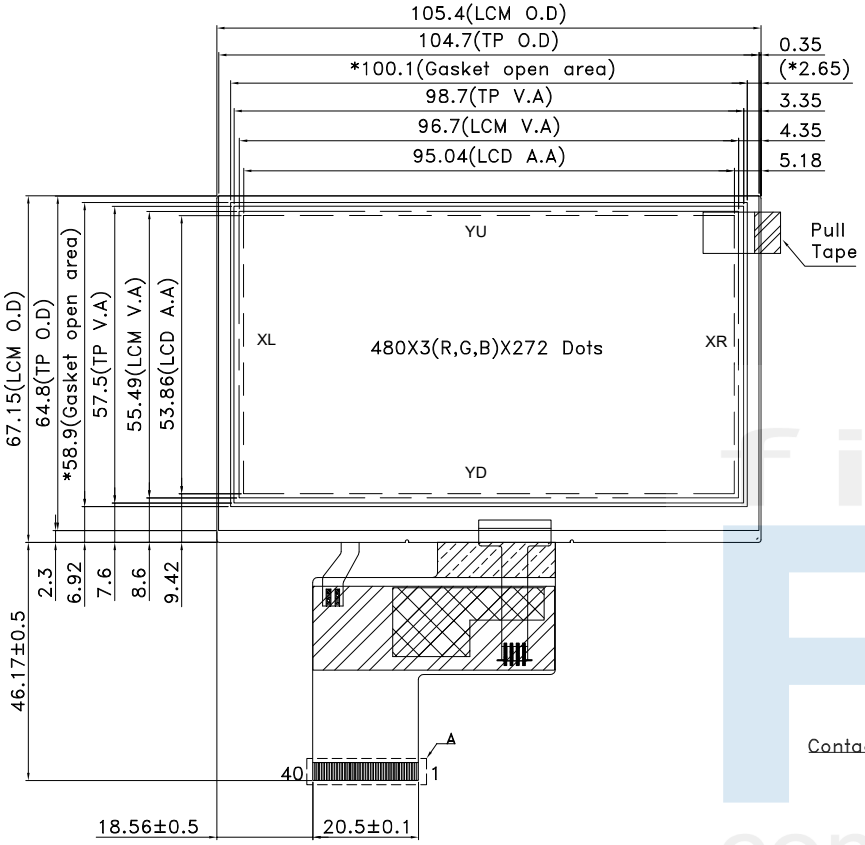
Electrical Characteristics

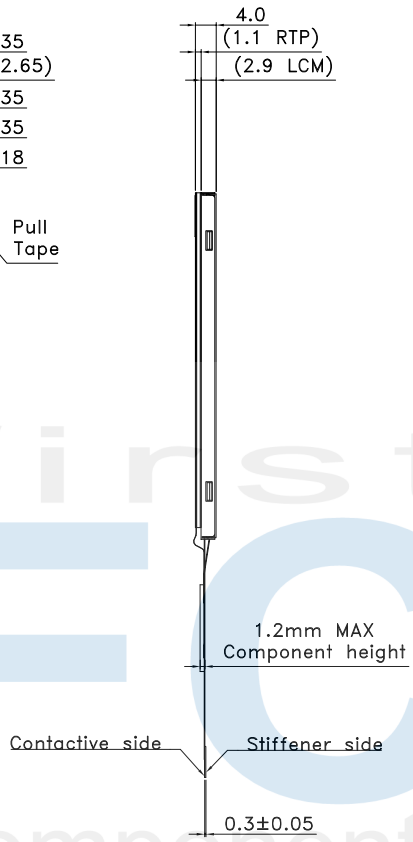
| Item | Specification |
|---|---|
| 1.Rated Voltage | DC 5V |
| 2.Resistance Between Terminals. | Direction X (Film side): 500Ω~ 1250Ω |
| | Direction Y (Glass side): 150Ω~ 450Ω |
| 3.Insulation Resistance | 20 MΩ or more (DC 25Ⅴ 1min) |
| 4.Linearity | ±1.5%.<br>Linearity(%)= ΔV/（EV-SV）*100.<br>ΔV: The difference between the ideal voltage and measured voltage on the each measuring line.<br>SV: Voltage of starting Points.<br>EV: Voltage of Ending Points.<br>(Test condition refers to 1.7.2 item4) |
| 5.Bouncing | <10ms |

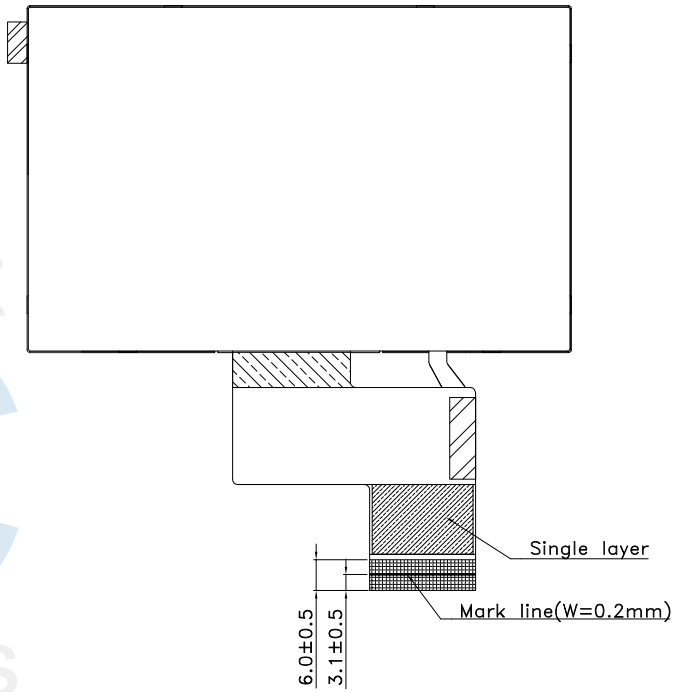
## Interface Pin Description

| Pin No. | Symbol | Function |
|---|---|---|
| 1 | VDD | Digital power |
| 2 | VDD | Digital power |
| 3 | NC | Not Connect |
| 4 | GND | Ground |
| 5 | CS | A chip select signal.Signal is active low. |
| 6 | SDA/ SDO1 | SPI bi-direction data pin |
| 7 | WRX/SCL | Write signal input for 8080 I/F,Clock input for SPI I/F |
| 8 | RDX | read enable input . |
| 9 | DCX/SDO2 | 8080 & 3/4 Line I/F<br>Data or Command<br>DCX = “H” is data ,DCX = “L” is command<br>Dual-SPI: the second data lane.<br>Quard-SPI: the second data pin |
| 10 | GND | Ground |
| 11 | RESET | Global reset. Active low |
| 12 | GND | Ground |
| 13 | D0 | When using 8080 8-bit parallel interface D8~D15 is pull low<br>When using 8080 9-bit parallel interface D9~D15 is pull low<br>When using 3/4 SPI interface<br>D[15:0] are not used and should connect to “L” by GND.<br>When using Dual-SPI interface<br>SDA:In/Out, DCX:In<br>D[15:0] are not used and should connect to “L” by GND.<br>When using Quard-SPI interface<br>D2: the third pin of Quard-SPI SDO3<br>D3: the fourth pin of Quard-SPI SDO4<br>D[15:2] are not used and should connect to “L” by GND. |
| 14 | D1 | |
| 15 | D2 | |
| 16 | D3 | |
| 17 | D4 | |
| 18 | D5 | |
| 19 | D6 | |
| 20 | D7 | |
| 21 | D8 | |
| 22 | D9 | |
| 23 | D10 | |
| 24 | D11 | |
| 25 | D12 | |

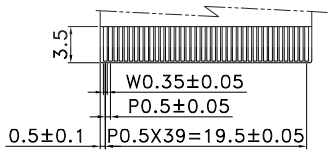
<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>26</td><td>D13</td><td></td></tr>
<tr><td>27</td><td>D14</td><td></td></tr>
<tr><td>28</td><td>D15</td><td></td></tr>
<tr><td>29</td><td>TE</td><td>Tearing effect output pin is used to synchronize MCU frame writing, activated by S/W command. When this pin is not activated (TE function OFF), this pin is GND level</td></tr>
<tr><td>30</td><td>IM0</td><td rowspan="2">IM0,IM1 selects interface mode.
<table>
<tr><th>IM1</th><th>IM0</th><th>Selected Interface</th></tr>
<tr><td rowspan="3">0</td><td rowspan="3">0</td><td>8080 series 8bit</td></tr>
<tr><td>8080 series 9bit</td></tr>
<tr><td>8080 series 16bit</td></tr>
<tr><td>0</td><td>1</td><td>3/4-wire SPI</td></tr>
<tr><td>1</td><td>0</td><td>Dual SPI</td></tr>
<tr><td>1</td><td>1</td><td>Quad SPI</td></tr>
</table></td></tr>
<tr><td>31</td><td>IM1</td></tr>
<tr><td>32</td><td>SPI4W</td><td>SPI 3/4 wire selection.<br>SPI4W=“H”, 4 wire SPI<br>SPI4W=“L”, 3wire SPI</td></tr>
<tr><td>33</td><td>GND</td><td>Ground</td></tr>
<tr><td>34</td><td>NC</td><td>Not Connect</td></tr>
<tr><td>35</td><td>A</td><td>Power supply for LED Backlight anode input</td></tr>
<tr><td>36</td><td>K</td><td>Power supply for LED Backlight cathode input</td></tr>
<tr><td>37</td><td>XR</td><td>Touch panel X axis ( RIGHT )</td></tr>
<tr><td>38</td><td>YD</td><td>Touch panel Y axis (BOTTOM)</td></tr>
<tr><td>39</td><td>XL</td><td>Touch panel X axis ( Left )</td></tr>
<tr><td>40</td><td>YU</td><td>Touch panel Y axis (TOP)</td></tr>
</table>



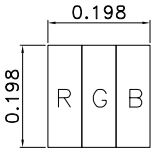




NOTES:
1.LCD TYPE: TFT LCD
2.LCD DISPLAY: Normally Black/TRANSMISSIVE
3.The tolerance unless classified ±0.3mm
4.Matched connector: HIROSE FH19SC-40S-0.5SH
5.▨Kapton tape, ▩Component Area(Unbending Area);▨ Single layer
6."*" Recommended Gasket Size
7.Recommended Housing open window should be less than Module V.A




Detail A
Scale: 2/1




SCALE:100X

| REV | REV BY | REVISER | DATE |
|---|---|---|---|
| 007 | | | |
| 006 | | | |
| 005 | | | |
| 004 | | | |
| 003 | | | |
| 002 | | | |
| 001 | NEW DRAWING | Mike | 2024/07/18 |

PART NO: PH480272T017-ZBB01

DRAWING NAME : LMD-PH480272T017-ZBB01

TITLE: LCD MODULE DRAWING

久正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

| | | | | | |
|---|---|---|---|---|---|
| Design | Mike | (3) | Surface | | |
| Check | Stone | Unit | MM | Material | |
| Approve | Rex | Scale | FIT | Thickness | |
| | | Page | 1/1 | Quantity | |

| Length(Min) (mm) | Tolerance | Precision | Level |
|---|---|---|---|
| 1 ~ 4 | | | ≤0.1 |
| 4 ~ 16 | | | ≤0.2 |
| 16 ~ 63 | | | ≤0.3 |
| 63 ~ 250 | | | ≤L*0.5% |
| 250 ~ 1000 | | | ≤L*1% |

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