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# Specification

| | |
|---|---|
| Part Number: | |
| Version: | |
| Date: | |

## Revision

| VERSION | DATE | REVISED PAGE NO. | Note |
|---|---|---|---|
| 0<br>A | 2015/06/29<br>2016/01/21 | | First issue<br>Modify Static electricity test |

| Key Attributes | Display Accessories |
|---|---|
| TFT LCD<br>мл¢м”<br>млнп È слл<br>² {±D !<br>Landscape<br>RGB<br>3.3V<br>[±5{ Interface<br>мсл cd/m2<br>нор x мпо¢л mm<br>-м0 ~ +с0 deg C<br>40 Way | MCIB-1п |

# Contents

# Midas Active Matrix Display Part Number System

| MC | T | 057 | A | 6 | * | W | 320240 | L | M | L | * | * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

1 = **MC:** Midas Components

2 = **T:** TFT**A:** Active Matrix OLED **M:** Monitor

3 = **Size**

4 = **Series**

5 = **Viewing Angle: 6:** 6 O'clock **12:** 12 O'clock **O:** All Round Viewing Angle

6 = **Blank:** No Touch **T:** Resistive Touchscreen **C:** Capacitive Touchscreen

7 = **Operating Temp Range:** **S:** 0+50Deg C **B:** -20+60Deg C **W:** -20+70Deg C **E:** -30+85Deg C **X:** -30+80Deg C

8 = **No of Pixels**

9 = **Orientation: P:** Portrait **L:** Landscape

10 = **Mode: R:** Reflective **M:** Transmissive **T:** Transflective **S:** Sunlight Readable (Transmissive) **W:** White on Black (Monochrome)

11 = **Backlight: Blank:** None **L:** LED **C:** CCFL

12 = **Blank:** No Module/board **C:** Controller board module (E-Tech)

13 = **Blank:** None **OB:** Optically Bonded **IPS:** In-plane switching

# 3.General Specifications

- Size: 10.1 inch
- Dot Matrix: 1024 RGB X 600 dots
- Module dimension: 235(W) x143(H) x 3.0(D) mm
- Active area: 222.72 (H) x 125.28(V) mm
- Dot pitch: 0.2175(W) x 0.2088(H) mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o’clock
- Gray Scale Inversion Direction: 6 o’clock
- Backlight Type: LED,Normally White
- With /Without TP: Without TP
- Surface: Anti-Glare

*Color tone slight changed by temperature and driving voltage.

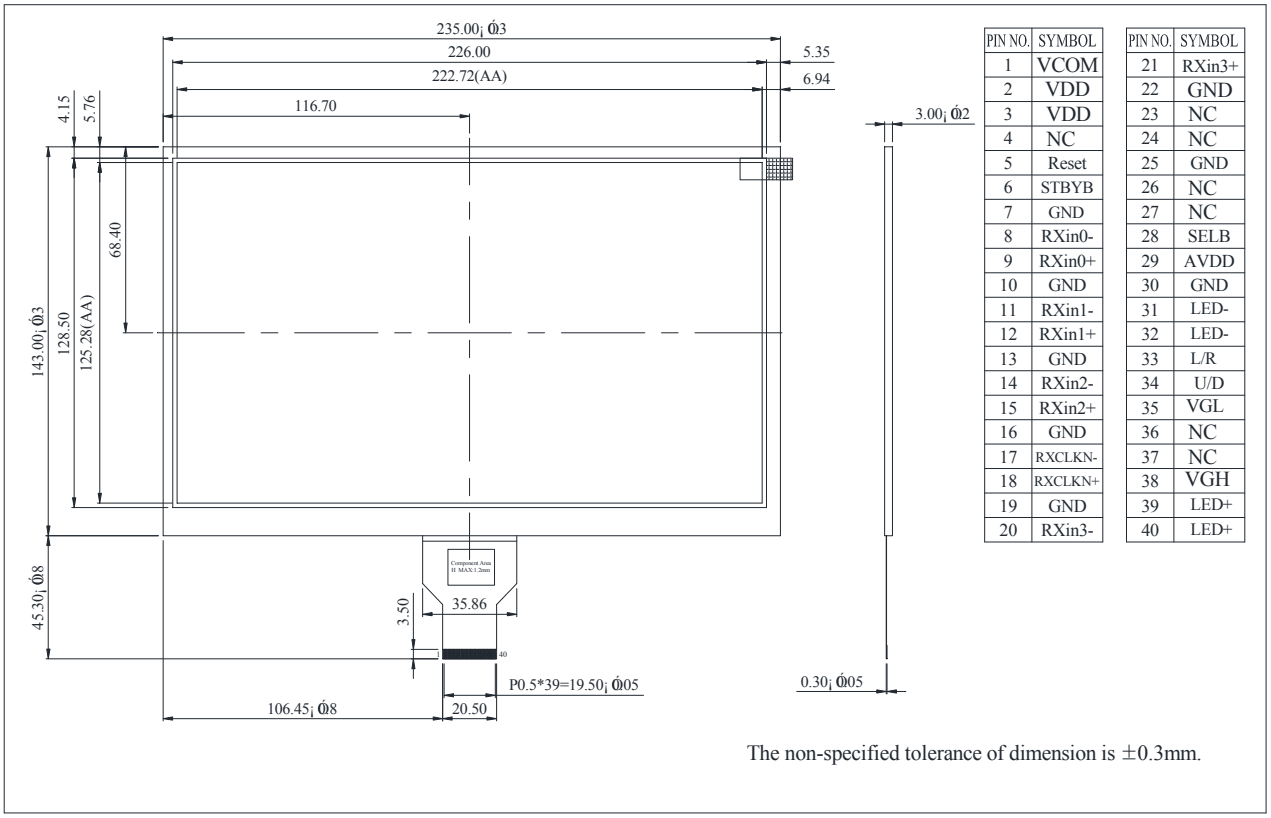
# 4.Interface

### 4.1. TFT LCD MODULE

| PinNo. | Symbol | Description |
|---|---|---|
| 1 | VCOM | Common voltage |
| 2 | VDD | Digital power |
| 3 | VDD | Digital power |
| 4 | NC | Not connect |
| 5 | RESET | Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10KΩ，C=1μF) |
| 6 | STBYB | Standby mode, normally pull high STBYB=”1”, normal operation STBYB=”0”,timing control, source driver will turn off, all output are high-Z |
| 7 | GND | Digital ground |
| 8 | NIND0 | Negative LVDS differential data inputs |
| 9 | PIND0 | Positive LVDS differential data inputs |
| 10 | GND | Digital ground |
| 11 | NIND1 | Negative LVDS differential data inputs |
| 12 | PIND1 | Positive LVDS differential data inputs |
| 13 | GND | Digital ground |
| 14 | NIND2 | Negative LVDS differential data inputs |
| 15 | PIND2 | Positive LVDS differential data inputs |
| 16 | GND | Digital ground |
| 17 | NINC | Negative LVDS differential clock inputs |
| 18 | PINC | Positive LVDS differential clock inputs |
| 19 | GND | Digital ground |
| 20 | NIND3 | Negative LVDS differential data inputs |
| 21 | PIND3 | Positive LVDS differential data inputs |
| 22 | GND | Digital ground |
| 23 | NC | Not connect |
| 24 | NC | Not connect |
| 25 | GND | Digital ground |
| 26 | NC | Not connect |
| 27 | NC | Not connect |
| 28 | SELB | 6-bit/8-bit input select SELB = L , 8-bit ; SELB = H , 6-bit |
| 29 | AVDD | Analog power |
| 30 | GND | Digital ground |
| 31 | VLED- | LED Cathode |
| 32 | VLED- | LED Cathode |
| 33 | SHLR | Left or right display control |
| 34 | UPDN | Up / down display control |
| 35 | VGL | Negative power for TFT |
| 36 | NC | Not connect |

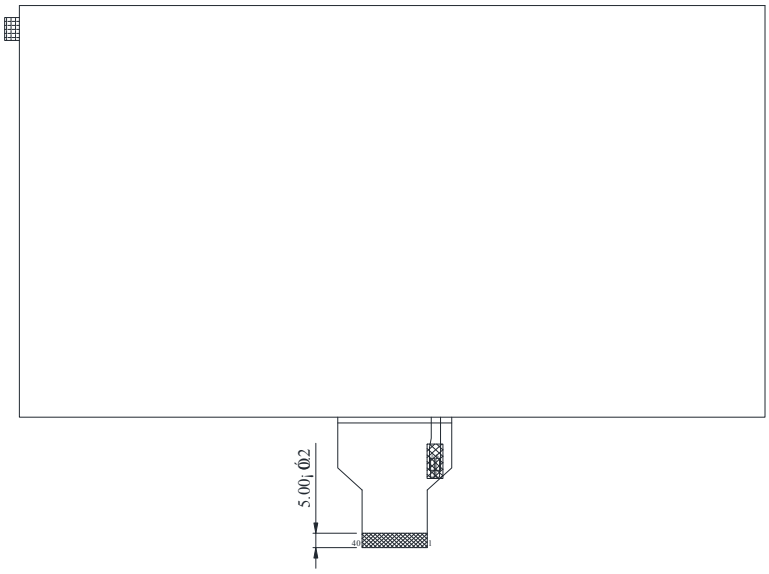
| | | |
|---|---|---|
| 37 | NC | Not connect |
| 38 | VGH | Positive power for TFT |
| 39 | VLED+ | LED Anode |
| 40 | VLED+ | LED Anode |

# 5.Contour Drawing




| PIN NO. | SYMBOL |
|---|---|
| 1 | VCOM |
| 2 | VDD |
| 3 | VDD |
| 4 | NC |
| 5 | Reset |
| 6 | STBYB |
| 7 | GND |
| 8 | RXin0- |
| 9 | RXin0+ |
| 10 | GND |
| 11 | RXin1- |
| 12 | RXin1+ |
| 13 | GND |
| 14 | RXin2- |
| 15 | RXin2+ |
| 16 | GND |
| 17 | RXCLKN- |
| 18 | RXCLKN+ |
| 19 | GND |
| 20 | RXin3- |

| PIN NO. | SYMBOL |
|---|---|
| 21 | RXin3+ |
| 22 | GND |
| 23 | NC |
| 24 | NC |
| 25 | GND |
| 26 | NC |
| 27 | NC |
| 28 | SELB |
| 29 | AVDD |
| 30 | GND |
| 31 | LED- |
| 32 | LED- |
| 33 | L/R |
| 34 | U/D |
| 35 | VGL |
| 36 | NC |
| 37 | NC |
| 38 | VGH |
| 39 | LED+ |
| 40 | LED+ |



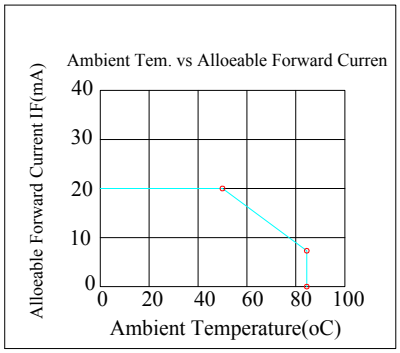

The non-specified tolerance of dimension is ±0.3mm.

# 6.Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Operating Temperature | TOP | -10 | — | +60 | □ |
| Storage Temperature | TST | -20 | — | +70 | □ |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. ≦60□, 90% RH MAX. Temp.＞60□, Absolute humidity shall be less than 90% RH at 60□



# 7.Electrical Characteristics

### 7.1. Typical Operation Conditions (At Ta = 25 °C,)

| ITEM | SYMBOL | MIN | TYP | MAX | UNIT | NOTE |
|---|---|---|---|---|---|---|
| Digital Power Supply Voltage For LCD | VDD | 3 | 3.3 | 3.6 | V | - |
| Analog Power Supply Voltage | AVDD | -- | 10.4 | 11 | V | - |
| Gate On Power Supply Voltage | VGH | 20 | 21 | 22 | V | - |
| Gate Off Power Supply Voltage | VGL | -8.5 | -8 | -7 | V | - |
| Common Power Supply Voltage | VCOM | -- | 3.8 | -- | V | Note1 |
| Logic Input Voltage | VIH | 0.7*DVDD | - | DVDD | V | - |
| | VIL | GND | - | 0.3*DVDD | V | |

Note1.Please adjust VCOM to make the flicker level be minimum.

### 7.2. Backlight Driving Conditions

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|
| Supply voltage of white LED backlight | VL | 8.4 | 9.6 | 10.8 | V | Note 1 |
| Current for LED backlight | IL | 135 | 140 | 150 | mA | |
| Uniformity | △ | 70 | 75 | - | % | |
| LED life time | - | 20,000 | - | - | Hr | Note2 |

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25□ and IL =140mA.
Note 2: The “LEDlife time” is defined as the module brightness decrease to 50%original brightness at Ta=25□ and IL =140mA. The LED lifetime could be decreased if operating IL is lager than 140mA.

# 8.Timing Characteristics

**DE mode**

| Item | Symbol | Values | | | Unit | Remark |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Horizontal Display Area | thd | - | 1024 | - | DCLK | |
| DCLK Frequency | fclk | 40.8 | 51.2 | 67.2 | MHz | |
| One Horizontal Line | th | 1114 | 1344 | 1400 | DCLK | |
| HS Blanking | Thb+thfp | 90 | 320 | 376 | DCLK | |
| Vertical display area | tvd | - | 600 | - | H | |
| VSYNC period time | tv | 610 | 635 | 800 | H | |
| VSYNC blanking | tvb+tvfp | 10 | 85 | 200 | H | |

# 9.Optical Characteristics

| Item | | Symbol | Condition. | Min | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|---|---|
| Response time | | Tr | θ=0°、Φ=0° | - | 4 | - | .ms | Note 3 |
| | | Tf | | - | 4 | - | .ms | Note 3 |
| Contrast ratio | | CR | At optimized viewing angle | - | 600 | - | - | Note 4 |
| Color Chromaticity | White | Wx | θ=0°、Φ=0 | 0.245 | 0.295 | 0.345 | - | Note 2,5 |
| | | Wy | | 0.281 | 0.331 | 0.381 | - | |
| Viewing angle (Gray Scale Inversion Direction) | Hor. | ΘR | CR≧10 | - | 65 | - | Deg. | Note 1 |
| | | ΘL | | - | 65 | - | | |
| | Ver. | ΦT | | - | 55 | - | | |
| | | ΦB | | - | 65 | - | | |
| Brightness | | - | - | 140 | 160 | - | cd/m$^2$ | Center of display |

Ta=25±2□

Note 1: Definition of viewing angle range

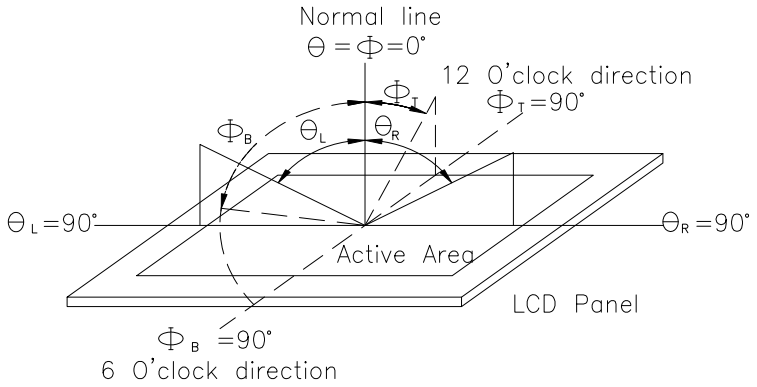



Fig. 9.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

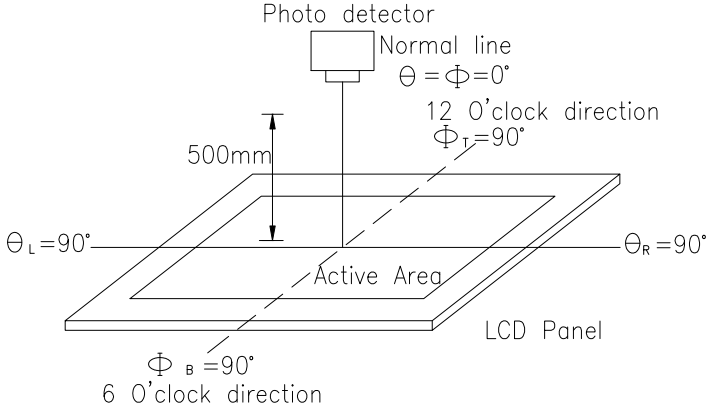
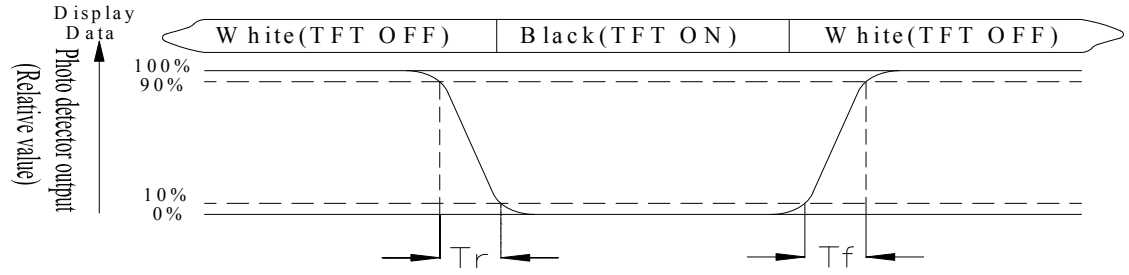



Fig. 9.2. Optical measurement system setup

Note 3: Definition of Response time:
The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time, Tr, is the time between photo detector output intensity changed from 90%to 10%. And fall time, Tf, is the time between photo detector output intensity changed from 10%to 90%




Note 4: Definition of contrast ratio:
The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: White Vi = $V_{i50}$ ± 1.5V
Black Vi = $V_{i50}$ ± 2.0V
“±” means that the analog input signal swings in phase with VCOM signal.
“±” means that the analog input signal swings out of phase with VCOM signal.
The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)
Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

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