Next Vision Display
Brighten The Future

# NEXT VISION DISPLAY

## SPECIFICATION

**CUSTOMER :** _____

**MODULE NO.:** NT070-C001MI

| | |
|---|---|
| Version | 1.0 |
| Engineer | |
| Date | 2022-06-07 |

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| Customer: |
|---|
| Approved by |

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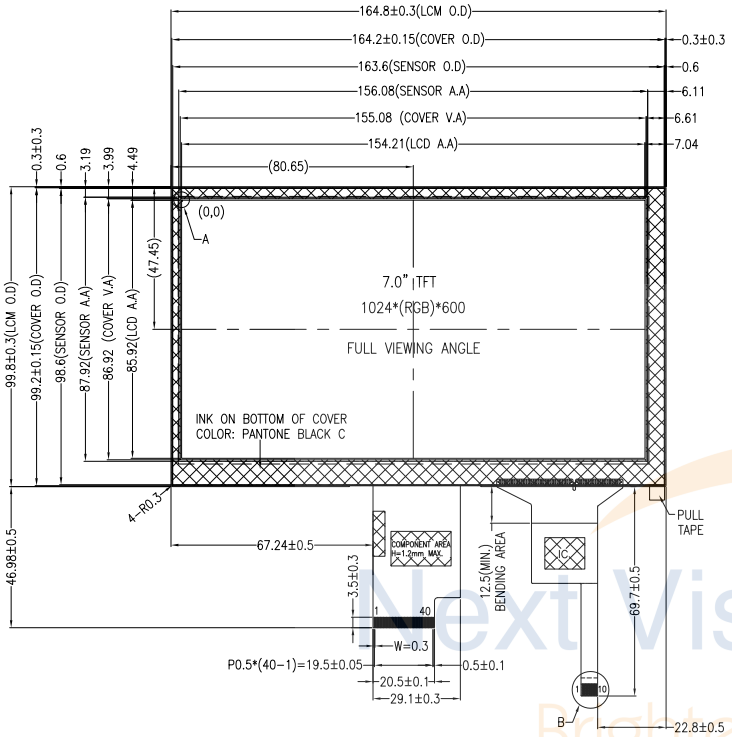
## ■ GENERAL INFORMATION

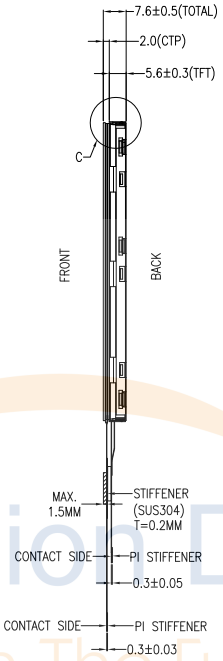
| Item | Specification | Unit |
|---|---|---|
| LCD Type | FFS TFT / Transmissive / Normally black | / |
| Size | 7.0 | Inch |
| Viewing Direction | Full Viewing Angle | O'clock |
| Gray Scale Inversion Direction | - | O'clock |
| LCM (W × H × D) | 164.80 × 99.80 × 7.60 | $mm^3$ |
| Active Area (W × H) | 154.21 × 85.92 | $mm^2$ |
| Pixel Pitch | 0.1506 × 0.1432 | $mm^2$ |
| Number of Dots | 1024 (RGB) × 600 | / |
| Driver IC | HX8282A11 + HX8696 | / |
| Backlight Type | 27LEDs | / |
| Interface Type | 3-/4-lane LVDS | / |
| Color Depth | 262K/16.7M | / |
| Pixel Configuration | R.G.B Vertical Stripe | / |
| Top Polarizer Surface Treatment | Anti-glare | / |
| Input Voltage | 3.3 | V |
| With / Without TSP | With CTP | / |
| TP Surface Treatment | Glare | / |
| Weight | TBD | g |

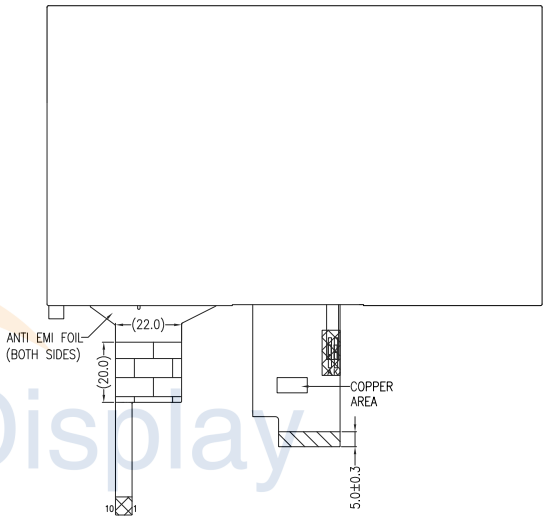
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Note 1: ROHS compliant;
Note 2: LCM weight tolerance: ±5%.

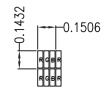
## ■ EXTERNAL DIMENSIONS



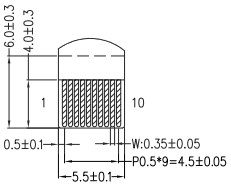



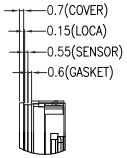

| PIN DESCRIPTION FOR CTP | | PIN DESCRIPTION FOR TFT | |
|---|---|---|---|
| PIN | SYMBOL | PIN | SYMBOL |
| 1 | VSS | 1 | VCOM |
| 2 | VDD | 2 | DVDD |
| 3 | SCL | 3 | DVDD |
| 4 | NC | 4 | NC |
| 5 | SDA | 5 | RESET |
| 6 | NC | 6 | STBYB |
| 7 | /RST | 7 | GND |
| 8 | NC | 8 | NIND0 |
| 9 | /INT | 9 | PIND0 |
| 10 | VSS | 10 | GND |
| | | 11 | NIND1 |
| | | 12 | PIND1 |
| | | 13 | GND |
| | | 14 | NIND2 |
| | | 15 | PIND2 |
| | | 16 | GND |
| | | 17 | NINC |
| | | 18 | PINC |
| | | 19 | GND |
| | | 20 | NIND3 |
| | | 21 | PIND3 |
| | | 22 | GND |
| | | 23 | NC |
| | | 24 | NC |
| | | 25 | GND |
| | | 26 | NC |
| | | 27 | NC |
| | | 28 | SELB |
| | | 29 | AVDD |
| | | 30 | GND |
| | | 31 | LED− |
| | | 32 | LED− |
| | | 33 | SHLR |
| | | 34 | UPDN |
| | | 35 | VGL |
| | | 36 | NC |
| | | 37 | NC |
| | | 38 | VGH |
| | | 39 | LED+ |
| | | 40 | LED+ |



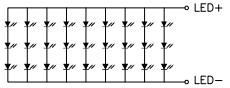

DETAIL A
(SCALE 40:1)




DETAIL B
(SCALE 4:1)




DETAIL C
(SCALE 2:1)




BACKLIGHT CIRCUIT DIAGRAM

NOTES FOR TFT:

1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY BLACK
2. OPERATING VOLTAGE: DVDD=3.3V (TYP.)
3. VIEWING DIRECTION: FULL VIEWING ANGLE
4. DRIVER IC: HX8282A11+HX8696
5. LED BACKLIGHT: 27−CHIP WHITE LED, IF=225mA, VF=8.4V~10.2V
6. TOP POLARIZER SURFACE TREATMENT: ANTI−GLARE

NOTES FOR CTP:

1. 7.0 INCH PROJECTIVE CAPACITIVE TOUCH PANEL
2. COVER GLASS + SENSOR GLASS + FPCA
3. OPERATING VOLTAGE: VDD=3.3V
4. DRIVER IC: FT5426DQ8−003
5. INTERFACE: I²C
6. MULTI FINGER: UP TO 10
7. HARDNESS OF COVER SURFACE: 7H
8. FIRMWARE FILE: TBD

NOTES FOR OTHERS:

1. OPERATING TEMP.: −20°C ~ 70°C
2. STORAGE TEMP.: −30°C ~ 80°C
3. SURFACE LUMINANCE: 380 CD/M^2 (TYP.) WITH CTP
4. THE SINGLE LAYER AREA OF FPC IS BENDABLE AND THE BENDING RADIUS MUST BE NOT LESS THAN 1.5MM
5. GENERAL TOLERANCE: ±0.3MM
6. ROHS COMPLIANT

| VER. | REVISED DESCRIPTION | REVISER | DATE |
|---|---|---|---|
| 01 | FIRST ISSUE | CAROL | 2021.12.08 |

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| | | | |
|---|---|---|---|
| DRAWN BY: | CAROL 2021.12.08 | | MODULE P/N: NT070-C001MI |
| CHECKED BY: | | SCALE : 1/1 | |
| APPROVED BY: | | UNIT: mm | DESCRIPTION: TFT + CTP MODULE |
| VERSION NO: | 01 | SHEET NO.: 1/1 | |

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## ■ ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Supply Voltage for Logic | DVDD | -0.3 | 4.0 | V |
| Supply Voltage for Analog | AVDD | -0.5 | 15.0 | V |
| Power Supply | VGH | -0.3 | 40 | V |
| | VGL | -20 | 0.3 | V |
| | VGH - VGL | - | 40 | V |
| Supply Current (One LED) | ILED | - | 30 | mA |
| Operating Temperature | TOP | -20 | 70 | ℃ |
| Storage Temperature | TST | -30 | 80 | ℃ |

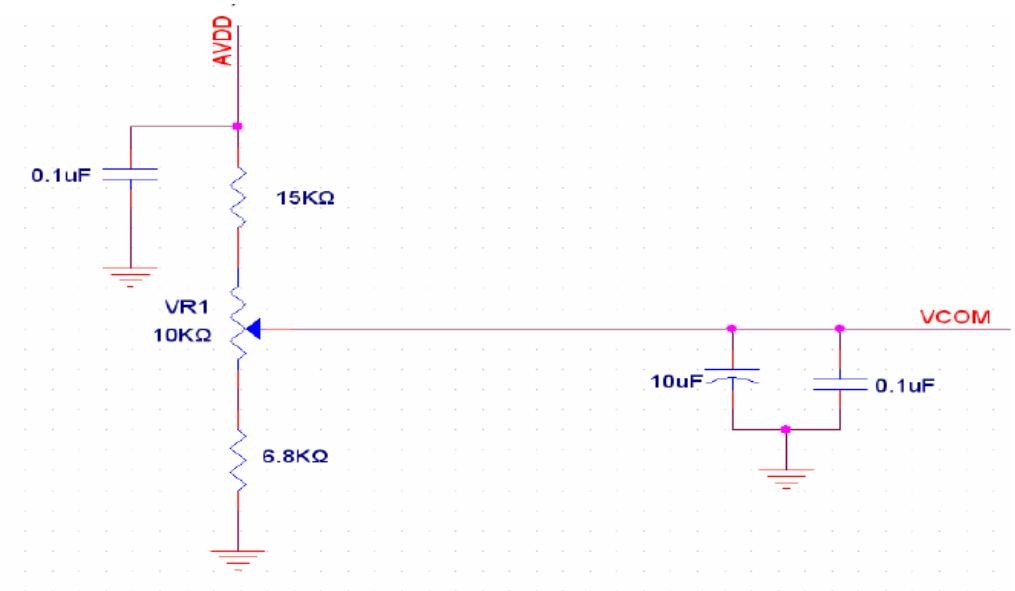
## ■ ELECTRICAL CHARACTERISTICS

### 1. DC CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Supply Voltage for Logic | DVDD | 2.3 | 3.3 | 3.6 | V | |
| Supply Voltage for Analog | AVDD | 8.9 | 9.0 | 9.1 | V | |
| Power Supply | VGH | 17 | 18 | 19 | V | |
| | VGL | -6.5 | -6.0 | -5.5 | V | |
| | VCOM | 3.0 | 3.15 | 3.3 | V | |
| Input High-Level Voltage | VIH | 0.7DVDD | - | DVDD | V | |
| Input Low-Level Voltage | VIL | 0 | - | 0.3DVDD | V | |

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Note 1: Be sure to apply DVDD and VGL to the LCD first, and then apply VGH;
Note 2: DVDD setting should match the signals output voltage (refer to Note 3) of customer's system board.
Note 3: LVDS, Reset.
Note 4: Typ. VCOM is only a reference value, it must be optimized according to each LCM. Be sure to use VR:



| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Current for Driver | IGH | - | 0.5 | 2.0 | mA | VGH=18V |
| | IGL | - | 0.5 | 2.0 | mA | VGL=-6.0V |
| | IDVDD | - | 38 | 60 | mA | DVDD=3.3V |
| | IAVDD | - | 30 | 50 | mA | AVDD=9.0V |
| | IVCOM | - | - | 1.5 | mA | VCOM=3.15V |

## ■ BACKLIGHT CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Forward Voltage | Vf | 8.7 | 9.6 | 9.9 | V | Ta=25±2°C, 60%RH±5% |
| Forward Current | If | - | 225 | - | mA | |
| Power Consumption | $W_{BL}$ | - | 2160 | - | mW | |
| Operating Life Time | - | 30000 | 50000 | - | Hrs | |

Note: Operating life time means brightness goes down to 50% initial brightness;
The life time of LED will be reduced if LED is driven by high current, high ambient temperature and humidity conditions;
Typical operating life time is an estimated data.

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## ■ ELECTRO-OPTICAL CHARACTERISTICS

Ta=25°C±2°C. DVDD=3.3V, If=225mA.

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit | Remark | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Response Time | | Tr + Tf | θ=0° | - | 30 | 50 | ms | FIG 1, 2 | 4 |
| Contrast Ratio | | Cr | | 600 | 800 | - | --- | FIG 1, 3 | 1 |
| Luminance Uniformity | | δ White | | 80 | - | - | % | FIG 1, 3 | 3 |
| Surface Luminance | | Lv | | 300 | 380 | - | cd/m² | FIG 1, 3 | 2 |
| Viewing Angle Range | | θ | Ø = 90° | 80 | 85 | - | deg | FIG 1, 4 | 1, 6 |
| | | | Ø = 270° | 80 | 85 | - | deg | | |
| | | | Ø = 0° | 80 | 85 | - | deg | | |
| | | | Ø = 180° | 80 | 85 | - | deg | | |
| CIE (x,y) Chromaticity | Red | x | θ=0° | 0.548 | 0.598 | 0.648 | --- | FIG 1, 3 | 5 |
| | | y | | 0.300 | 0.350 | 0.400 | | | |
| | Green | x | | 0.313 | 0.363 | 0.413 | | | |
| | | y | | 0.511 | 0.561 | 0.611 | | | |
| | Blue | x | | 0.093 | 0.143 | 0.193 | | | |
| | | y | | 0.091 | 0.141 | 0.191 | | | |
| | White | x | | 0.267 | 0.317 | 0.367 | | | |
| | | y | | 0.304 | 0.354 | 0.404 | | | |
| NTSC | | - | - | - | 45.9 | - | % | - | - |

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Note 1. Contrast Ratio (CR) is defined by following formula. For more information see FIG 3.

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Average Surface Luminance with all black pixels (P1, P2, P3, P4, P5)}}$$

Note 2. Surface luminance is the LCD surface luminance with all pixels displaying white state. For more information see FIG 3.

Lv = Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)

Note 3. The uniformity in surface luminance (δ White) is determined by measuring luminance at each test position 1 through 5, and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance. For more information see FIG 3.

$$\delta \text{ White} = \frac{\text{Minimum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Maximum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}$$

Note 4. Response time is the time required for the display to transition from white to black (Rise Time, Tr) and from black to white (Fall Time, Tf). For additional information see FIG 2.

Note 5. CIE (x,y) chromaticity, color coordinates measured at center point of LCD.

Note 6. Viewing angle is the angle at which the contrast ratio is greater than a specific value. For TFT module, the specific value of contrast ratio is 10. For monochrome module, the specific value of contrast ratio is 2. 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 FIG 4.

## ■ INTERFACE DESCRIPTION

| Pin No. | Symbol | I/O/P | Description |
|---|---|---|---|
| 1 | VCOM | P | Common voltage. |
| 2 | DVDD | P | Power voltage for digital circuit. |
| 3 | DVDD | P | Power voltage for digital circuit. |
| 4 | NC | - | No connection. |
| 5 | RESET | I | Global reset pin. |
| 6 | STBYB | I | Standby mode, normally pulled high STBYB="1", normal operation STBYB="0", timing controller, source driver will turn off, all output are High-Z. |
| 7 | GND | P | Ground. |
| 8 | NIND0 | I | -LVDS differential data input. |
| 9 | PIND0 | I | +LVDS differential data input. |
| 10 | GND | P | Ground. |
| 11 | NIND1 | I | -LVDS differential data input. |
| 12 | PIND1 | I | +LVDS differential data input. |
| 13 | GND | P | Ground. |
| 14 | NIND2 | I | -LVDS differential data input. |
| 15 | PIND2 | I | +LVDS differential data input. |
| 16 | GND | P | Ground. |
| 17 | NINC | I | -LVDS differential clock input. |
| 18 | PINC | I | +LVDS differential clock input. |
| 19 | GND | P | Ground. |
| 20 | NIND3 | I | -LVDS differential data input. |
| 21 | PIND3 | I | +LVDS differential data input. |
| 22 | GND | P | Ground. |
| 23 | NC | - | No connection. |
| 24 | NC | - | No connection. |
| 25 | GND | P | Ground. |
| 26 | NC | - | No connection. |
| 27 | NC | - | No connection. |
| 28 | SELB | I | 6-/8-bit mode select. |
| 29 | AVDD | P | Power for analog circuit. |
| 30 | GND | P | Ground. |
| 31 | LED- | P | Cathode of backlight. |
| 32 | LED- | P | Cathode of backlight. |
| 33 | SHLR | I | Horizontal inversion. |
| 34 | UPDN | I | Vertical inversion. |
| 35 | VGL | I | Gate off voltage. |
| 36 | NC | - | No connection. |
| 37 | NC | - | No connection. |
| 38 | VGH | I | Gate on voltage. |
| 39 | LED+ | P | Anode of backlight. |
| 40 | LED+ | P | Anode of backlight. |

Note 1: I/O/P definition: I----Input O----Output P----Power/Ground

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