



**WINSTAR Display Co.,Ltd.**  
**華凌光電股份有限公司**



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## 華凌光電股份有限公司



WEB: <https://www.winstar.com.tw> E-mail: [sales@winstar.com.tw](mailto:sales@winstar.com.tw)

### SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODEL NO. :** WLOF00035000XGAABSA00

**APPROVED BY:**

( FOR CUSTOMER USE ONLY )

| SALES BY | APPROVED BY | CHECKED BY             | PREPARED BY |
|----------|-------------|------------------------|-------------|
|          |             | Leo Liu<br>Erick Chung | Debby Hsu   |

| VERSION | DATE       | REVISED<br>PAGE NO. | SUMMARY                                  |
|---------|------------|---------------------|------------------------------------------|
| A       | 2023/09/11 | 9                   | Add note in 6.Electrical Characteristics |

TFT Display Inspection Specification: <https://www.winstar.com.tw/technology/download.html>

Precaution in use of TFT module: <https://www.winstar.com.tw/technology/download/declaration.html>

| RECORDS OF REVISION |            |                     | DOC. FIRST ISSUE                         |
|---------------------|------------|---------------------|------------------------------------------|
| VERSION             | DATE       | REVISED<br>PAGE NO. | SUMMARY                                  |
| 0                   | 2023/03/29 |                     | First issue                              |
| A                   | 2023/09/11 | 9                   | Add note in 6.Electrical Characteristics |
|                     |            |                     |                                          |

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# 1. Smart Display Classification Information

|   |   |    |        |     |   |   |    |   |   |    |
|---|---|----|--------|-----|---|---|----|---|---|----|
| W | L | 0F | 000350 | 00X | G | A | AB | S | A | 00 |
| ① | ② | ③  | ④      | ⑤   | ⑥ | ⑦ | ⑧  | ⑨ | ⑩ | ⑪  |

|   |                                                                  |                  |                                                                                                                                                                                   |                                                                                    |
|---|------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| ① | W: WINSTAR products                                              |                  |                                                                                                                                                                                   |                                                                                    |
| ② | Type: L:Standard    K:Customization                              |                  |                                                                                                                                                                                   |                                                                                    |
| ③ | Display Type:                                                    | Standard:        | 0H: Character STN<br>0X: Graphic STN (TAB/COF)<br>0F: TFT<br>EH: Character OLED<br>EX: OLED (TAB/COF)                                                                             | 0G: Graphic STN<br>0P: Graphic STN (COG)<br><br>EG: Graphic OLED<br>EP: OLED (COG) |
|   |                                                                  | Customization:   | DH: Character<br>DN: Graphic<br>ED: OLED                                                                                                                                          | DG: Graphic STN<br>OJ: TFT                                                         |
| ④ | Display size:<br>(diagonal) /<br>Display format:<br>(resolution) | Character STN:   | e.g., 8x1: 000801    16x2: 001602    24x4: 002404                                                                                                                                 |                                                                                    |
|   |                                                                  | Graphic STN:     | e.g., 128x64: 012864    320x240: 320240                                                                                                                                           |                                                                                    |
|   |                                                                  | TFT Size (inch): | 000096-0.96" / 000350-3.5" / 000430-4.3" / 000570-5.7"<br>000700-7.0" / 000800-8.0" / 001020-10.2" / 001210-12.1"<br>(The last two digits are two digits after the decimal point) |                                                                                    |
| ⑤ | Serial No:                                                       | OLED:            | e.g., 128x64: 012864 Customization: 0001XX                                                                                                                                        |                                                                                    |
|   |                                                                  | 0A1 ~ 0ZZ        | Customization STN: 000                                                                                                                                                            |                                                                                    |

|   |                       |                                                                                                      |                                                                                                              |                                         |
|---|-----------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| ⑥ | Touch Panel Type:     | N: Without TP T: RTP G: CTP                                                                          |                                                                                                              |                                         |
| ⑦ | Model Interface:      | A: CAN<br>B: Bluetooth<br>C:Controller Specified<br>D: RS485<br>E: RS232<br>F: USART<br>G: Logic I/O | H: HDMI<br>R: Memory Specified<br>P: RS422<br>N: Ethernet<br>J: Analog I/O<br>K: USB<br>L: WIFI<br>M: Zigbee | X: Combined<br>Y: Proprietary interface |
| ⑧ | Interface Serial No.: | AA ~ ZZ                                                                                              |                                                                                                              |                                         |
| ⑨ | Control Category:     | S: Smart Display E: Entry N: Non-specified                                                           |                                                                                                              |                                         |
| ⑩ | Special Code:         | A ~ Z                                                                                                |                                                                                                              |                                         |
| ⑪ | Model code:           | 00 ~ ZZ                                                                                              |                                                                                                              |                                         |

## **2. Summary**

### **3.5 Inch Smart Display Feature**

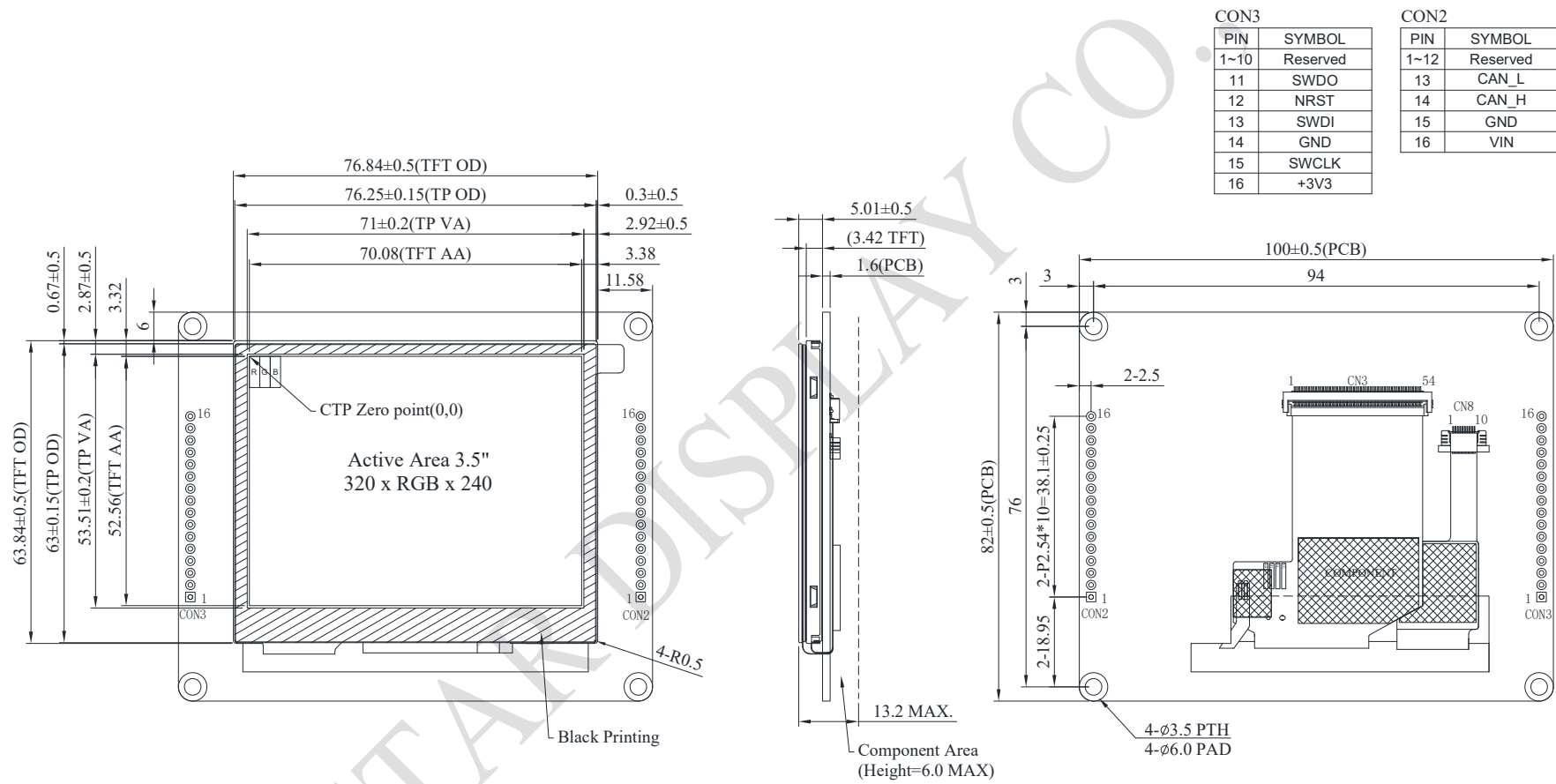
1. DC 5V~24V working voltage, low power consumption.
2. Self-testing after booting function.
3. CAN bus communication interface.
4. Supports Custom CAN ID protocol, default baud rate at 250KB.
5. Built in flash memory, store the font and Object Dictionary Data.
6. Support capacitive touch panel(CTP).
7. Embedded buzzer controlled by Master Device.
8. Demo set HOST can be used on multiple platforms, such as Computer (with USB to CAN Dongle), MCU, Raspberry Pi (with PiCAN2).

### 3. Product information

#### General information

| Item                    | Standard Value                    | Unit              |
|-------------------------|-----------------------------------|-------------------|
| Operating voltage       | 5 ~ 24                            | Vdc               |
| Communication Interface | CAN bus differential $\pm 3.3$    | Vpp               |
| MCU                     | STM32F750                         | N/A               |
| Flash Memory            | 16                                | MB                |
| SDRAM Frequency         | 108                               | MHz               |
| LCD display size        | 3.5                               | inch              |
| Dot Matrix              | 320× 3(RGB) × 240                 | dot               |
| Module dimension        | 100(W) x 82(H) x 13.2(D)          | mm                |
| Active area             | 70.08(W) x 52.56(H)               | mm                |
| Pixel pitch             | 0.219 x 0.219                     | mm                |
| Brightness              | Min: 300; Typ: 400                | cd/m <sup>2</sup> |
| LCD type                | TFT, Normally Black, Transmissive |                   |
| View Direction          | 80/80/80/80                       |                   |
| Aspect Ratio            | 4:3                               |                   |
| With /Without TP        | With CTP                          |                   |
| Surface                 | Glare                             |                   |

# 4. Contour Drawing



The non-specified tolerance of dimension is  $\pm 0.3$ mm.

## 5. Absolute Maximum Ratings

| Item                  | Symbol | Min | Typ | Max | Unit | Remark |
|-----------------------|--------|-----|-----|-----|------|--------|
| Operating Temperature | TOP    | -20 | —   | +70 | °C   |        |
| Storage Temperature   | TST    | -30 | —   | +80 | °C   |        |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above  
Temp.  $\leq 60^{\circ}\text{C}$ , 90% RH MAX. Temp.  $> 60^{\circ}\text{C}$ , Absolute humidity shall be less than 90% RH at  $60^{\circ}\text{C}$

## 6. Electrical Characteristics

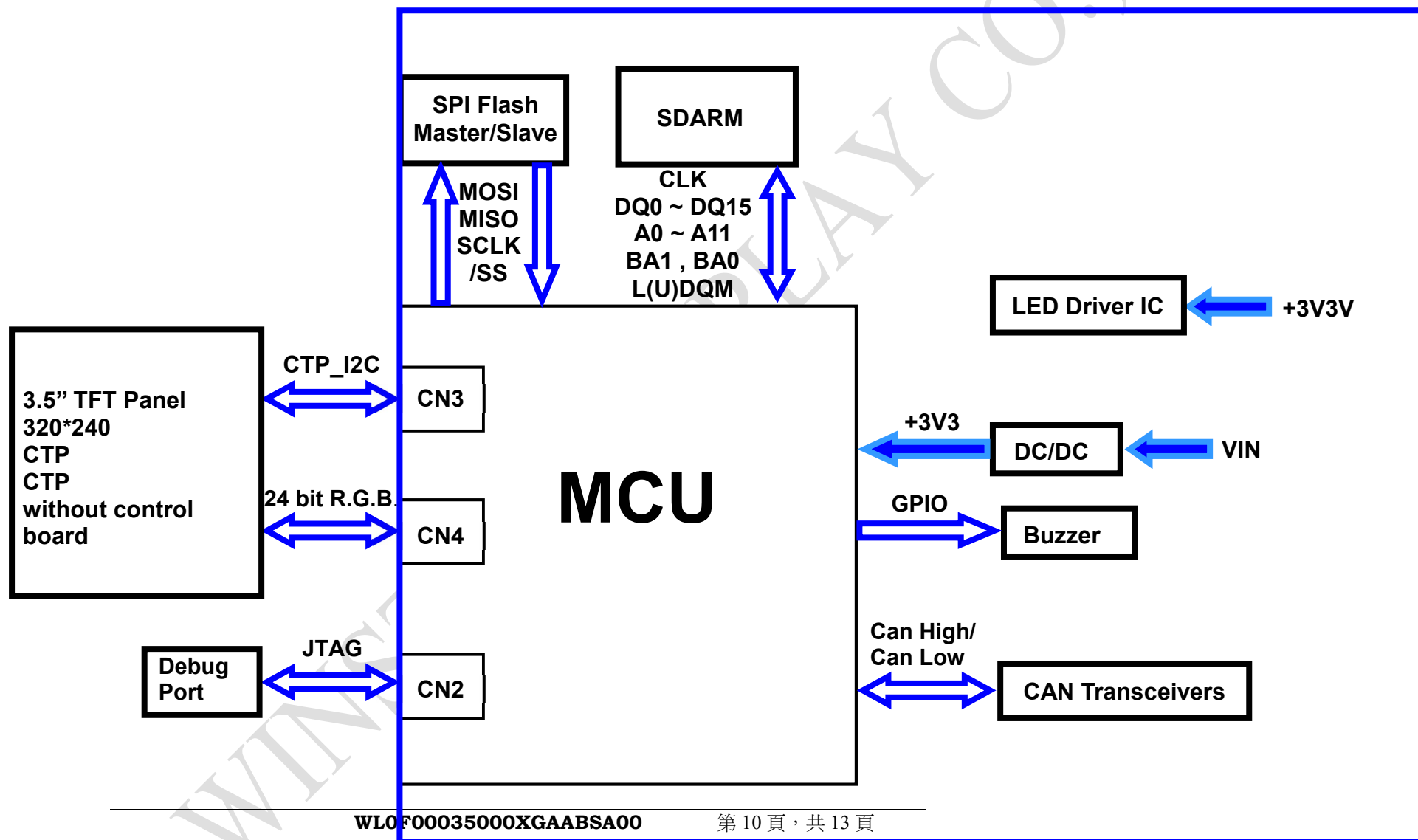
| Item           | Symbol | Min | Typ | Max | Unit | Remark |
|----------------|--------|-----|-----|-----|------|--------|
| Supply Voltage | VIN    | 5   | 12  | 24  | V    |        |
| Supply Current | ICC    | -   | 150 | -   | mA   |        |

Note: if device supply voltage more than 12V. Must in power add one 10uF/50V~100uF/50V electrolytic capacitor.

## 7. BOM

| Item | Description          | Remark |
|------|----------------------|--------|
| LCM  | WF35XTYACDNG0#       |        |
| PCBA | SV100035000XA00N0102 |        |

## 8. Block diagram



## 9. Interface

### CON2 definition:

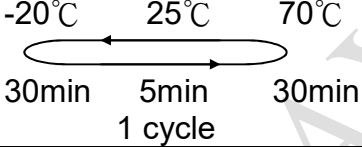
| Pin  | Symbol   | Function      | Remark |
|------|----------|---------------|--------|
| 16   | VIN      | Power +5V~24V | Input  |
| 15   | GND      | Power GND     | Input  |
| 14   | CAN_H    | CAN bus D+    | I/O    |
| 13   | CAN_L    | CAN bus D-    | I/O    |
| 12-1 | Reserved | --            | --     |

### CON3 definition:

| Pin  | Symbol   | Function                      | Remark |
|------|----------|-------------------------------|--------|
| 16   | +3V3     | 3.3V power for JTAG interface | Output |
| 15   | SWCLK    | CLK pin for JTAG interface    | Input  |
| 14   | GND      | GND for JTAG interface        | Output |
| 13   | SWDIO    | Data pin for JTAG interface   | I/O    |
| 12   | NRST     | Reset pin for JTAG interface  | Input  |
| 11   | SWO      | Data pin for JTAG interface   | I/O    |
| 10-1 | Reserved | --                            | -      |

# 10. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

| Environmental Test                      |                                                                                                                                                                                                                                                                   |                                                                                                                                                  |      |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Test Item                               | Content of Test                                                                                                                                                                                                                                                   | Test Condition                                                                                                                                   | Note |
| High Temperature storage                | Endurance test applying the high storage temperature for a long time.                                                                                                                                                                                             | 80°C<br>200hrs                                                                                                                                   | 2    |
| Low Temperature storage                 | Endurance test applying the low storage temperature for a long time.                                                                                                                                                                                              | -30°C<br>200hrs                                                                                                                                  | 1,2  |
| High Temperature Operation              | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.                                                                                                                                            | 70°C<br>200hrs                                                                                                                                   | —    |
| Low Temperature Operation               | Endurance test applying the electric stress under low temperature for a long time.                                                                                                                                                                                | -20°C<br>200hrs                                                                                                                                  | 1    |
| High Temperature/<br>Humidity Operation | The module should be allowed to stand at 60°C,90%RH max                                                                                                                                                                                                           | 60°C,90%RH<br>96hrs                                                                                                                              | 1,2  |
| Thermal shock resistance                | <p>The sample should be allowed stand the following 10 cycles of operation</p>  <p style="text-align: center;">-20°C    25°C    70°C<br/>30min    5min    30min<br/>1 cycle</p> | -20°C/70°C<br>10 cycles                                                                                                                          | —    |
| Vibration test                          | Endurance test applying the vibration during transportation and using.                                                                                                                                                                                            | <p>Total fixed amplitude : 1.5mm<br/>Vibration<br/>Frequency : 10~55Hz<br/>One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes</p> | 3    |
| Static electricity test                 | Endurance test applying the electric stress to the terminal.                                                                                                                                                                                                      | <p>VS=±2kV~±6kV(contact),±2kV~±8kV(air),<br/>RS=330Ω<br/>CS=150pF<br/>10 times</p>                                                               | —    |

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

# 11. Product inspection check list

Check samples by meter  $V_{IN}$ ,  $I_{system}$

| Item              | No 1 | No 2 | No 3 | Note |
|-------------------|------|------|------|------|
| $V_{IN}$ (V)      | 12   | 12   | 12   |      |
| $I_{system}$ (mA) | 150  | 151  | 150  |      |

Check sample Reliability Test

| Item                       | Result        | Note                                                                                                                                   |
|----------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Thermal shock              |               | -20°C/70°C 20 cycles                                                                                                                   |
| High Temperature Operation | PASS_20210406 | 80°C<br>200hrs                                                                                                                         |
| Low Temperature Operation  | PASS_20210305 | -30°C<br>200hrs                                                                                                                        |
| Static electricity test    |               | VS=±2KV~±6KV(contact),±2KV~±8KV (air),<br>RS=330Ω<br>CS=150pF<br>10 times                                                              |
| Vibration test             | —             | Total fixed amplitude : 1.5mm<br>Vibration Frequency : 10~55Hz<br>One cycle 60 seconds to 3 directions of X,Y,Z for<br>Each 15 minutes |

- Prepare sets for testing