



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

## SPECIFICATION

**MODULE NO.: WO320240D-TFH-V#**

### General Specification

| ITEM              | STANDARD VALUE       | UNIT |
|-------------------|----------------------|------|
| Number of dots    | 320x240              | —    |
| Outline dimension | 94.7 x 83.3 x 8.6max | mm   |
| View area         | 81.4 x 61.0          | mm   |
| Active area       | 76.785 x 57.11       | mm   |
| Dot size          | 0.223 x 0.225        | mm   |
| Dot pitch         | 0.238 x 0.24         | mm   |
| Duty              | 1/240                |      |
| Backlight         | LED                  |      |
| IC                | RA8835               |      |

# Absolute Maximum Ratings

| Item                     | Symbol          | Min  | Typ | Max          | Unit |
|--------------------------|-----------------|------|-----|--------------|------|
| Operating Temperature    | $T_{OP}$        | -20  | —   | +70          | °C   |
| Storage Temperature      | $T_{ST}$        | -30  | —   | +80          | °C   |
| Input Voltage            | $V_{IN}$        | -0.3 | —   | $V_{DD}+0.3$ | V    |
| Supply Voltage For Logic | $V_{DD}-V_{SS}$ | -0.3 | —   | 7.0          | V    |
| Supply Voltage For LCD   | $V_{DD}-V_0$    | 0    | —   | 32           | V    |

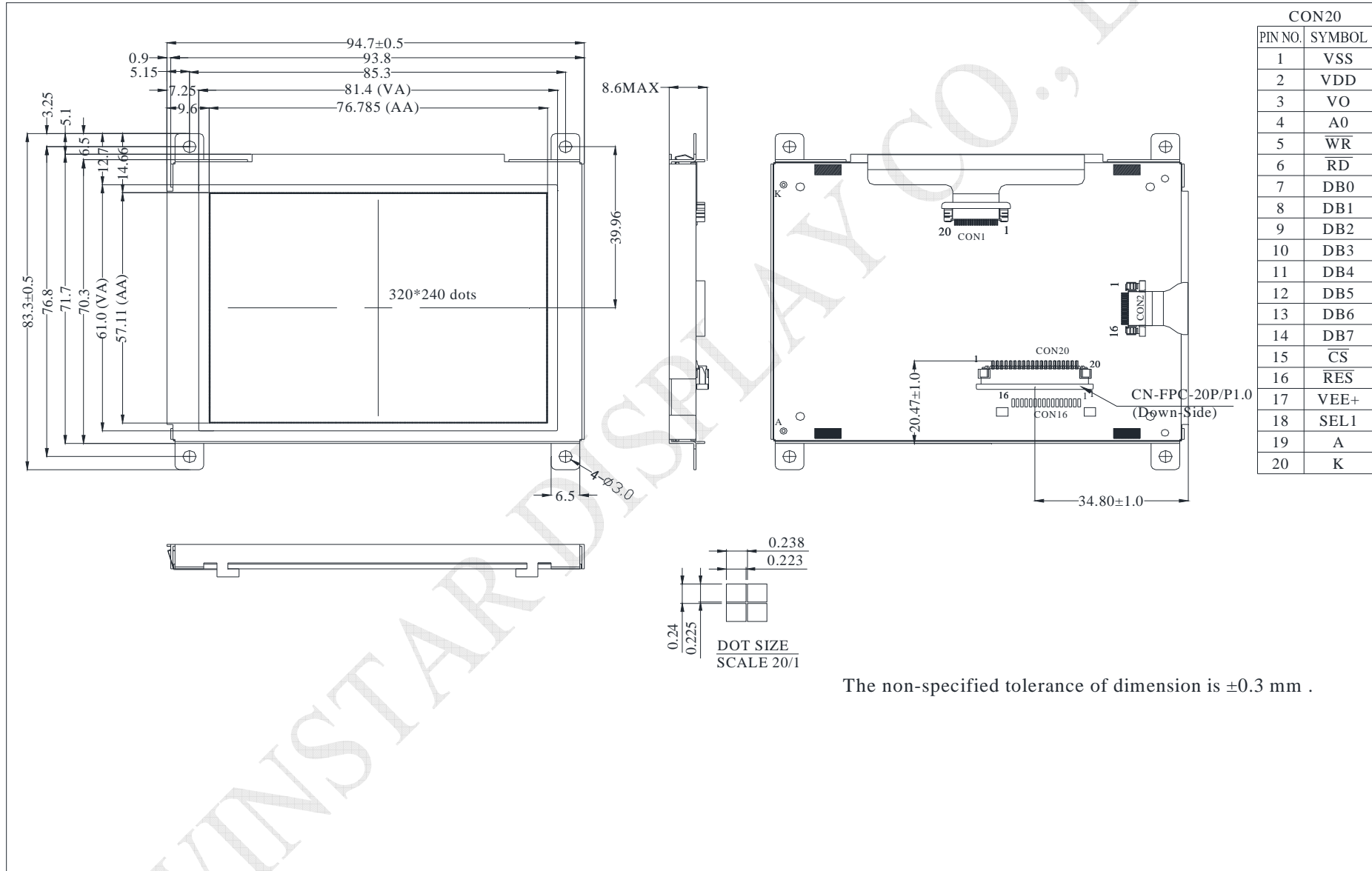
# Electrical Characteristics

| Item                     | Symbol          | Condition                 | Min          | Typ  | Max          | Unit |
|--------------------------|-----------------|---------------------------|--------------|------|--------------|------|
| Supply Voltage For Logic | $V_{DD}-V_{SS}$ | —                         | 3.0          | 3.3  | 3.6          | V    |
|                          | $V_{DD}-V_{SS}$ | —                         | 4.7          | 5.0  | 5.3          | V    |
| Supply Voltage For LCD   | $V_{OP}$        | $T_a=-20^{\circ}\text{C}$ | —            | —    | —            | V    |
|                          |                 | $T_a=25^{\circ}\text{C}$  | 22.7         | 23.0 | 23.3         | V    |
|                          |                 | $T_a=70^{\circ}\text{C}$  | —            | —    | —            | V    |
| Input High Volt.         | $V_{IH}$        | —                         | $0.5V_{DD}$  | —    | $V_{DD}$     | V    |
| Input Low Volt.          | $V_{IL}$        | —                         | $V_{SS}$     | —    | $0.2V_{DD}$  | V    |
| Output High Volt.        | $V_{OH}$        | —                         | $V_{DD}-0.4$ | —    | —            | V    |
| Output Low Volt.         | $V_{OL}$        | —                         | —            | —    | $V_{SS}+0.4$ | V    |
| Supply Current           | $I_{DD}$        | $V_{DD}=3.3\text{V}$      | —            | 63.5 | 100.0        | mA   |
|                          | $I_{DD}$        | $V_{DD}=5.0\text{V}$      | —            | 52.0 | 80.0         | mA   |

# Interface Pin Function

| Pin No. | Symbol           | Level      | Description                                            |
|---------|------------------|------------|--------------------------------------------------------|
| 1       | $V_{SS}$         |            | Ground                                                 |
| 2       | $V_{DD}$         |            | Power supply for Logic                                 |
| 3       | $V_O$            | (Variable) | Operation voltage LCD driving                          |
| 4       | $A_0$            | H/L        | H:Data L:Instruction                                   |
| 5       | $\overline{WR}$  | H          | 8080 family: Write signal, 6800 family: R/W signal     |
| 6       | $\overline{RD}$  | L          | 8080 family: Read signal, 6800 family: Enable clock    |
| 7-14    | DB0-DB7          | H/L        | DB0 Data bus line                                      |
| 15      | $\overline{CS}$  | H/L        | Chip Enable                                            |
| 16      | $\overline{RES}$ | H/L        | Reset                                                  |
| 17      | VEE              |            | Positive voltage output                                |
| 18      | SEL1             | H/L        | 8080 OR 6800 Family Interface Select ; H:68xx , L:80xx |
| 19      | A                |            | Power supply for B/L+                                  |
| 20      | K                |            | Power supply for B/L-                                  |

# Contour Drawing & Block Diagram



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