



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

SPECIFICATION

MODULE NO.:

WH2004D

General Specification

| Item | Dimension | Unit |
|----------------------|-------------------------|------|
| Number of Characters | 20 Characters x 4 Lines | — |
| Module dimension | 77.0 x 47.0 x 12.4(MAX) | mm |
| View area | 60.0 x 22.0 | mm |
| Active area | 55.1 x 17.56 | mm |
| Dot size | 0.46 x 0.42 | mm |
| Dot pitch | 0.51 x 0.47 | mm |
| Character size | 4.03 x 2.30 | mm |
| Character pitch | 4.51 x 2.78 | mm |
| Duty | 1/16 | |
| Backlight Type | LED | |
| IC | ST7066U | |
| Interface | 6800 | |

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_I | V_{SS} | — | V_{DD} | V |
| Supply Voltage For Logic | $V_{DD}-V_{SS}$ | -0.3 | — | 7 | V |
| Supply Voltage For LCD | $V_{DD}-V_0$ | -0.3 | — | 13 | V |

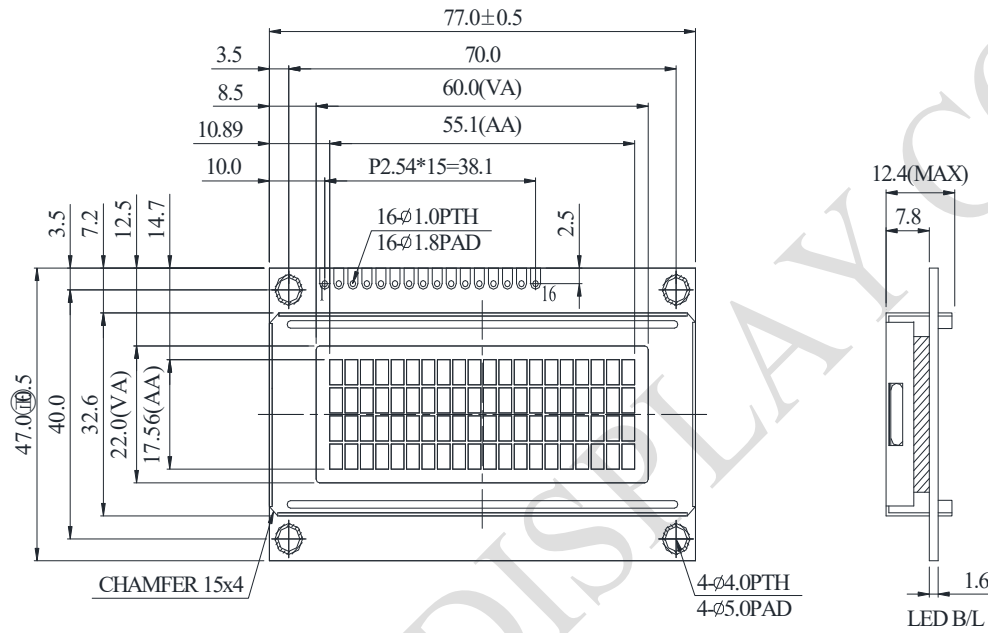
Electrical Characteristics

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|--------------------------|-----------------|---------------------------|--------------|-----|----------|------|
| Supply Voltage For Logic | $V_{DD}-V_{SS}$ | — | 4.5 | 5.0 | 5.5 | V |
| Supply Voltage For LCD | $V_{DD}-V_0$ | $T_a=-20^{\circ}\text{C}$ | — | — | 5.3 | V |
| | | $T_a=25^{\circ}\text{C}$ | 4.4 | 4.5 | 4.6 | V |
| | | $T_a=70^{\circ}\text{C}$ | 3.8 | — | — | V |
| Input High Volt. | V_{IH} | — | $0.7 V_{DD}$ | — | V_{DD} | V |
| Input Low Volt. | V_{IL} | — | V_{SS} | — | 0.6 | V |
| Output High Volt. | V_{OH} | — | 3.9 | — | V_{DD} | V |
| Output Low Volt. | V_{OL} | — | 0 | — | 0.4 | V |
| Supply Current | I_{DD} | $V_{DD}=5.0\text{V}$ | 1.0 | 1.2 | 1.5 | mA |

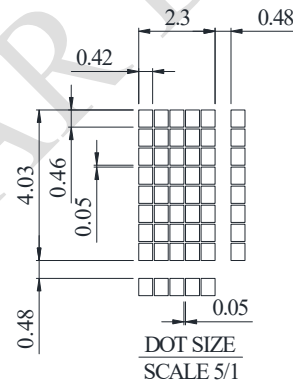
Interface Pin Function

| Pin No. | Symbol | Level | Description |
|---------|-----------------|------------|------------------------------|
| 1 | V _{SS} | 0V | Ground |
| 2 | V _{DD} | 5.0V | Supply Voltage for logic |
| 3 | VO | (Variable) | Operating voltage for LCD |
| 4 | RS | H/L | H: DATA, L: Instruction code |
| 5 | R/W | H/L | H: Read L: Write |
| 6 | E | H,H→L | Chip enable signal |
| 7 | DB0 | H/L | Data bus line |
| 8 | DB1 | H/L | Data bus line |
| 9 | DB2 | H/L | Data bus line |
| 10 | DB3 | H/L | Data bus line |
| 11 | DB4 | H/L | Data bus line |
| 12 | DB5 | H/L | Data bus line |
| 13 | DB6 | H/L | Data bus line |
| 14 | DB7 | H/L | Data bus line |
| 15 | A | — | Power supply for B/L(+) |
| 16 | K | — | Power supply for B/L(-) |

Contour Drawing



| PIN NO. | SYMBOL |
|---------|--------|
| 1 | Vss |
| 2 | Vdd |
| 3 | Vo |
| 4 | RS |
| 5 | R/W |
| 6 | E |
| 7 | DB0 |
| 8 | DB1 |
| 9 | DB2 |
| 10 | DB3 |
| 11 | DB4 |
| 12 | DB5 |
| 13 | DB6 |
| 14 | DB7 |
| 15 | A |
| 16 | K |



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