# LCD / LCM SPECIFICATION


WINSTAR Display Co.,Ltd.

華凌光電股份有限公司

# SPECIFICATION

## MODULE NO.: WG320240D0

# General Specification

| Item | Dimension | Unit |
|---|---|---|
| Number of dots | 320 x 240 | — |
| Module dimension | 142.0 x 96.0 x 15.7 (MAX) | mm |
| View area | 104.0 x 79.3 | mm |
| Active area | 95.97 x 71.97 | mm |
| Dot size | 0.27 x 0.27 | mm |
| Dot pitch | 0.30 x 0.30 | mm |
| LCD type | FSTN Positive Transflective<br>(In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.) | |
| Duty | 1/240 | |
| View direction | 6 o'clock | |
| Backlight Type | LED, White | |
| IC | RA8835 | |
| Interface | 80 series | |

# Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Operating Temperature | $T_{OP}$ | -20 | — | +70 | ℃ |
| Storage Temperature | $T_{ST}$ | -30 | — | +80 | ℃ |
| 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 | $V_{DD}$-$V_{SS}$ | — | 4.5 | 5.0 | 5.5 | V |
| Supply Voltage For LCD | $V_{DD}$-$V_O$ | Ta=-20℃ | — | — | 23.5 | V |
| | | Ta=25℃ | 21.0 | 21.6 | 22.2 | V |
| | | Ta=70℃ | 19.8 | — | — | V |
| Input High Volt. | $V_{IH}$ | — | 0.5$V_{DD}$ | — | $V_{DD}$ | V |
| Input Low Volt. | $V_{IL}$ | — | $V_{SS}$ | — | 0.2$V_{DD}$ | V |
| Output High Volt. | $V_{OH}$ | — | $V_{DD}$ -0.4 | — | — | V |
| Output Low Volt. | $V_{OL}$ | — | — | — | $V_{SS}$ +0.4 | V |
| Supply Current | $I_{DD}$ | $V_{DD}$=5.0V | 98 | 112 | 135 | mA |

# Interface Pin Function

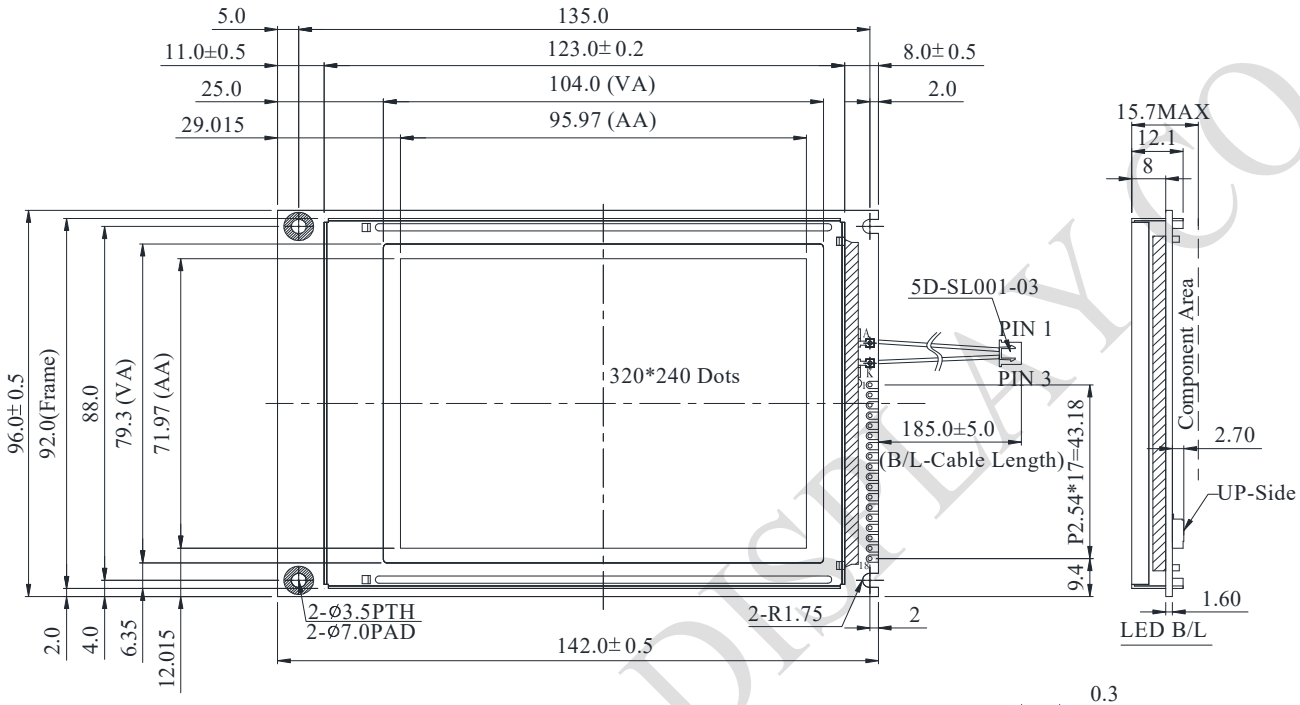
**CON 1**

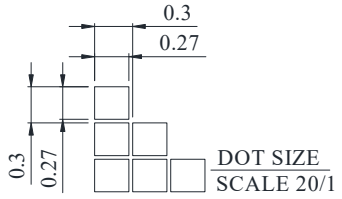
| Pin No. | Symbol | Level | Description |
|---|---|---|---|
| 1 | VSS | 0V | Ground |
| 2 | VDD | 5.0V | Power supply for Logic |
| 3 | VO | (Variable) | Driving voltage for LCD |
| 4 | A0 | H/L | RD=L WR=H ,A0=L :Data Read AO=H :Status read<br>RD=H WR=L ,A0=L :Data Write AO=H :Command write |
| 5 | WR | H/L | 8080 family MPU interface : Write signal |
| 6 | RD | H/L | 8080 family MPU interface: Read signal |
| 7~14 | DB0~DB7 | H/L | Data bus line |
| 15 | CS | H/L | Chip select ,Active L |
| 16 | RES | H/L | Controller reset signal, Active L |
| 17 | VEE | | Negative voltage output (Optional) |
| 18 | DISPOFF | | Display off |

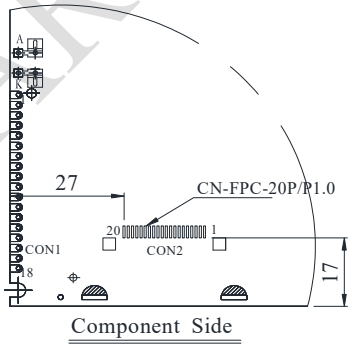
**CON 2**

| Pin No. | Symbol | Level | Description |
|---|---|---|---|
| 1 | VSS | 0V | Ground |
| 2 | VDD | 5.0V | Power supply for Logic |
| 3 | VO | (Variable) | Driving voltage for LCD |
| 4 | A0 | H/L | RD=L WR=H ,A0=L :Data Read AO=H :Status read<br>RD=H WR=L ,A0=L :Data Write AO=H :Command write |
| 5 | WR | H/L | 8080 family MPU interface : Write signal |
| 6 | RD | H/L | 8080 family MPU interface: Read signal |
| 7~14 | DB0~DB7 | H/L | Data bus line |
| 15 | CS | H/L | Chip select ,Active L |
| 16 | RES | H/L | Controller reset signal, Active L |
| 17 | VEE | — | Negative voltage output (Optional) |
| 18 | DISPOFF | — | Display off |
| 19 | A | — | Power supply for B/L + |
| 20 | K | — | Power supply for B/L - |

# Contour Drawing




| PIN NO. | SYMBOL | PIN NO. | SYMBOL |
|---|---|---|---|
| 1 | Vss | 1 | Vss |
| 2 | Vdd | 2 | Vdd |
| 3 | Vo | 3 | Vo |
| 4 | A0 | 4 | A0 |
| 5 | $\overline{WR}$ | 5 | $\overline{WR}$ |
| 6 | $\overline{RD}$ | 6 | $\overline{RD}$ |
| 7 | DB0 | 7 | DB0 |
| 8 | DB1 | 8 | DB1 |
| 9 | DB2 | 9 | DB2 |
| 10 | DB3 | 10 | DB3 |
| 11 | DB4 | 11 | DB4 |
| 12 | DB5 | 12 | DB5 |
| 13 | DB6 | 13 | DB6 |
| 14 | DB7 | 14 | DB7 |
| 15 | $\overline{CS}$ | 15 | $\overline{CS}$ |
| 16 | $\overline{RES}$ | 16 | $\overline{RES}$ |
| 17 | Vee | 17 | Vee |
| 18 | DISP/NC | 18 | DISPOFF |
| CON1 | | 19 | A |
| | | 20 | K |
| | | CON2 | |

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