



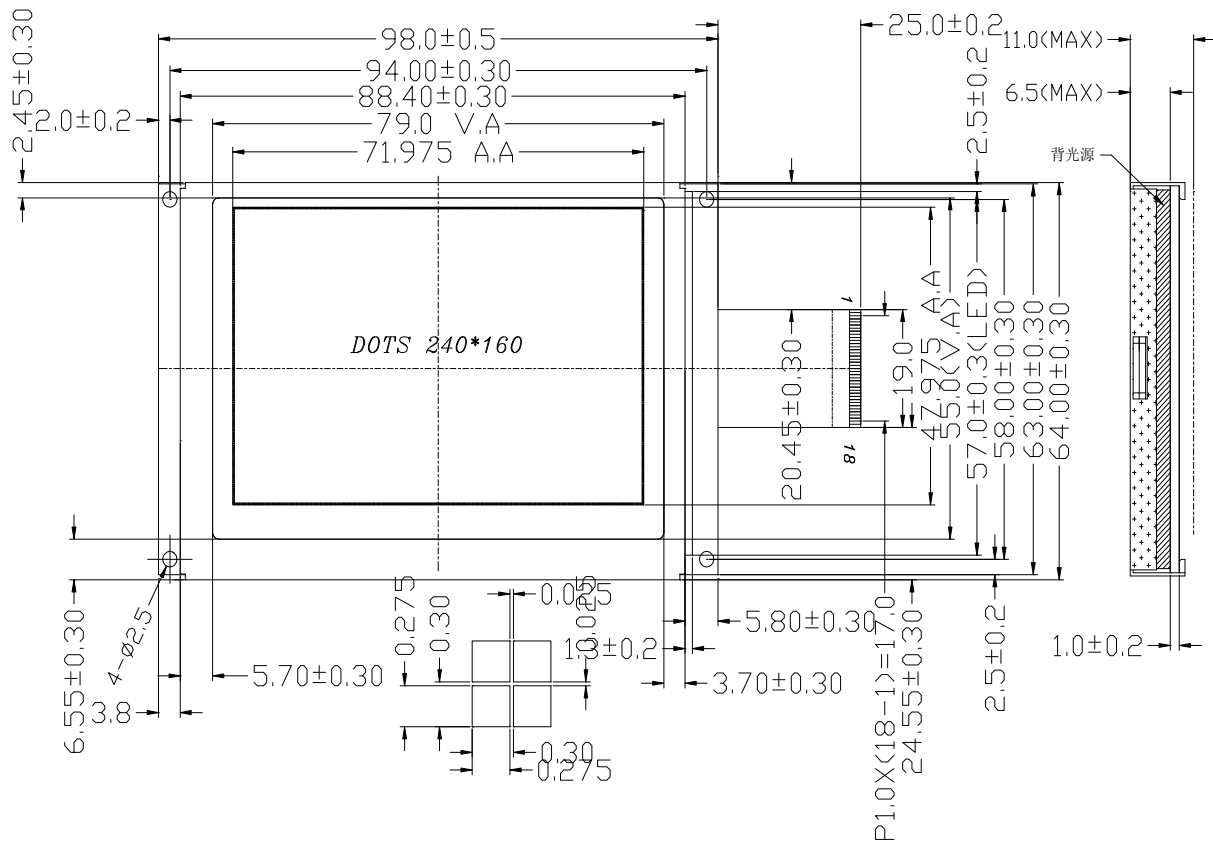
PRODUCT SPECIFICATIONS

TNS-G240160BTDLW-3W

- EXTERNAL DIMENSIONS
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EXTERNAL DIMENSIONS



PHYSICAL DATA

| Item | Contents | Unit |
|---------------------|------------------------------|---------|
| DIMENSIONAL OUTLINE | 98.0(W)×64.0(H)×11.0(MAX)(T) | mm |
| VIEWING AREA | 55.0(W)×79.0(H) | mm |
| EFFECTIVE AREA | 71.975(W)× 44.975 (H) | mm |
| LCD TYPE | STN-NEGATIVE | --- |
| LCD DUTY | 1/160 | --- |
| LCD BIAS | 1/12 | --- |
| VIEWING DIRECTION | 6 | o'clock |
| NUMBER OF DOTS | 240×160 | dots |
| DOT SIZE | 0.275W)×0.275(H) | mm |
| DOT PITCH | 0.30(W)×0.30(H) | mm |



■ ABSOLUTE MAXIMUM RATINGS (Ta = 25°C VSS=0V)

| Parameter | Symbol | Min | Max | Unit |
|--------------------------|------------------|------|-----------------------|------|
| Supply Voltage For Logic | V _{DD} | -0.3 | 4.0 | V |
| Supply Voltage For LCD | V _{LCD} | -0.3 | 18.0 | V |
| Input Voltage | V _I | -0.4 | V _{DD} + 0.5 | V |
| Operating Temperature | TOP | -20 | 70 | °C |
| Storage Temperature | TST | -30 | 85 | °C |

■ ELECTRICAL CHARACTERISTICS

DC Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit | Condition |
|------------------------------|----------------------------------|----------------------|-----|--------------------|------|-----------------------|
| Supply Voltage For logic | V _{DD} -V _{SS} | 2.5 | 3.0 | 3.3 | V | --- |
| Supply Voltage For LCD | V _{DD} -V _{SS} | | 15 | | V | 25°C - |
| Input Voltage | V _{IH} | 0.8 5V _{DD} | | V _{DD} | V | --- |
| | V _{IL} | V _{SS} | | 0.2V _{DD} | V | |
| Power Supply Current For LCM | I _{DD} | | 2.7 | | mA | V _{DD} =5.0V |

Please refer to "UC1611" data sheet.

■ ELECTRO-OPTICAL CHARACTERISTICS

| Item | Symbol | Min | Typ | Max | Unit | Remarks | Condition |
|---------------------------|-----------------|------|------|------|------|----------------------------------|-----------|
| Operating Voltage For LCD | V _{OP} | 18.1 | 18.6 | 19.1 | V | Θ=0 Cr:Max | -10°C |
| | | 17.8 | 18.3 | 18.8 | | | 25°C |
| | | 17.5 | 18.0 | 18.5 | | | 60°C |
| Response Time | Tr | --- | 269 | --- | ms | Θ=0 V _{OP} =18.6v | -10°C |
| | Tf | | 138 | | ms | | |
| | Tr | | 223 | | ms | Θ=0 V _{OP} =18.3v | 25°C |
| | Tf | --- | 116 | --- | ms | | |
| Contrast Ratio | Cr | --- | 9.0 | --- | --- | Θ=0 V _{OP} =18.3v | 25°C |
| Viewing Angle | θ _{x1} | 43 | --- | --- | deg | (Cr≥2) V _{OP} =18.3v | 25°C |
| | θ _{x2} | 44 | --- | --- | | | |
| | θ _{y1} | 48 | --- | -- | | | |



| | | | | | | | |
|--|------|----|-----|-----|--|--|--|
| | 0 y2 | 43 | --- | --- | | | |
|--|------|----|-----|-----|--|--|--|

■ INTERFACE PIN CONNECTIONS

| Pin No. | Symbol | Level | Description |
|---------|--------|-------|----------------------------------|
| 1 | CS0 | H/L | Chip select pin |
| 2 | RST | H/L | Reset signal pin |
| 3 | CD | H/L | L: control data; H: display data |
| 4 | WR0 | H/L | Read/write signal pin |
| 5 | WR1 | H/L | Enable chip signal pin |
| 6 | D0 | H/L | Data bit 0 |
| 7 | D1 | H/L | Data bit 1 |
| 8 | D2 | H/L | Data bit 2 |
| 9 | D3 | H/L | Data bit 3 |
| 10 | D4 | H/L | Data bit 4 |
| 11 | D5 | H/L | Data bit 5 |
| 12 | D6 | H/L | Data bit 6 |
| 13 | D7 | H/L | Data bit 7 |
| 14 | VDD | 3.0v | Power supply +3.0v |
| 15 | VSS | 0 | Ground |
| 16 | NC | --- | No connection |
| 17 | LED+ | 3V | Backlight power supply +3.0v |
| 18 | LED- | 0 | Ground |