# MIDAS Displays
design • manufacture • supply

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| MCCOG128064B12W-BNMLW | 128 x 64 | N/A | LCD Module |
|---|---|---|---|

| Specification | |
|---|---|
| Version:   1 | Date:  31/10/2016 |

| Revision | |
|---|---|
| | |

| Display Features | |
|---|---|
| Resolution | 128 x 64 |
| Appearance | White on Blue |
| Logic Voltage | 5V |
| Interface | Parallel / SPI |
| Font Set | N/A |
| Display Mode | Transmissive |
| LC Type | BSTN |
| Module Size | 54.60 x 42.20 x 4.33 |
| Operating Temperature | -20°C ~ +70°C |
| Construction | COB |
| LED Backlight | White |

RoHS compliant

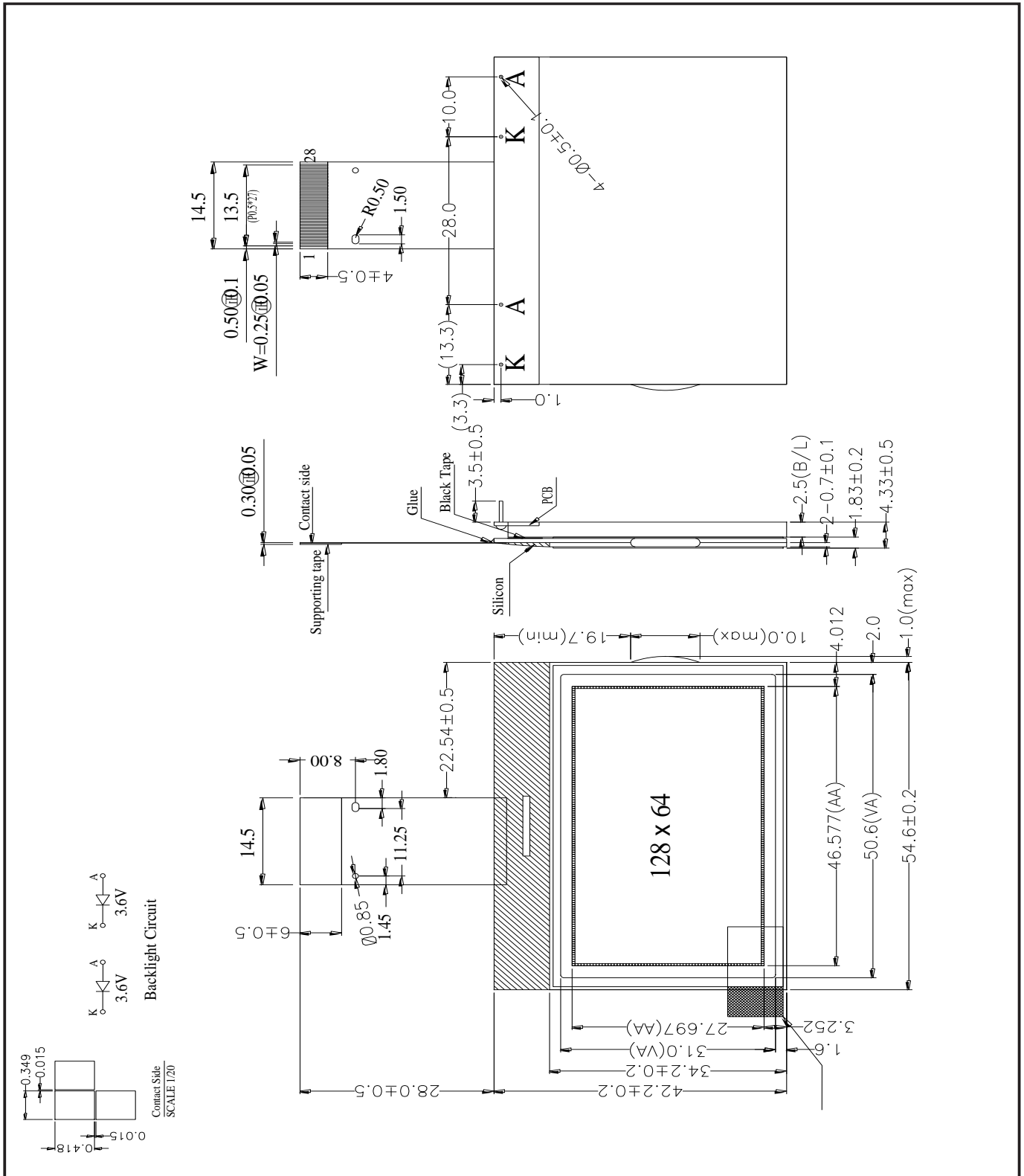| Box Quantity | Weight / Display |
|---|---|
| --- | --- |

* - For full design functionality, please use this specification in conjunction with the ST7565P specification. (Provided Separately)

| Display Accessories | |
|---|---|
| **Part Number** | **Description** |
| MCIB-12 | UNO 32 Breakout Board with SD Card and LED BKL driver. |
| MPBV-7 | 30-Way FFC to Cable and Wires 0.5mm Pitch. |
| | |

| Optional Variants | |
|---|---|
| **Appearances** | **Voltage** |
| Black on White<br>Black on Yellow/Green<br>Black on RGB | |

# Mechanical Specifications

| Module Size | 54.60 x 42.20 x 4.33 ( With Backlight) | | | W x H x D mm |
|---|---|---|---|---|
| Viewing Area | 50.60 x 31.00 | W x H mm | Hole-to-Hole | --- | W x H mm |
| Dot Size | --- | W x H mm | Dot Pitch | --- | W x H mm |

# Pin layout

| Pin | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | P/S | P/S = H: Parallel Data I/O<br>P/S = L: Serial Data Input | |
| 2 | C86 | MPU Interface Selection Pin | |
| 3 | V0 | Multi-Level power supply for LCD. Voltage applied is determined by LC cell, changed through resistive voltage divided or changing impedance using OP. AMP.<br>Levels determined on VSS must maintain magnitudes shown: V0 ≥ V1 ≥ V2 ≥ V3 ≥ V4 ≥VSS | |
| 4 | V1 | | |
| 5 | V2 | | |
| 6 | V3 | | |
| 7 | V4 | | |
| 8 | C2- | DC/DC Converter. Capacitor between this terminal and CAP2P terminal. | |
| 9 | C2+ | DC/DC Converter. Capacitor between this terminal and CAP2N terminal. | |
| 10 | C1+ | DC/DC Converter. Capacitor between this terminal and CAP1N terminal. | |
| 11 | C1- | DC/DC Converter. Capacitor between this terminal and CAP1P terminal. | |
| 12 | C3+ | DC/DC Converter. Capacitor between this terminal and CAP1N terminal. | |
| 13 | VOUT | Voltage Converter I/O | |
| 14 | VSS | Ground | |
| 15 | VDD | Power Supply | |
| 16 | D7 | 8-Bit bi-directional data bus, connect to 8-bit or 16-bit standard MPU data bus.<br>SPI-4 is selected P/S = L<br>D7 Serial data input (SI); D6 Serial Clock Input (SCL).<br>D0~D5 connected to VDD or floating.<br>When chip select not active, D0~D7 set to high impedance. | |
| 17 | D6 | | |
| 18 | D5 | | |
| 19 | D4 | | |
| 20 | D3 | | |
| 21 | D2 | | |
| 22 | D1 | | |
| 23 | D0 | | |
| 24 | E (/RD) | When connected to 8080MPU, Pin treated as the "/RD" signal of the 8080MPU and is LOW-active.<br>Data bus output status when signal is "L".<br>Connect 6800 MPU, pin treated as "E" signal of 6800 MPU, and is HIGH-active. | |
| 25 | R/W (/WR) | When connected to 8080MPU, Pin treated as the "/WR" signal of the 8080MPU and is LOW-active.<br>Connect 6800 MPU, pin treated as "R/W" signal of 6800 MPU, decides access type: R/W = H: Read R/W = L: Write. | |
| 26 | D/C | Determines whether data bits are data or command. | |
| 27 | /CS1 | Chip Select. | |
| 28 | /RES | /Res is "L", register settings initialised.<br>Reset operation is performed by the /RES signal Level. | |

## Absolute Maximums Ratings

| Item | Symbol | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|---|
| Power Supply Voltage | V0, VOUT | -0.3 | --- | 14.5 | V |
| Power Supply Voltage | V1,V2,V3,V4 | -0.3 | --- | V0+0.3 | V |
| Power Supply Voltage | VDD | -0.3 | --- | 3.6 | V |
| Operating Temperature | T$_{OP}$ | -20°C | --- | 70°C | °C |
| Storage temperature | T$_{ST}$ | -30°C | --- | 80°C | °C |

## Electronic Characteristics

| Item | Symbol | Condition | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | V |
| Supply Voltage Logic | V$_{DD}$ ~ V$_{SS}$ | --- | 3.20 | 3.30 | 3.40 | V |
| Supply Voltage LCD | V$_{DD}$ ~ V$_0$ | Ta=25°C | 8.60 | 8.80 | 9.00 | V |
| Supply Current | I$_{DD}$ | V$_{DD}$=3.3V | --- | 0.10 | --- | mA |

## LCD Characteristics

For STN/FSTN LCD Panel Types

| Item | Symbol | Condition | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|---|---|
| Viewing Angle | Φ2 – Φ1 | CR ≥ 2 | --- | --- | 45 | ψ=180° |
| | Θ | --- | --- | | | |
| Contrast Ratio | CR | --- | 3 | --- | --- | --- |
| Response Time (Rise) | TR | --- | --- | --- | 250 | ms |
| Response Time (Fall) | TF | --- | --- | --- | 250 | ms |

## LED Characteristics

| Item | Symbol | Condition | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|---|---|
| Supply Current | ILED | V=3.60V | --- | 32 | 40 | mA |
| Supply Voltage | V | --- | 3.50 | 3.60 | 3.70 | V |
| Reverse Voltage | VR | --- | --- | --- | 5 | V |
| Luminance (Without LCD) | IV | ILED=32mA | 640 | 800 | --- | Cd/m$^2$ |
| --- | --- | --- | --- | --- | --- | --- |
| LED Life Time | --- | ILED=32mA | --- | 50K | --- | Hour |

**Attention:** It is constant current, not constant voltage, which should be applied when driving the LED backlight, please ensure you adhere to this rule.

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