


|                       |          |                  |            |
|-----------------------|----------|------------------|------------|
| MCCOG128064B12W-BNMLW | 128 x 64 |                  | LCD Module |
| <b>Specification</b>  |          |                  |            |
| Version: 1            |          | Date: 01/10/2019 |            |
| <b>Revision</b>       |          |                  |            |
| 29/09/2019            |          | First Issue      |            |

| Display Features      |                      |  |     |
|-----------------------|----------------------|--|-----|
| Resolution            | 128 x 64             |  |     |
| Appearance            | White on Blue        |  |     |
| Logic Voltage         | 3.3V                 |  |     |
| 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          | COG                  |  |     |
| LED Backlight         | White                | ---  | --- |

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

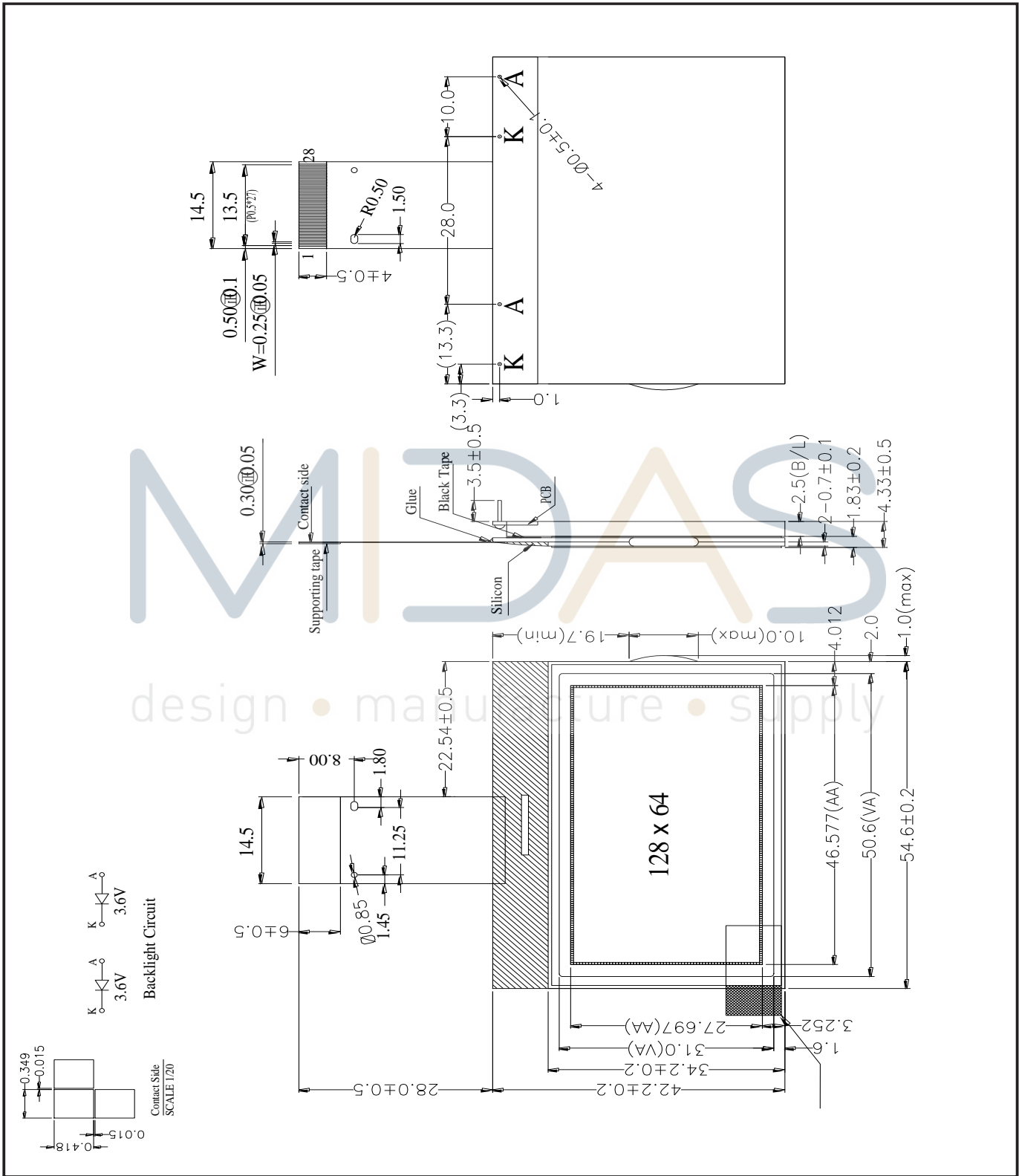
| Display Accessories |  |
|---------------------|--|
| Part Number         | Description  |
| MCIB-12             | UNO 32 Breakout Board with SD Card and LED BKL driver. |
| MPBV-7              | 30-Way FFC to Cable and Wires 0.5mm Pitch.             |
| MCCOG128064B-BEZEL  | Bezel made for the MCCOG12064B series                  |
| MDC28-0.5-BC        | 28 way connector with 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 |



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## 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: $V0 \geq V1 \geq V2 \geq V3 \geq V4 \geq VSS$         |         |
| 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.  |         |

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| 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 <sub>OP</sub> | -20°C   | ---     | 70°C    | °C   |
| Storage temperature       | T <sub>ST</sub> | -30°C   | ---     | 80°C    | °C   |

| Electronic Characteristics |                                   |                       |         |         |         |      |
|----------------------------|-----------------------------------|-----------------------|---------|---------|---------|------|
| Item                       | Symbol                            | Condition             | Minimum | Typical | Maximum | Unit |
| ---                        | ---                               | ---                   | ---     | ---     | ---     | ---  |
| ---                        | ---                               | ---                   | ---     | ---     | ---     | ---  |
| ---                        | ---                               | ---                   | ---     | ---     | ---     | V    |
| Supply Voltage Logic       | V <sub>DD</sub> - V <sub>SS</sub> | ---                   | 3.20    | 3.30    | 3.40    | V    |
| Supply Voltage LCD         | V <sub>DD</sub> - V <sub>0</sub>  | T <sub>a</sub> =25°C  | 8.60    | 8.80    | 9.00    | V    |
| Supply Current             | I <sub>DD</sub>                   | V <sub>DD</sub> =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          | I <sub>LED</sub> | V=3.60V                | ---     | 32      | 40      | mA                |
| Supply Voltage          | V                | ---                    | 3.50    | 3.60    | 3.70    | V                 |
| Reverse Voltage         | V <sub>R</sub>   | ---                    | ---     | ---     | 5       | V                 |
| Luminance (Without LCD) | I <sub>V</sub>   | I <sub>LED</sub> =32mA | 640     | 800     | ---     | Cd/m <sup>2</sup> |
| ---                     | ---              | ---                    | ---     | ---     | ---     | ---               |
| LED Life Time           | ---              | I <sub>LED</sub> =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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