


|                       |          |                  |            |
|-----------------------|----------|------------------|------------|
| MCCOG128064B12W-FPTLW | 128 x 64 | N/A              | LCD Module |
| <b>Specification</b>  |          |                  |            |
| Version: 1            |          | Date: 31/10/2016 |            |
| <b>Revision</b>       |          |                  |            |
|                       |          |                  |            |

| Display Features      |                      |  |                  |  |  |
|-----------------------|----------------------|--|------------------|--|--|
| Resolution            | 128 x 64             |  |                  |  |  |
| Appearance            | Black on White       |  |                  |  |  |
| Logic Voltage         | 5V                   |  |                  |  |  |
| Interface             | Parallel / SPI       |  |                  |  |  |
| Font Set              | N/A                  |  |                  |  |  |
| Display Mode          | Transflective        |  |                  |  |  |
| LC Type               | FSTN                 |  |                  |  |  |
| Module Size           | 54.60 x 42.20 x 4.48 |  |                  |  |  |
| Operating Temperature | -20°C ~ +70°C        |  |                  |  |  |
| Construction          | COB                  | Box Quantity   | Weight / Display |  |  |
| LED Backlight         | White                | ---  | ---              |  |  |

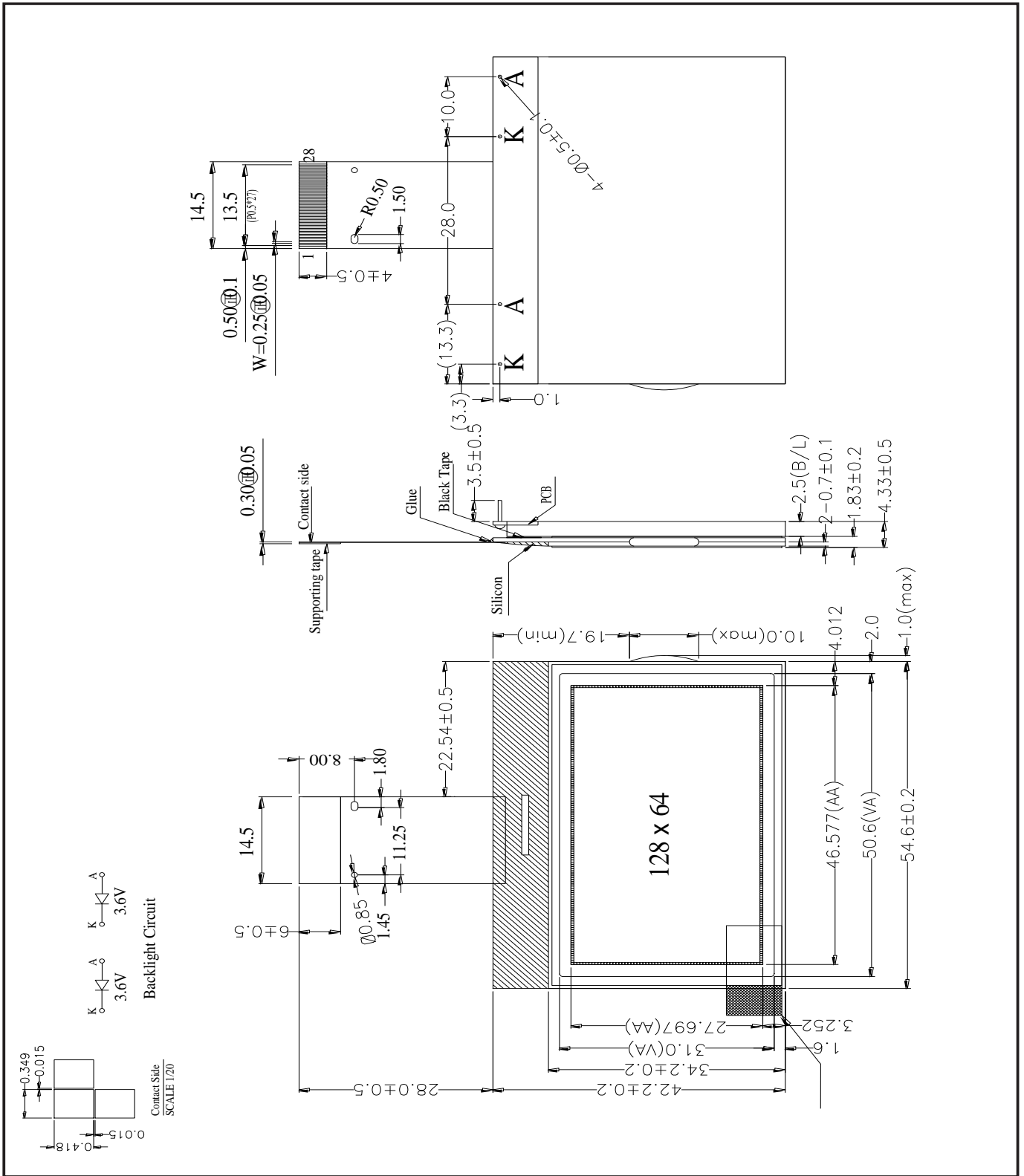
\* - For full design functionality, please use this specification in conjunction with the ST7565P specification. (Provided Separately)

| 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.             |
|                     |  |

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

# Mechanical Specifications

|              |  |          |              |              |          |
|--------------|--|----------|--------------|--------------|----------|
| Module Size  | 54.60 x 42.20 x 4.48 ( 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         | VOOUT     | 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                | Φ <sub>2</sub> - Φ <sub>1</sub> | 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         | VR               | ---                    | ---     | ---     | 5       | V                 |
| Luminance (Without LCD) | IV               | 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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