

|                  |            |                                |             |
|------------------|------------|--------------------------------|-------------|
| MCOB22010A1V-EBP | 2 x 20     | Euro/Jap/Cyrillic              | OLED Module |
| Specification    |            |                                |             |
| Version: 4       |            | Date: 16/05/2017               |             |
| Revision         |            |                                |             |
| 0                | 25/06/2014 | First release                  |             |
| A                | 26/11/2015 | Add Low Temperature storage.   |             |
| B                | 26/11/2015 | Modify Block Diagram           |             |
| C                | 01/06/2016 | Modify Static electricity test |             |

| Display Features      |                               |  |                  |
|-----------------------|-------------------------------|--------------------------------------------------------------------------------------|------------------|
| Character Count       | 2 x 20                        |                                                                                      |                  |
| Appearance            | Blue on Black                 |                                                                                      |                  |
| Logic Voltage         | 5V                            |                                                                                      |                  |
| Interface             | Parallel                      |                                                                                      |                  |
| Font Set              | English / European / Cyrillic |                                                                                      |                  |
| Character Height      | 9.66 mm                       |                                                                                      |                  |
| Module Size           | 180.00 x 40.00 x 9.30 mm      |                                                                                      |                  |
| Operating Temperature | -40°C ~ +80°C                 |                                                                                      |                  |
| Construction          | COB                           | Box Quantity                                                                         | Weight / Display |
|                       |                               | ---                                                                                  | ---              |

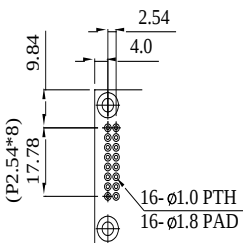
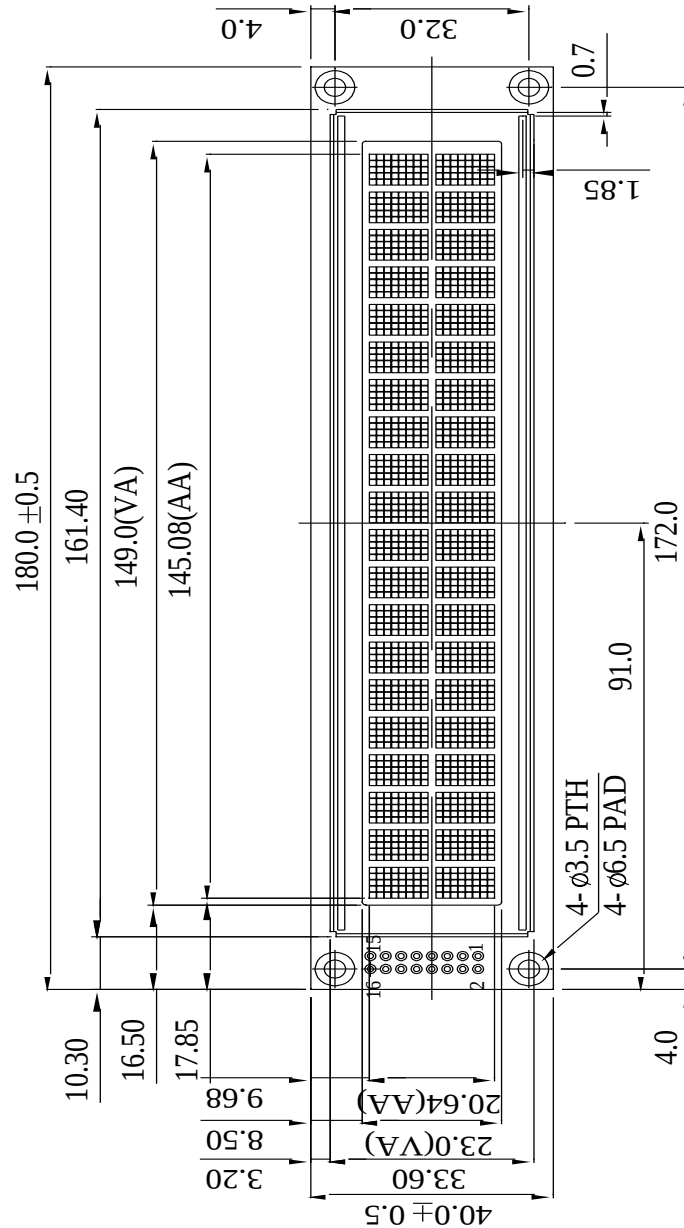
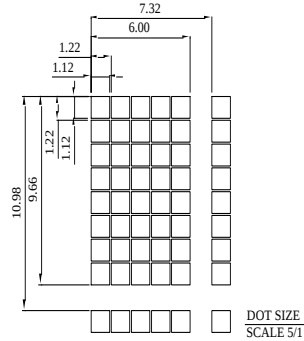
\* - For full design functionality, please use this specification in conjunction with the MS0010 specification. (Provided Separately)

| Display Accessories    |                                                                                                      |
|------------------------|------------------------------------------------------------------------------------------------------|
| Part Number            | Description                                                                                          |
| MCCMDB-16DIL           | LCD Interconnect board, can be driven from either a PC or a single Board computer with a USB output. |
| MCCBL1A16DILP-DILS-150 | 16 Way, Dual in-line to Dual in-line connector cable.                                                |
|                        |                                                                                                      |

| Optional Variants                                   |         |
|-----------------------------------------------------|---------|
| Appearance                                          | Voltage |
| White on Black<br>Yellow on Black<br>Green on Black |         |
|                                                     |         |

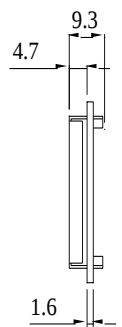
## Mechanical Specifications

| Module Size    | 180.00 x 40.00 x 9.30 ( With Backlight) |          |                 |               | W x H x D mm |
|----------------|-----------------------------------------|----------|-----------------|---------------|--------------|
| Viewing Area   | 149.00 x 23.00                          | W x H mm | Hole-to-Hole    | 75.00 x 31.00 | W x H mm     |
| Character Size | 6.00 x 9.66                             | W x H mm | Character Pitch | 7.32 x 10.98  | W x H mm     |
| Dot Size       | 1.12 x 1.12                             | W x H mm | Dot Pitch       | 1.22 x 1.22   | W x H mm     |



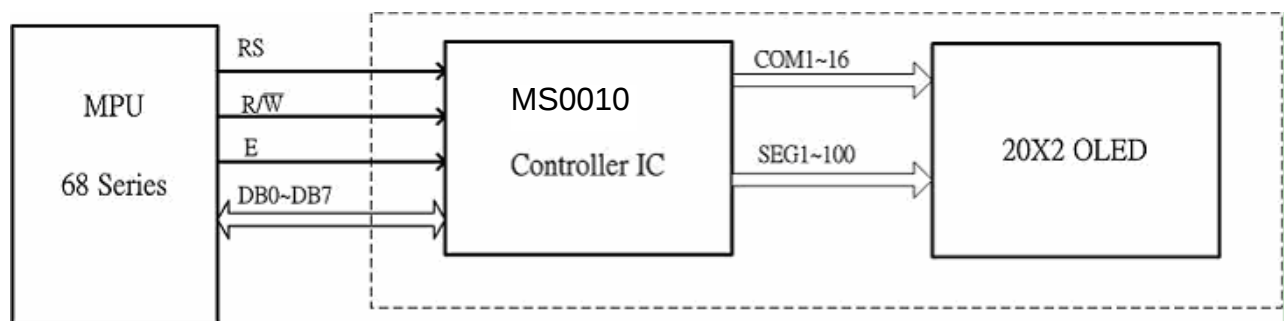
PIN DETAIL

The non-specified tolerance of dimension is  $\pm 0.3$  mm .



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| Pin layout |        |                                               |          |
|------------|--------|-----------------------------------------------|----------|
| Pin        | Symbol | Description                                   | Remarks  |
| 1          | VSS    | Ground                                        |          |
| 2          | VDD    | Supply Voltage for Logic                      | 5V       |
| 3          | NC     | No Connection                                 |          |
| 4          | RS     | H: Data L: Instruction Code                   | H/L      |
| 5          | R/W    | H: Read (Module-->MPU) L: Write(MPU-->Module) | H/L      |
| 6          | E      | Chip Enable Signal                            | H, H-->L |
| 7          | DB0    | Data Bus Line                                 | H/L      |
| 8          | DB1    | Data Bus Line                                 | H/L      |
| 9          | DB2    | Data Bus Line                                 | H/L      |
| 10         | DB3    | Data Bus Line                                 | H/L      |
| 11         | DB4    | Data Bus Line                                 | H/L      |
| 12         | DB5    | Data Bus Line                                 | H/L      |
| 13         | DB6    | Data Bus Line                                 | H/L      |
| 14         | DB7    | Data Bus Line                                 | H/L      |
| 15         | NC     | No Connection                                 |          |
| 16         | NC     | No Connection                                 |          |



| Address Format         | DB7 | DB6  | DB5  | DB4  | DB3  | DB2  | DB1  | DB0  |
|------------------------|-----|------|------|------|------|------|------|------|
| CA (Character Address) | 1   | ADD6 | ADD5 | ADD4 | ADD3 | ADD2 | ADD1 | ADD0 |

| 1          | 2          | 3          | 4          | ..... | ..... | 17         | 18         | 19         | 20         |
|------------|------------|------------|------------|-------|-------|------------|------------|------------|------------|
| CA10000000 | CA10000001 | CA10000010 | CA10000011 | ..... | ..... | CA10010000 | CA10010001 | CA10010010 | CA10010011 |
| CA11000000 | CA11000001 | CA11000010 | CA11000011 | ..... | ..... | CA11010000 | CA11010001 | CA11010010 | CA11010011 |

|                  |        |                   |             |
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| Version: 4       |        | Date: 16/05/2017  |             |
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## Font Map

| Upper<br>4bit<br>Lower<br>4bit | LLLL             | LLLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHHH | HLLL | HLLH | HLHL | HLHH | HHLL | HHLH | HHHL | HHHH |
|--------------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL                           | CG<br>RAM<br>(1) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLLH                           | (2)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHL                           | (3)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHH                           | (4)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLL                           | (5)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLH                           | (6)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHL                           | (7)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHH                           | (8)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLL                           | (1)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLH                           | (2)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHL                           | (3)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHH                           | (4)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLL                           | (5)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLH                           | (6)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHL                           | (7)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHH                           | (8)              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

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| Upper<br>4bit<br>Lower<br>4bit |                  | LLLL | LLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHHH | HLLL | HLLH | HLHL | HLHH | HHLL | HHLH | HHHL | HHHH |
|--------------------------------|------------------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL                           | CG<br>RAM<br>(1) |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLH                            | (2)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHL                           | (3)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHH                           | (4)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLL                           | (5)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLH                           | (6)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHL                           | (7)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHH                           | (8)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLL                           | (1)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLH                           | (2)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHL                           | (3)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHH                           | (4)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLL                           | (5)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLH                           | (6)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHL                           | (7)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHH                           | (8)              |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

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| Upper<br>4bit<br>Lower<br>4bit | LLLL             | LLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHHH | HLLL | HLLH | HLHL | HLHH | HHLL | HHLH | HHHL | HHHH |
|--------------------------------|------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL                           | CG<br>RAM<br>(1) |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLH                            | (2)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHL                           | (3)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLHH                           | (4)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLL                           | (5)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHLH                           | (6)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHL                           | (7)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LHHH                           | (8)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLL                           | (1)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLLH                           | (2)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHL                           | (3)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLHH                           | (4)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLL                           | (5)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHLH                           | (6)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHL                           | (7)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HHHH                           | (8)              |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

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| Absolute Maximums Ratings |        |         |         |         |      |
|---------------------------|--------|---------|---------|---------|------|
| Item                      | Symbol | Minimum | Typical | Maximum | Unit |
| Supply Voltage for Logic  | V0     | -0.30   | ---     | 5.30    | V    |
| Operating Temperature     | Vopr   | -40     | ---     | 80      | °C   |
| Storage Temperature       | Vstg   | -40     | ---     | 80      | °C   |

| Electronic Characteristics        |         |            |         |         |         |      |
|-----------------------------------|---------|------------|---------|---------|---------|------|
| Item                              | Symbol  | Condition  | Minimum | Typical | Maximum | Unit |
| Input High Voltage                | VIH     | ---        | 0.80    | ---     | VDD     | V    |
| Input Low Voltage                 | VIL     | ---        | GND     | ---     | 0.20    | V    |
| Output High Voltage               | VOH     | IOH=-0.5mA | 0.80    | ---     | VDD     | V    |
| Output Low Voltage                | VOL     | IOL=0.5mA  | GND     | ---     | 0.20    | V    |
| Supply Voltage for Logic          | VDD~VSS | ---        | 4.80    | 5.00    | 5.30    | V    |
| 50% Checkboard Operating Current. | IDD     | VDD=5V     | 75      | 85      | 90      | mA   |

| OLED Characteristics                   |        |           |         |         |         |                   |
|----------------------------------------|--------|-----------|---------|---------|---------|-------------------|
| Item                                   | Symbol | Condition | Minimum | Typical | Maximum | Unit              |
| Viewing Angle                          | (V)θ   | ---       | 160     | ---     | ---     | Deg               |
|                                        | (H)φ   | ---       | 160     | ---     | ---     | Deg               |
| Contrast Ratio                         | CR     | Dark      | 2000:1  | ---     | ---     | ---               |
| Response Time                          | T Rise | ---       | ---     | 10      | ---     | μs                |
|                                        | T Fall | ---       | ---     | 10      | ---     | μs                |
| Display with 50% Checkboard Brightness |        |           | 50      | 60      | ---     | cd/m <sup>2</sup> |
| CIEx(Blue)                             |        | (CIE1931) | 0.12    | 0.16    | 0.20    | ---               |
| CIEy(Blue)                             |        | (CIE1931) | 0.22    | 0.26    | 0.30    | ---               |

| OLED Life Time      |                                              |              |        |
|---------------------|----------------------------------------------|--------------|--------|
| Item                | Conditions                                   | Typical      | Remark |
| Operating Life Time | Ta=25°C. Initial checkboard brightness, 50%. | 50,000 Hours | ---    |

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