

|                      |            |                          |            |
|----------------------|------------|--------------------------|------------|
| MC44005A6W-BNMLWI-V3 | 4 x 40     | 4.89 mm Character Height | LCD Module |
| Specification        |            |                          |            |
| Version: 1           |            | Date: 22/03/2025         |            |
| Revision             |            |                          |            |
| 1                    | 20/03/2025 | First Issue              |            |

| Display Features      |                           |  |                  |
|-----------------------|---------------------------|--------------------------------------------------------------------------------------|------------------|
| Character Count       | 4 x 40                    |                                                                                      |                  |
| Appearance            | White on Blue             |                                                                                      |                  |
| Supply Voltage        | 5V                        |                                                                                      |                  |
| Interface             | I2C                       |                                                                                      |                  |
| Font Set              | English / Japanese        |                                                                                      |                  |
| Display Mode          | Transmissive              |                                                                                      |                  |
| Character Height      | 4.89 mm                   |                                                                                      |                  |
| LC Type               | Blue STN                  |                                                                                      |                  |
| Module Size           | 190.00 x 54.00 x 13.00 mm |                                                                                      |                  |
| Operating Temperature | -20°C ~ +70°C             | Created By                                                                           | Checked By       |
| Construction          | COB                       | CL                                                                                   | WE               |
| LED Backlight         | White                     | Box Quantity                                                                         | Weight / Display |
|                       |                           | ---                                                                                  | ---              |

\* - For full design functionality, please use this specification in conjunction with the RW1063 display driver specification. (Provided Separately)

| Display Accessories |                                                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part Number         | Description                                                                                                                                                      |
| MCCMDB-16SILDIL     | LCD Interconnect board, can be driven from either a PC or a single Board computer with a USB output.                                                             |
| MDIB-CC1            | Interconnect board for standard pitch pinouts to fine pitch wires. Providing pinouts for 2.54 pinout. 1.27, 1, 0.845, 0.8, 0.7, 0.65, 0.62, 0.6, 0.5 & 0.3 pads. |
|                     |                                                                                                                                                                  |
|                     |                                                                                                                                                                  |

| Optional Variants                |                                                             |            |
|----------------------------------|-------------------------------------------------------------|------------|
| Fonts                            | Appearances                                                 | Voltage    |
| English/Euro<br>English/Cyrillic | Black on Yellow/<br>Green<br>Black on White<br>Black on RGB | 3V<br>3.3V |
|                                  |                                                             |            |
|                                  |                                                             |            |



## FEATURES

| AVAILABLE OPTIONS          | CHARACTERISTICS                                         | CODE | No. |
|----------------------------|---------------------------------------------------------|------|-----|
| DISPLAY FORMAT             | <b>40 Characters by 4 Lines</b>                         |      |     |
| POLARIZER OPTIONS          | <b>Negative Transmissive</b>                            |      |     |
| BACKLIGHT TYPE OPTIONS     | <b>Edge Type LED Backlight (Long life span version)</b> |      |     |
| BACKLIGHT COLOR OPTIONS    | <b>White color</b>                                      |      |     |
| LCD PANEL OPTIONS          | <b>Blue STN</b>                                         |      |     |
| VIEWING ANGLE OPTIONS      | <b>6:00 ( Bottom )</b>                                  |      |     |
| TEMPERATURE RANGE OPTIONS  | <b>-20°C ~ 70°C, Single Supply Voltage</b>              |      |     |
| SUGGESTED DRIVING VOLTAGE  | <b>V<sub>lcm</sub> = 5.0V V<sub>led</sub> = 5.0V</b>    |      |     |
| SUGGESTED LED DRIVING MODE | <b>PIN17: LED+, PIN18:LED-</b>                          |      |     |
| CONTROLLER                 | <b>IIC controller</b>                                   |      |     |
| FONT MAP CODE              | <b>E Version</b>                                        |      |     |
| DRIVING DUTY               | <b>1/16</b>                                             |      |     |
| DRIVING BIAS               | <b>1/5</b>                                              |      |     |

## MECHANICAL SPECIFICATIONS

|                |                       |           |                 |                       |           |
|----------------|-----------------------|-----------|-----------------|-----------------------|-----------|
| OVERALL SIZE   | <b>190.0W x 54.0H</b> | <b>mm</b> | THICKNESS       | <b>max 13.0</b>       | <b>mm</b> |
| VIEWING AREA   | <b>147.0W x 29.5H</b> | <b>mm</b> | HOLE-HOLE       | <b>183.0W x 47.0H</b> | <b>mm</b> |
| CHARACTER SIZE | <b>2.78W x 4.89H</b>  | <b>mm</b> | CHARACTER PITCH | <b>0.75W x 1.20H</b>  | <b>mm</b> |
| DOT SIZE       | <b>0.50W x 0.55H</b>  | <b>mm</b> | DOT PITCH       | <b>0.07W x 0.07H</b>  | <b>mm</b> |

## ABSOLUTE MAXIMUM RATINGS

| ITEM                   | SYMBOL           | CONDITION | MIN                         | TYP      | MAX                        | UNIT      |
|------------------------|------------------|-----------|-----------------------------|----------|----------------------------|-----------|
| POWER SUPPLY ( LOGIC ) | V <sub>dd</sub>  | 25°C      | <b>-0.3</b>                 | <b>—</b> | <b>7.0</b>                 | <b>V</b>  |
| POWER SUPPLY (LCD)     | V <sub>0</sub>   | 25°C      | <b>V<sub>dd</sub> -13.5</b> | <b>—</b> | <b>V<sub>dd</sub> +0.3</b> | <b>V</b>  |
| INPUT VOLTAGE          | V <sub>in</sub>  | 25°C      | <b>-0.3</b>                 | <b>—</b> | <b>V<sub>dd</sub> +0.3</b> | <b>V</b>  |
| OPERATING TEMPERATURE  | V <sub>opr</sub> | —         | <b>-20</b>                  | <b>—</b> | <b>70</b>                  | <b>°C</b> |
| STORAGE TEMPERATURE    | V <sub>stg</sub> | —         | <b>-30</b>                  | <b>—</b> | <b>80</b>                  | <b>°C</b> |

## ELECTRONIC CHARACTERISTICS \*

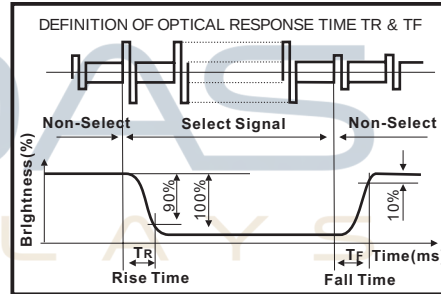
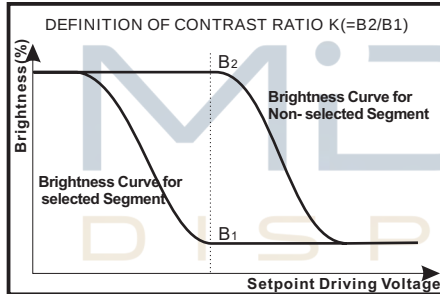
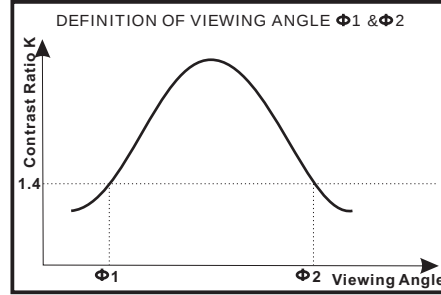
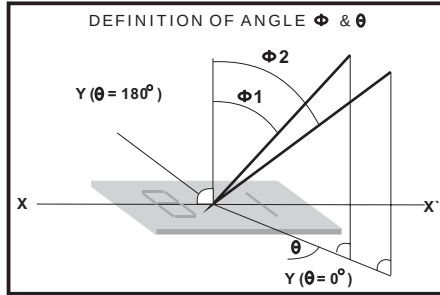
|  | ITEM                             | SYMBOL                                                 | CONDITION                | MIN         | TYP         | MAX         | UNIT      |
|--|----------------------------------|--------------------------------------------------------|--------------------------|-------------|-------------|-------------|-----------|
|  | INPUT VOLTAGE                    | V <sub>lcm</sub> = V <sub>dd</sub>                     | <b>—</b>                 | <b>—</b>    | <b>5.0</b>  | <b>—</b>    | <b>V</b>  |
|  | SUPPLY CURRENT                   | I <sub>dd</sub>                                        | <b>V<sub>dd</sub>=5V</b> | <b>—</b>    | <b>1.5</b>  | <b>—</b>    | <b>mA</b> |
|  | DRIVING VOLTAGE<br>FOR LCD PANEL | V <sub>lcd</sub> = (V <sub>dd</sub> - V <sub>0</sub> ) | <b>-20°C</b>             | <b>4.15</b> | <b>—</b>    | <b>4.45</b> | <b>V</b>  |
|  |                                  |                                                        | <b>0°C</b>               | <b>—</b>    | <b>—</b>    | <b>—</b>    |           |
|  |                                  |                                                        | <b>25°C</b>              | <b>4.30</b> | <b>4.40</b> | <b>4.70</b> |           |
|  |                                  |                                                        | <b>50°C</b>              | <b>—</b>    | <b>—</b>    | <b>—</b>    |           |
|  |                                  |                                                        | <b>70°C</b>              | <b>4.30</b> | <b>—</b>    | <b>4.70</b> |           |

\* All data are recorded from TEST REPORT #FSYP027800111

## LCD CHARACTERISTICS

FOR STN/FSTN TYPE LCD Panel (TA=25 °C, Vlcd=5.0V ± 0.5V)

| ITEM                | SYMBOL            | CONDITION | MIN | TYP | MAX | UNIT |
|---------------------|-------------------|-----------|-----|-----|-----|------|
| VIEWING ANGLE       | $\Phi 2 - \Phi 1$ | K=4       | 40  | —   | —   | deg  |
|                     | $\theta$          |           | 60  |     |     |      |
| CONTRAST RATIO      | K                 | —         | 6   | —   | —   | —    |
| RESPONSE TIME(RISE) | TR                | —         | —   | 150 | 250 | ms   |
| RESPONSE TIME(FALL) | TF                | —         | —   | 150 | 250 | ms   |



## LED CHARACTERISTICS

| ITEM                         | SYMBOL       | CONDITION       | MIN  | TYP | MAX  | UNIT              |
|------------------------------|--------------|-----------------|------|-----|------|-------------------|
| LED FORWARD VOLTAGE          | Vf           | 25 °C           | 2.6  | —   | 3.0  | V                 |
| LED FORWARD CURRENT          | If           | 25 °C           | —    | 50  | —    | mA                |
| LED REVERSE CURRENT          | Ir           | 25 °C Vr=5.0V   | —    | —   | 100  | μA                |
| LED COLOR RANGE              | X coordinate | 25 °C If = 50mA | 0.26 | —   | 0.30 | —                 |
|                              | Y coordinate |                 | 0.27 | —   | 0.31 | —                 |
| LED BRIGHTNESS (WITHOUT LCD) | Lv           | 25 °C If = 50mA | —    | 420 | —    | cd/m <sup>2</sup> |
| LED BRIGHTNESS UNIFORMITY    | Lvmin/Lvmax  | 25 °C If = 50mA | 70   | —   | —    | Ratio             |
| LED LIFE TIME                | —            | 25 °C If = 50mA | 20K  | —   | —    | Hours             |

▲2 YOUR ATTENTION: It is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

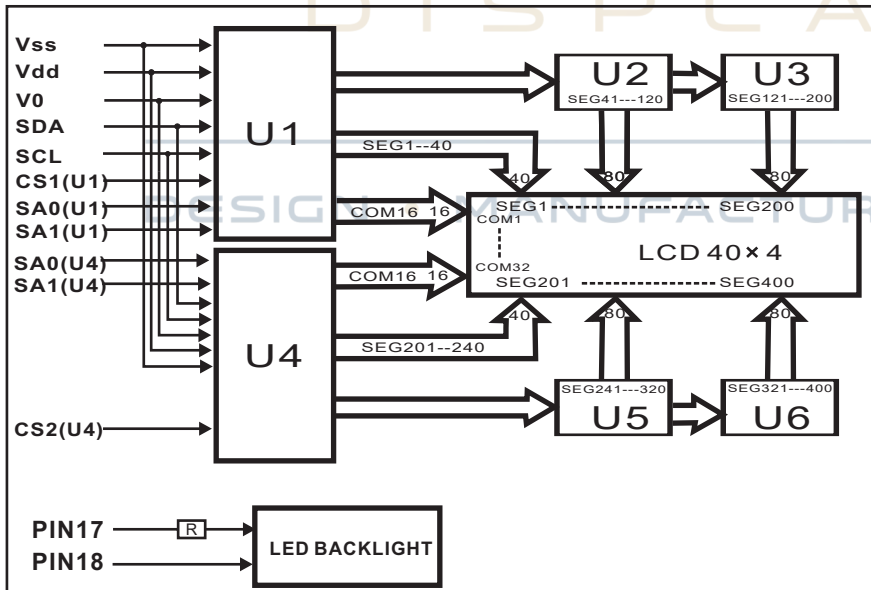
\* For operation above 25 °C, The Ifm Ifp & Pd must be derated, the Current derating is -0.36\*10mA/ °C for DC drive and -0.86\*10 mA/ °C for Pulse drive, the power dissipation is -75\*10 mW/ °C The product working current must not be more than 60% of the Ifm or Ifp according to the working temperature.

\* Wrong storage condition will decrease the adhesive power of film and shell. Suggested Storage Condition: Temperature (25 °C + 10 °C) and Humidity (65%RH + 20%RH)

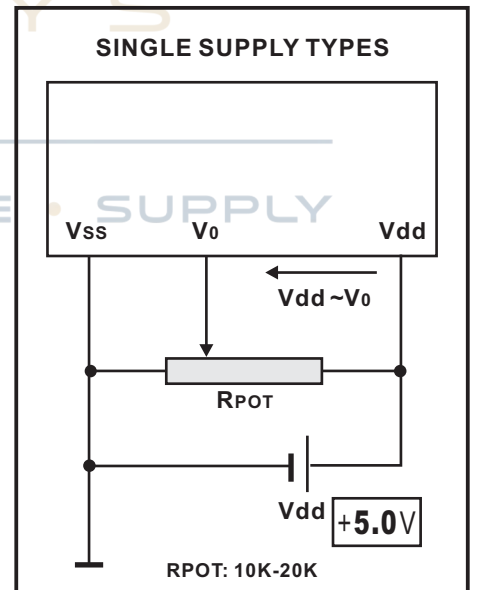
# PIN ASSIGNMENT

| PIN | SYMBOL  | DESCRIPTION          | REMARKS |
|-----|---------|----------------------|---------|
| 1   | SCL     | Serial clock input   |         |
| 2   | SDA     | Serial input data    |         |
| 3   | CS1(U1) | Chip select          |         |
| 4   | NC      | No connection        |         |
| 5   | SA1(U4) | Slave address        |         |
| 6   | SA0(U4) | Slave address        |         |
| 7   | SA1(U1) | Slave address        |         |
| 8   | SA0(U1) | Slave address        |         |
| 9   | NC      | No connection        |         |
| 10  | NC      | No connection        |         |
| 11  | NC      | No connection        |         |
| 12  | V0      | Contrast Adjust      |         |
| 13  | Vss     | GND                  |         |
| 14  | Vdd     | Power supply for LCM | 5.0V    |
| 15  | CS2(U4) | Chip select          |         |
| 16  | NC      | No connection        |         |
| 17  | LED+    | Power supply for BKL | 5.0V    |
| 18  | LED-    | Power supply for BKL |         |

BLOCK DIAGRAM



POWER SUPPLY DIAGRAM



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

