

|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC21605C6W-FPTLR-V2  | 2 x 16 | 5mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 20/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

| <b>Display Features</b> |                         |
|-------------------------|-------------------------|
| Operating Temp. Range   | -20°C ~ +70°C           |
| Viewing Direction       | 6 O'Clock               |
| STN                     | FSTN Transflective      |
| Backlight               | LED Red                 |
| Controller              | SPLC780D                |
| Characters              | 2 x 16                  |
| Voltage                 | 5V                      |
| Module Size             | 80.00 x 36.00 x 13.5 mm |
| Character Height        | 5mm                     |
| Display Construction    | Chip on Board           |



| Box Quantity | Weight / Display |
|--------------|------------------|
| 45 pcs       | 28.88 grams      |

\* - For full design functionality, please use this specification in conjunction with the SPLC780D specification. (Provided Separately)

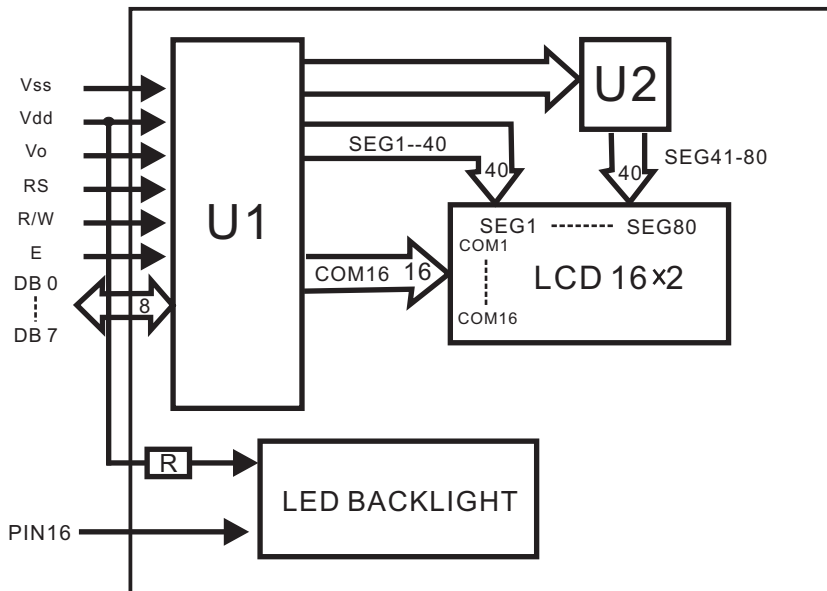
| Optional Variants |                  |         | Display Accessories      |  |
|-------------------|------------------|---------|--------------------------|--|
| Fonts             | Physical Aspects | Voltage | Part Number              | Description  |
| English/Japanese  | N/A              | N/A     | MCCMDB-16SIL             | LCD interconnect board, can be driven from either a PC or a single board computer with a USB output. |
|                   |                  |         | MCCBL1A16SILP-16DILS-150 | 16 Way, Single in-line to Dual In-line connector Cable.  |
|                   |                  |         | MCCBL1A16SILP-16SILS-150 | 16 Way, Single in-line to Single In-line connector Cable.  |



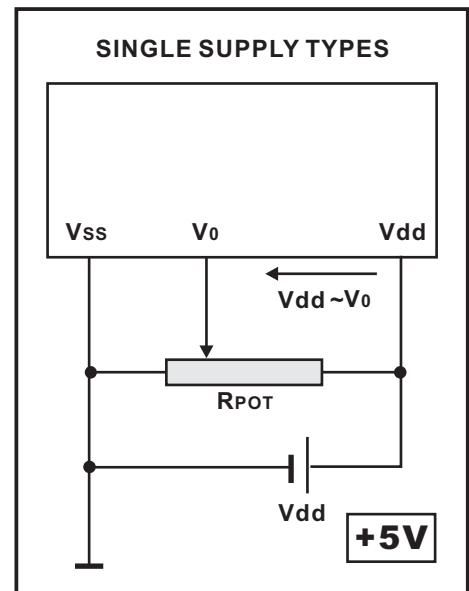
# Pin Layout

| PI | SYMBOL | DESCRIPTION            | REMARKS |
|----|--------|------------------------|---------|
| 1  | Vss    | GND                    |         |
| 2  | Vdd    | Power supply for LCM   | 5.0V    |
| 3  | V0     | Contrast Adjust        |         |
| 4  | RS     | Register Select Signal |         |
| 5  | R/W    | Data Read / Write      |         |
| 6  | E      | Enable Signal          |         |
| 7  | DB0    | Data bus line          |         |
| 8  | DB1    | Data bus line          |         |
| 9  | DB2    | Data bus line          |         |
| 10 | DB3    | Data bus line          |         |
| 11 | DB4    | Data bus line          |         |
| 12 | DB5    | Data bus line          |         |
| 13 | DB6    | Data bus line          |         |
| 14 | DB7    | Data bus line          |         |
| 15 | LED+   | Power supply for BKL   | 5.0V    |
| 16 | LED-   | Power supply for BKL   |         |

## Block Diagram



## Power Supply Diagram



|                      |        |                      |            |
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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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| Absolute Maximum Ratings |        |           |           |     |          |      |
|--------------------------|--------|-----------|-----------|-----|----------|------|
| Item                     | Symbol | Condition | Min       | Typ | Max      | Unit |
| Power Supply ( LOGIC)    | Vdd    | 25°C      | -0.3      | --- | 7.0      | V    |
| Power Supply (LCD)       | V0     | 25°C      | Vdd -13.5 | --- | Vdd +0.3 | V    |
| Input Voltage            | Vin    | 25°C      | -0.3      | --- | Vdd +0.3 | V    |
| Operating Temperature    | Vopr   | ---       | -20       | --- | 70       | C    |
| Storage Temperature      | Vstg   | ---       | -30       | --- | 80       | C    |

| Electronic Characteristics    |                   |           |      |      |      |      |
|-------------------------------|-------------------|-----------|------|------|------|------|
| Item                          | Symbol            | Condition | Min  | Typ  | Max  | Unit |
| Input Voltage                 | Vlcm = Vdd        | ---       | ---  | 5.0  | ---  | V    |
| Supply Current                | Idd               | Vdd=5V    | ---  | 1.5  | ---  | mA   |
| Driving Voltage for LCD Panel | Vlcd = (Vdd - V0) | -20°C     | 4.40 | ---  | 4.80 | V    |
|                               |                   | 0°C       | 4.25 | ---  | 4.70 |      |
|                               |                   | 25°C      | 4.10 | 4.50 | 4.60 |      |
|                               |                   | 50°C      | 4.05 | ---  | 4.55 |      |
|                               |                   | 70°C      | 4.00 | ---  | 4.50 |      |

| LCD Characteristics          |                   |           |     |     |     |      |
|------------------------------|-------------------|-----------|-----|-----|-----|------|
| For STN/FSTN LCD Panel Types |                   |           |     |     |     |      |
| Item                         | Symbol            | Condition | Min | Typ | Max | Unit |
| Viewing Angle                | $\Phi 2 - \Phi 1$ | K = 4     | 40° | --- | --- | Deg  |
|                              | $\Theta$          |           | 60° |     |     |      |
| Contrast Ratio               | K                 | ---       | --- | 10  | --- | ---  |
| 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         | --- | 3.0 | --- | V                 |
| LED Forward Current*         | If          | 25°C         | --- | 15  | --- | mA                |
| LED Reverse Current          | Ir          | 25°C Vr=5.0V | --- | --- | 10  | A                 |
| LED Peak Wave Length         | $\lambda p$ | 25°C If=15mA | 620 | --- | 630 | nm                |
| LED Brightness (Without LCD) | Lv          | 25°C If=15mA | --- | 100 | --- | cd/m <sup>2</sup> |
| LED Brightness Uniformity    | Lvmin/Lvmax | 25°C If=15mA | 70  | --- | --- | Ratio             |
| LED Life Time                |             | 25°C If=15mA | 9K  | --- | --- | Hours             |

**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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