

|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC21605A6W-FPTLW-V2  | 2 x 16 | 5mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 21/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

| <b>Display Features</b> |                         |
|-------------------------|-------------------------|
| Operating Temp. Range   | -20°C - +70°C           |
| Viewing Direction       | 6 O'Clock               |
| STN                     | FSTN Transflective      |
| Backlight               | LED White               |
| Controller              | SPLC780D                |
| Characters              | 2 x 16                  |
| Voltage                 | 5V                      |
| Module Size             | 84.00 x 44.00 x 13.5 mm |
| Character Height        | 5mm                     |
| Display Construction    | Chip on Board           |



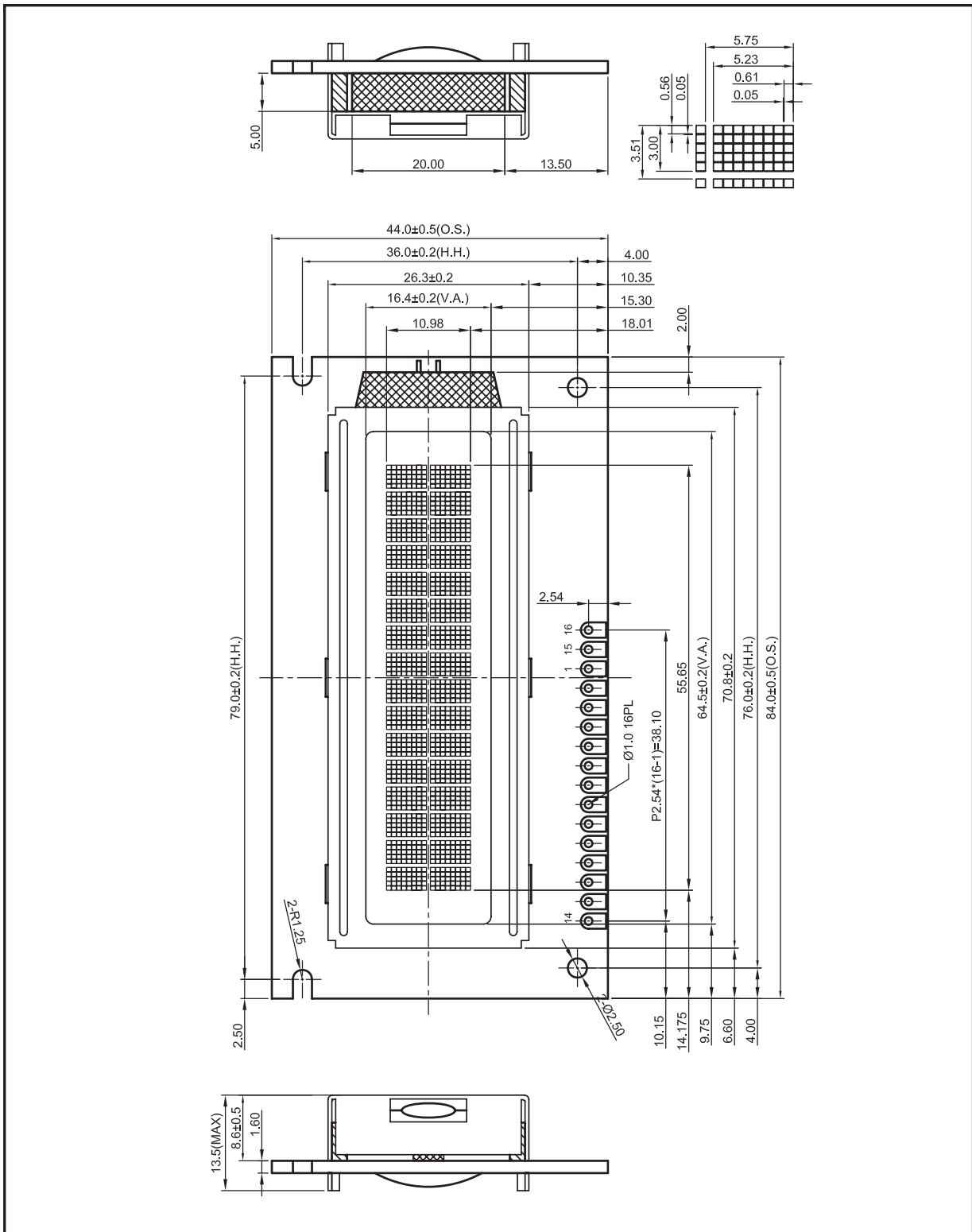
|              |                  |
|--------------|------------------|
| Box Quantity | Weight / Display |
| 45 pcs       | 28.88 grams      |

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

| <b>Optional Variants</b> |                  |         | <b>Display Accessories</b> |  |
|--------------------------|------------------|---------|----------------------------|--|
| 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.  |

## Mechanical Specifications

|                |                                       |          |                 |               |              |
|----------------|---------------------------------------|----------|-----------------|---------------|--------------|
| Module Size    | 84.00 x 44.00 x 13.5 (With Backlight) |          |                 |               | W x H x D mm |
| Viewing Area   | 64.50 x 16.40                         | W x H mm | Hole-to-Hole    | 79/76 x 36.00 | W x H mm     |
| Character Size | 3.00 x 5.23                           | W x H mm | Character Pitch | 0.51 x 0.52   | W x H mm     |
| Dot Size       | 0.56 x 0.61                           | W x H mm | Dot Pitch       | 0.05 x 0.05   | W x H mm     |

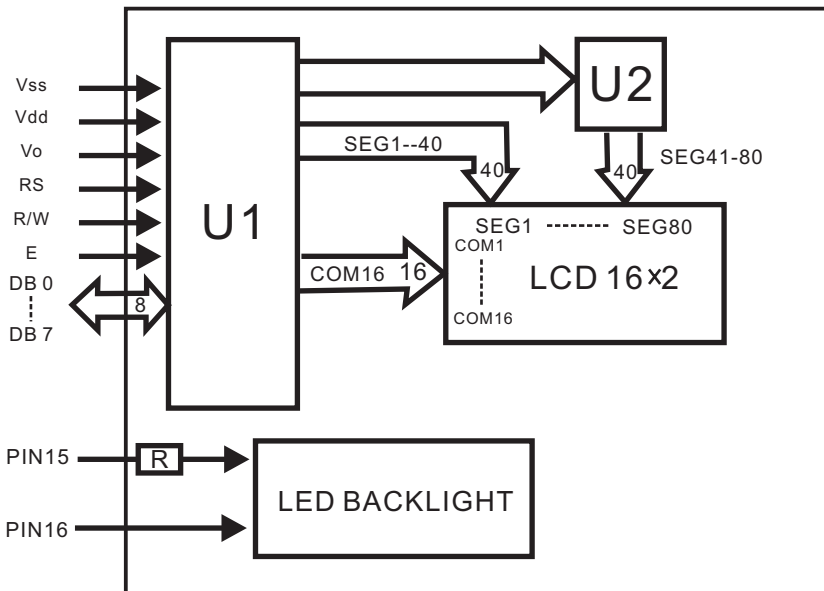


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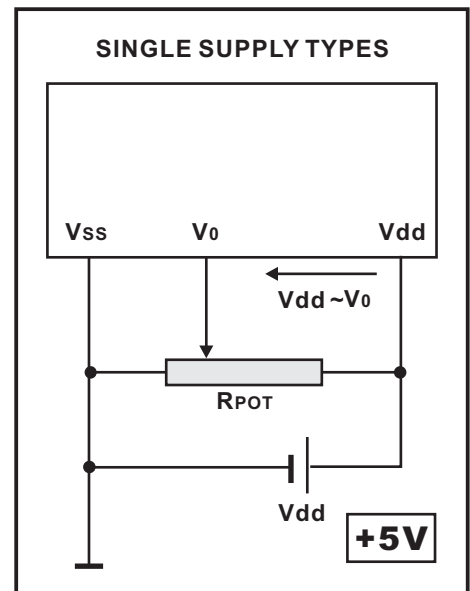
# Pin Layout

| 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    | 4.45 | ---  | 4.90 | V    |
|                               |                   | 0 °C      | 4.35 | ---  | 4.85 |      |
|                               |                   | 25 °C     | 4.25 | 4.50 | 4.80 |      |
|                               |                   | 50 °C     | 4.15 | ---  | 4.70 |      |
|                               |                   | 70 °C     | 4.05 | ---  | 4.60 |      |

| 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 If=15mA  | 2.8  | --- | 3.1  | V                 |
| LED Forward Current*         | If           | 25°C          | ---  | 15  | ---  | mA                |
| LED Reverse Current          | Ir           | 25°C Vr=5.0V  | ---  | --- | 10   | A                 |
| LED Colour Range             | X Coordinate | 25°C If=15mA  | 0.26 | --- | 0.30 | ---               |
|                              | Y Coordinate |               | 0.27 | --- | 0.31 | ---               |
| LED Brightness (Without LCD) | Lv           | 25°C If= 15mA | ---  | 240 | ---  | 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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