


|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC42004A6WK-BNMLW-V2 | 4 x 20 | 4mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 31/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

| Display Features      |                          |              |                  |
|-----------------------|--------------------------|--------------|------------------|
| Character Count       | 4 x 20                   |              |                  |
| Appearance            | White on Blue            |              |                  |
| Logic Voltage         | 5V                       |              |                  |
| Interface             | Parallel                 |              |                  |
| Font Set              | English / European       |              |                  |
| Display Mode          | Transmissive             |              |                  |
| Character Height      | 4.03mm                   |              |                  |
| LC Type               | BSTN                     |              |                  |
| Module Size           | 77.00 x 47.00 x 14.50 mm |              |                  |
| Operating Temperature | -20°C ~ +70°C            |              |                  |
| Construction          | COB                      | Box Quantity | Weight / Display |
| LED Backlight         | White                    | 45 pcs       | 28.88 grams      |



**RoHS**  
compliant

\* - For full design functionality, please use this specification in conjunction with the ST7066U specification. (Provided Separately)

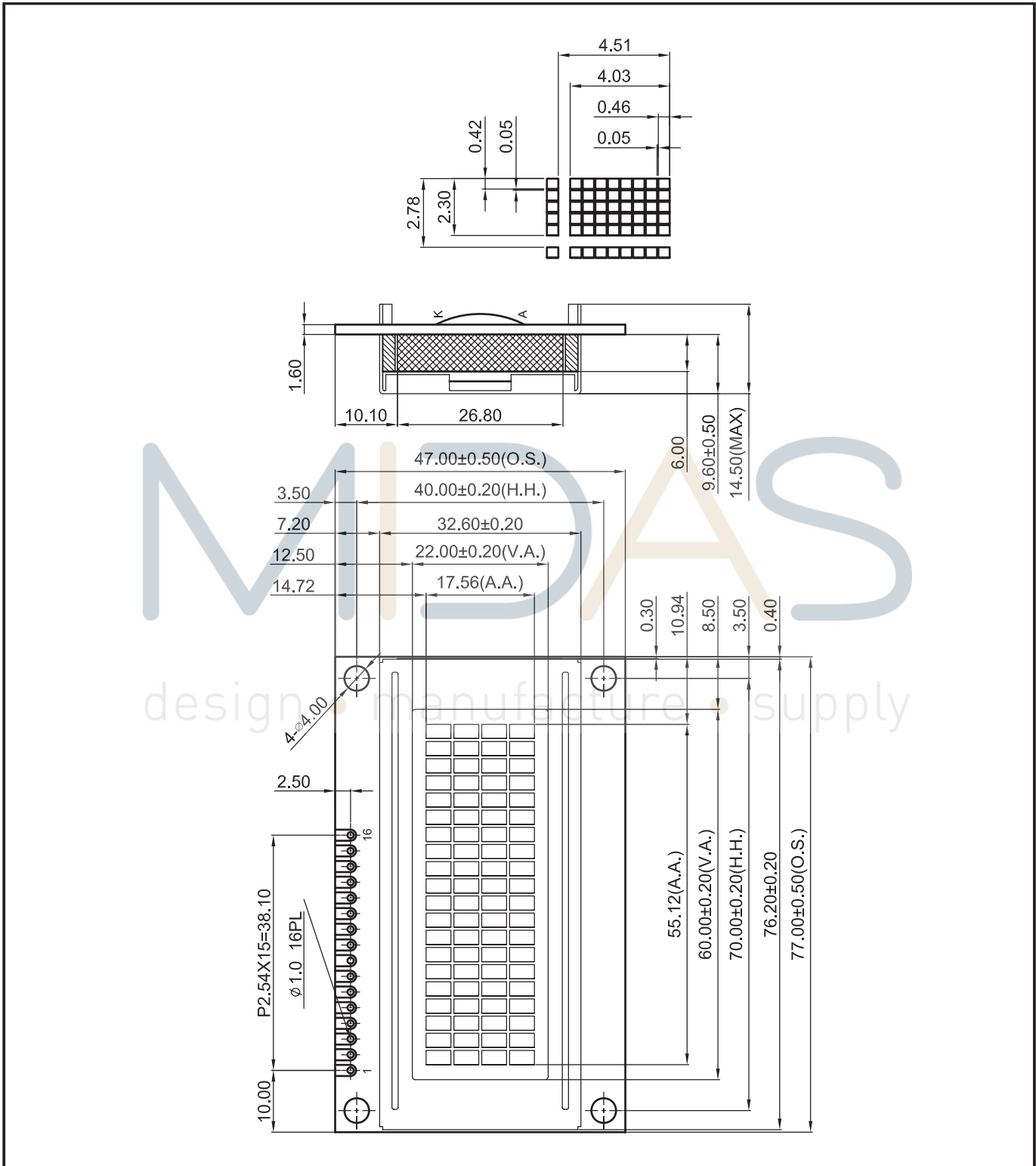
| Display Accessories      |  |
|--------------------------|--|
| Part Number              | Description  |
| MCCMDB-16SIL             | LCD Interconnect board, can be driven from either a PC or a single Board computer with a USB output. |
| MCCBL1A16SLIP-16DILS-150 | 16 Way, Single in-line to Dual In-line connector Cable.  |
| MCCBL1A16SLIP-16SILS-150 | 16 Way, Single in-line to Single In-line connector Cable.  |

| Optional Variants |   |         |
|-------------------|---|---------|
| Fonts             | Appearances   | Voltage |
| English / Russian | Black on Yellow/Green<br>Black on White<br>Black on Red<br>Black on Amber | 3V      |



## Mechanical Specifications

|                |   |          |                 |               |              |
|----------------|---|----------|-----------------|---------------|--------------|
| Module Size    | 77.00 x 47.00 x 14.50 ( With Backlight) |          |                 |               | W x H x D mm |
| Viewing Area   | 60.00 x 22.00                           | W x H mm | Hole-to-Hole    | 70.00 x 40.00 | W x H mm     |
| Character Size | 2.30 x 4.03                             | W x H mm | Character Pitch | 0.48 x 0.48   | W x H mm     |
| Dot Size       | 0.42 x 0.46                             | W x H mm | Dot Pitch       | 0.05 x 0.05   | W x H mm     |



|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC42004A6WK-BNMLW-V2 | 4 x 20 | 4mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 31/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

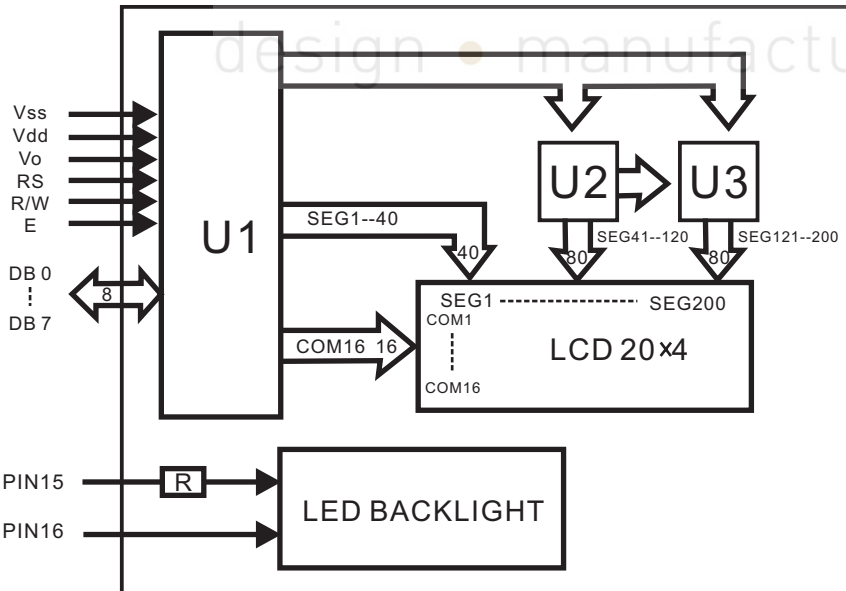


# Pin Layout

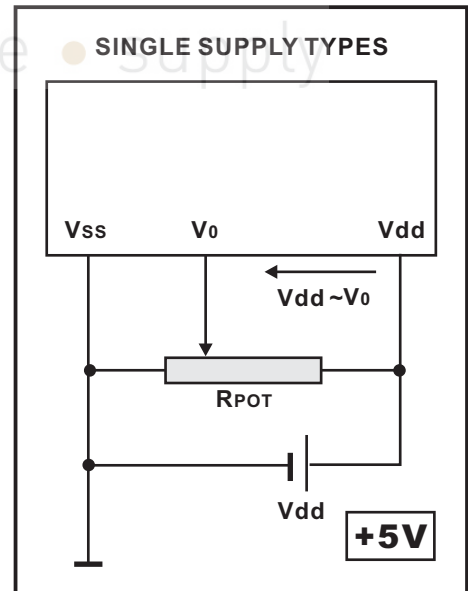
| PI | SYMBOL | DESCRIPTION            | REMARKS |
|----|--------|------------------------|---------|
| 1  | Vss    | GND                    |         |
| 2  | Vdd    | Power supply for LCM   | 5.0V    |
| 3  | V0     | Contrast Adjust        |         |
| 4  | RS     | Register Select Signal |         |
| 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   |         |

MIDAS

**Block Diagram**



**Power Supply Diagram**



|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC42004A6WK-BNMLW-V2 | 4 x 20 | 4mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 31/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |



# Font Map

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

|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC42004A6WK-BNMLW-V2 | 4 x 20 | 4mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 31/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |



| 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     | 4.25 | ---  | 4.70 | V    |
|                               |                   | 0°C       | 4.25 | ---  | 4.75 |      |
|                               |                   | 25°C      | 4.25 | 4.50 | 4.80 |      |
|                               |                   | 50°C      | 4.20 | ---  | 4.70 |      |
|                               |                   | 70°C      | 4.20 | ---  | 4.65 |      |

| 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 | ---  | 5.0 | ---  | V                 |
| LED Forward Current*         | If           | 25°C         | ---  | 15  | ---  | mA                |
| LED Reverse Current          | Ir           | 25°C Vr=5.0V | ---  | --- | 10   | μA                |
| 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 | ---  | 295 | ---  | 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.

|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MC42004A6WK-BNMLW-V2 | 4 x 20 | 4mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 31/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

