

|                   |        |                      |            |
|-------------------|--------|----------------------|------------|
| MC22405C6WK-BNMLW | 2 x 24 | 5mm Character Height | LCD Module |
| Specification     |        |                      |            |
| Version: 1        |        | Date: 31/10/2016     |            |
| Revision          |        |                      |            |
|                   |        |                      |            |

| Display Features      |                           |  |                  |
|-----------------------|---------------------------|--------------------------------------------------------------------------------------|------------------|
| Character Count       | 2 x 24                    |                                                                                      |                  |
| Appearance            | White on Blue             |                                                                                      |                  |
| Logic Voltage         | 5V                        |                                                                                      |                  |
| Interface             | Parallel                  |                                                                                      |                  |
| Font Set              | English / European        |                                                                                      |                  |
| Display Mode          | Transmissive              |                                                                                      |                  |
| Character Height      | 5.55mm                    |                                                                                      |                  |
| LC Type               | BSTN                      |                                                                                      |                  |
| Module Size           | 118.00 x 36.00 x 13.60 mm |                                                                                      |                  |
| Operating Temperature | -20°C ~ +70°C             |                                                                                      |                  |
| Construction          | COB                       | Box Quantity                                                                         | Weight / Display |
| LED Backlight         | White                     | ---                                                                                  | ---              |

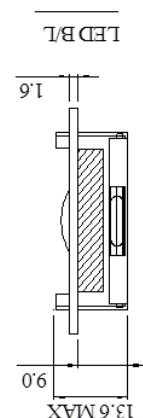
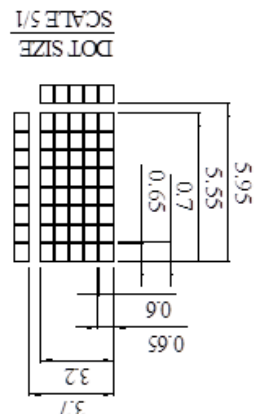
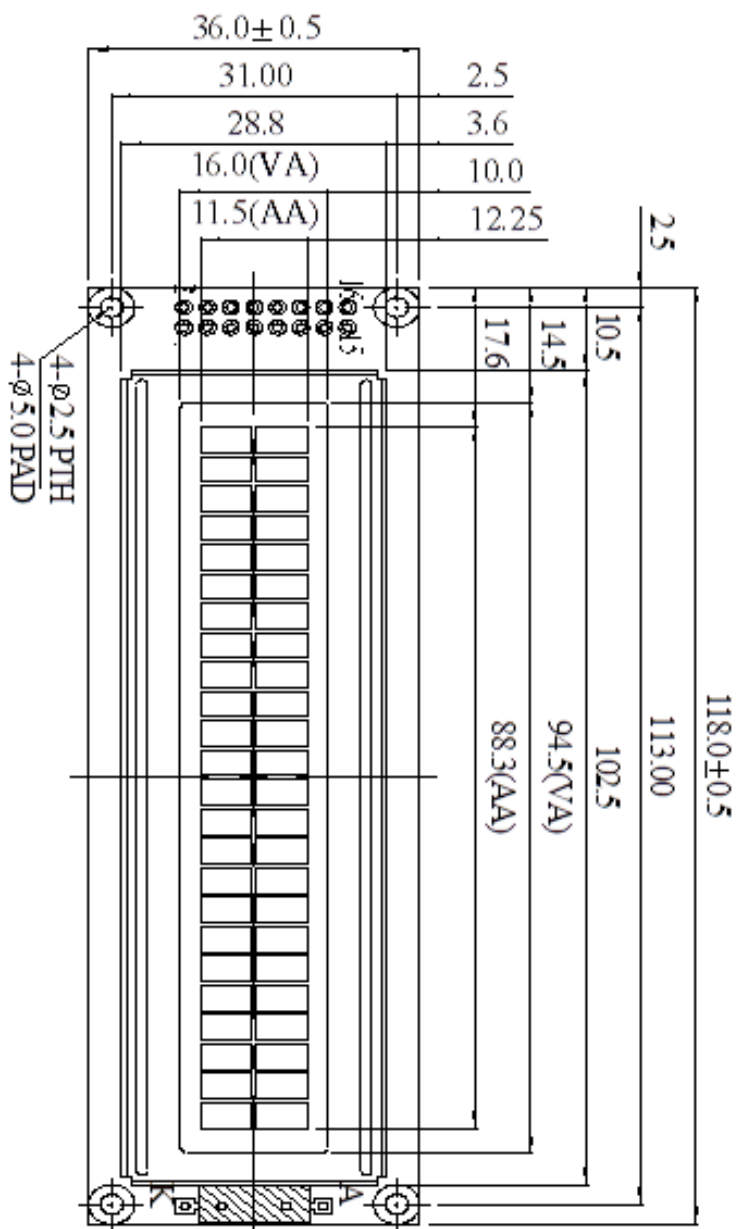
\* - For full design functionality, please use this specification in conjunction with the ST7066U specification. (Provided Separately)

| 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. |
| MCCBL1A16DLIP-16DILS-150 | 16 Way, Dual in-line to Dual In-line connector Cable.                                                |
|                          |                                                                                                      |

| Optional Variants |                       |         |
|-------------------|-----------------------|---------|
| Fonts             | Appearances           | Voltage |
| English / Russian | Black on Yellow/Green |         |
|                   |                       |         |

## Mechanical Specifications

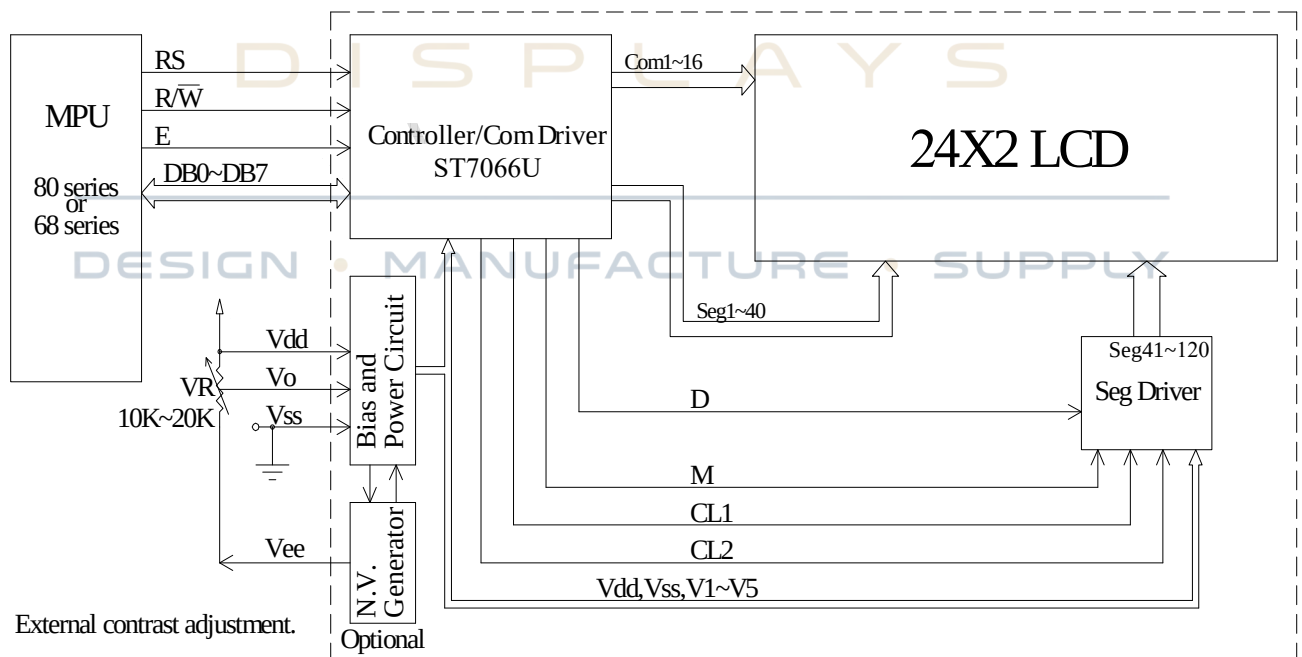
| Module Size    | 118.00 x 36.00 x 13.60 ( With Backlight) |          |                 |                | W x H x D mm |
|----------------|------------------------------------------|----------|-----------------|----------------|--------------|
| Viewing Area   | 94.50 x 16.00                            | W x H mm | Hole-to-Hole    | 108.00 x 29.00 | W x H mm     |
| Character Size | 3.20 x 5.55                              | W x H mm | Character Pitch | 3.70 x 5.95    | W x H mm     |
| Dot Size       | 0.60 x 0.65                              | W x H mm | Dot Pitch       | 0.65 x 0.70    | 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     | Operating Voltage for LCD |         |
| 4  | RS     | Instruction Code          |         |
| 5  | R/W    | Data Read / Write         |         |
| 6  | E      | Chip 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 | A      | Power supply for BKL+     | 5.0V    |
| 16 | K      | Power supply for BKL -    |         |



|                   |    |    |    |    |    |    |       |    |    |    |    |    |    |
|-------------------|----|----|----|----|----|----|-------|----|----|----|----|----|----|
| Character located | 1  | 2  | 3  | 4  | 5  | 6  | ----- | 19 | 20 | 21 | 22 | 23 | 24 |
| DDRAM address     | 00 | 01 | 02 | 03 | 04 | 05 | ----- | 12 | 13 | 14 | 15 | 16 | 17 |
| DDRAM address     | 40 | 41 | 42 | 43 | 44 | 45 | ----- | 52 | 53 | 54 | 55 | 56 | 57 |

|                      |        |                      |            |
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|                      |        | Page 3 of 5          |            |

## Font Map

| Upper<br>4bit<br>Lower<br>4bit | LLLL             | LL LH | LL HL | LL HH | LH LL | LH LH | LH HL | LH HH | HL LL | HL LH | HL HL | HL HH | HH LL | HH LH | HH HL | HH HH |
|--------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| LLLL                           | CG<br>RAM<br>(1) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LL LH                          | (2)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LL HL                          | (3)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LL HH                          | (4)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LH LL                          | (5)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LH LH                          | (6)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LH HL                          | (7)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LH HH                          | (8)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HLLL                           | (1)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HLLH                           | (2)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HLHL                           | (3)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HLHH                           | (4)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HHLL                           | (5)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HHLH                           | (6)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HHHL                           | (7)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HHHH                           | (8)              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

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|                   |        | Page 4 of 5          |            |

| Absolute Maximums Ratings |                 |                      |         |                        |      |
|---------------------------|-----------------|----------------------|---------|------------------------|------|
| Item                      | Symbol          | Minimum              | Typical | Maximum                | Unit |
| Power Supply (Logic)      | V <sub>dd</sub> | -0.3                 | ---     | 7.00                   | V    |
| Power Supply (LCD)        | V <sub>0</sub>  | V <sub>ss</sub> -0.3 | ---     | V <sub>ss</sub> +13.00 | V    |
| Input Voltage             | V <sub>in</sub> | V <sub>ss</sub>      | ---     | V <sub>dd</sub>        | V    |
| Operating Temperature     | T <sub>OP</sub> | -20°C                | ---     | 70°C                   | °C   |
| Storage temperature       | T <sub>ST</sub> | -30°C                | ---     | 80°C                   | °C   |

| Electronic Characteristics |                                   |                       |         |         |                 |      |
|----------------------------|-----------------------------------|-----------------------|---------|---------|-----------------|------|
| Item                       | Symbol                            | Condition             | Minimum | Typical | Maximum         | Unit |
| Input Voltage High         | V <sub>IH</sub>                   | ---                   | 0.70    | ---     | V <sub>DD</sub> | V    |
| Input Voltage Low          | V <sub>IL</sub>                   | ---                   | -0.30   | ---     | 0.60            | V    |
| Output Voltage High        | V <sub>OH</sub>                   | ---                   | 3.90    | ---     | ---             | V    |
| Output Voltage Low         | V <sub>OL</sub>                   | ---                   | ---     | ---     | 0.40            | V    |
| Supply Voltage Logic       | V <sub>DD</sub> ~ V <sub>SS</sub> | ---                   | 4.50    | 5.00    | 5.50            | V    |
| Supply Voltage LCD         | V <sub>DD</sub> ~ V <sub>0</sub>  | Ta=25°C               | ---     | 4.50    | ---             | V    |
| Supply Current             | I <sub>DD</sub>                   | V <sub>DD</sub> =5.0V | 1.00    | 1.20    | 1.50            | mA   |

| LCD Characteristics          |         |           |         |         |         |        |
|------------------------------|---------|-----------|---------|---------|---------|--------|
| For STN/FSTN LCD Panel Types |         |           |         |         |         |        |
| Item                         | Symbol  | Condition | Minimum | Typical | Maximum | Unit   |
| Viewing Angle                | Φ2 – Φ1 | CR ≥ 10   | 20      |         | 40      | ψ=180° |
|                              | Θ       | CR ≥ 10   | -30     |         | 30      |        |
| Contrast Ratio               | CR      | ---       | ---     | 3       | ---     | ---    |
| Response Time (Rise)         | TR      | ---       | ---     | 200     | 300     | ms     |
| Response Time (Fall)         | TF      | ---       | ---     | 200     | 300     | ms     |

| LED Characteristics     |                  |                        |         |         |         |                   |
|-------------------------|------------------|------------------------|---------|---------|---------|-------------------|
| Item                    | Symbol           | Condition              | Minimum | Typical | Maximum | Unit              |
| Supply Current          | I <sub>LED</sub> | V=5.0V                 | 28.8    | 32      | 50      | mA                |
| Supply Voltage          | V                | ---                    | 3.40    | 3.50    | 3.60    | V                 |
| Reverse Voltage         | VR               | ---                    | ---     | 5       | ---     | V                 |
| Luminance (Without LCD) | IV               | I <sub>LED</sub> =32mA | 210     | 230     | ---     | Cd/m <sup>2</sup> |
| ---                     | ---              | ---                    | ---     | ---     | ---     | ---               |
| LED Life Time           | ---              | I <sub>LED</sub> =32mA | ---     | 50K     | ---     | Hour              |

**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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|                   |        | Page 5 of 5          |            |