


|                      |        |                      |            |
|----------------------|--------|----------------------|------------|
| MCCOG21605C6W-BNMLWI | 2 x 16 | 5mm Character Height | LCD Module |
| <b>Specification</b> |        |                      |            |
| Version: 1           |        | Date: 19/10/2016     |            |
| <b>Revision</b>      |        |                      |            |
|                      |        |                      |            |

| Display Features      |                         |  |     |  |  |
|-----------------------|-------------------------|--|-----|--|--|
| Character Count       | 2 x 16                  |  |     |  |  |
| Appearance            | White on Blue           |  |     |  |  |
| Logic Voltage         | 5V                      |  |     |  |  |
| Interface             | I2C                     |  |     |  |  |
| Font Set              | English / Japanese      |  |     |  |  |
| Display Mode          | Transmissive            |  |     |  |  |
| Character Height      | 5.55mm                  |  |     |  |  |
| LC Type               | BSTN                    |  |     |  |  |
| Module Size           | 74.20 x 25.20 x 6.30 mm |  |     |  |  |
| Operating Temperature | -20°C ~ +70°C           |  |     |  |  |
| Construction          | COG                     |  |     |  |  |
| LED Backlight         | White                   | ---  | --- |  |  |

\* - For full design functionality, please use this specification in conjunction with the ST70321 specification. (Provided Separately)

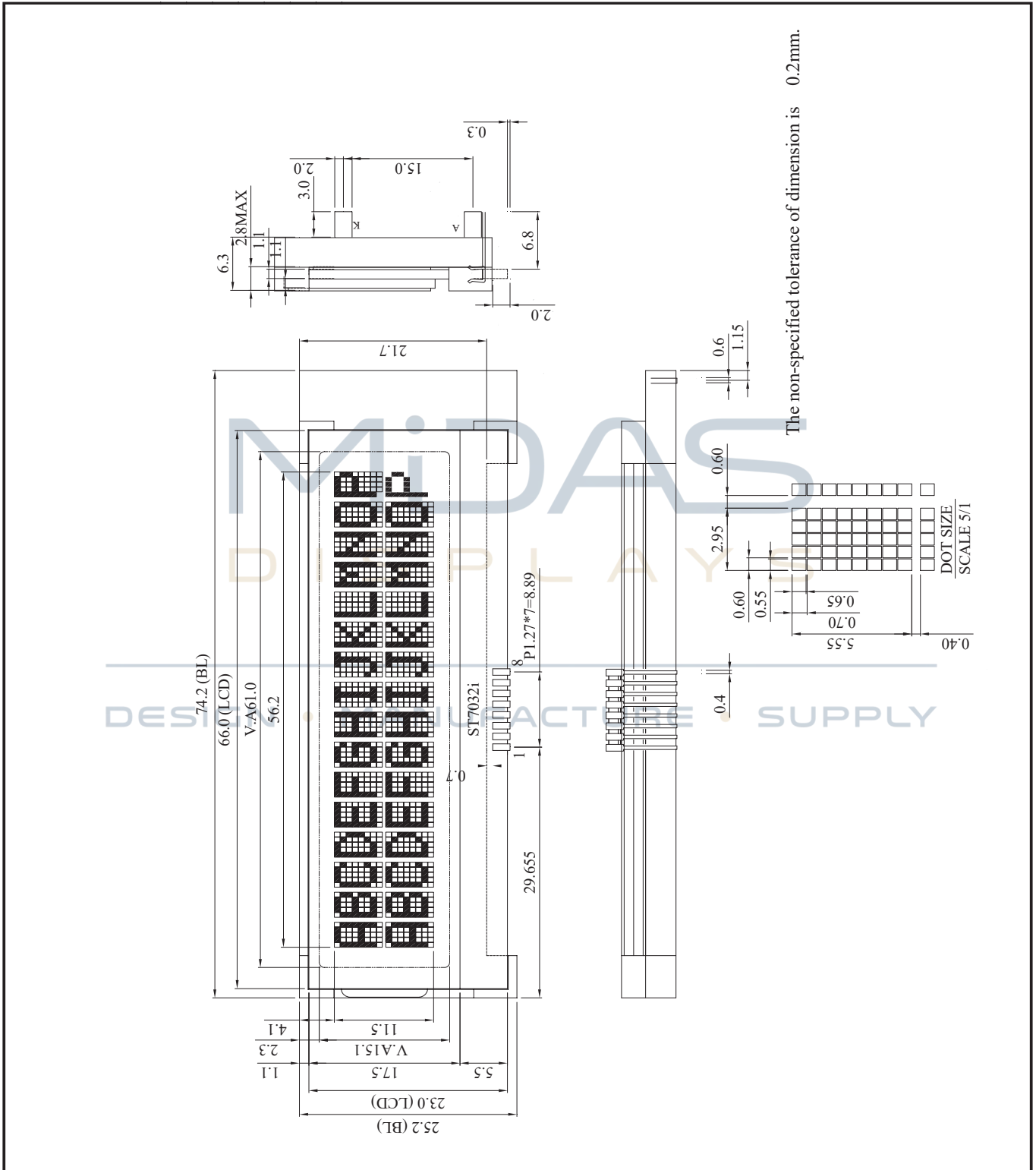
| Display Accessories |  |
|---------------------|--|
| Part Number         | Description  |
| MCCOG-I2C-I-8       | Fine pitch(1.27mm) COG I2C interface board. Compatible with both Arduino and UC32 controller boards. |
|                     |  |
|                     |  |

| Optional Variants |             |         |
|-------------------|-------------|---------|
| Fonts             | Appearances | Voltage |
|                   |             |         |
|                   |             |         |



## Mechanical Specifications

|                |  |          |                 |              |          |
|----------------|--|----------|-----------------|--------------|----------|
| Module Size    | 74.20 x 25.20 x 6.30 ( With Backlight) |          |                 | W x H x D mm |          |
| Viewing Area   | 61.00 x 15.10                          | W x H mm | Hole-to-Hole    | ---          | W x H mm |
| Character Size | 2.95 x 5.55                            | W x H mm | Character Pitch | 3.55 x 5.95  | W x H mm |
| Dot Size       | 0.55 x 0.65                            | W x H mm | Dot Pitch       | 0.60 x 0.70  | W x H mm |



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| Pin Layout |        |                                   |         |
|------------|--------|-----------------------------------|---------|
| PI         | SYMBOL | DESCRIPTION                       | REMARKS |
| 1          | VOUT   | DC/DC Voltage Converter           |         |
| 2          | CAP1N  | Voltage booster Circuit (VDD-VSS) |         |
| 3          | CAP1P  |                                   |         |
| 4          | VDD    | Power Supply                      | 5.0V    |
| 5          | VSS    | Ground                            |         |
| 6          | SDA    | Input Data                        |         |
| 7          | SCL    | Clock Input Data                  |         |
| 8          | RST    | Reset                             |         |




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DESIGN • MANUFACTURE • SUPPLY

|                      |        |                      |            |
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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 Maximums Ratings |                 |                      |         |                       |      |
|---------------------------|-----------------|----------------------|---------|-----------------------|------|
| Item                      | Symbol          | Minimum              | Typical | Maximum               | Unit |
| Power Supply (Logic)      | V <sub>DD</sub> | -0.3                 | ---     | 6.0                   | V    |
| Power Supply (LCD)        | V <sub>0</sub>  | 7.0 -V <sub>SS</sub> | ---     | -0.3 +V <sub>SS</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>                   | ---                  | ---     | ---     | 0.20            | V    |
| Output Voltage High        | V <sub>OH</sub>                   | ---                  | 0.80    | ---     | V <sub>DD</sub> | V    |
| Output Voltage Low         | V <sub>OL</sub>                   | ---                  | ---     | ---     | 0.20            | V    |
| Supply Voltage Logic       | V <sub>DD</sub> ~ V <sub>SS</sub> | ---                  | 3.00    | 3.30    | 5.00            | V    |
| Supply Voltage LCD         | V <sub>DD</sub> ~ V <sub>0</sub>  | T <sub>a</sub> =25°C | ---     | 4.50    | ---             | V    |
| Supply Current             | I <sub>DD</sub>                   | ---                  | ---     | 0.19    | ---             | mA   |

| LCD Characteristics          |                                 |           |         |         |         |        |
|------------------------------|---------------------------------|-----------|---------|---------|---------|--------|
| For STN/FSTN LCD Panel Types |                                 |           |         |         |         |        |
| Item                         | Symbol                          | Condition | Minimum | Typical | Maximum | Unit   |
| Viewing Angle                | Φ <sub>2</sub> - Φ <sub>1</sub> | CR ≥ 2    | 20      | ---     | 40      | ψ=180° |
|                              | Θ                               | ---       | -30     | ---     | 30      |        |
| Contrast Ratio               | CR                              | ---       | ---     | 3       | ---     | ---    |
| Response Time (Rise)         | T <sub>R</sub>                  | ---       | ---     | 250     | 400     | ms     |
| Response Time (Fall)         | T <sub>F</sub>                  | ---       | ---     | 100     | 250     | ms     |

| LED Characteristics     |                  |                        |         |         |         |                   |
|-------------------------|------------------|------------------------|---------|---------|---------|-------------------|
| Item                    | Symbol           | Condition              | Minimum | Typical | Maximum | Unit              |
| Supply Current          | I <sub>LED</sub> | V=3.5V                 | 28.80   | 32      | 50      | mA                |
| Supply Voltage          | V                | ---                    | 3.40    | 3.50    | 3.60    | V                 |
| Reverse Voltage         | V <sub>R</sub>   | ---                    | ---     | ---     | 5       | V                 |
| Luminance (Without LCD) | I <sub>V</sub>   | I <sub>LED</sub> =32mA | 422.40  | 528     | ---     | 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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