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|----------------------|--------|----------------------|-----------|
| MC21609A12W-VNMLB | 2 x 16 | 9mm Character Height | VA Module |
| Specification | | | |
| Version: 1 | | Date: 29/09/2016 | |
| Revision | | | |
| | | | |

| Display Features | |  | |
|-----------------------|---------------------------|---|--------------|
| Character Count | 2 x 16 | | |
| Appearance | Blue on Black | | |
| Logic Voltage | 5V | | |
| Interface | Parallel | | |
| Font Set | English / Japanese | | |
| Display Mode | Transmissive | | |
| Character Height | 9.22mm | | |
| LC Type | VATN | | |
| Module Size | 122.00 x 44.00 x 13.60 mm | | |
| Operating Temperature | -20°C ~ +70°C | | |
| Construction | COB | | Box Quantity |
| LED Backlight | Blue | --- | --- |

* - For full design functionality, please use this specification in conjunction with the RW1063 specification. (Provided Separately)

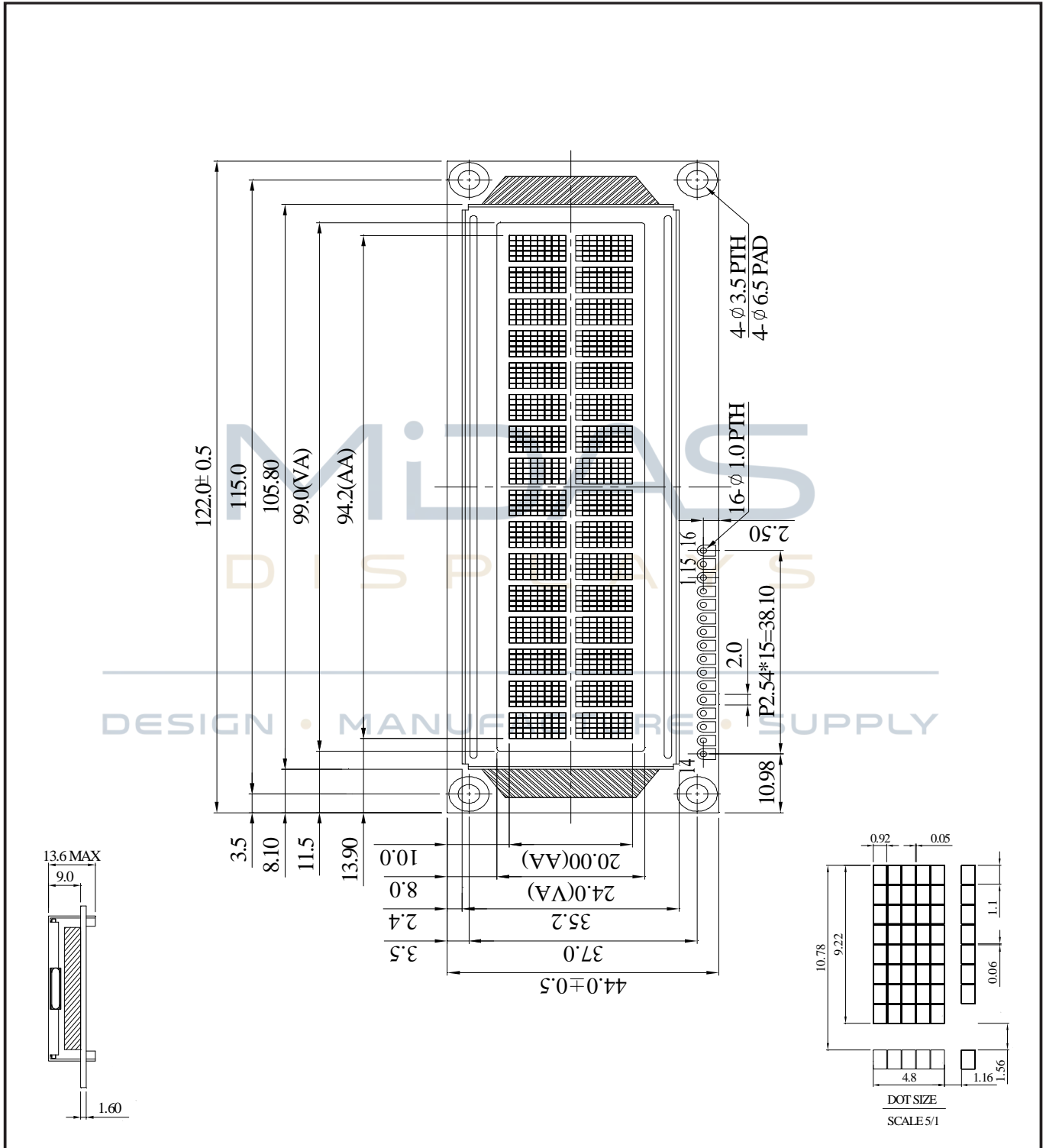
| Display Accessories | |
|------------------------------|--|
| Part Number | Description |
| MCCMDB-16SIL | LCD Interconnect board, can be driven from either a PC or a single Board computer with a USB output. |
| MCCBL1A16SLIP -16DILS-150 | 16 Way, Single in-line to Dual In-line connector Cable. |
| MCCBL1A16DLIP -16DILS-150 | 16 Way, Single in-line to Single In-line connector Cable. |

| Optional Variants | | |
|-------------------|---|---------|
| Fonts | Appearances | Voltage |
| | Green on Black White on Black Yellow on Black Red on Black | |



Mechanical Specifications

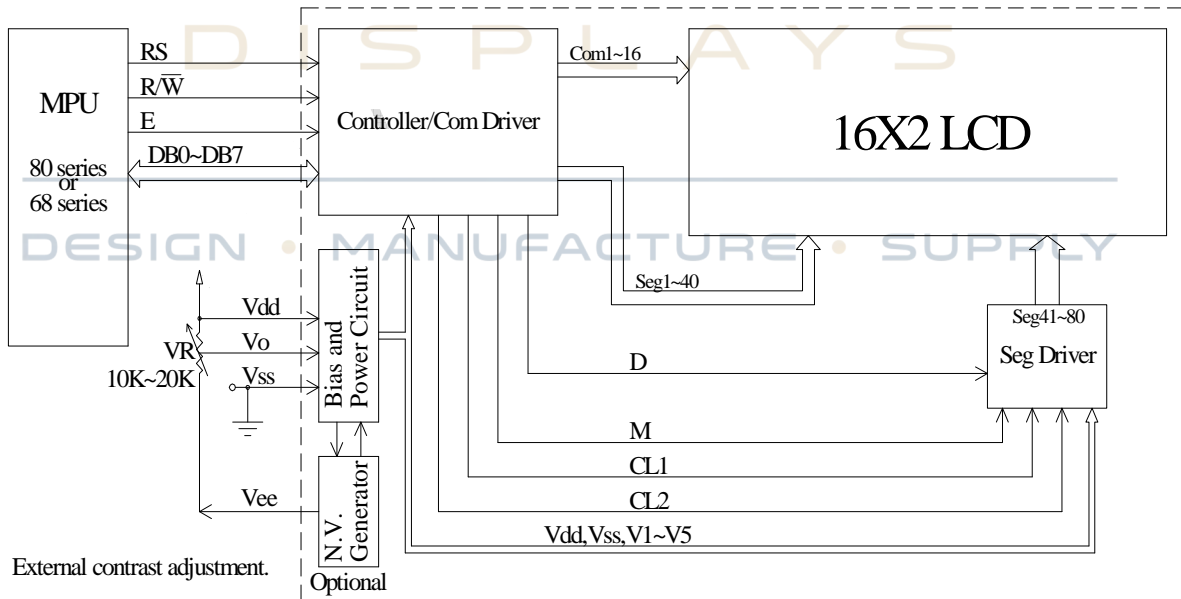
| | | | | | |
|----------------|--|----------|-----------------|----------------|--------------|
| Module Size | 122.00 x 44.00 x 13.60 (With Backlight) | | | | W x H x D mm |
| Viewing Area | 99.00 x 24.00 | W x H mm | Hole-to-Hole | 115.00 x 37.00 | W x H mm |
| Character Size | 4.80 x 9.22 | W x H mm | Character Pitch | 5.96 x 10.78 | W mm |
| Dot Size | 0.92 x 1.10 | W x H mm | Dot Pitch | 0.97 x 1.16 | 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 | VO | Contrast Adjustment | |
| 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 | Vee | Negative Voltage Output | |
| 16 | K | LED- | |



| | | | | | | | | | | | | | | | | |
|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Character located | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| DDRAM address | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F |
| DDRAM address | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 4A | 4B | 4C | 4D | 4E | 4F |

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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) | | | | | | | | | | | | | | | |

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Absolute Maximum Ratings

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|-----------------------|--------|-----------|---------|-----|----------|------|
| Power Supply (LOGIC) | Vdd | 25 °C | -0.3 | --- | 5.5 | V |
| Power Supply (LCD) | V0 | 25 °C | Vss-0.3 | --- | Vss +7.0 | 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 | Minimum | Typical | Maximum | Unit |
|----------------------|-----------------------------------|-----------------------|---------|---------|-----------------|------|
| Input Voltage High | V _{IH} | --- | 2.50 | --- | V _{DD} | V |
| Input Voltage Low | V _{IL} | --- | -0.3 | --- | 0.60 | V |
| Output Voltage High | V _{OH} | --- | 3.90 | --- | Vdd | V |
| Output Voltage Low | V _{OL} | --- | --- | --- | 0.40 | V |
| Supply Voltage Logic | V _{DD} - V _{SS} | --- | 4.50 | 5.00 | 5.50 | V |
| Supply Voltage LCD | V _{DD} - V ₀ | Ta=25°C | 6.40 | 6.60 | 6.80 | V |
| Supply Current | I _{DD} | V _{DD} =5.0V | --- | 1.00 | --- | mA |

LCD Characteristics

| For STN/FSTN LCD Panel Types | | | | | | |
|------------------------------|---------------------------------|-----------|---------|---------|---------|--------|
| Item | Symbol | Condition | Minimum | Typical | Maximum | Unit |
| Viewing Angle | Φ ₂ - Φ ₁ | CR ≥ 10 | --- | 60 | --- | ψ=180° |
| | Θ | --- | --- | | | |
| Contrast Ratio | CR | --- | 10 | --- | --- | --- |
| Response Time (Rise) | TR | --- | --- | 300 | 350 | ms |
| Response Time (Fall) | TF | --- | --- | 300 | 350 | ms |

LED Characteristics

| Item | Symbol | Condition | Minimum | Typical | Maximum | Unit |
|-------------------------|------------------|------------------------|---------|---------|---------|-------------------|
| Supply Current | I _{LED} | V=5.0V | --- | 128 | 160 | mA |
| Supply Voltage | V | --- | 4.90 | 5.00 | 5.10 | V |
| Reverse Voltage | VR | --- | --- | --- | 5 | V |
| Luminance (Without LCD) | IV | I _{LED} =45mA | 168 | 210 | --- | Cd/m ² |
| Wave Length | λP | I _{LED} =45mA | 460 | 470 | 480 | nm |
| LED Life Time | --- | I _{LED} =45mA | --- | 50K | --- | Hour |

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