


| | | | |
|----------------------|------------|----------------------|------------|
| MD22005A6W-FPTLRGB | 2 x 20 | 5mm Character Height | LCD Module |
| Specification | | | |
| Version: 1 | | Date: 15/10/2021 | |
| Revision | | | |
| 1 | 13/10/2021 | First Issue | |

| Display Features | |  |
|-----------------------|---------------------------|--------------------------------------------------------------------------------------|
| Character Count | 2 x 20 | |
| Appearance | Black on RGB | |
| Logic Voltage | 5V | |
| Interface | Parallel | |
| Font Set | English / Japanese | |
| Display Mode | Transflective | |
| Character Height | 4.75mm | |
| LC Type | FSTN | |
| Module Size | 116.00 x 37.00 x 13.50 mm | |
| Operating Temperature | -20°C ~ +70°C | |
| Construction | COB | |
| LED Backlight | RGB | |
| | Box Quantity | --- |
| | Weight / Display | --- |

* - For full design functionality, please use this specification in conjunction with the ST7066U + ST7063C 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. |
| | |

| Optional Variants | | |
|----------------------------------|--------------------------------------------------------------|------------|
| Fonts | Appearances | Voltage |
| English/Euro English/Cyrillic | Black on Yellow/ Green White on Blue Black on White | 3V 3.3V |



FEATURES

| AVAILABLE OPTIONS | CHARACTERISTICS |
|----------------------------|--------------------------------------------------|
| DISPLAY FORMAT | 20 Characters by 2 Lines |
| POLARIZER OPTIONS | Positive Transflective |
| BACKLIGHT TYPE OPTIONS | Edge Type LED Backlight (Long life span version) |
| BACKLIGHT COLOR OPTIONS | Red Green Blue three color |
| LCD PANEL OPTIONS | FSTN |
| VIEWING ANGLE OPTIONS | 6:00 (Bottom) |
| TEMPERATURE RANGE OPTIONS | -20°C ~ 70°C, Single Supply Voltage |
| SUGGESTED DRIVING VOLTAGE | V _{lcm} = 5.0V V _{led} = 5.0V |
| SUGGESTED LED DRIVING MODE | PIN15: LED+, PIN16:K(B),PIN17:K(G),PIN18:K(R) |
| CONTROLLER | ST7066U + ST7063C |
| FONT MAP CODE | E Version |
| DRIVING DUTY | 1/16 |
| DRIVING BIAS | 1/5 |

MECHANICAL SPECIFICATIONS

| | | | | | |
|-----------------------|----------------|----|------------------------|----------------|----|
| OVERALL SIZE | 116.0W x 37.0H | mm | THICKNESS | max 13.5 | mm |
| VIEWING AREA | 83.0W x 18.6H | mm | HOLE-HOLE | 108.0W x 29.0H | mm |
| CHARACTER SIZE | 3.20W x 5.55H | mm | CHARACTER PITCH | 0.50W x 0.80H | mm |
| DOT SIZE | 0.60W x 0.65H | mm | DOT PITCH | 0.05W x 0.05H | mm |

ABSOLUTE MAXIMUM RATINGS

| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|-----------------------|------------------|-----------|-----------------------|-----|----------------------|------|
| POWER SUPPLY (LOGIC) | V _{dd} | 25°C | -0.3 | — | 7.0 | V |
| POWER SUPPLY (LCD) | V ₀ | 25°C | V _{dd} -13.5 | — | V _{dd} +0.3 | V |
| INPUT VOLTAGE | V _{in} | 25°C | -0.3 | — | V _{dd} +0.3 | V |
| OPERATING TEMPERATURE | V _{opr} | — | -20 | — | 70 | °C |
| STORAGE TEMPERATURE | V _{stg} | — | -30 | — | 80 | °C |

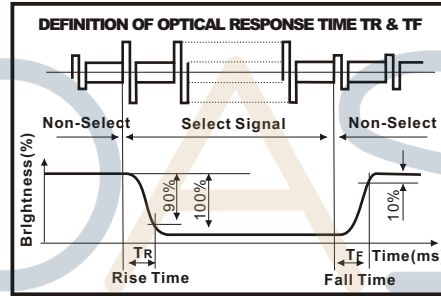
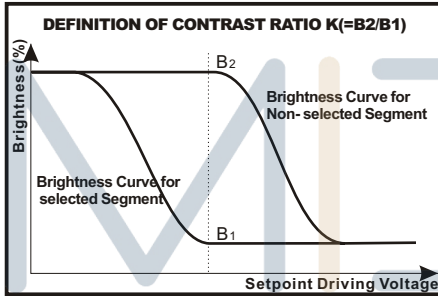
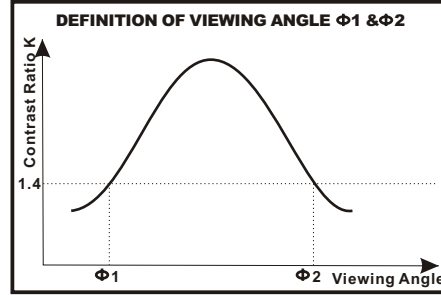
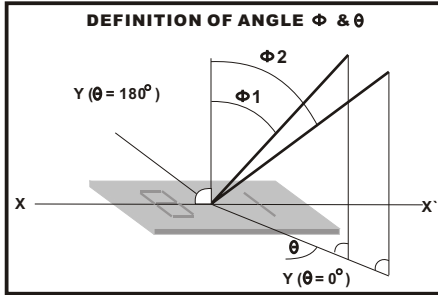
ELECTRONIC CHARACTERISTICS *

| | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|--|-------------------------------|--------------------------------------------------------|---------------------|------|------|------|------|
| | INPUT VOLTAGE | V _{lcm} = V _{dd} | — | — | 5.0 | — | V |
| | SUPPLY CURRENT | I _{dd} | V _{dd} =5V | — | 1.5 | — | mA |
| | DRIVING VOLTAGE FOR LCD PANEL | V _{lcd} = (V _{dd} - V ₀) | -20°C | 4.30 | — | 4.80 | V |
| | | | 0°C | 4.20 | — | 4.70 | |
| | | | 25°C | 4.10 | 4.50 | 4.65 | |
| | | | 50°C | 4.05 | — | 4.65 | |
| | | | 70°C | 4.00 | — | 4.65 | |

LCD CHARACTERISTICS

FOR STN/FSTN TYPE LCD Panel (TA=25 °C, Vlcd=5.0V ± 0.5V)

| | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|--|---------------------|-------------------|-----------|-----|-----|-----|------|
| | VIEWING ANGLE | $\Phi 2 - \Phi 1$ | K=4 | 40 | — | — | deg |
| | | θ | | 60 | | | |
| | CONTRAST RATIO | K | — | 6 | — | — | — |
| | RESPONSE TIME(RISE) | TR | — | — | 150 | 250 | ms |
| | RESPONSE TIME(FALL) | TF | — | — | 150 | 250 | ms |



LED CHARACTERISTICS

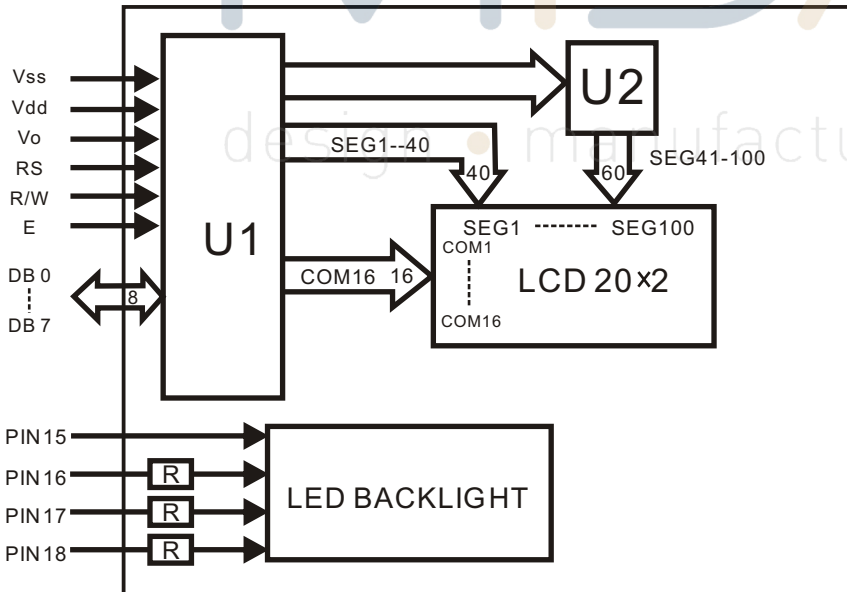
| | ITEM | SYMBOL | CONDITION | MIN | | | TYP | | | MAX | | | UNIT |
|--|------------------------------|-------------|-----------|-----|-----|-----|-----|-----|----|-----|-----|-----|-------------------|
| | LED FORWARD VOLTAGE | Vf | 25 °C | R | G | B | R | G | B | R | G | B | V |
| | | | | 1.8 | 2.9 | 2.9 | — | — | — | 2.2 | 3.4 | 3.4 | |
| | LED FORWARD CURRENT | If | 25 °C | — | — | — | 30 | 30 | 30 | — | — | — | mA |
| | LED REVERSE CURRENT | Ir | 25 °C | — | — | — | — | — | — | 10 | 10 | 10 | µA/LED |
| | LED PEAK WAVE LENGTH | λ_p | 25 °C | 620 | 520 | 465 | — | — | — | 630 | 530 | 475 | nm |
| | LED BRIGHTNESS (WITHOUT LCD) | Lv | 25 °C | — | — | — | 82 | 347 | 55 | — | — | — | cd/m ² |
| | LED BRIGHTNESS UNIFORMITY | Lvmin/Lvmax | 25 °C | 70 | | | — | | | — | | | Ratio |
| | LED LIFE TIME | — | 25 °C | 20K | | | — | | | — | | | Hours |



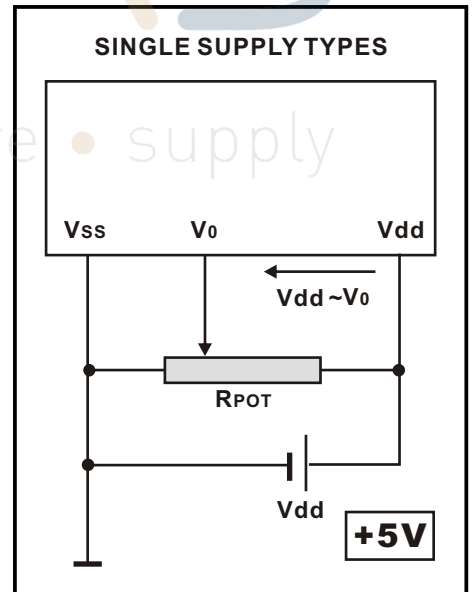
PIN ASSIGNMENT

| PIN | 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 | K(B) | Power supply for BKL | 0V |
| 17 | K(G) | Power supply for BKL | 0V |
| 18 | K(R) | Power supply for BKL | 0V |

BLOCK DIAGRAM



POWER SUPPLY DIAGRAM



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



