Electra House, 32 Southtown Road
Great Yarmouth, Norfolk
NR31 0DU, England

Telephone +44 (0)1493 602602
Fax +44 (0)1493 665111
Email:sales@midasdisplays.com
www.midasdisplays.com

| MC240128A6W-BNMLW-V2 | 240 x 128 | LCD Module |
|---|---|---|
| **Specification** | | |
| Version: 1 | | Date: 02/06/2016 |
| **Revision** | | |
| 1 | 30/05/2016 | First Issue |

| Display Features | |
|---|---|
| Resolution | 240 x 128 |
| Appearance | White on Blue |
| Logic Voltage | 5V |
| Interface | Parallel |
| Font Set | N/A |
| Display Mode | Transmissive |
| LC Type | Blue STN |
| Module Size | 144.00 x 104.00 x 13.00mm |
| Operating Temperature | -20°C ~ +70°C |
| Construction | COB |
| LED Backlight | White |

RoHS compliant

| Box Quantity | Weight / Display |
|---|---|
| ... | ... |

| 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. |
| MCCBL1A16DILP -DILS-150 | 16 Way, Dual in-line to Dual in-line connector cable. |
| | |

| Optional Variants | |
|---|---|
| **Appearances** | **Voltage** |
| Black on White<br>Black on Yellow/Green | |

## FEATURES

| AVAILABLE OPTIONS | CHARACTERISTICS |
|---|---|
| DISPLAY FORMAT | **240 Characters by 128 Lines** |
| POLARIZER OPTIONS | **Negative Transmissive** |
| BACKLIGHT TYPE OPTIONS | **Edge Type LED Backlight (Long life span version)** |
| BACKLIGHT COLOR OPTIONS | **White color** |
| LCD PANEL OPTIONS | **Blue STN** |
| VIEWING ANGLE OPTIONS | **6:00 (Bottom )** |
| TEMPERATURE RANGE OPTIONS | **-20℃ ~ 70℃, Positive Voltage Driving Only** |
| SUGGESTED DRIVING VOLTAGE | **Vlcm = 5.0V Vled = 5.0V** |
| SUGGESTED LED DRIVING MODE | **PIN19: LED+, PIN20:LED-** |
| CONTROLLER ▲1 | **RA6963(RAIO)+NT7086** |
| FONT MAP CODE | **NO FONT SET** |
| DRIVING DUTY | **1/128** |
| DRIVING BIAS | **1/12** |

▲1 Please ask for datasheet of the mentioned controller from Midas or Midas's authorized distributors. You can find the related information including AC & DC characteristics, Write & Read Timing diagram, Instruction table and descriptions, DDRAM & CGRAM, Rest Function and so on from the datasheet of controller.

▲1 You can ask for the example of software program (C language) from Midas or Midas's authorized distributors.

## MECHANICAL SPECIFICATIONS

| | | | | | |
|---|---|---|---|---|---|
| **OVERALL SIZE** | **144.0W x 104.0H** | **mm** | **THICKNESS** | **max 13.0** | **mm** |
| **VIEWING AREA** | **114.0W x 64.0H** | **mm** | **HOLE-HOLE** | **138.0W x 97.0H** | **mm** |
| **CHARACTER SIZE** | **—** | **mm** | **CHARACTER PITCH** | **—** | **mm** |
| **DOT SIZE** | **0.40W x 0.40H** | **mm** | **DOT PITCH** | **0.05W x 0.05H** | **mm** |

## ABSOLUTE MAXIMUM RATINGS

| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| POWER SUPPLY ( LOGIC) | Vdd | 25℃ | **-0.3** | **—** | **7.0** | **V** |
| POWER SUPPLY (LCD) | V0 | 25℃ | **Vdd -30** | **—** | **Vdd +0.3** | **V** |
| INPUT VOLTAGE | Vin | 25℃ | **-0.3** | **—** | **Vdd +0.3** | **V** |
| OPERATING TEMPERATURE | Vopr | — | **-20** | **—** | **70** | **℃** |
| STORAGE TEMPERATURE | Vstg | — | **-30** | **—** | **80** | **℃** |

## ELECTRONIC CHARACTERISTICS*

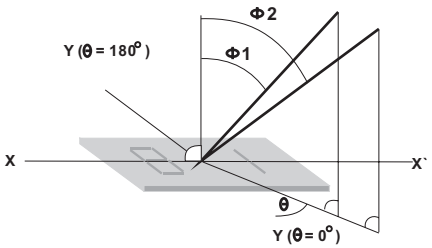
| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| INPUT VOLTAGE | Vlcm = Vdd | **+5.0** | **4.7** | **5.0** | **5.5** | **V** |
| SUPPLY CURRENT | Idd | **Vdd=5V** | **—** | **29.0** | **—** | **mA** |
| DRIVING VOLTAGE FOR LCD PANEL | Vlcd = (Vdd - V0) | **-20℃** | **17.3** | **—** | **17.5** | **V** |
| | | **0℃** | **—** | **—** | **—** | |
| | | **25℃** | **17.0** | **—** | **17.5** | |
| | | **50℃** | **—** | **—** | **—** | |
| | | **70℃** | **16.1** | **—** | **16.7** | |

## LCD CHARACTERISTICS

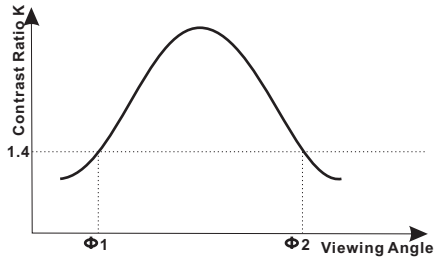
FOR STN/FSTN TYPE LCD Panel ($T_A$=25 °C, Vlcd=5.0V ± 0.5V)

| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| VIEWING ANGLE | Φ2 − Φ1 | K=4 | 40 | — | — | deg |
| | θ | | 60 | | | |
| CONTRAST RATIO | K | — | 6 | — | — | — |
| RESPONSE TIME(RISE) | TR | — | — | 150 | 250 | ms |
| RESPONSE TIME(FALL) | TF | — | — | 150 | 250 | ms |

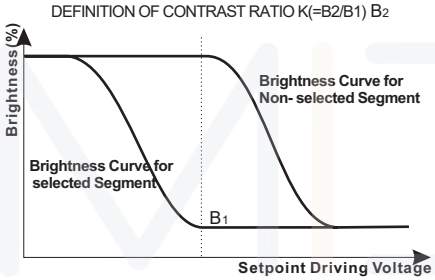
DEFINITION OF ANGLE Φ & θ



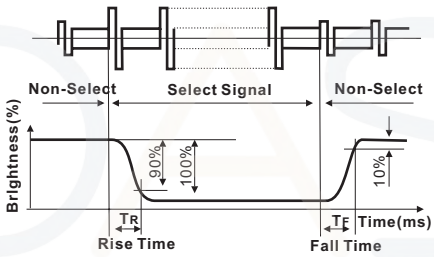

DEFINITION OF VIEWING ANGLE Φ& Φ




DEFINITION OF CONTRAST RATIO K(=B2/B1) $B_2$




DEFINITION OF OPTICAL RESPONSE TIME TR & TF




## LED CHARACTERISTICS

| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| LED FORWARD VOLTAGE | Vf | 25°C If = 75mA | 2.6 | — | 3.0 | V |
| LED FORWARD CURRENT ▲2 | If | 25°C | — | 75 | — | mA |
| LED REVERSE CURRENT | Ir | 25°C Vr=5.0V | — | — | 140 | μA |
| LED COLOR RANGE | X coordinate | 25°C If = 75mA | 0.26 | — | 0.30 | — |
| | Y coordinate | | 0.27 | — | 0.31 | — |
| LED BRIGHTNESS (WITHOUT LCD) | Lv | 25°C If = 75mA | — | 420 | — | $cd/m^2$ |
| LED BRIGHTNESS UNIFORMITY | Lvmin/Lvmax | 25°C If = 75mA | 70 | — | — | Ratio |
| LED LIFE TIME | — | 25°C If = 75mA | 20K | — | — | Hours |

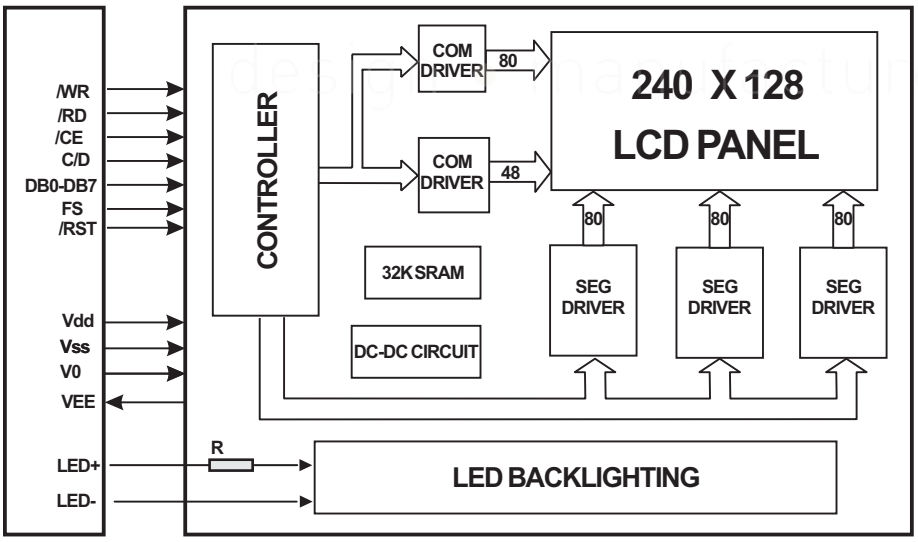
▲2 Please notice that it is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

∗ For operation above 25°C,The Ifm Ifp & Pd must be derated,the Current derating is -0.36*14mA/°C for DC drive and -0.86*14 mA/°C for Pulse drive,
the power dissipation is -75*14 mW/°C The product working current must not be more than 60% of the Ifm ir Ifp according to the working temperature.

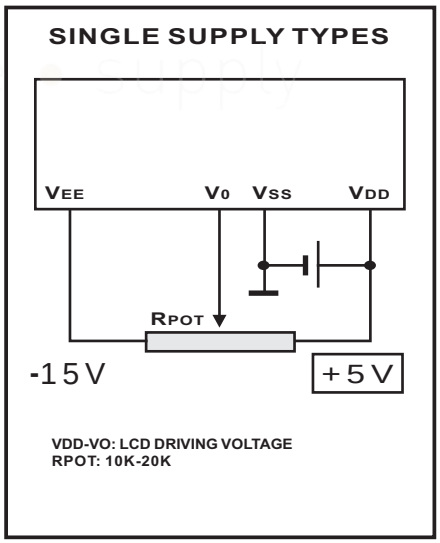
## PIN ASSIGNMENT

| PIN | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|
| 1 | Vee | Negative voltage output | -15.0V |
| 2 | Vss | Power supply for LCM | |
| 3 | Vdd | Power supply for LCM | 5.0V |
| 4 | V0 | Contrast Adjust | |
| 5 | $\overline{WR}$ | Data Write | |
| 6 | $\overline{RD}$ | Data Read | |
| 7 | $\overline{CE}$ | Chip Enable | |
| 8 | C/D | Command/Data Select | |
| 9 | $\overline{RST}$ | Reset Signal | |
| 10 | DB0 | Data bus line | |
| 11 | DB1 | Data bus line | |
| 12 | DB2 | Data bus line | |
| 13 | DB3 | Data bus line | |
| 14 | DB4 | Data bus line | |
| 15 | DB5 | Data bus line | |
| 16 | DB6 | Data bus line | |
| 17 | DB7 | Data bus line | |
| 18 | FS | Font Selection | |
| 19 | LED+ | Power supply for BKL | 5.0V |
| 20 | LED- | Power supply for BKL | |

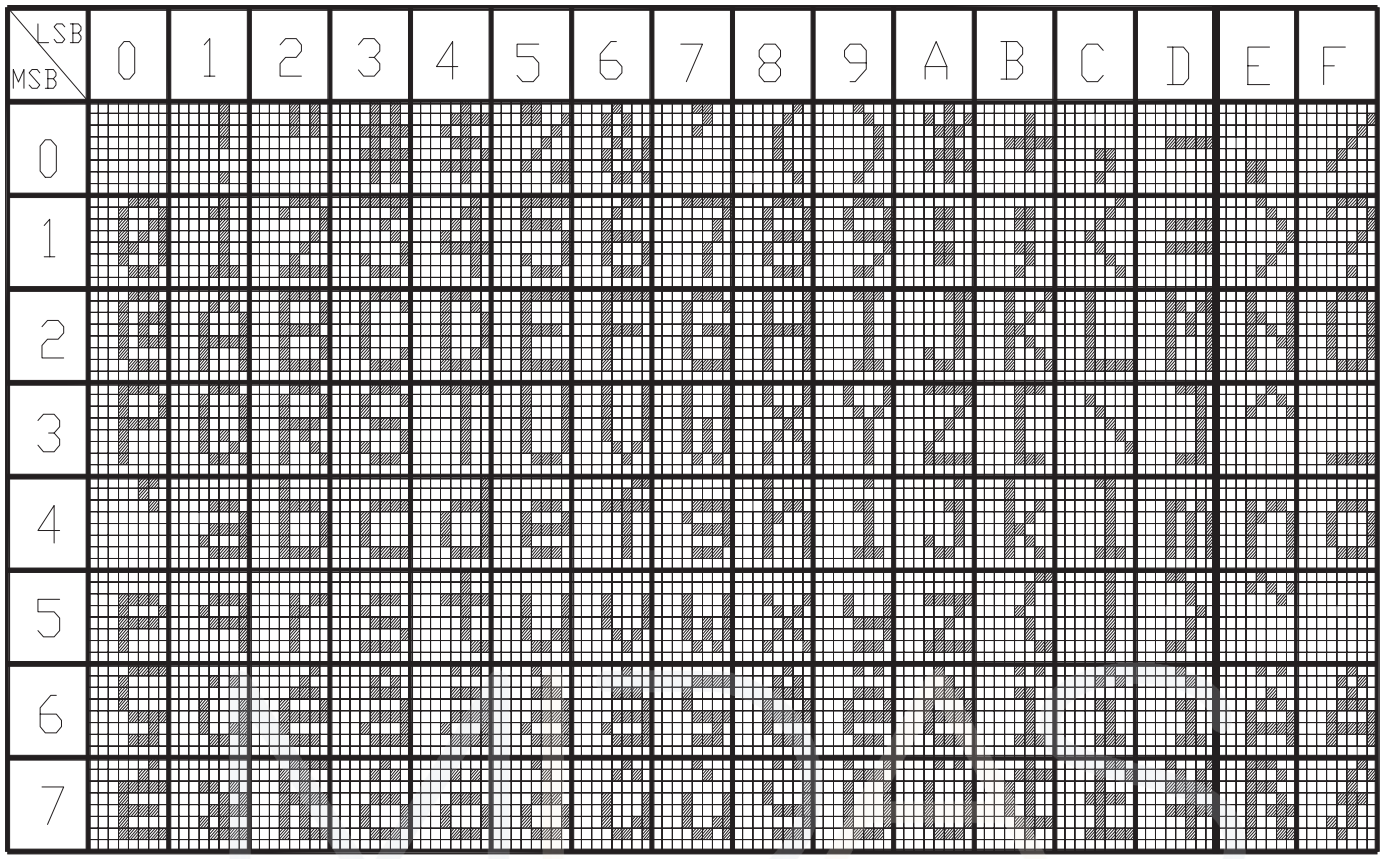
## BLOCK DIAGRAM

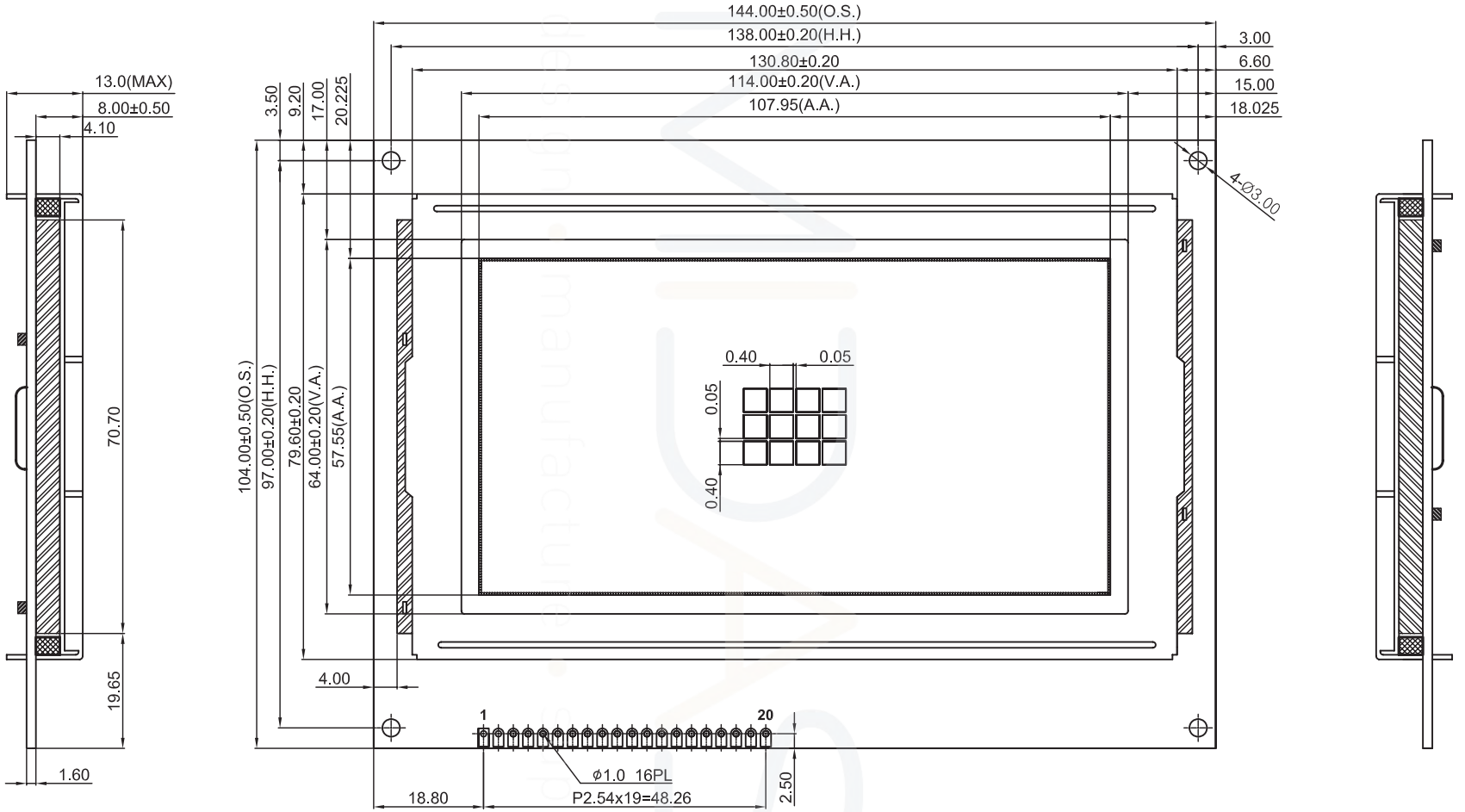



## POWER SUPPLY DIAGRAM



**ROM Code 0101**




144.00±0.50(O.S.)
138.00±0.20(H.H.)
130.80±0.20
114.00±0.20(V.A.)
107.95(A.A.)
3.00
6.60
15.00
18.025
4-Ø3.00
13.0(MAX)
8.00±0.50
4.10
3.50
9.20
17.00
20.225
104.00±0.50(O.S.)
97.00±0.20(H.H.)
79.60±0.20
64.00±0.20(V.A.)
57.55(A.A.)
70.70
19.65
1.60
4.00
0.40
0.05
0.05
0.40
1
20
ϕ1.0 16PL
P2.54x19=48.26
18.80
2.50