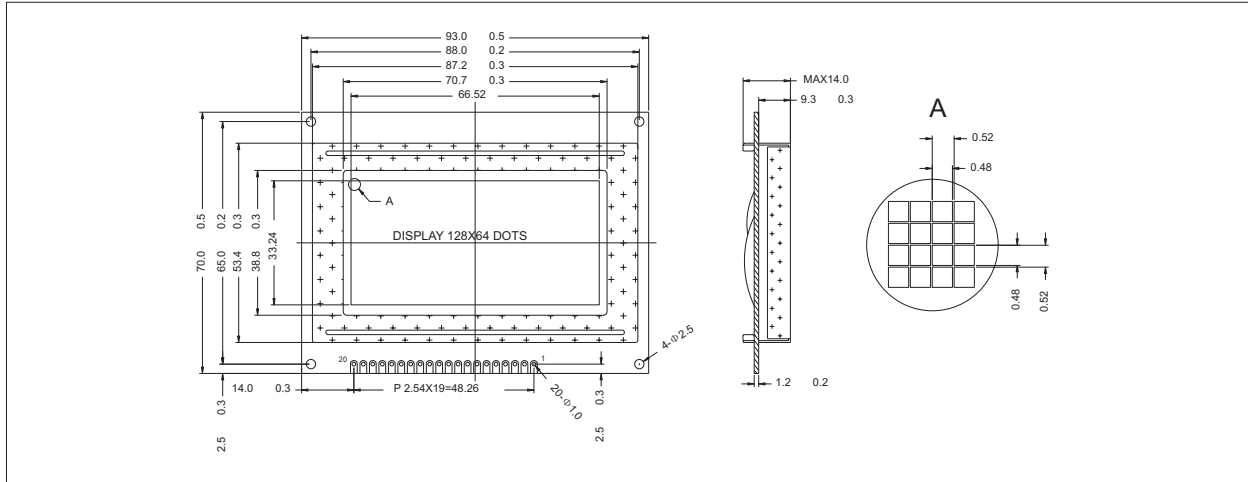


STANDARD GRAPHIC MODULES

YMS12864-03

128 x 64DOTS
1/64DUTY, 1/9BIAS

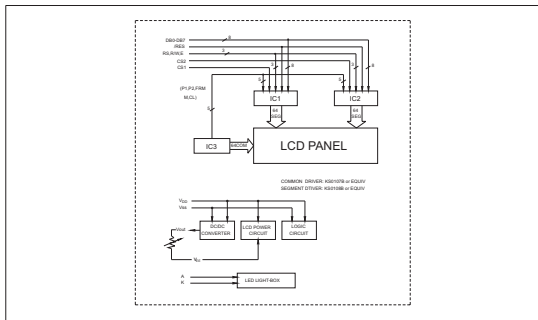
1 EXTERNAL DIMENSION AND DISPLAY PATTERN



2 MECHANICAL DATA

| ITEM | SPECIFICATION | UNIT |
|---------------------|--------------------|------|
| Module Size(WXHXT) | 93.0 x 70.0 x 14.0 | mm |
| Viewing Area(WXH) | 70.7 x 38.8 | mm |
| Number of Dots(WXH) | 128 x 64 | dots |
| Dot Pitch(WXH) | 0.52 x 0.52 | mm |
| Dot Size(WXH) | 0.48 x 0.48 | mm |

3 BLOCK DIAGRAM



4 PIN CONFIGURATION

| PIN | SYMBOL | LEVEL | SIGNAL DESCRIPTION |
|-----|------------------|-------|--|
| 1 | V _{SS} | 0V | Ground |
| 2 | V _{DD} | +5V | Supply Voltage for Logic And LCD |
| 3 | V _{EE} | - | Operating Voltage for LCD (Variable) |
| 4 | RS | H/L | H:Data L:Instruction Code |
| 5 | RW | H/L | H:Read(Module-MPU),L:Write(MPU-Module) |
| 6 | E | H,H-L | Chip Enable Signal |
| 7 | DB0 | H/L | Data Bit 0 |
| 8 | DB1 | H/L | Data Bit 1 |
| 9 | DB2 | H/L | Data Bit 2 |
| 10 | DB3 | H/L | Data Bit 3 |
| 11 | DB4 | H/L | Data Bit 4 |
| 12 | DB5 | H/L | Data Bit 5 |
| 13 | DB6 | H/L | Data Bit 6 |
| 14 | DB7 | H/L | Data Bit 7 |
| 15 | CS1 | H/L | Chip Select Signal for IC 1 |
| 16 | CS2 | H/L | Chip Select Signal for IC 2 |
| 17 | /RES | H,H-L | Reset Signal |
| 18 | V _{out} | - | Power Supply Voltage for LCD |
| 19 | A | - | Anode of LED Unit |
| 20 | K | - | Cathode of LED Unit |

5 ABSOLUTE MAXIMUM RATINGS(Ta=25 °C)

| PARAMETER | SYMBOL | MIN. | MAX. | UNIT |
|-----------------------|--|------------|----------------------|------|
| Supply Voltage Logic | V _{DD} (V _{DD} -V _{SS}) | -0.3 | 7.0 | V |
| Supply Voltage Driver | V _{DD} -V _{EE} | -0.3 | 18.0 | V |
| Input Voltage | V _{IN} | -0.3 | V _{DD} +0.3 | V |
| Operating Temp. | | See page 9 | | |
| Storage Temp. | | See page 9 | | |

6 ELECTRICAL CHARACTERISTICS(Ta=25 °C)

| ITEM | SYMBOL | CONDITION | SPEC. VALUE | | | UNIT |
|--------------------------|----------------------------------|---------------------------|---------------------|------|---------------------|------|
| | | | MIN. | TYP. | MAX. | |
| Supply Voltage (Logic) | V _{DD} -V _{SS} | | 4.5 | 5.0 | 5.5 | V |
| Supply Current (Logic) | I _{DD} | V _{DD} =5V | - | 3.0 | 4.5 | mA |
| Input Voltage | "HIGH" | | 0.7 V _{DD} | - | V _{DD} | V |
| | "LOW" | | 0 | - | 0.3 V _{DD} | V |
| Output Voltage | "HIGH" | I _{OH} =-0.205mA | 2.4 | - | - | V |
| | "LOW" | I _{OL} =1.6mA | - | - | 0.4 | V |
| LCD Operating Voltage | V _{DD} -V _{EE} | V _{DD} =5V | - | 13.5 | - | V |
| Supply Current LCD Drive | I _{EE} | Ta=25 °C | - | 3.0 | 4.5 | mA |

Note(1): () Value is high Reliability type.
Note(2): Electro-Optical Characteristics: See page 6.

7 BACKLIGHT CHARACTERISTICS(Ta=25 °C)

| ITEM | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------|------------------|-----------|------|------|------|-------------------|
| Supply Voltage | V _{LED} | - | 3.85 | 4.05 | 4.25 | V |
| Power Consumption | P _{LED} | IF=360mA | - | 1458 | - | mW |
| Luminous | I _v | IF=360mA | 125 | 156 | - | cd/m ² |

8 INTERFACE TIMING CHARACTERISTICS

| PARAMETER | SYMBOL | MIN. | MAX. | UNIT |
|------------------------|--------------------|------|------|------|
| E Cycle Time | t _{cycle} | 1000 | - | ns |
| E High Level Width | t _{EH} | 450 | - | ns |
| E Low Level Width | t _{EL} | 450 | - | ns |
| E Rise Time | t _r | - | 25 | ns |
| E Fall Time | t _f | - | 25 | ns |
| Address Setup Time | t _{AS} | 149 | - | ns |
| Address Hold Time | t _{AH} | 150 | - | ns |
| Data Setup Time | t _{DS} | 200 | - | ns |
| Data Delay Time | t _{DD} | - | 320 | ns |
| Data Delay Time(Write) | t _{DW} | 150 | - | ns |
| Data Hold Time(Read) | t _{DH} | 20 | - | ns |

