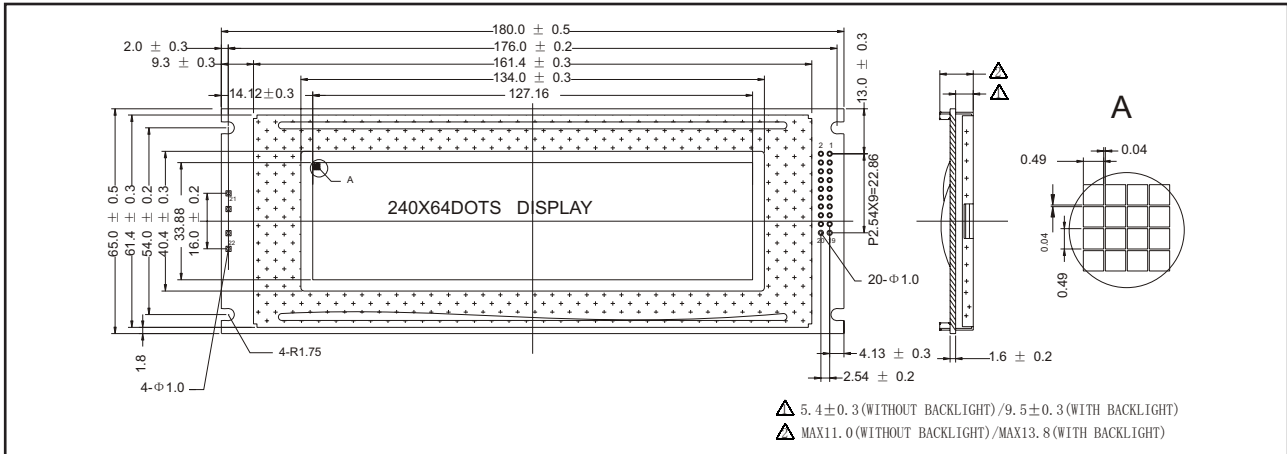


## STANDARD GRAPHIC MODULES

### YMS 24064-02

240 X 64 DOTS, 1/64 DUTY, 1/9 BIAS

#### EXTERNAL DIMENSION AND DISPLAY PATTERN



#### MECHANICAL DATA

| ITEM                    | SPECIFICATION            | UNIT |
|-------------------------|--------------------------|------|
| Module Size (W x H x T) | 180.0 x 65.0 x 11.0/13.8 | mm   |
| Viewing Area (W x H)    | 134.0 x 40.4             | mm   |
| Number of Dots          | 240 x 64                 | dots |
| Dot Pitch (W x H)       | 0.53 x 0.53              | mm   |
| Dot Size (W x H)        | 0.49 x 0.49              | mm   |

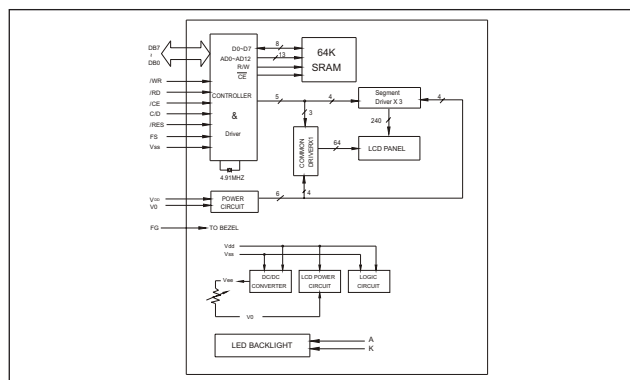
#### ABSOLUTE MAXIMUM RATINGS

| PARAMETER             | SYMBOL                     | MIN. | MAX.           | UNIT |
|-----------------------|----------------------------|------|----------------|------|
| Supply Voltage Logic  | $V_{DD} (V_{DD} - V_{SS})$ | -0.3 | 7.0            | V    |
| Supply Voltage Drive  | $V_{DD} - V_{EE}$          | -0.3 | 30.0           | V    |
| Input Voltage         | $V_{IN}$                   | -0.3 | $V_{DD} + 0.3$ | V    |
| Operating Temperature | See page 8                 |      |                |      |
| Storage Temperature   |                            |      |                |      |

#### PIN CONFIGURATION

| PIN | SYMBOL          | LEVEL  | SIGNAL DESCRIPTION                            |
|-----|-----------------|--------|---|
| 1   | FG              | 0V     | Frame Ground                                  |
| 2   | $V_{SS}$        | 0V     | GND (0 V)                                     |
| 3   | $V_{DD}$        | +5V    | Supply Voltage for Logic and LCD              |
| 4   | $V_0$           |        | Operating Voltage for LCD (variable)          |
| 5   | /WR             | L      | Write Signal                                  |
| 6   | /RD             | L      | Read Signal                                   |
| 7   | /CE             | L      | Chip Enable Signal                            |
| 8   | C/D             | H/L    | H: Instruction Code, L: DATA Code             |
| 9   | $V_{EE}$        |        | Supply Voltage LCD Driver                     |
| 10  | /RES            | H, H-L | Reset Signal                                  |
| 11  | DB <sub>0</sub> | H/L    | Data Bit 0                                    |
| 12  | DB <sub>1</sub> | H/L    | Data Bit 1                                    |
| 13  | DB <sub>2</sub> | H/L    | Data Bit 2                                    |
| 14  | DB <sub>3</sub> | H/L    | Data Bit 3                                    |
| 15  | DB <sub>4</sub> | H/L    | Data Bit 4                                    |
| 16  | DB <sub>5</sub> | H/L    | Data Bit 5                                    |
| 17  | DB <sub>6</sub> | H/L    | Data Bit 6                                    |
| 18  | DB <sub>7</sub> | H/L    | Data Bit 7                                    |
| 19  | FS              | H/L    | Font Select Signal (H: 6x8 dots, L: 8x8 dots) |
| 20  | NC              |        | No Connection                                 |
| 21  | A               |        | Anode of LED Unit                             |
| 22  | K               |        | Cathode of LED Unit                           |

#### BLOCK DIAGRAM



# STANDARD GRAPHIC MODULES

## YMS 24064-02

240 X 64 DOTS, 1/64 DUTY, 1/9 BIAS

### ELECTRICAL CHARACTERISTICS, Ta = 25°C

| ITEM                     | SYMBOL                            | CONDITION                          | SPEC. VALUE             |                       |                 | UNIT |
|--------------------------|-----------------------------------|------------------------------------|-------------------------|-----------------------|-----------------|------|
|                          |                                   |                                    | MIN.                    | TYP.                  | MAX.            |      |
| Supply Voltage (Logic)   | V <sub>DD</sub> - V <sub>SS</sub> |                                    | 4.5                     | 5.0                   | 5.5             | V    |
| Supply Current (Logic)   | I <sub>DD</sub>                   | V <sub>DD</sub> = 5V               |                         | 8.7                   | 13.0            | mA   |
| Input Voltage            | HIGH                              | V <sub>IH</sub>                    | V <sub>DD</sub> - 2.2   |                       | V <sub>DD</sub> | V    |
|                          | LOW                               | V <sub>IL</sub>                    | 0                       |                       | 0.8             | V    |
| Output Voltage           | HIGH                              | V <sub>OH</sub>                    | I <sub>OH</sub> = 3.0mA | V <sub>DD</sub> - 0.3 | V <sub>DD</sub> | V    |
|                          | LOW                               | V <sub>OL</sub>                    | I <sub>OL</sub> = 3.0mA | 0                     | 0.3             | V    |
| LCD Operating Voltage    | V <sub>DD</sub> - V <sub>O</sub>  | V <sub>DD</sub> = 5V<br>Ta = +25°C |                         | 11.0                  |                 | V    |
| Supply Current LCD Drive | I <sub>O</sub>                    |                                    |                         | 2.0                   | 3.0             | mA   |

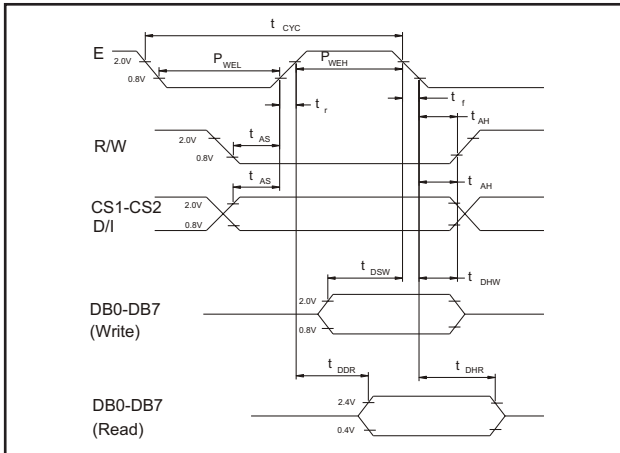
Note (1): Value is high reliability type.

Note (2): Electro-Optical Characteristics: See page 5.

### BACKLIGHTING CHARACTERISTICS, Ta = 25°C, LED

| ITEM              | SYMBOL           | CONDITION              | SPEC. VALUE |      |      | UNIT              |
|-------------------|------------------|------------------------|-------------|------|------|-------------------|
|                   |                  |                        | MIN.        | TYP. | MAX. |                   |
| Supply Voltage    | V <sub>LED</sub> |                        | 7.9         | 8.2  | 8.5  | V                 |
| Power Consumption | P <sub>LED</sub> | I <sub>F</sub> = 400mA |             | 3280 |      | mW                |
| Luminous          | I <sub>V</sub>   | I <sub>F</sub> = 400mA |             |      |      | cd/m <sup>2</sup> |

### INTERFACE TIMING CHARACTERISTICS



| PARAMETER             | SYMBOL  | MIN. | MAX. | UNIT |
|-----------------------|---|------|------|------|
| C/D Setup Time        | t <sub>CDS</sub>                                | 100  |      | ns   |
| C/D Hold Time         | t <sub>CDH</sub>                                | 10   |      | ns   |
| /CE/RD/WR Pulse Width | t <sub>CE</sub> t <sub>RD</sub> t <sub>WR</sub> | 80   |      | ns   |
| Data Setup Time       | t <sub>DS</sub>                                 | 80   |      | ns   |
| Data Hold Time        | t <sub>DH</sub>                                 | 40   |      |      |
| Access Time           | t <sub>ACC</sub>                                |      | 150  | ns   |
| Output Hold Time      | t <sub>OH</sub>                                 | 10   | 50   | ns   |

Condition: V<sub>DD</sub> = +5.0V ± 10%, V<sub>SS</sub> = 0V, Ta = +25°C