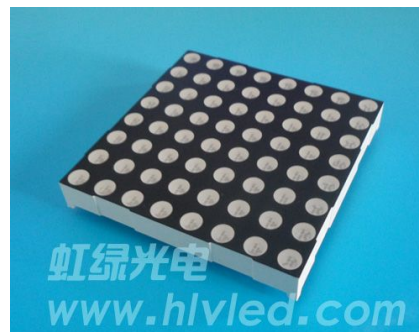






### ■ Features:

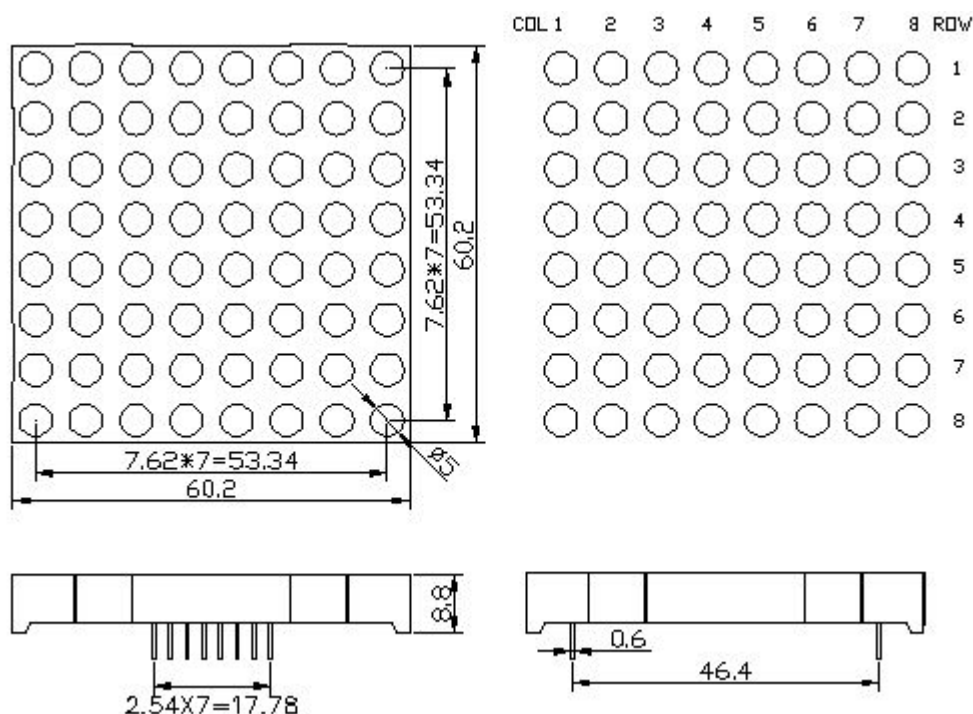
1. 8×8 dot matrix display.
2. Dot Size: 5.0mm.
3. Low power consumption.
4. Lens Color : black face and white segments.
5. Categorized for luminous intensity.
6. RoHS compliant



### ■ Device Selection Guide :

| Model No.  | Description  | Chip     |                  |
|------------|--------------|----------|------------------|
|            |              | Material | Emitting Color   |
| HL-M2388BR | Common Anode | AlGaInP  | Super Orange Red |

### ■ Mechanical Dimensions:

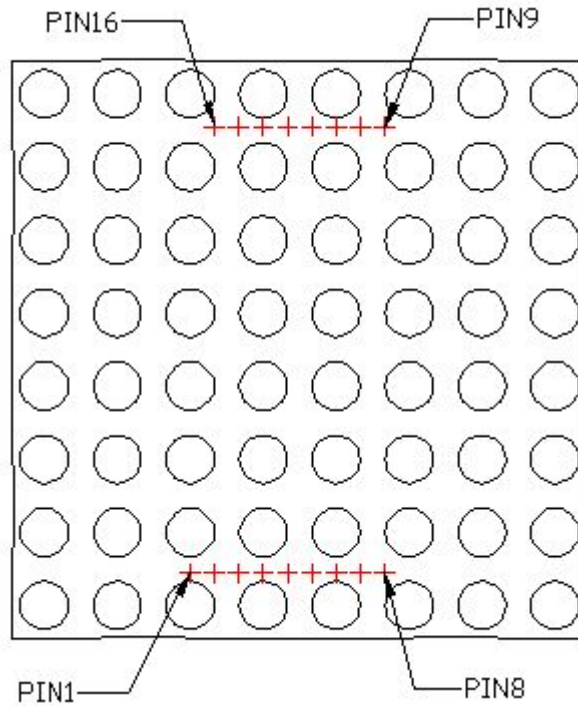


#### Notes:

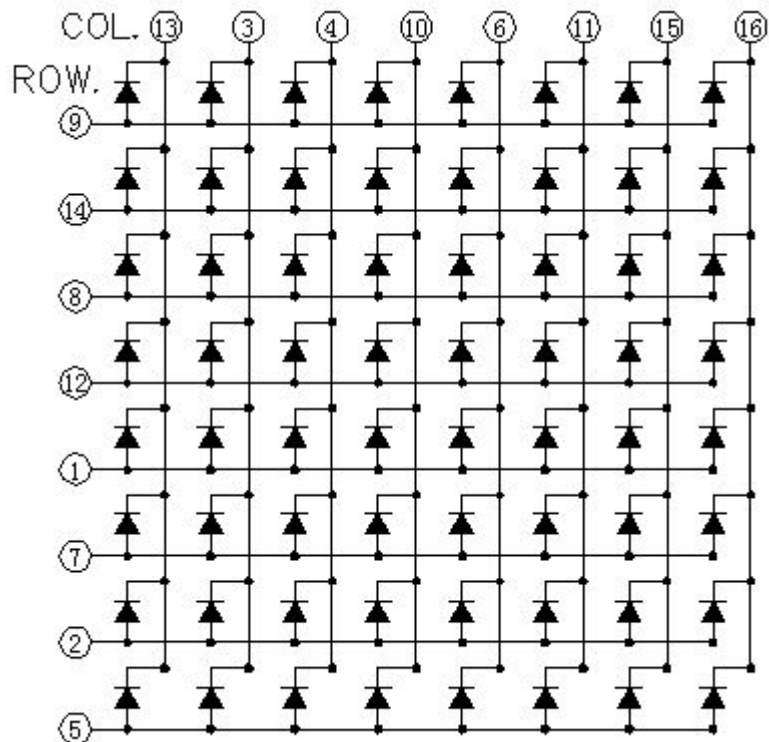
1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}$  (.01") unless otherwise specified.
3. Specifications are subject to change without notice.



■ All Light On Segments Feature & Pin Position:



■ Internal Circuit Diagrams:





■ Absolute Maximum Ratings (Ta=25°C)

| Parameter               | Symbol          | Rating    | Unit |
|-------------------------|-----------------|-----------|------|
| Pulse Forward Current*1 | Pd              | 60        | mW   |
| Forward Current         | I <sub>F</sub>  | 30        | mA   |
| Peak Forward Current    | I <sub>FP</sub> | 80        | mA   |
| Reverse Volage          | V <sub>R</sub>  | 5         | V    |
| Operating Temperature   | Topr            | -40~ +105 | °C   |
| Storage Temperature     | Tstg            | -40~ +105 | °C   |
| Reflow Temperature*2    | Tsol            | 260       | °C   |
| Electrostatic Discharge | ESD             | 2000      | V    |

Note:

\*1: I<sub>Fp</sub> Conditions :Pulse Width ≤10msec.and Duty cycle≤1/10.

\*2: Reflow time≤5 seconds.

■ Electrical and optical characteristics (Ta=25°C)

| Parameter                  | Symbol         | Condition            | Min. | Typ. | Max. | Unit |
|----------------------------|----------------|----------------------|------|------|------|------|
| Forward Voltage            | V <sub>f</sub> | I <sub>F</sub> =20mA | -    | 2.0  | 2.5  | V    |
| Luminous Intensity/segment | I <sub>v</sub> | I <sub>F</sub> =10mA | -    | 35   | -    | mcd  |
| Reverse Current            | I <sub>R</sub> | V <sub>R</sub> =5V   | -    | -    | 100  | μA   |
| Peak Wave Length           | λ <sub>p</sub> | I <sub>F</sub> =20mA |      | 630  |      | nm   |
| Dominant Wave Length       | λ <sub>d</sub> | I <sub>F</sub> =20mA | 620  | -    | 630  | nm   |
| Spectral Line Half-width   | Δλ             | I <sub>F</sub> =20mA | -    | 20   | -    | nm   |



■ Typical Electro-Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Relative Radiant Intensity VS. Wavelength

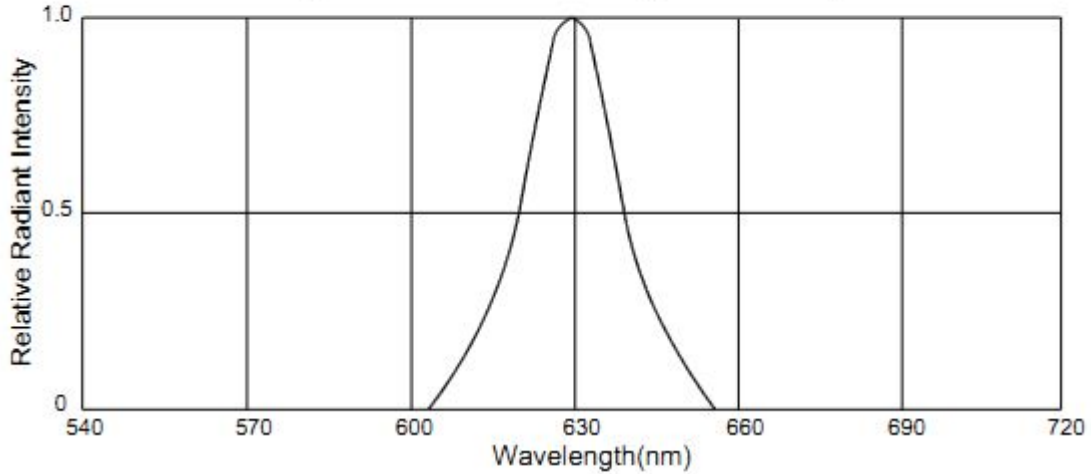


Fig.2 Forward Current VS. Forward Voltage

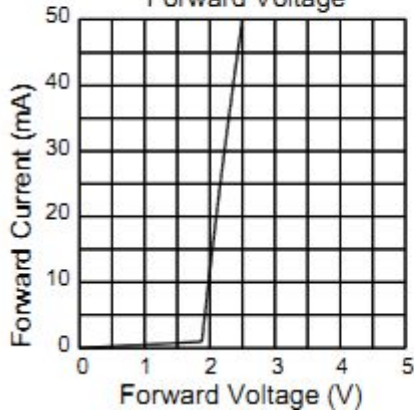


Fig.3 Relative Luminous Intensity VS. Ambient Temperature

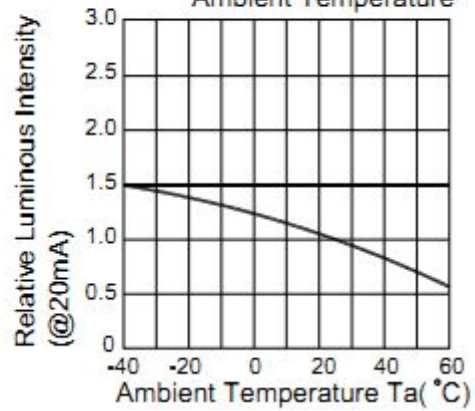


Fig.4 Relative Luminous Intensity VS. Forward Current

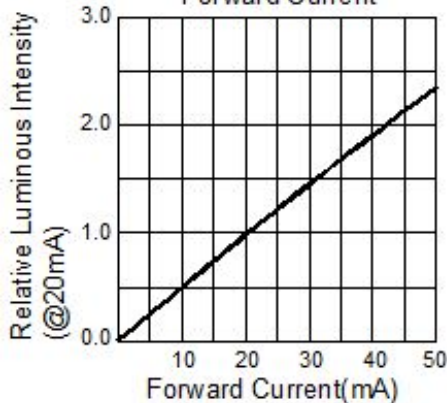
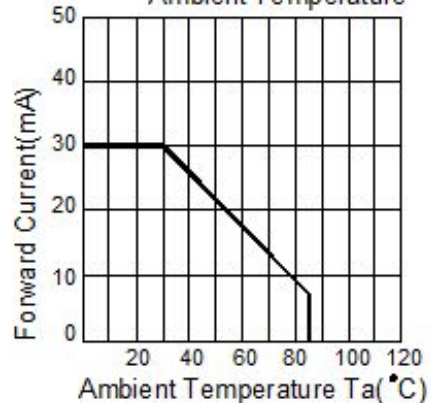


Fig.5 Forward Current Derating Curve VS. Ambient Temperature





■ Reliability test items:

| No. | Test Item               | Test Condition                    | Time/Cycle | Judgment Criteria          | Number Damaged |
|-----|-------------------------|-----------------------------------|------------|----------------------------|----------------|
| 1   | Reflow Soldering        | TEMP: 260°C± 5°C<br>MAX: 5sec     | 6 Min      | Iv≤Ivt*0.5<br>Vf≥U<br>Vf≤L | 0/30           |
| 2   | Thermal shock           | H: +100°C 5min<br>L: -40°C 5min   | 300 Cycles |                            | 0/30           |
| 3   | High temp storage       | 100°C                             | 1000 Hrs   |                            | 0/30           |
| 4   | Low temp storage        | -40°C                             | 1000 Hrs   |                            | 0/30           |
| 5   | Temperature cycle       | H: +100°C 15min<br>L: -40°C 15min | 300 Cycles |                            | 0/30           |
| 6   | High temp high humidity | 85°C,85%RH                        | 1000 Hrs   |                            | 0/30           |

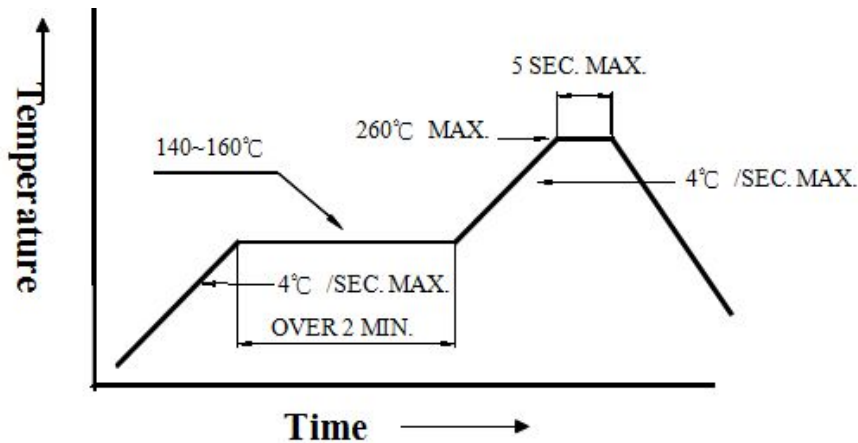
Note: Ivt: The test Iv value of the chip before the reliability test.

IV: The test value of the chip that has completed the reliability test.

U: Upper Specification Limit.

L: Lower Specification Limit.

■ IR Reflow temperature/Time:



■ Soldering Iron:

Ferrochromium soldering: power keep no more than 40W, tip temperature should not pass 260°C, soldering Time Within 3 second.