

# SML080CWY3K-031

Super Yellow

Axial Surface Mount LEDs

2.1×2.2×2.7mm, Z-bend leads

35° viewing angle

DWG BY:  
BL / GP  
01-31-07

CHK BY:  
PL  
10-11-07

QA:  
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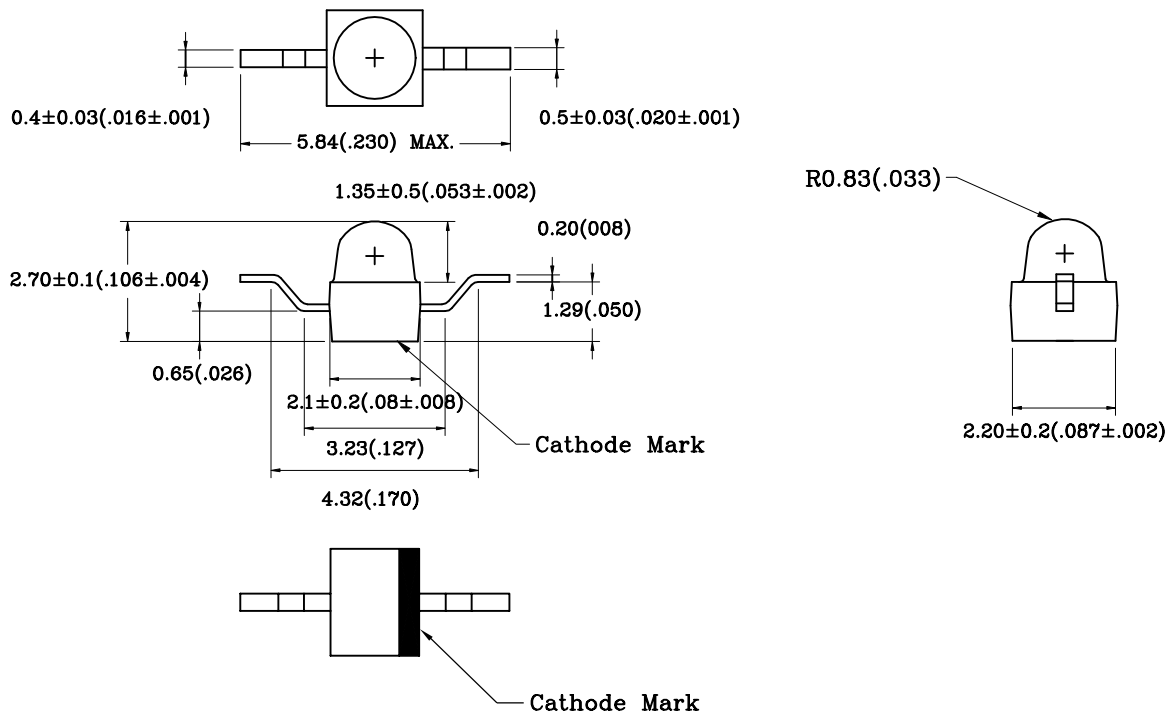
MFG:  
\_\_\_\_\_  
\_\_-\_\_-\_\_

REVISION LTR: -  
10-10-07

## Features:

- High intensity
- Axial type
- “Z-bend” leads

## Package Dimensions:



| Part No.        | Chip Material | Lens Color  | Emission Color |
|-----------------|---------------|-------------|----------------|
| SML080CWY3K-031 | InGaAlP       | Water Clear | Super Yellow   |

### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25$ mm (.010") unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

● **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  | 2.6  | V     |
| Luminous Intensity       | I <sub>v</sub>    | I <sub>F</sub> =20mA | -    | 2000 | -    | mcd   |
| Peak Wave Length         | λ <sub>p</sub>    | I <sub>F</sub> =20mA | 594  | 597  | 601  | nm    |
| Dominant Wave Length     | λ <sub>d</sub>    | I <sub>F</sub> =20mA | 590  | 592  | 596  | nm    |
| Spectral Line Half-width | Δλ                | I <sub>F</sub> =20mA | -    | 17   | -    | nm    |
| Viewing Angle*           | 2θ <sub>1/2</sub> | I <sub>F</sub> =20mA | -    | 35   | -    | deg   |
| Radiant Intensity        | I <sub>e</sub>    | I <sub>F</sub> =20mA | -    | 5000 | -    | μW/sr |
| Chromaticity Coordinates | X                 | I <sub>F</sub> =20mA | -    | 0.59 | -    |       |
|                          | Y                 |                      | -    | 0.41 | -    |       |

\* Viewing angle is the Off-axis at which the luminous intensity is half the axial intensity.

\* This product is RoHS compliant.

● **Absolute Maximum Ratings (Ta=25°C)**

|  |                     |                    |
|--|---------------------|--------------------|
| Reverse Voltage  | V <sub>R</sub>      | 5V                 |
| Reverse Current (VR=5V)                                    | I <sub>R</sub>      | 100μA              |
| Continuous Forward Current                                 | I <sub>f</sub>      | 30mA               |
| Peak Forward Current<br>1/10 duty cycle, 0.1ms Pulse Width | Peak I <sub>f</sub> | 100mA              |
| Power Dissipation  | P <sub>d</sub>      | 100mW              |
| Operating Temperature Range                                | Topr                | -25°C ~ 80°C       |
| Storage Temperature Range                                  | Tstg                | -30°C ~ 100°C      |
| Lead Soldering Temperature                                 |                     | 260° for 5 seconds |

● **Typical Electro-Optical Characteristics Curves**

Fig.1 Relative intensity vs. wavelength

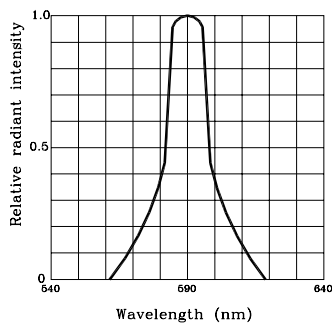


Fig.2 FORWARD CURRENT DERATING CURVE

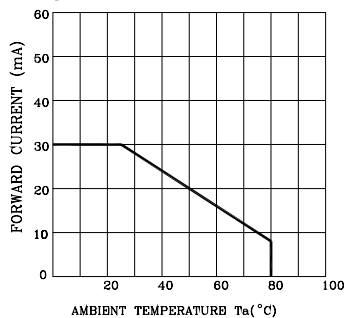


Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

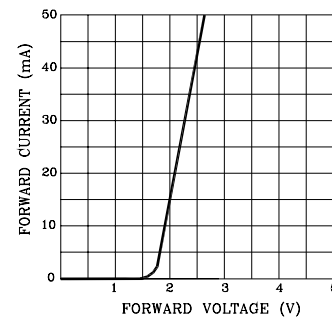


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

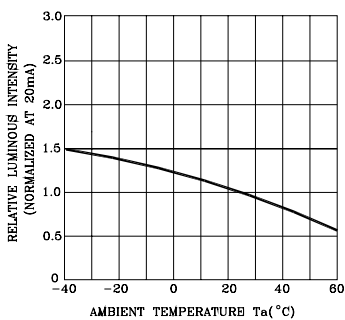


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

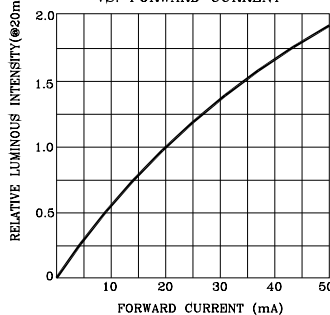
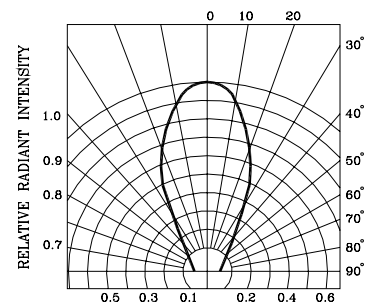
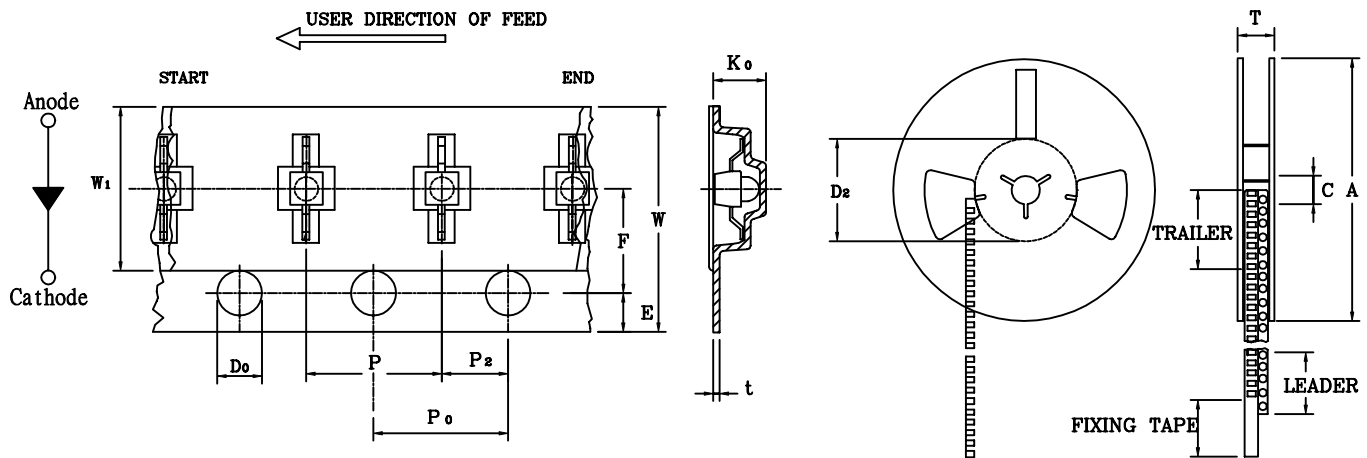


Fig.6 RADIATION DIAGRAM



● Taping specifications (Units: mm)

| ITEM                                     | SYMBOL         | SPECIFICATION |       |         |       |
|--|----------------|---------------|-------|---------|-------|
|  |                | Minimum       |       | Maximum |       |
|  |                | mm            | inch  | mm      | inch  |
| Tape Feed Hole Diameter (DIA)            | D <sub>0</sub> | 1.40          | 0.055 | 1.55    | 0.061 |
| Feed Hole Location                       | E              | 1.65          | 0.065 | 1.85    | 0.072 |
| Centers Line Dimensions Length Direction | F              | 5.45          | 0.215 | 5.55    | 0.218 |
| Compartment Depth                        | K <sub>0</sub> | 2.10          | 0.083 | 2.15    | 0.084 |
| Carrier Tape Overall Thickness           | K              | 3.00          | 0.118 | 3.20    | 0.126 |
| Compartment Pitch                        | P              | 3.90          | 0.153 | 4.10    | 0.161 |
| Sprocket Hole Diameter                   | P <sub>0</sub> | 3.90          | 0.153 | 4.10    | 0.161 |
| Centers Line Dimensions Length Direction | P <sub>2</sub> | 1.95          | 0.076 | 2.05    | 0.080 |
| Carrier Tape Thickness                   | t              | —             | —     | 0.30    | 0.012 |
| Carrier Tape Width                       | W              | 12.00         | 0.472 | 12.30   | 0.484 |
| Flange Diameter                          | A              | 178.0         | 7.008 | 180.0   | 7.087 |
| Hub Spindle Hole                         | C              | 12.50         | 0.492 | 13.50   | 0.531 |
| Hub Diameter                             | D <sub>2</sub> | 20.00         | 0.788 | 21.50   | 0.846 |
| Fixing Tape Width                        | W <sub>1</sub> | 9.00          | 0.354 | 9.30    | 0.366 |
| Flange Space Between Flanges             | T              | 16.00         | 0.629 | 17.00   | 0.669 |
| Compartment Length                       | A <sub>0</sub> | 1.87          | 0.074 | 2.07    | 0.081 |
| Compartment Width                        | B <sub>0</sub> | 6.30          | 0.248 | 6.50    | 0.256 |



NOTE: 1500 pcs PER REEL

**RELIABILITY TEST**

| Classification     | Test Item                               | Reference Standard   | Test Conditions  | Result |
|--------------------|---|--|--|--------|
| Endurance Test     | Operation Life                          | MIL-STD-750: 1026<br>MIL-STD-883: 1005<br>JIS C 7021: B-1                      | Connect with a power I = 20mA<br>T <sub>a</sub> = Under room temperature<br>Test time = 1,000hrs                 | 0/20   |
|                    | High Temperature, High Humidity Storage | MIL-STD-202: 103B<br>JIS C 7021: B-11  | T <sub>a</sub> = +65°C±5°C<br>RH = 90%-95%<br>Test time = 240hrs   | 0/20   |
|                    | High Temperature Storage                | MIL-STD-883: 1008<br>JIS C 7021: B-10  | High T <sub>a</sub> = +85°C±5°C<br>Test time = 1,000hrs  | 0/20   |
|                    | Low Temperature Storage                 | JIS C 7021: B-12   | Low T <sub>a</sub> = -35°C±5°C<br>Test time = 1,000hrs   | 0/20   |
| Environmental Test | Temperature Cycling                     | MIL-STD-202: 107D<br>MIL-STD-750: 1051<br>MIL-STD-883: 1010<br>JIS C 7021: A-4 | -35°C ~ +25°C ~ +85°C ~ +25°C<br>60min. 20min. 60min. 20min.<br>Test time = 5 cycles                             | 0/20   |
|                    | Thermal Shock                           | MIL-STD-202: 107D<br>MIL-STD-750: 1051<br>MIL-STD-883: 1011                    | -35°C±5°C ~ +85°C±5°C<br>20min. 20min.<br>Test time = 10 cycles  | 0/20   |
|                    | Solder Resistance                       | MIL-STD-202: 201A<br>MIL-STD-750: 2031<br>JIS C 7021: A-1                      | Preheating:<br>140°C - 160°C, within 2 minutes.<br>Operation heating:<br>235°C (Max.), within 10 seconds. (Max.) | 0/20   |

**JUDGEMENT CRITERIA OF FAILURE FOR THE RELIABILITY TEST**

| Measuring items    | Symbol               | Measuring conditions  | Judgment criteria for failure |
|--------------------|----------------------|-----------------------|-------------------------------|
| Forward voltage    | V <sub>f</sub> (V)   | I <sub>f</sub> = 20mA | Over Ux1.2                    |
| Reverse current    | I <sub>r</sub> (uA)  | V <sub>r</sub> = 5V   | Over Ux2                      |
| Luminous intensity | I <sub>v</sub> (mcd) | I <sub>f</sub> = 20mA | Below Sx0.5                   |

Note: 1. U means the upper limit of specific characteristics. S means initial value.  
 2. Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

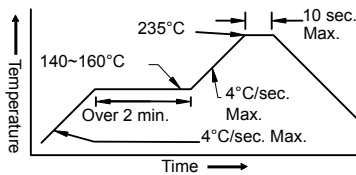
**1. Soldering**

**Manual of Soldering**

The temperature of the iron tip should not be higher than 300°C (572°F) and soldering within 3 seconds per solder-land is to be observed.

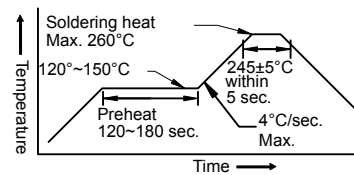
**Reflow Soldering**

Preheating: 140°C~160°C ±5°C, within 2 minutes.  
 Operation heating: 235°C (Max.) within 10 seconds. (Max.)  
 Gradual Cooling (Avoid quenching).



**DIP Soldering (Wave Soldering)**

Preheating: 120°C~150°C, within 120~180 sec.  
 Operation heating: 245°C ±5°C within 5 sec.  
 260°C (Max.)  
 Gradual Cooling (Avoid quenching).



**2. Handling**

Care must be taken not to cause damage to the epoxy resin portion of LEDs while it is exposed to high temperatures, or abrade the epoxy resin portion of LEDs with hard or sharp items as from sand blasting and use of pointed objects.

**3. Notes for designing**

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the LEDs.

**4. Storage:**

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, store it in the following environment:

- (1) Temperature: 5°C-30°C (41°F-86°F) Humidity: RH 60% Max.
- (2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
  - a. Completed within 24 hours.
  - b. Stored at less than 30% RH
- (3) Devices require baking before mounting if: (2)a or (2)b is not met.
- (4) If baking is required, devices must be baked under below conditions:  
 12 hours at 60°C ±3°C