

SML1004H-TR

Orange

Surface Mount LED

3.2 × 1.6 × 1.1 mm Chip LED

120° viewing angle

DWG BY:
BL / GP
03-24-08

CHK BY:
PL
03-25-08

QA:
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MFG:
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REVISION LTR: -
03-24-08

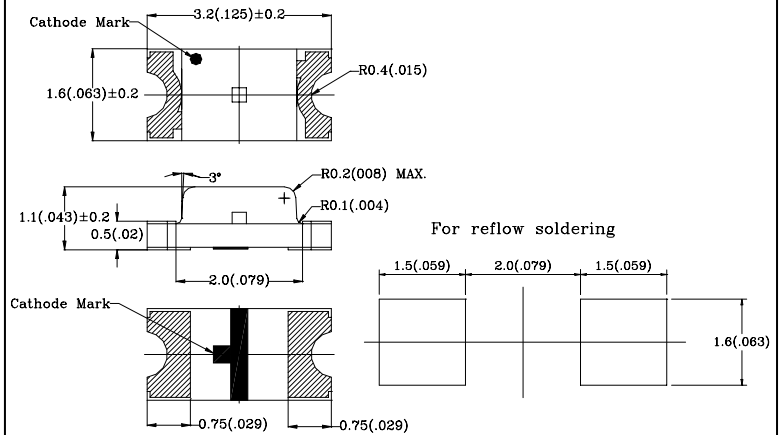
● **Features:**

1. Emitted Color : Orange
2. Lens Appearance : Water Clear.
3. Mono-color type.
4. 3.2x1.6x1.1mm(1206) standard package.
5. Suitable for all SMT assembly methods.
6. Compatible with infrared and vapor phase reflow solder process.
7. Compatible with automatic placement equipment.
8. This product is RoHS compliant.

● **Applications:**

1. Automotive : Dashboards, stop lamps, turn signals.
2. Backlighting : LCDs, Key pads advertising.
3. Status indicators : Consumer & industrial electronics.
4. General use.

● **Package Dimensions:**



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.10mm (0.004") unless otherwise specified.
3. Specifications are subject to change without notice.

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

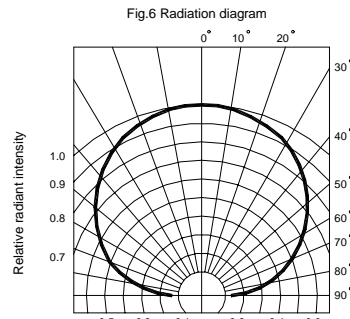
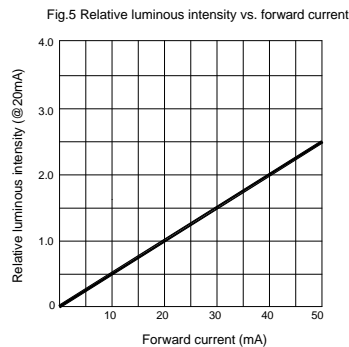
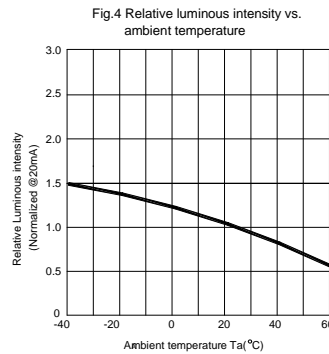
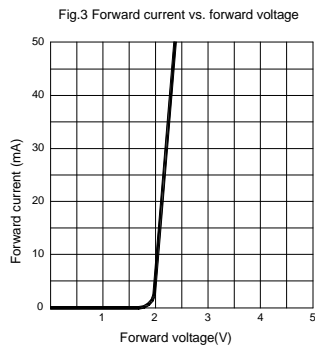
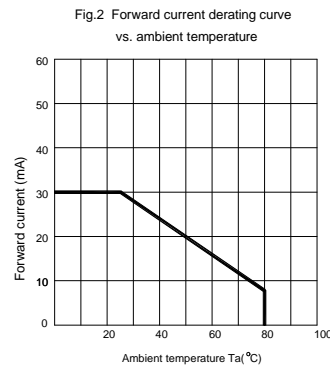
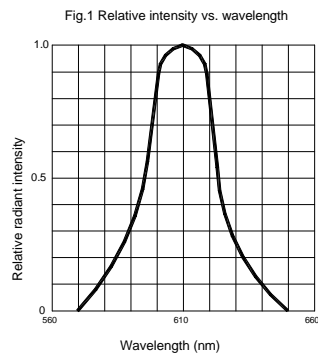
| Parameter | Symbol | Rating | Unit |
|--------------------------|-----------------|-------------|------|
| Power Dissipation | Pd | 80 | mW |
| Forward Current | I _F | 30 | mA |
| Peak Forward Current * 1 | I _{FP} | 100 | mA |
| Reverse Voltage | V _R | 5 | V |
| Operating Temperature | Topr | -25°C ~80°C | - |
| Storage Temperature | Tstg | -30°C ~85°C | - |
| Soldering Temperature | Tsol | See Page6 | - |

* 1 Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width.

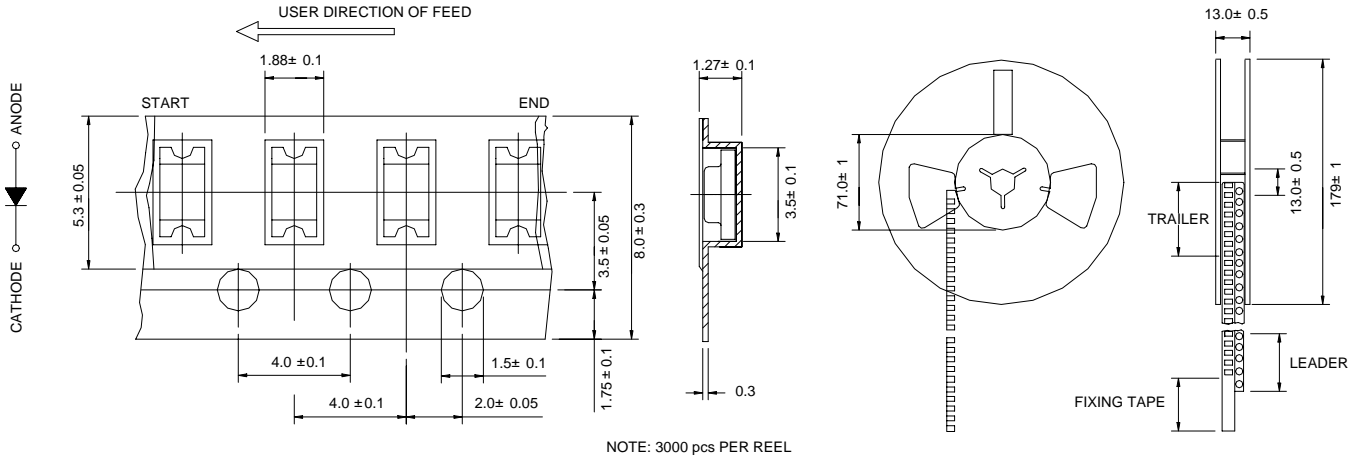
● **Electrical and optical characteristics(Ta=25°C)**

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------|------------------|------------|------|------|------|------------|
| Forward Voltage | V_F | $I_F=20mA$ | - | 2.1 | 2.6 | V |
| Luminous Intensity | I_v | $I_F=20mA$ | 2.4 | 5.0 | - | mcd |
| Reverse Current | I_R | $V_R=5V$ | - | - | 100 | μA |
| Peak Wave Length | λ_p | $I_F=20mA$ | - | 610 | - | nm |
| Dominant Wave Length | λ_d | $I_F=20mA$ | 605 | - | 615 | nm |
| Spectral Line Half-width | $\Delta \lambda$ | $I_F=20mA$ | - | 35 | - | nm |
| Viewing Angle | $2\theta_{1/2}$ | $I_F=20mA$ | - | 120 | - | deg |
| Radiant Intensity | | $I_F=20mA$ | - | - | - | $\mu W/sr$ |
| Chromaticity Coordinates | X | $I_F=20mA$ | - | 0.64 | - | |
| | Y | | - | 0.36 | - | |

● **Typical Electro-Optical Characteristics Curves**



● **Tapping and packaging specifications(Units: mm)**



● **Bin Limits**

Intensity Bin Limits (At 20mA)

| BIN CODE | Min. (mcd) | Max. (mcd) |
|----------|------------|------------|
| F | 2.4 | 3.7 |
| G | 3.7 | 5.5 |
| H | 5.5 | 8.2 |
| J | 8.2 | 12.3 |

Tolerance for each Bin limit is ±15%.

● **BIN : X**



● **Reliability Test**

| Classification | Test Item | Reference Standard | Test Conditions | Result |
|--------------------|--|---|---|--------|
| Endurance Test | Operation Life | MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1 | Connect with a power $I_f=20\text{mA}$ T_a =Under room temperature Test time=1,000hrs | 0/20 |
| | High Temperature High Humidity Storage | MIL-STD-202:103B JIS-C-7021 :B-11 | $T_a=+65^\circ\text{C} \pm 5^\circ\text{C}$ RH=90%-95% Test time=240hrs | 0/20 |
| | High Temperature Storage | MIL-STD-883:1008 JIS-C-7021 :B-10 | High $T_a=+85^\circ\text{C} \pm 5^\circ\text{C}$ Test time=1,000hrs | 0/20 |
| | Low Temperature Storage | JIS-C-7021 :B-12 | Low $T_a=-35^\circ\text{C} \pm 5^\circ\text{C}$ Test time=1,000hrs | 0/20 |
| Environmental Test | Temperature Cycling | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4 | $-35^\circ\text{C} \sim +25^\circ\text{C} \sim +85^\circ\text{C} \sim +25^\circ\text{C}$ 60min 20min 60min 20min Test Time=5cycle | 0/20 |
| | Thermal Shock | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011 | $-35^\circ\text{C} \pm 5^\circ\text{C} \sim +85^\circ\text{C} \pm 5^\circ\text{C}$ 20min 20min Test Time=10cycle | 0/20 |
| | Solder Resistance | MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1 | Preheating : $140^\circ\text{C} \sim 160^\circ\text{C}$, within 2 minutes. Operation heating : 260°C (Max.), within 10seconds. (Max.) | 0/20 |

● **Judgment criteria of failure for the reliability**

| Measuring items | Symbol | Measuring conditions | Judgement criteria for failure |
|--------------------|-------------------------|----------------------|--------------------------------|
| Forward voltage | V_F (V) | $I_F=20\text{mA}$ | Over $U_x1.2$ |
| Reverse current | I_R (μA) | $V_R=5\text{V}$ | Over U_x2 |
| Luminous intensity | I_v (mcd) | $I_F=20\text{mA}$ | Below $SX0.5$ |

Note: 1.U means the upper limit of specified characteristics. S means initial value.

2.Measurment shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

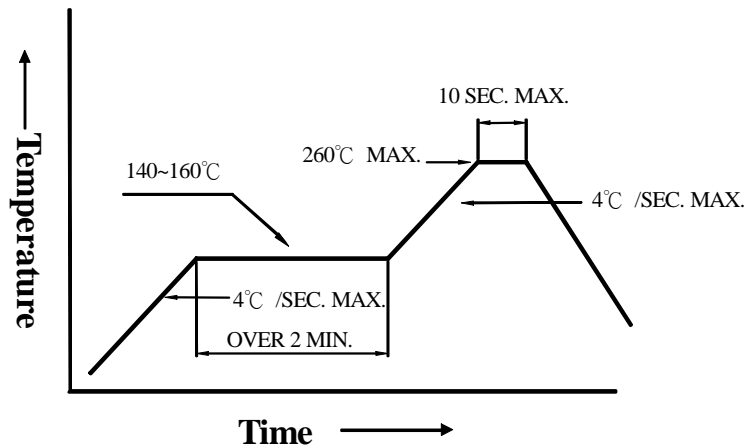
● **Soldering :**

1. 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.

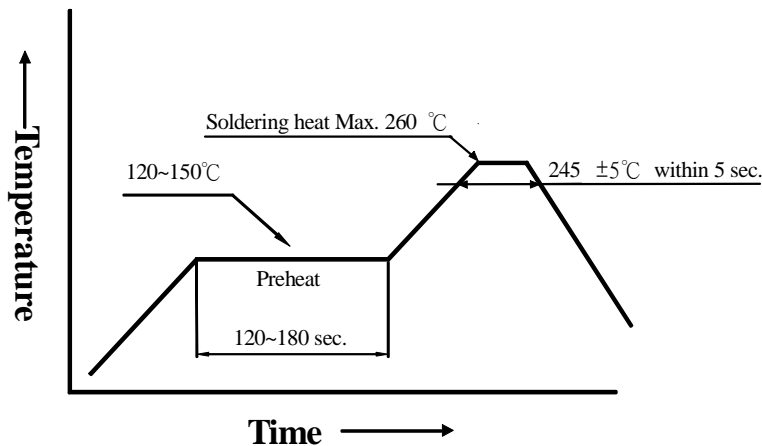
2. Reflow Soldering

Preheating : 140°C~160°C ±5°C, within 2 minutes.
 Operation heating : 260°C (Max.) within 10 seconds.(Max)
 Gradual Cooling (Avoid quenching).



3. 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).



● **Handling :**

Care must be taken not to cause to the epoxy resin portion of LEDs while it is exposed to high temperature.

Care must be taken not rub the epoxy resin portion of LEDs with hard or sharp article such as the sand blast and the metal hook.