

■Features

- Single chip
- Super high brightness of surface mount LED
- Sorting for I_v and V_f @ 5mA of I_f
- Compact package outline
(LxWxT) of 1.6mm x 0.8mm x 0.6mm
- Compatible to IR reflow soldering.

■Applications

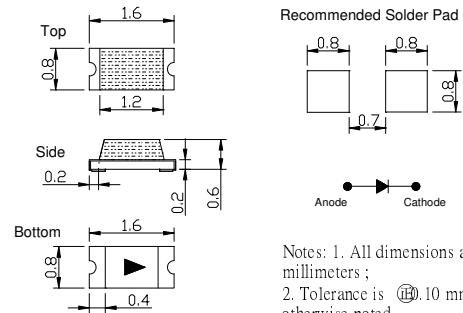
- Backlighting (switches, keys, etc.)
- Marker lights (e.g. steps, exit ways, etc.)

■Absolute Maximum Rating (Ta=25°C)

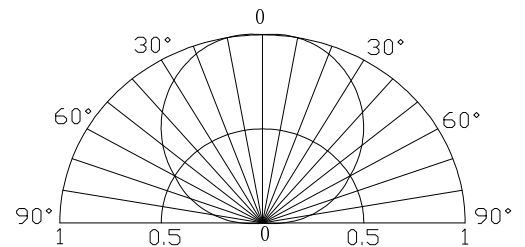
| Item | Symbol | Value | | Unit |
|----------------------------|-----------|--------------------|-------------|------|
| | | M/W/K4/VX/B5/B6/G5 | G8/Y5/O5/R5 | |
| DC Forward Current | I_F | 20 | 20 | mA |
| Pulse Forward Current# | I_{FP} | 100 | 100 | mA |
| Reverse Voltage | V_R | 5 | 5 | V |
| Power Dissipation | P_D | 68 | 48 | mW |
| Operating Temperature | T_{opr} | -40 ~ +85 | | °C |
| Storage Temperature | T_{stg} | -40 ~ +85 | | °C |
| Lead Soldering Temperature | T_{sol} | 260°C/10sec | | - |

#Pulse width Max 0.1ms, Duty ratio max 1/10














■Outline Dimension



■Directivity



■Electrical -Optical Characteristics (Ta=25°C)

| Part Number | Color | | | V_F (V) | | | I_R (μ A) | I_v (mcd) | | | λ_D (nm) | | | $2\theta_{1/2}$ (deg) |
|-------------|---------------|----|---|-----------|------|------|------------------|-------------|------|------|-----------------------------|------|------|-----------------------|
| | | | | Min. | Typ. | Max. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Typ. |
| | | | | $I_F=5mA$ | | | $V_R=5V$ | $I_F=5mA$ | | | | | | |
| OSM50603C1E | Warm White | M5 |  | 2.5 | 2.8 | 3.4 | 10 | 60 | - | 160 | 2700-3300K(X:0.44, Y:0.41) | | | 120 |
| OSM70603C1E | Neutral White | M7 |  | 2.5 | 2.8 | 3.4 | 10 | 250 | - | 350 | 4000-5000K(X:0.37, Y:0.38) | | | 120 |
| OSW40603C1E | White | W4 |  | 2.5 | 2.8 | 3.4 | 10 | 100 | - | 200 | 5500-8500K(X:0.31, Y:0.33) | | | 120 |
| OSW50603C1E | White | W5 |  | 2.5 | 2.8 | 3.4 | 10 | 100 | - | 200 | 8500-18000K(X:0.27, Y:0.28) | | | 120 |
| OSK40603C1E | Pink | K4 |  | 2.5 | 2.8 | 3.4 | 10 | 50 | - | 100 | X=0.31, Y=0.20 | | | 120 |
| OSVX0603C1E | Violet | VX |  | 2.5 | 2.8 | 3.4 | 10 | 70 | - | 130 | X=0.20, Y=0.09 | | | 120 |
| OSB50603C1E | Blue | B5 |  | 2.5 | 2.8 | 3.4 | 10 | 14 | - | 40 | 455 | 470 | 475 | 120 |
| OSB60603C1E | Ice Blue | B6 |  | 2.5 | 2.8 | 3.4 | 10 | 80 | - | 200 | X=0.18 Y=0.26 | | | 120 |
| OSG50603C1E | True Green | G5 |  | 2.5 | 2.8 | 3.4 | 10 | 120 | - | 220 | 520 | 525 | 530 | 120 |
| OSG80603C1E | Yellow Green | G8 |  | 1.6 | 1.8 | 2.4 | 10 | 5 | - | 15 | 565 | 570 | 575 | 120 |
| OSY50603C1E | Yellow | Y5 |  | 1.6 | 1.8 | 2.4 | 10 | 15 | - | 50 | 585 | 590 | 595 | 120 |
| OSO50603C1E | Orange | O5 |  | 1.6 | 1.8 | 2.4 | 10 | 15 | - | 50 | 600 | 605 | 610 | 120 |
| OSR50603C1E | Red | R5 |  | 1.6 | 1.8 | 2.4 | 10 | 15 | - | 50 | 617 | 625 | 630 | 120 |

*1 Tolerance of measurements of chromaticity coordinate is $\pm 10\%$

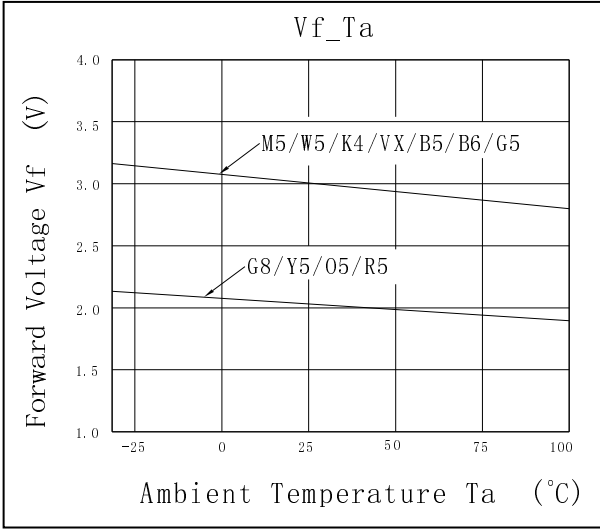
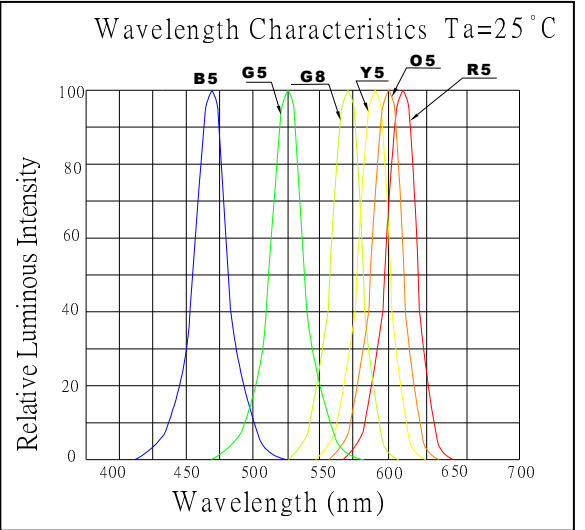
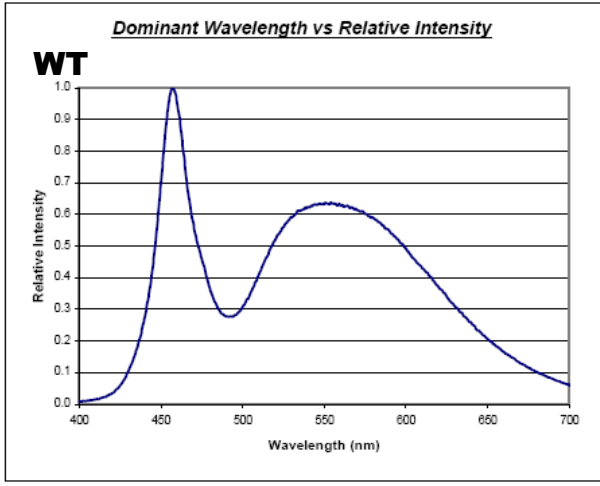
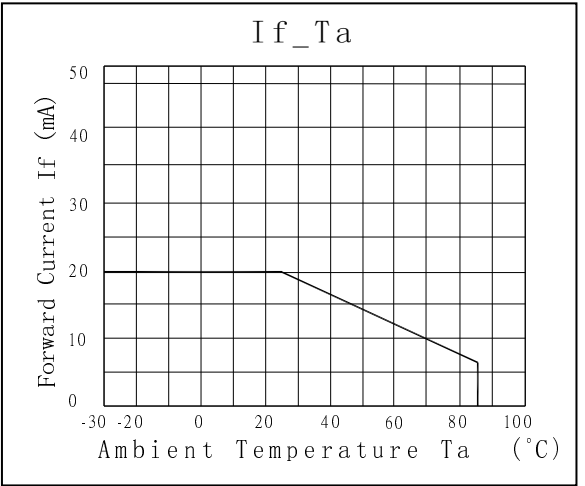
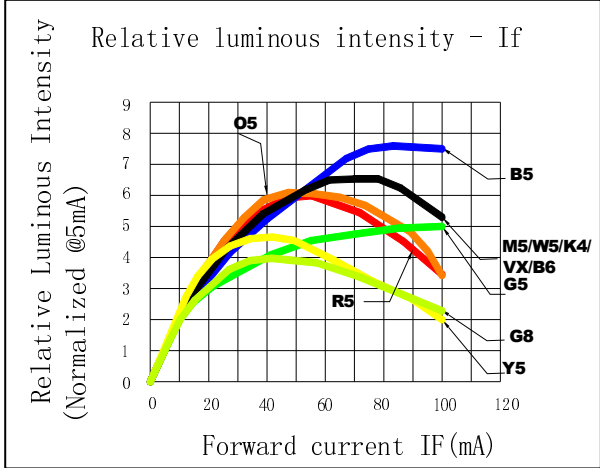
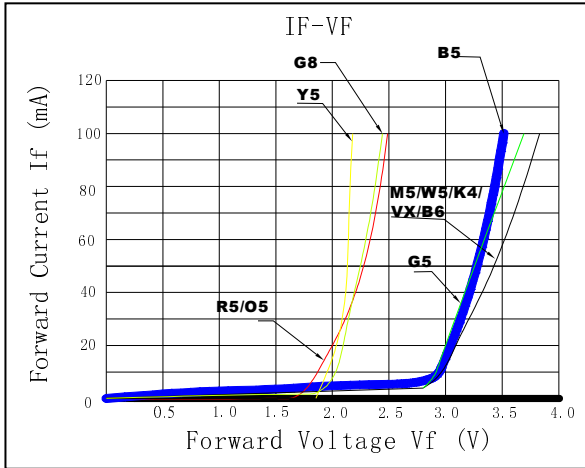
*2 Tolerance of measurements of dominant wavelength is $\pm 1nm$

*3 Tolerance of measurements of luminous intensity is $\pm 15\%$

*4 Tolerance of measurements of forward voltage is $\pm 0.1V$

■ **Optical and electrical characteristics**

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES



RELIABILITY TEST REPORT

| CLASSIFICATION | TEST ITEM | TEST CONDITION |
|--------------------|--|--|
| ENDURANCE TEST | ROOM TEMPERATURE OPERATION LIFE | If: 5mA Ta: 25 ± 5 °C TEST TIME=1000HRS |
| | HIGH TEMPERATURE HIGH HUMIDITY STORAGE | R.H: 90~95% Ta: 65 ± 5 °C TEST TIME=240HRS(+2HRS) |
| | HIGH TEMPERATURE STORAGE | Ta: 85 °C TEST TIME=500HRS(-24HRS,+48HRS) |
| | LOW TEMPERATURE STORAGE | Ta: -40 °C TEST TIME=500HRS(-24HRS,+48HRS) |
| ENVIRONMENTAL TEST | TEMPERATURE CYCLING | -40 °C ~ 25 °C ~ 85 °C ~ 25 °C 30min 5min 30min 5min 100cycles |
| | RESISTANCE TO SOLDERING HEAT | Ta: 260 ± 5 °C TEST TIME=10 ± 1sec |
| | SOLDERABILITY | Ta: 245 ± 5 °C TEST TIME=5 ± 1sec |

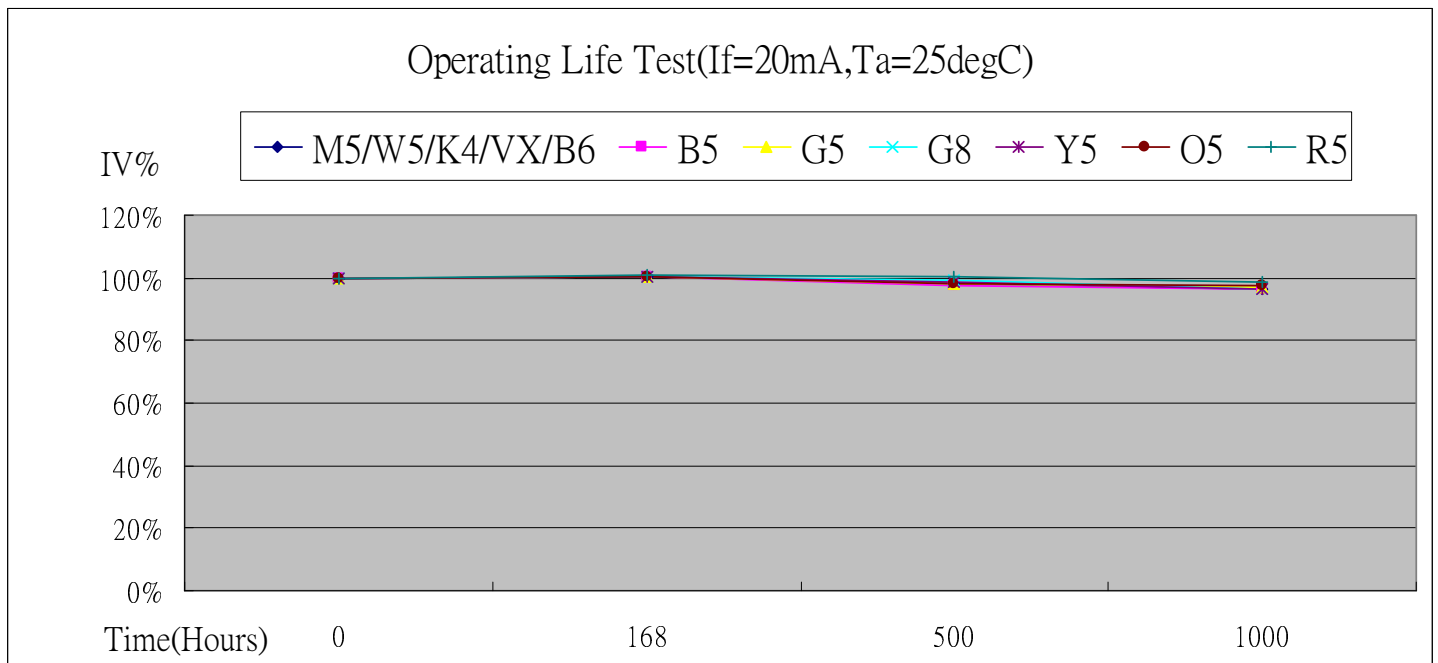
JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

| MEASURING ITME | SYMBOL | CONDITIONS | FAILURE CRITERIA |
|--------------------|--------|------------|-------------------------------|
| LUMINOUS INTENSITY | IV | IF=5mA | IV < 0.5 * L.S.L |
| FORWARD VOLTAGE | VF | IF=5mA | VF > 1.2 * U.S.L |
| REVERSE CURRENT | IR | Vr=5V | IR > 2 * U.S.L |
| SOLDERABILITY | - | - | LESS THAN 95% SOLDER COVERAGE |

U.S.L : Upper Specification Limit

L.S.L : Lower Specification Limit

OPERATION LIFE TEST LUMINANCE RATE CURVE



*Burn-in condition: 5mA

*Projection of Statistical Average Light Output Degradation Performance for LED Technology
Extrapolated from OptoSupply QA Dept. Test Data.

*According to OptoSupply outgoing Packaged Products Specification

*MTBF:50,000hrs, 90% Confidence (A Failure is Any LED Which is Open, shorted or fails to Emit Light)

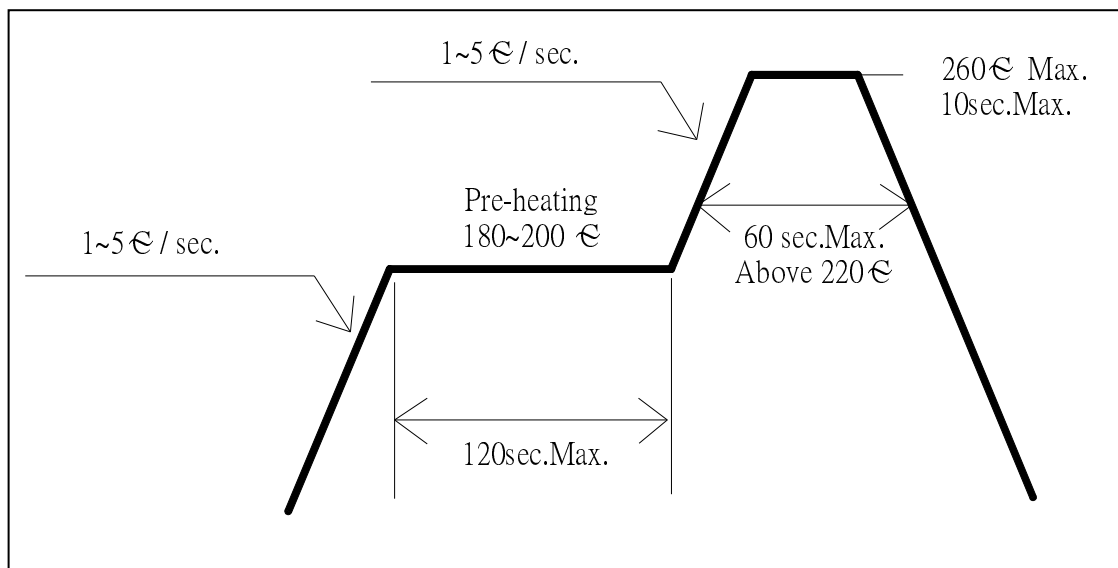
*The Projected Data is Base on The Feature of LED Itself Under Normal Operation Conditions.

*Any Improper Circuit Design or External Factors Might Cause a Different Result.

■ **Soldering Conditions**

| Reflow Soldering | | Hand Soldering | |
|------------------|------------------------------|----------------------------|--|
| Pre-Heat | 180 ~ 200°C | Temperature Soldering time | 350°C Max. 3 sec. Max. (one time only) |
| Pre-Heat Time | 120 sec. Max. | | |
| Peak temperature | 260°C Max. | | |
| Dipping Time | 10 sec. Max. | | |
| Condition | Refer to Temperature-profile | | |

• **Reflow Soldering Condition(Lead-free Solder)**



*Recommended soldering conditions vary according to the type of LED

*Although the recommended soldering conditions are specified in the above table, reflow, or hand soldering at the lowest possible temperature is desirable for the LEDs.

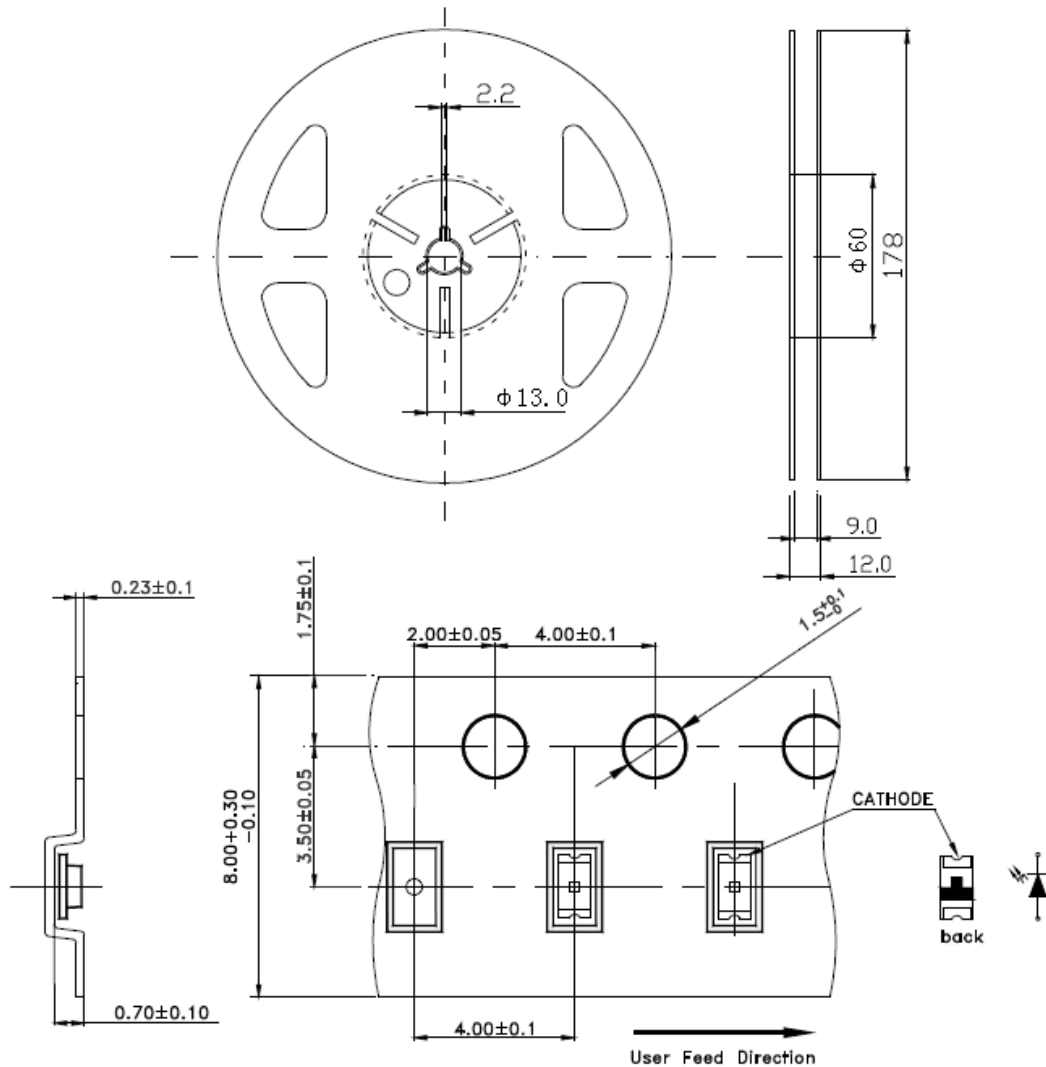
*A rapid-rate process is not recommended for cooling the LEDs down from the peak temperature.

- All SMD LED products are pb-free soldering available.
- Occasionally there is a brightness decrease caused by the influence of heat or ambient atmosphere during air reflow. It is recommended that the User use the nitrogen reflow method.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than two times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

■ Reel & Tape Dimensions:

Quantity: 4,000 units/reel

Diameter: 178 mm



Notes: 1. All dimensions are in millimeters ;

■ **Cautions:**

1. After open the package, the LED's floor life is 4 Weeks under 30°C or less and 60%RH or less(MSL:2a).
2. Heat generation must be taken into design consideration when using the LED.
3. Power must be applied resistors for protection, over current would be caused the optic damage to the devices and wavelength shift.
4. Manual tip solder may cause the damage to Chip devices, so advised that heat of iron should be lower than 15W with temperature control under 5 seconds at 230-260 deg. C. (The device would be got damage in re working process, recommended under 5 seconds at 230-260 deg. C)
5. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handing the LED.
6. Use IPA as a solvent for cleaning the LED. The other solvent may dissolve the LED package and the epoxy, Ultrasonic cleaning should not be done.
7. Damaged LED will show unusual characteristics such as leak current remarkably increase, turn-on voltage becomes lower and the LED get unlight at low current.