

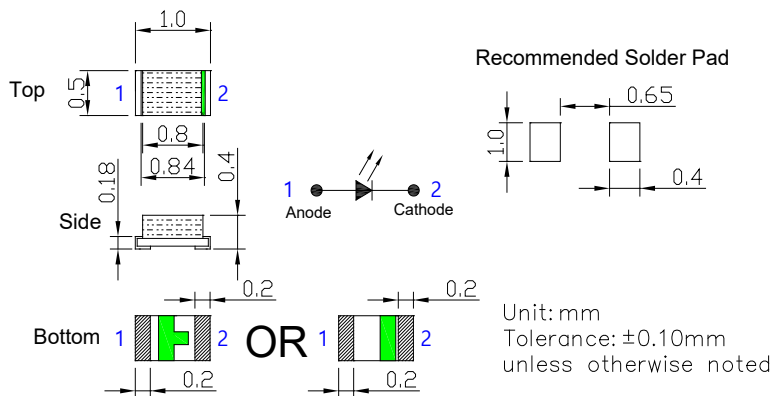
■Features

- Single chip
- Super high brightness of surface mount LED
- Sorting for I_v and V_f @ 20mA of I_f
- Compact package outline
(LxWxT) of 1.0mm x 0.5mm x 0.4mm
- Compatible to IR reflow soldering.

■Applications

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

■Outline Dimension



■Absolute Maximum Rating

($T_a=25^\circ\text{C}$)

Item	Symbol	Value		Unit
		HR / YG/ OR/YL	BL/PG/W/M	
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	52	72	mW
Operating Temperature	T_{opr}	-40 ~ +85		$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +85		$^\circ\text{C}$
Lead Soldering Temperature	T_{sol}	260 $^\circ\text{C}$ /10sec		-

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

■Electrical -Optical Characteristics

($T_a=25^\circ\text{C}$)

Part Number	Color			V_F (V)			I_R (μA)	I_v (mcd)			λ_D (nm)			$2\theta_{1/2}$ (deg)
				Min.	Typ.	Max.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Typ.
				$I_F=20\text{mA}$			$V_R=5\text{V}$	$I_F=20\text{mA}$			$I_F=20\text{mA}$			
OSM50402C1C	Warm White	M	■	-	3.1	3.6	100	250	400	600	2300-3500K			120
OSWA0402C1C	Pure White	W	■	-	3.1	3.6	100	250	400	600	6500-9000K			120
OSB50402C1C	Blue	BL	■	-	3.1	3.6	100	60	90	150	460	465	475	120
OSG50402C1C	Pure Green	PG	■	-	3.1	3.6	100	250	400	600	515	525	530	120
OSG80402C1C	Yellow Green	YG	■	-	2.1	2.6	100	20	30	40	565	570	575	120
OSY50402C1C	Yellow	YL	■	-	2.1	2.6	100	50	100	200	585	590	595	120
OSO50402C1C	Orange	OR	■	-	2.1	2.6	100	50	100	200	600	605	610	120
OSR50402C1C	Red	HR	■	-	2.1	2.6	100	50	100	200	620	625	630	120

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

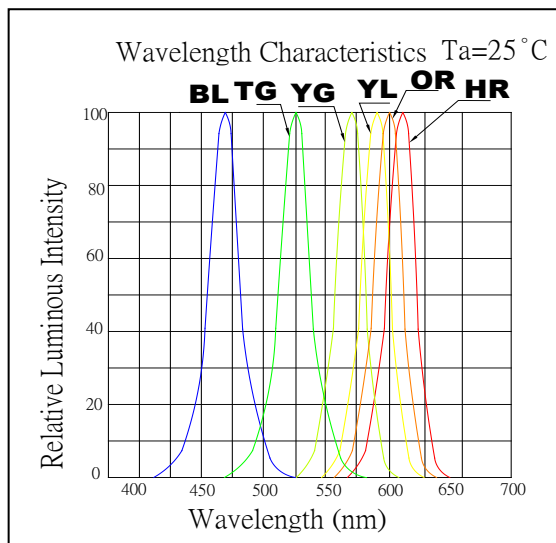
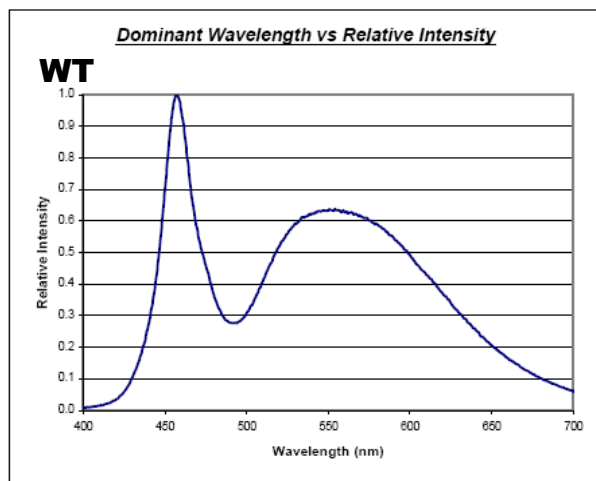
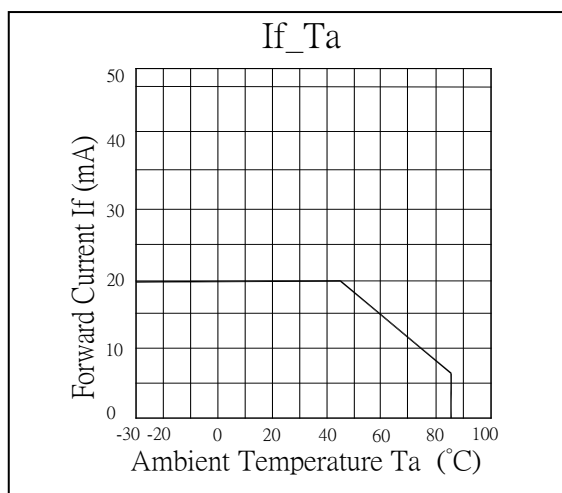
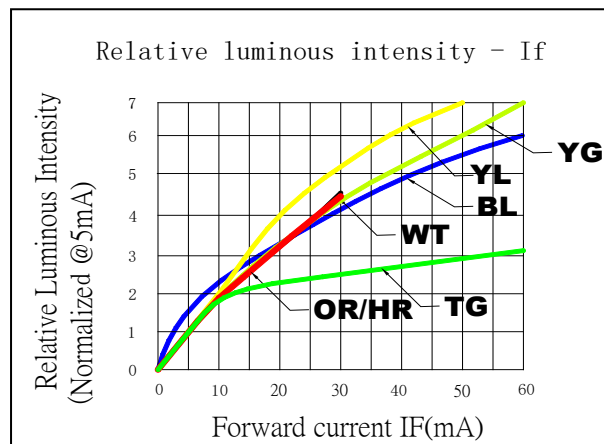
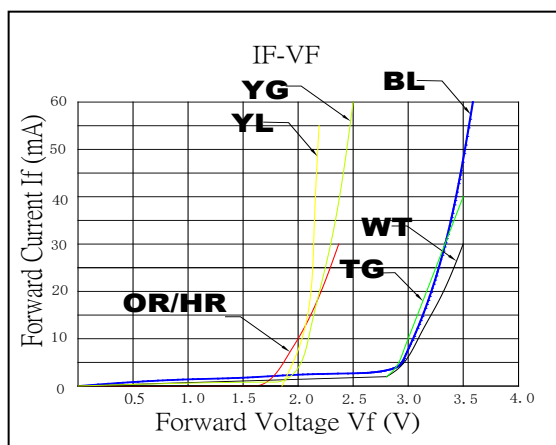
*2 Tolerance of measurements of dominant wavelength is $\pm 1\text{nm}$

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

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

■ Optical and electrical characteristics

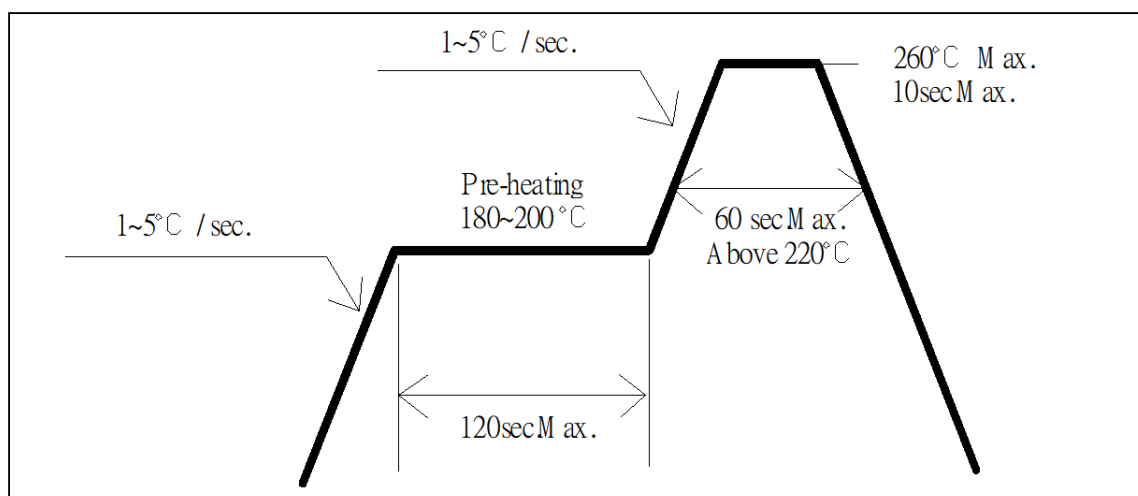
TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES



■ 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.

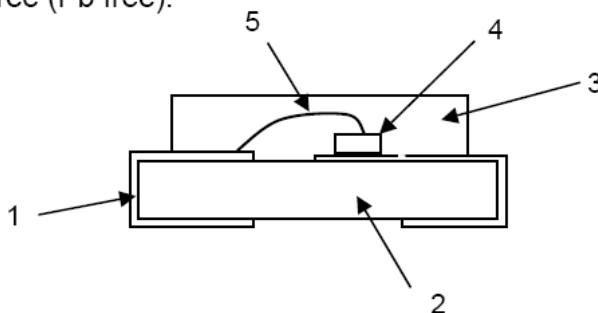
• After soldering, do not warp the circuit board.

■ Material

White/ Blue/ Yellow green/ Yellow/ Orange/ Red /True green :

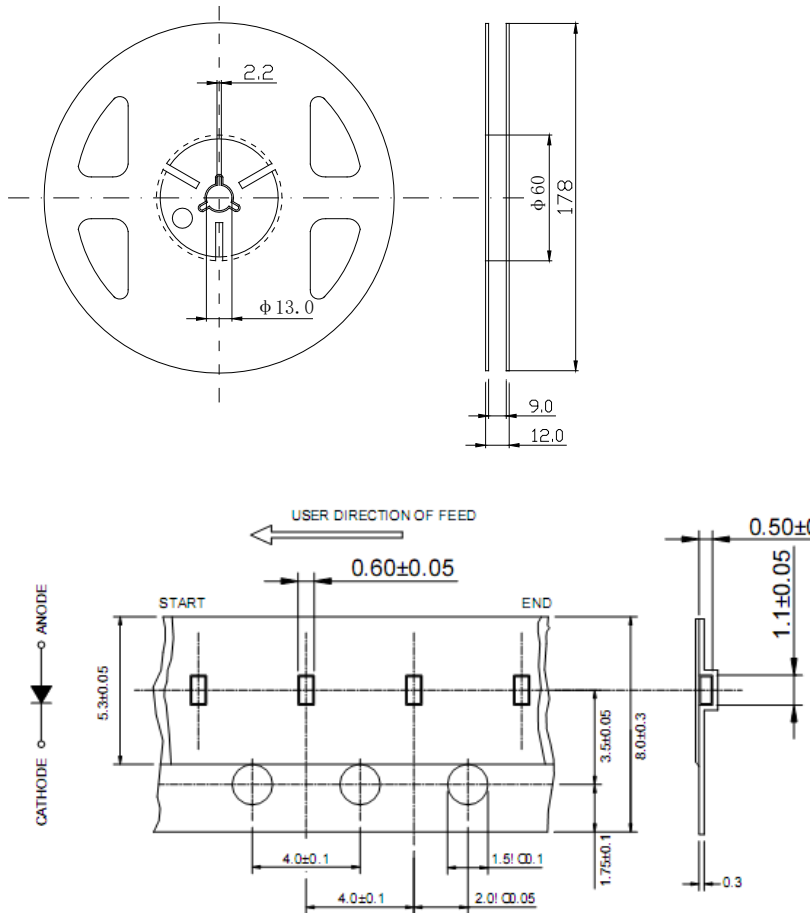
	Material
1. Lead-frame. / Soldering Leads	Cu Alloy With Ni, Au Plating.
2. PCB	BT Resin.
3. Encapsulate	Epoxy Resin.
4. Die	AlInGaP based
5. Bonding wire	Au Chip : Ball Bonding / PCB : Ball Bonding

Note: Product is lead-free (Pb free).



■ Taping and Orientation

1. Quantity: 4000pcs/Reel 2. Diameter: 178 mm 3. General Tolerance : ± 0.1



■ 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 handling 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.

■ Reliability Test :

	Test Item	Test Conditions	Time	Test Q'ty	Fail Q'ty	O.K
1	Thermal Cycle Test (168 cycles)	H: +75°C 30 min ~ L: -35°C 30 min	168 Hrs	20	0	Pass
2	Thermal Shock Test (84 cycles, Rate= 5min)	H: +85°C (Holding 1 hr) ~ L: -40°C (Holding 1 hr)	168 Hrs	20	0	Pass
3	High Temp. Storage Test	Temp.: 100°C	168 Hrs	20	0	Pass
4	Low Temp. Storage Test	Temp.: -40°C	168 Hrs	20	0	Pass
5	High Temp. High Humidity Test	85°C/85%RH,	168 Hrs	20	0	Pass
6	Press Cook Test	T=121°C, P=2atms H=100%RH	168 Hrs	20	0	Pass
7	Operating Life Test	IF=20 mA, 25°C	168 Hrs	20	0	Pass
8	IR-Reflow Test	Max 260°C (Pb free condition)	2 Times	10	0	Pass

Conclusions:

The reliability tests were designed to evaluate both package integrity as well as workability of product performance over time.

All samples have done well by completed test requirement and passed all the qualification criteria with zero failure. From design standpoint, the package is robust enough to meet its datasheet conditions. Based on the good result shows on the above test, this product is qualified and released for market.