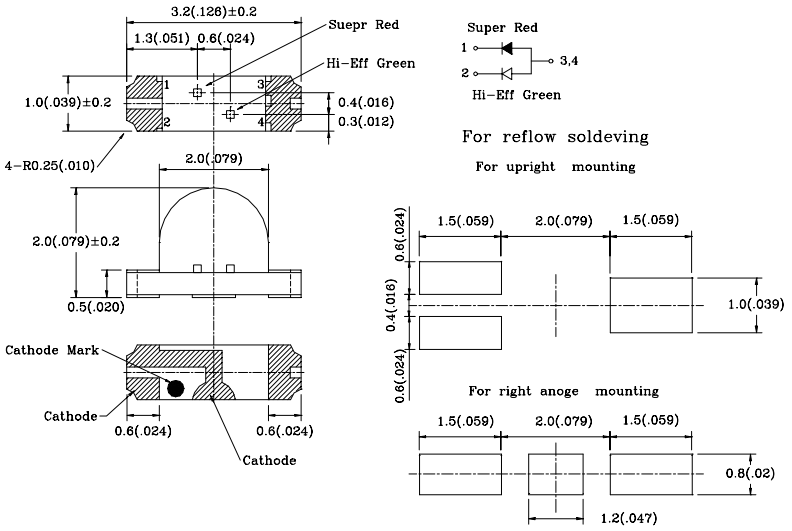
● Features:

1. Emitted Color : Super Red and Hi-Eff Green
2. Lens Appearance : Water Clear
3. Bi-color type.
4. 3.2x1.0x2.0mm(1203) 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.

● Applications:

1. Automotive : Dashboards, stop lamps, turn signals.
2. Backlighting : LCDs, Key pads advertising.
3. Status indicators : Comsumer & 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℃)

Parameter	Symbol	Super Red	Hi-Eff Green	Unit
Power Dissipation	Pd	60	100	mW
Forward Current	I_F	30	30	mA
Peak Forward Current ＊1	I_{FP}	100	100	mA
Reverse Volage	V_R	5		V
Operating Temperature	Topr	-25℃~80℃		-
Storage Temperature	Tstg	-30℃~85℃		-
Soldering Temperature	Tsol	See Page6		-

＊1 Condition for IFp is pulse of 1/10 duty and 0.1msec width.

● Electrical and optical characteristics(Ta=25℃)

Parameter	Symbol	Condition	Color	Min.	Typ.	Max.	Unit
Forward Voltage	Vf	I_F=20mA	Super Red Hi-Eff Green	-	1.8 2.2	2.6 2.6	V
Luminous Intensity	Iv	I_F=20mA	Super Red Hi-Eff Green	8.2 5.5	25 20	-	mcd
Reverse Current	I_R	V_R=5V	Super Red Hi-Eff Green	-	-	100	μA
Peak Wave Length	λp	I_F=20mA	Super Red Hi-Eff Green	-	660 568	-	nm
Dominant Wave Length	λd	I_F=20mA	Super Red Hi-Eff Green	638 566	-	648 576	nm
Spectral Line Half-width	Δλ	I_F=20mA	Super Red Hi-Eff Green	-	20 30	-	nm
Veiwing Angle	$2\theta_{1/2}$	I_F=20mA	Super Red Hi-Eff Green	-	100	-	deg

● Typical Electro-Optical Characteristics Curves

Fig.1 Relative intensity vs. wavelength

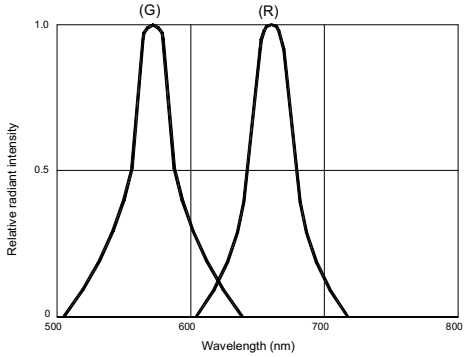


Fig.2 Forward current derating curve vs. ambient temperature

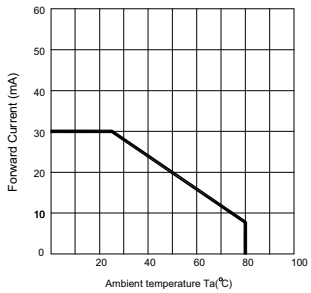


Fig.3 Forward current vs. forward voltage

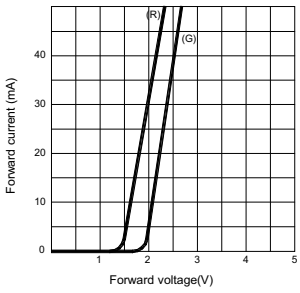


Fig.4 Relative luminous intensity vs. ambient temperature

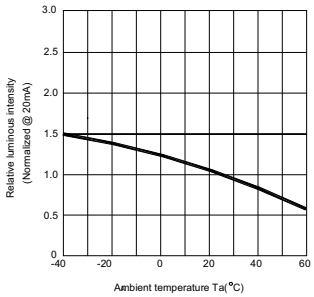


Fig.5 Relative luminous intensity vs. forward current

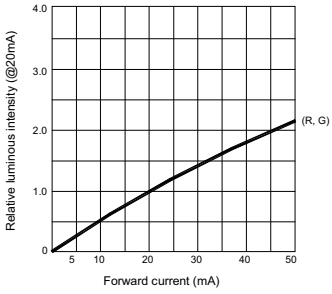
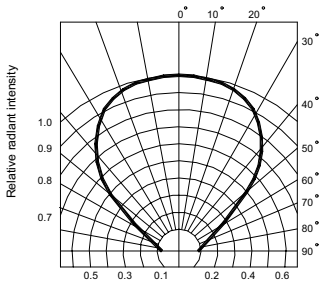
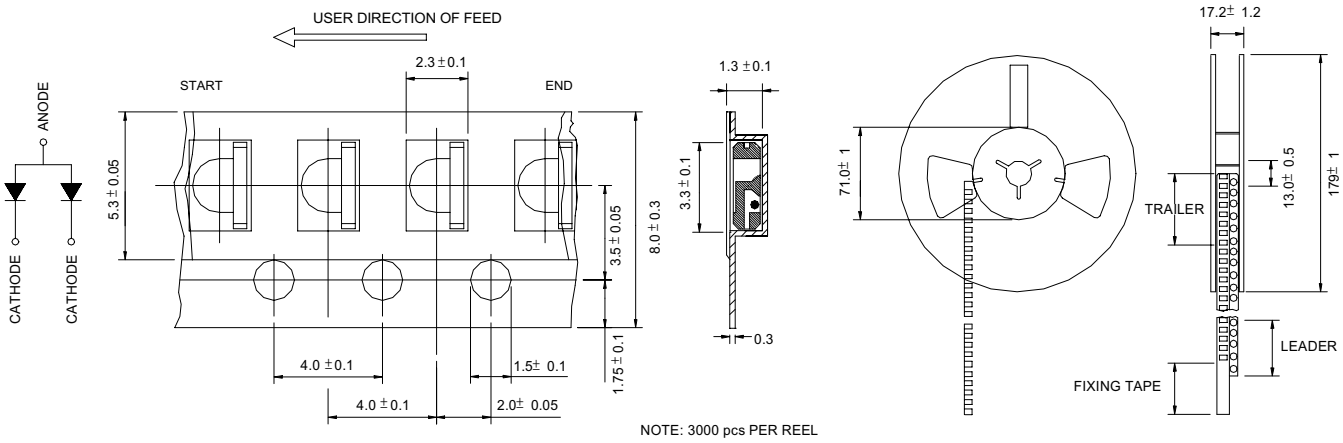


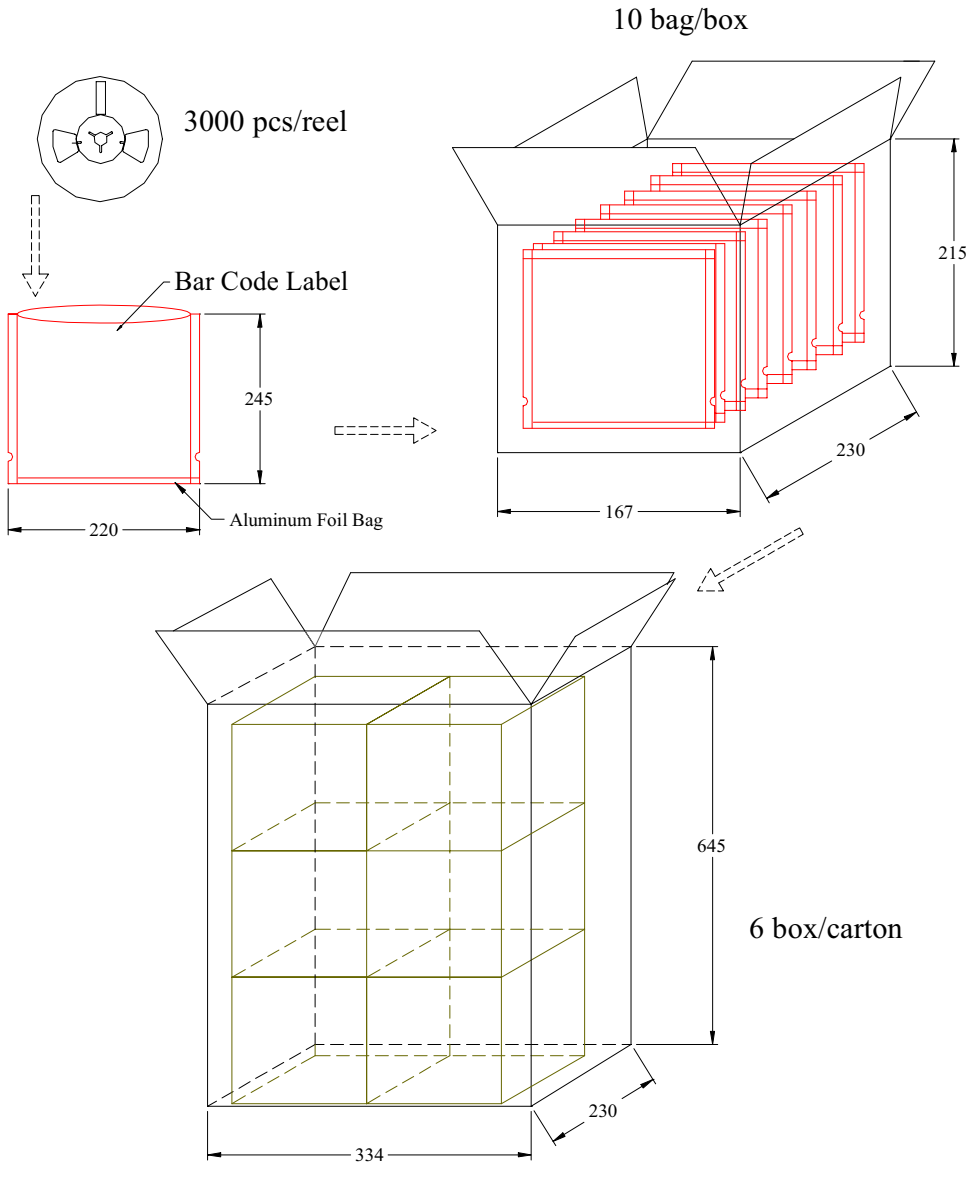
Fig.6 Radiation diagram



● Tapping and packaging specifications(Units: mm)



●Package Method:(unit:mm)



● 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 If=20mA Ta=Under room temperature Test time=1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	Ta=+65℃±5℃ RH=90%-95% Test time=240hrs	0/20
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High Ta=+85℃±5℃ Test time=1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 :B-12	Low Ta=-35℃±5℃ 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℃ ~ +25℃ ~ +85℃ ~ +25℃ 60min 20min 60min 20min Test Time=5cycle	0/20
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	-35℃±5℃ ~+85℃±5℃ 20min 20min Test Time=10cycle	0/20
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating： 140℃-160℃,within 2 minutes. Operation heating： 235℃(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=20mA	Over Ux1.2
Reverse current	I_R(uA)	V_R=5V	Over Ux2
Luminous intensity	Iv (mcd)	I_F=20mA	Below SX0.5

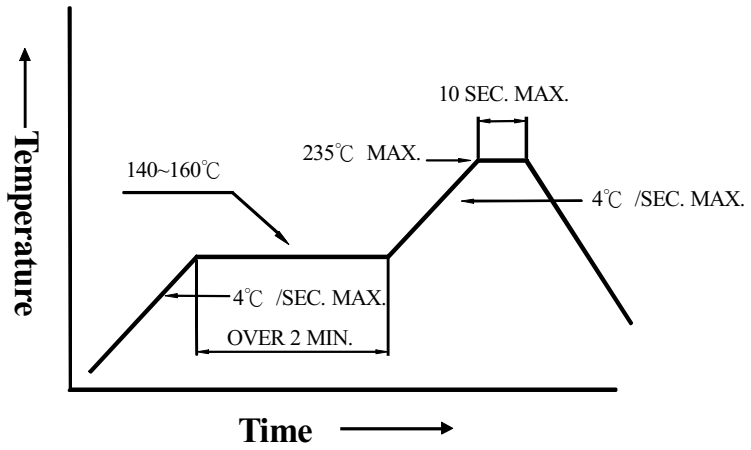
Note: 1.U means the upper limit of specified characteristics. S means initial value.

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.

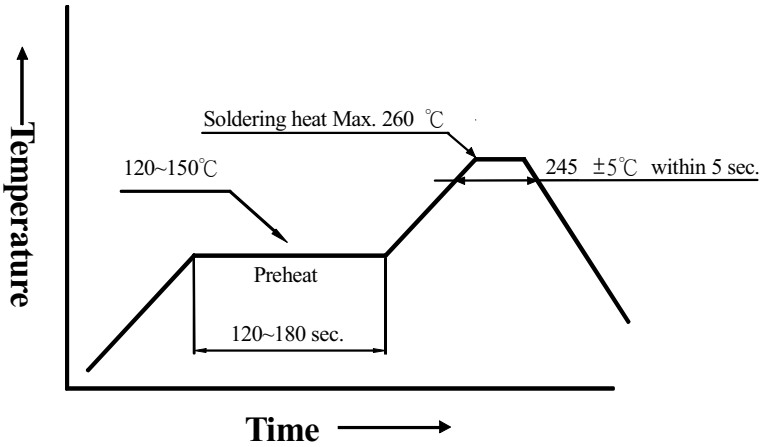
● Soldering :

1. Manual Of Soldering
   The temperature of the iron tip should not be higher than 300℃(572℉) and Soldering within 3 seconds per solder-land is to be observed.

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



3. DIP soldering (Wave Soldering) :
   Preheating : 120℃~150℃,within 120~180 sec.
   Operation heating : 245℃ ±5℃ within 5 sec.260℃ (Max)
   Gradual Cooling (Avoid quenching).



● Handling :

Care must be taken not to cause to the epoxy resin portion of BRIGHT LEDs while it is exposed to high temperature.
Care must be taken not rub the epoxy resin portion of BRIGHT LEDs with hard or sharp article such as the sand blast and the metal hook.