

SML12RG4H-TR
Hi-Eff Red/Hi-Eff Green
Surface Mount LED
3.2 × 2.7 × 1.1 mm Chip LED
120° viewing angle

DWG BY:
BL/GP
08-29-06

CHK BY:
PL
05-15-07

QA:

__-__-__

MFG:

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REVISION LTR: -

05-15-07

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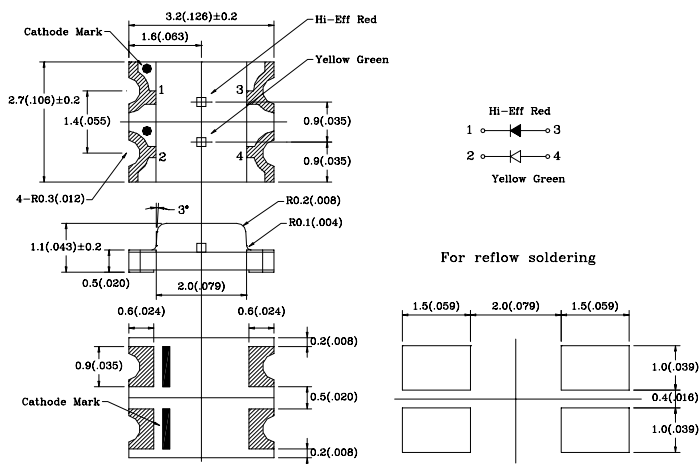
● **Features:**

1. Emitted Color : Hi-Eff Red and Hi-Eff Green
2. Lens Appearance : Water Clear.
3. Bi-color type.
4. 3.2x2.7x1.1mm(1210) 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 $\pm 0.10\text{mm}$ (0.004") unless otherwise specified.
3. Specifications are subject to change without notice.

● **Absolute Maximum Ratings($T_a=25^\circ\text{C}$)**

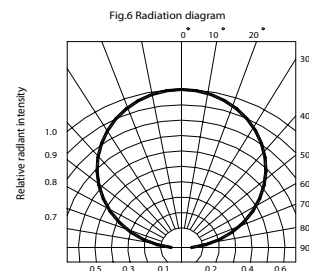
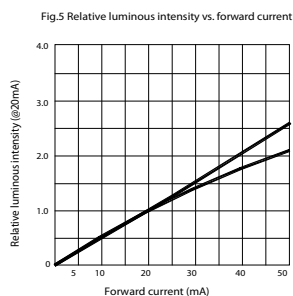
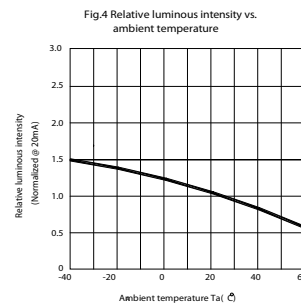
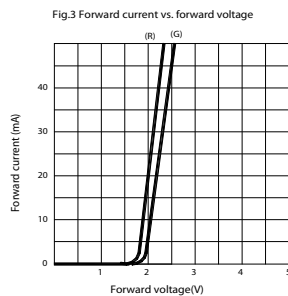
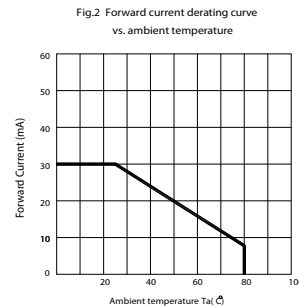
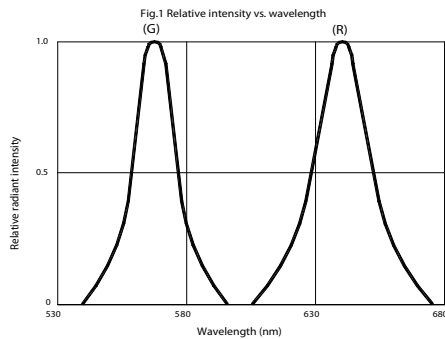
Parameter	Symbol	Hi-Eff Red	Hi-Eff Green	Unit
Power Dissipation	P_d	80	80	mW
Forward Current	I_F	30	30	mA
Peak Forward Current * 1	I_{FP}	100	100	mA
Reverse Voltage	V_R	5		V
Operating Temperature	T_{opr}	$-25^\circ\text{C} \sim 80^\circ\text{C}$		-
Storage Temperature	T_{stg}	$-30^\circ\text{C} \sim 85^\circ\text{C}$		-
Soldering Temperature	T_{sol}	See Page 5		-

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

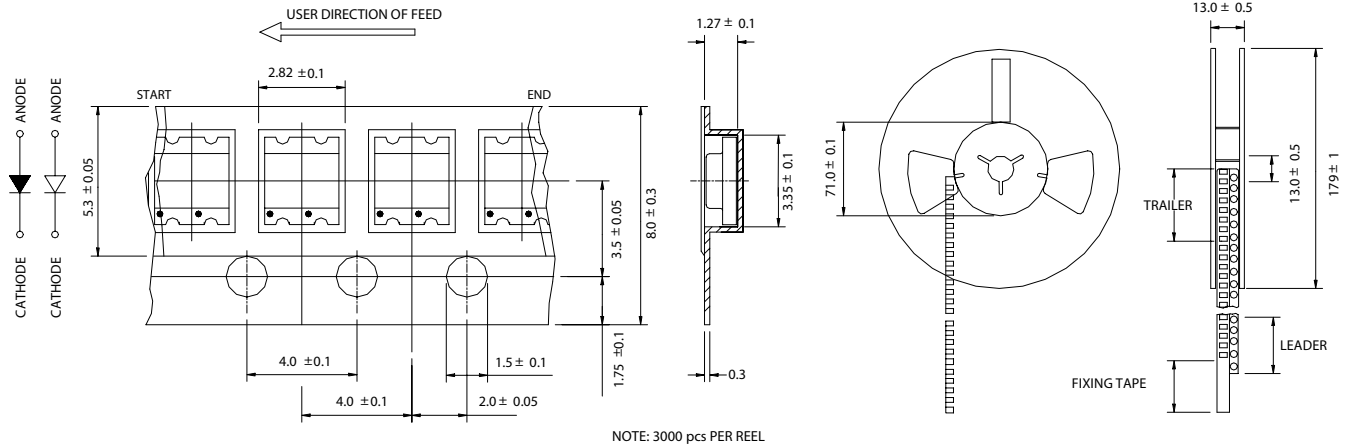
● Electrical and optical characteristics(Ta=25℃)

Parameter	Symbol	Condition	Color	Min.	Typ.	Max.	Unit
Forward Voltage	V _f	I _F =20mA	Hi-Eff Red Hi-Eff Green	-	2.0 2.2	2.6 2.6	V
Luminous Intensity	I _v	I _F =20mA	Hi-Eff Red Hi-Eff Green	- -	8.0 14.0	-	mcd
Reverse Current	I _R	V _R =5V	Hi-Eff Red Hi-Eff Green	-	-	100	μA
Peak Wave Length	λ _p	I _F =20mA	Hi-Eff Red Hi-Eff Green	638 560	644 565	649 569	nm
Dominant Wave Length	λ _d	I _F =20mA	Hi-Eff Red Hi-Eff Green	626 567	628 571	632 574	nm
Spectral Line Half-width	Δλ	I _F =20mA	Hi-Eff Red Hi-Eff Green	-	44 29	-	nm
Viewing Angle	2θ _{1/2}	I _F =20mA	Hi-Eff Red Hi-Eff Green	-	120	-	deg
Chromaticity Coordinates	X	I _F =20mA	Hi-Eff Red	-	0.70	-	
	Y			-	0.29	-	
Chromaticity Coordinates	X	I _F =20mA	Hi-Eff Green	-	0.45	-	
	Y			-	0.54	-	

● Typical Electro-Optical Characteristics Curves



● Tapping and packaging specifications(Units: mm)



● Bin Limits

Intensity Bin Limits (E1) (At 20mA)

BIN CODE	Min. (mcd)	Max. (mcd)
G	3.2	6.3
H	4.8	9.4
J	7.0	14.0
K	11.0	21.0

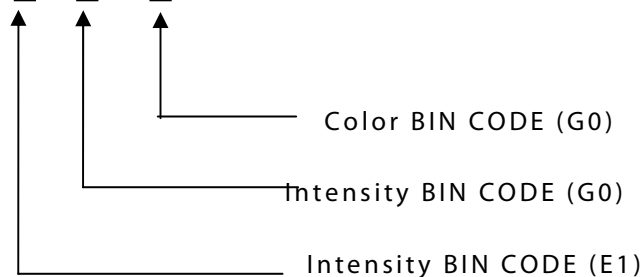
Intensity Bin Limits (G0) (At 20mA)

BIN CODE	Min. (mcd)	Max. (mcd)
F	2.1	4.2
G	3.2	6.3
H	4.8	9.4
J	7.0	14.0

Color Bin Limits (G0) (At 20mA)

BIN CODE	Min. (nm)	Max. (nm)
4	565	569
5	567	571
6	569	573
7	571	575
8	573	577

● BIN : X - X X



● Reliability Test

Classification	Test Item	Reference Standard	Test Conditions	
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 °C -160 °C, within 2 minutes. Operation heating : 235 °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 $U \times 1.2$
Reverse current	I_R (uA)	$V_R=5\text{V}$	Over $U \times 2$
Luminous intensity	I_v (mcd)	$I_F=20\text{mA}$	Below $S \times 0.5$

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

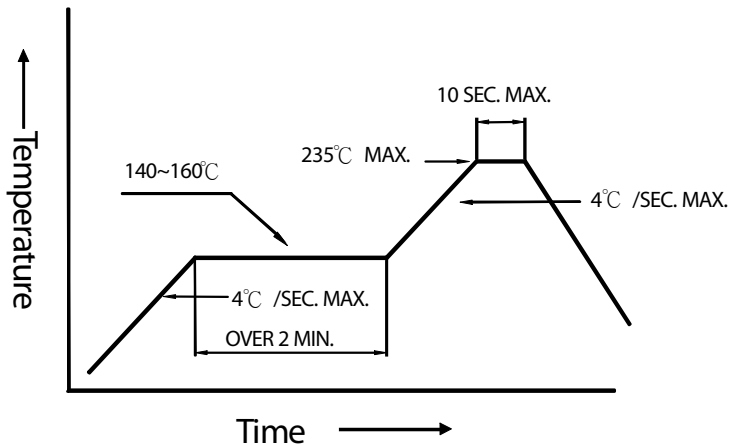
The temperature of the iron tip should not be higher than 300°C (572°C) and Soldering within 3 seconds per solder-land is to be observed.

2. Reflow Soldering

Preheating : 140°C ~160°C ±5°C, within 2 minutes.

Operation heating : 235°C (Max.) within 10 seconds.(Max)

Gradual Cooling (Avoid quenching).

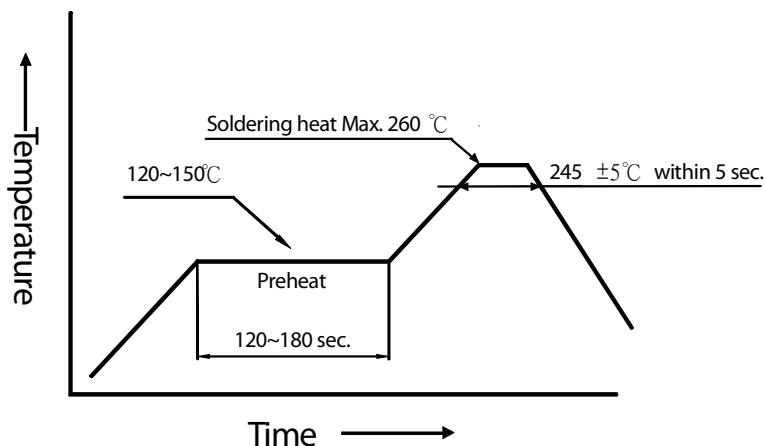


3. DIP soldering (Wave Soldering) :

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 .