LEDTRONICS, INC.®

23105 Kashiwa Court, Torrance, CA 90505
Phone: (800) 579-4875 or (310) 534-1505 Fax: (310) 534-1424
E-mail: webmaster@ledtronics.com
Website: http://www.ledtronics.com

SML10E3KH-TR

Super Red
1206 Profile Surface Mount LED
3.2 ×1.6 ×1.1 mm Chip LED
120° viewing angle

DWG BY: BL / JG 11-30-06
CHK BY: PL 12-13-06
QA: __ 12-__-06
MFG: __ __-__-__
REVISION LTR: - 12-13-06

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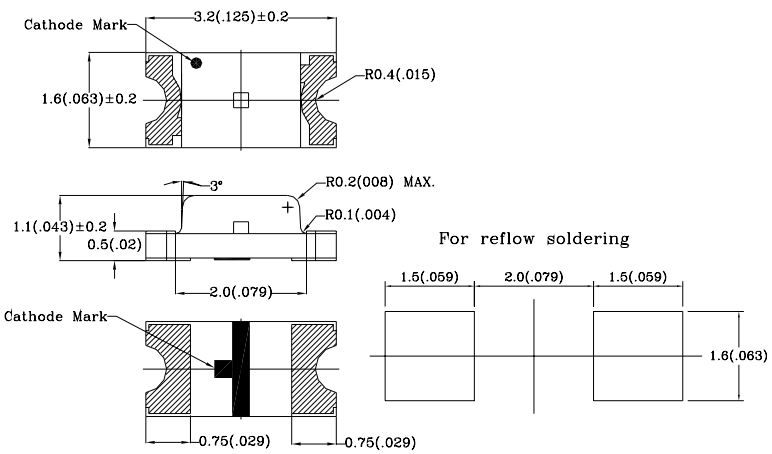
● Features:

1. Emitted Color : Super Red
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.

● 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.

● Applications:

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

RoHS
COMPLIANT
2002/95/EC

● Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	100	mW
Forward Current	I_F	30	mA
Peak Forward Current ＊1	I_{FP}	150	mA
Reverse Voltage	V_R	5	V
Operating Temperature	Topr	-40℃~85℃	-
Storage Temperature	Tstg	-40℃~100℃	-
Soldering Temperature	Tsol	See Page 6	-

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

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● Electrical and optical characteristics(Ta=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F=20mA	-	1.9	2.6	V
Luminous Intensity	Iv	I_F=20mA	-	136	-	mcd
Reverse Current	I_R	V_R=5V	-	-	100	μA
Peak Wave Length	λp	I_F=20mA	628	631	634	nm
Dominant Wave Length	λd	I_F=20mA	619	621	623	nm
Spectral Line Half-width	Δλ	I_F=20mA	-	17	-	nm
Viewing Angle	$2\theta_{1/2}$	I_F=20mA	-	120	-	deg
Radiant Intensity		I_F=20mA	-	-	-	μW/sr
Chromaticity Coordinates	X	I_F=20mA	-	0.69	-	
	Y		-	0.30	-	

● Typical Electro-Optical Characteristics Curves

Fig.1 Relative intensity vs. wavelength

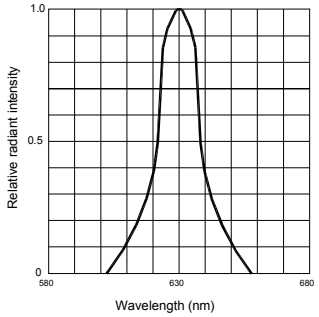


Fig.2 Forward current derating curve vs. ambient temperature

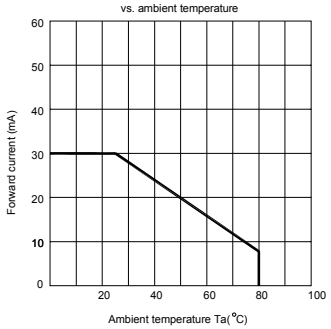


Fig.3 Forward current vs. forward voltage

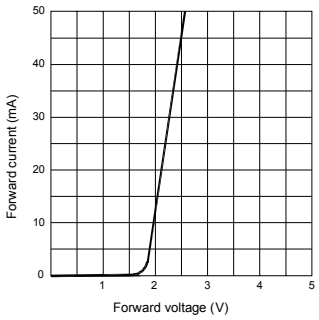


Fig.4 Relative luminous intensity vs. ambient temperature

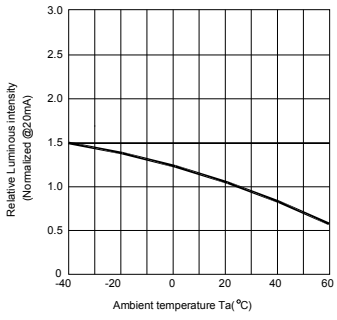


Fig.5 Relative luminous intensity vs. forward current

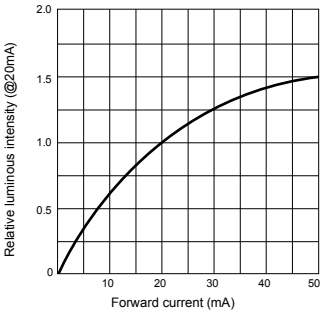
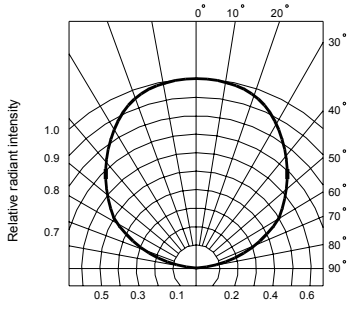


Fig.6 Radiation diagram



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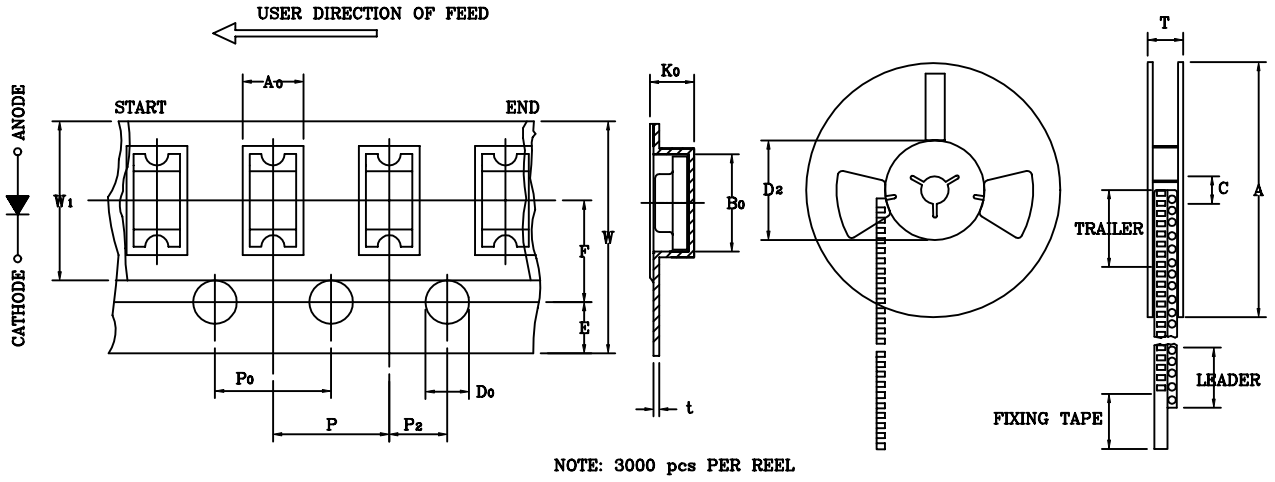
● Tape and reel packaging specifications (Units: mm)

ITEM	SYMBOL	SPECIFICATION			
		Minimum		Maximum	
		mm	inch	mm	inch
Tape Feed Hole Diameter (DIA)	D_0	1.40	0.055	1.60	0.063
Feed Hole Location	E	1.65	0.064	1.85	0.073
Centers Line Dimensions Length Direction	F	3.45	0.135	3.55	0.139
Compartment Depth	K_0	1.19	0.047	1.39	0.055
Compartment Pitch	P	3.90	0.153	4.10	0.161
Sprocket Hole Diameter	P_0	3.90	0.153	4.10	0.161
Centers Line Dimensions Length Direction	P_2	1.95	0.076	2.05	0.080
Carrier Tape Thickness	t	—	—	0.30	0.012
Carrier Tape Width	W	7.70	0.303	8.30	0.326
Flange Diameter	A	178.0	7.008	180.0	7.087
Hub Spindle Hole	C	12.50	0.492	13.50	0.531
Hub Diameter	D_2	70.00	2.755	72.00	2.830
Fixing Tape Width	W_1	5.25	0.206	5.35	0.210
Flange Space Between Flanges	T	12.50	0.492	13.50	0.531
Compartment Length	A_0	1.68	0.066	1.88	0.074
Compartment Width	B_0	3.30	0.130	3.50	0.138



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

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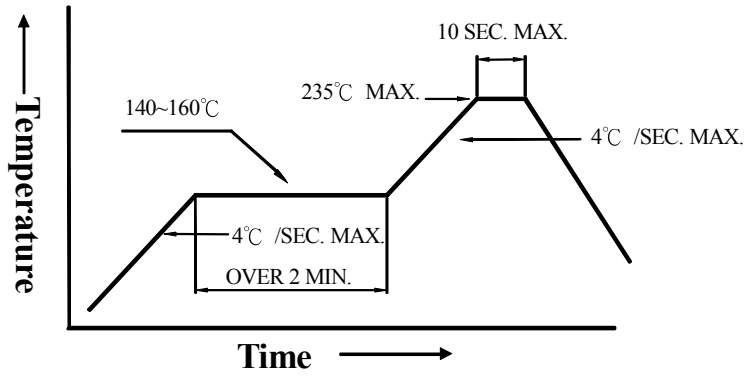
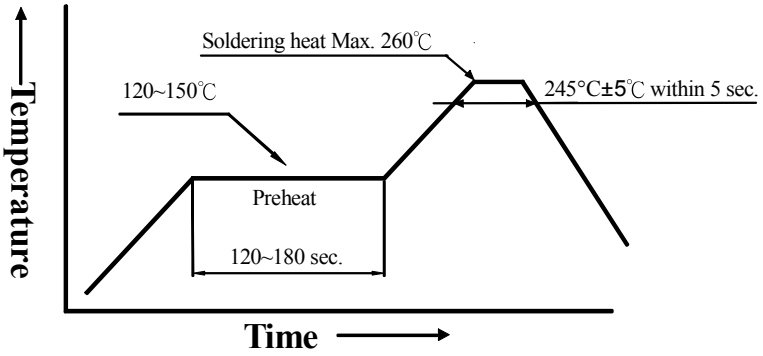
1. Soldering :

- 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.

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



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



2. Handling

Care must be taken not to cause damage to the epoxy resin portion of LEDs while it is exposed to high temperatures, or abrade the epoxy resin portion of LEDs with hard or sharp items as from sand blasting and the use of sharp metallic objects.

3. Notes for designing

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit. When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the LEDs.

4. Storage:

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.
If the envelope is still packed, store it in the following environment:
(1) Temperature: 5°C-30°C (41°F-86°F) Humidity: RH 60% Max.
(2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
a. Completed within 24 hours.
b. Stored at less than 30% RH
(3) Devices require baking before mounting if: (2)a or (2)b is not met.
(4) If baking is required, devices must be baked under below conditions:
12 hours at 60°C ±3°C