

SML080CWR5B-031

Hi-Eff Red

Axial Surface Mount LEDs
2.1×2.2×2.7mm, Z-bend leads
35° viewing angle

DWG BY:
BL / GP
10-19-07

CHK BY:
PL
10-22-07

QA:

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MFG:

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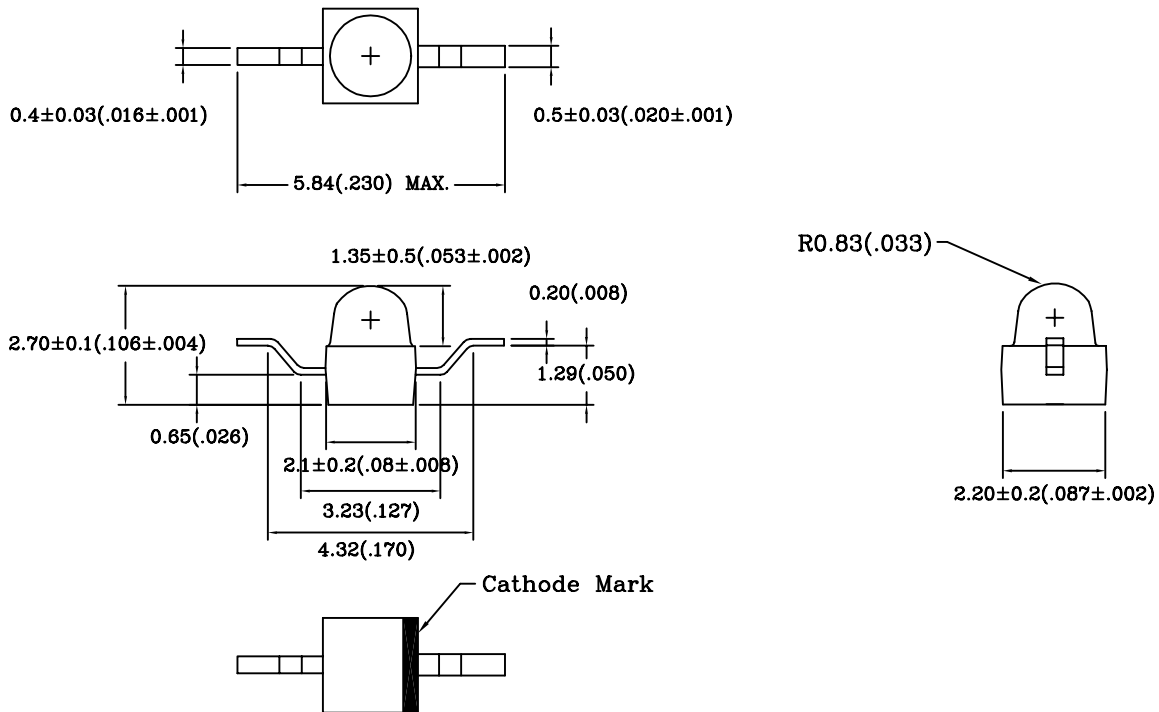
REVISION LTR: -

10-19-07

Features:

- High intensity
- Axial type
- “Z-bend” leads

Package Dimensions:



Emission Color	Lens Color
Hi-Eff Red	Water Clear

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm ($.010$ in) unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

● **Electrical and optical characteristics (Ta=25°C)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V _F	I _F =20mA	-	2.0	2.6	V
Luminous Intensity	I _v	I _F =20mA	18.5	40.0	-	mcd
Peak Wave Length	λ _p	I _F =20mA	-	642	-	nm
Dominant Wave Length	λ _d	I _F =20mA	-	628	-	nm
Spectral Line Half-width	Δλ	I _F =20mA	-	40	-	nm
Viewing Angle*	2θ _{1/2}	I _F =20mA	-	35	-	deg
Radiant Intensity	I _e	I _F =20mA	-	-	-	μW/sr
Chromaticity Coordinates	X	I _F =20mA	-	0.70	-	
	Y		-	0.30	-	

* Viewing angle is the Off-axis at which the luminous intensity is half the axial intensity.

* This product is RoHS compliant.

● **Absolute Maximum Ratings (Ta=25°C)**

Reverse Voltage	V _R	5V
Reverse Current (VR=5V)	I _R	100μA
Continuous Forward Current	I _f	30mA
Peak Forward Current 1/10 duty cycle, 0.1ms Pulse Width	Peak I _f	100mA
Power Dissipation	P _d	80mW
Operating Temperature Range	Topr	-25°C ~ 80°C
Storage Temperature Range	Tstg	-30°C ~ 85°C
Lead Soldering Temperature		260° for 5 seconds

● **Typical Electro-Optical Characteristics Curves**

Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

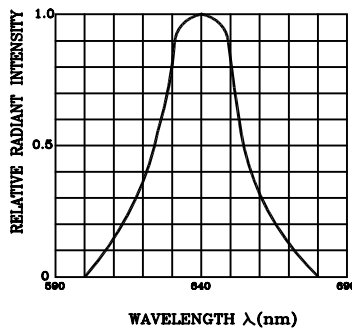


Fig.2 FORWARD CURRENT DERATING CURVE

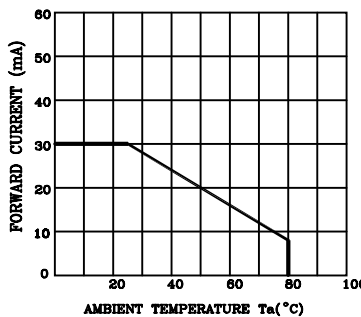


Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

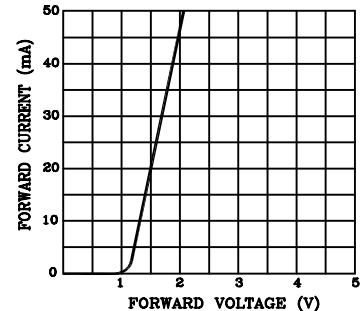


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

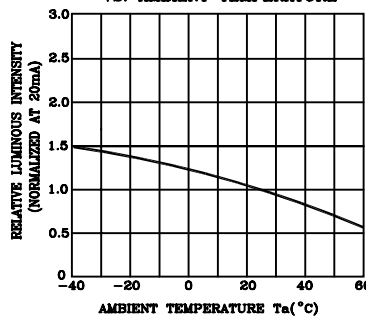


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

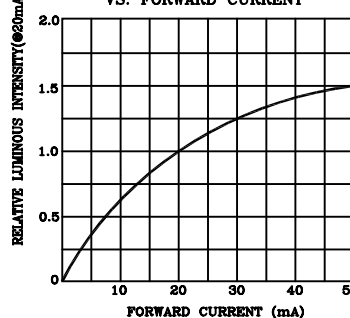
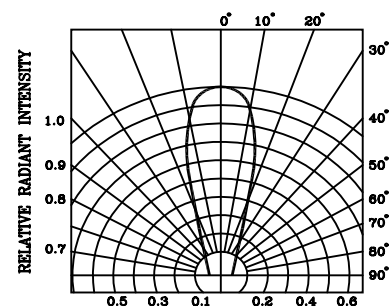
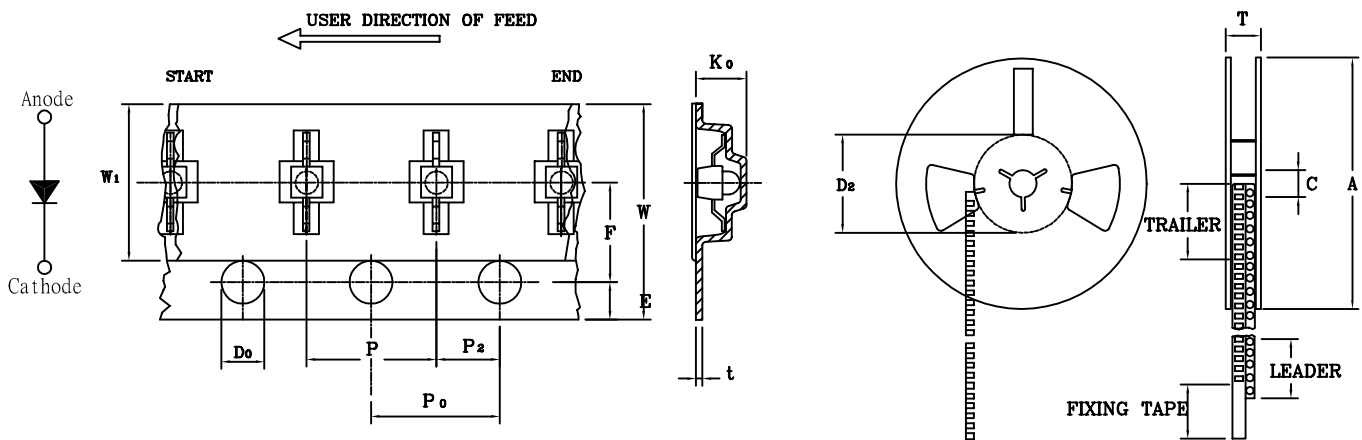


Fig.6 RADIATION DIAGRAM



● Taping and packaging specifications (Units: mm)

ITEM	SYMBOL	SPECIFICATION			
		Minimum		Maximum	
		mm	inch	mm	inch
Tape Feed Hole Diameter (DIA)	D_0	1.40	0.055	1.55	0.061
Feed Hole Location	E	1.65	0.065	1.85	0.072
Centers Line Dimensions Length Direction	F	5.45	0.215	5.55	0.218
Compartment Depth	K_0	3.00	0.118	3.20	0.126
Carrier Tape Overall Thickness	K	3.00	0.118	3.20	0.126
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	12.00	0.472	12.30	0.484
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	20.00	0.788	21.50	0.846
Fixing Tape Width	W_1	9.00	0.354	9.30	0.366
Flange Space Between Flanges	T	16.00	0.629	17.00	0.669
Compartment Length	A_0	1.87	0.074	2.07	0.081
Compartment Width	B_0	6.30	0.248	6.50	0.256



NOTE: 1500 pcs PER REEL

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 I = 20mA 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°C±5°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°C±5°C Test time = 1,000hrs	0/20
	Low Temperature Storage	JIS C 7021: B-12	Low T _a = -35°C±5°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°C ~ +25°C ~ +85°C ~ +25°C 60min. 20min. 60min. 20min. Test time = 5 cycles	0/20
	Thermal Shock	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011	-35°C±5°C ~ +85°C±5°C 20min. 20min. Test time = 10 cycles	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 10 seconds. (Max.)	0/20

JUDGEMENT CRITERIA OF FAILURE FOR THE RELIABILITY TEST

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V _f (V)	I _f = 20mA	Over U _x 1.2
Reverse current	I _r (uA)	V _r = 5V	Over U _x 2
Luminous intensity	I _v (mcd)	I _f = 20mA	Below S _x 0.5

Note: 1. U means the upper limit of specific 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.

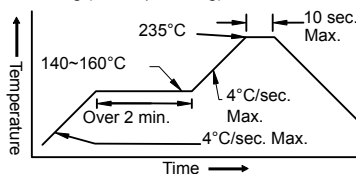
1. Soldering

Manual of Soldering

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

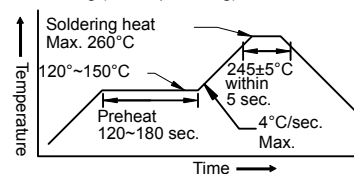
Reflow Soldering

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



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).



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 use of pointed 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