

**$I_V = 1500$  mcd,  $V_F = 3.2$  V  
Surface Mount LED  
SEP1P91407DTA**

**Description**

The SEP1P91407DTA is a surface mount orange LED. The product includes a protection diode for ESD protection.

**Features**

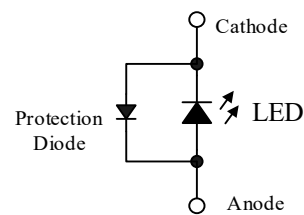
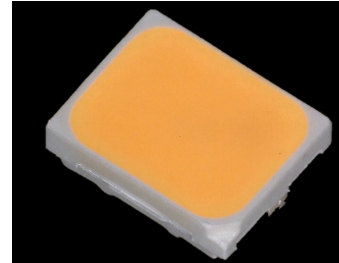
- Color-----Orange
- Luminous Intensity,  $I_V$ -- 1500 mcd (typ.) ( $I_F = 20$  mA)
- Forward Voltage,  $V_F$ ----- 3.2 V (typ.) ( $I_F = 20$  mA)
- Chromaticity (x, y)----- (0.562, 0.432)
- Viewing Angle,  $2\theta_{1/2}$ ----- 120 deg
- MSL 3
- RoHS Compliant
- Pb-free, Reflow Soldering
- High Reliability

**Applications**

- Automotive Interior
- Switch
- Indicator
- Backlight

**Package**

Dimensions (L × W × H): 3.5 × 2.8 × 1.2 mm



Not to scale

This product uses technology licensed from the National Institute for Materials Science (NIMS).  
This technology is protected by worldwide patents, including Japan Patent No. 3931239 owned by NIMS.

**Absolute Maximum Ratings**Unless specifically noted,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Rating	Unit
Power Dissipation	$P_D$		111	mW
Forward Current	$I_F$		30	mA
Forward Current Reduction	$\Delta I_F$	$T_A \geq 85\text{ }^\circ\text{C}$	-0.76	mA/ $^\circ\text{C}$
Pulse Forward Current	$I_{FP}$	Frequency = 1 kHz Pulse Width $\leq 100\text{ }\mu\text{s}$	100	mA
Reverse Current	$I_R$		10	mA
Operating Temperature	$T_{OP}$		-40 to 110	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		-40 to 110	$^\circ\text{C}$
Junction Temperature	$T_J$		115	$^\circ\text{C}$

**Electrical / Optical Characteristics**Unless specifically noted,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	$V_F$	$I_F = 20\text{ mA}$	—	3.2	3.7	V
Reverse Voltage	$V_R$	$I_R = 1\text{ mA}$	—	0.8	—	V
Luminous Intensity	$I_V$	$I_F = 20\text{ mA}$	1200	1500	1800	mcd
Chromaticity	x	$I_F = 20\text{ mA}$	—	0.562	—	—
	y		—	0.432	—	—
Dominant Wavelength	$\lambda_D$	$I_F = 20\text{ mA}$	—	588.5	—	nm
Viewing Angle	$2\theta_{1/2}$	$I_F = 20\text{ mA}$	—	120	—	deg
Thermal Resistance	$\theta_{(J-A)}$		—	150	—	$^\circ\text{C}/\text{W}$

**Mechanical Characteristics**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Package Weight		—	0.0271	—	g

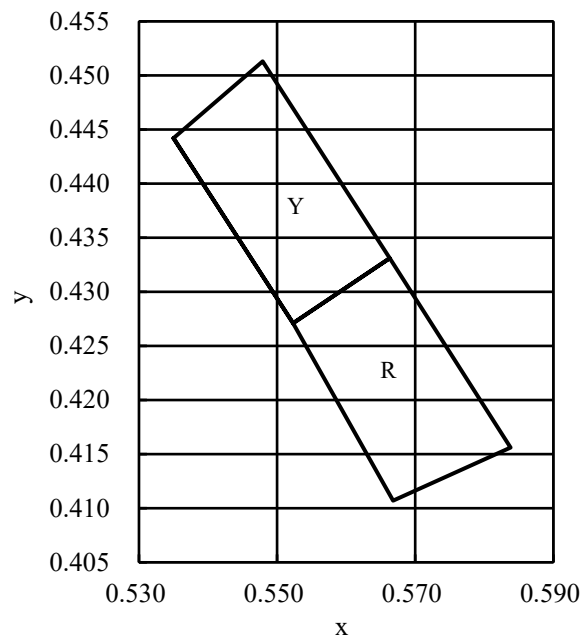
**Luminous Intensity Bins**The values have a tolerance of  $\pm 20\%$ .

Bin Number	Luminous Intensity Range	Unit
C	1200 to 1800	mcd

**Chromaticity Bins**

The values have a tolerance of  $\pm 0.01\%$ .

Bin Number	x	y
Y	0.5350	0.4442
	0.5479	0.4513
	0.5663	0.4331
	0.5523	0.4271
R	0.5523	0.4271
	0.5663	0.4331
	0.5838	0.4156
	0.5668	0.4107



Derating Curves

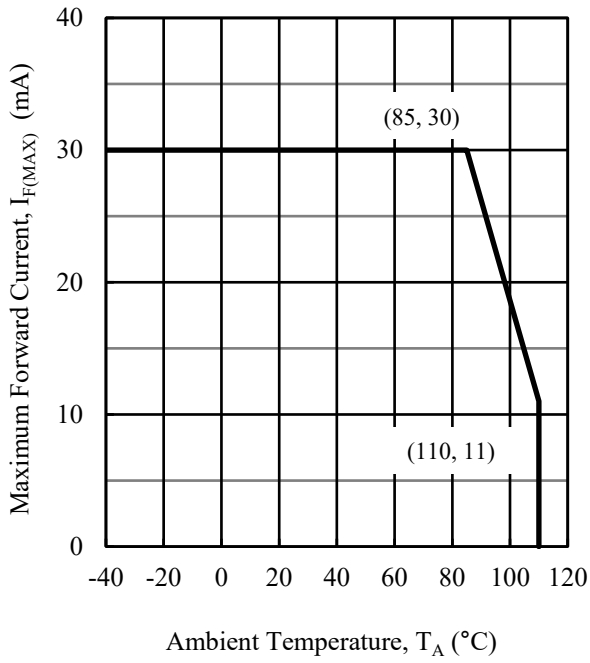


Figure 1.  $I_{F(MAX)}$  vs.  $T_A$

Characteristic Curves

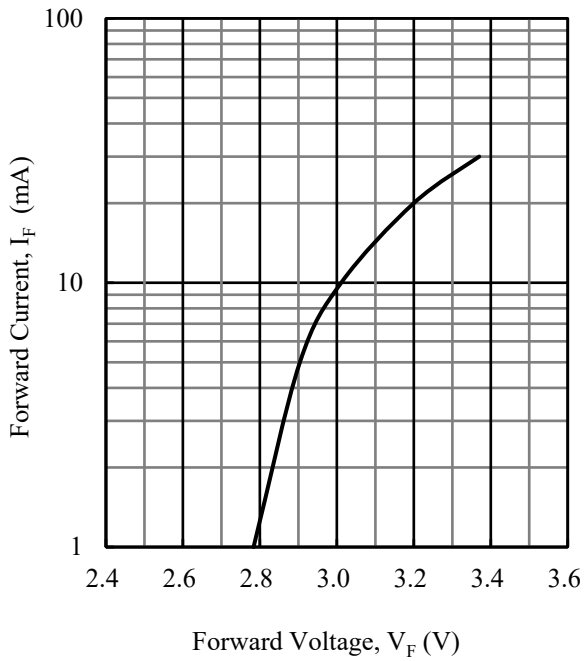


Figure 2.  $I_F$  vs.  $V_F$

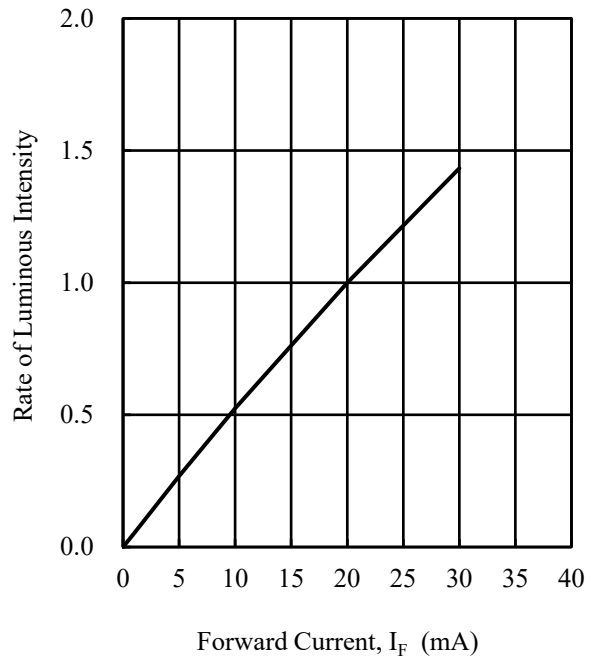


Figure 3. Rate of Luminous Intensity vs.  $I_F$

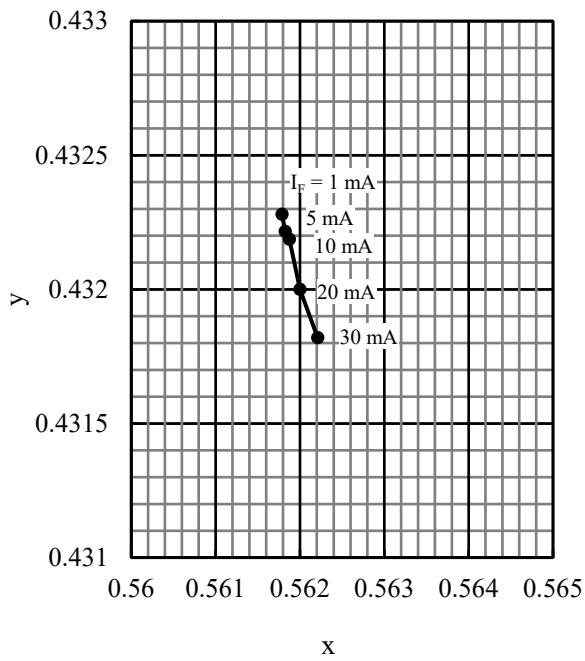


Figure 4.  $I_F$  vs. Chromaticity

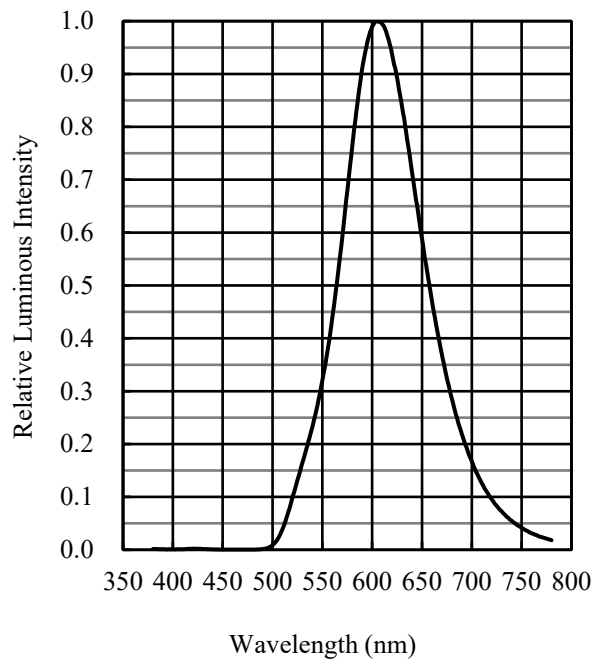


Figure 5. Spectrum

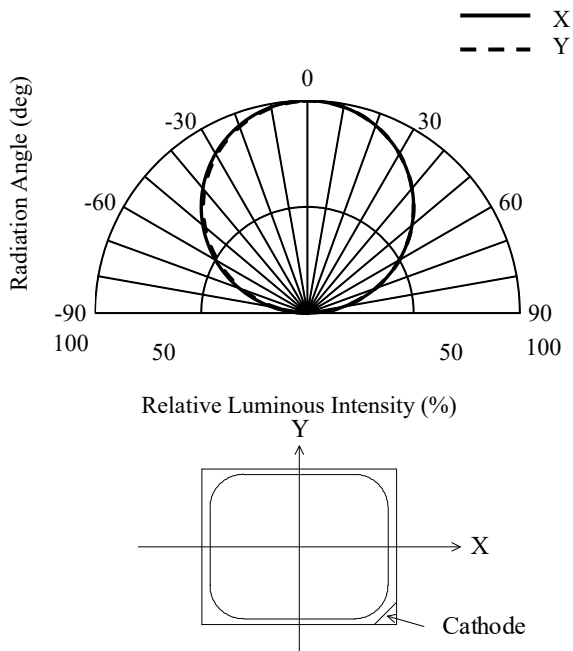
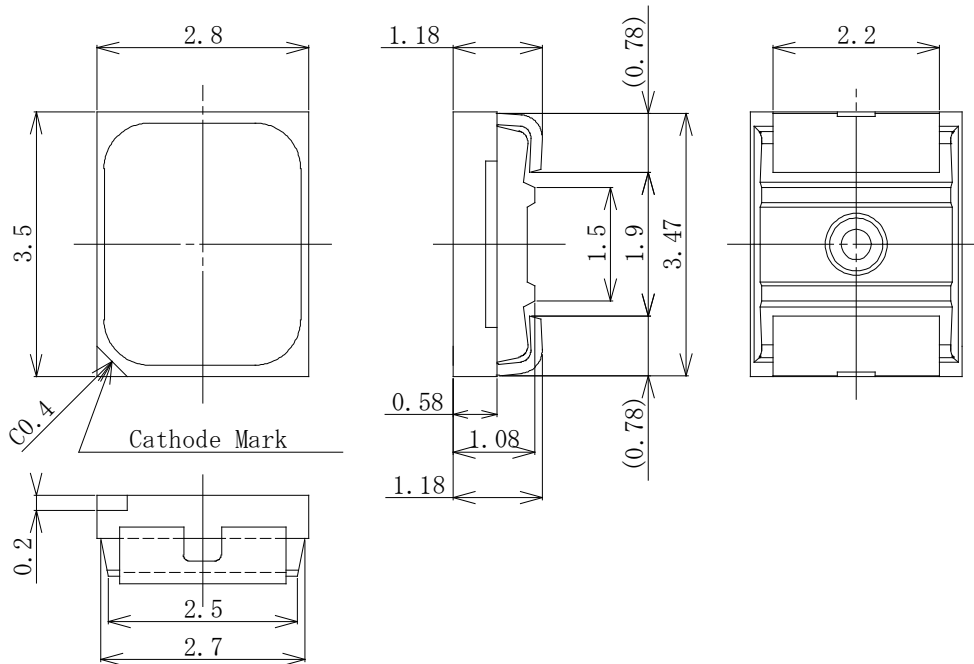


Figure 6. Directivity

Physical Dimensions

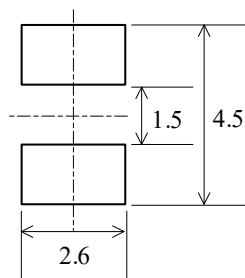
• Surface Mount (3.5 × 2.8 × 1.2 mm)



NOTES:

- Dimensions in millimeters
- Unless specifically noted, tolerance is  $\pm 0.2$ .
- RoHS compliant
- MSL 3 (Moisture Sensitivity Level 3)

• Land Pattern Example



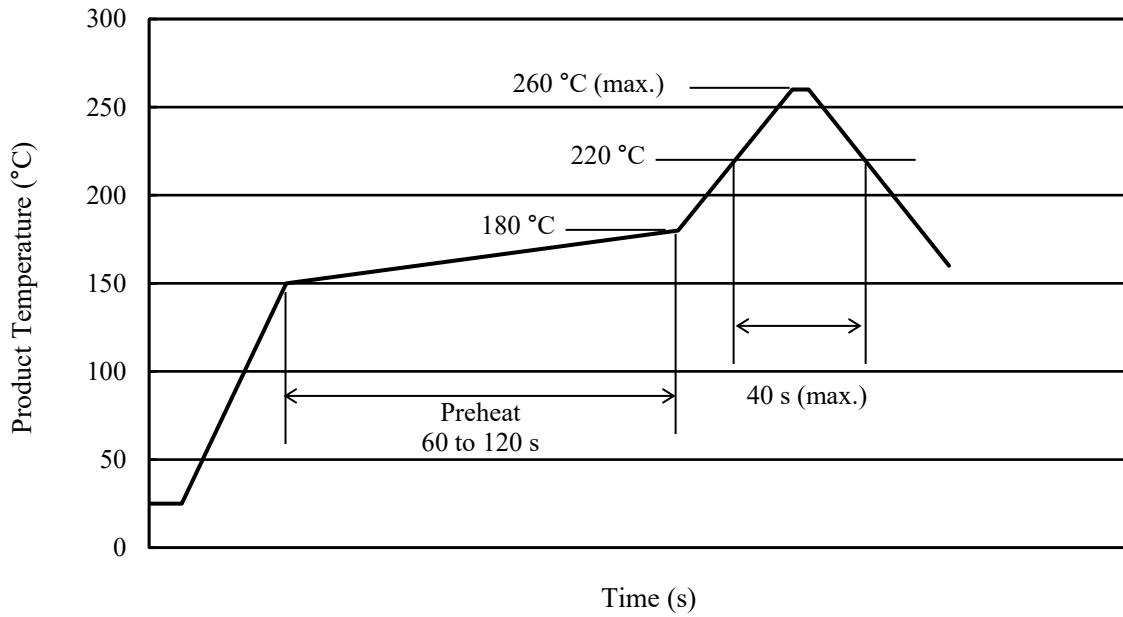
Unit: mm

### Soldering Conditions

When soldering the products, it is required to minimize the working time within the following limits:

- Reflow:
  - Preheat: 150 to 180 °C / 60 to 120 s
  - Solder heating: 220 °C / 40 s (260 °C peak, 2 times)
- Soldering iron: 350 ±10 °C / 3 s, 1 time

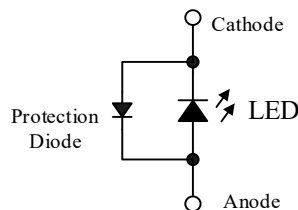
● Reference Reflow Profile



**Precautions for Use****• Measures for Electrostatic Discharge (ESD)**

Generally, InGaN-based elements such as blue LEDs are very sensitive to ESD. For enhanced ESD withstand capability, this product is designed to include a surge protection diode as shown in the figure below. Therefore, the following ESD withstand capabilities are ensured:  $\geq 200$  V on machine model ( $C = 200$  pF,  $R = 0 \Omega$ ), and  $\geq 2000$  V on human body model ( $C = 100$  pF,  $R = 1.5$  k $\Omega$ ). Note that, however, all the values mentioned above are not guaranteed.

When using the product, care should be taken not to apply a voltage in the opposite direction of the LED. If a voltage is applied in the opposite direction of the LED, the surge protection diode becomes conductive, and then an unintended current may flow through the set.

**• Other**

- After soldering the product, care should be taken not to apply mechanical stress or excessive vibration until it cools to room temperature.
- Do not cool the product rapidly.
- When mounting the product on a board, mounting position and orientation should be taken into account so that any stress due to board warpage is not applied to the product.
- Do not touch the encapsulating resin of the product with sharp objects such as a tweezer or fingernails. Also, do not use the product again after removal.
- Do not touch the product after mounting it on a board.
- The product emits a high-power light. Therefore, care should be taken not to look at the light emission directly for a long time because it may hurt your eyes.
- Use the product at rated current (sorting current) as much as possible. When the product is used at a current lower than the rated current (sorting current), a variation in forward voltage or luminous intensity may increase. Therefore, care should be taken for such variation when you use the product at low current.
- When the product comes into contact with material containing sulfide or is exposed to an atmosphere containing sulfide gas, the following may be caused: discoloration in the silver plating of the metal parts inside and outside the package; change in the brightness and tint of the original luminescent color.



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