

**$I_V = 1500$  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

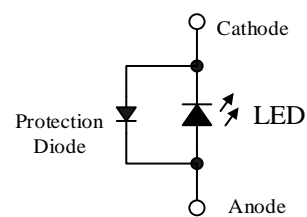
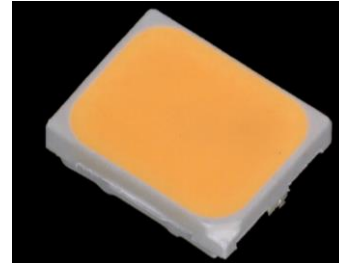
- Color-----Orange
- Luminous Intensity,  $I_V$ -- 1500 mcd (typ.) ( $I_F = 20$  mA)
- Forward Voltage,  $V_F$ ----- 3.2 V (typ.) ( $I_F = 20$  mA)
- Chromaticity (x, y)----- (0.562, 0.432)
- Viewing Angle,  $2\theta_{1/2}$ ----- 120 deg
- MSL 3
- RoHS Compliant
- Pb-free, Reflow Soldering
- High Reliability

## Applications

- Automotive Interior
- Switch
- Indicator
- Backlight

## Package

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



Not to scale

**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	—	$^{\circ}\text{C/W}$

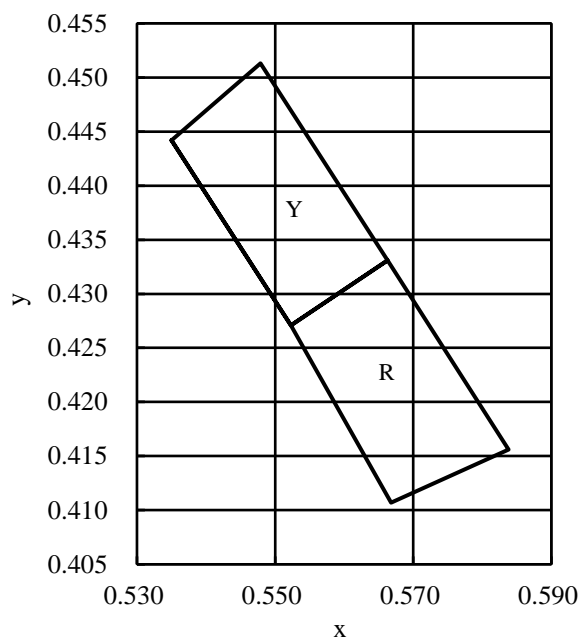
**Luminous Intensity Bins**The values have a tolerance of  $\pm 20\%$ .

Bin Number	Luminous Intensity Range	Unit
C	1200 to 1800	mcd

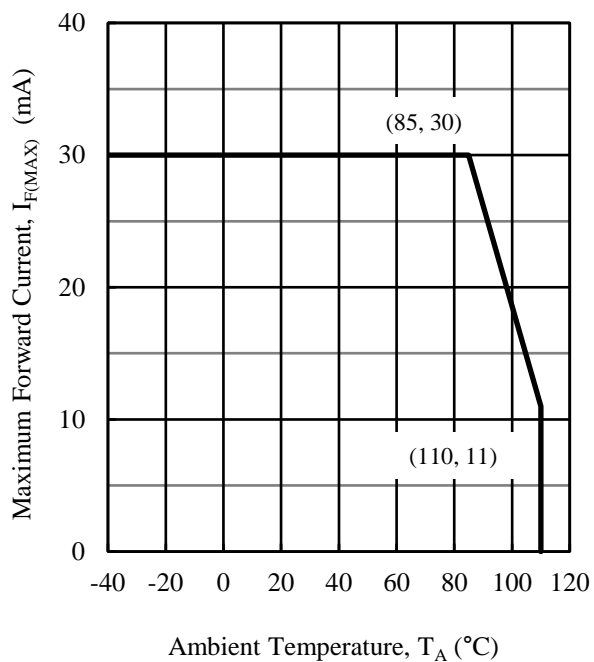
## Chromaticity Bins

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

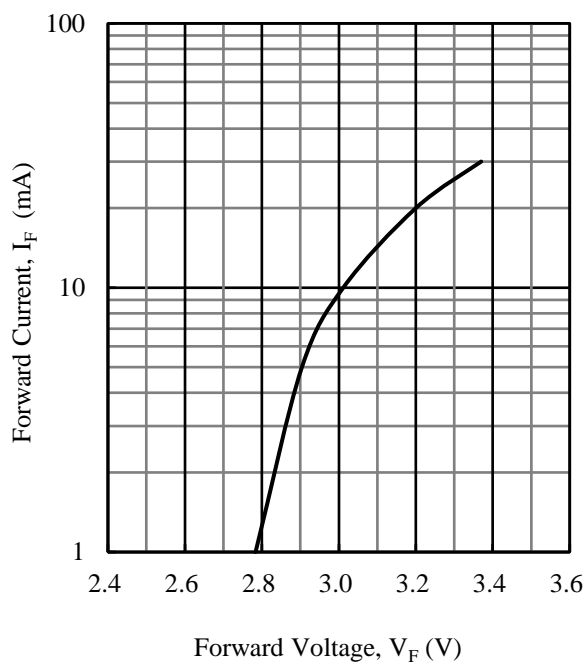
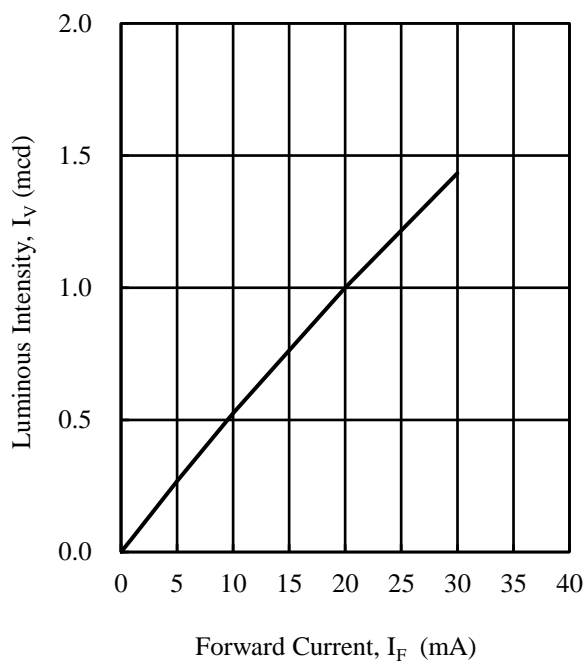
Bin Number	x	y
Y	0.5350	0.4442
	0.5479	0.4513
	0.5663	0.4331
	0.5523	0.4271
R	0.5523	0.4271
	0.5663	0.4331
	0.5838	0.4156
	0.5668	0.4107



## Derating Curves

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

## Characteristic Curves

Figure 2.  $I_F$  vs.  $V_F$ Figure 3.  $I_V$  vs.  $I_F$

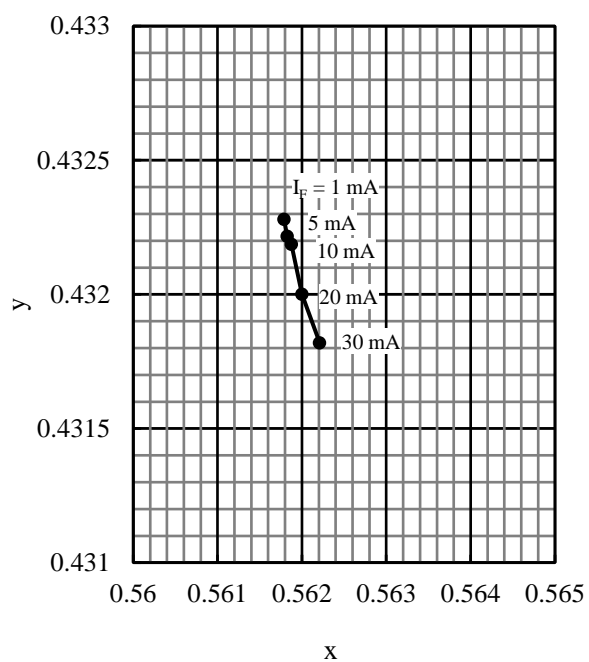
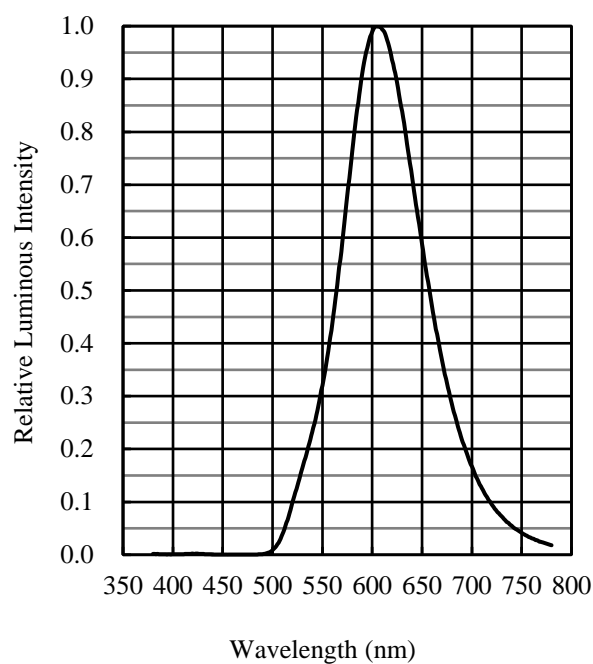
Figure 4.  $I_F$  vs. Chromaticity

Figure 5. Spectrum

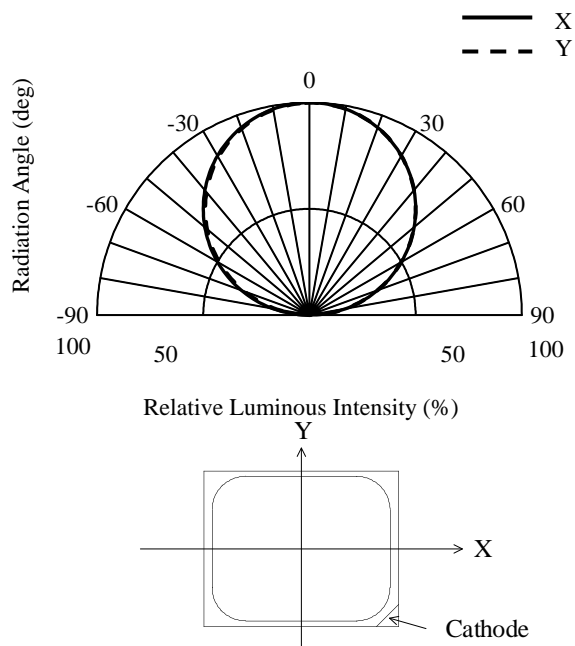
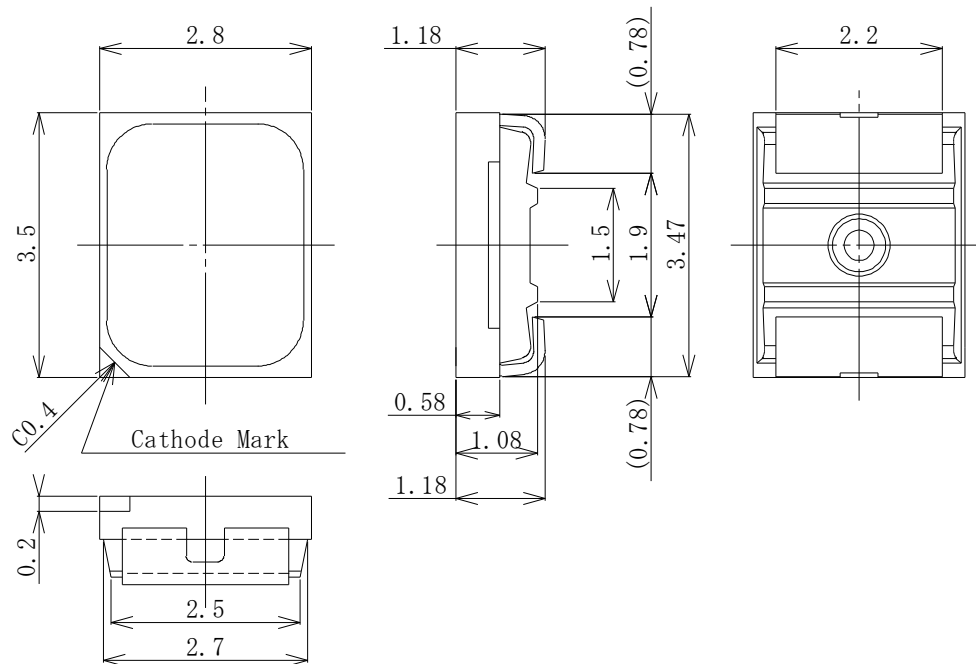


Figure 6. Directivity

## Physical Dimensions

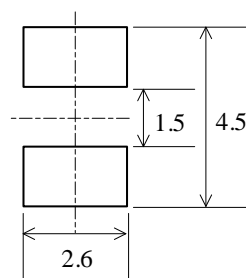
### • Surface Mount (3.5 × 2.8 × 1.2 mm)



### NOTES:

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

### • Land Pattern Example



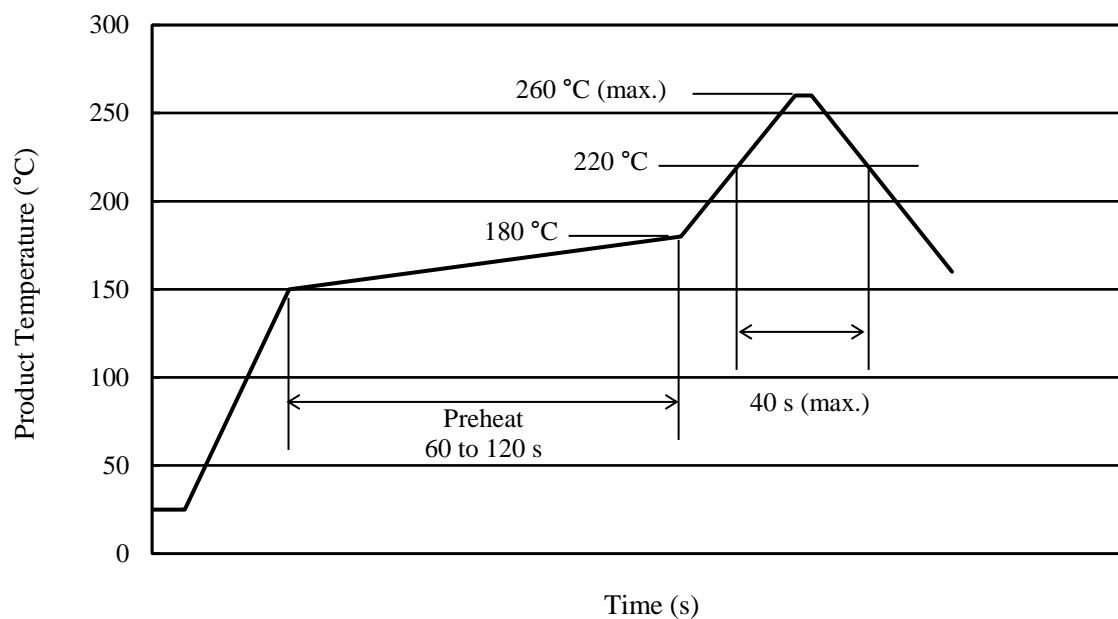
Unit: mm

## 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

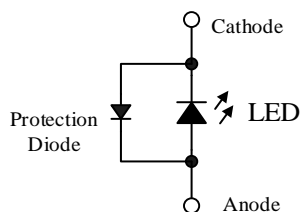
### ● Reference Reflow Profile



**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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