I_V = 1500 mcd, V_F = 3.2 V
Surface Mount LED

SEP1P91407DTA

Data Sheet

Description

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

Features

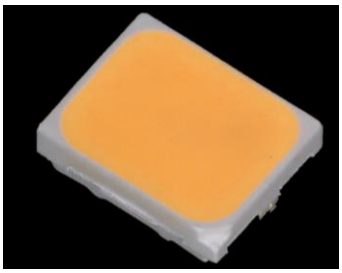
- Color ----------Orange
- Luminous Intensity, I_V -- 1500 mcd (typ.) (I_F = 20 mA)
- Forward Voltage, V_F --------- 3.2 V (typ.) (I_F = 20 mA)
- Chromaticity (x, y) ----------(0.562, 0.432)
- Viewing Angle, $2\theta_{1/2}$ ---------- 120 deg
- MSL 3
- RoHS Compliant
- Pb-free, Reflow Soldering
- High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

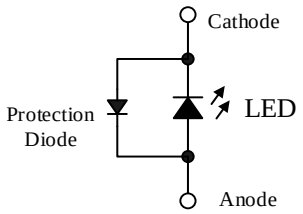
Applications

- Automotive Interior
- Switch
- Indicator
- Backlight

Package

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





Not to scale

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This technology is protected by worldwide patents, including Japan Patent No. 3931239 owned by NIMS.

Absolute Maximum Ratings

Unless specifically noted, T_A = 25 °C.

Parameter	Symbol	Conditions	Rating	Unit
Power Dissipation	P_D		111	mW
Forward Current	I_F		30	mA
Forward Current Reduction	ΔI_F	$T_A \geq 85$ °C	−0.76	mA/°C
Pulse Forward Current	I_{FP}	Frequency = 1 kHz Pulse Width ≤ 100 µs	100	mA
Reverse Current	I_R		10	mA
Operating Temperature	T_{OP}		−40 to 110	°C
Storage Temperature	T_{STG}		−40 to 110	°C
Junction Temperature	T_J		115	°C

Electrical / Optical Characteristics

Unless specifically noted, T_A = 25 °C.

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

Luminous Intensity Bins

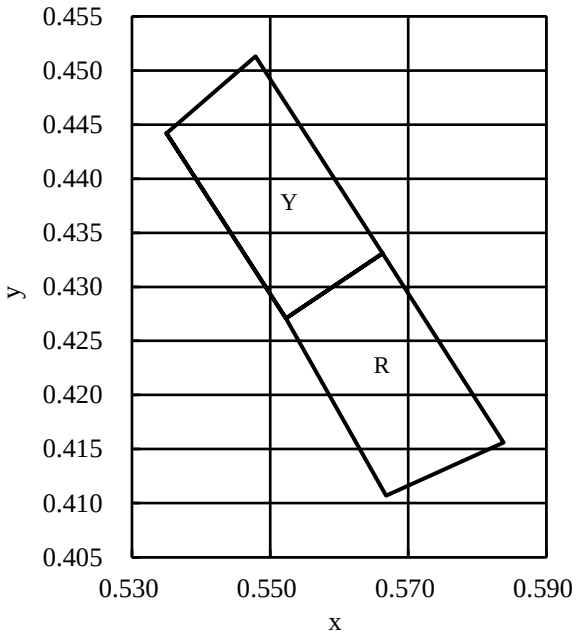
The values have a tolerance of ±20%.

Bin Number	Luminous Intensity Range	Unit
C	1200 to 1800	mcd

Chromaticity Bins

The values have a tolerance of ±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

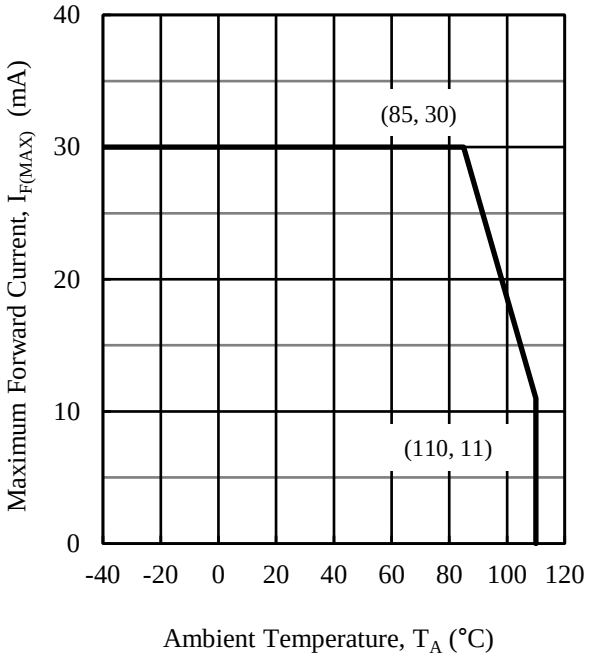


Figure 1. $I_{F(MAX)}$ vs. T_A

Characteristic Curves

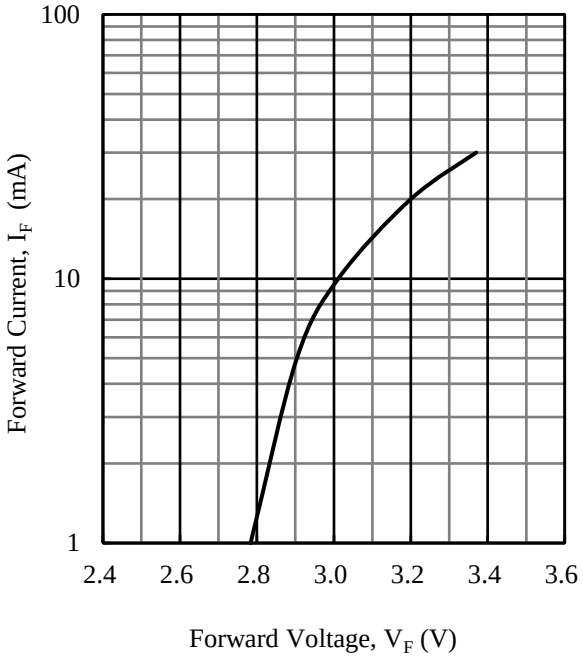


Figure 2. I_F vs. V_F

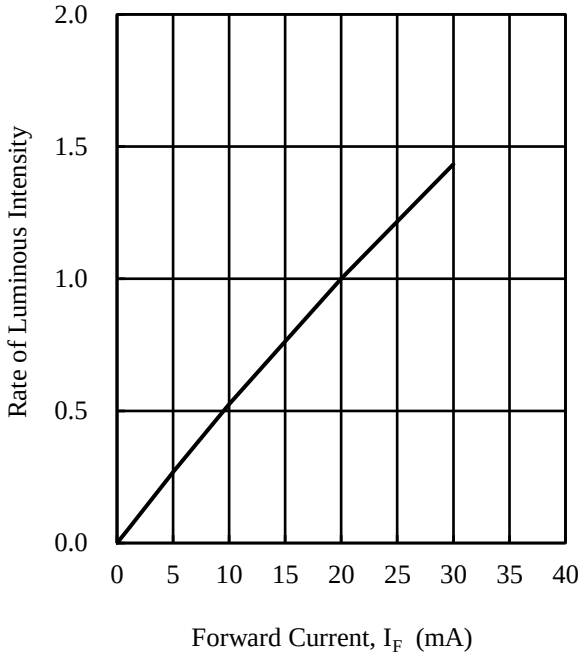


Figure 3. Rate of Luminous Intensity vs. I_F

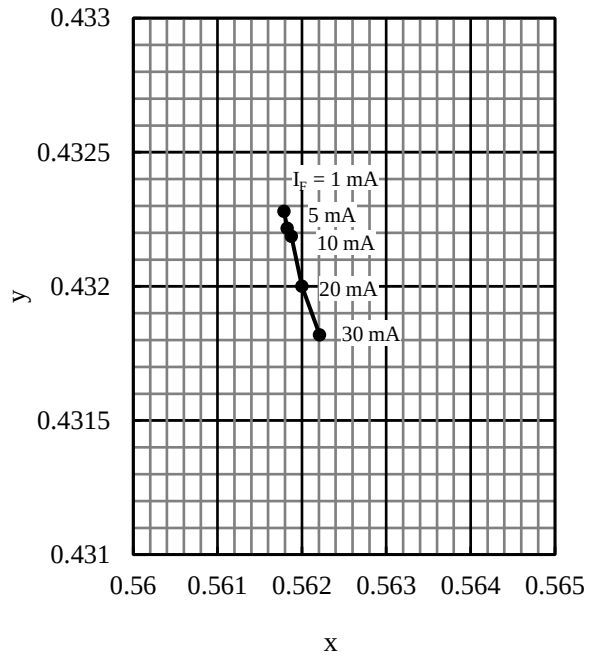


Figure 4. I_F vs. Chromaticity

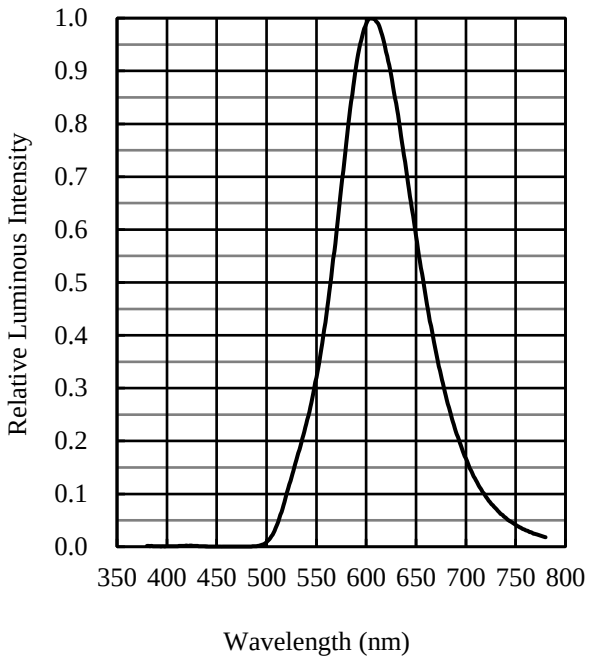


Figure 5. Spectrum

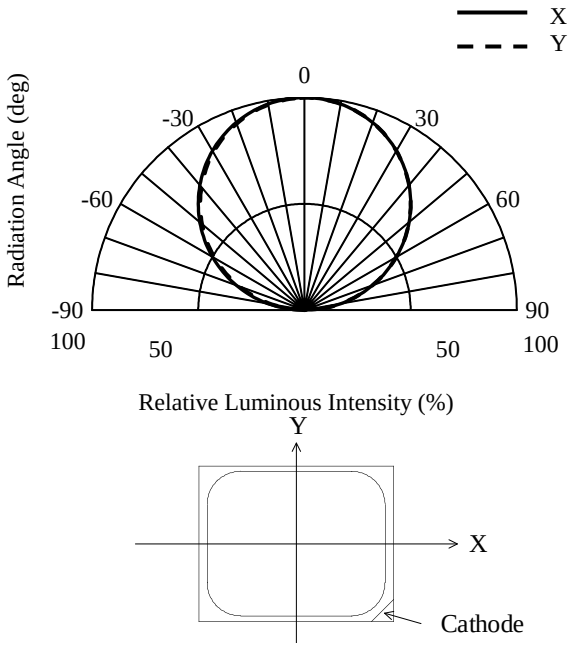
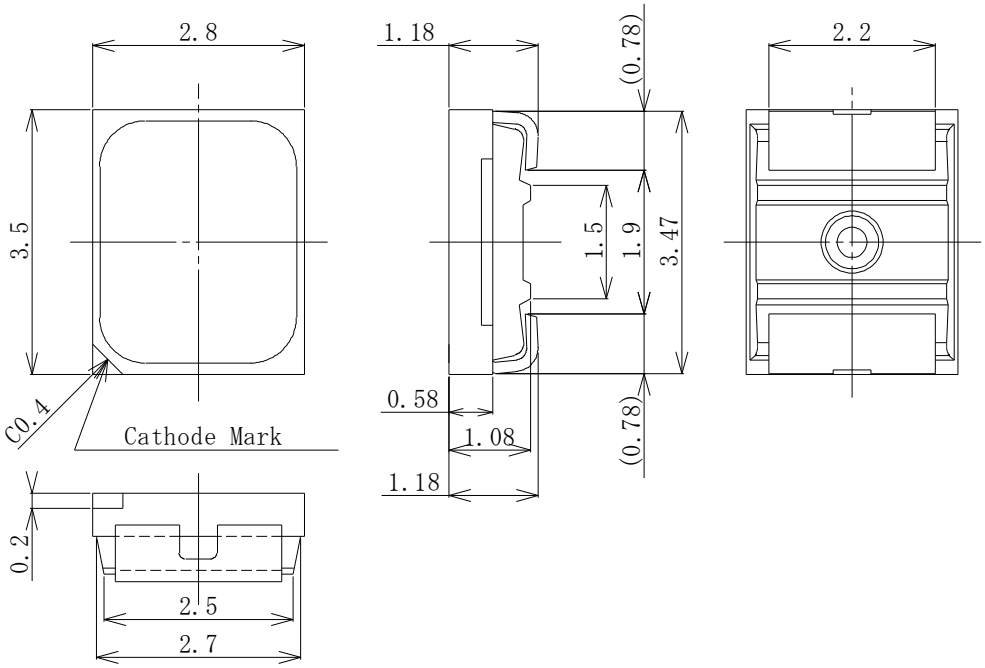


Figure 6. Directivity

Physical Dimensions

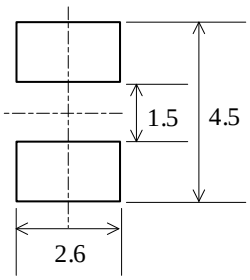
● **Surface Mount (3.5 × 2.8 × 1.2 mm)**



NOTES:

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

● Land Pattern Example



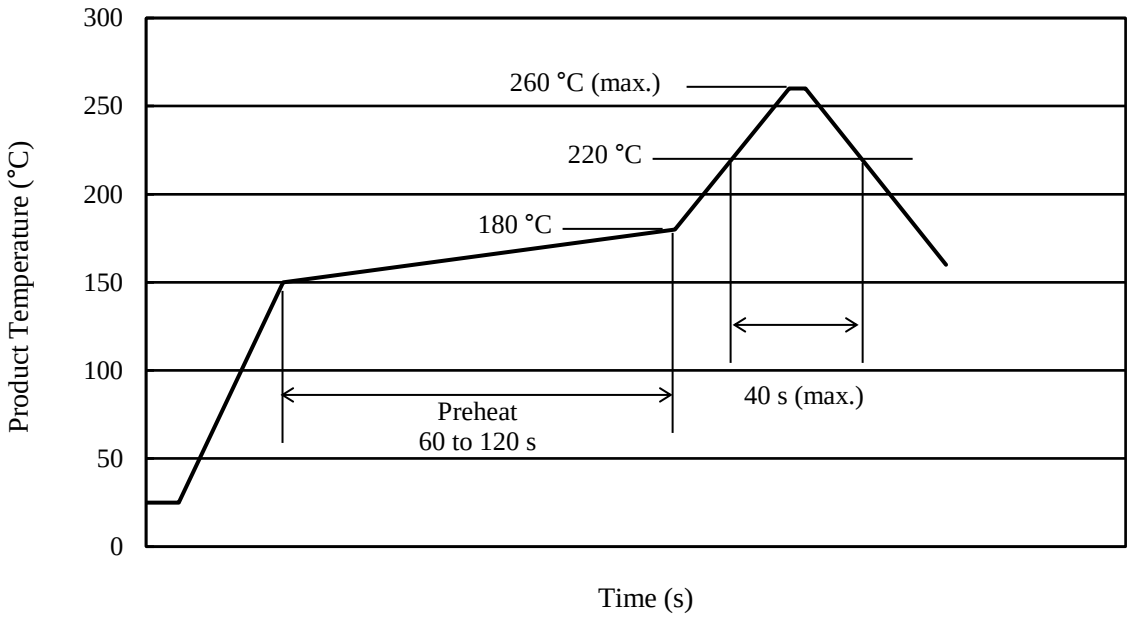
Unit: mm

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**

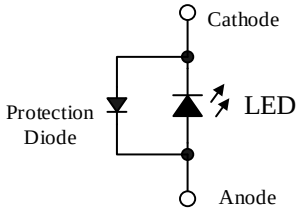


Precautions for Use

● **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: ≥200 V on machine model (C = 200 pF, R = 0 Ω), and ≥2000 V on human body model (C = 100 pF, R = 1.5 kΩ). 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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