

**$I_V = 550$  mcd,  $V_F = 2.9$  V  
Surface Mount LED  
SEP1E1404**



**Data Sheet**

**Description**

The SEP1E1404 is a surface mount blue LED.

**Package**

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

**Features**

- Color ----- Blue
- Luminous Intensity,  $I_V$ ----550 mcd (typ.) ( $I_F = 20$  mA)
- Forward Voltage,  $V_F$ ----- 2.9 V (typ.) ( $I_F = 20$  mA)
- Dominant Wavelength,  $\lambda_D$  ----- 471 nm
- Viewing Angle,  $2\theta_{1/2}$ ----- 120 deg
- MSL 3
- RoHS Compliant
- Pb-free, Reflow Soldering
- High Reliability



**Applications**

- Switch
- Indicator
- Backlight



(1) Cathode  
(2) Anode

Not to scale

## Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Power Dissipation	$P_D$		120	mW
Forward Current	$I_F$		30	mA
Forward Current Reduction	$\Delta I_F$	$T_A \geq 60\text{ }^\circ\text{C}$	-0.6	mA/ $^\circ\text{C}$
Pulse Forward Current	$I_{FP}$	Frequency = 1 kHz Pulse Width $\leq 100\text{ }\mu\text{s}$	70	mA
Reverse Voltage	$V_R$		3	V
Operating Temperature	$T_{OP}$		-40 to 85	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		-40 to 100	$^\circ\text{C}$
Junction Temperature	$T_J$		100	$^\circ\text{C}$

## Electrical / Optical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	$V_F$	$I_F = 20\text{ mA}$	—	2.9	3.6	V
Reverse Current	$I_R$	$V_R = 3\text{ V}$	—	—	10	$\mu\text{A}$
Luminous Intensity	$I_V$	$I_F = 20\text{ mA}$	387	550	840	mcd
Dominant Wavelength	$\lambda_D$	$I_F = 20\text{ mA}$	—	471	—	nm
Viewing Angle	$2\theta_{1/2}$	$I_F = 20\text{ mA}$	—	120	—	deg
Thermal Resistance	$\theta_{(J-A)}$		—	175	—	$^\circ\text{C}/\text{W}$

## Luminous Intensity Bins

The values have a tolerance of  $\pm 20\%$ .

Bin Number	Luminous Intensity Range	Unit
C	387 to 630	mcd
D	630 to 840	mcd

## Wavelength Bins

The values have a tolerance of  $\pm 2\text{ nm}$ .

Bin Number	Wavelength Range	Unit
B	463 to 471	nm
G	471 to 478	nm

Derating Curves

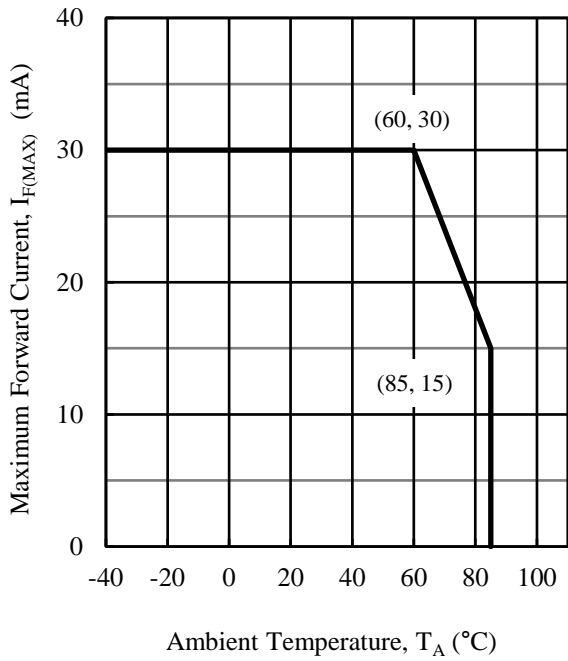


Figure 1.  $I_{F(MAX)}$  vs.  $T_A$

Performance Curves

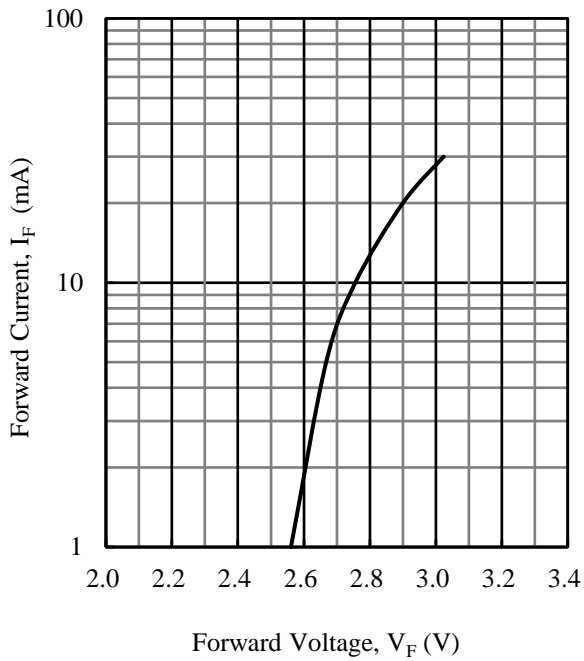


Figure 2.  $I_F$  vs.  $V_F$

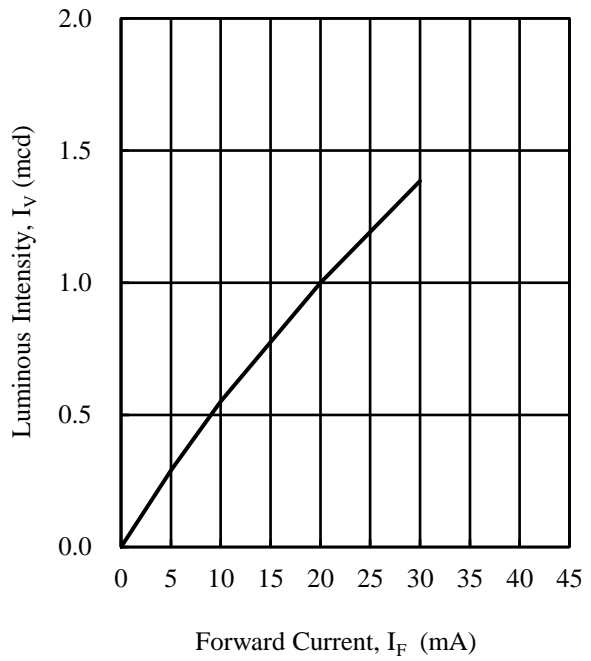


Figure 3.  $I_V$  vs.  $I_F$

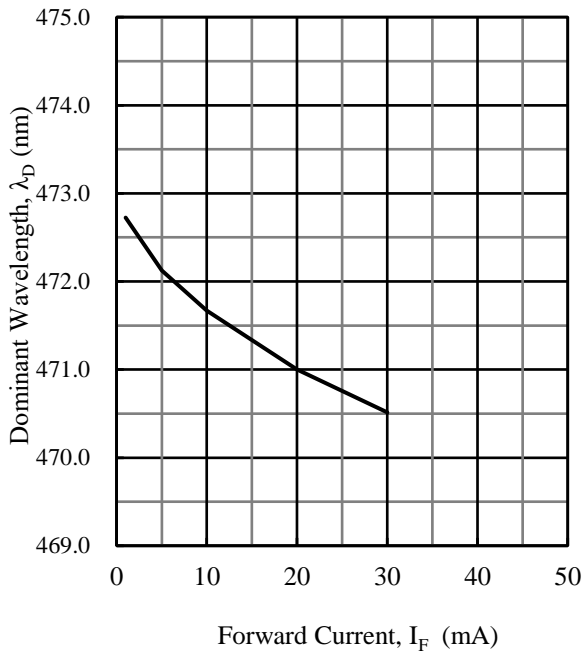


Figure 4.  $\lambda_D$  vs.  $I_F$

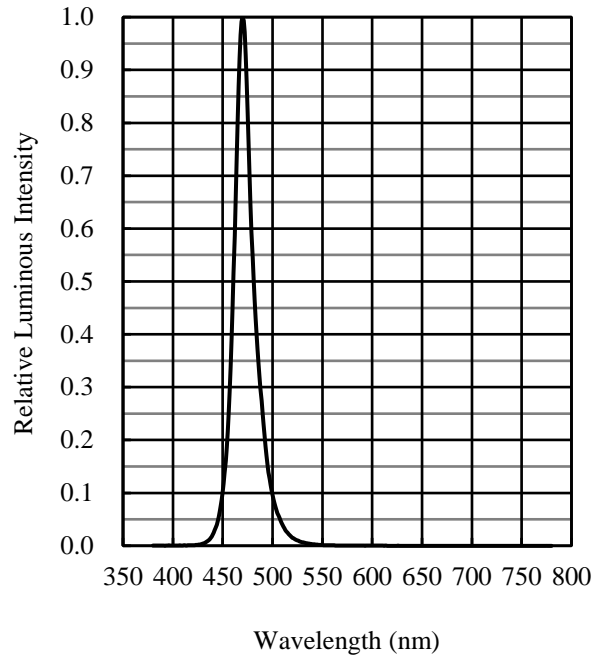


Figure 5. Spectrum

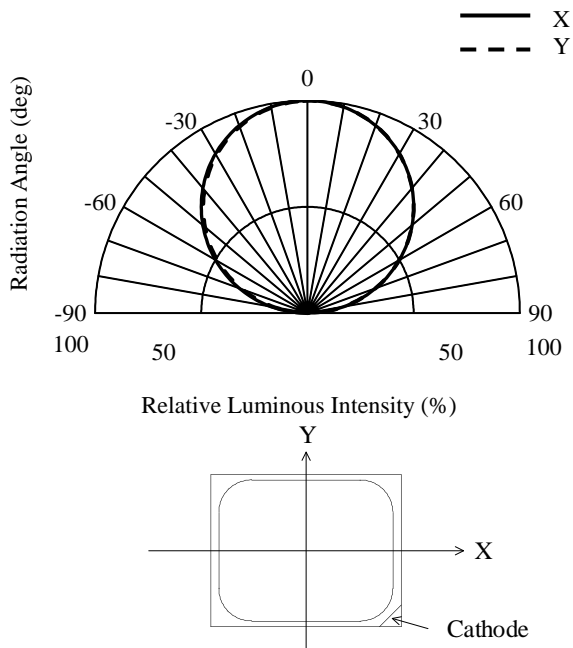
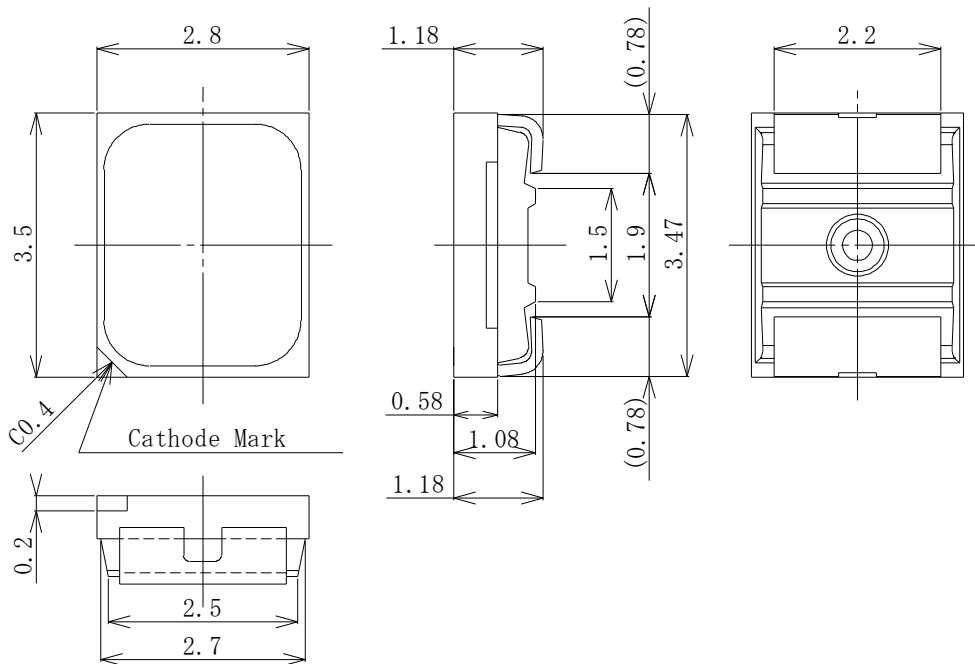


Figure 6. Directivity

Physical Dimensions

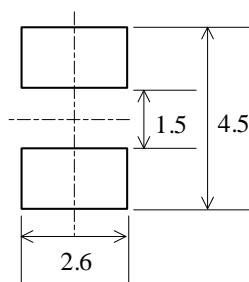
- Surface Mount (3.5 × 2.8 × 1.2 mm)



NOTES:

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

- Land Pattern Example



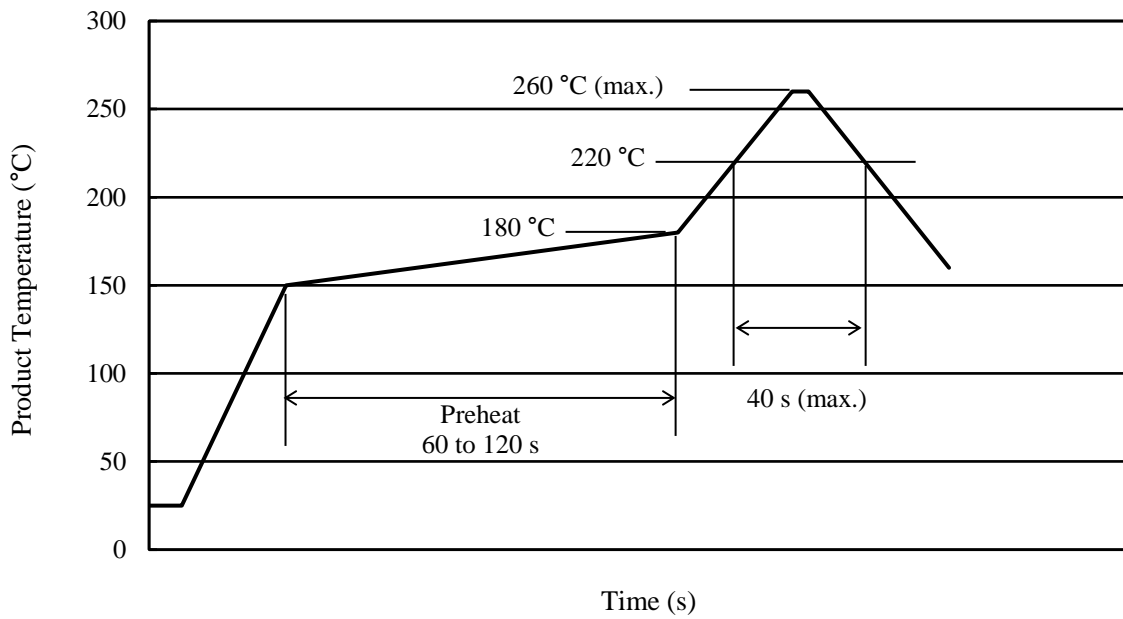
Unit: mm

### 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



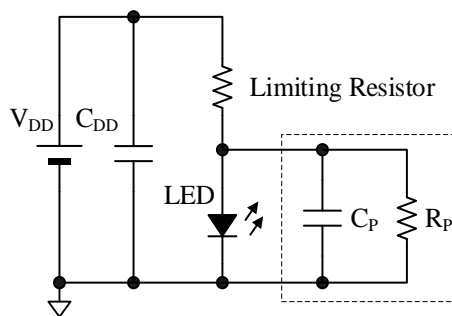
## Precautions for Use

### • Measures for Electrostatic Discharge (ESD)

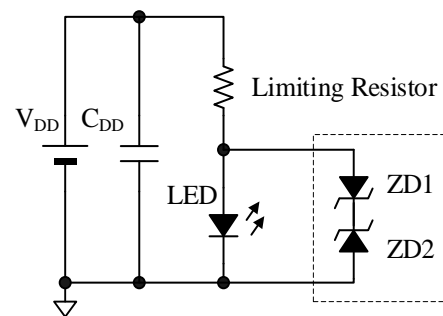
Because this product is sensitive to ESD, it is necessary to take adequate measures against ESD and surge for safe and proper handling. In particular, note that when a voltage that exceeds the absolute maximum rating is applied, the product may be damaged.

### • Reference Protection Circuits for Electrostatic Discharge and Surge

The following figures show reference protection circuits that prevent the product from any damage due to ESD or surge. Note that these circuits are only examples; therefore, be sure to check the ESD and surge levels in your actual system and to take appropriate measures (e.g., adding a part) as needed.



Example of Adding Filter  
( $C_P \geq 0.01 \mu\text{F}$ ,  $R_P = 10 \text{ k}\Omega$ )



Example of Adding Zener Diodes  
(ZD1, ZD2:  $V_Z = 7 \text{ V to } 8 \text{ V}$ )

### • 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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