

Description

The SEP1WB1416DA is a surface mount white LED. The product includes a protection diode for ESD protection.

Features

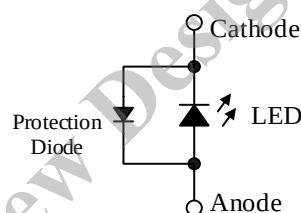
- Color----- White
- Luminous Intensity, I_V -- 2900 mcd (typ.) ($I_F = 20 \text{ mA}$)
- Forward Voltage, V_F ----- 3.2 V (typ.) ($I_F = 20 \text{ mA}$)
- Chromaticity (x, y)----- (0.315, 0.310)
- Viewing Angle, $2\theta_{1/2}$ ----- 120 deg
- MSL 3
- RoHS Compliant
- Pb-free, Reflow Soldering
- High Reliability

Applications

- Automotive Interior
- Switch
- Indicator

Package

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



Not to scale

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

Parameter	Symbol	Conditions	Rating	Unit
Power Dissipation	P_D		166	mW
Forward Current	I_F		45	mA
Forward Current Reduction	ΔI_F	$T_A \geq 87\text{ }^{\circ}\text{C}$	-1.52	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		120	$^{\circ}\text{C}$

Electrical / Optical CharacteristicsUnless 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	$I_F = 20\text{ mA}$	2010	2900	4180	mcd
Chromaticity	x	$I_F = 20\text{ mA}$	—	0.315	—	—
	y		—	0.310	—	—
Viewing Angle	$2\theta_{1/2}$	$I_F = 20\text{ mA}$	—	120	—	deg
Thermal Resistance	$\theta_{(J-A)}$		—	155	—	$^{\circ}\text{C/W}$

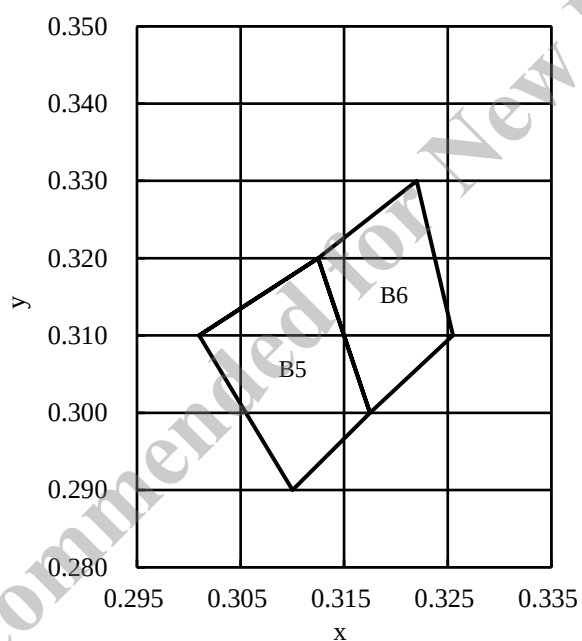
Luminous Intensity BinsThe values have a tolerance of $\pm 20\%$.

Bin Number	Luminous Intensity Range	Unit
C	2010 to 2900	mcd
D	2900 to 4180	mcd

Chromaticity Bins

The values have a tolerance of ± 0.01 .

Bin Number	x	y
B5	0.3010	0.3100
	0.3100	0.2900
	0.3175	0.3000
	0.3125	0.3200
B6	0.3125	0.3200
	0.3175	0.3000
	0.3255	0.3100
	0.3220	0.3300



Derating Curves

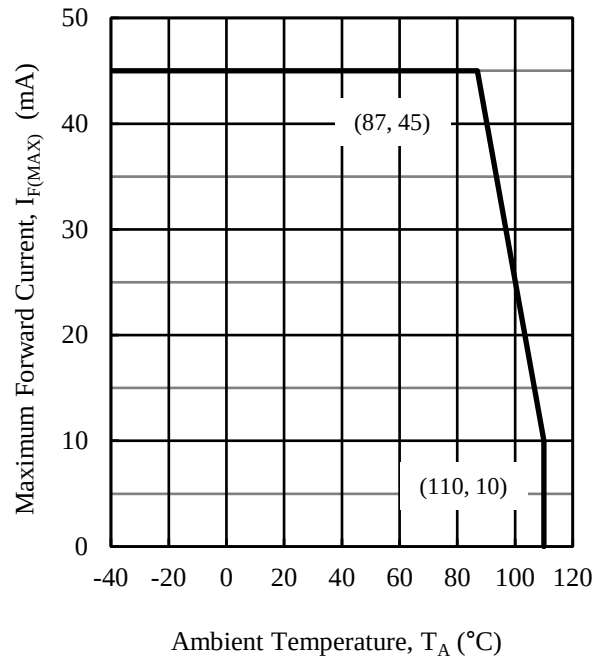


Figure 1. $I_{F(MAX)}$ vs. T_A

Characteristic Curves

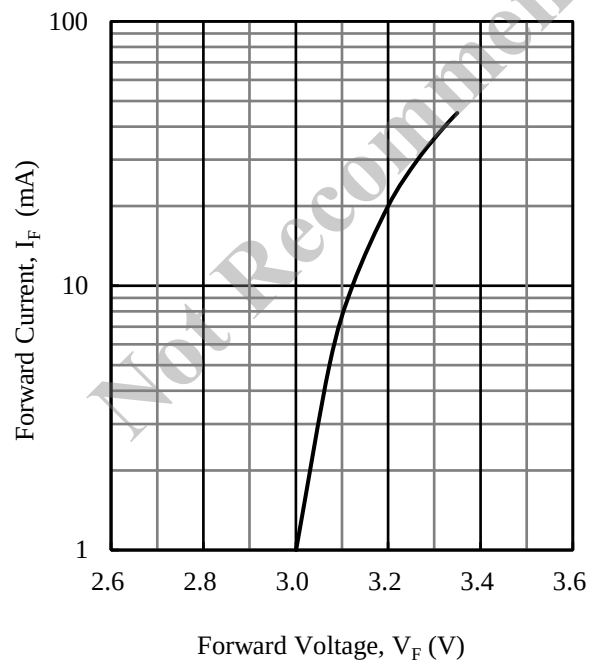


Figure 2. I_F vs. V_F

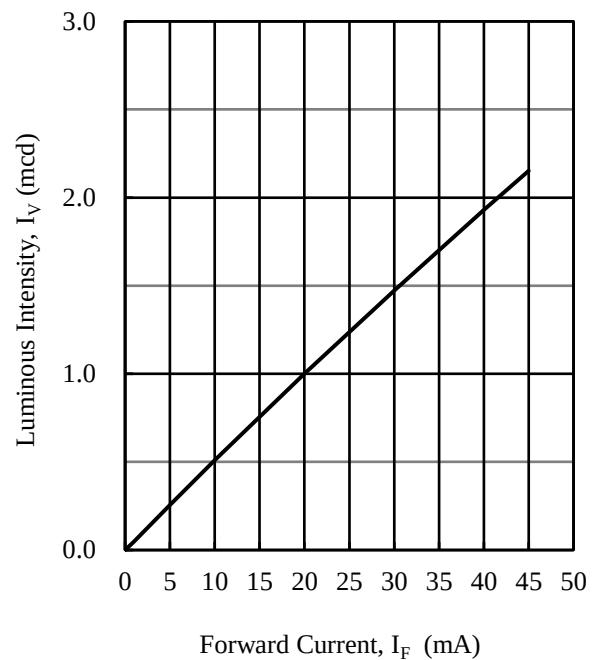


Figure 3. I_V vs. I_F

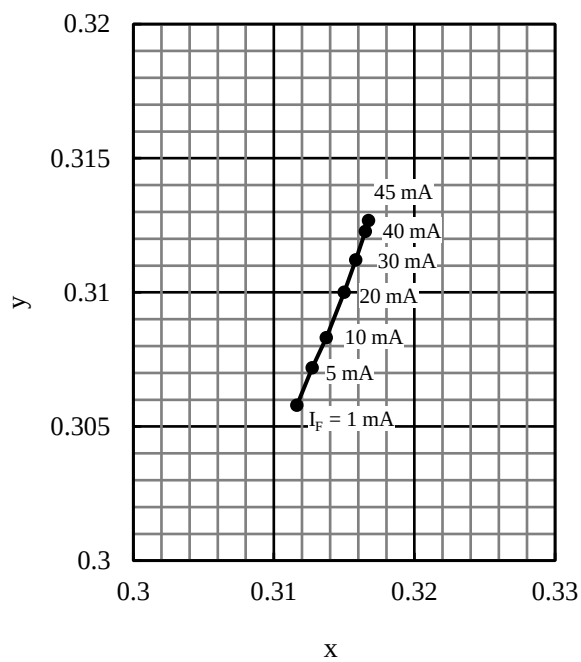
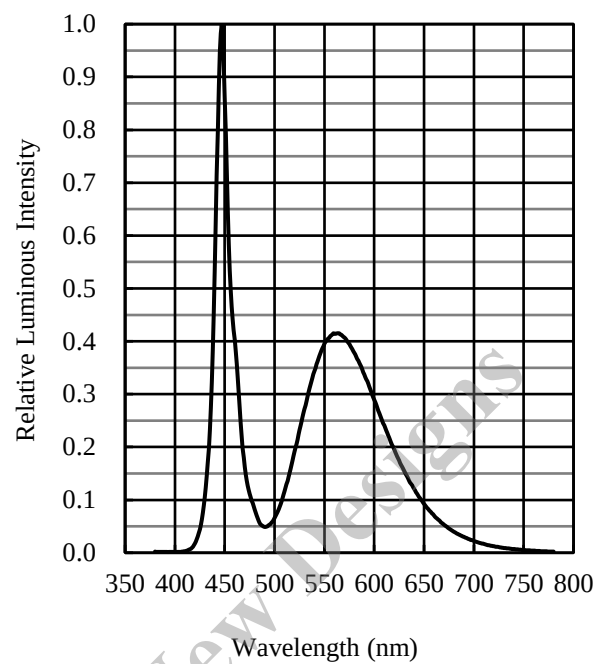
Figure 4. I_F vs. Chromaticity

Figure 5. Spectrum

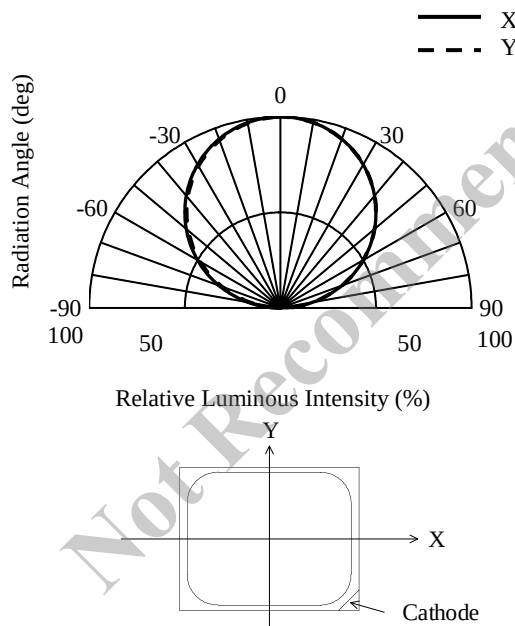
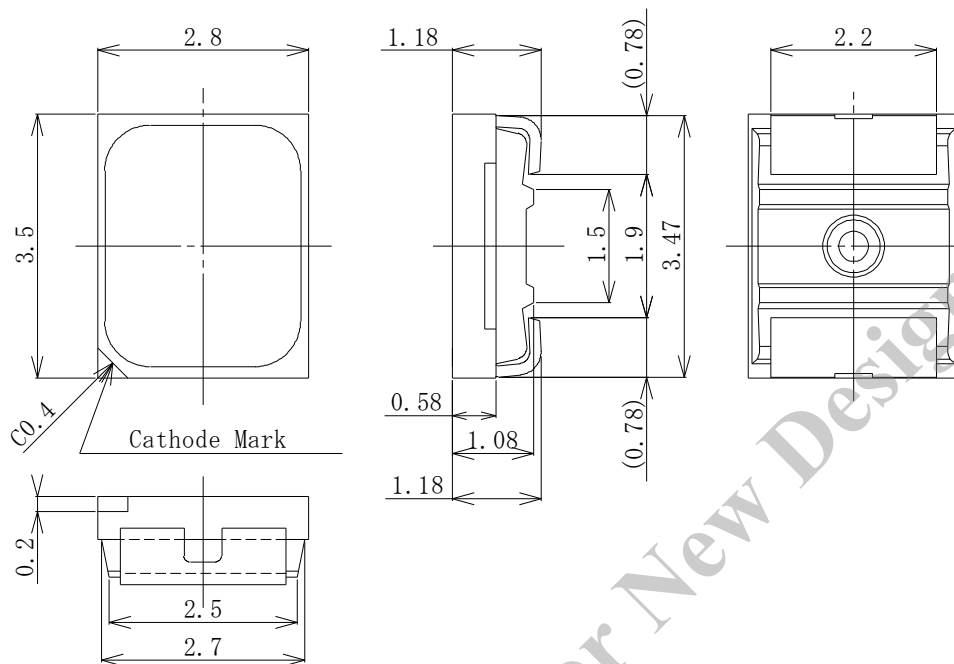


Figure 6. Directivity

Physical Dimensions

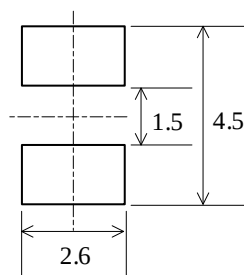
• Surface Mount (3.5 × 2.8 × 1.2 mm)



NOTES:

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

• Land Pattern Example



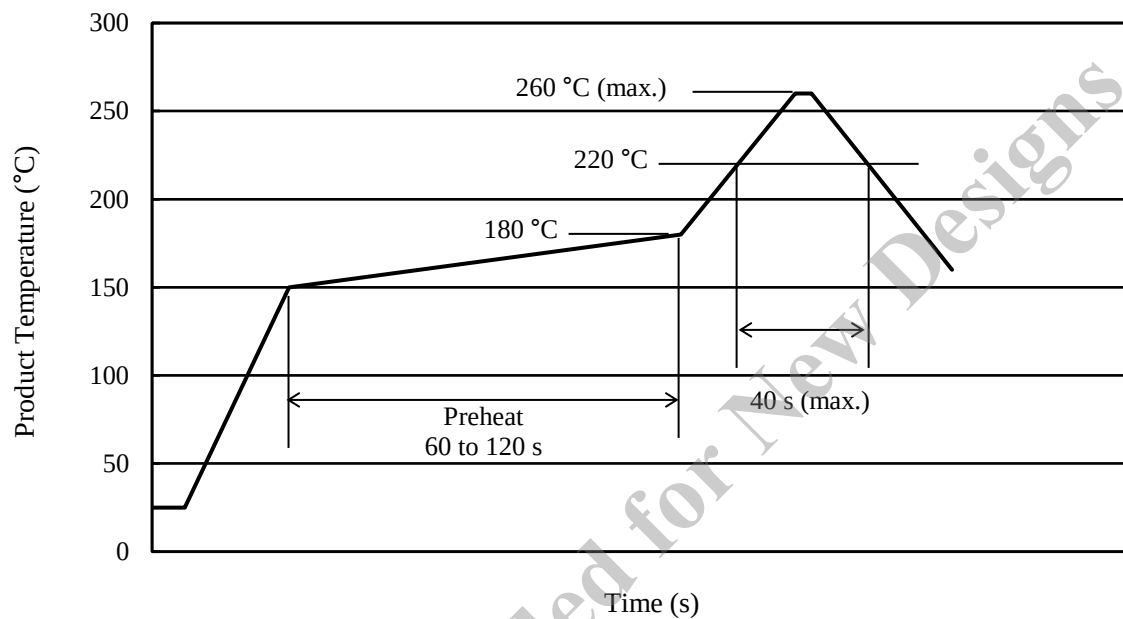
Unit: mm

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

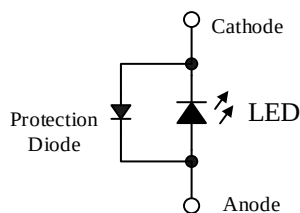


Precautions for Use

• 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, $R = 0 \Omega$), and ≥ 2000 V on human body model ($C = 100$ pF, $R = 1.5$ k Ω). 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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