LED – White3535

Product Brief

Description

•The product is White - LED.

•Package Size :3.5x3.5x3.0mm.

•The package design coupled with careful selection of component materials allow these products to perform with high reliability.

Features and Benefits

•High optical output power

•Long life and low light attenuation

•Environmental protection, energy saving and high reliability

•Durable, shock-proof, easy to design, suitable for multi-field applications

•Pb-free Reflow Soldering Application

Key Applications

•Plant lighting

•Outdoor lighting

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Performance Characteristics

Table 1. Product Selection Guide, White I_F=300mA, Ta= 25ºC, RH30%

Part Number	CCT(K)		RANK	Forward Voltage[1]		RANK	Luminous Intensity	
				VF(V)			I_V(lm)	
	Min	Max		Min	Max		Min	Max
White	2700	6500	V28	2.7	3.3	C1	140	180

Notes :

(1) Indo Japan maintains a tolerance of ±0.1V on Forward Voltage measurements.

(2) VF, Lm and CCT can be classified according to customers' requirements.

Performance Characteristics

Table 2. Characteristics, White I_F=300mA,Ta= 25ºC, RH30%

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Forward Current	I_F	-	300	-	mA
Forward Voltage[1]	V_F	2.7	-	3.3	V
Luminous Intensity(4000K)[1]	I_V	140	-	180	Cd(lm）
CRI[1]	Ra	70	-	-	%
Viewing Angle [2]	$2\Theta_{1/2}$	-	120	-	Deg.
Thermal resistance (J to S) [3]	$R\theta_{J-S}$	-	10	-	ºC/W
ESD Sensitivity(HBM)	-	Class 3A JESD22-A114-E			

Table 3. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I_F	700	mA
Junction Temperature	Tj	100	ºC
Operating Temperature	T_{opr}	-30~ + 60	ºC
Storage Temperature	T_{stg}	-30 ~ + 100	ºC

Notes :

(1) Tolerance : VF :±0.1V, IV :±5%, Ra :±2, x,y :±0.005

(2) $2\Theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 of the peak intensity.

(3) Thermal resistance : Rth_{JS} (Junction / solder)

• LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

• Thermal resistance can be increased substantially depending on the heat sink design/operating condition, and the maximum possible driving current will decrease accordingly.

• All measurements were made under the standardized environment of Indo Japan.

Characteristics Graph

Fig 1. Relative Spectrum Power Distribution, Ta = 25ºC

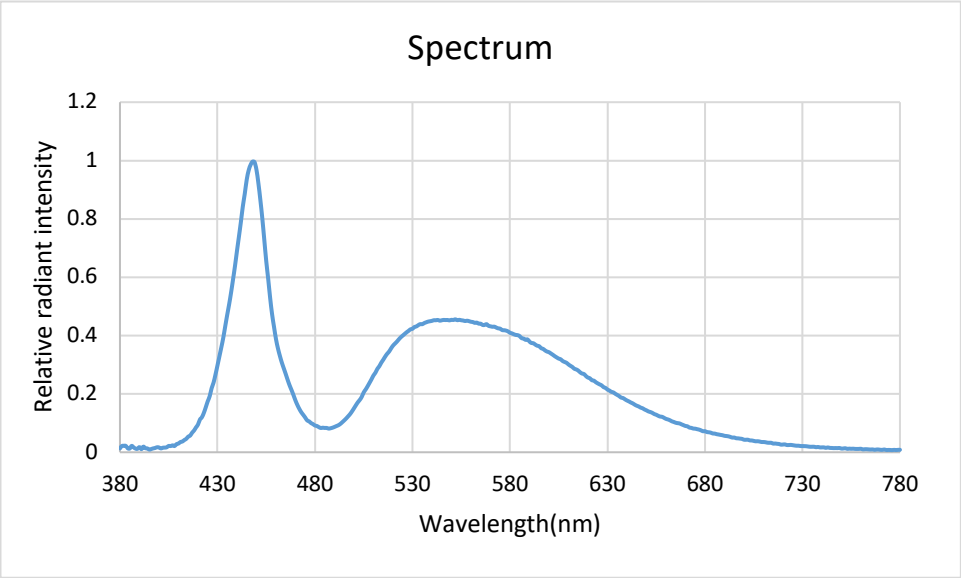
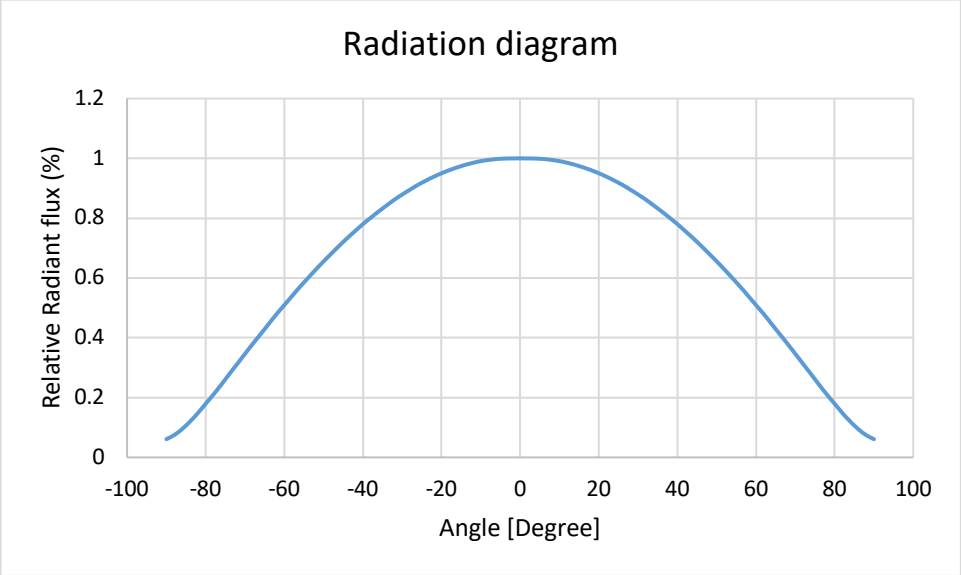


Fig 2. Radiation diagram, Ta = 25ºC



Characteristics Graph

Fig 3. White Forward Voltage vs. Forward Current, Ta = 25ºC

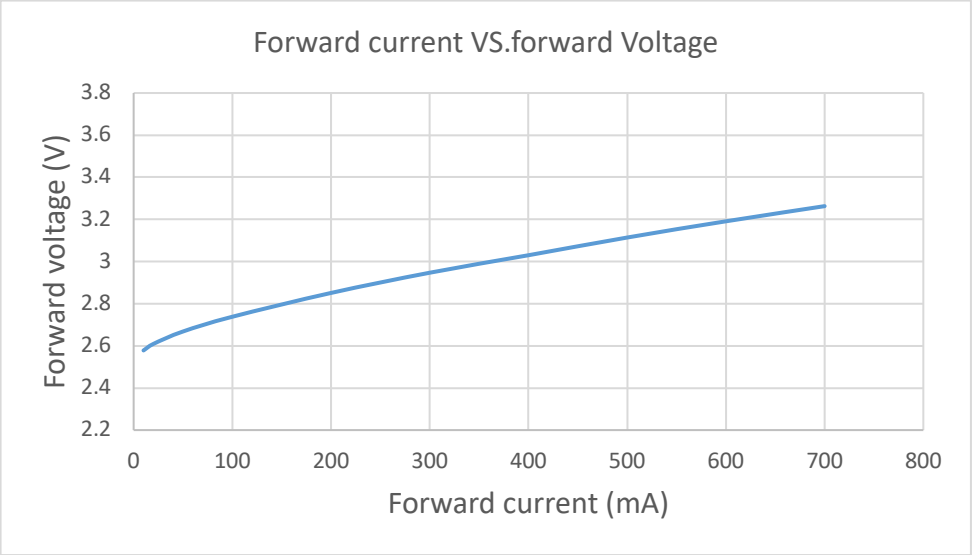
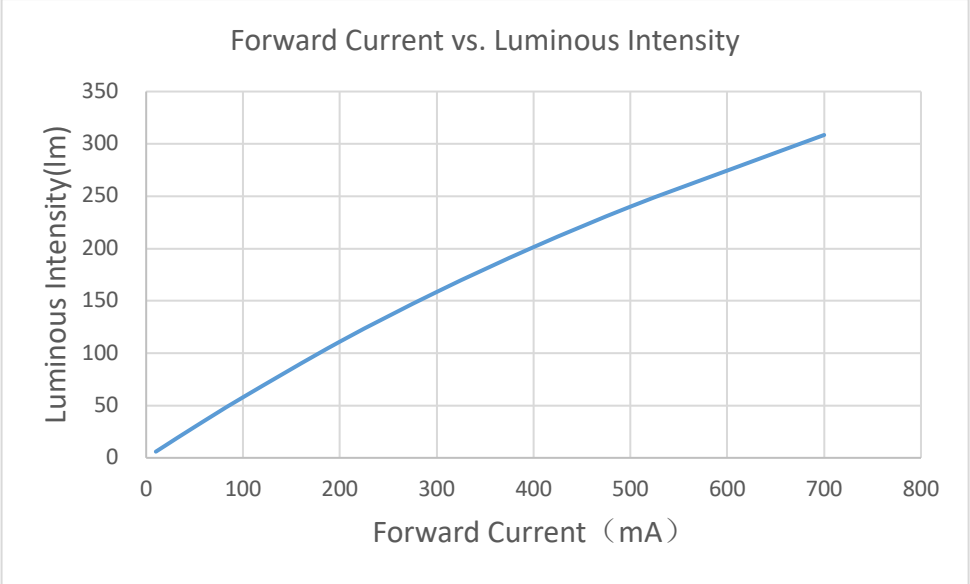
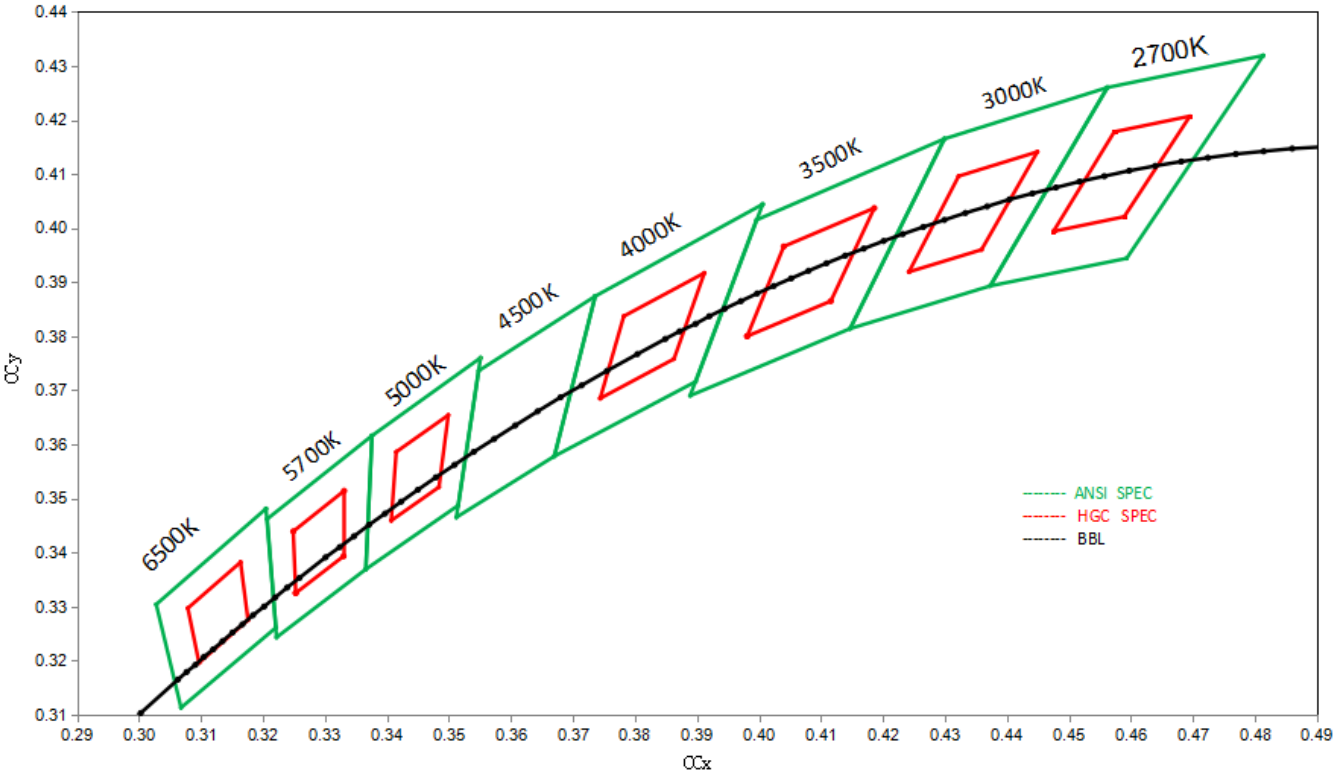


Fig 4. Forward Current vs. Relative Luminous Intensity, Ta = 25ºC



Color Bin Structure

Table 4. Bin Code Description, Ta=25℃, I_F=300mA



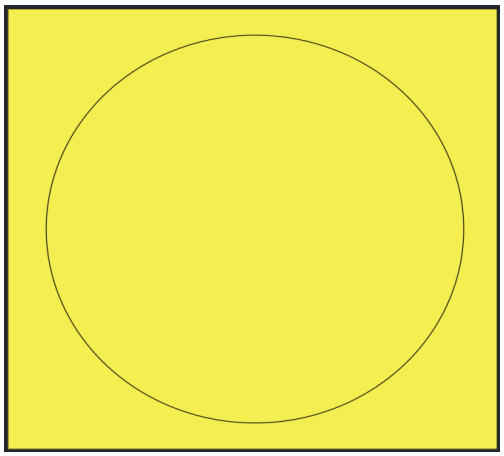
*Notes :

All measurements were made under the standardized environment of Indo Japan.

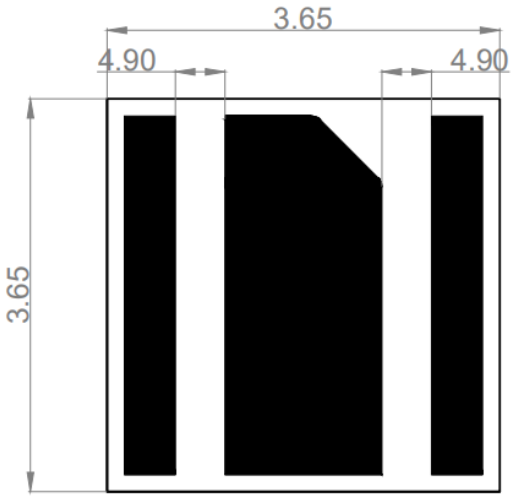
In order to ensure availability, single color rank will not be orderable.

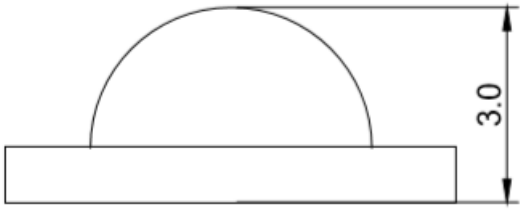
Mechanical Dimensions

Top View



Bottom View





Side View

*Notes :

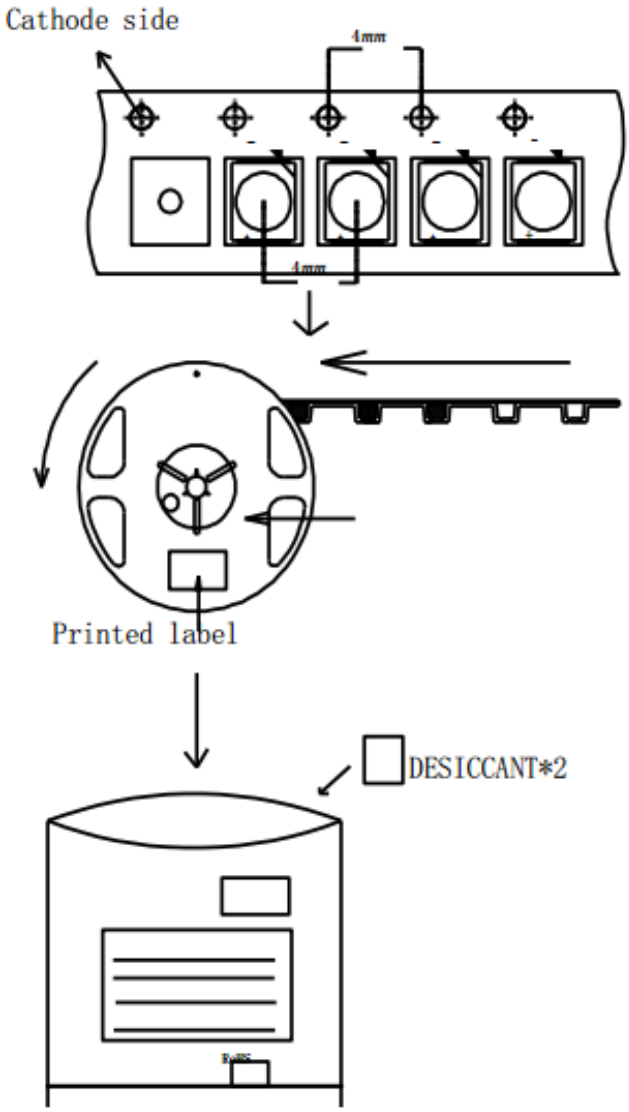
(1) All dimensions are in millimeters.

(2) Undefined tolerance is ±0.2mm.

(3) It is recommended that metal mask is designed to be under 80% of dimension of solder pad.

(4) It is suggested that the size of PCB pad and LED pad should be 1.1:1.

Emitter Tape & Reel Packaging



Notes :

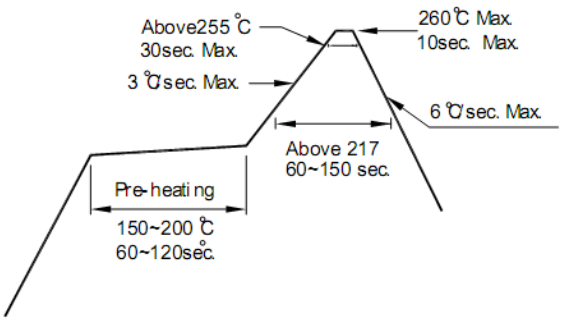
(1) Loaded Quantity 1000pcs per reel

(2) Empty component pockets are sealed with top cover tape

(3) The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications

Soldering Conditions

Reflow Soldering Conditions (Pb Free)



Profile Feature	Pb-Free Assembly
Average ramp-up rate (Tsmax to Tp)	3℃/second max.
- Temperature Min (Tsmin)	120℃
- Temperature Max (Tsmax)	180℃
- Time (Tsmin to Tsmax) (ts)	60-80 seconds
Time maintained above:	
- Temperature (TL)	183℃
- Time (tL)	60-80 seconds
Peak Temperature (Tp)	220℃
Time within 5°C of actual Peak Temperature (tp)2	30 seconds max
Ramp-down Rate	6℃/second max.
Time 25°C to Peak Temperature	8 minutes max.

Notes:

(1) Reflow soldering should not be done more than two times.

(2) When soldering, do not put stress on the LEDs during heating.

(3) When hand soldering, the temperature of the iron must less than 260℃ for 3 seconds.

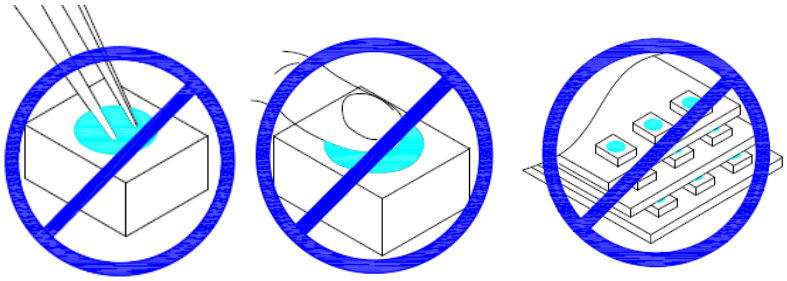
(4) The hand solder should be done only one times.

(5) Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.

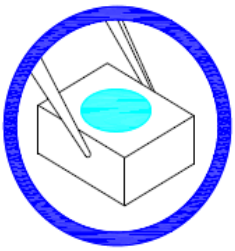
(6) After soldering, do not warp the circuit board.

Handling of Silicone Resin for LEDs

(1) During processing,mechanical stress on the surface should be minimized as much as possible.
Sharp objects of all types should not be used to pierce the sealing compound.



(2) In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.



(3) When populating boards in SMT production, there are basically no restrictions regarding the formof the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.
This is assured by choosing a pick and place nozzle which is larger than the LED's reflector area.

(4) Silicone differs from materials conventionally used for the manufacturing of LEDs.
These conditions must be considered during the handling of such devices. Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust.

As mentioned previously, the increased sensitivity to dust requires special care during processing.
In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components.

(5) Indo Japan suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin.
Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

(6) Please do not mold this product into another resin (epoxy, urethane, etc) and do not handle this.
Product with acid or sulfur material in sealed space.

Precaution for Use

(1) Storage

To avoid the moisture penetration, we recommend store in a dry box with a desiccant.

The recommended storage temperature range is 5℃ to 30℃ and a maximum humidity of RH50%.

(2) Use Precaution after Opening the Packaging

Use proper SMT techniques when the LED is to be soldered dipped as separation of the lens may affect the light output efficiency.

Pay attention to the following:

a. Recommend conditions after opening the package

- Sealing
- Temperature : 5 ~ 30℃ Humidity : Less than RH60%

b. If the package has been opened more than 4 week (MSL_2a) or the color of the desiccant changes, components should be dried for 10-24hr at 65±5℃

(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering.

(4) Do not rapidly cool device after soldering.

(5) Components should not be mounted on warped (non coplanar) portion of PCB.

(6) Radioactive exposure is not considered for the products listed here in.

(7) Gallium arsenide is used in some of the products listed in this publication.

These products are dangerous if they are burned or shredded in the process of disposal.

It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed of.

(8) This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When washing is required, IPA (Isopropyl Alcohol) should be used.

(9) When the LEDs are in operation the maximum current should be decided after measuring the package temperature.

Precaution for Use

(10) The appearance and specifications of the product may be modified for improvement without notice.

(11) Long time exposure of sunlight or occasional White exposure will cause lens discoloration.

(12) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy.
The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues.

(13) Attaching LEDs, do not use adhesives that outgas organic vapor.

(14) The driving circuit must be designed to allow forward voltage only when it is ON or OFF.
If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.

(15) Similar to most Solid state devices;
LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).
Below is a list of suggestions that Indo Japan purposes to minimize these effects.

a. ESD (Electro Static Discharge)
Electrostatic discharge (ESD) is the defined as the release of static electricity when two objects come into contact. While most ESD events are considered harmless, it can be an expensive problem in many industrial environments during production and storage.
The damage from ESD to an LEDs may cause the product to demonstrate unusual characteristics such as:
- Increase in reverse leakage current lowered turn-on voltage
- Abnormal emissions from the LED at low current

The following recommendations are suggested to help minimize the potential for an ESD event.
One or more recommended work area suggestions:
- Ionizing fan setup
- ESD table/shelf mat made of conductive materials
- ESD safe storage containers

One or more personnel suggestion options:
- Antistatic wrist-strap
- Antistatic material shoes
- Antistatic clothes

Environmental controls:
- Humidity control (ESD gets worse in a dry environment)

Precaution for Use

b. EOS (Electrical Over Stress)

Electrical Over-Stress (EOS) is defined as damage that may occur when an electronic device is subjected to a current or voltage that is beyond the maximum specification limits of the device.
The effects from an EOS event can be noticed through product performance like:

- Changes to the performance of the LED package
(If the damage is around the bond pad area and since the package is completely encapsulated the package may turn on but flicker show severe performance degradation.)
- Changes to the light output of the luminaire from component failure
- Components on the board not operating at determined drive power

Failure of performance from entire fixture due to changes in circuit voltage and current across total circuit causing trickle down failures.
It is impossible to predict the failure mode of every LED exposed to electrical overstress as the failure modes have been investigated to vary, but there are some common signs that will indicate an EOS event has occurred:

- Damaged may be noticed to the bond wires (appearing similar to a blown fuse)
- Damage to the bond pads located on the emission surface of the LED package (shadowing can be noticed around the bond pads while viewing through a microscope)
- Anomalies noticed in the encapsulation and phosphor around the bond wires.
- This damage usually appears due to the thermal stress produced during the EOS event.

c. To help minimize the damage from an EOS event Indo Japan recommends utilizing:

- A surge protection circuit
- An appropriately rated over voltage protection device
- A current limiting device

Company Information

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Indo Japan Horologicals (P) Ltd., India's FIRST Company making SMD LED, High Power LED and COB LED, an ISO 9001 and ISO 14001 Company is headquartered at Kolkata in India.

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