

EdiPower® III

SL Series

Datasheet



Introduction :

For bakery lighting applications, Edison's Aroma LED presents champagne gold color which can help to emphasize the luster of bread, cheese and wine.

Moreover, Edison Opto also develops special phosphor proportion to emit deep pink light (Ruby LED) which can enhance the red in fresh meat and flowers.

Edison Opto launcher Mela LED which can bring out the rosy luster of natural skin. Featuring high CRI (up to 90), EdiPower SL Mela LED is the perfect match for beauty makeup lighting.

Description :

Mela --- Application: Skin, bright or colorful fabrics and goods, etc.

- Brightness effect can be obtained by making the color of skin to be appeared as gentle and soft. Contrast bright and colorful appearance of goods. Easy to be applied in COB LED lighting.

Ruby --- Application: Fresh meat, dark meat, and goods with red appearance.

- Bring out the color of red ingredient, especially on meat. Easy to be applied in COB LED lighting.

Snow White --- Application: Irradiate fabric, clothing, paint.

- Bring out white colors effect in fabric and paint. Similar to Ceramic Metal Halide (CDM) in spectrum. Easy design-in Solid State Lighting (SSL).

Aroma --- Application: Bread, Cheese, Champagne, Wine, and color of yellow ingredient.

- Refine the visual sense of bread, cheese and wine, to make color of yellow, orange, gold ingredients stand out. Easy to be designed in COB Retail lighting.

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General Information

Ordering Code Format

<u>2</u> X1	<u>P</u> X2	<u>S L</u> X3	<u>3 0</u> X4	<u>x W</u> X5	<u>x x</u> X6	<u>P x x</u> X7	<u>x x x</u> X8		
X1		X2		X3		X4		X5	
Type		Component		Series		Wattage		Color	
2	Emitter	P	EdiPower®	SL	SL Series	30	30W	MW	Mela
								AW	Aroma
								RW	Ruby
								SW	Snow White

X6		X7		X8	
Internal code		PCB Board		Serial Number	
-	-	P13	19x19	-	-

Absolute Maximum Ratings

Absolute maximum ratings ($T_c=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Units
Input Power	P_i	2PSL30RW27P13010 : 63.9 2PSL30AW27P13010 : 63.9 2PSL30SW27P13010 : 28.1 2PSL30MW38P13010 : 63.9	W
DC Forward Current ¹	I_F	2PSL30RW27P13010 : 1400 2PSL30AW27P13010 : 1400 2PSL30SW27P13010 : 720 2PSL30MW38P13010 : 1400	mA
Min. Forward Current	Min. I_F	30	mA
Reverse Current ²	I_R	1	mA
Operating Temperature	T_{op}	-40 ~ +100	$^{\circ}\text{C}$
Storage Temperature	T_{st}	-40 ~ +100	$^{\circ}\text{C}$
LED junction Temperature ³	T_j	125	$^{\circ}\text{C}$
Case Temperature	T_c	2PSL30RW27P13010 : 105 2PSL30AW27P13010 : 105 2PSL30SW27P13010 : 85 2PSL30MW38P13010 : 105	$^{\circ}\text{C}$
Thermal Resistance	R_{j-c}	0.88	$^{\circ}\text{C}/\text{W}$

Notes:

1. DC forward current should not exceed LED's operating current; the current tolerance should be kept within a range of 5%.
2. LEDs are not designed to be driven in reverse bias.
3. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
4. Refer to Outline drawing for T_c measurement point.
5. D.C. Current : $T_j = T_c + R_{j-c} * P_i$

Luminous Flux Characteristic

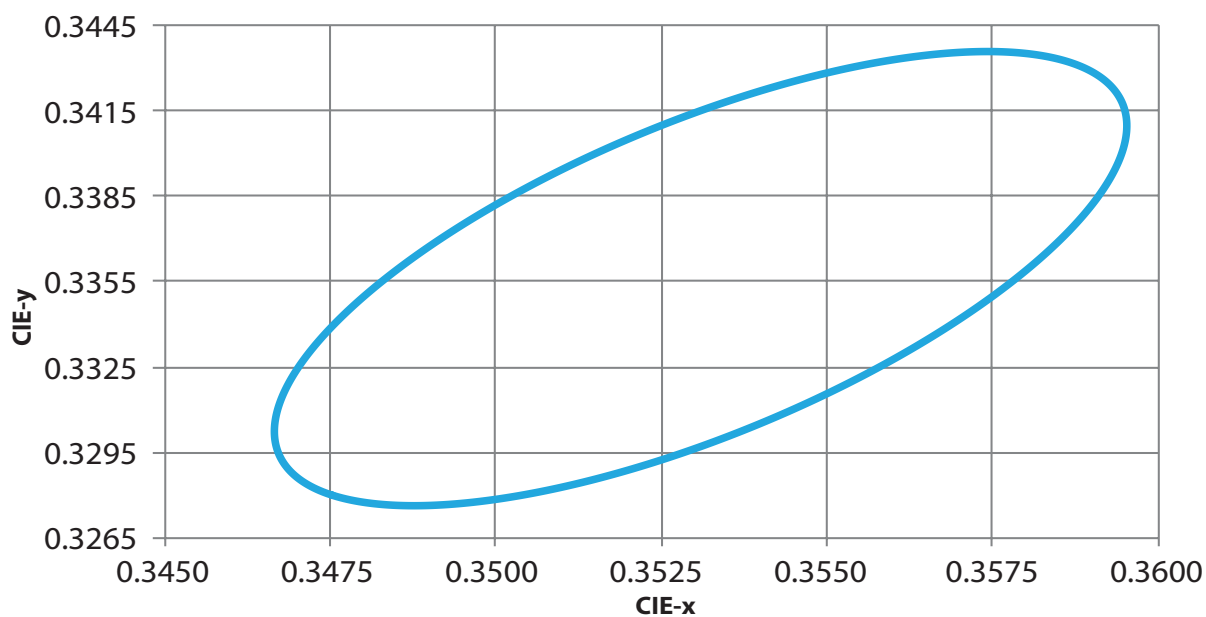
Order Code	CCT (K)	Luminous Flux(lm) $T_c=85^{\circ}\text{C}$		Luminous Flux(lm) $T_c=25^{\circ}\text{C}$		Efficacy (lm/W)	CRI Ra	CRI R9	Forward Voltage V_F (V)			Forward Current (mA)
		Min.	Typ.	Min.	Typ.				Min.	Typ.	Max.	
2PSL30RW27P13010	2000	1645	1960	1890	2250	84	70	0	33.6	37.2	38.4	720
2PSL30AW27P13010	2400	1835	2180	2105	2505	94	80	0	33.6	37.2	38.4	720
2PSL30SW27P13010	3000	1885	2240	2165	2575	96	80	0	33.6	37.2	39.0	720
2PSL30MW38P13010	4500	1765	2100	2025	2410	90	90	50	33.6	37.2	38.4	720

Notes :

1. Edison Opto Corp. maintains forward voltage $\pm 3\%$, luminous flux $\pm 10\%$, Ra and R9 ± 2 tolerance.
2. Flux values @ 25°C are calculated and for reference only.

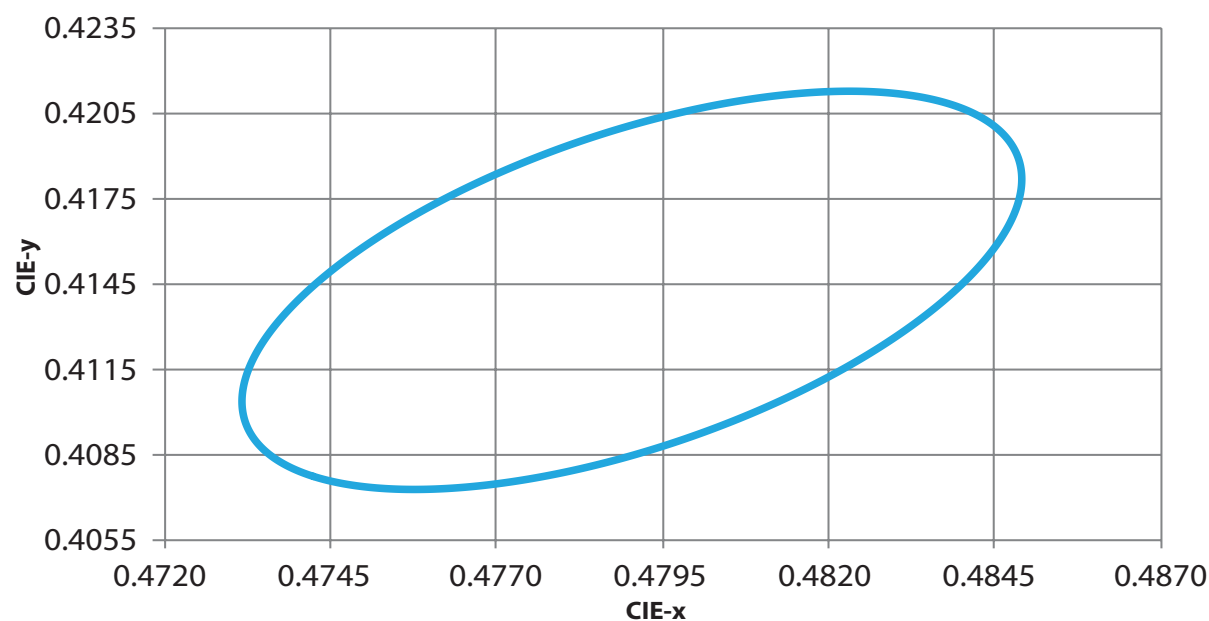
Chromaticity coordinates(3_Step, $T_c=25^\circ\text{C}$)

Mela - 4500K



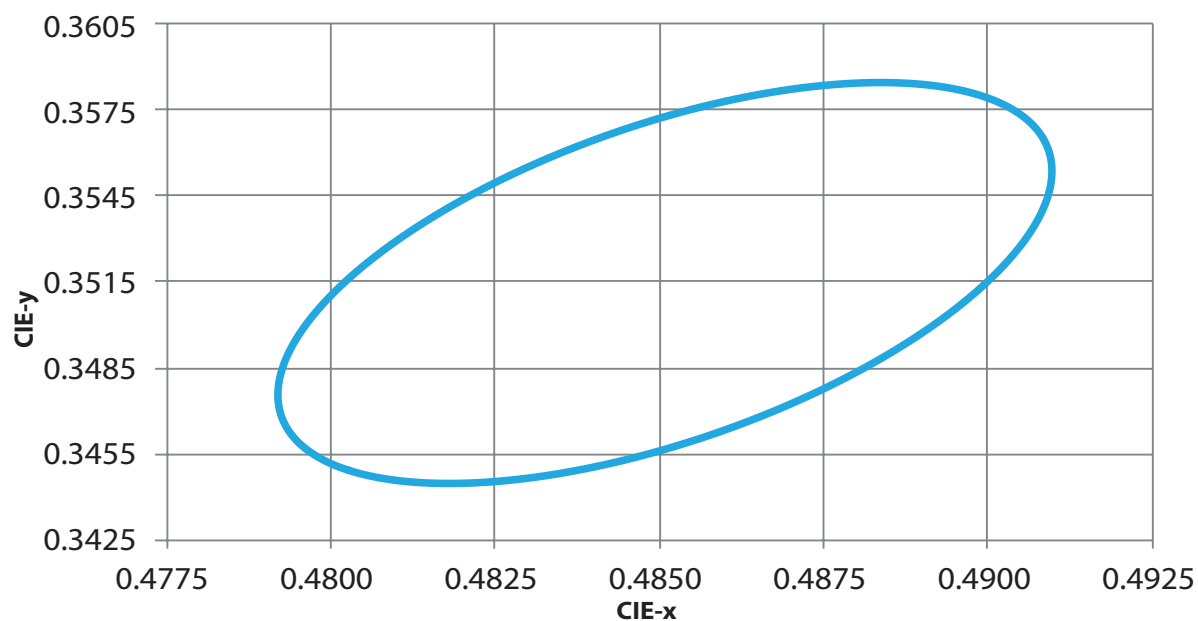
CCT	Steps	Cx	Cy	a	b	theta
4500K	3	0.3531	0.3356	0.00939	0.00402	53.72

Aroma-2400K



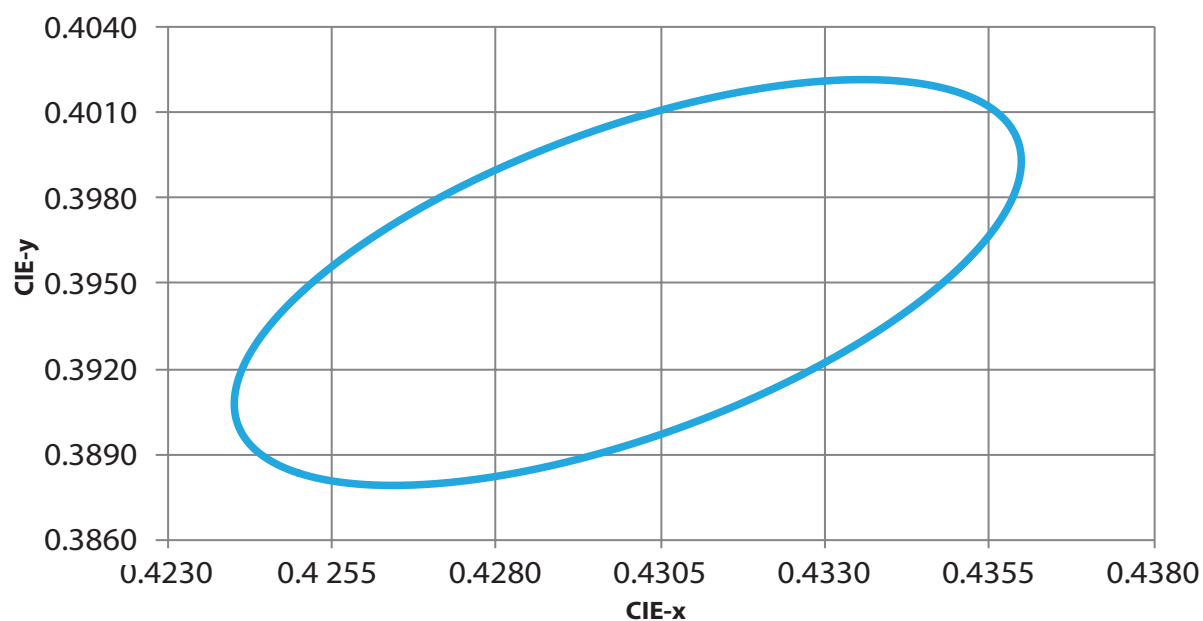
CCT	Steps	Cx	Cy	a	b	theta
2400K	3	0.4791	0.4143	0.00810	0.00420	53.70

Ruby - 2000K

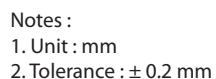


CCT	Steps	Cx	Cy	a	b	theta
2000K	3	0.4851	0.3515	0.00810	0.00420	53.7

Snow White-3000K

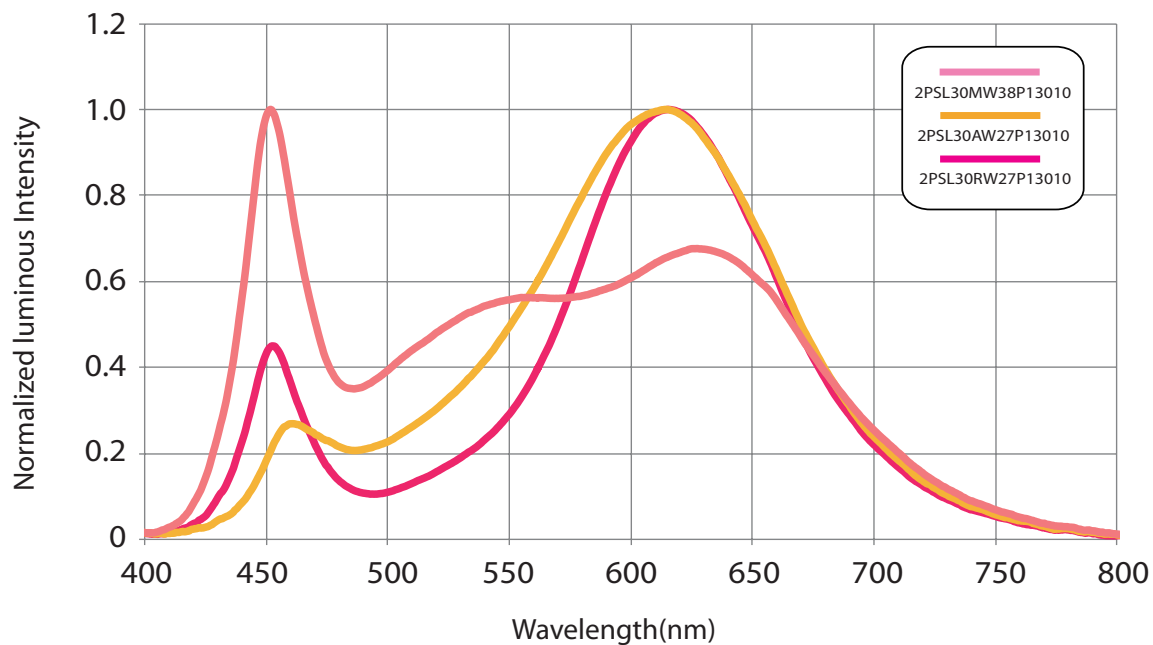


CCT	Steps	Cx	Cy	a	b	theta
3000K	3	0.4300	0.3950	0.00834	0.00408	53.22

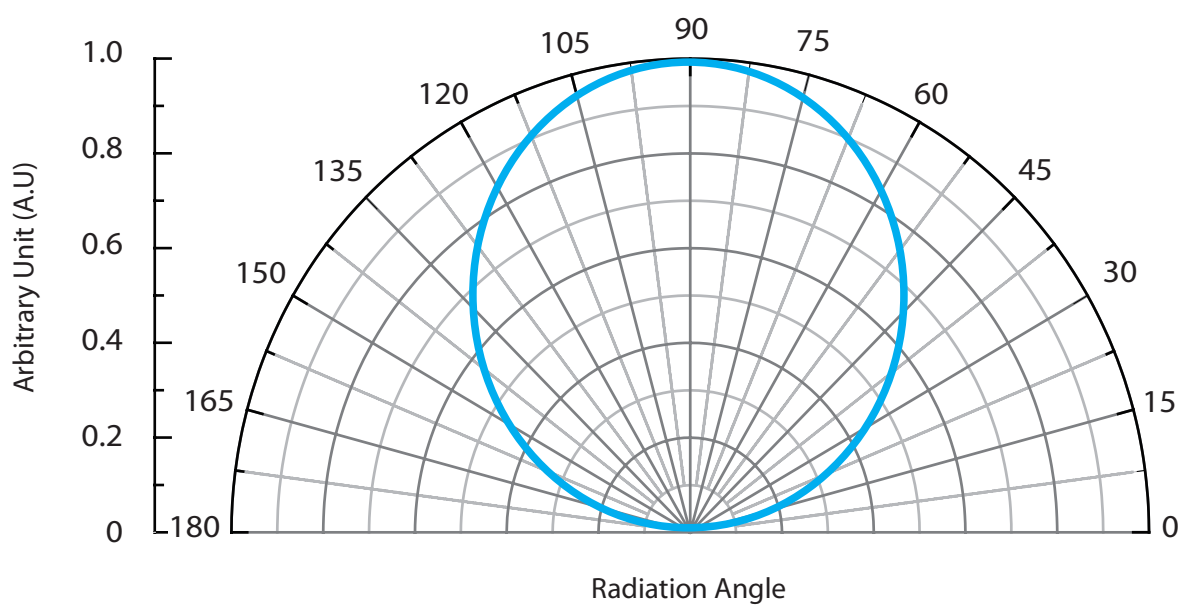


Characteristic curve

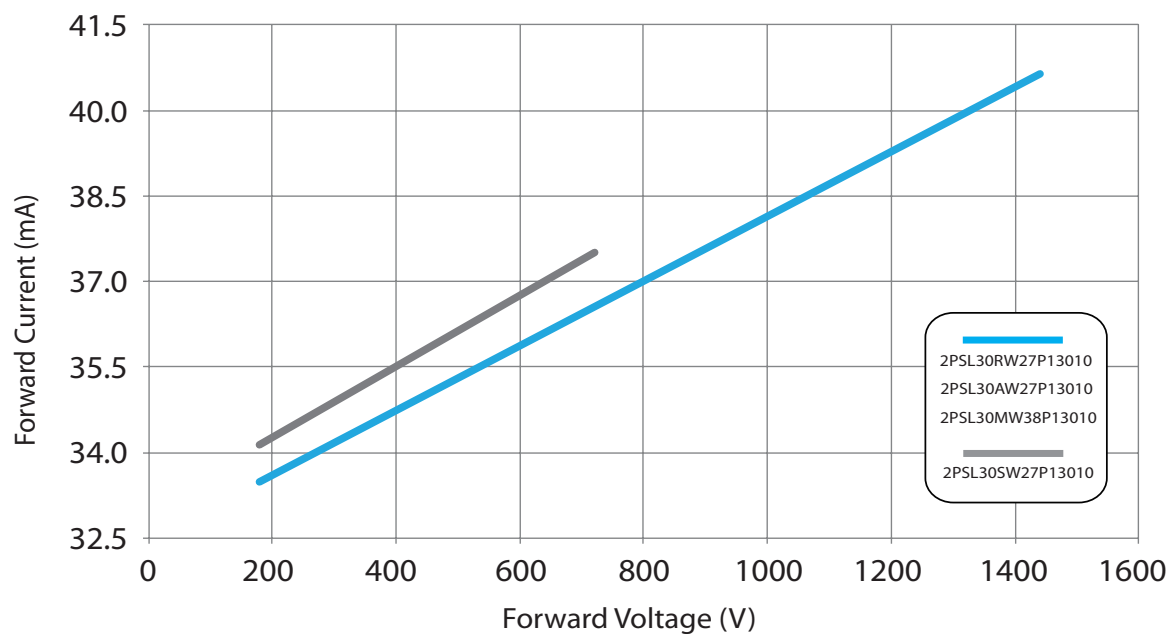
Color Spectrum



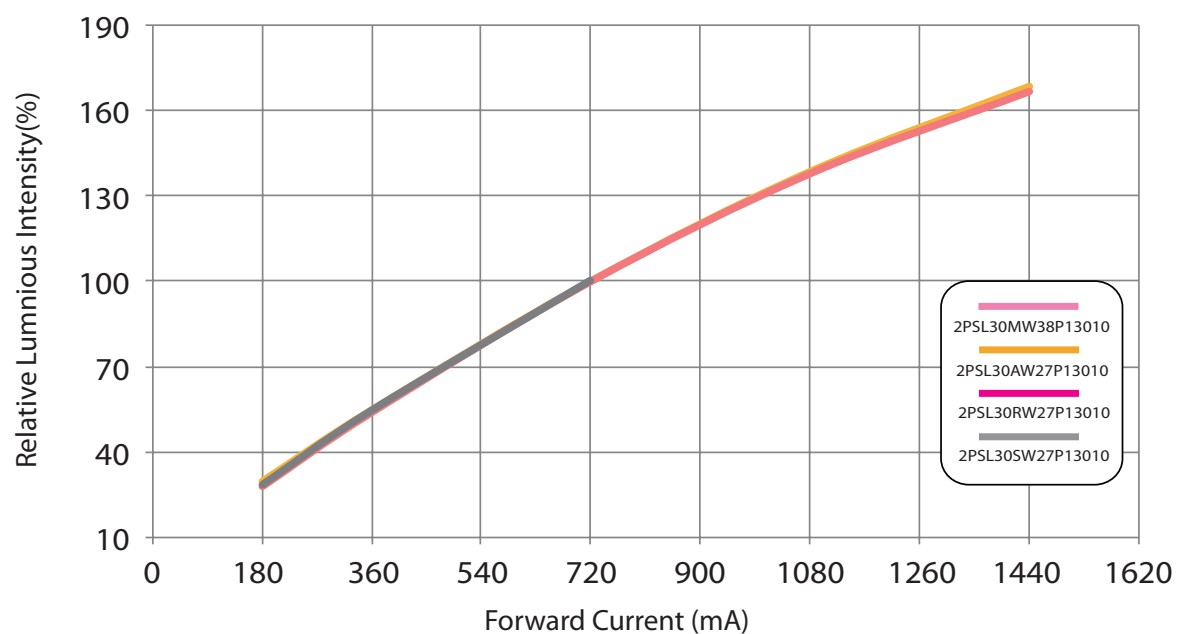
Beam Pattern



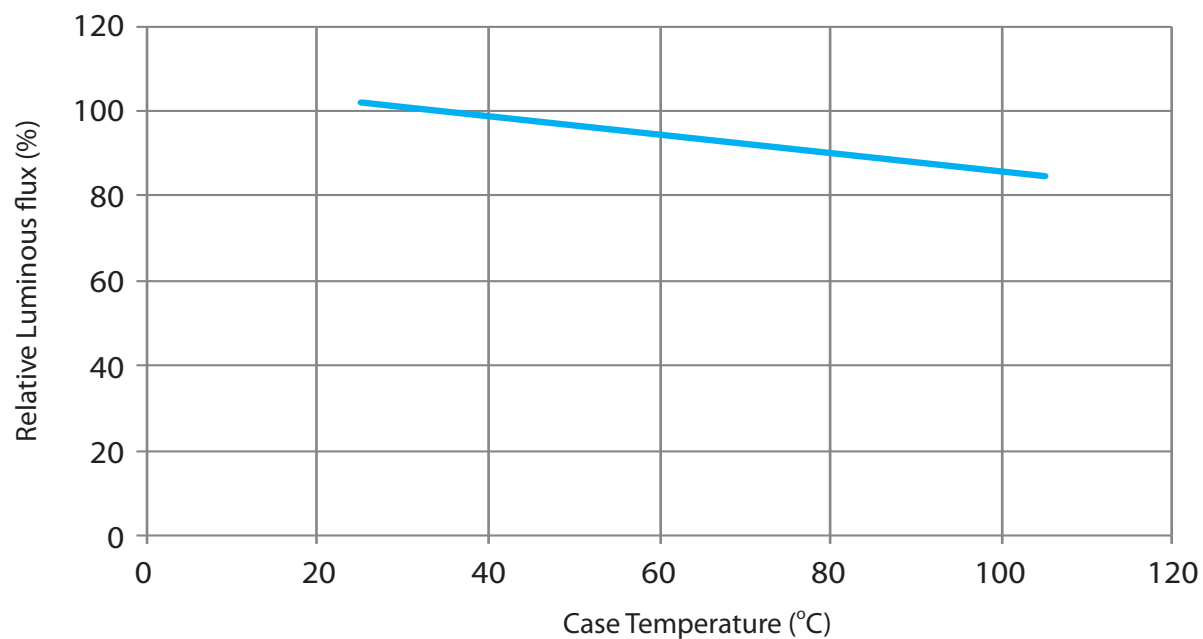
Forward Current vs. Forward Voltage



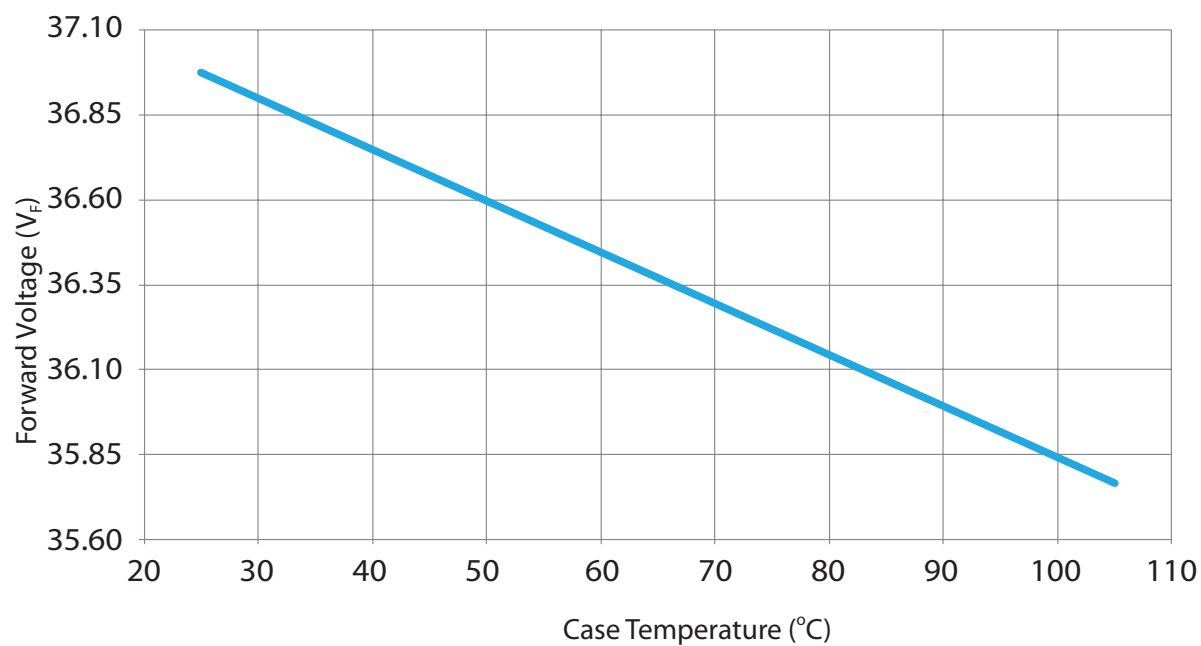
Relative Luminous Intensity vs. Forward Current



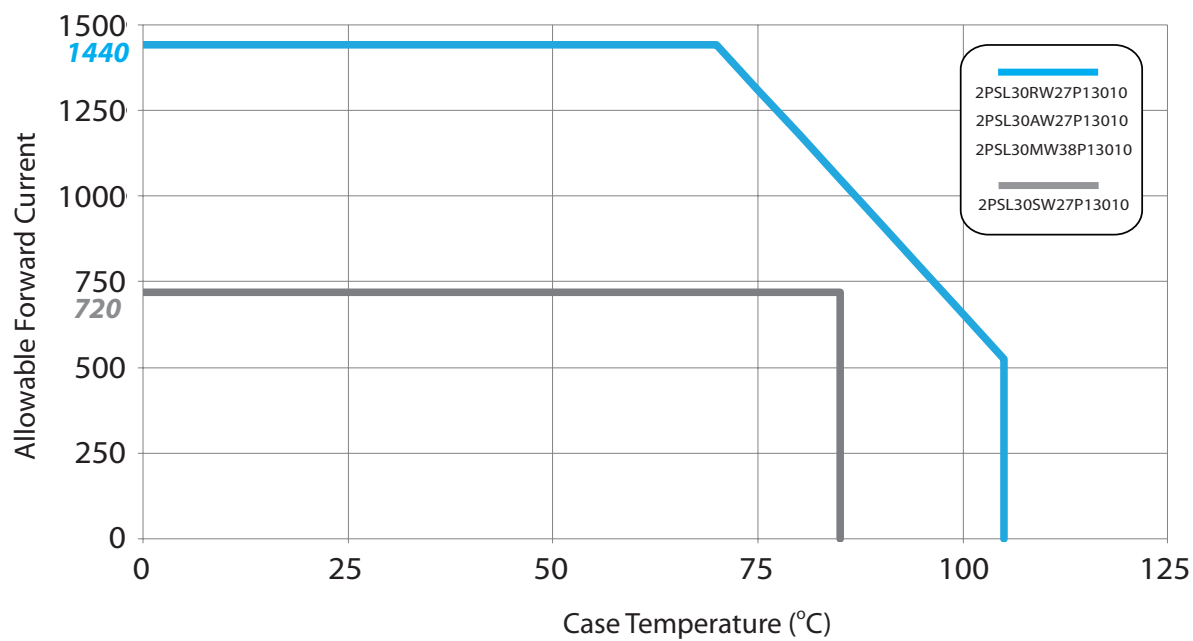
Relative Luminous Flux vs. Case Temperature



Forward Voltage vs. Case Temperature



Allowable Forward Current vs. Case Temperature



Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C (30 mins / 30 mins)	100 Cycle
2	Thermal Shock	-40°C~100°C (15,min/15 mins 10 sec)	100 Cycle
3	High-Temperature Storage	Ta=100°C	1000 hrs
4	Humidity Heat Storage	Ta=85°C, RH=85%	500 hrs
5	Low-Temperature Storage	Ta= -40°C	1000 hrs
6	Operation Life test	25°C	6000 hrs
7	High Temperature Operation Life test	85°C	1000 hrs
8	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	1 μ A
Resistance to Soldering Heat	No dead lamps or visual damage	



Average Lumen Maintenance Characteristics

Lumen maintenance for light sources or luminaires is defined in terms of the change in light output of a light source over operational life, relative to initially measured light output. Edison Opto projects that EdiPower® III SL Series products will deliver, on average, greater than 70% lumen maintenance (L70) after 50,000 hours of operation at the rated forward test current. This performance is based on constant current operation with case temperature maintained at or below 85°C.

These projections are based on a combination of package test data, semiconductor chip reliability data, a fundamental understanding of package related degradation mechanisms, and performance observed from products installed in the field using Edison Opto die technology. Observation of design limits in this datasheet is required in order to achieve this projected lumen maintenance.



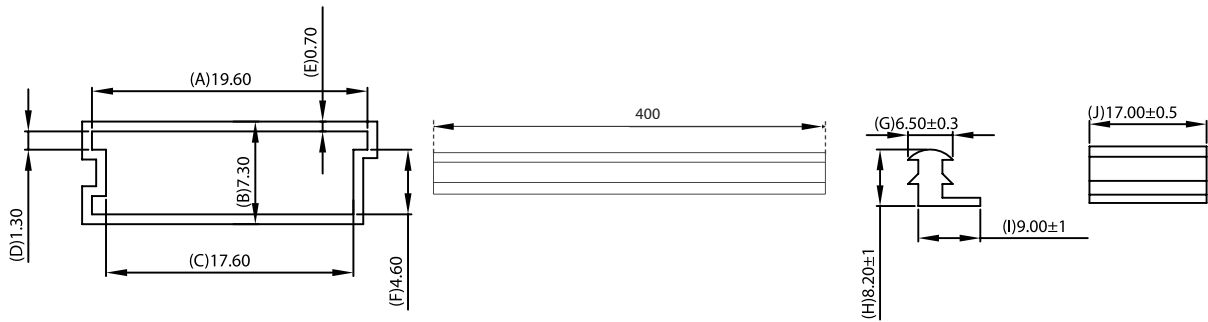
Limited Warranty for Edison Opto EdiPower® III SL Series

This limited warranty is provided by Edison Opto to the original purchaser of the LED lighting product that is identified on our invoice reflecting its original purchase (the "Product"). We warrant that the Product, under normal operation ($T_c < 85^\circ\text{C}$ $T_j < 125^\circ\text{C}$ and the operation current is lower than maximum forward current which is described in the datasheet), will be free of defects in material and workmanship for a period of **FIVE (5) YEARS** from the date of original purchase.

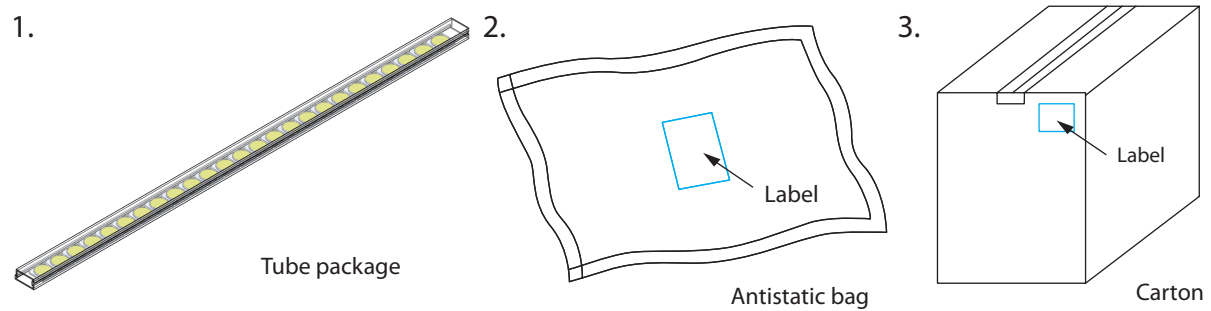
Notes:

1. This limited warranty cannot be transferred to subsequent purchasers of the Product; even Product is resold in new condition and in its original packaging.
2. The determination of whether the Product is defective shall be made by Edison Opto in our sole discretion with consideration given to the overall performance of the Product.

Product Packaging Information



Tube package dimension.



Packaging items for SL Series

Notes:

1. All dimensions are in mm.
2. 20pcs emitters in a full tube.
3. There are 20 tubes in a bag.
4. 4 bags in a carton.
5. A bag contains one humidity indicator card and drying agent.

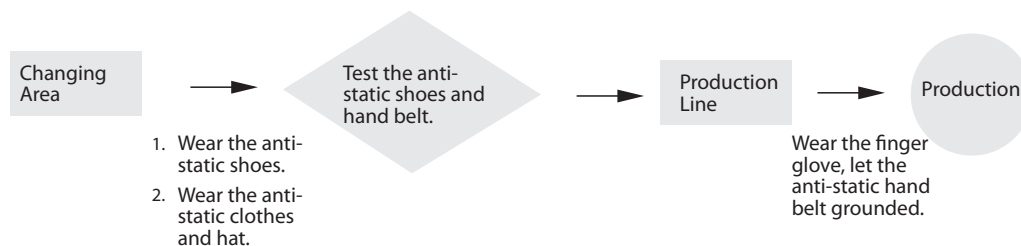
Handling with a EdiPower® III Series

Notification on Anti-static

LED device are combine by many accurate parts which belong to static sensitive device. A human body may aware of the discharge voltage about 2-3KV, which is much larger than an electronic device may bear. Therefore, to keep the LED operation environment away from static and lower the exits static become an important issue in a LED manufacture

1. Anti-Static Steps - All the staffs who has the possibility to contact with the LED components should follow the instructions to eliminate the static:

- Put on the hand or finger gloves before touch a LED device. (Do not use a nylon or rubber Glove)
- Do not do any actions that may generate the static in the protection area. Such as wipe hands or foot, put on/off the clothes.
- Avoid any movement that may cause static damages. When remove a component from the package, please be slow and gentle.
- Do not touch the metal part of a LED component.



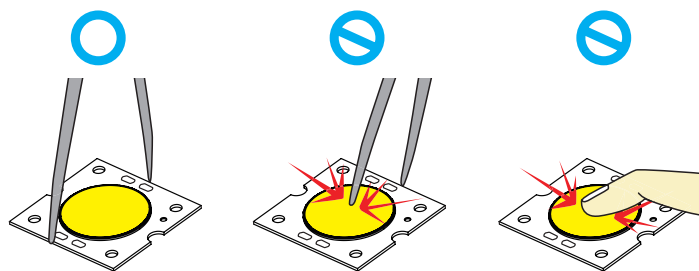
2. Environmental anti-static protection

- Use an anti-static floor and make earth. Materials such as plastic or rubber contain carbon or conductive polyester is recommended.
- LEDs should be operated on the desk which is laid by the static discharge material.
- Protection area with a temperature at $22\pm 5^{\circ}\text{C}$ and a relative humidity at $70\pm 10\%\text{RH}$ are recommended.
- Layout an appropriate earth system. All the equipments should earth isolated into the ground or pillar.
- All soldering and testing equipments should also provide earth ability.
- Prevent the accumulation and the fractions between stuffs.

3. Anti-Static steps for package, transportation and storage.

- Package: All the bags must have the ability of anti-static. Do not use any nylon bag, normal plastic bag or polyester bag for package. Do not open the bag if a LED is not ready to be handling. Open the bag at the protection area and put in a conductive case.
- Transportation: The cart should install the conductive wheels. Avoid the mechanical vibration and impacts.
- Storage: Be attention of the temperature and the relative humidity under the suggest condition.

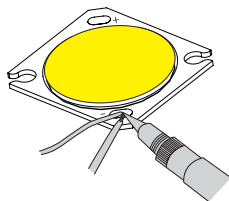
Handling with a EdiPower® III Component



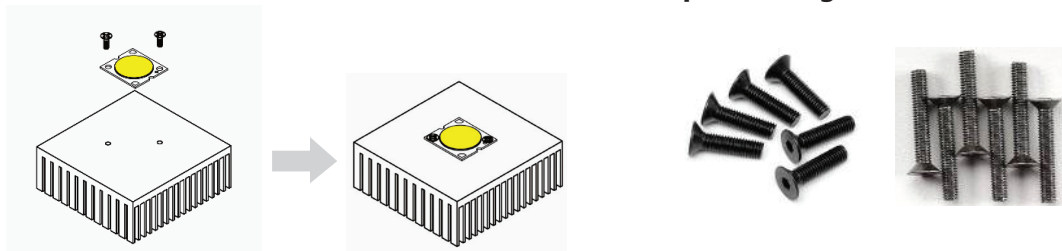
- Proper handling of the EdiPower® III using tweezers or gloved fingers.
- Do not touch the emitting region.
- Use only the IPA and swab to clean the flux/dust of the EdiPower® III surface. Other organic solvent may cause the failure

Notification of Installation.

1. Soldering pads are present for direct electrical wiring. Manual soldering at $360 \pm 5^\circ\text{C}$, <5 secs are recommended. (No need with IR reflow process)



EdiPower® III can be secured with M2/M3 screws. To ensure optimal usage.



Recommendations:

Flat screws or countersunk screws are recommended.

Avoid the screw head touching the pad to prevent from the electric leakage.

Screw Torque Specification

Size	Tightening Torque (N.m)
M2	0.25~1
M3	1~1.25

Thermal Management

About 80% of input power of a LED transform into heat. A high temperature operation condition always easily causes the LEDs to decrease of flux and the life decay of LED dies. The highest operation temperature of a component is able to be found in its datasheet which is indicated as T_j .

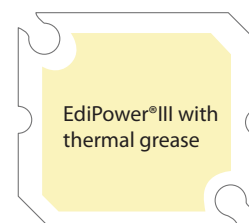
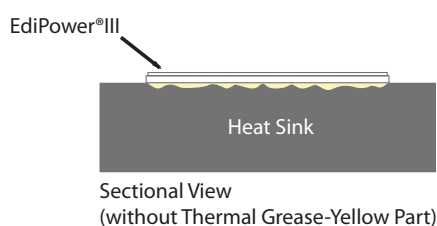
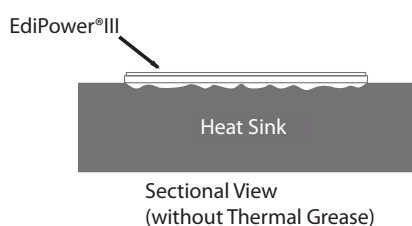
The power dissipation ability, the ambient temperature between the LED junction, environment, thermal path and its thermal resistance are the mean parameters which affect the performance of a LED device. Therefore, the limitation of the junction temperature has become an important issue when designing a LED product.

For LEDs, choose an appropriate operation environment and conduct the heat to the air after light on LEDs may maintain the better performance and lifetime. Four major thermal path are as follow:

- (1) From heat source (component) to heat sink. (By conduction)
- (2) Conduction from within the heat sink to its surface. (By conduction)
- (3) Transfer from the surface to the surrounding air. (By convection)
- (4) Emit heat from the heat sink surface. (By Radiation)



Path(1): The contact surface of the component and heat sink are not perfectly flat, they are not able to meet each other completely. Air between these two materials will result high thermal resistance and reduce the effect of heat transfer. To enhance the ability of thermal conduction, one common method is applying thermal grease between the two interfaces and use the screws to enforce the adhesion between two surface.



Recommended thermal Grease Parameters

Characteristics	Value	Unit
Thermal Conductivity (K)	>3.0	W/m ² K
Thickness	≤0.1	mm

Revision History

Versions	Description	Release Date
1	Establish order code information	2015/04/10
2	Revise Aroma application	2015/04/17

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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