

EdiPower® V

2PHE83xWxxP35020

Datasheet



Track Light



Spot Light



High Bay



Cylinder Light

Introduction :

Edison COB is a high uniformity array component which delivers high lumen output with excellent efficacy. Edison COB is optimized to simplify luminaire designs and lower the system cost. Edison COB combines the advantages of performance, reliability and ease-of-use in one LED. As for the applications, Edison COB can be widely used in general lighting such as spot light, down light, high bay, floodlight and PAR lamp.

Description :

- High efficacy chip on board solution
- Best luminous and color uniformity
- Enables halogen and CDM replacement
- The article itself presents the actual color.

Feature and Benefits :

- Based on the mirror aluminum MCPCB which excellent 98% reflectivity and High thermal conductivity. ($k=200 \text{ w/mK}$)
- Low R_{th}
- Meet the ErP specification ($CRI>80$ and $R9>0$)
- Meet the CEC specification ($CRI>90$ and $R9>50$)
- Excellent reliability
- 3 / 5 – step Macadam

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General Information

Ordering Code Format

<u>2</u>	<u>P</u>	<u>HE</u>	<u>83</u>	<u>xW</u>	<u>xx</u>	<u>P35</u>	<u>xxx</u>
X1	X2	X3	X4	X5	X6	X7	X8

X1		X2		X3		X4		X5	
Type		Component		Series		Wattage		Color	
2	Emitter	P	EdiPower®	HE	HE Series	83	83W	CW	Cool White
								NW	Neutral White
								WW	Warm White

X6		X7		X8	
Internal code		PCB Board		Serial Number	
-	-	P35	28x28	-	-

Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Input Power	P _i	179	W
DC Forward Current ¹	I _F	3240	mA
Min. Forward Current	Min. I _F	90	mA
Reverse Current ²	I _R	1	mA
Operating Temperature	T _{op}	-40 ~ +100	°C
Storage Temperature	T _{st}	-40 ~ +100	°C
LED junction Temperature ³	T _J	125	°C
Case Temperature	T _C	105	°C
Thermal Resistance	R _{J-C}	0.16	°C/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 : $T_J = T_C + R_{J-C} \cdot P_i$

Luminous Flux Characteristic ($T_j=85^{\circ}\text{C}$)

Order Code	CCT (K)	Luminous Flux(lm) $T_j=85^{\circ}\text{C}$		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.	
2PHE83WW27P35020	2700	10708	11898	11780	13089	144	80	0	47.0	51.1	55.2	1620
	3000	11053	12282	12160	13511	148	80	0	47.0	51.1	55.2	1620
	3500	11203	12448	12325	13694	150	80	0	47.0	51.1	55.2	1620
2PHE83NW27P35020	4000	11278	12531	12407	13786	151	80	0	47.0	51.1	55.2	1620
2PHE83CW27P35020	5000	11428	12698	12572	13969	153	80	0	47.0	51.1	55.2	1620
	5700	11128	12365	12242	13603	149	80	0	47.0	51.1	55.2	1620
	6500	11083	12315	12193	13548	149	80	0	47.0	51.1	55.2	1620
2PHE83WW38P35020	2700	9102	10113	10013	11126	122	90	50	47.0	51.1	55.2	1620
	3000	9395	10439	10336	11484	126	90	50	47.0	51.1	55.2	1620
	3500	9523	10581	10476	11640	128	90	50	47.0	51.1	55.2	1620
2PHE83NW38P35020	4000	9587	10652	10546	11718	129	90	50	47.0	51.1	55.2	1620
2PHE83CW38P35020	5000	9714	10793	10687	11874	130	90	50	47.0	51.1	55.2	1620
	5700	9459	10510	10406	11562	127	90	50	47.0	51.1	55.2	1620
	6500	9421	10468	10364	11516	126	90	50	47.0	51.1	55.2	1620

Notes :

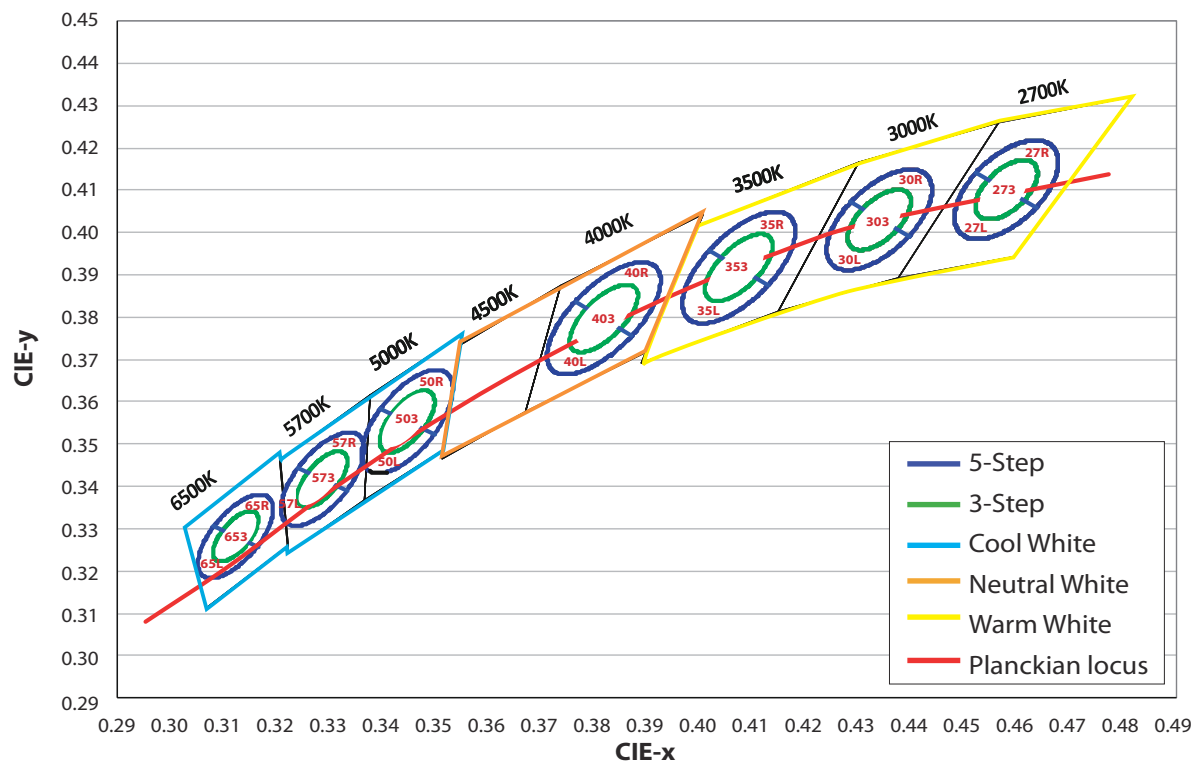
- Edison Opto Corp. maintains forward voltage $\pm 3\%$, luminous flux $\pm 10\%$, Ra and R9 ± 2 tolerance.
- Flux values @ 25°C are calculated and for reference only.

Chromaticity coordinates($T_c=85^\circ\text{C}$)

Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.

The chromaticity center refers to ANSI C78.377:2011.

Please refer to ANSI C78.377 for the chromaticity center.

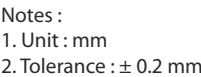


CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.70
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22
3500K	5	0.4073	0.3917	0.01545	0.00690	54.00
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
5700K	5	0.3287	0.3417	0.01243	0.00533	59.09
6500K	5	0.3123	0.3282	0.01115	0.00475	58.57

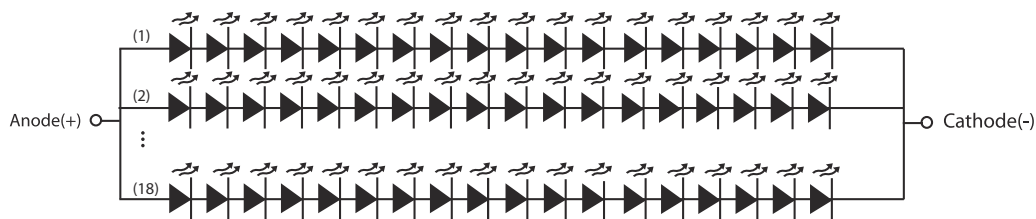
CCT	Steps	Cx	Cy	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.70
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22
3500K	3	0.4073	0.3917	0.00927	0.00414	54.00
4000K	3	0.3818	0.3797	0.00939	0.00402	53.72
5000K	3	0.3447	0.3553	0.00822	0.00354	59.62
5700K	3	0.3287	0.3417	0.00746	0.00320	59.09
6500K	3	0.3123	0.3282	0.00669	0.00285	58.57

Note: CIE_{x,y} tolerance: ± 0.005 .

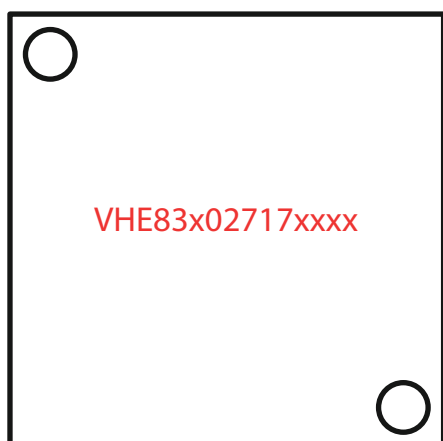
Emitter Dimensions



Emitter Circuit Layout



Product marking



V
X1

HE83
X2

x0
X3

27
X4

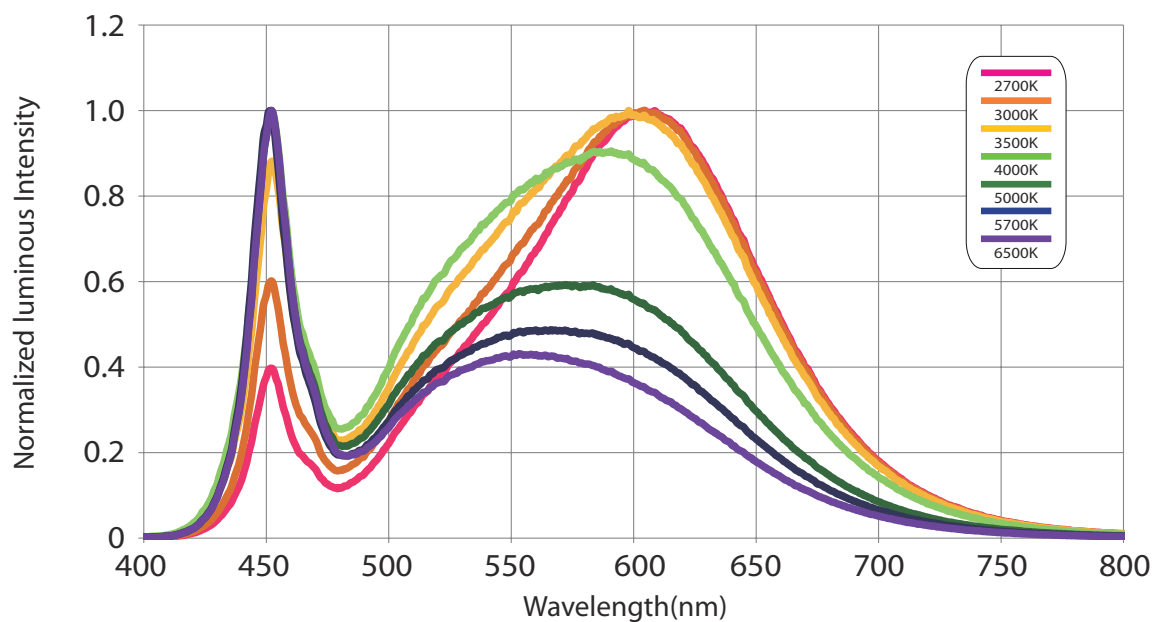
17
X5

xxxx
X6

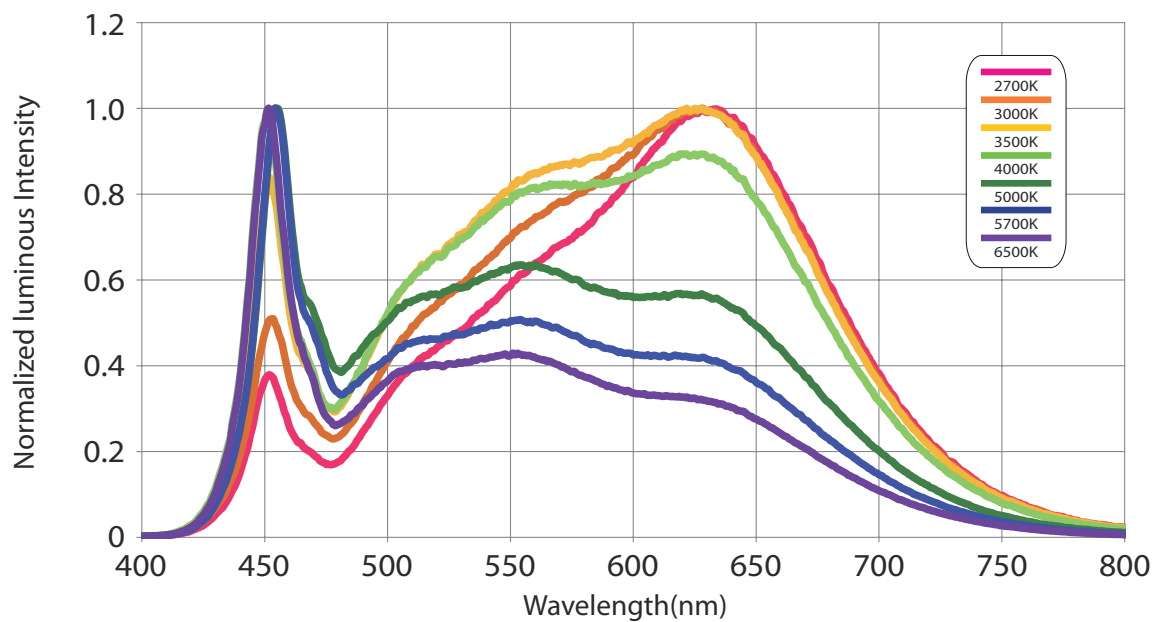
X1		X2		X3		X4		X5		X6	
Type		Series		CRI		CCT		Year		Serial Number	
V	EdiPower® V	HE83	HE83	80	CRI80	27	2700K	17	2017	xxxx	-
				90	CRI90						

Characteristic curve

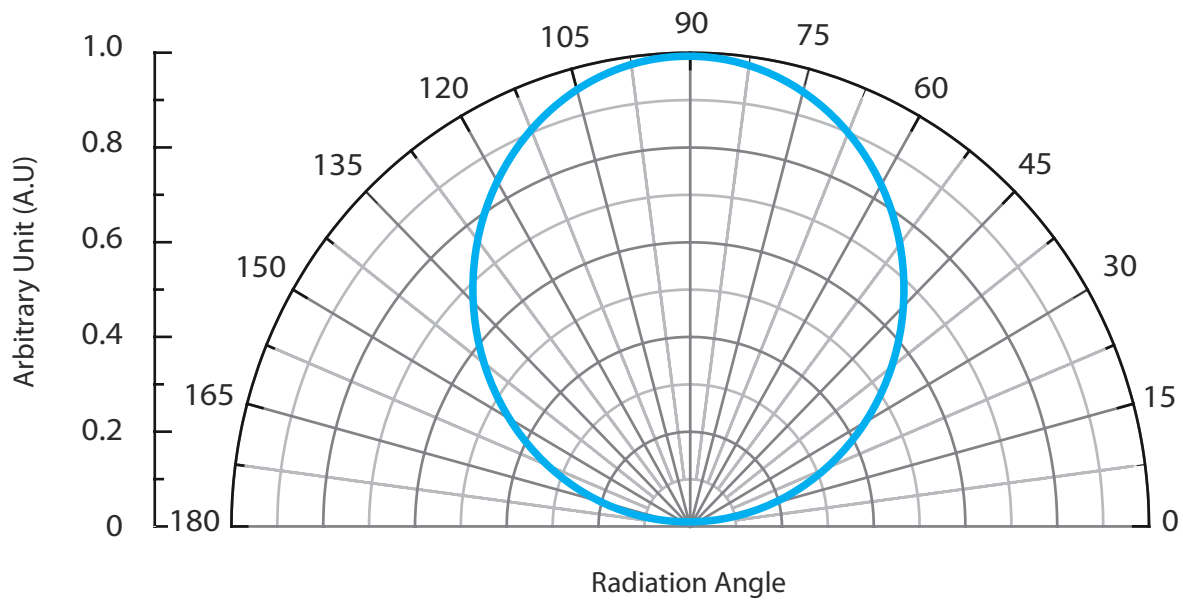
Color Spectrum ($T_c=25^\circ\text{C}, I_F=1620\text{mA}$)_CRI80



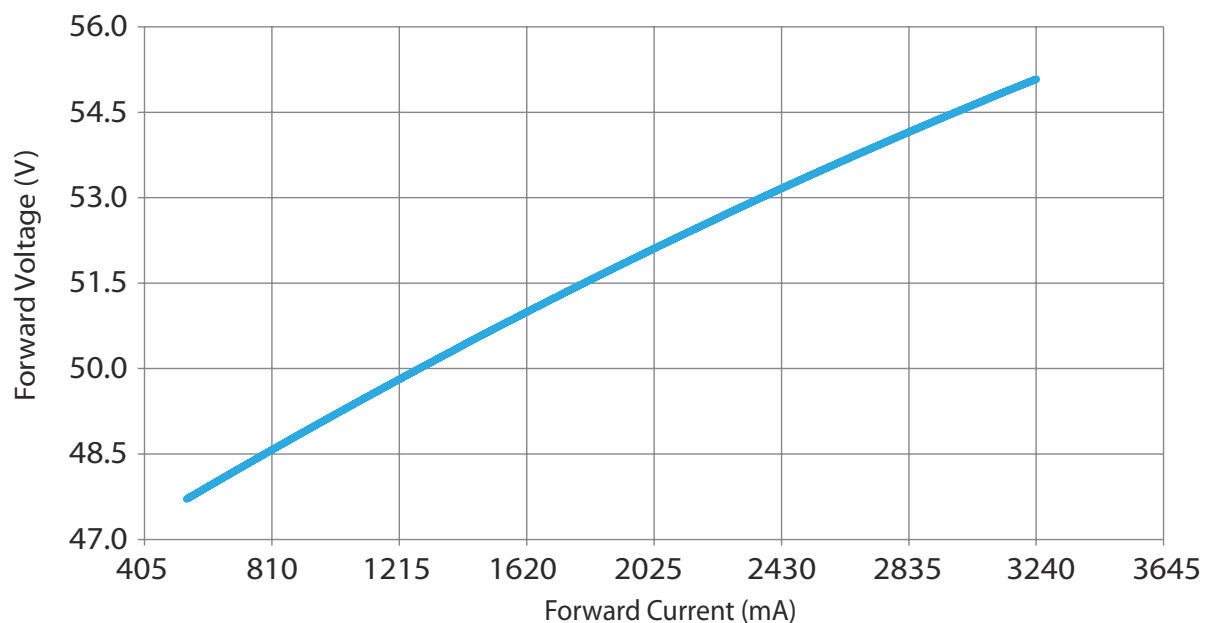
Color Spectrum ($T_c=25^\circ\text{C}, I_F=1620\text{mA}$)_CRI90



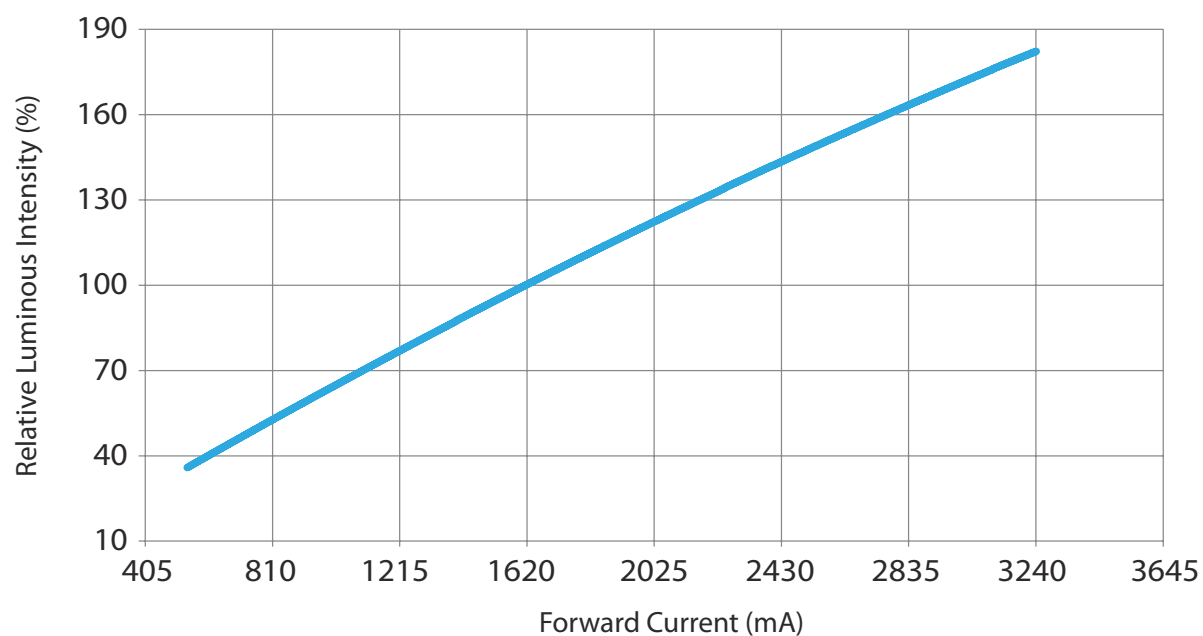
Beam Pattern



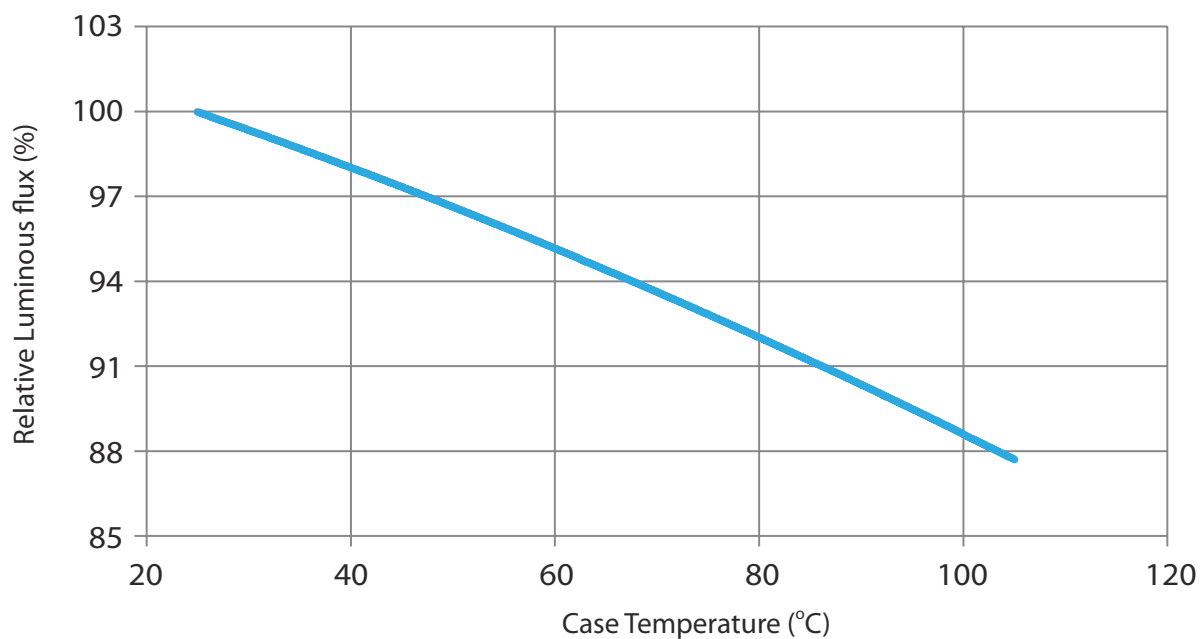
Forward Voltage vs. Forward Current ($T_c=25^\circ\text{C}$)



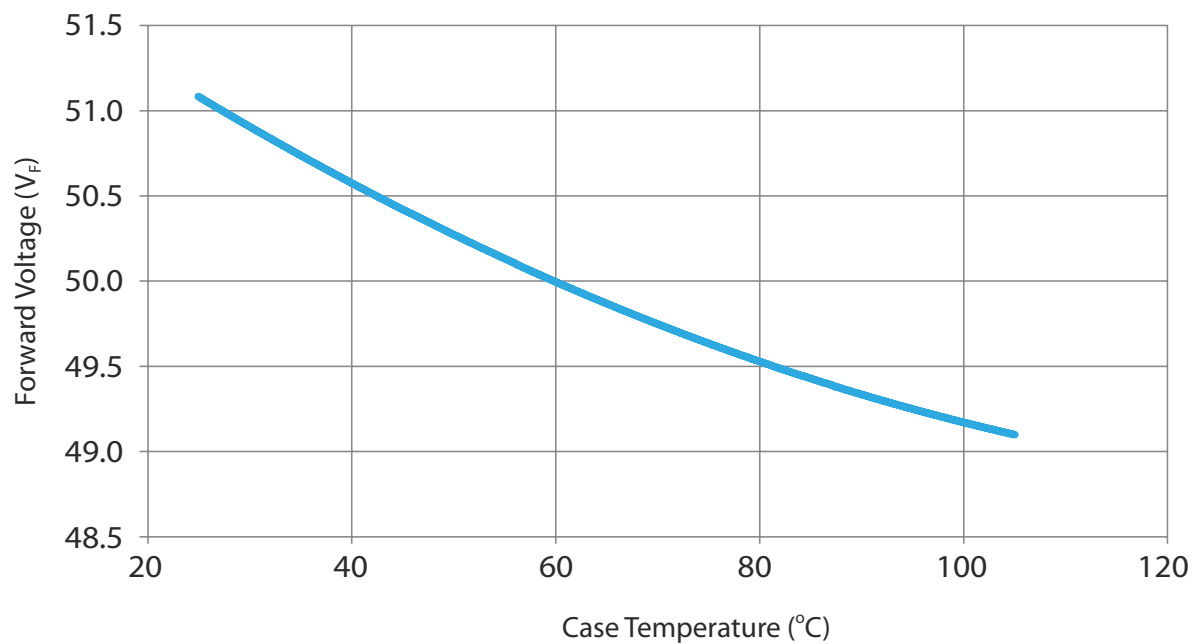
Relative luminous Intensity vs. Forward Current ($T_c=25^\circ\text{C}$)



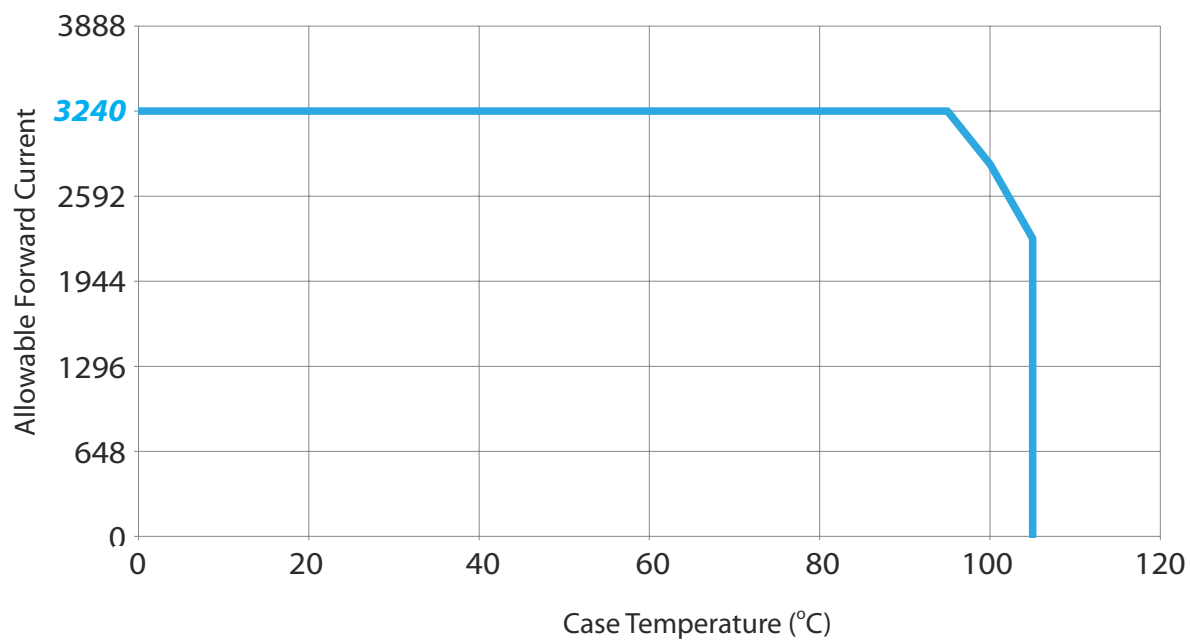
Relative Luminous Flux vs. Case Temperature ($I_F=1620\text{mA}$)



Forward Voltage vs. Case Temperature ($I_F=1620\text{mA}$)



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

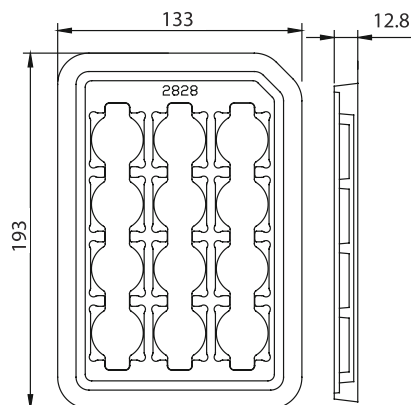
Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μ A
Resistance to Soldering Heat	No dead lamps or visual damage	

Cautions

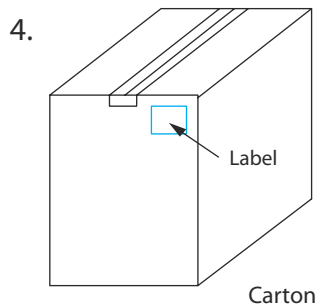
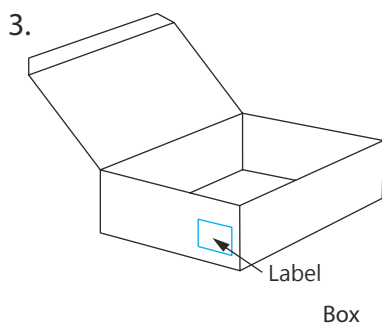
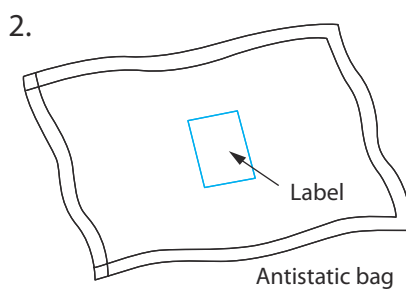
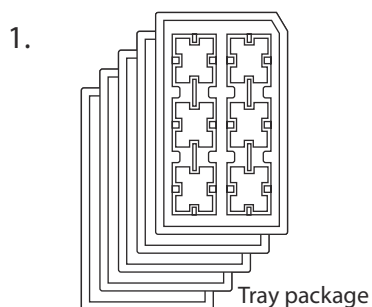
LED avoids being stored and lighted in the environment containing sulfur. Some materials, such as seals, printing ink, enclosure and adhesives, may contain sulfur, avoiding the exposure in acid or halogen environment.

Product Packaging Information

Tray Packing



Tray package dimension.



Packaging items for HE Series

Notes:

1. All dimensions are in mm.
2. There are 12pcs emitters in a full tray.
3. There are 5 trays in a bag.
4. There are 10 bags in a box.
5. There are 10 boxes in a carton.
6. A bag contains one humidity indicator card and drying agent.
7. Carton dimensions: 488x260x364mm

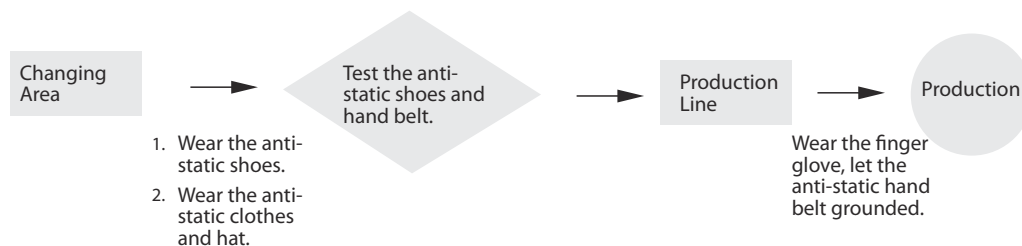
Handling with a EdiPower® V Series

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

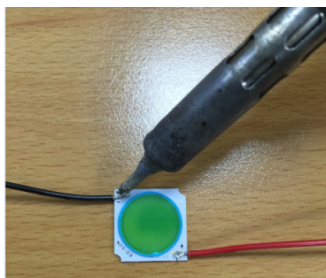
- Use an anti-static floor and make earth. Materials such as plastic or rubber contain carbon or conductive polyester is recommended.
- LEDs should be operated on the desk which is laid by the static discharge material.
- Protection area with a temperature at $22\pm 5^{\circ}\text{C}$ and a relative 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.

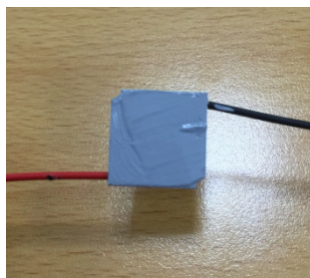
- Package: All the bags must have the ability of anti-static. Do not use any nylon bag, normal plastic bag or polyester bag for package. Do not open the bag if a LED is not ready to be handling. Open the bag at the protection area and put in a conductive case.
- Transportation: The cart should install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

Protector Operation Manual

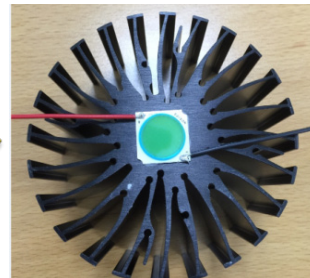
Solder electric wires



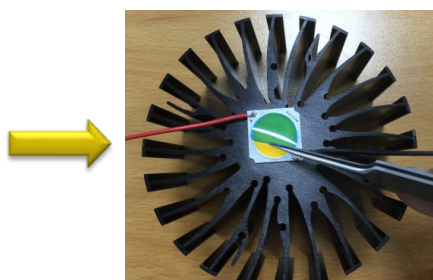
Backside coated with thermal grease



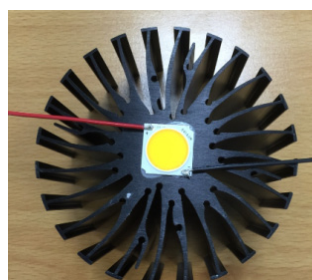
Mount the COB components to the heatsink modules



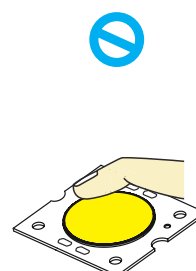
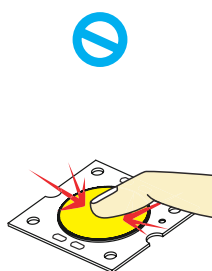
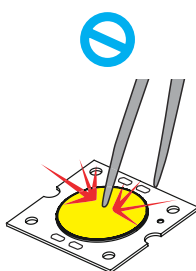
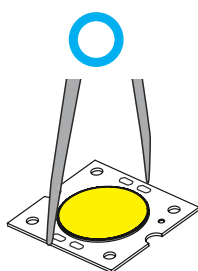
Remove the Blue protective film with tweezers



Complete operation process



Handling with a EdiPower® V Component



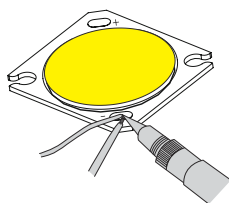
Do not touch the emitting region

Do not touch Dam

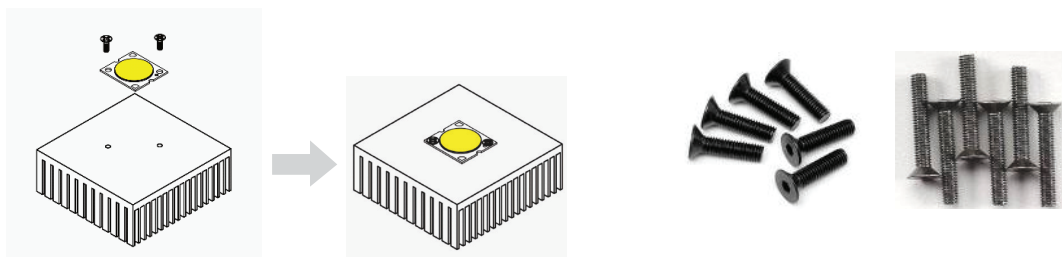
- Proper handling of the EdiPower® V using tweezers or gloved fingers.
- Do not touch the emitting region and Dam.
- Use only the IPA and swab to clean the flux/dust of the EdiPower® V surface. Other organic solvent may cause the failure

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® V 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 .

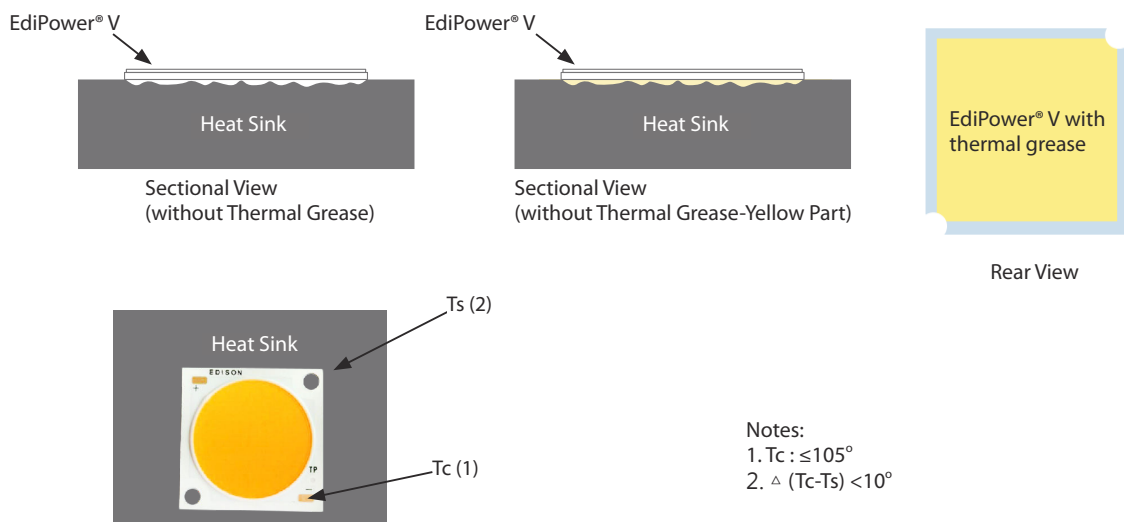
The power dissipation ability, the ambient temperature between the LED junction, environment, thermal path and its thermal resistance are the mean parameters which affect the performance of a LED device. Therefore, the limitation of the junction temperature has become an important issue when designing 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*K
Thickness	≤0.1	mm

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2017/10/13

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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