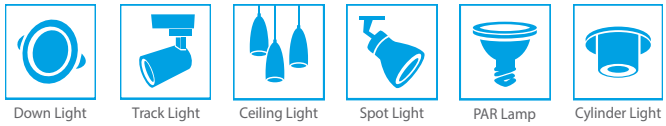
EdiPower® V

2PHE03xxxxP32091

Datasheet



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 w /mK)
- Low Rth
- Meet the ErP specification (Ra>80 and R9>0)
- Meet the CEC specification (Ra>90 and R9>50)
- Excellent reliability
- 3 / 5 – step Macadam
- Current input from 90mA to 180mA(3W-6W)

Lighting Design Manufacturing Service

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Lighting Design Manufacturing Service

General Information

Ordering Code Format

2	P	H E	0 3	x x	x x	P 3 2	x x x
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	03	3W	27	2700K
								30	3000K
								40	4000K
								50	5000K
								65	6500K

X6		X7		X8	
Internal code		PCB Board		Serial Number	
-	-	P32	13x13	-	-

Lighting Design Manufacturing Service

Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Input Power	Pi	6.75	W
DC Forward Current[1]	I_F	180	mA
Min. Forward Current	Min. I_F	5	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	$R_{j\text{-}c}$	2.60	°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 Tc measurement point.
5. D.C. Current : $Tj = Tc + R_{j\text{-}c}*Pi$

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Luminous Flux Characteristic (T_J=85°C)

Order Code	CCT (K)	Luminous Flux(lm) T_J=85°C		Luminous Flux(lm) T_C=25°C		Efficacy (lm/W)	CRI Ra	CRI R9	Forward Voltage V_F (V)			Forward Current (mA)
		Min.	Typ.	Min.	Typ.	Typ.	Min.	Min.	Min.	Typ.	Max.	
2PHE032727P32091	2700	395	440	435	480	152	80	0	31.2	35	36.8	90
2PHE033027P32091	3000	405	450	450	495	157	80	0	31.2	35	36.8	90
2PHE034027P32091	4000	415	465	460	510	162	80	0	31.2	35	36.8	90
2PHE035027P32091	5000	415	465	460	510	162	80	0	31.2	35	36.8	90
2PHE036527P32091	6500	405	450	450	495	157	80	0	31.2	35	36.8	90
2PHE032738P32091	2700	335	370	370	410	130	90	50	31.2	35	36.8	90
2PHE033038P32091	3000	345	385	380	425	135	90	50	31.2	35	36.8	90
2PHE034038P32091	4000	355	395	390	440	140	90	50	31.2	35	36.8	90
2PHE035038P32091	5000	355	395	395	440	140	90	50	31.2	35	36.8	90
2PHE036538P32091	6500	345	385	380	420	133	90	50	31.2	35	36.8	90

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

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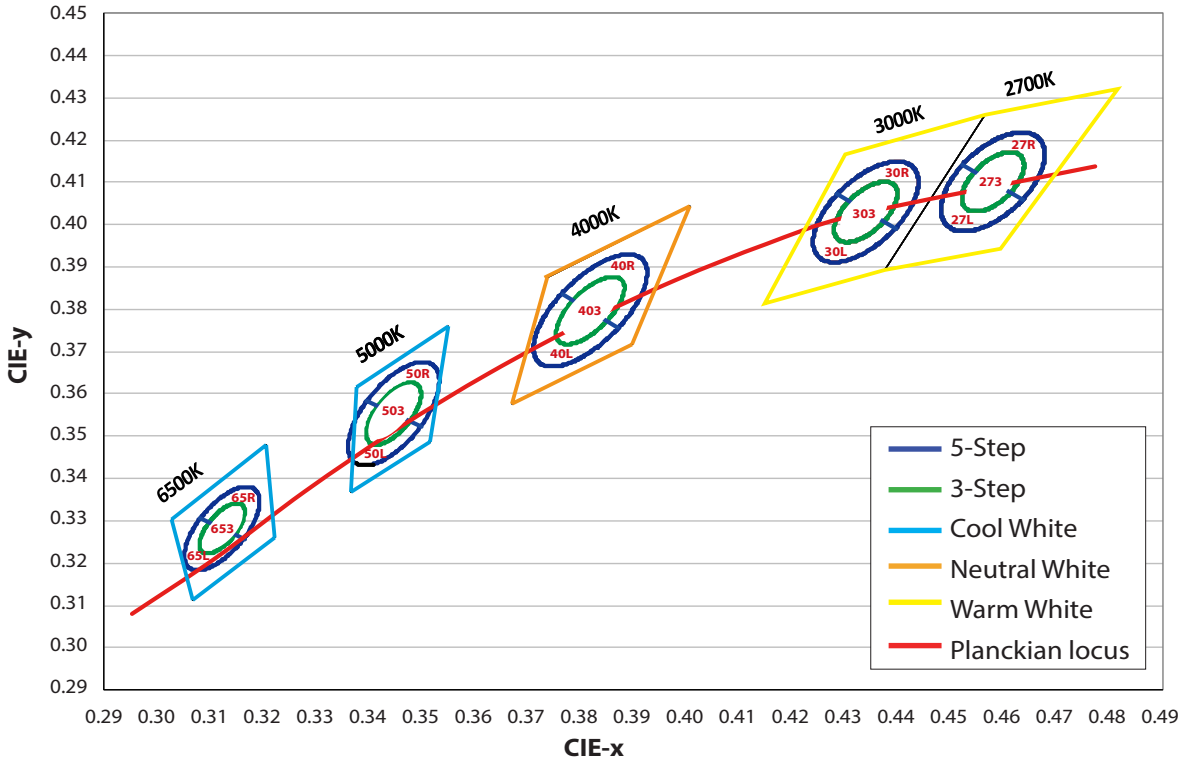
Chromaticity coordinates(T_J=85°C)

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
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
6500K	5	0.3123	0.3282	0.01115	0.00475	58.57

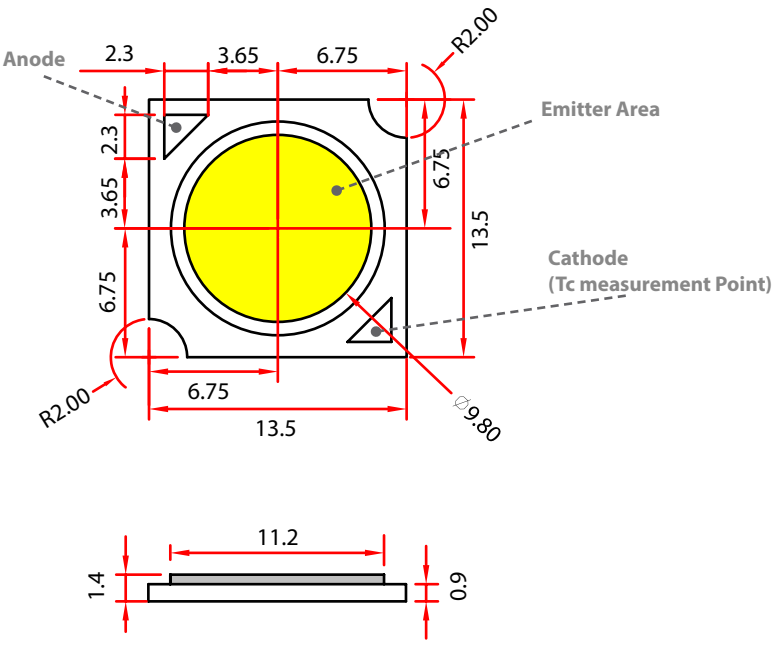
CCT	Steps	Cx	Cy	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.70
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22
4000K	3	0.3818	0.3797	0.00939	0.00402	53.72
5000K	3	0.3447	0.3553	0.00822	0.00354	59.62
6500K	3	0.3123	0.3282	0.00669	0.00285	58.57

Note: CIE_x,y tolerance: ±0.005.

Lighting Design Manufacturing Service

Mechanical Dimensions

Emitter Dimensions

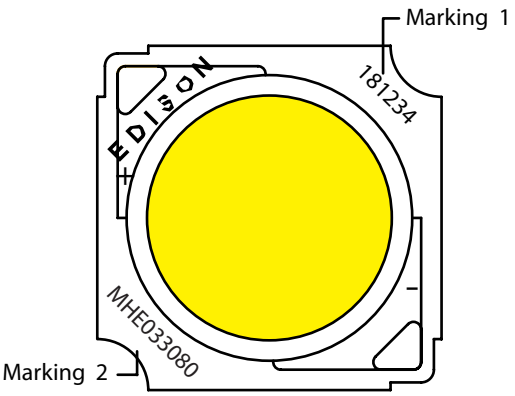


Notes :
1. Unit : mm
2. Tolerance : ± 0.2 mm

Emitter Circuit Layout

Lighting Design Manufacturing Service

Product marking



Marking 1

1 8	x x x x
X5	X6

X5		X6	
Production Year		Serial Number	
18	2018	xxxx	-

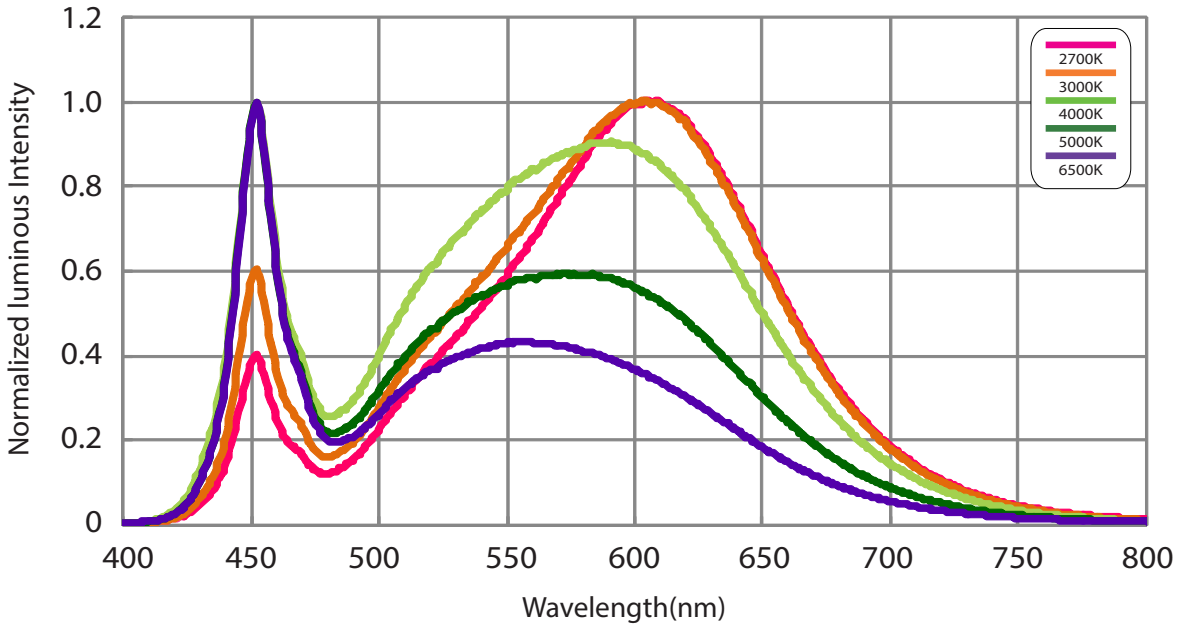
Marking 2

M	H E 0 3	3 0	x 0
X1	X2	X3	X4

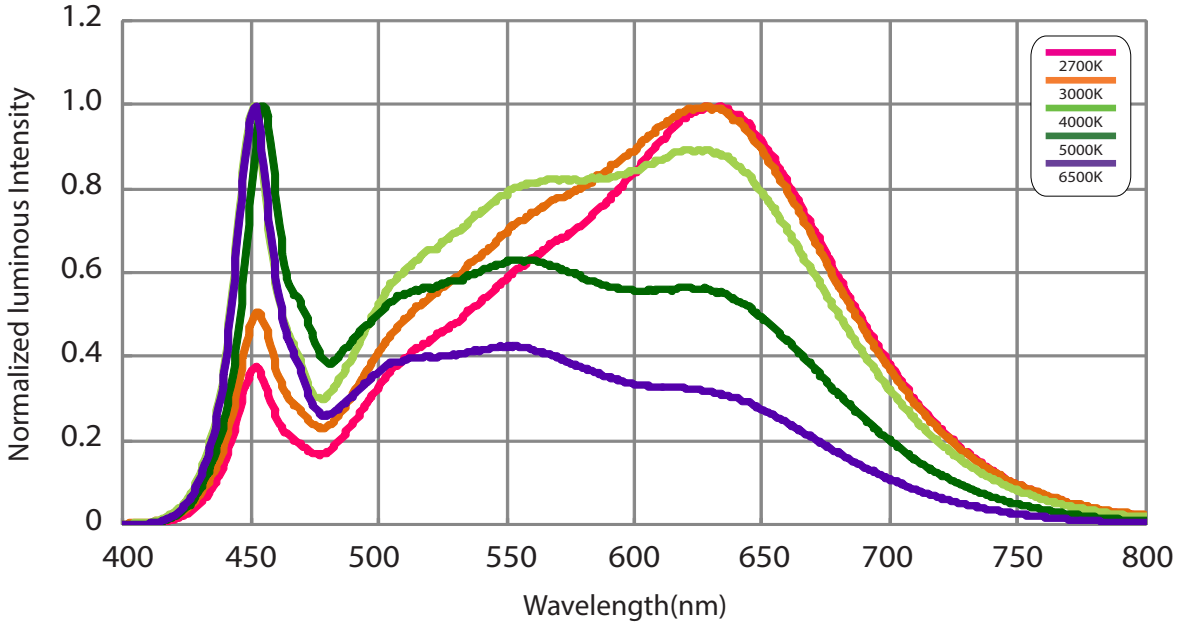
X1		X2		X3		X4	
Type		Series		CCT		CRI (Ra)	
--	--	HE03	HE03	30	3000K	80	CRI (Ra) 80
						90	CRI (Ra) 90

Characteristic curve

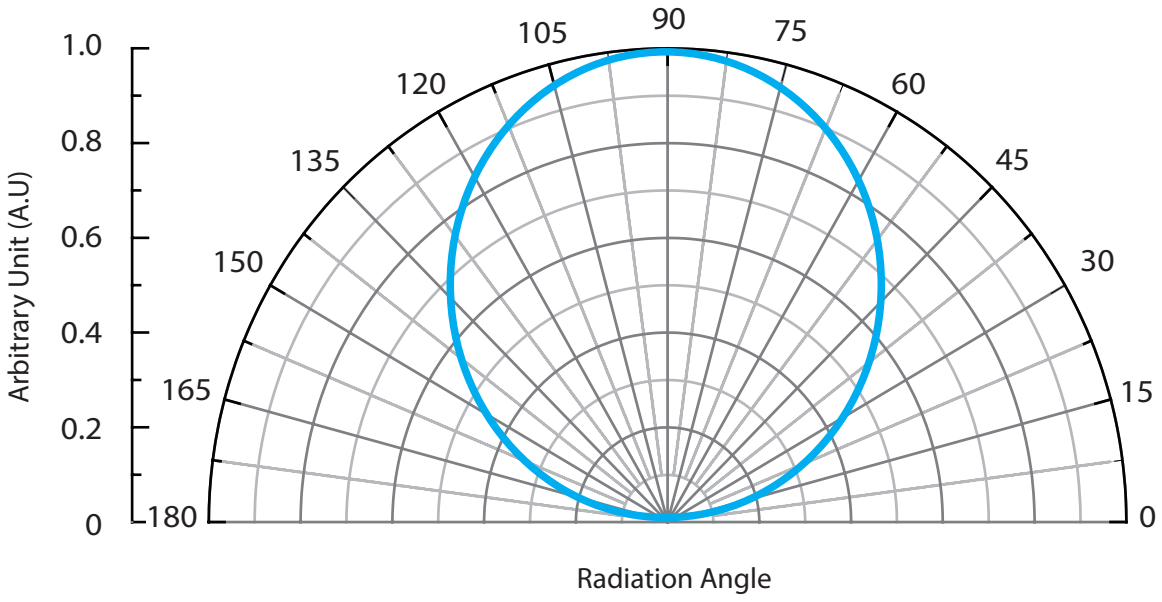
Color Spectrum (T_C=25°C,I_F=90mA)_Ra80



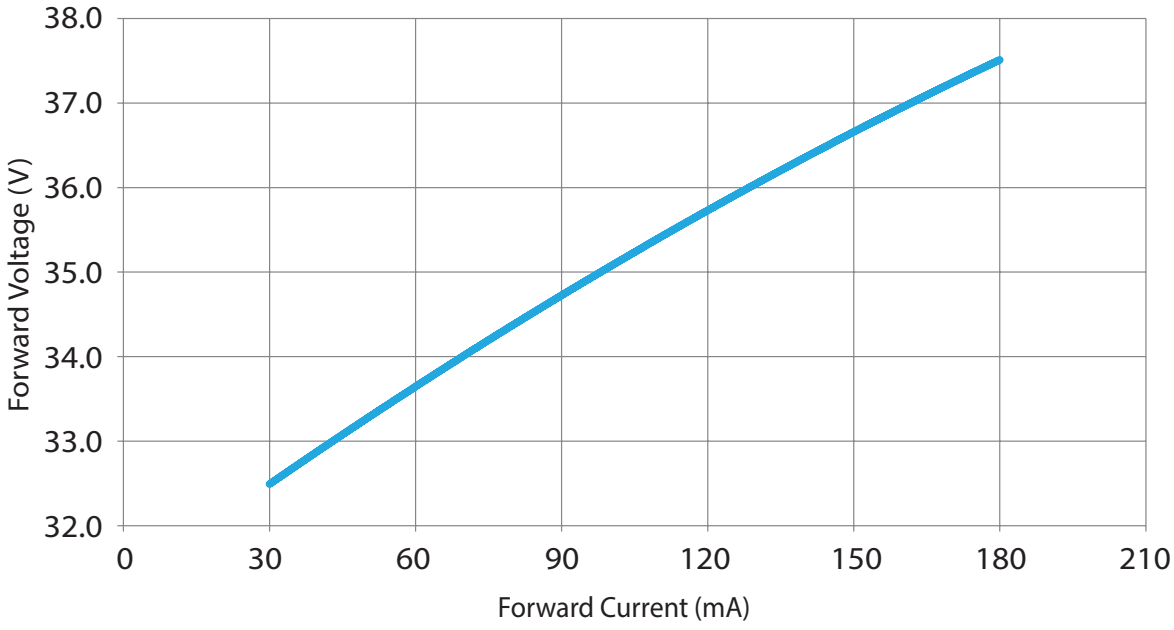
Color Spectrum (T_C=25°C,I_F=90mA)_Ra90



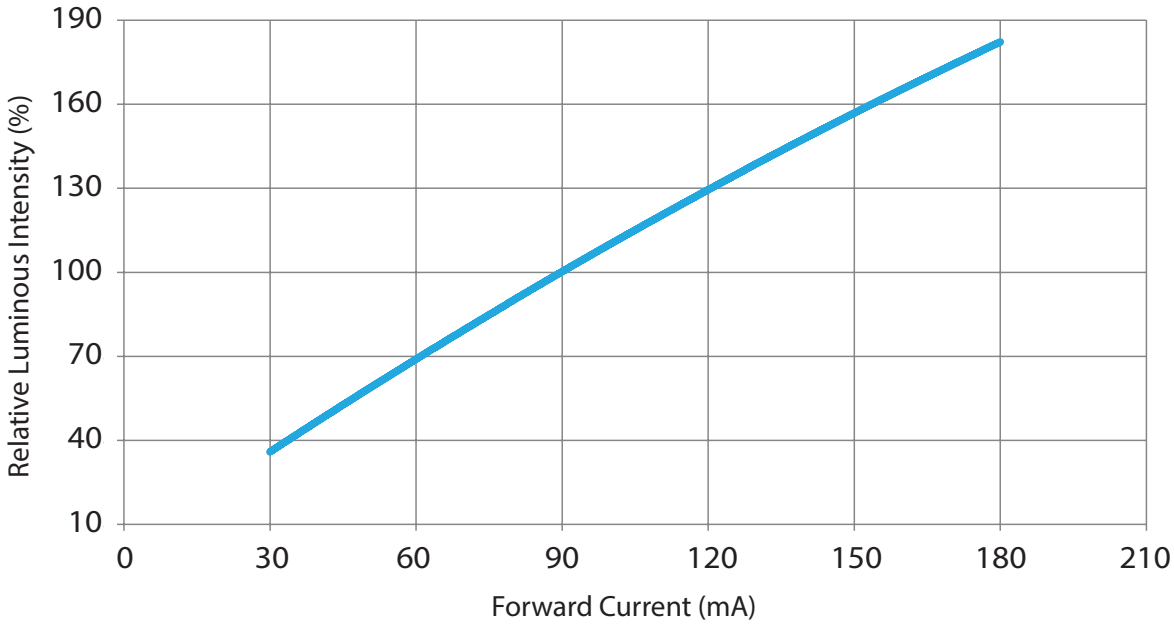
Beam Pattern



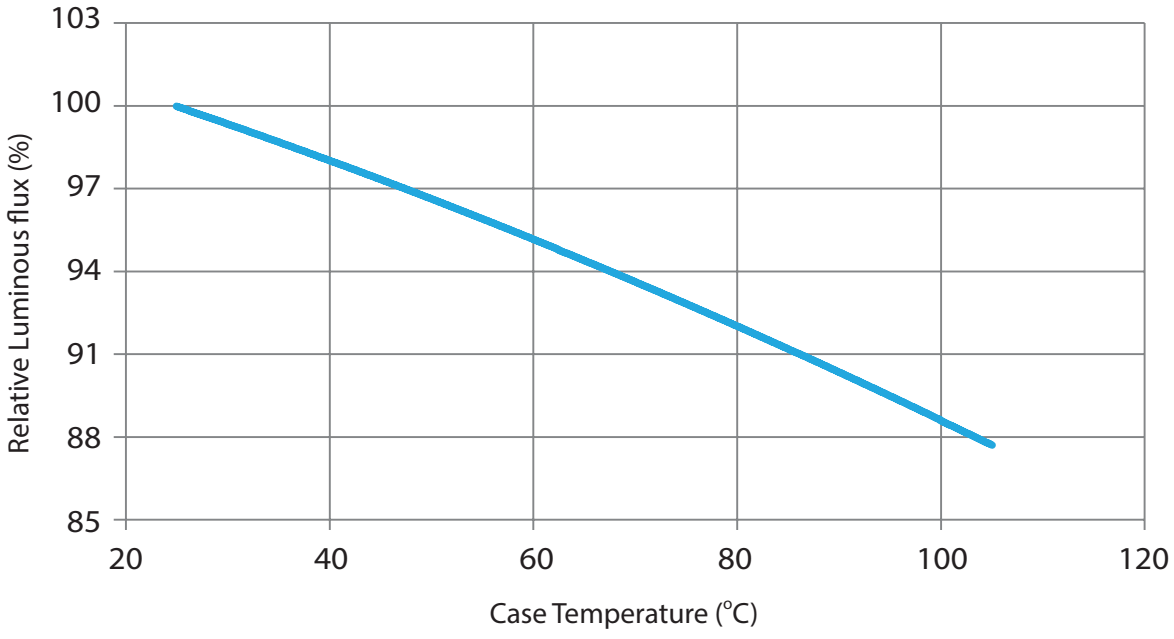
Forward Voltage vs. Forward Current (T_C=25°C)



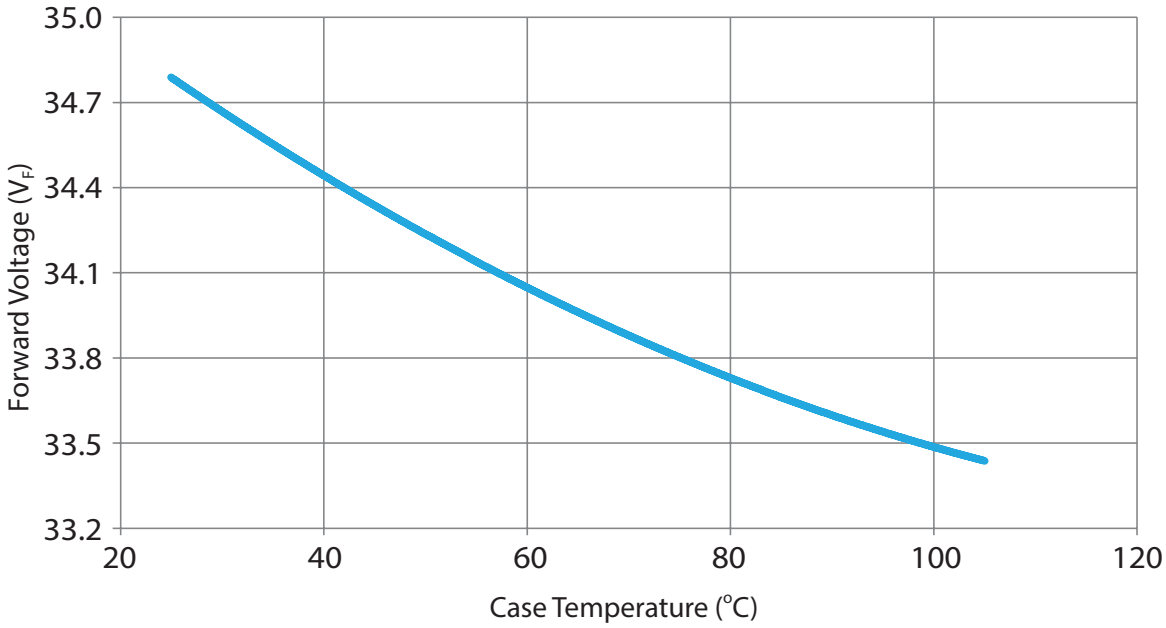
Relative luminous Intensity vs. Forward Current (T_C=25°C)



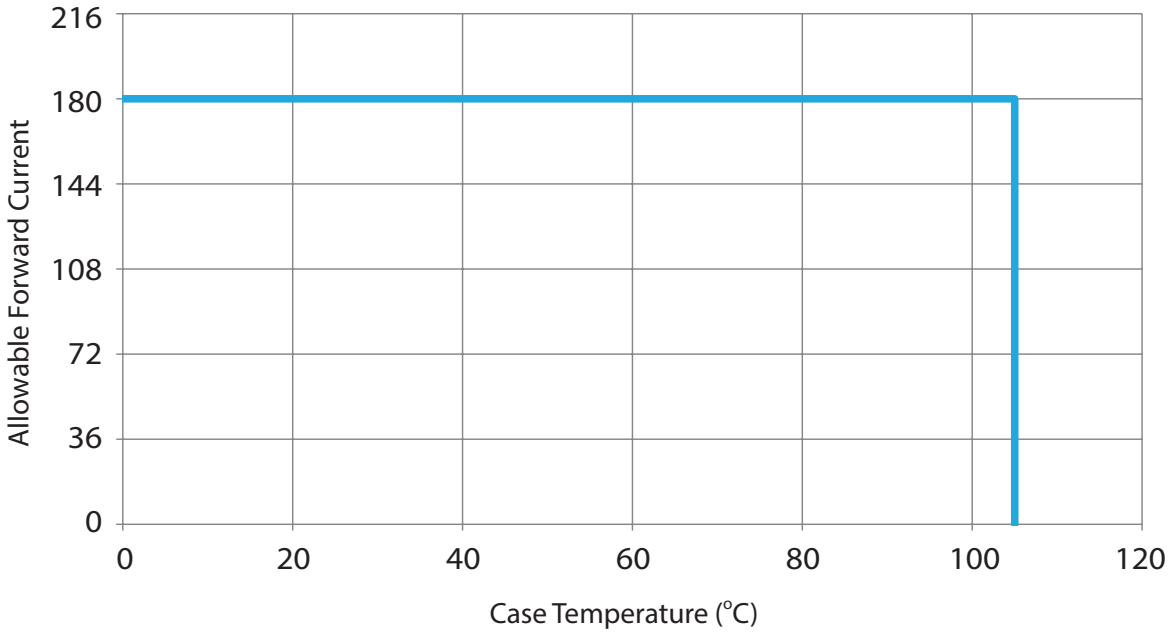
Relative Luminous Flux vs. Case Temperature (I_F=90mA)



Forward Voltage vs. Case Temperature (I_F=90mA)



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%	-
Δu'v'	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μA
Resistance to Soldering Heat	No dead lamps or visual damage	

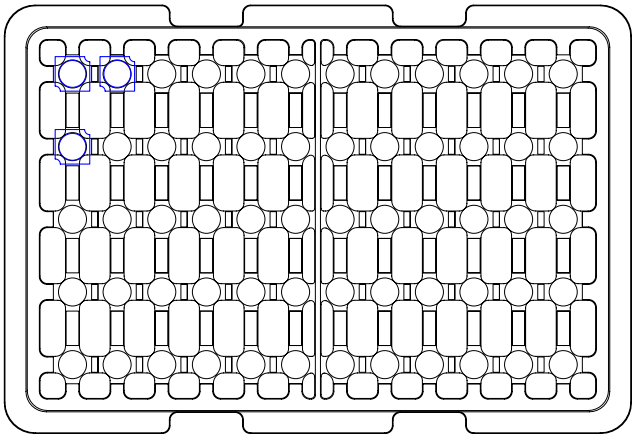
Cautions

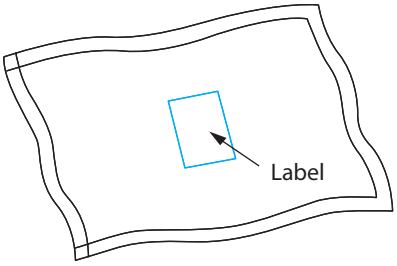
LED avoids being stored and lighted in the environment containing sulfur. Some matrrials, such as seals, printing ink, enclosure and adhesives, may contain sulfur, avoiding the exposure in acid or halogen environment.

Lighting Design Manufacturing Service

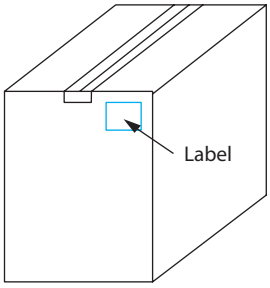
Product Packaging Information

Tray Packing





Antistatic bag



Carton

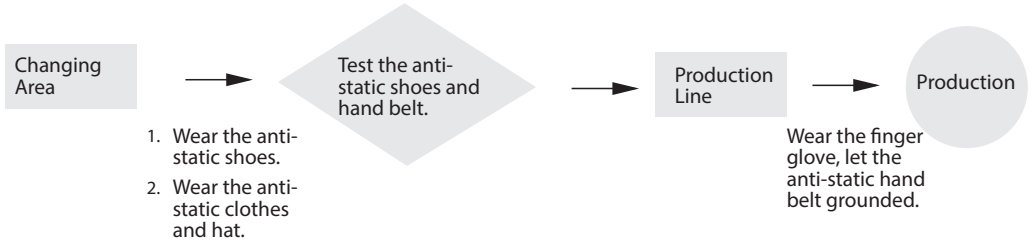
Notes:
1. All dimensions are in mm.
2. Tray dimensions: 168×246×10mm
3. 60pcs emitters in a full tray.
4. There are 5 trays in a bag.
5. 10 bags in a carton
6. A bag contains one drying agent.
7. Carton dimensions: 353x254x256mm.

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.

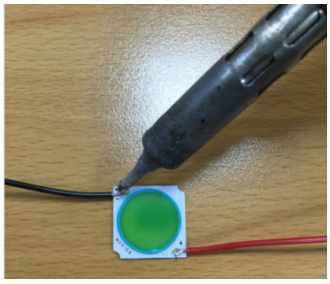


2. Environmental anti-static protection
   - Use an anti-static floor and make earth. Materials such as plastic or rubber contain carbon or conductive polyester is recommended.
   - LEDs should be operated on the desk which is laid by the static discharge material.
   - Protection area with a temperature at 22±5°C and a relative humidity at 70±10%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.

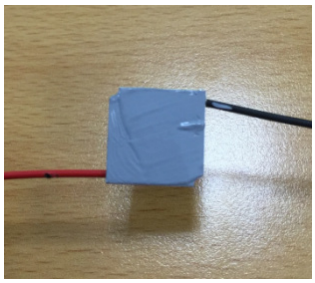
3. Anti-Static steps for package, transportation and storage.
   - Package: All the bags must have the ability of anti-static. Do not use any nylon bag, normal plastic bag or polyester bag for package. Do not open the bag if a LED is not ready to be handling. Open the bag at the protection area and put 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

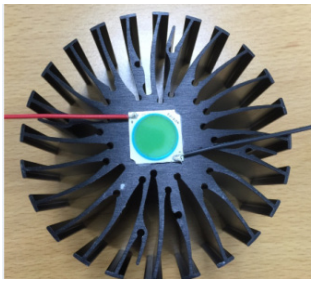
Solder electric wires



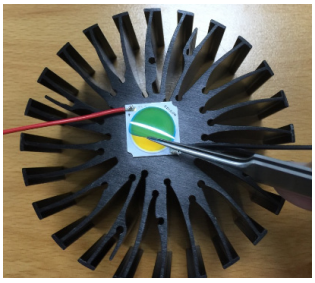
Backside coated with thermal grease



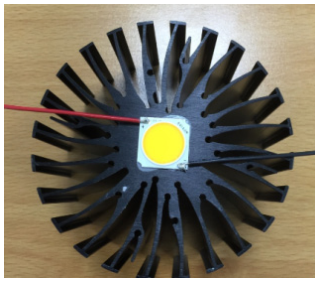
Mount the COB components to the heatsink modules



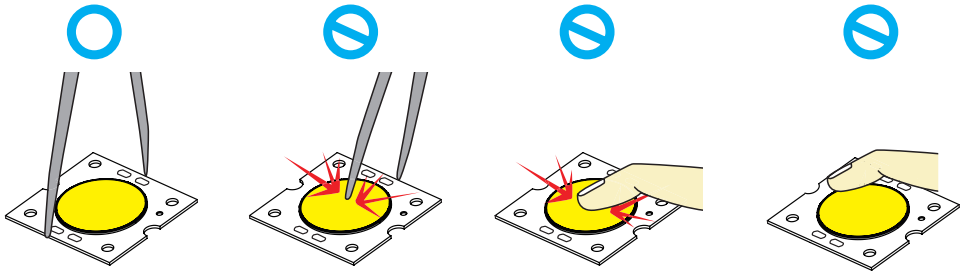
Remove the Blue protective film with tweezer



Complete operation process



Handling with a EdiPower® V Component



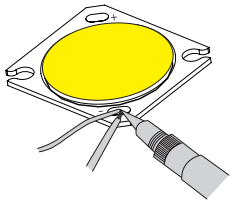
Do not touch the emitting region

Do not touch Dam

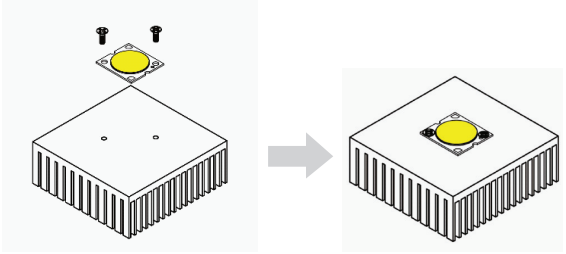
- Proper handling of the EdiPower® V using tweezers or gloved fingers.
- Do not touch the emitting region and Dam.
- Use only the IPA and swab to clean the flux/dust of the EdiPower® V surface. Other organic solvent may cause the failure

Notification of Installation.

1. Soldering pads are present for direct electrical wiring. Manual soldering at 360±5°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.

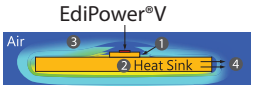
For LEDs, choose an appropriate operation environment and conduct the heat to the air after light on LEDs may maintain the better performance and lifetime. Four major thermal path are as follow:

(1) From heat source (component) to heat sink. (By conduction)

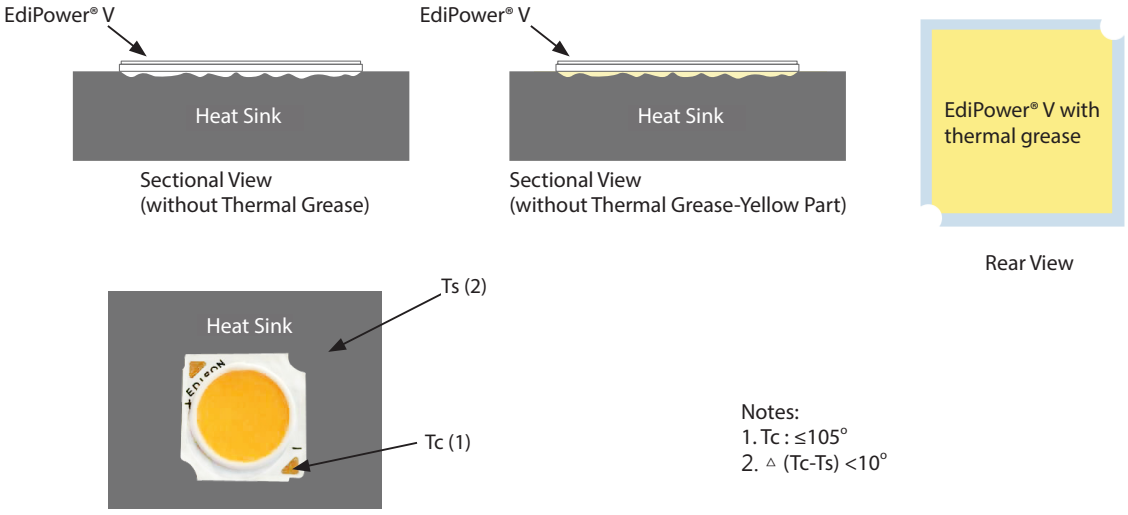
(2) Conduction from within the heat sink to its surface. (By conduction)

(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.



Notes:
1. Tc : ≤105°
2. ▵ (Tc-Ts) <10°

Recommended thermal Grease Parameters

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

Lighting Design Manufacturing Service

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2021/04/08
2	Update the Luminous Flux Characteristic	2023/11/30

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

www.edison-opto.com

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