

EdiPower® III

DOB Series PHI33

Dim to Warm 230V

Datasheet



Down Light



Spot Light



PAR Lamp



Bulb

Introduction :

Compared with DC LED modules, Edison DOB(driver on board) Series module doesn't need to connect external driver so that it can help to reduce the circuit cost and the size of luminaires. It is more convenient for luminaire design with DOB Series module. Users can adjust the brightness of LED lamps easily with Smart lighting dimming system.

Description :

- 7/10/12/14W_230V_>80lm/W
- CCT : 2700K/3000K
- CRI min : 95
- Power Factor > 0.95
- Current THD < 20%

Feature and Benefits :

- Internal Structure: Aluminum mirror Chip on Board
- High efficiency and high power factor (PF>0.95) & Low THD
- Color consistency and is compliant with 3-step / 5-step MacAdam

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General Information

Ordering Code Format

2 DAT C x 90 23 xx 30 xx
 X1 X2-X4 X5 X6 X7-X8 X9-X10 X11-X12 X13-X14 X15-X16

X1		X2-X4		X5		X6		X7-X8	
Type		Component		Dimensions		Internal code		CRI	
2	Emitter	DAT	Triac CCT dimming	C	Circle	-	-	90	CRI 90

X9-X10		X11-X12		X13-X14		X15-X16	
Voltage		Emitter Power		Emitting color		Serial Number	
23	230V	7	7W	30	3000K	-	-
		10	10W				
		12	12W				
		14	14W				

Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Maximum operation voltage	V_{op}	253	V
Operation temperature	T_{op}	-30~+85	°C
Storage temperature	T_{st}	-40~+100	°C
Case Temperature	T_c	70	°C
Junction Temperature	T_j	125	°C
Insulation voltage	Viso[RMS]	1.5	KV
Tolerance of Surge	Vs	1.5	KV

Note:

Need to put thermal conductive pad under the module (Size Phi 39mm) that insulation voltage can reach 3KV.

Luminous Flux Characteristic

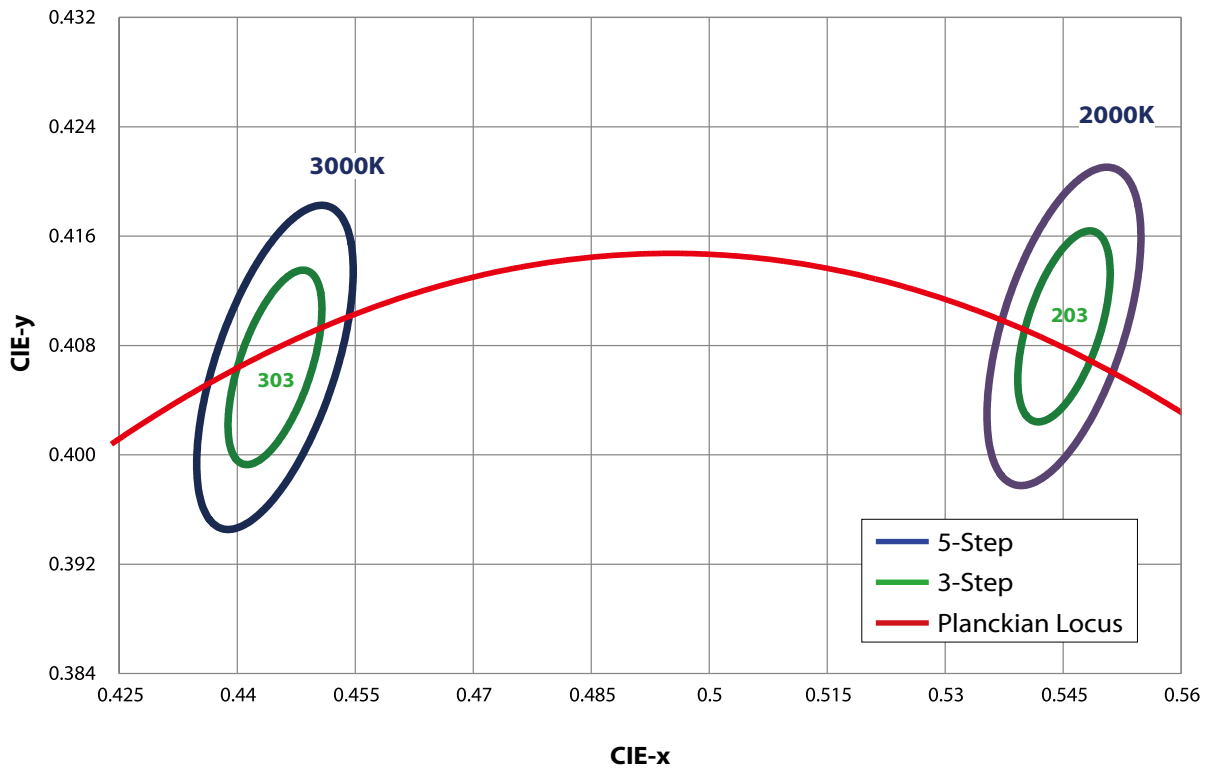
Order Code	CCT (K)	Luminous Flux(lm) T _c =25°C		Efficacy (lm/W)	CRI Ra	CRI R9	Vac	Watt
		Min.	Typ.	Typ.	Min.	Min.	Typ.	
2DATCN9023073006	2000	30	35	37	-	-	80	0.9
	3000	535	595	85	95	90	230	7
2DATCN9023103006	2000	55	65	33	-	-	80	1.9
	3000	725	805	82	95	90	230	9.8
2DATCN9023123006	2000	55	65	34	-	-	80	1.9
	3000	880	975	82	95	90	230	11.9
2DATCN9023143006	2000	55	65	32	-	-	80	1.9
	3000	1020	1130	81	95	90	230	13.9

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition
Viewing Angle FWHM	2θ1/2	105	115	120	deg	Vop=230V
Operation Voltage	Vop	198	230	253	V	-
Power Dissipation	(2DATCN9023073006) (2DATCN9023103006) (2DATCN9023123006) (2DATCN9023143006)	Pd	5.7 8.1 9.5 10.9	7.0 9.8 11.9 13.9	8.0 10.9 13.8 15.4	W Vop=230V
Operation Frequency	Fop	50/60			Hz	Vop=230V
Power Factor	PF	Over 0.95			-	Vop=230V
Current THD	ATHD	Less than 20%			%	Vop=230V

Notes:

1. At 230Vac, Ta=25°C.
2. Edison Opto Corp. maintains luminous flux ±10%, Ra and R9±2 tolerance.

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

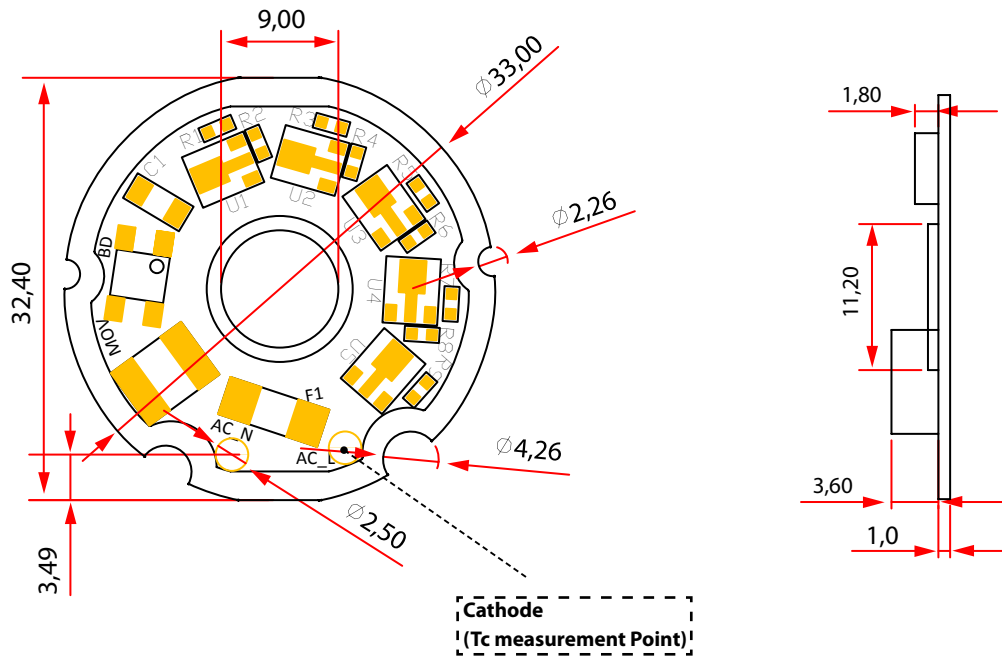


CCT	Steps	Cx	Cy	a	b	theta
2000K	5	0.5451	0.4094	0.01350	0.00700	53.70
3000K	5	0.4448	0.4064	0.01390	0.00680	53.22
2000K	3	0.5451	0.4094	0.00810	0.00420	53.70
3000K	3	0.4448	0.4064	0.00834	0.00408	53.22

Note:
CIE_x,y tolerance: ± 0.005 .

Mechanical Dimensions

Emitter Dimensions

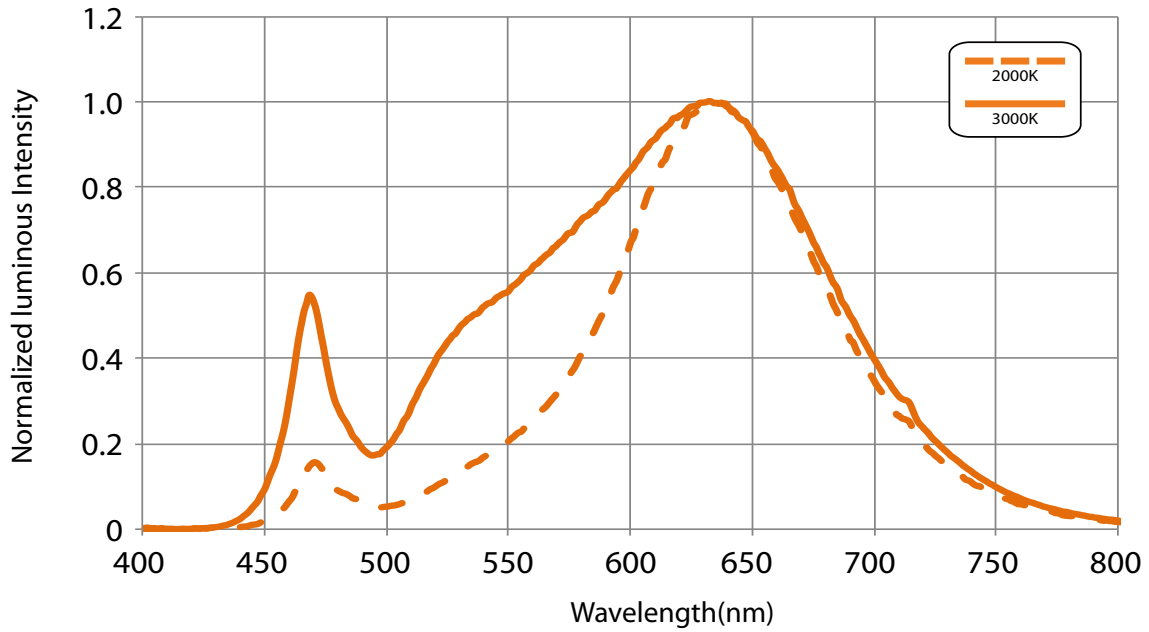


Notes :

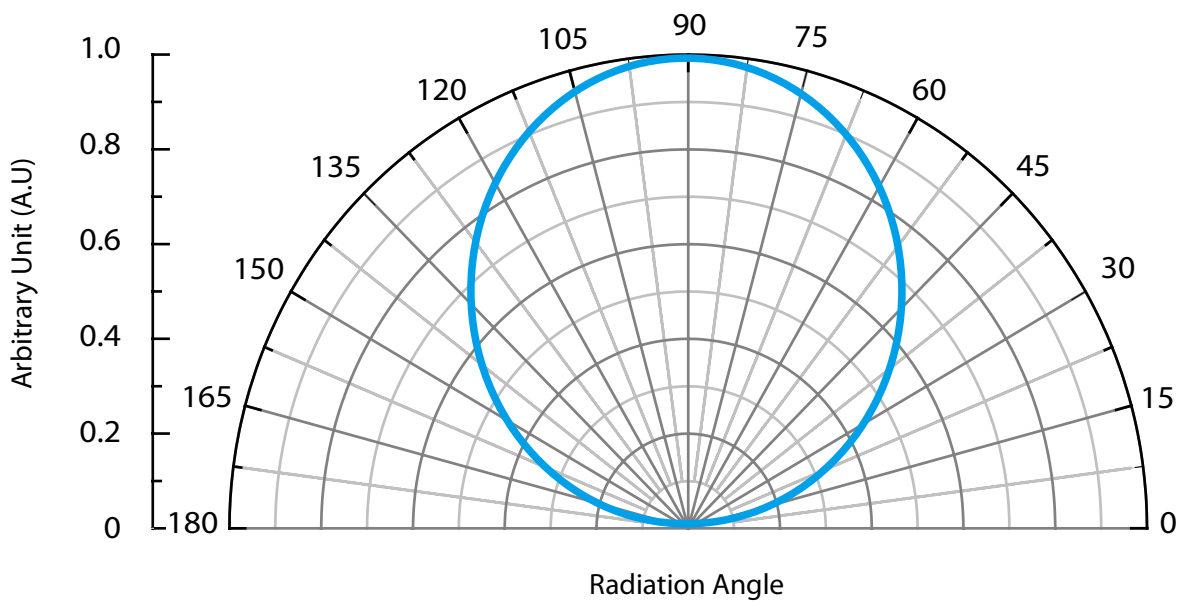
1. Unit : mm
2. Tolerance : ± 0.2 mm

Characteristic curve

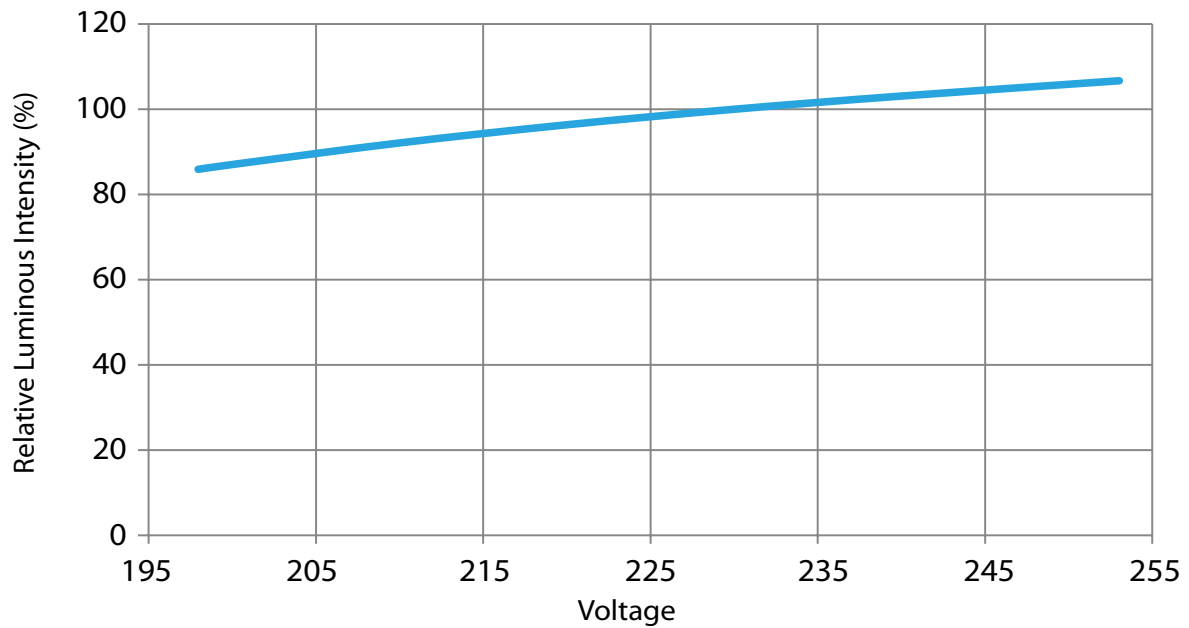
Color Spectrum



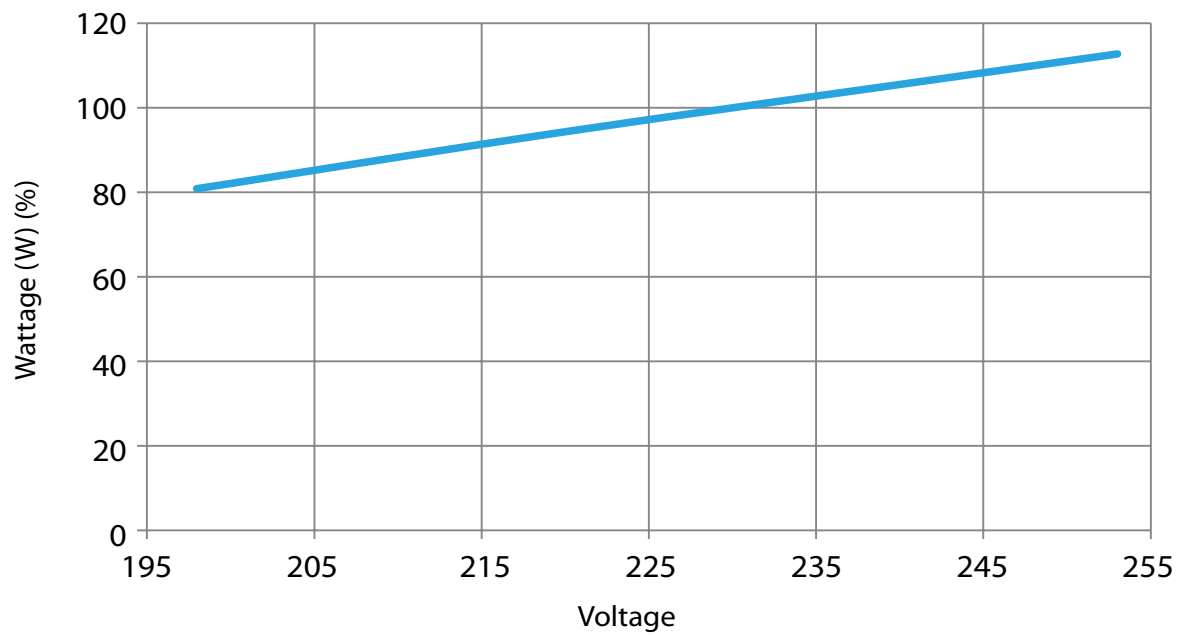
Beam Pattern



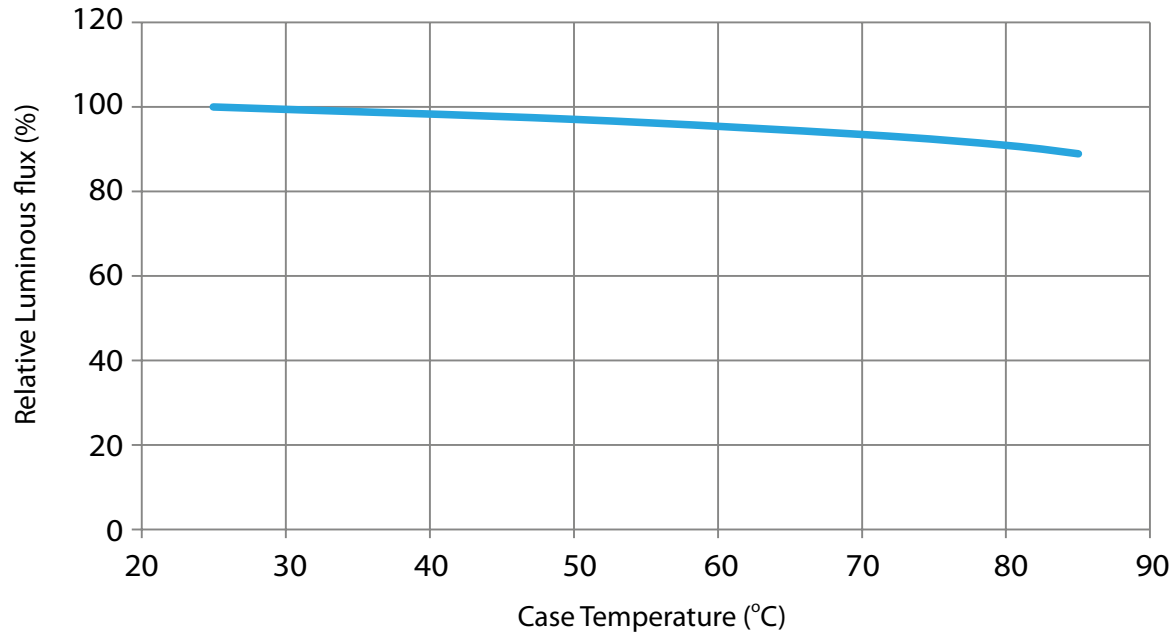
Relative luminous Intensity vs. Voltage



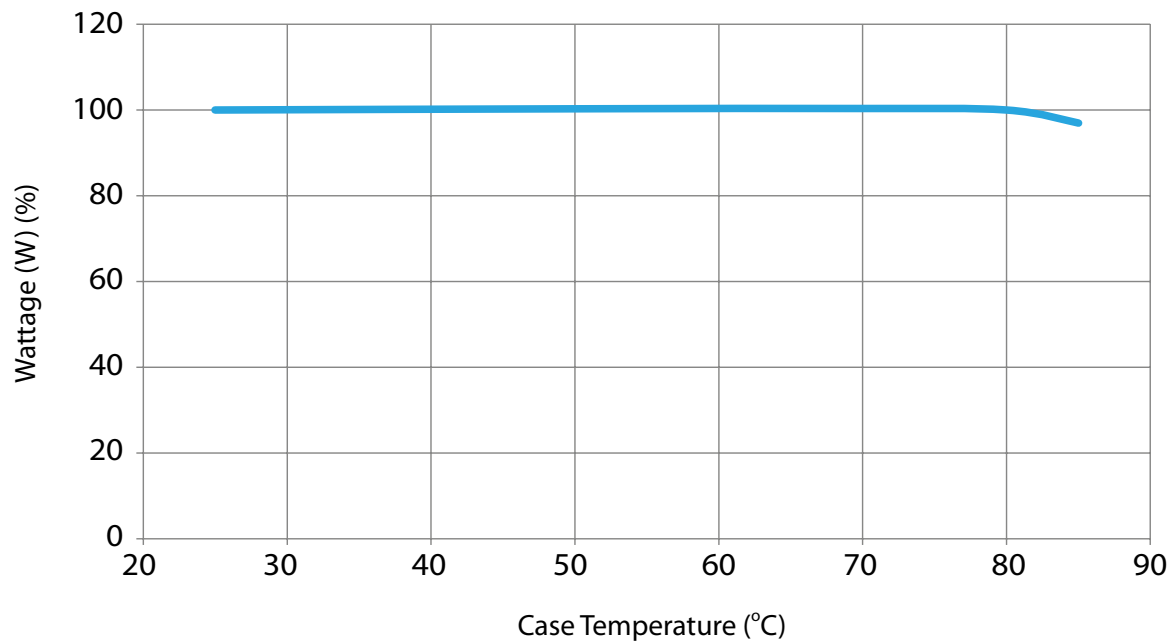
Wattage vs. Voltage



Relative Luminous Flux vs. Case Temperature



Wattage vs. Case Temperature



Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C (30 mins / 30 mins)	100 Cycle
2	Low-Temperature Storage	Ta= -40°C	1000 hrs
3	High-Temperature Storage	Ta=105°C	1000 hrs
4	High Temperature High Humidity Life test	Ta=85°C, RH=85%	500 hrs
5	Operation Life test	Ta = 25°C	1000 hrs
6	High Temperature Operation Life test	Tc = 70°C	1000 hrs
7	ON/OFF Test	3 sec ON, 3 sec OFF	1.5W times

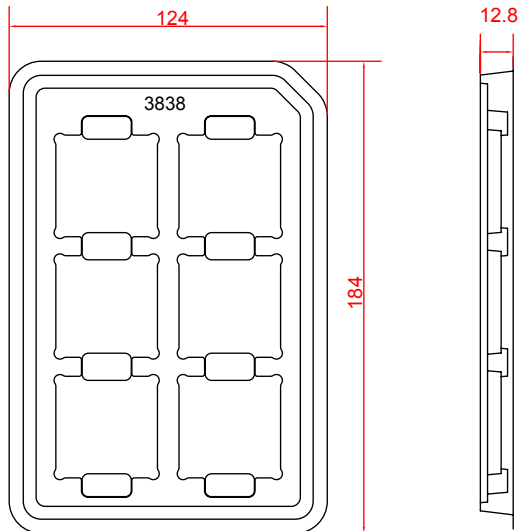
Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Luminous Flux	0.85	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Resistance to Soldering Heat	No dead lamps or visual damage	

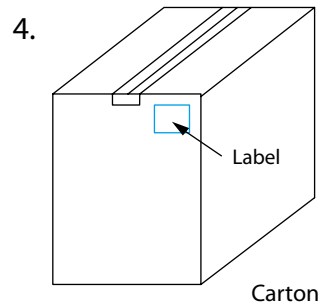
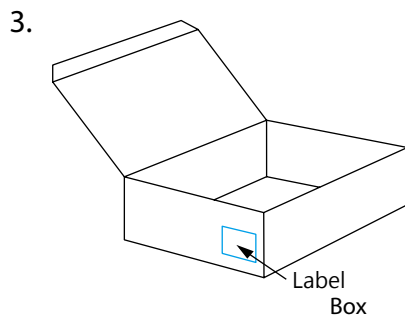
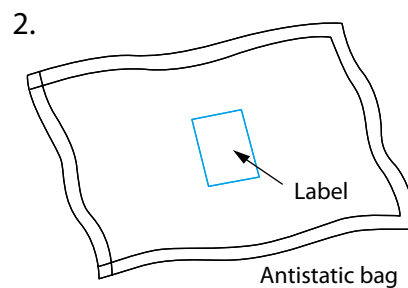
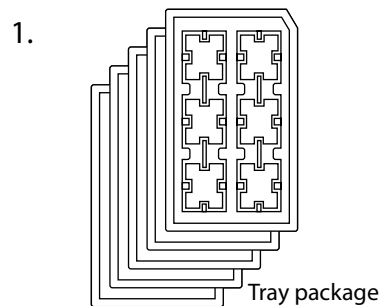
Cautions

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 package dimension.



Notes:

1. All dimensions are in mm.
2. There are 6pcs 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.

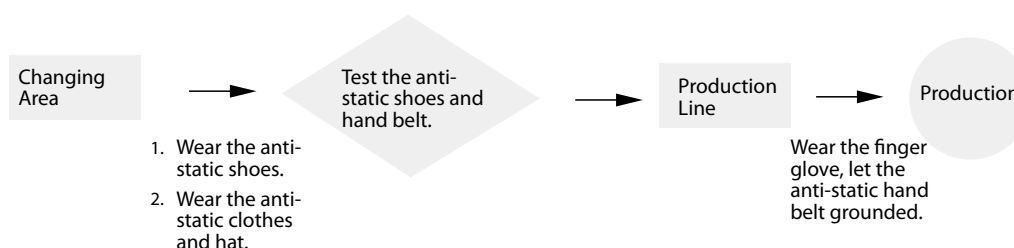
Handling with a DOB Series

√ Both the light emitting area and white dam over the light emitting area is composed of resin materials. Please avoid the resin area from being pressed, stressed, rubbed, come into contact with sharp metal nail because the function, performance and reliability of this product are negatively impacted.

√ 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.

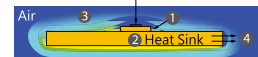
√ Thermal Management

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 .

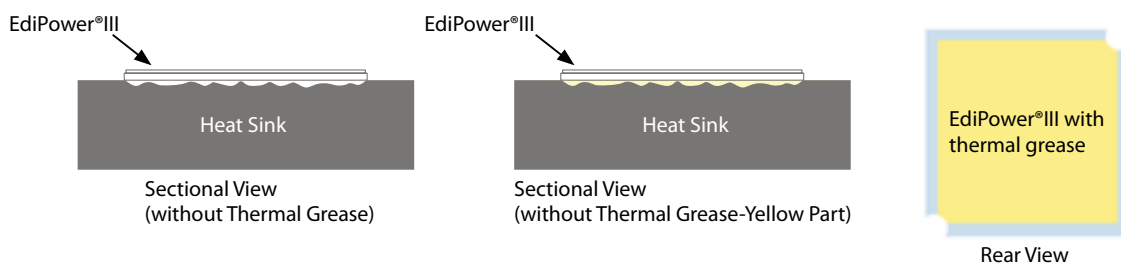
The power dissipation ability, the ambient temperature between the LED junction, environment, thermal path and its thermal resistance are the mean parameters which affect the performance of a LED device. Therefore, the limitation of the junction temperature has become an important issue when designing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

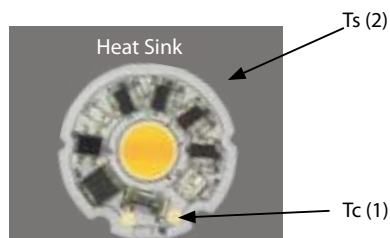
For LEDs, choose an appropriate operation environment and conduct the heat to the air after light on LEDs may maintain the better performance and lifetime. Four major thermal path are

- (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. $T_c \leq 70^\circ\text{C}$
2. $\Delta(T_c - T_s) < 10^\circ\text{C}$

Recommended thermal Grease Parameters

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

- √ DO NOT touch any of the circuit board, components or terminals with body or metal while circuit is active.
- √ DO NOT add or change wires while circuit is active
- √ DO NOT make any modification on module.
- √ DO NOT use together with the materials containing Sulfur.
- √ DO NOT exceed the values given in this specification
- √ Keep cautions not to apply higher voltage above the maximum rating. Otherwise damage may occur.
Pay attention not to exceed the maximum operation temperature of 85°C at the T_c Point when the modules are used in an enclosed environment.
- √ DO NOT assemble in conditions of high moisture and/or oxidizing gas such as Cl, H₂S, NH₃, SO₂, NO_x, etc.
Damage by corrosion will not be allowed as defect claim. LED Module is recommended for Indoor use only.
- √ Long time exposure to sunlight or UV can cause the lens to discolor.
- √ Storage Conditions
 - (1) Before opening the package: The LED light engines should be kept at 30°C or less and 90% RH or less. The LED light engines should be used within a year. When storing the LED light engines, moisture-proof packaging with moisture-absorbent material (silica gel) is recommended.
 - (2) After opening the package: The LED light engines should be kept at 30°C or less and 70% RH or less. The LEDs should be soldered within 168 hours (7 days) after opening the package. If unused LED light engines remain, they should be stored in moisture-proof packages, such as sealed containers with packages of moisture-absorbent material (silica gel). It is also recommended to return the LED light engines to the original moisture-proof bag and to reseal the moisture-proof bag again.
 - (3) Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2016/09/27
2	1. Revise the CRI Value 2. Update Mechanical Dimensions	2016/11/23
3	Add the Cautions of reliability	2017/05/19
4	1. Revise Chromaticity coordinates 2. Update Luminous flux characteristic 3. Update CCT from 1500K to 2000K	2017/09/19
5	Revise Chromaticity coordinates	2017/12/13
6	1. Revise the photo of front page 2. Update the Absolute Maximum Ratings and Information 3. Update the Mechanical Dimensions Information	2019/03/08

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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