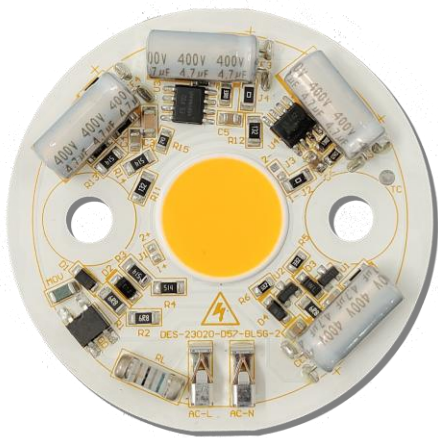


# DOB III AC Module D57 230V Series



## Application



Down Light



Spot Light



PAR Lamp

## Product Description

15W/18W/20W Power Consumption  
AC 230V Voltage input  
Module Diameter 57mm  
LES Diameter 18mm

## Features

High color rendering index CRI(Ra)> 80/90  
Small color tolerance MacAdam < 3  
TRIAC dimming compatible  
Uniform Full dimming  
High Power Factor > 0.9  
Low THDi 30%(Typ)  
Low EMI  
RoHS compliant  
No photo-biological hazard: RG1  
Percent flickering <10%  
SVM < 0.4  
Wire push in connector

## Benefits

Module with integrated electronic  
Enables thin designs of luminaries

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## General Information

### Ordering Code Format

<u>5</u>	<u>DAT</u>	<u>C</u>	<u>N</u>	<u>90</u>	<u>2 3</u>	<u>10</u>	<u>xx</u>	<u>xx</u>	
X1	X2—X4	X5	X6	X7-X8	X9-X10	X11-X12	X13-X14	X15-X16	
X1	X2-X4		X5		X6		X7-X8		
Item	Module application		Dimensions		IC		CRI		
5	Module	DAT	DOB dim	C	Circle	-	-	90	90
								80	80
X9-X10		X11-X12		X13-X14		X15-X16			
Voltage		Power Consumption		Emitting color		Serial Number			
12	120V	15	15W	27	2700K	-	-		
23	230V	18	18W	30	3000K				
		20	20W	40	4000K				
				50	5000K				
				57	5700k				
				65	6500k				

## Absolute Maximum

Parameter	Symbol	Value	Units	Units
Maximum operation voltage	$V_{op}$	253	V	-
Power Dissipation	$P_d$	16.6 / 20 / 22.2	W	$V_{op}=230V$
Operation ambient temperature	$T_a$	-40~+85	°C	$V_{op}=230V$
Storage temperature	$T_{st}$	-40~+100	°C	
Case Temperature	$T_c$	85	°C	$V_{op}=230V$
Insulation voltage	$V_{iso}[RMS]$	1.5	KV	
Tolerance of Surge	$V_s$	1.5	KV	$V_{op}=230V$

## Luminous Flux Characteristic (T<sub>c</sub>=25°C)

Order Code	CCT (K)	Luminous Flux(lm) T <sub>c</sub> =25°C		Efficacy (lm/W)	CRI Ra	LES (mm)	Vac	Watt
		Min.	Typ.	Typ.	Typ.	Typ.	Typ.	
5DATCN8023152705	2700	1215	1350	90	80	18	230	15
5DATCN8023153005	3000	1215	1350	90				
5DATCN8023154005	4000	1305	1450	95				
5DATCN8023155005	5000	1305	1450	95				
5DATCN8023155705	5700	1305	1450	95				
5DATCN8023156505	6500	1260	1400	93	90	18	230	15
5DATCN9023152705	2700	1035	1150	76				
5DATCN9023153005	3000	1035	1150	76				
5DATCN9023154005	4000	1215	1350	90				
5DATCN9023155005	5000	1215	1350	90				
5DATCN9023155705	5700	1215	1350	90				
5DATCN9023156505	6500	1125	1250	83				

Order Code	CCT (K)	Luminous Flux(lm) T <sub>c</sub> =25°C		Efficacy (lm/W)	CRI Ra	LES (mm)	Vac	Watt
		Min.	Typ.	Typ.	Typ.	Typ.	Typ.	
5DATCN8023182705	2700	1395	1550	83	80	18	230	18
5DATCN8023183005	3000	1395	1550	83				
5DATCN8023184005	4000	1530	1700	94				
5DATCN8023185005	5000	1530	1700	94				
5DATCN8023185705	5700	1530	1700	94				
5DATCN8023186505	6500	1485	1650	92	90	18	230	18
5DATCN9023182705	2700	1215	1350	75				
5DATCN9023183005	3000	1215	1350	75				
5DATCN9023184005	4000	1395	1550	86				
5DATCN9023185005	5000	1395	1550	86				
5DATCN9023185705	5700	1395	1550	86				
5DATCN9023186505	6500	1305	1450	80				

Order Code	CCT (K)	Luminous Flux(lm) T <sub>c</sub> =25°C		Efficacy (lm/W)	CRI Ra	LES (mm)	Vac	Watt
		Min.	Typ.	Typ.	Typ.	Typ.	Typ.	
5DATCN8023202705	2700	1485	1650	82	80	18	230	20
5DATCN8023203005	3000	1485	1650	82				
5DATCN8023204005	4000	1665	1850	92				
5DATCN8023205005	5000	1665	1850	92				
5DATCN8023205705	5700	1665	1850	92				
5DATCN8023206505	6500	1575	1750	87	90	18	230	20
5DATCN9023202705	2700	1305	1450	72				
5DATCN9023203005	3000	1305	1450	72				
5DATCN9023204005	4000	1485	1650	82				
5DATCN9023205005	5000	1485	1650	82				
5DATCN9023205705	5700	1485	1650	82				
5DATCN9023206505	6500	1395	1550	77				

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition
Viewing Angle FWHM	2θ1/2	-	120	-	deg	Vop=230V
Operation Voltage	V <sub>op</sub>	207	230	253	V	Vop=230V
Power Dissipation	P <sub>d</sub>	13.5	15	16.6	W	Vop=230V
		16.2	18	20		
		18	20	22.2		
Operation Frequency	Fop	50 / 60			Hz	Vop=230V
Power Factor	PF	0.9			-	Vop=230V
Current THD	ATHD	-	30		%	Vop=230V
Flicker	-	-	5	10	%	Vop=230V
DF	-	0.9	-	-	-	Vop=230V

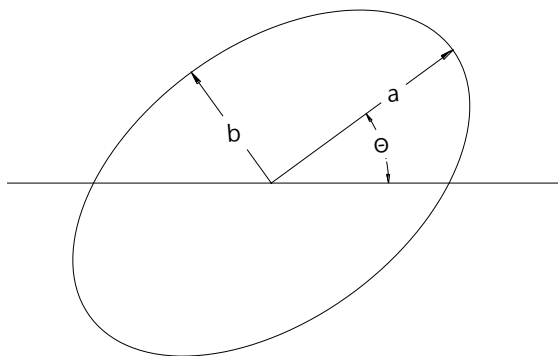
Notes:

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



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

.CIE chromaticity Diagram



The color ranks have chromaticity ranges within 3-step MacAdam ellipse

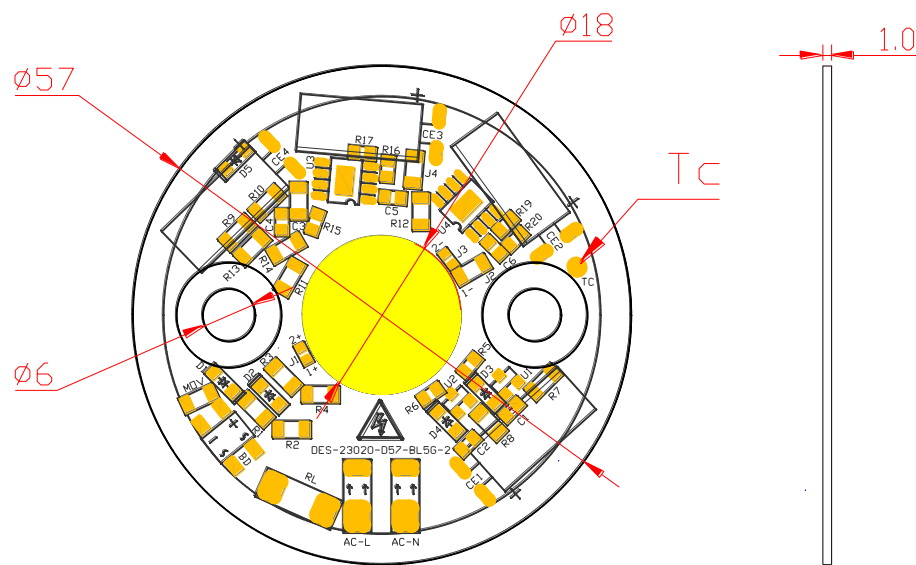
CCT	Steps	C <sub>x</sub>	C <sub>y</sub>	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.70
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22
4000K	3	0.3818	0.3797	0.00939	0.00402	53.72
5000K	3	0.3447	0.3553	0.00822	0.00354	59.62
5700K	3	0.3287	0.3417	0.00746	0.00320	59.09
6500K	3	0.3123	0.3282	0.00669	0.00285	58.57

Note:

Tolerance of measurements of the chromaticity coordinate is  $\pm 0.005$ .

## Mechanical Dimensions

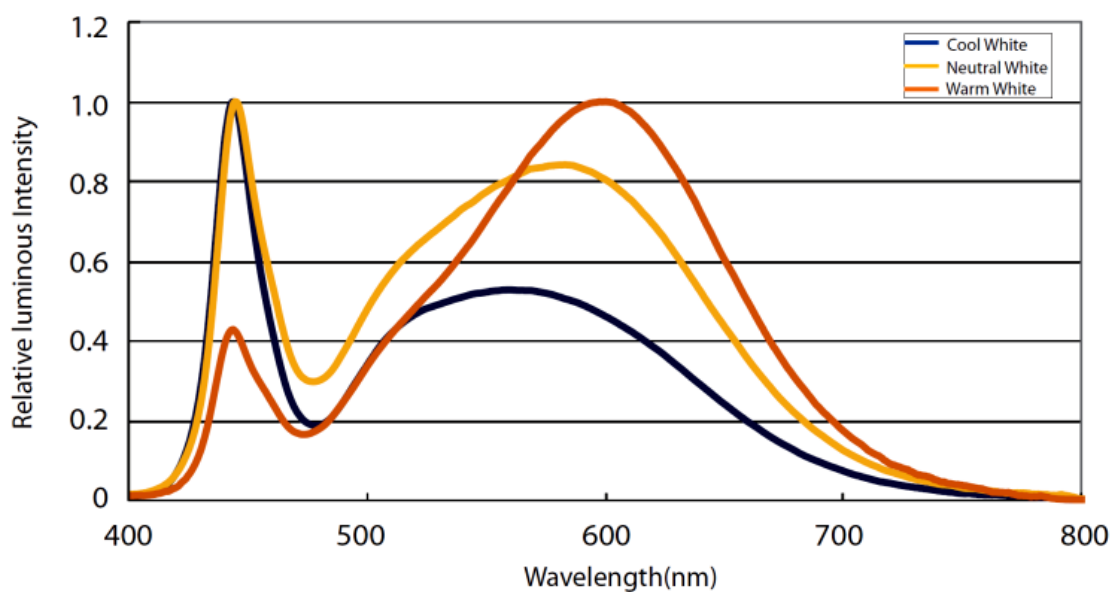
### Emitter Dimensions



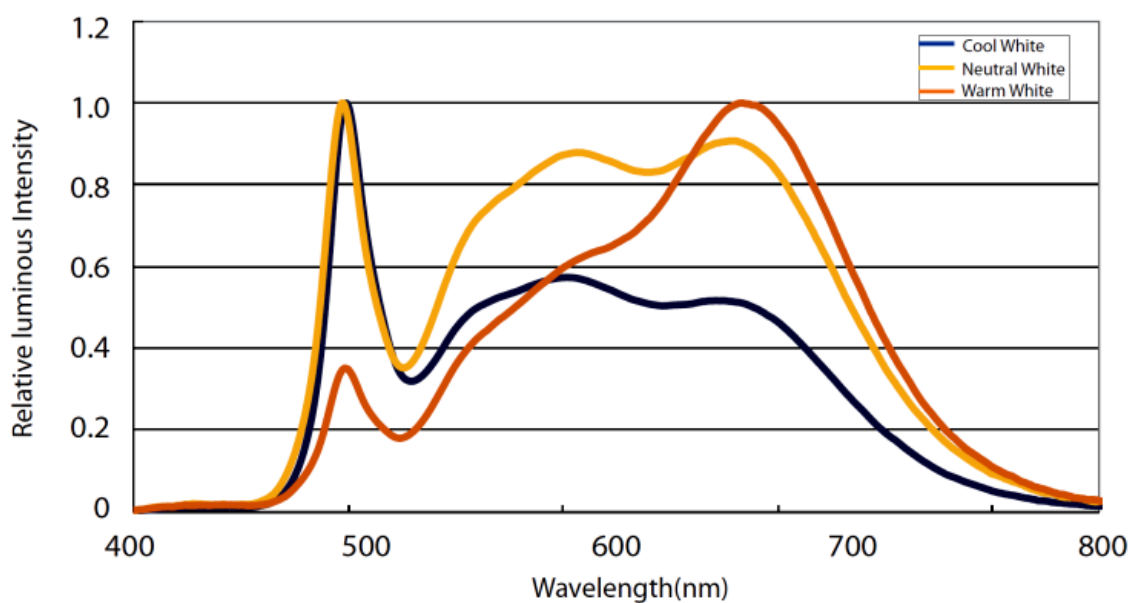
Note: Unit: mm

## Characteristic curve

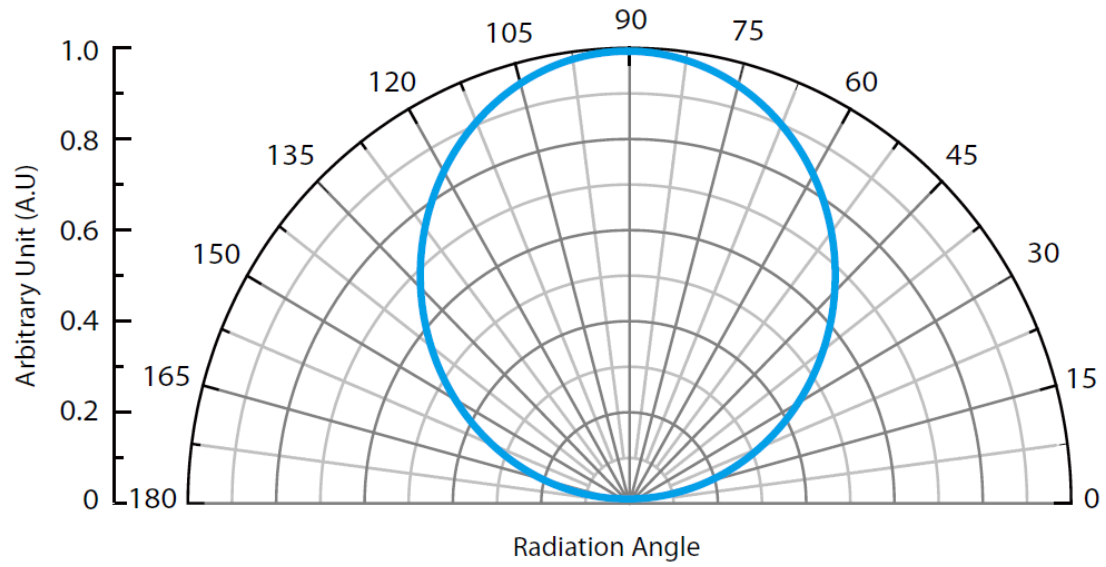
### Color Spectrum ( $T_c=25^{\circ}\text{C}$ , $VAC=230V$ )\_Ra 80



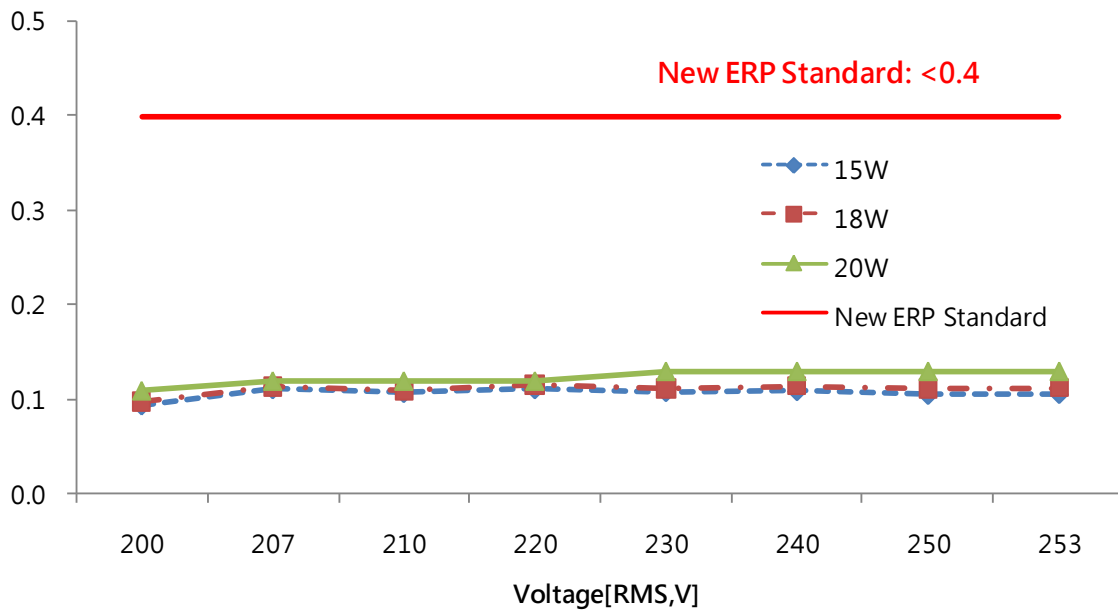
### Color Spectrum ( $T_c=25^{\circ}\text{C}$ , $VAC=230V$ )\_Ra 90



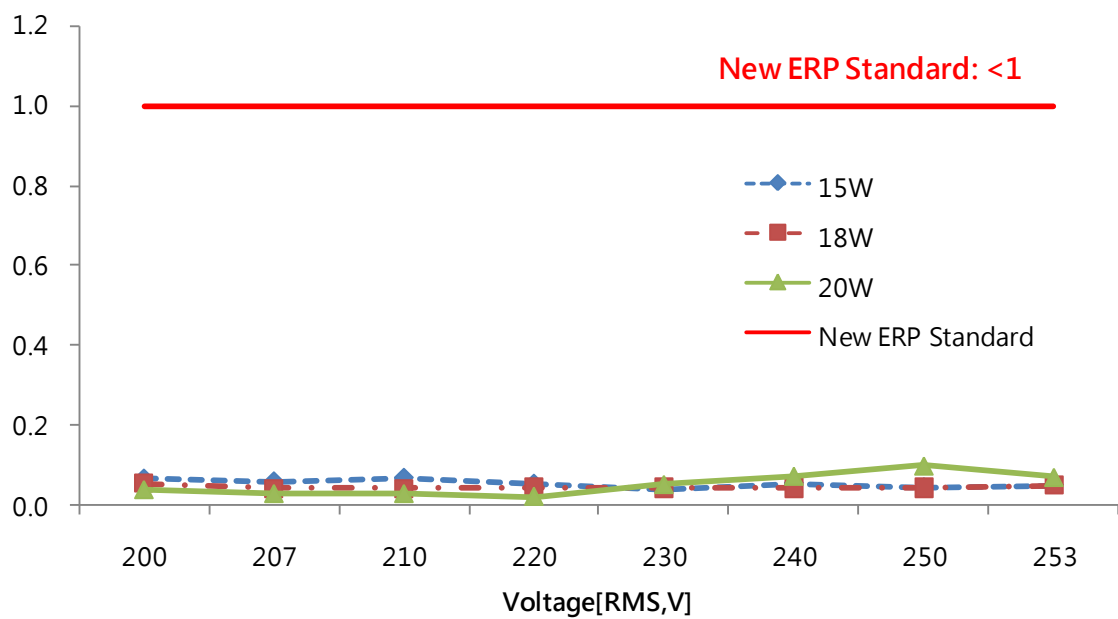
## Beam Pattern



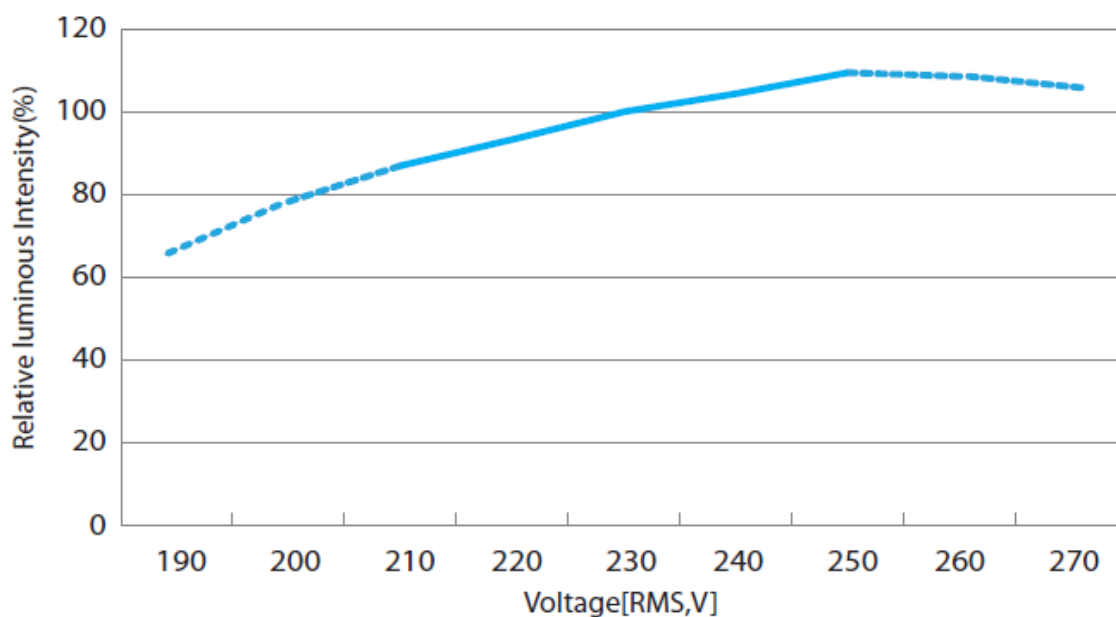
### SVM Test( $T_c=25^{\circ}\text{C}$ )



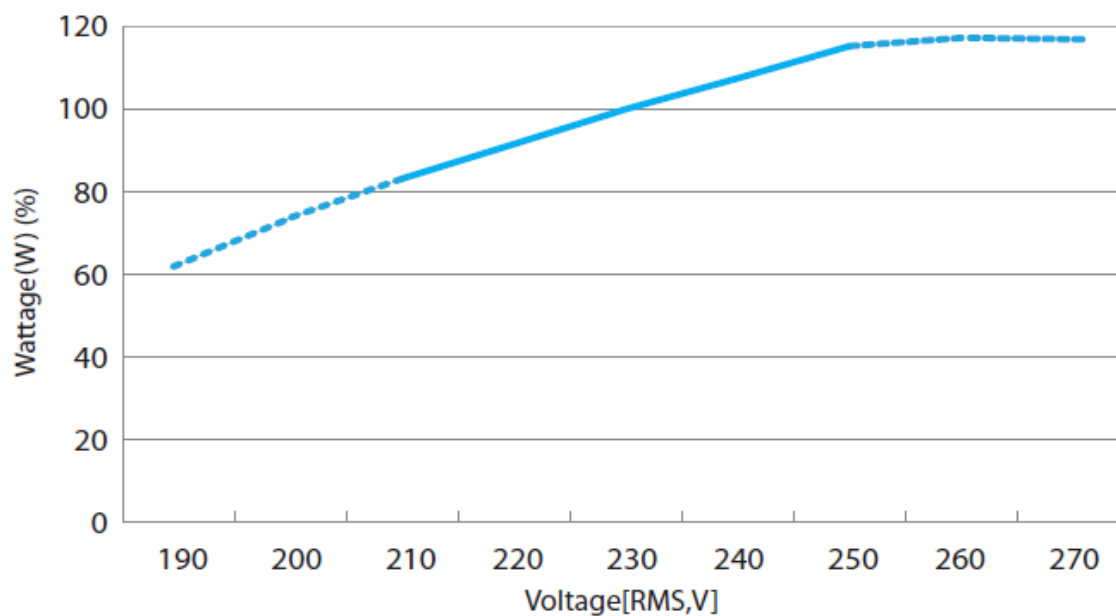
### PST Test( $T_c=25^{\circ}\text{C}$ )



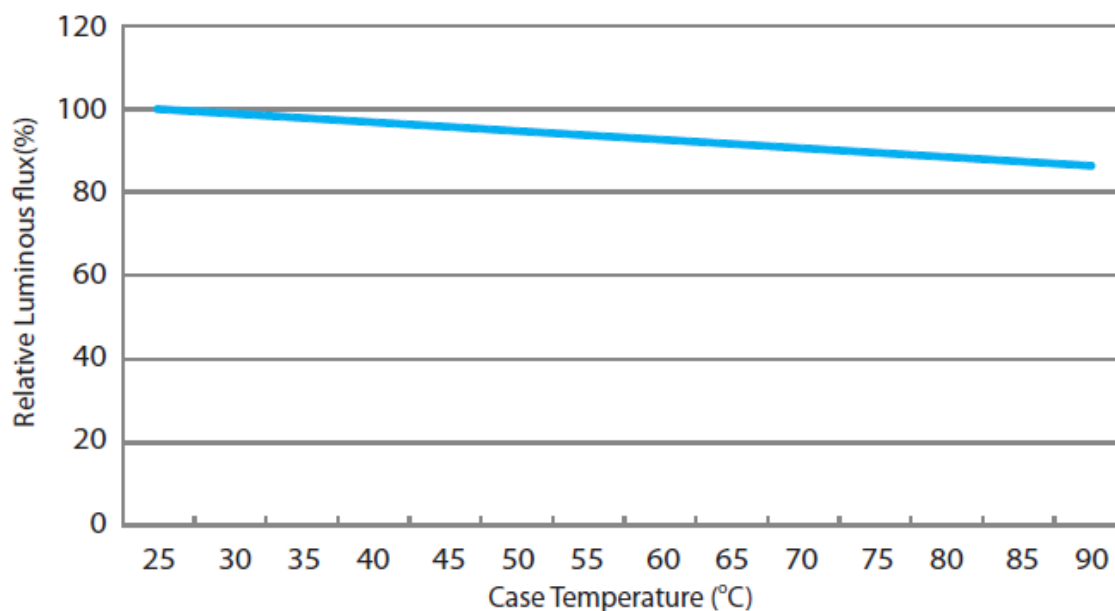
### Relative luminous Intensity vs. Voltage ( $T_c=25^{\circ}\text{C}$ )



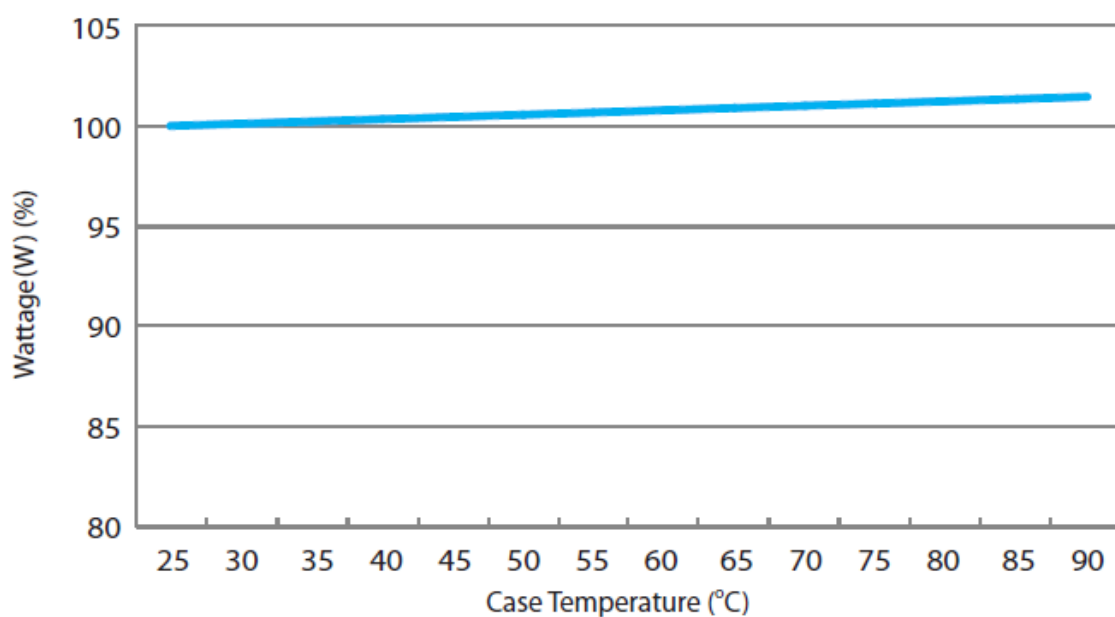
### Wattage vs. Voltage ( $T_c=25^{\circ}\text{C}$ )



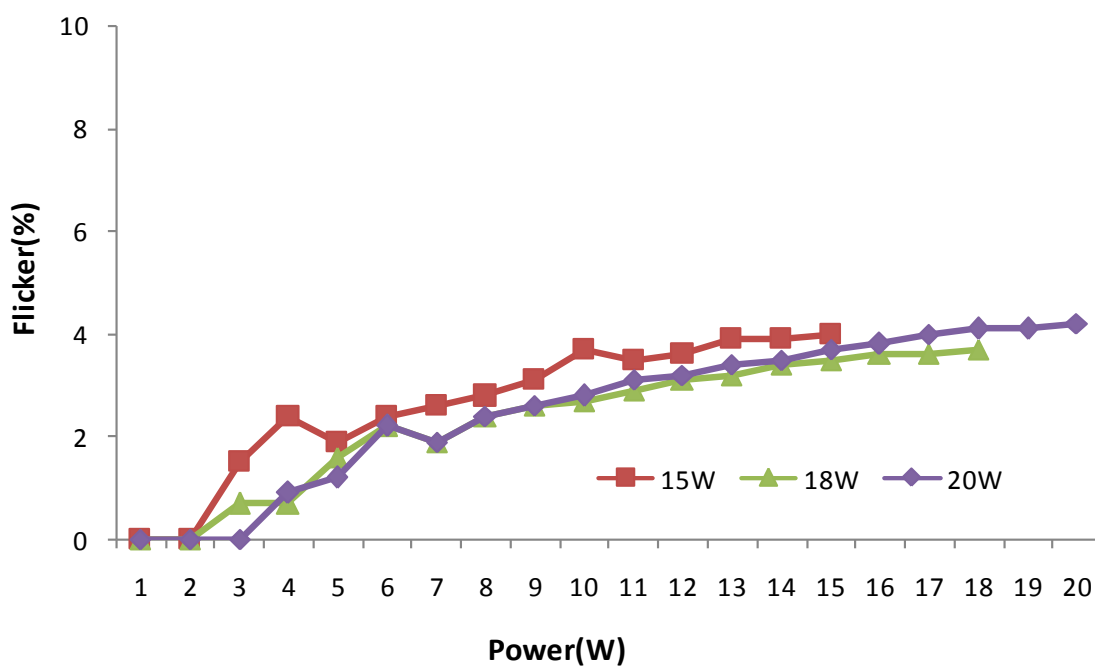
### Relative Luminous Flux vs. Case Temperature (VAC=230V)



### Wattage vs. Case Temperature (VAC=230V)



## Flicker Performance (During dimming)





## Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C(30mins/30mins)	100 Cycle
2	Operation Life test	T <sub>a</sub> =25°C	1000 hrs
3	ON/OFF Test	3secON,3secOFF	15K times

## Failure Criteria

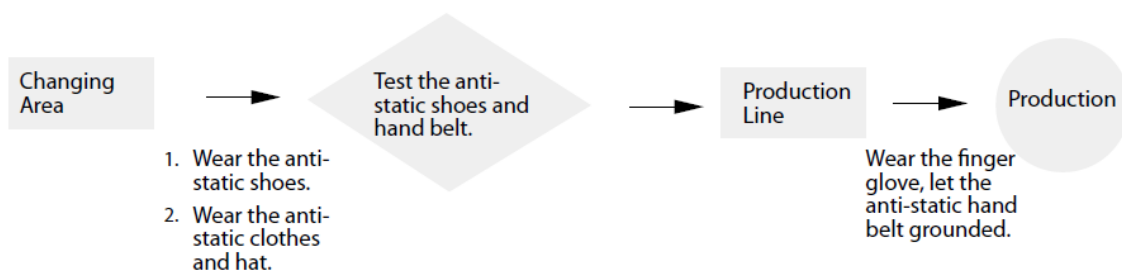
Item	Criteria for Judgment	
	Min.	Max.
Luminous Flux	0.85	-
$\Delta u'v'$	-	0.006
Resistance to Soldering Heat	No dead lamps or visual damage	

## 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.

## Handling with a DOB

- ✓ 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 have 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.
- Protect area with a temperature at  $22\pm 5^{\circ}\text{C}$  and relative humidity at  $70\pm 10\%\text{RH}$  are recommended.
- Layout an appropriate earth system. All the equipment should earth isolated into the ground or pillar.
- All soldering and testing equipment 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

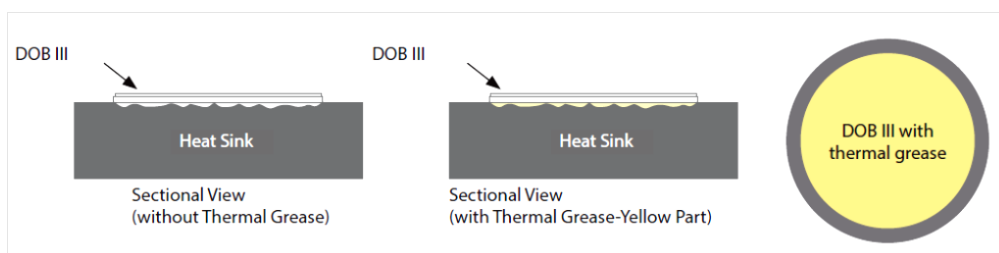
About 80% of input power of a LED transform into heat. A high temperature operation condition always easily causes the LEDs to decrease of flux and the life decay of LED dies. The highest operation temperature of a component is able to be found in its datasheet which is indicated as  $T_j$ .

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.



### 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 the Tc Point when the modules are used in an enclosed environment.
- √ DO NOT use adhesives to attach the LED that outgas organic vapor.
- √ DO NOT directly make the HI-POT test over 750V on the module.
- √ DO NOT separately connection L and N terminal when the power source turn on
- √ DO NOT wear any conductive accessories (such as jewelry) which could accidentally get an electric shock.
- √ DO NOT press the product; even a slight pressure may damage the product. The environments such as high temperatures, high humidity or direct expose to sunlight should be avoided since the product is sensitive to these conditions
- √ DOB AC Module uses integrated circuit (IC) which can be damaged when exposed to static electricity. Please operate with antistatic device. Do not touch the product unless ESD protection is used. DOB AC Module can't be installed in end product unless the ESD protection is used
- √ DO NOT assemble in conditions of high moisture and/or oxidizing gas such as Cl, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, etc. Damage by corrosion will not be allowed as defect claim.
- √ LED Module is recommended for Indoor use only. Longtime exposure to sunlight or UV can cause the lens to discolor.
- √ Please note that BOBAC Module products are driven by high voltage, therefore when operating DOB AC Modules should be very cautious
- √ Faults, lightning, or fast switch may cause voltage surge which surpasses the normal value
- √ The failure of internal component may cause excessive voltages
- √ Storage Precautions:
  - (1) The devices should be stored in the anti-static bag.
  - (2) If the anti-static bag has been opened, please make sure to reseal the bag to avoid air and moisture infiltrate in the bag.

## Revision History

Versions	Description	Release Date
1	Establish Datasheet	2021/10/27
2	Add CCT 5000k module order code	2022/05/27

## 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](http://www.edison-opto.com)

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