EdiPower II Series

EdiPower II series can provide different operating powers and different colors. They serve as optical engine and can be utilized in general lighting and special lighting applications, such as MR16 and projectors. Furthermore, the high CRI options allow the customers to optimize the effect in various fields such as interior architecture.

Features

- LED light engine
- High power operation
- Instant on
- Long lifetime

Table of Contents

Product Nomenclature

The following table describes the available color, power, and lens type. For more information on luminous flux and forward voltage, please refer to the Multi-chip Bin Group document.

< Table 1 EdiPower II series Nomenclature >

EP	S	x	-	V	F	2	3
X1	X2	X3		X4	X5	X6	X7

X1 LED Item

Code	Type
EP	EdiPower

X2 Emitter Color

Code	Type
S	Square

X3 Emitter Color

Code	Type
W	Cool White
H	Neutral White
X	Warm White

X4 Serial NO.1

X5 Serial NO.2

X6 Circuit Series

Code	Type
1~9	1~9 Series

X7 Circuit Parallel

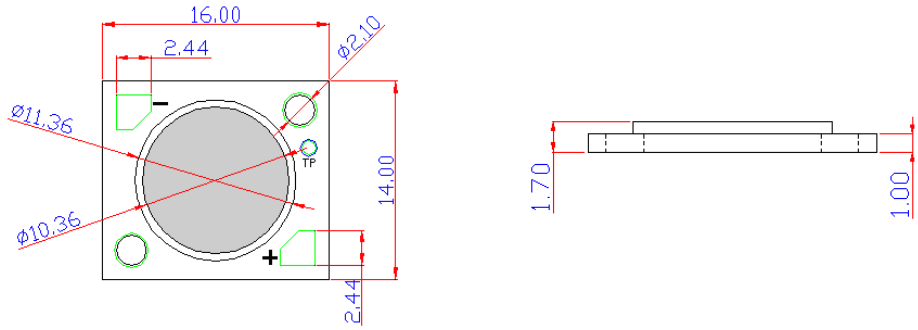
Code	Type
1~9	1~9 Parallel

Environmental Compliance

EdiPower II series are compliant to the Restriction of Hazardous Substances Directive or RoHS. The restricted materials including lead, mercury cadmium hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE) are not used in EdiPower II to provide an environmentally friendly product to the customers.

Package Dimensions

4-6W Emitter Dimensions

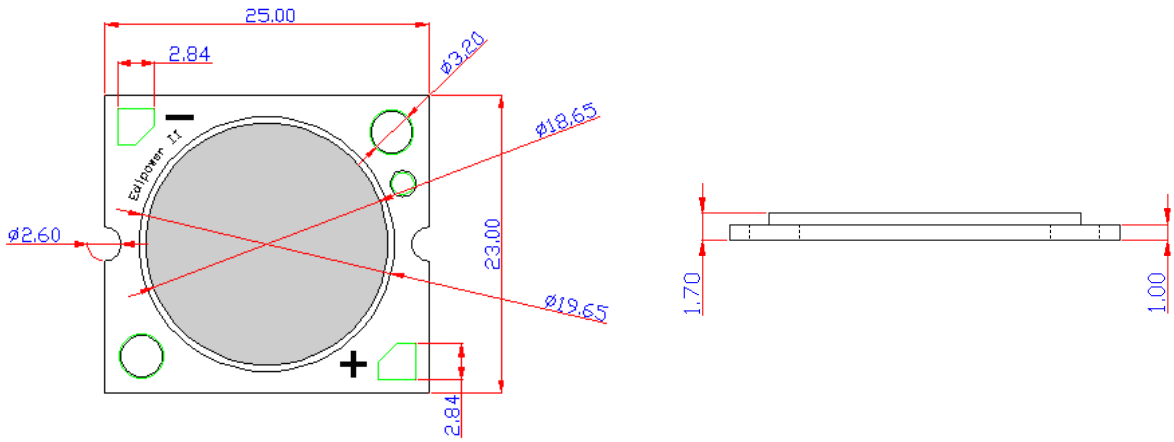


< Figure 1 4-6W EdiPower® Series Dimensions >

Notes:

1. Unit : mm
2. Tolerance : 0.2 mm
3. Drawings are not to scale

8~24W Emitter Dimensions

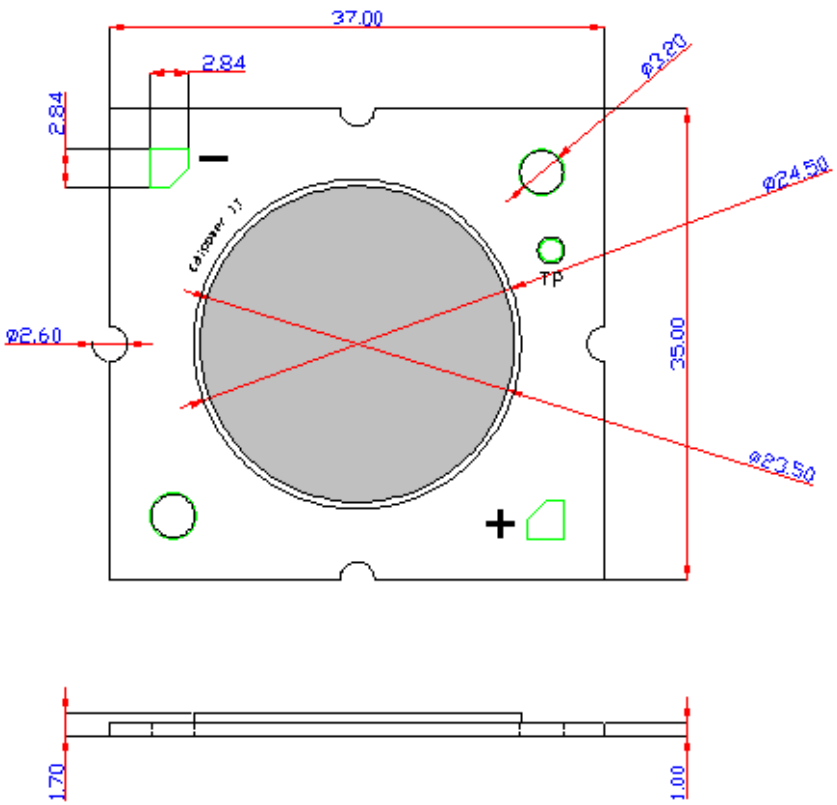


< Figure 2 8~15W/16~24W EdiPower II Series Dimensions >

Notes:

1. Unit : mm
2. Tolerance : 0.2 mm
3. Drawings are not to scale

30~50W Emitter Dimensions

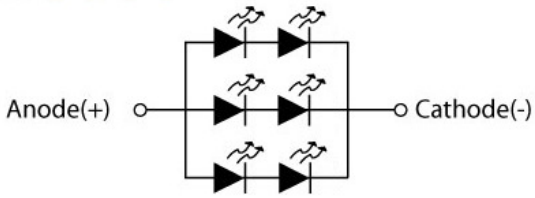


< Figure 3 30~50W EdiPower II Series Dimensions >

Notes:

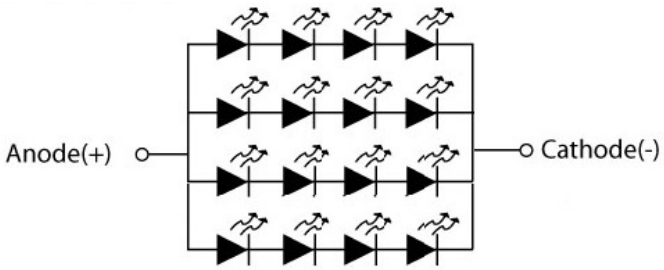
1. Unit : mm
2. Tolerance : 0.2 mm
3. Drawings are not to scale

4-6W Emitter Circuit Layout

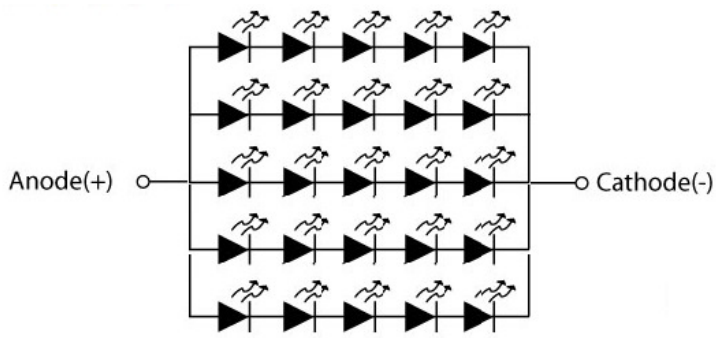


< Figure 4 4-6W EdiPower II Circuit Layout>

8~15W Emitter Circuit Layout

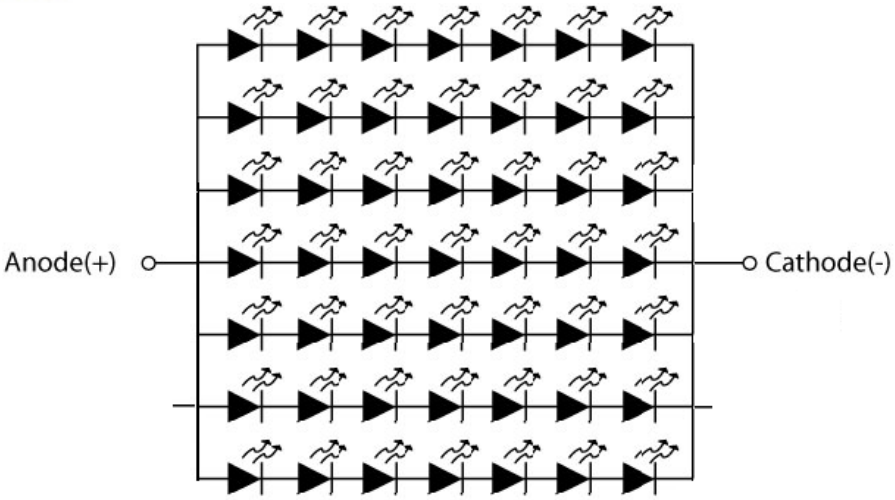


16~24W Emitter Circuit Layout



< Figure 5 8~24W EdiPower II series Circuit Layout >

30~50W Emitter Circuit Layout



< Figure 6 30~50W EdiPower II series Circuit Layout >

Absolute Maximum Ratings

The following table describes absolute maximum ratings of EdiPower II series.

< Table 2 Absolute maximum ratings for EdiPower II series >

Test	Parameter	Unit	Symbol
Reverse Voltage[2]	Note 2	V	V_R
LED junction Temperature[3]	125	℃	T_J
Operating Temperature	-40 ~ +110	℃	
Storage Temperature	-40 ~ +120	℃	
LED Substrate Temperature	<80	℃	T_s
ESD Sensitivity	2,000	V	V_B
Isolation Voltage	1,000	V	

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.

Operating Current and Luminous Flux Characteristics

The following tables describe luminous flux of EdiPower II series under various current.

< Table 3 Luminous flux characteristics at T_J=25℃ for EdiPower II series>

Color	Part Number	Typical Luminous Flux(lm) T_{case}=60℃	Typical Luminous Flux(lm) T_J=25℃	Typical Forward Voltage V_F (V)	Forward Current (mA)
Cool White	EPSW-VF23	370	410	6.4	700
		490	540	6.7	1000
	EPSW-VF44	765	850	12.0	700
		1080	1200	12.5	1000
		1260	1400	12.8	1200
	EPSW-VF55	1300	1450	15.5	1000
		1500	1670	16.0	1200
		1845	2050	16.5	1500
	EPSW-VF77	2500	2760	21.2	1500
		3330	3700	22.0	2000
		3680	4100	22.6	2200

Color	Part Number	Typical Luminous Flux(lm) T_{case}=60℃	Typical Luminous Flux(lm) T_J=25℃	Typical Forward Voltage V_F (V)	Forward Current (mA)
Natural White	EPSH-VF23	315	350	6.4	700
		410	460	6.7	1000
	EPSH-VF44	675	750	12.0	700
		900	1000	12.5	1000
		1050	1190	12.8	1200
	EPSH-VF55	1050	1200	15.5	1000
		1280	1420	16.0	1200
		1575	1750	16.5	1500
	EPSH-VF77	2100	2340	21.2	1500
		2820	3140	22.0	2000
		3130	3480	22.6	2200

Color	Part Number	Typical Luminous Flux(lm) T_{case}=60℃	Typical Luminous Flux(lm) T_J=25℃	Typical Forward Voltage V_F (V)	Forward Current (mA)
Warm White	EPSX-VE23	270	300	6.4	700
		380	420	6.7	1000
	EPSX-VE44	540	600	12.0	700
		765	850	12.5	1000
		880	980	12.8	1200
	EPSX-VE55	900	1000	15.5	1000
		1050	1165	16.0	1200
		1300	1450	16.5	1500
	EPSX-VE77	1730	1930	21.2	1500
		2330	2590	22.0	2000
		2580	2870	22.6	2200

The following table describes thermal resistance of EdiPower II series.

< Table 4 Temperature Coefficient of Forward Voltage & Thermal Resistance Junction to Case Characteristics at T_J=25℃ for EdiPower II series >

Part Name	Test Current (mA)	$\triangle V_F/\triangle T$		$R\theta_{J-B}$	
		Typ.	Unit	Typ.	Unit
EPSx-Vx23	1000	-2 to -8	mV/℃	1.4	℃/W
EPSx-Vx44	1200	-5 to -10	mV/℃	0.7	℃/W
EPSx-Vx55	1500	-5 to -12	mV/℃	0.5	℃/W
EPSx-Vx77	2200	-8 to -16	mV/℃	0.2	℃/W

Reliability Items and Failure Measures

Reliability test

The following table describes operating life, mechanical, and environmental tests performed on EdiPower II series package.

< Table 5 Operating life, mechanical, and environmental characteristics and T_J=25℃ for EdiPower II series>

Stress Test	Stress Conditions	Stress Duration	Failure Criteria
Room Temperature Operating Life	25℃, $I_F = I_{Fmax}$ (Note 1)	1,000 hours	Note 2
Temperature Cycle	-40℃/100℃ ,30 min dwell ＜5min transfer	100 cycles	Note 2
High Temperature Storage Life	85℃	1,000 hours	Note 2
Low Temperature Storage Life	-40℃	1,000 hours	Note 2
Thermal Shock	-40 / 125℃, 15 min dwell /＜10 sec transfer	100 cycles	No catastrophics
Natural Drop	On concrete from 1.2 m, 3X		No catastrophics
Variable Vibration Frequency	10-2,000-10 Hz, log or linear sweep rate, 20 G about 1 min, 1.5 mm, 3X/axis		No catastrophics
Solder Heat Resistance (SHR)	260℃ ± 5℃	10 secs	No catastrophics

Notes:

1. Depending on the maximum derating curve.
2. Failure Criteria:

Electrical failures

V_F shift >=10%

Light Output Degradation

% Iv shift >= 30% @1,000hrs or 500 cycle

Visual failures

Broken or damaged package

Solderability < 95% wetting

Dimension out of tolerance

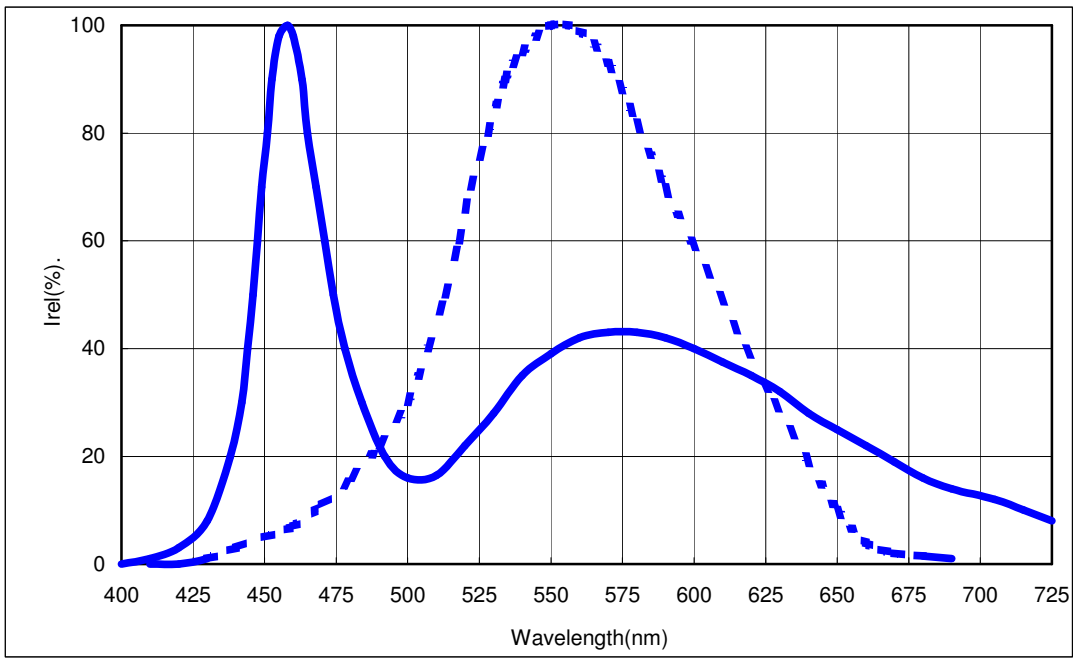
Failure Types

Catastrophic failures are failures that result in the LED emitting no light or very little light at normal current levels (e.g. 700 mA). Catastrophic failures are not expected for EdiPower II emitters that are handled and operated within the limits specified in EdiPower II documentation. Please refer to Absolute Maximum Ratings for more information on design limits.

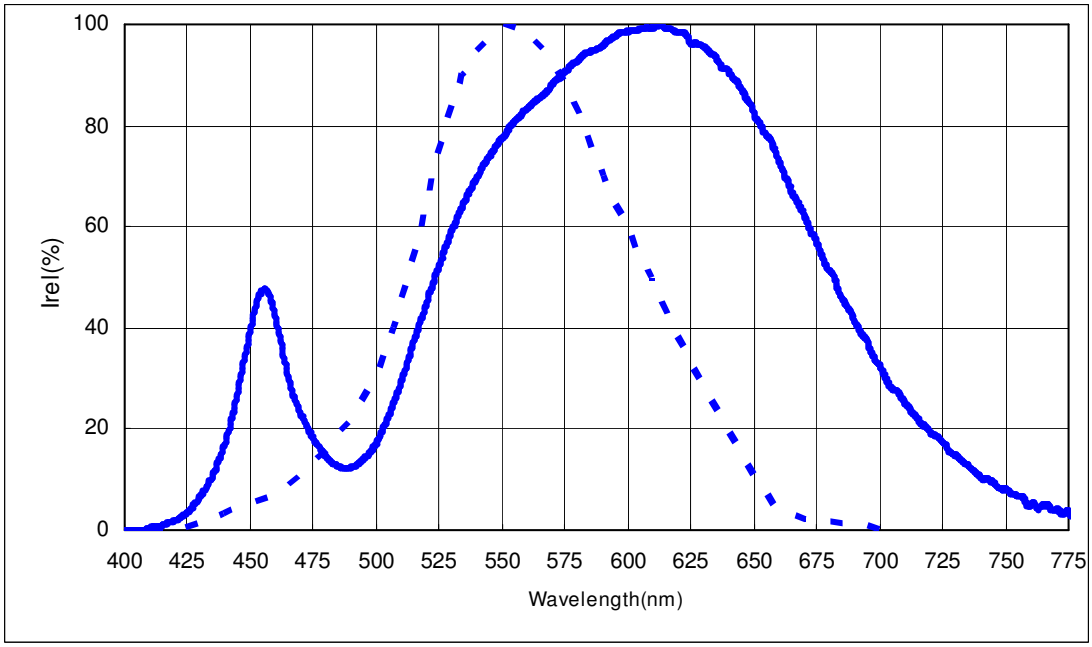
Parametric failures are failures that cause key characteristics to shift outside of acceptable bounds. The most common parametric failure, for a high-power LED, is permanent light output degradation over operating life. Most other light sources experience catastrophic failure at the end of their useful life, providing a clear indication that the light source must be replaced. For instance, the filament of an incandescent light bulb breaks and the bulb ceases to create light. In contrast, high-power LEDs generally do not experience catastrophic failure but simply become too dim to be useful in the intended application. Further discussion of this matter can be found in the Long-Term Lumen Maintenance Testing section of this document.

Another parametric failure common to white LEDs is a large and permanent shift in the exact color of white light output, called the white point or color point. A shift in white point may not be detectable in one LED by itself, but would be obvious in a side-by-side comparison of multiple LEDs. Since each lighting installation commonly uses many high-power LEDs, white point stability is a point of concern for lighting designers. Typically, white high-power LEDs, created by combining blue LEDs with yellow (and sometimes red) phosphor, will shift towards blue over operational life. This shift can be accelerated by high temperatures and high drive currents. For example, a cool white (e.g., 6500K CCT) LED with a white point failure will typically appear light blue instead of white. In some high-power LEDs, this failure mode can occur after just 1,000 hours of operational life.

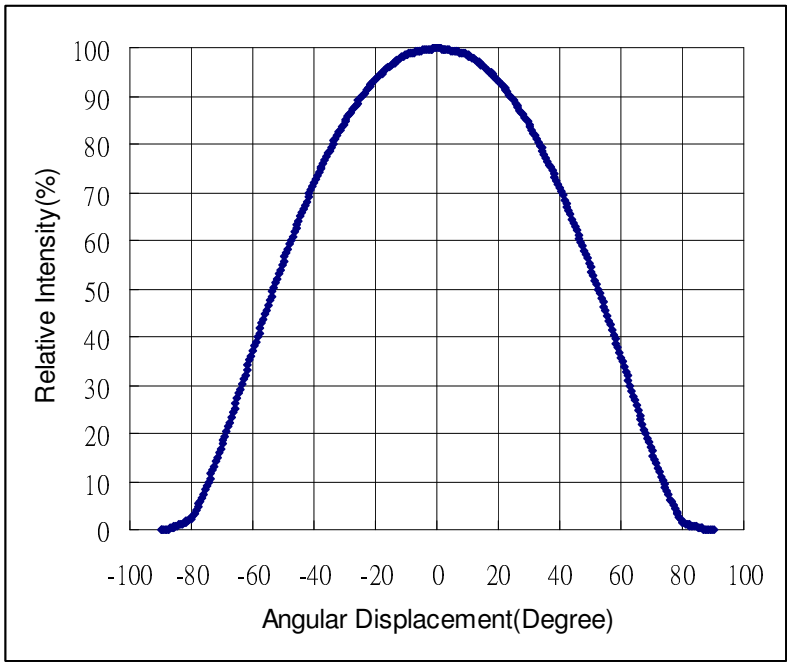
Color Spectrum and Radiation Pattern



<Figure 7 Color spectrum for EdiPower II cool white>



< Figure 8 Color spectrum for EdiPower II warm white and neutral white >



< Figure 9 Lambertain at T_J=25℃ for EdiPower II series >

Color Temperature or Dominant Wavelength Characteristics T_J=25℃

< Table 6 Dominant Wavelength or Color Temperature Characteristics at T_J=25℃ for EdiPower II series >

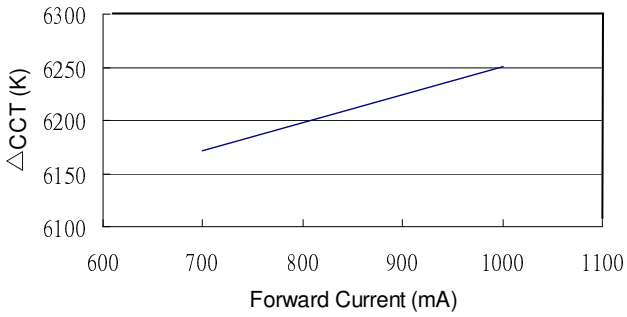
Part Name	Color	λd/CCT		Unit
		Min.	Max.	
EPSW-VFxx	Cool White	5,000	10,000	K
EPSH-VFxx	Neutral White	3,800	5,000	K
EPSX-VExx	Warm White	2,670	3,800	K

Notes:

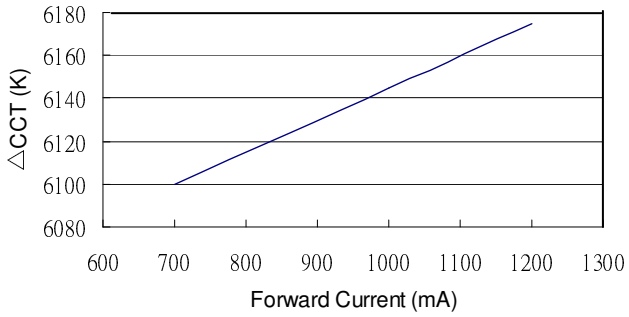
1. **CCT is measured with an accuracy of ± 200K.**
2. **Wavelength is measured with an accuracy of ± 0.5nm.**

Optical & Electric Curves

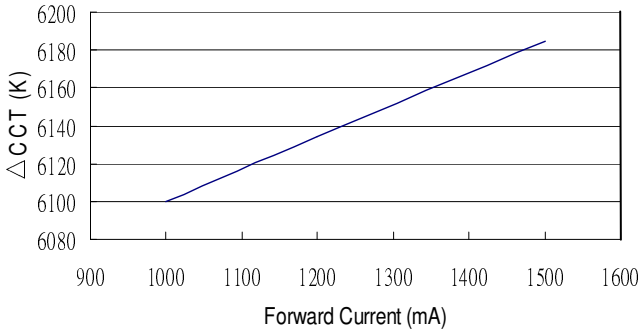
Typical CCT shift Characteristic for Cool White T_J=25℃



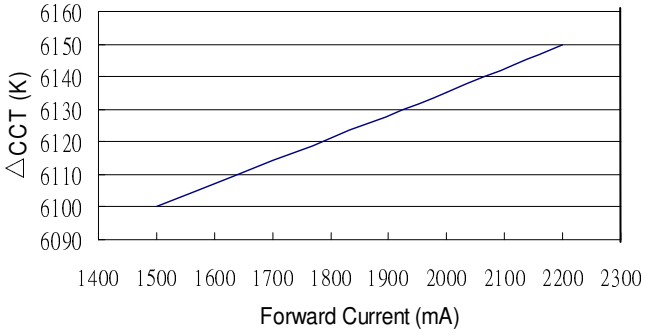
< Figure 10 CCT shift for EPSW-VF23 >



< Figure 11 CCT shift for EPSW-VF44 >

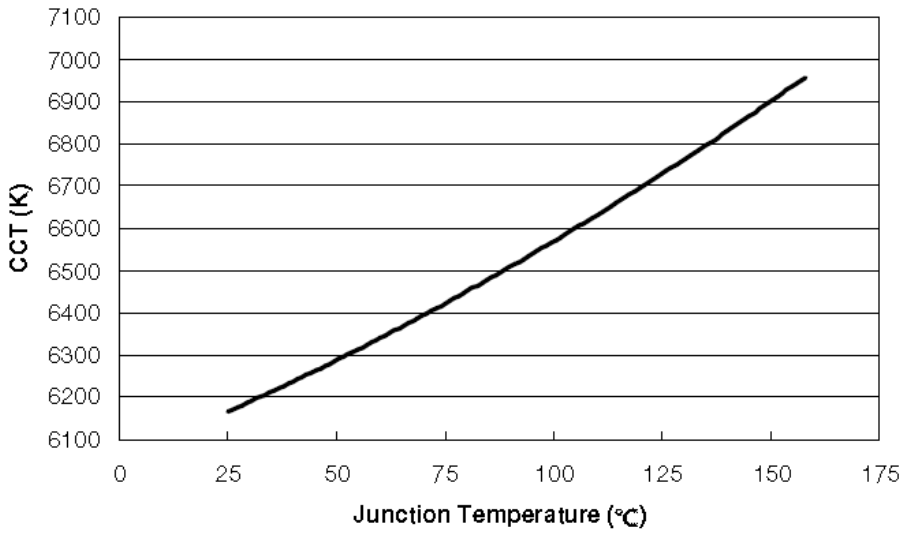


< Figure 12 CCT shift for EPSW-VF55 >



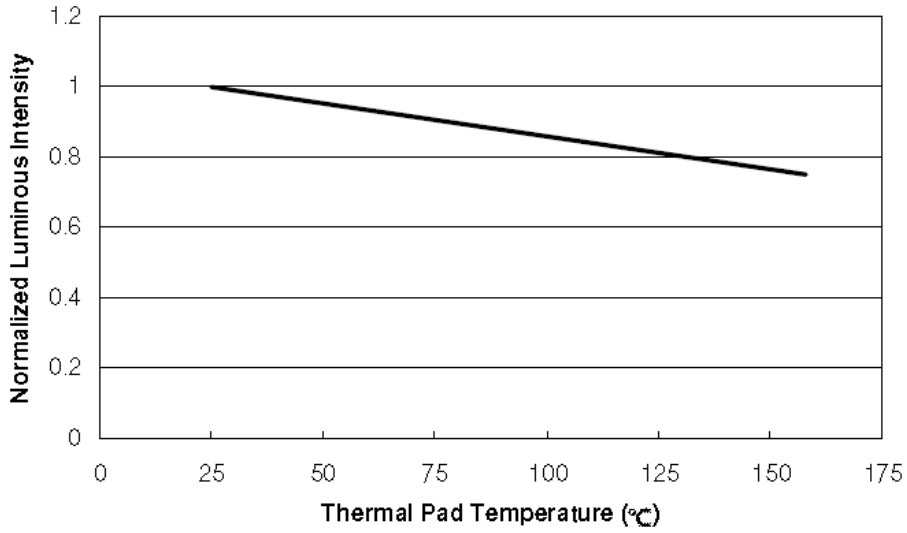
< Figure 13 CCT shift for EPSW-VF77 >

Typical CCT Shift Characteristic for Cool White



< Figure 14 Typical CCT vs. junction temperature for Cool White >

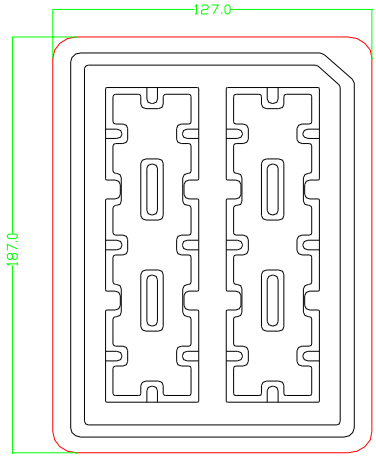
Typical Light Output Characteristics over Thermal Pad Temperature for Cool White



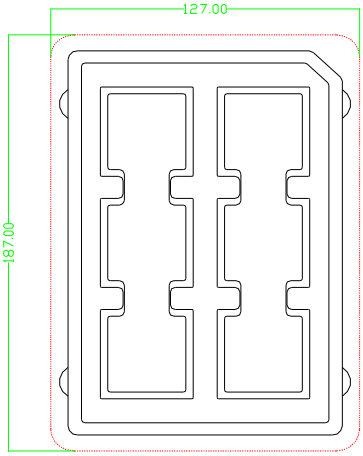
< Figure 15 Relative luminous flux vs. thermal pad temperature for Cool White >

EdiPower II Packaging Information

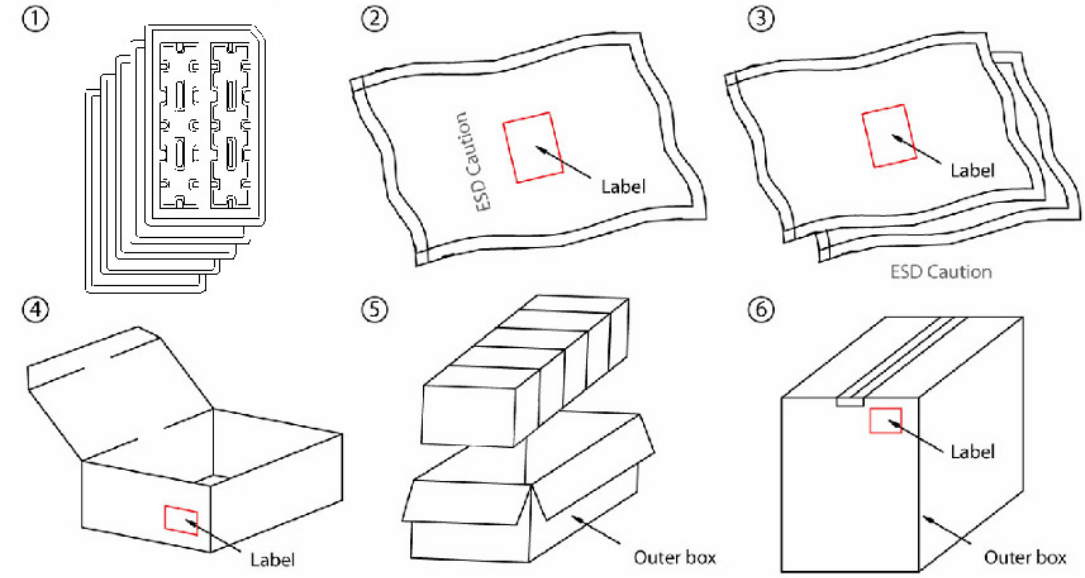
Tray Packing for 4-6W/8-24W



Tray Packing for 30-50W



< Figure 16 Tray package dimension >



< Figure 17 Packaging steps >

Notes:

1. All dimensions are in mm.
2. There are 4-6W 24pcs or 8-24W 30-50W 6pcs emitters in a full tray.
3. There are 5 trays in a bag.
4. There are 5 bags in an inner box.
5. There are 5 inner boxes in an outer box.
6. A bag contains one humidity indicator card and drying agent.