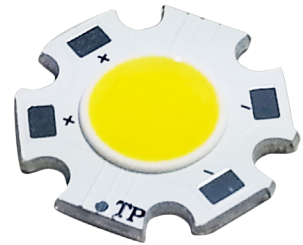


# EdiPower® II Star Series Datasheet



## Features :

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

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## General Information

### Introduction

EdiPower® II Star 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.

### Ordering Code Format

<u>2</u> X1	<u>P</u> X2	<u>H V</u> X3	<u>x x</u> X4	<u>x W</u> X5	<u>x x</u> X6	<u>P 0 5</u> X7	<u>x x x</u> X8		
X1 Type	X2 Component	X3 Series	X4 Wattage		X5 Color				
2	Emitter	P	EdiPower® II	HV	HV Series	05	5W	CW	Cool White
						06	6W	NW	Neutral White
						07	7W	WW	Warm White
						10	10W		
X6 Internal code		X7 PCB Board	X8 Serial Number						
--	--	P05	Star	--	--				

## Absolute Maximum Ratings ( $T_J=25^{\circ}\text{C}$ )

Parameter	Symbol	Value	Units
DC Forward Current <sup>1</sup>	$I_F$	2PHV05xWxxP05001: 500 2PHV06xWxxP05001: 250 2PHV07xWxxP05001: 700 2PHV10xWxxP05001: 500	mA
Max Forward Current	$I_F$	2PHV05xWxxP05001: 500 2PHV06xWxxP05001: 350 2PHV07xWxxP05001: 700 2PHV10xWxxP05001: 700	mA
Reverse Voltage <sup>2</sup>	$V_R$	Note 2	V
LED junction Temperature <sup>3</sup>	$T_J$	150	$^{\circ}\text{C}$
Operating Temperature	-	-40 ~ +80	$^{\circ}\text{C}$
Storage Temperature	-	-40 ~ +120	$^{\circ}\text{C}$
ESD Sensitivity (HBM)	$V_B$	2,000	V
Isolation Voltage	-	1,000	V
Thermal Measurement Point ( $T_p$ )	$T_s$	<85	$^{\circ}\text{C}$

Notes:

- DC forward current should not exceed LED's operating current; the current tolerance should be kept within a range of 5%.
- LEDs are not designed to be driven in reverse bias.
- Proper current derating must be observed to maintain junction temperature below the maximum at all time.

## Characteristic

Parameter	Symbol	Value	Units
Viewing Angle	$2\theta_{1/2}$	105~120	Degree
Forward voltage	$V_F$	2PHV05xWxxP05001: 9.5 ~ 11.0 2PHV06xWxxP05001: 22.0 ~ 25.0 2PHV07xWxxP05001: 9.5 ~ 11.0 2PHV10xWxxP05001: 18.0 ~ 20.0	V
CCT	-	Cool White: 5,000 - 10,000 Neutral White: 3,800 - 5,000 Warm White: 2,670 - 3,800	K
Thermal resistance	$R\theta_{J-B}$	2PHV05xWxxP05001: 2.4 2PHV06xWxxP05001: 2 2PHV07xWxxP05001: 1.8 2PHV10xWxxP05001: 1.8	$^{\circ}\text{C}/\text{W}$
$\Delta V_f/\Delta T$	-	2PHV05xWxxP05001: -8 to -16 2PHV06xWxxP05001: -2 to -8 2PHV07xWxxP05001: -6 to -12 2PHV10xWxxP05001: -2 to -8	mV/ $^{\circ}\text{C}$
CRI	-	80	-

Notes:

- $2\theta_{1/2}$  is the off-axis angle where the luminous intensity is half of the axial luminous intensity.
- CCT is measured with an accuracy of  $\pm 5\%$ .
- Color Rendering index CRI tolerance:  $\pm 2$ .

## Luminous Flux Characteristic

Luminous Flux Characteristics  $T_j=25^{\circ}\text{C}$

Wattage (W)	Color	Typ. Luminous Flux(lm) $T_j=85^{\circ}\text{C}$	Typ. Luminous Flux(lm) $T_j=25^{\circ}\text{C}$	Typ. Forward Voltage $V_f$ (V)	Forward Current (mA)	Order Code	
3-5W	2700K	235	270	9.3	350	2PHV05WW27P05001	
		310	355	10.5	<b>500</b>		
	3000K	245	280	9.3	350		
		330	375	10.5	<b>500</b>		
	3500K	260	295	9.3	350		
		340	390	10.5	<b>500</b>		
	4000K	265	300	9.3	350	2PHV05NW27P05001	
		350	400	10.5	<b>500</b>		
	5000K	265	305	9.3	350	2PHV05CW27P05001	
			400	10.5	<b>500</b>		
		3500K	265	305	9.3		350
			355	405	10.5		<b>500</b>
6500K	265	300	9.3	350			
	345	395	10.5	<b>500</b>			
6-10W	2700K	495	565	24.5	<b>250</b>	2PHV06WW27P05001	
		655	750	24.9	350		
	3000K	500	575	24.5	<b>250</b>		
		670	770	24.9	350		
	3500K	515	590	24.5	<b>250</b>		
		695	795	24.9	350		
	4000K	535	615	24.5	<b>250</b>	2PHV06NW27P05001	
		720	825	24.9	350		
	5000K	545	625	24.5	<b>250</b>	2PHV06CW27P05001	
		735	840	24.9	350		
	5700K	545	625	24.5	<b>250</b>		
		730	835	24.9	350		
6500K	530	610	24.5	<b>250</b>			
	710	815	24.9	350			

Notes:

1. Forward Voltage has  $\pm 3.6\text{V}$  tolerance.
2. The emphasised value with bold font showed at forward current means the DC forward current value.

Wattage (W)	Color	Typ. Luminous Flux(lm) T <sub>j</sub> =85°C	Typ. Luminous Flux(lm) T <sub>j</sub> =25°C	Typ. Forward Voltage V <sub>F</sub> (V)	Forward Current (mA)	Order Code	
4-7W	2700K	345	395	9.2	500	2PHV07WW27P05001	
		450	515	10.3	<b>700</b>		
	3000K	355	405	9.2	500		
		465	530	10.3	<b>700</b>		
	3500K	365	420	9.2	500		
		485	555	10.3	<b>700</b>		
	4000K	385	440	9.2	500	2PHV07NW27P05001	
		500	575	10.3	<b>700</b>		
	5000K	390	445	9.2	500	2PHV07CW27P05001	
			505	580	10.3		<b>700</b>
		5700K	385	440	9.2		500
			500	575	10.3		<b>700</b>
6500K	380	435	9.2	500			
	495	565	10.3	<b>700</b>			
9-14W	2700K	685	785	18.6	<b>500</b>		2PHV10WW27P05001
		895	1025	20.4	700		
	3000K	700	805	18.6	<b>500</b>		
		925	1060	20.4	700		
	3500K	745	855	18.6	<b>500</b>		
		885	1125	20.4	700		
	4000K	755	865	18.6	<b>500</b>	2PHV10NW27P05001	
		995	1140	20.4	700		
	5000K	765	875	18.6	<b>500</b>	2PHV10CW27P05001	
		1020	1170	20.4	700		
	5700K	750	860	18.6	<b>500</b>		
		995	1140	20.4	700		
6500K	730	835	18.6	<b>500</b>			
	955	1095	20.4	700			

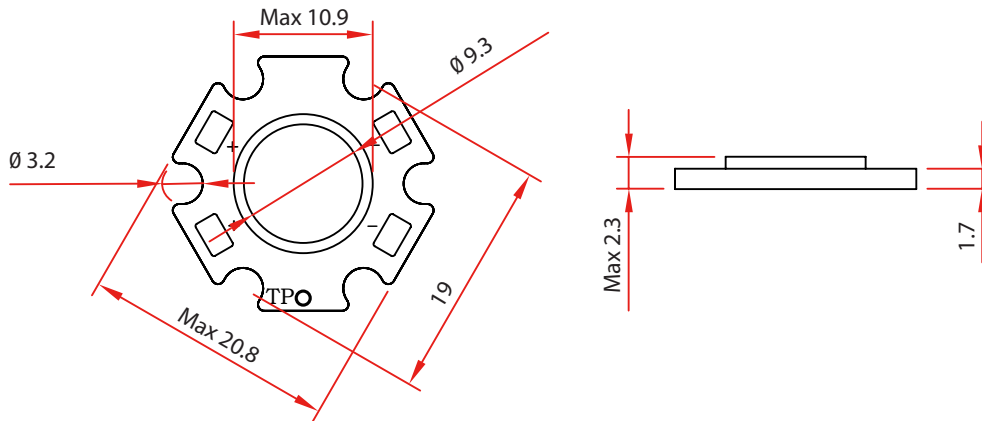
Notes:

1. Forward Voltage has ±3.6V tolerance.
2. The emphasised value with bold font showed at forward current means the DC forward current value.

## Mechanical Dimensions

### Emitter Dimensions

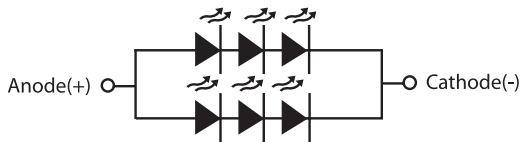
5W/ 6W / 7W/ 10W Emitter Dimensions



Notes:

1. Unit : mm
2. Tolerance :  $\pm 0.2$  mm
3. Drawings are not to scale
4.  $T_p$  : Thermal measurement point

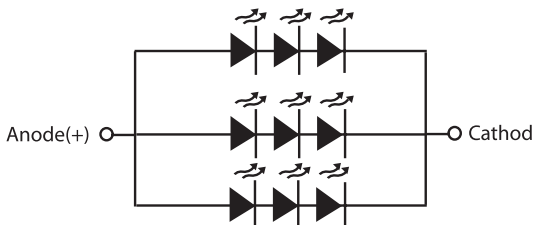
### 5W Emitter Circuit Layout



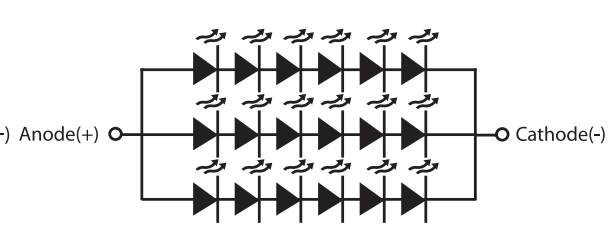
### 6W Emitter Circuit Layout



### 7W Emitter Circuit Layout



### 10W Emitter Circuit Layout

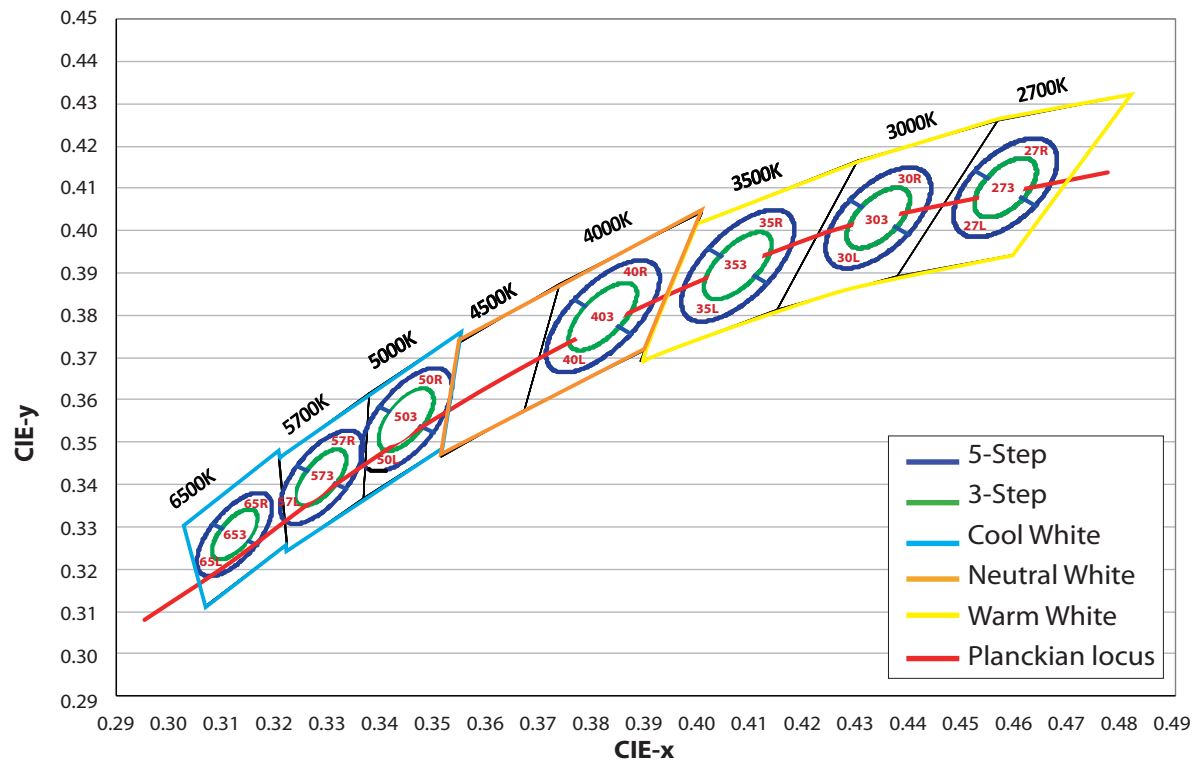


## Chromaticity coordinates( $T_j=85^\circ\text{C}$ )

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

The chromaticity center refers to ANSI C78.377:2008.

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



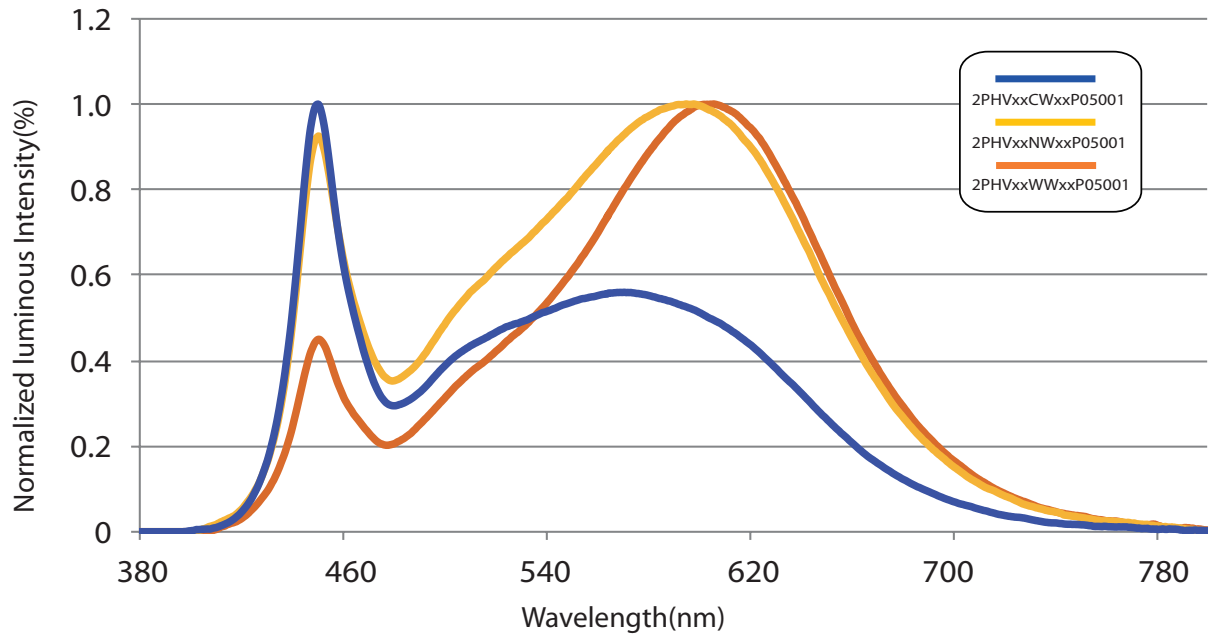
CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.7
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22
3500K	5	0.4073	0.3917	0.01545	0.00690	54
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
5700K	5	0.3287	0.3417	0.01243	0.00533	59.09
6500K	5	0.3123	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	53.7
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22
3500K	3	0.4073	0.3917	0.00927	0.00414	54
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



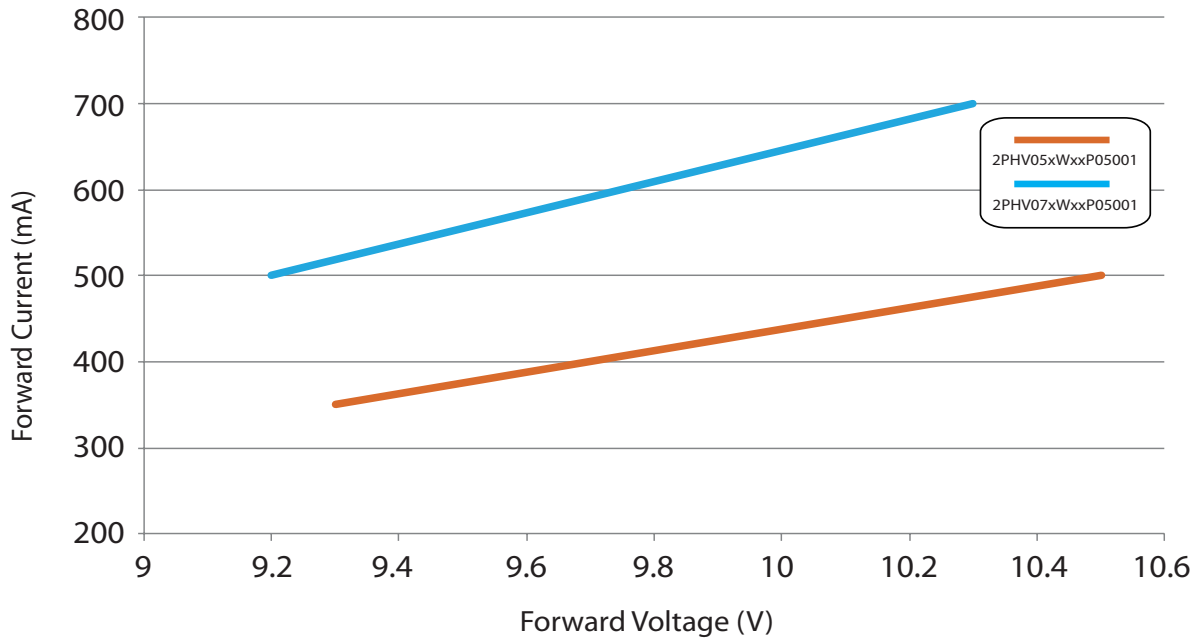
## Characteristic curve

### Color Spectrum

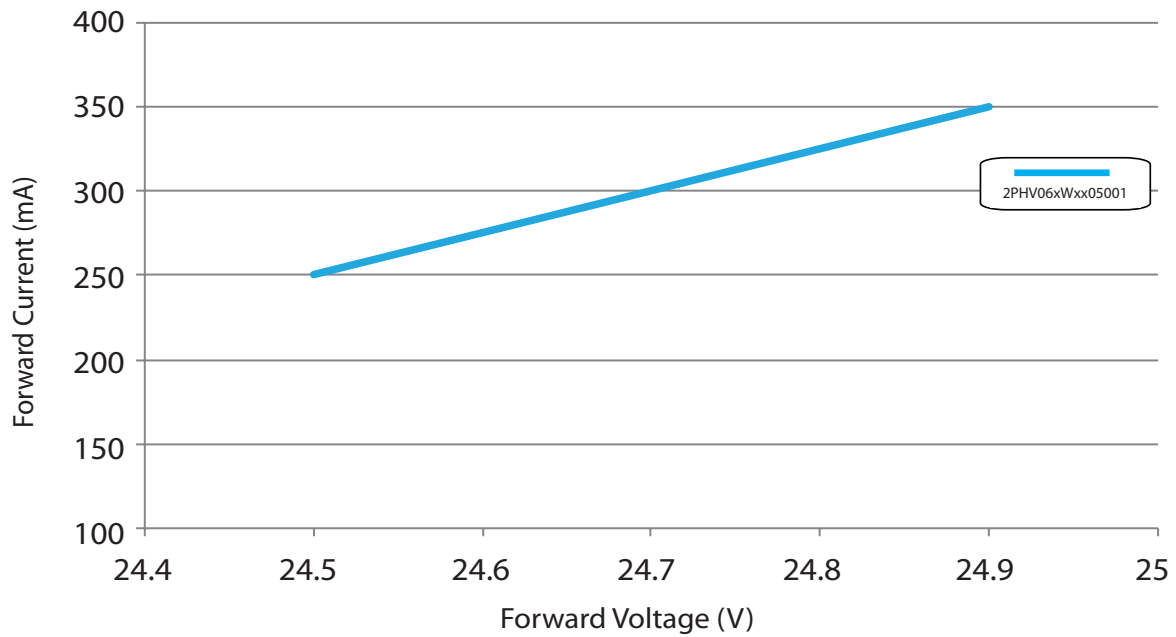


Color Spectrum at a typical CCT for EdiPower® II Star series

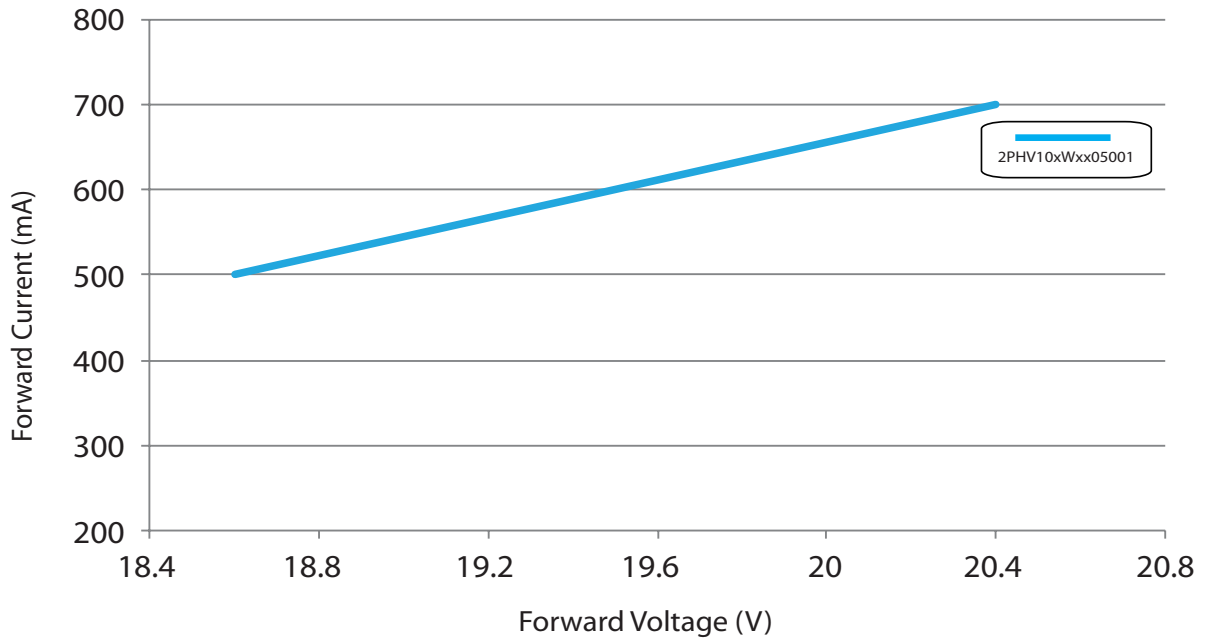
### Forward Current vs. Forward Voltage



Forward Voltage vs. Forward Current for EdiPower® II Star 5/ 7W series

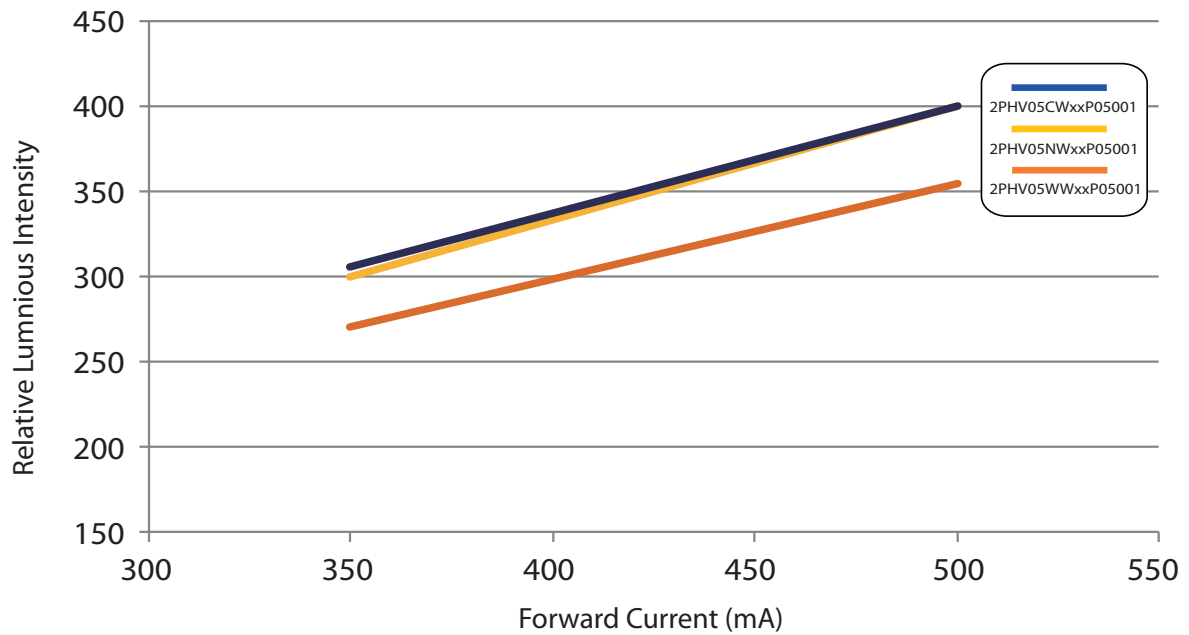


Forward Voltage vs. Forward Current for EdiPower® II Star 6W series



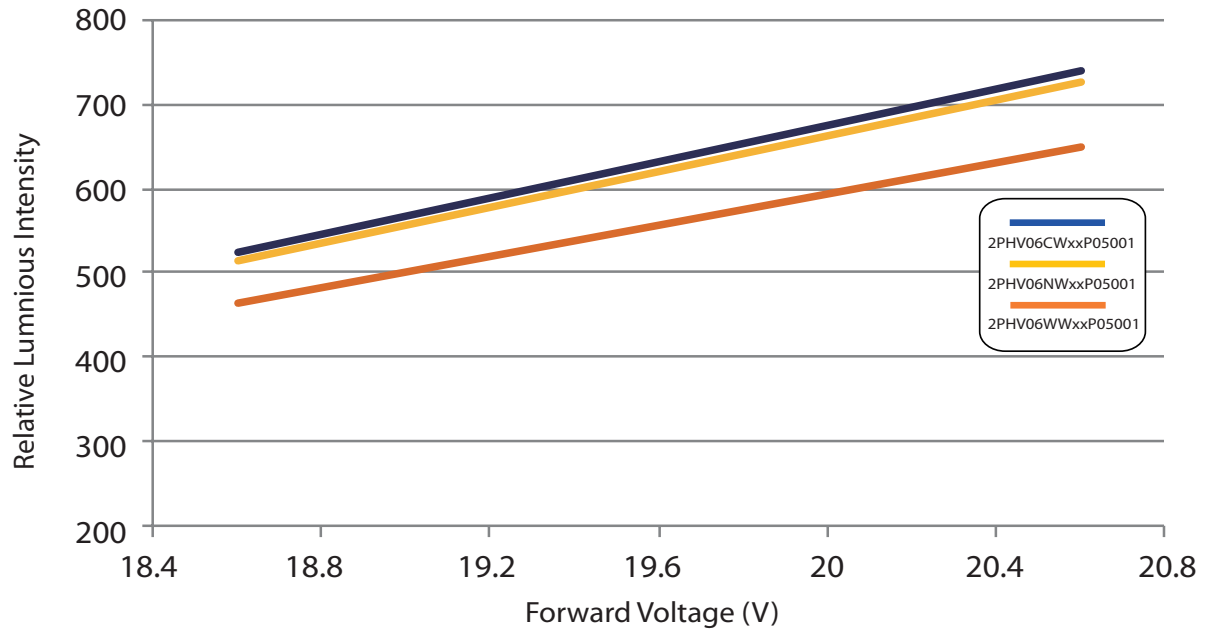
Forward Voltage vs. Forward Current for EdiPower® II Star 10W series

**Relative Intensity vs. Forward Current (5W)**



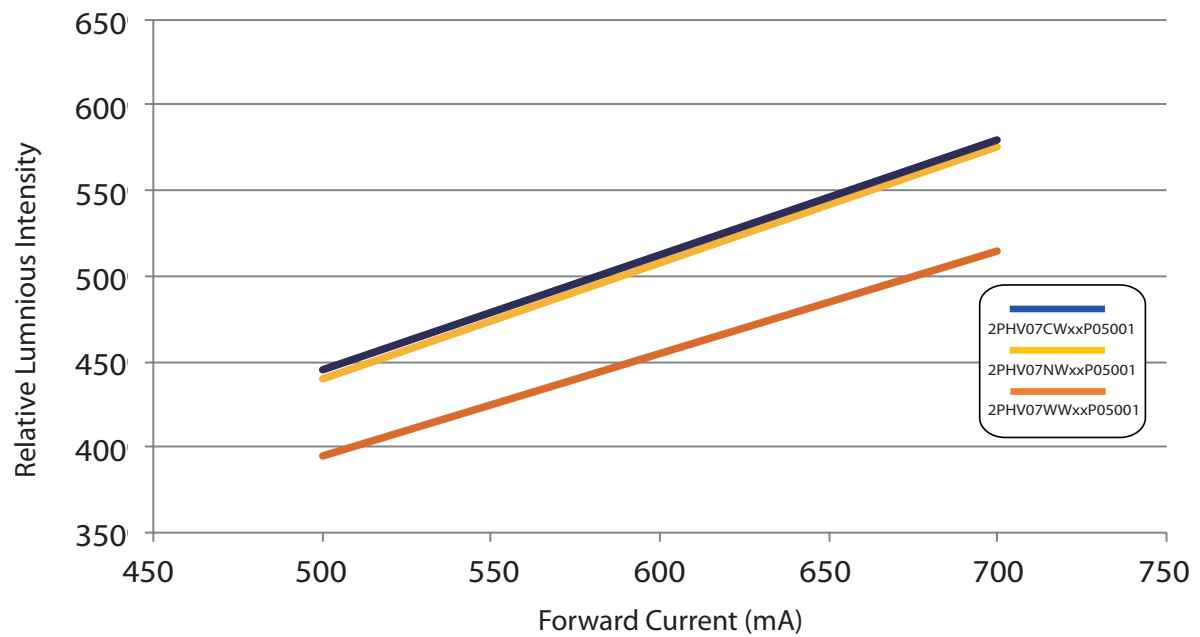
Forward Current vs. Luminous Intensity for EdiPower® II Star 5W series

### Relative Intensity vs. Forward Current (6W)



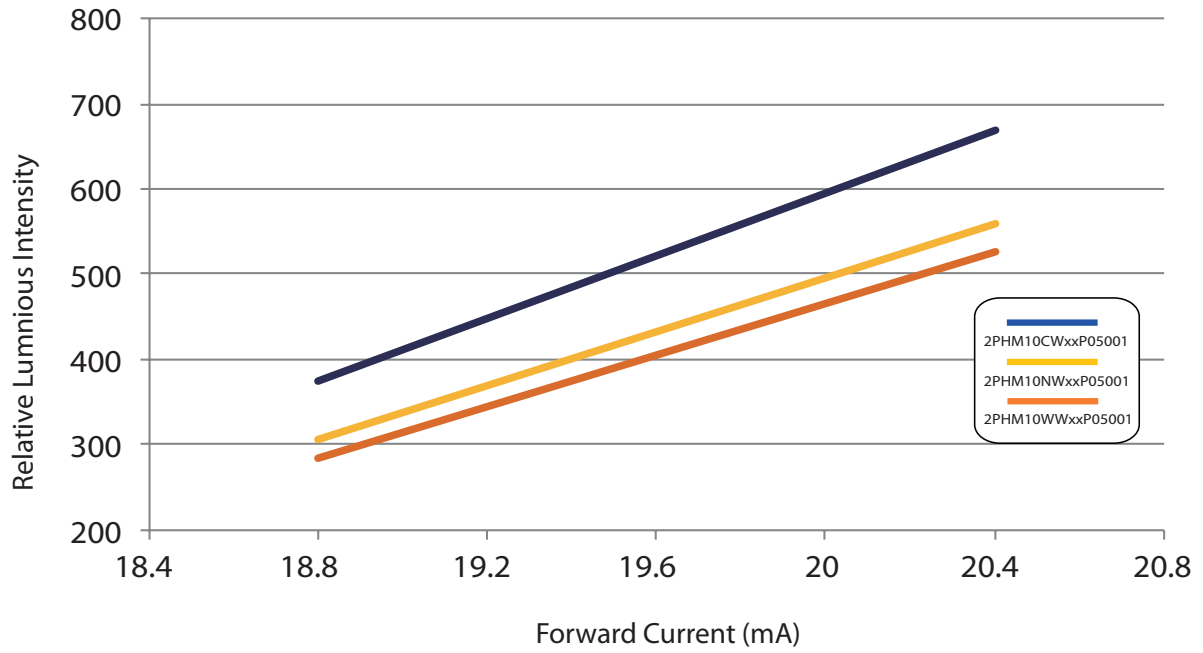
Forward Current vs. Luminous Intensity for EdiPower® II Star 6W series

### Relative Intensity vs. Forward Current (7W)



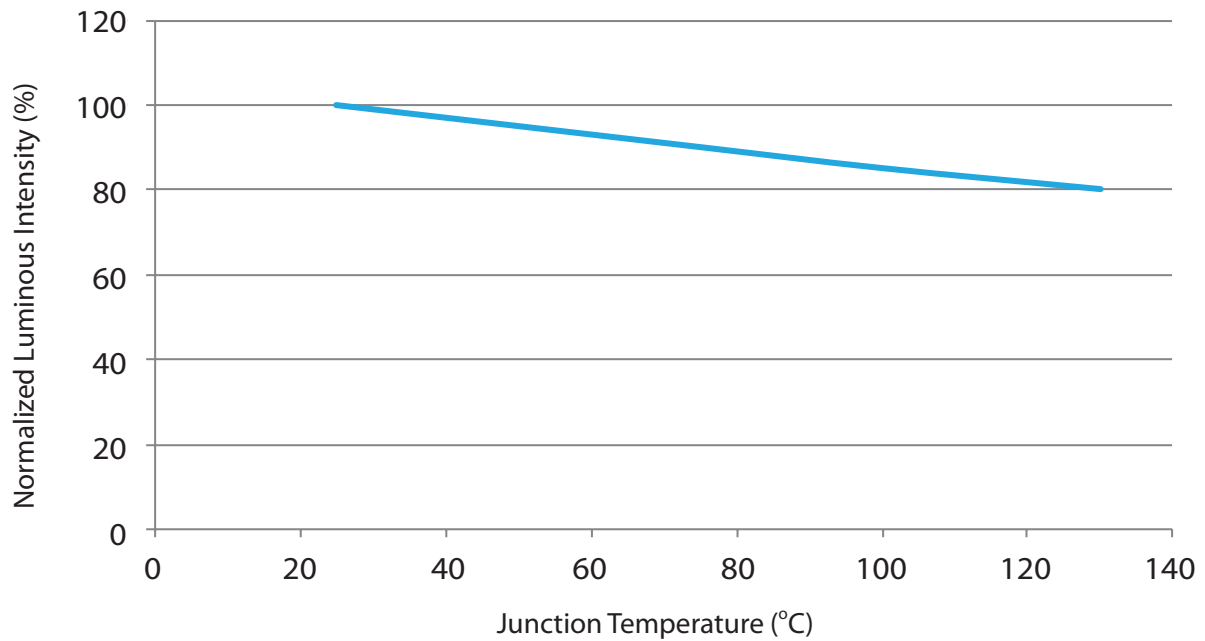
Forward Current vs. Luminous Intensity for EdiPower® II Star 7W series

**Relative Intensity vs. Forward Current (10W)**



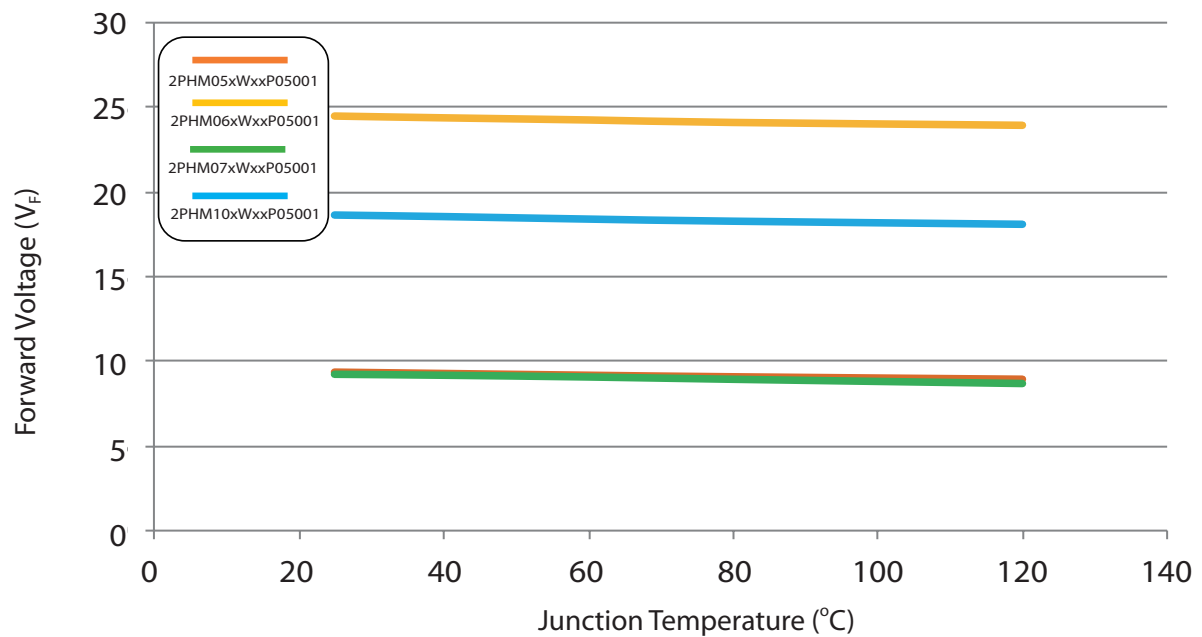
Forward Current vs. Luminous Intensity for EdiPower® II Star 10W series

### Luminous Flux vs. Junction Temperature



Luminous flux vs. junction temperature for EdiPower® II Star series

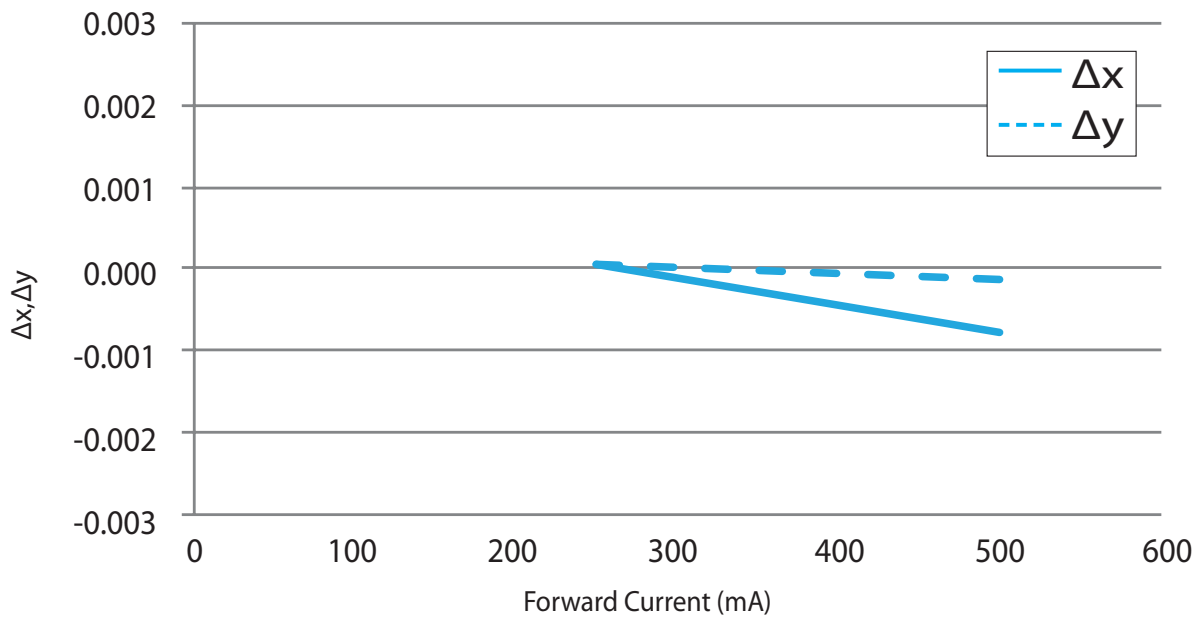
### Forward Voltage vs. Junction Temperature



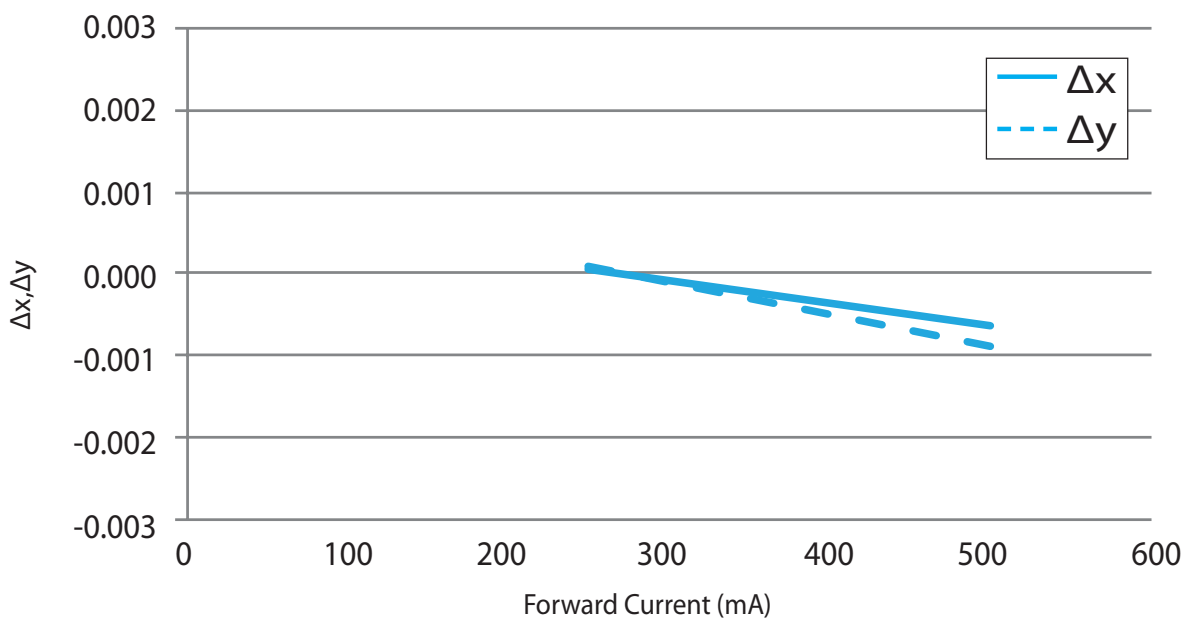
Forward voltage vs. junction temperature for EdiPower® II Star series

The trend of  $\Delta x, \Delta y$  vs. Forward Current characteristic curve 2PHV06xWxxP05001, 2PHV07xWxxP05001, 2PHV10xWxxP05001 resemble curve 2PHV05xWxxP05001.

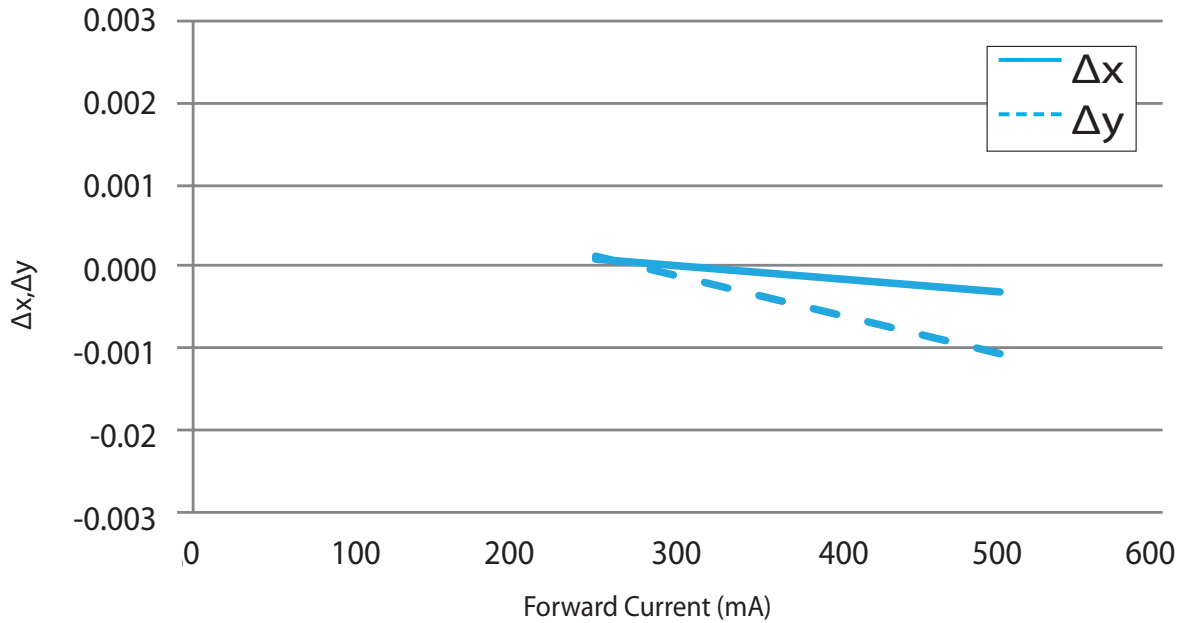
**$\Delta x, \Delta y$  vs. Forward Current**



$\Delta x, \Delta y$  vs. Forward Current for 2PHV05CWxxP05001

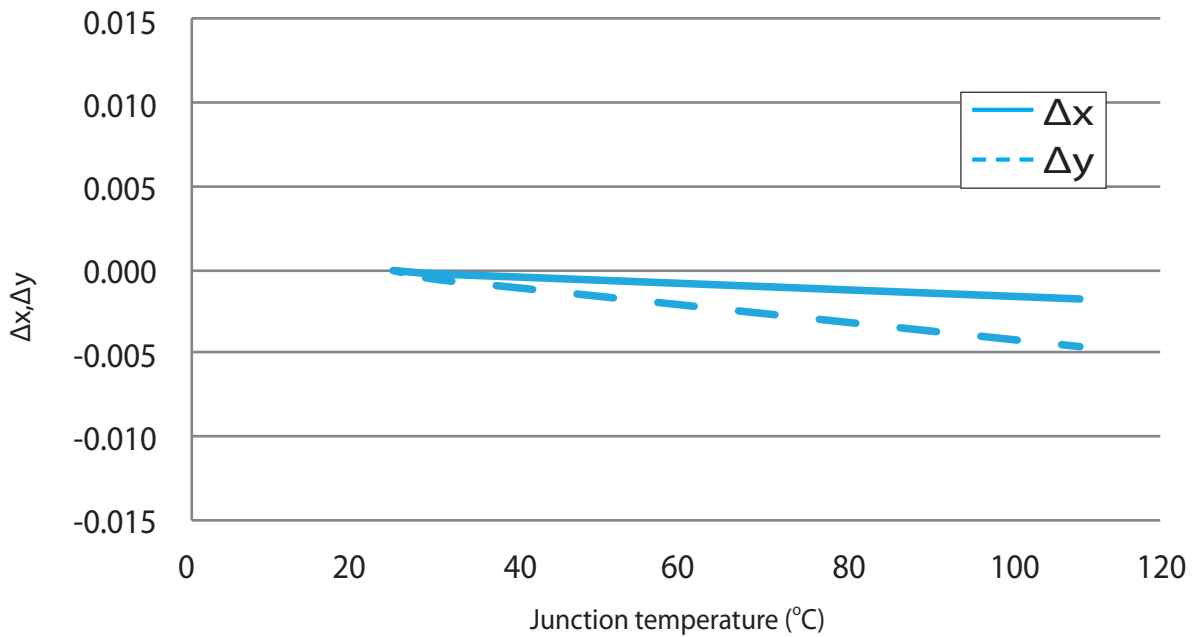


$\Delta x, \Delta y$  vs. Forward Current for 2PHV05NWxxP05001



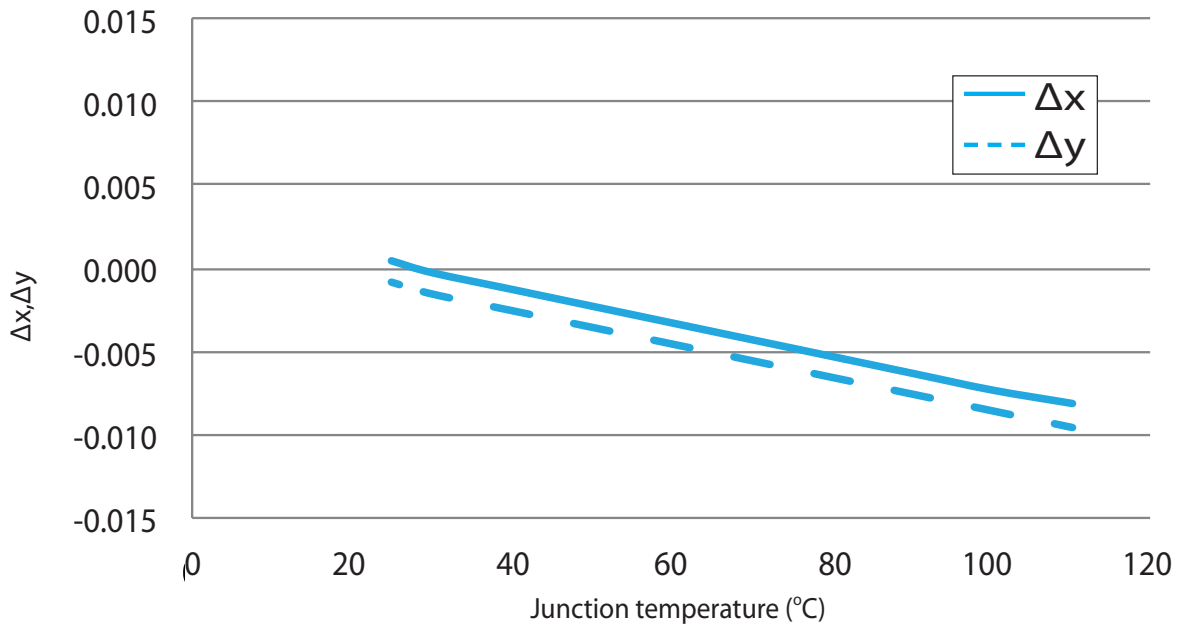
Δx, Δy vs. Forward Current for 2PHV05WWxxP05001

**Δx, Δy vs. Junction Temperature**

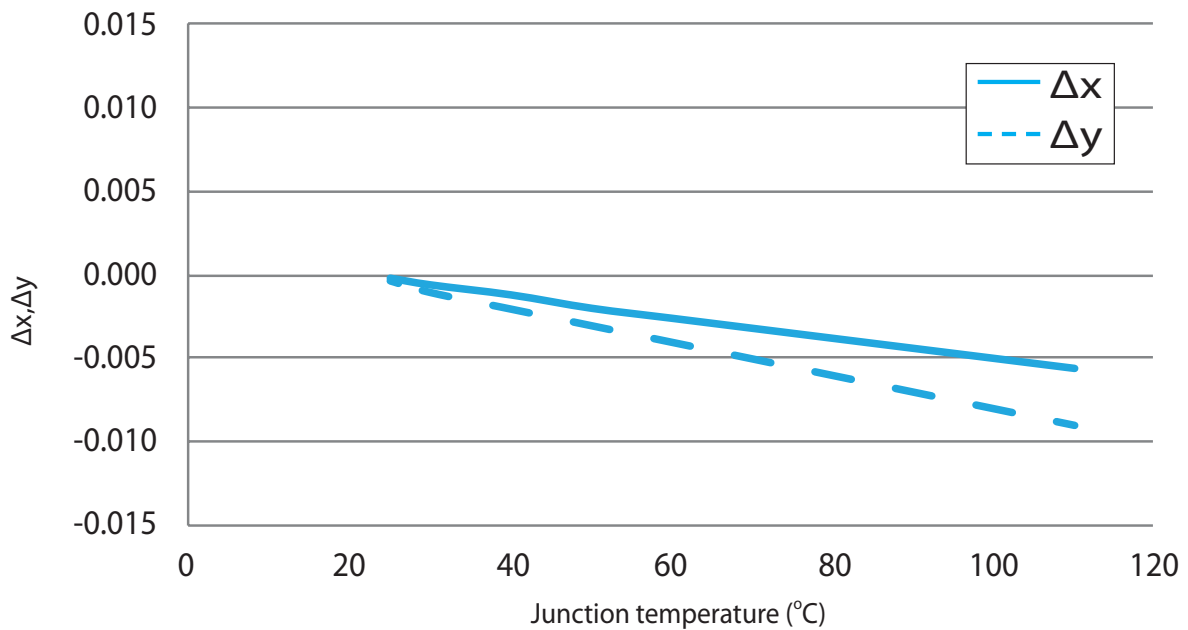


Δx, Δy vs. Junction temperature for 2PHVxxCWxxP05001





$\Delta x, \Delta y$  vs. Junction temperature for 2PHVxxNWxxP05001



$\Delta x, \Delta y$  vs. Junction temperature for 2PHVxxWWxxP05001

## Reliability

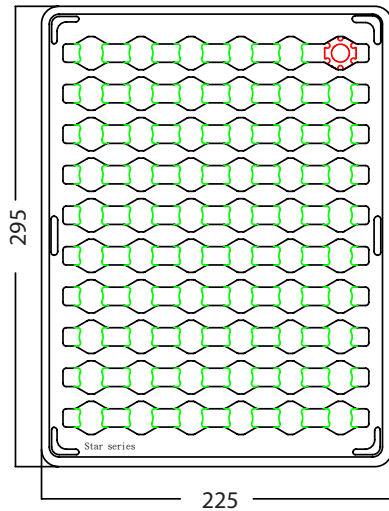
NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins $\leq$ 10 sec	100 Cycle
3	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
4	High-Temperature Storage	T <sub>A</sub> =100°C	1,000 hrs
5	Humidity Heat Storage	T <sub>A</sub> =85°C RH=85%	1,000 hrs
6	Low-Temperature Storage	T <sub>A</sub> =-40°C	1,000 hrs
7	Operation Life test	25°C	6,000 hrs
8	High Temperature Operation Life test	85°C	1,000 hrs
9	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
10	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

## Failure Criteria

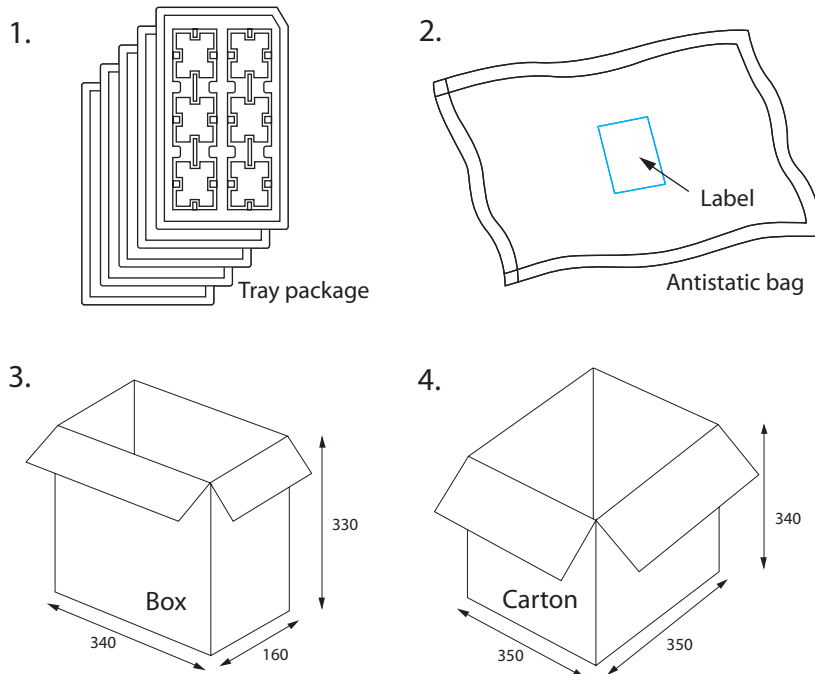
Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 $\mu$ A
Resistance to Soldering Heat	No dead lamps or visual damage	

## Product Packaging Information

### Tray Packing for 5/ 6/ 7/ 10 W



Tray package dimension.



Packaging steps.

Notes:

1. All dimensions are in mm.
2. There are 60pcs stars in a 5/6/7/10W star tray.
3. There are 10 trays in a bag.
4. There are 20 trays in a box.
5. There are 2 boxes in a carton.
6. A bag contains one humidity indicator card and drying agent.

## Revision History

Versions	Description	Release Date
1	Establish order code information	2014/01/13
2	1. Update Junction temperature 2. Revise all the characteristic curve 3. Update Luminous flux characteristic 4. Update Reliability	2014/04/08
3	1. Update Reliability 2. Revise Chromaticity coordinates	2014/09/04

## 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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