

ProLight PACK-42FxL-xC6N
42W COB Light-Engine LEDs
Technical Datasheet
Version: 1.1

ProLight Opto ® ProEngine Series

Features

- High flux density of lighting source
- Good color uniformity
- RoHS compliant
- Energy Star binning structure, neutral white and warm white with 2 steps guarantee.
- More energy efficient than incandescent and most halogen lamps
- No UV
- Long lifetime
- 5 year warranty

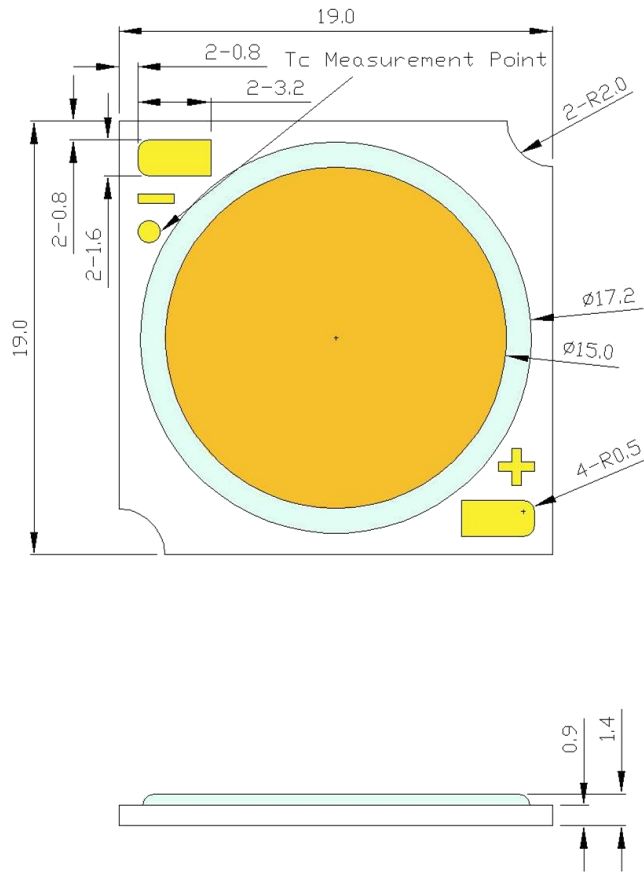
Main Applications

- Par lighting
- LED Bulb
- Ceiling lighting
- Spot lighting
- Down lighting

Introduction

·The input power is 42 Watt, the multi-chip ultra high power ProEngine Series delivers never before seen luminous flux output from a single emitter. The superficial illuminating nature of ProEngine makes them the preference in Par lighting, typical applications include commercial down lighting, LED bulb, accent lighting, ceiling lighting and spot lighting.

Emitter Mechanical Dimensions



Notes:

1. Slots in aluminum-core PCB for M3 mounting screw.
2. Solder pads are labeled "+" and "-" to denote positive and negative, respectively.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5. Unless otherwise indicated, tolerances are ± 0.30 mm.
6. **Please do not use a force of over 0.3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.**

*The appearance and specifications of the product may be modified for improvement without notice.

Flux Characteristics, $T_c = 25^\circ\text{C}$

Radiation Pattern	Color	Part Number COB	DC Forward Current (mA)		Luminous Flux Φ_v (lm)		CRI Min.	R9 Min.
			540*	1080	Min.	Typ.		
Lambertian	White	PACK-42FWL-AC6N	540*	1080	2750	3140	70	-
	Neutral White	PACK-42FNL-AC6N	540*	1080	2705	3090	70	-
	Warm White	PACK-42FVL-AC6N	540*	1080	2600	2970	70	-
	White	PACK-42FWL-BC6N	540*	1080	2695	3075	80	0
	Neutral White	PACK-42FNL-BC6N	540*	1080	2650	3030	80	0
	Warm White	PACK-42FVL-BC6N	540*	1080	2545	2905	80	0
	White	PACK-42FWL-DC6N	540*	1080	2370	2705	90	50
	Neutral White	PACK-42FNL-DC6N	540*	1080	2330	2665	90	50
	Warm White	PACK-42FVL-DC6N	540*	1080	2240	2555	90	50
	Neutral White	PACK-42FNL-EC6N	540*	1080	2050	2345	95	90
	Warm White	PACK-42FVL-EC6N	540*	1080	1970	2250	95	90

- The mark "*" indicated product is tested and binned at the specified drive current.
- ProLight maintains a tolerance of $\pm 7\%$ on flux and power measurements.
- ProLight maintains a tolerance of ± 2 on CRI measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics at 540mA, $T_c = 25^\circ\text{C}$

Color	Forward Voltage V_F (V)			Thermal Resistance Junction to Board ($^\circ\text{C}/\text{W}$)
	Min.	Typ.	Max.	
White	33.7	36.0	38.3	0.71
Neutral White	33.7	36.0	38.3	0.71
Warm White	33.7	36.0	38.3	0.71

- ProLight maintains a tolerance of $\pm 1\text{V}$ for Voltage measurements.

Optical Characteristics at 540mA, $T_c = 25^\circ\text{C}$

Color	Bin Code	Color Temperature CCT			Total included Angle (degrees) $\theta_{0.90\text{V}}$	Viewing Angle (degrees) $2\theta_{1/2}$
		Min.	Typ.	Max.		
White	V0	4740 K	5000 K	5310 K	160	120
	W0	5310 K	5700 K	6010 K	160	120
	X0	6020 K	6500 K	7030 K	160	120
Neutral White	S0	3900 K	4000 K	4070 K	160	120
	M0	2670 K	2700 K	2770 K	160	120
Warm White	N0	2990 K	3000 K	3090 K	160	120
	Q0	3380 K	3500 K	3550 K	160	120

- ProLight maintains a tolerance of $\pm 5\%$ for CCT measurements.

Supply Specifications

Part Number	CIR	Color Bin Code						
		V0	W0	X0	S0	M0	N0	Q0
PACK-42F _x L-AC6N	70	V			V	V		
PACK-42F _x L-BC6N	80	V	V	V	V	V	V	V
PACK-42F _x L-DC6N	90	V			V	V	V	V
PACK-42F _x L-EC6N	95				V	V	V	

Electro-Optical Characteristics, $T_c = 25^\circ\text{C}$

I_F (mA)	V_F (V)	Power (W)	PACK-42FWL-AC6N		PACK-42FNL-AC6N		PACK-42FVL-AC6N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
360	34.63	12.47	2333	187.2	2297	184.2	2207	177.0
540*	36.00	19.44	3140	161.5	3090	159.0	2970	152.8
720	37.23	26.81	3947	147.2	3883	144.9	3733	139.3
900	38.42	34.58	4753	137.5	4677	135.2	4497	130.0
1080	39.53	42.69	5560	130.2	5470	128.1	5260	123.2
I_F (mA)	V_F (V)	Power (W)	PACK-42FWL-BC6N		PACK-42FNL-BC6N		PACK-42FVL-BC6N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
360	34.63	12.47	2285	183.3	2253	180.7	2160	173.3
540*	36.00	19.44	3075	158.2	3030	155.9	2905	149.4
720	37.23	26.81	3865	144.2	3807	142.0	3650	136.2
900	38.42	34.58	4655	134.6	4583	132.6	4395	127.1
1080	39.53	42.69	5445	127.5	5360	125.5	5140	120.4
I_F (mA)	V_F (V)	Power (W)	PACK-42FWL-DC6N		PACK-42FNL-DC6N		PACK-42FVL-DC6N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
360	34.63	12.47	2020	162.0	1990	159.6	1907	153.0
540*	36.00	19.44	2705	139.1	2665	137.1	2555	131.4
720	37.23	26.81	3390	126.5	3340	124.6	3203	119.5
900	38.42	34.58	4075	117.8	4015	116.1	3852	111.4
1080	39.53	42.69	4760	111.5	4690	109.9	4500	105.4
I_F (mA)	V_F (V)	Power (W)	PACK-42FNL-EC6N		PACK-42FVL-EC6N			
			Flux (lm)	lm/W	Flux (lm)	lm/W		
360	34.63	12.47	1750	140.4	1680	134.8		
540*	36.00	19.44	2345	120.6	2250	115.7		
720	37.23	26.81	2940	109.7	2820	105.2		
900	38.42	34.58	3535	102.2	3390	98.0		
1080	39.53	42.69	4130	96.7	3960	92.8		

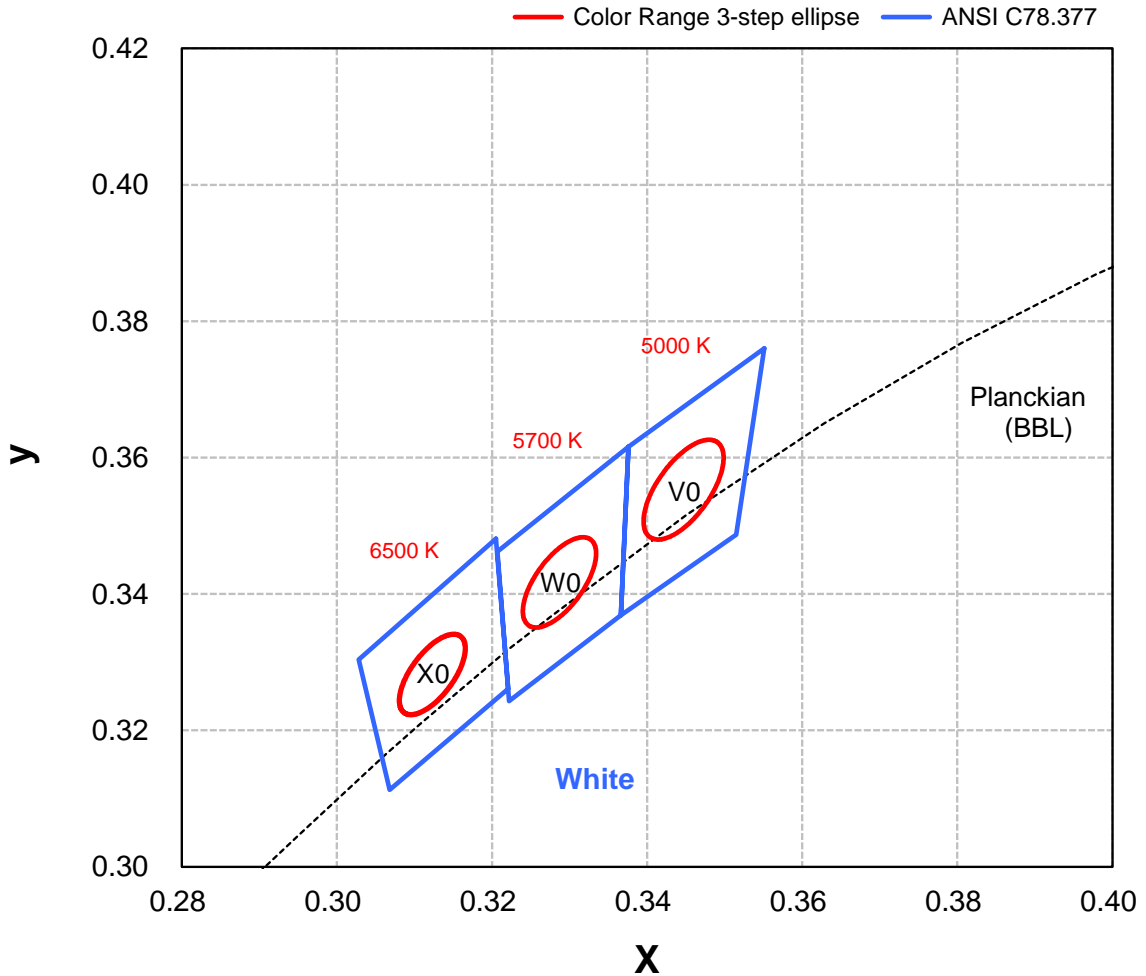
● All values are reference only.

Absolute Maximum Ratings

Parameter	White/Neutral White/Warm White
Max DC Forward Current (mA)	1080
Max Voltage at 1080mA	42
Peak Pulsed Forward Current (mA)	1620 (less than 1/10 duty cycle@1KHz)
ESD Sensitivity (HBM per MIL-STD-883E Method 3015.7)	±2000V
LED Junction Temperature	120°C
Operating Board Temperature at Maximum DC Forward Current	-40°C - 90°C
Storage Temperature	-40°C - 120°C
Reverse Voltage	Not designed to be driven in reverse bias

Color Bin

White Binning Structure Graphical Representation



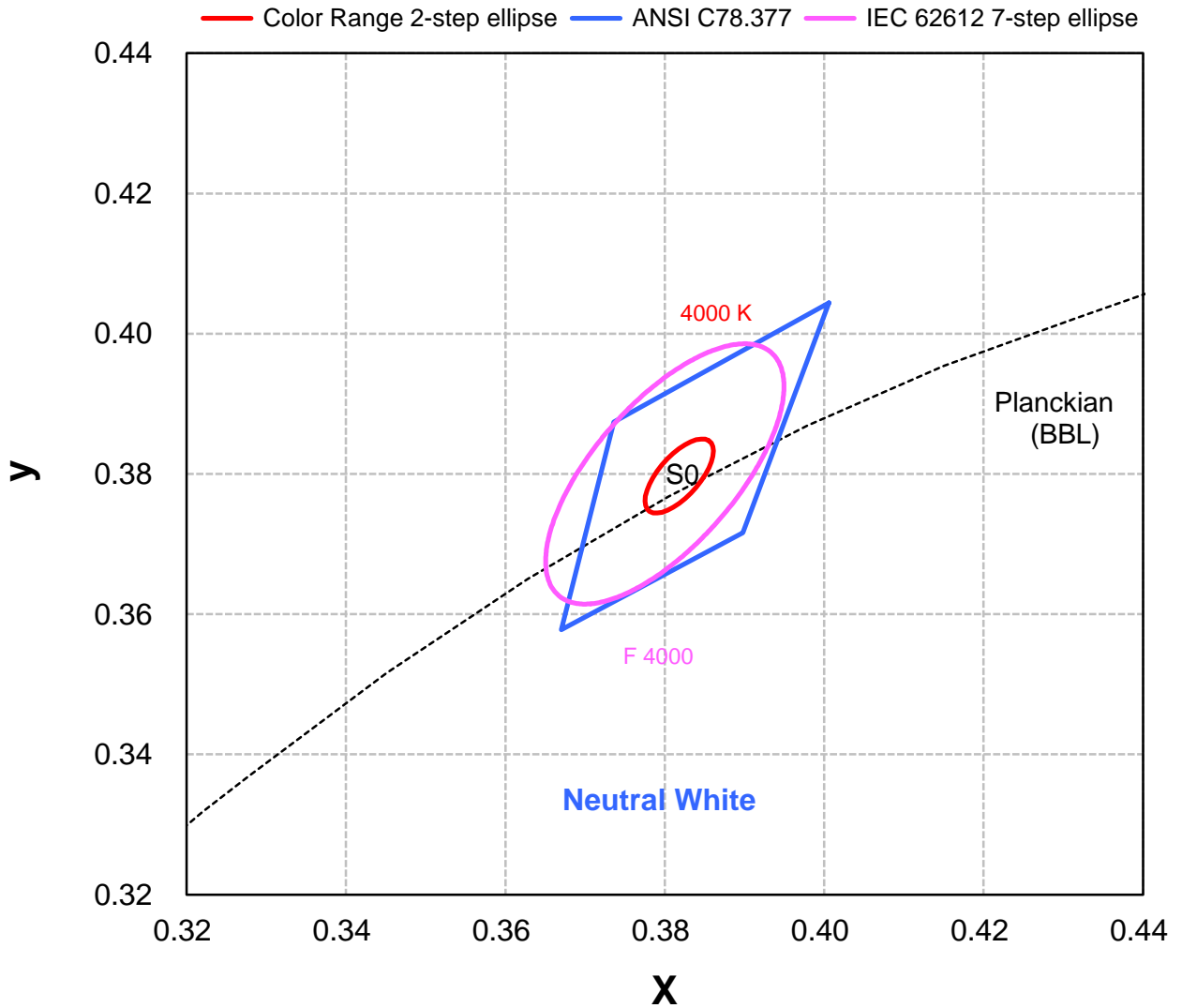
White Bin Structure

Bin Code	Center	Oval parameter	Typ. CCT (K)	Bin Code	Center	Oval parameter	Typ. CCT (K)
V0	x	a	5000	X0	x	a	6500
	y	b			y	B	
		e°				e°	
W0	x	a	5700				
	y	B					
		e°					

- Color range stay within MacAdam “3-step” ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is ± 0.005

Color Bin

Neutral White Binning Structure Graphical Representation



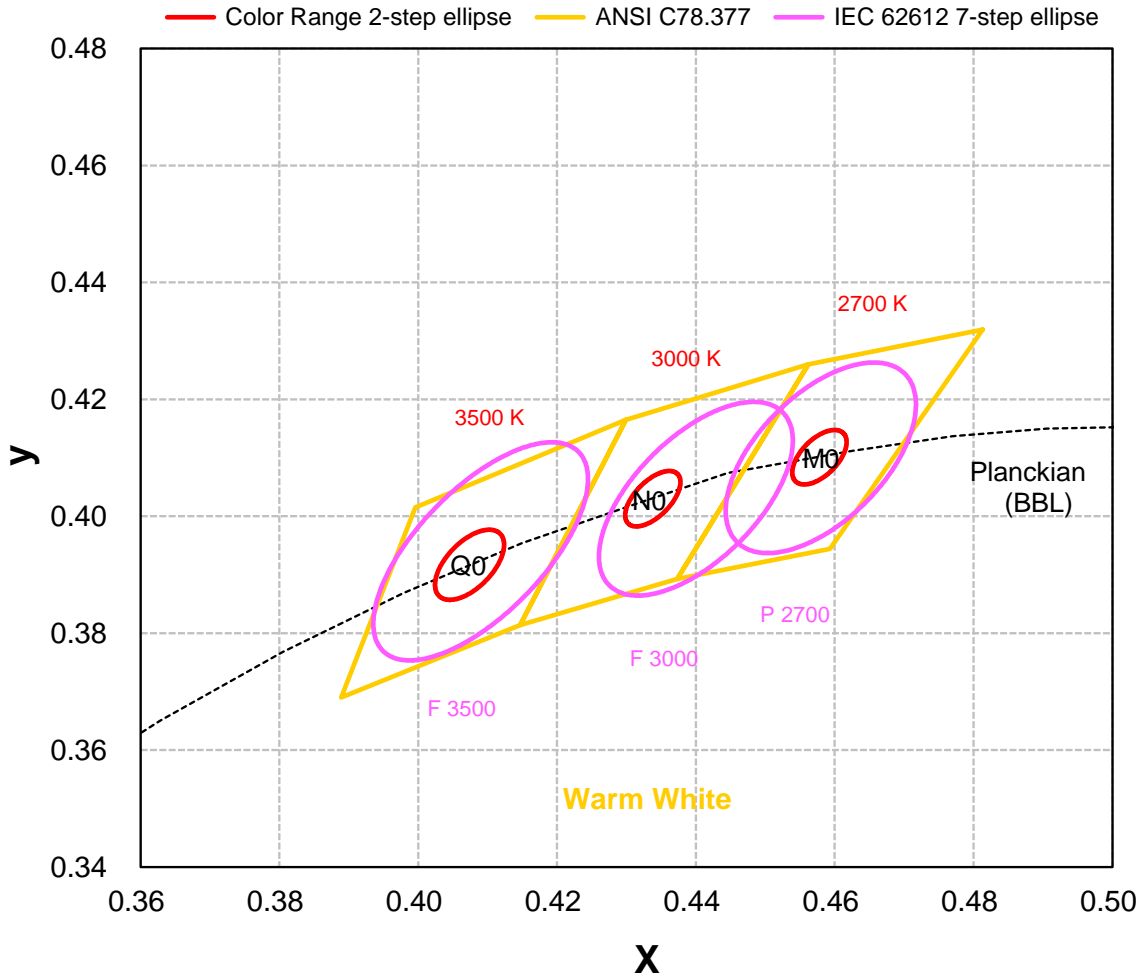
Neutral White Bin Structure

Bin Code	Center	Oval parameter	Typ. CCT (K)
S0	x	0.3818	4000
	y	0.3797	
	a	0.00626	
	b	0.00268	
		e°	53.72

- Color range stay within MacAdam "2-step" ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is ± 0.005

Color Bin

Warm White Binning Structure Graphical Representation



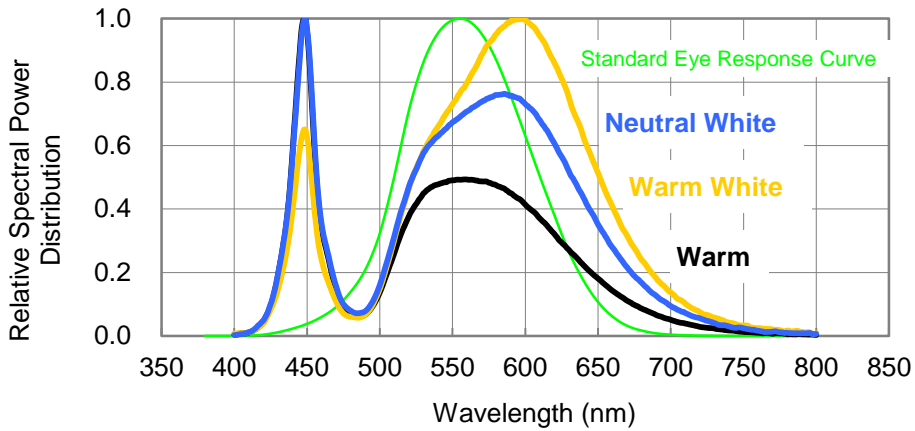
Warm White Bin Structure

Bin Code	Center	Oval parameter	Typ. CCT (K)	Bin Code	Center	Oval parameter	Typ. CCT (K)
M0	x	0.4578	2700	Q0	x	0.4074	3500
	y	0.4101			y	0.3917	
	a	0.0054			a	0.00695	
N0	x	0.4338	3000	Q0	x	0.4074	3500
	y	0.4030			y	0.3917	
	a	0.00556			a	0.00695	
		b	0.00272			b	0.00352
		e°	53.22			e°	54.09

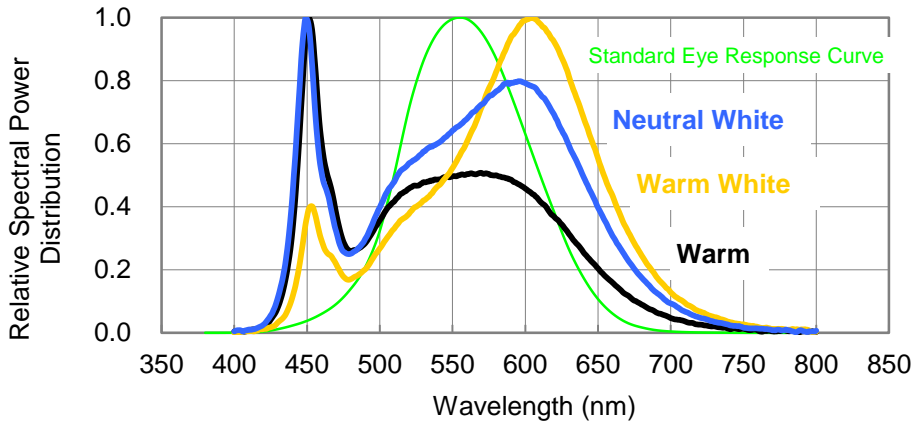
- Color range stay within MacAdam “2-step” ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is ± 0.005

Color Spectrum, $T_c = 25^\circ\text{C}$

1. PACK-42FWL-AC6N 、 PACK-42FNL-AC6N 、 PACK-42FVL-AC6N

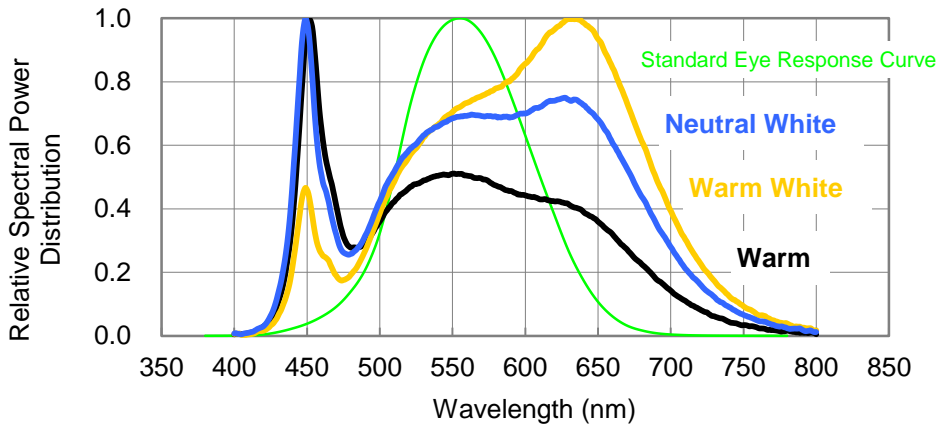


2. PACK-42FWL-BC6N 、 PACK-42FNL-BC6N 、 PACK-42FVL-BC6N

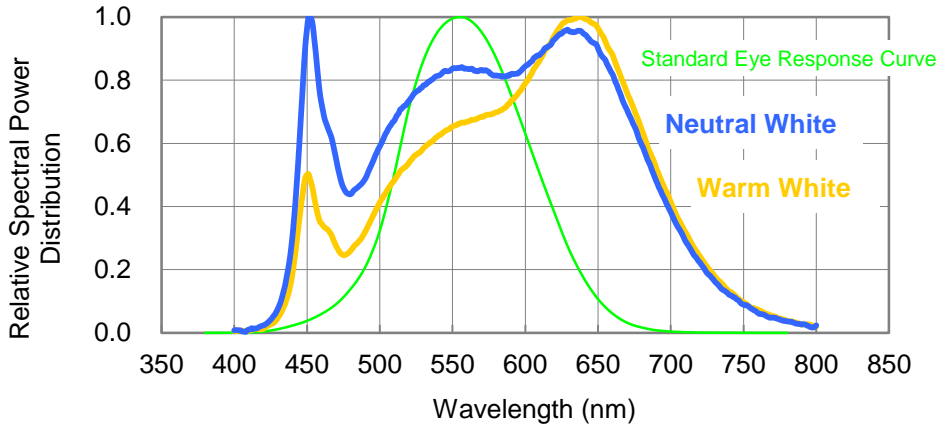


Color Spectrum, $T_c = 25^\circ\text{C}$

3. PACK-42FWL-DC6N 、PACK-42FNL-DC6N 、PACK-42FVL-DC6N



4. PACK-42FNL-EC6N 、PACK-42FVL-EC6N



Case Temperature Relative Characteristics

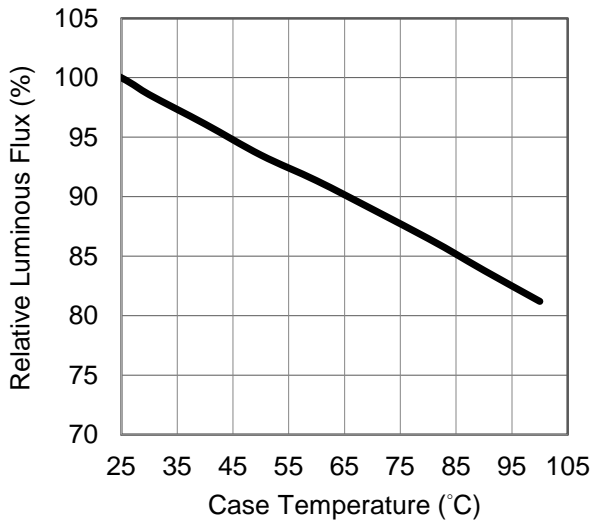


Fig 1. Case Temperature vs. Relative Luminous Flux at 540mA.

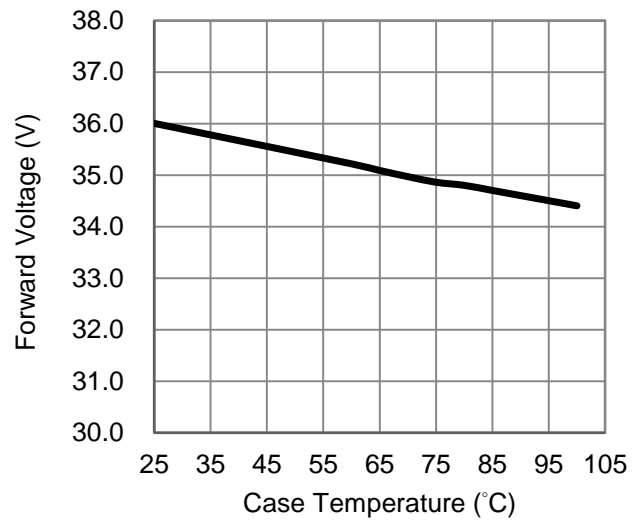


Fig 2. Case Temperature vs. Forward Voltage at 540mA.

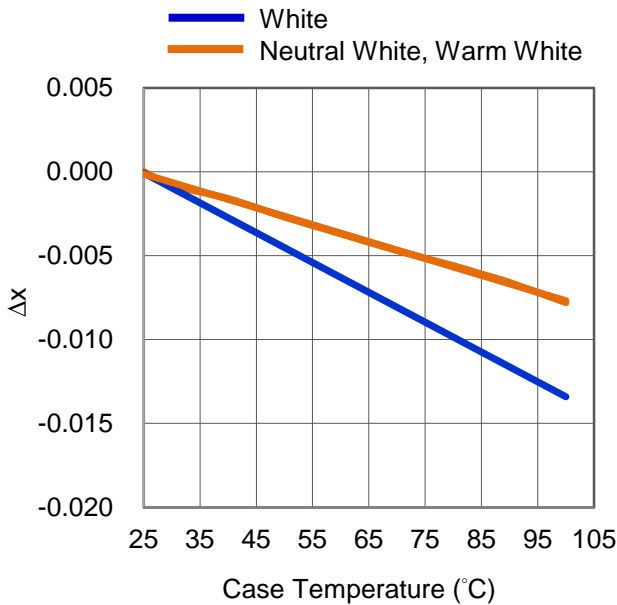


Fig 3. Case Temperature vs. Chromaticity Coordinate Δx at 540mA.

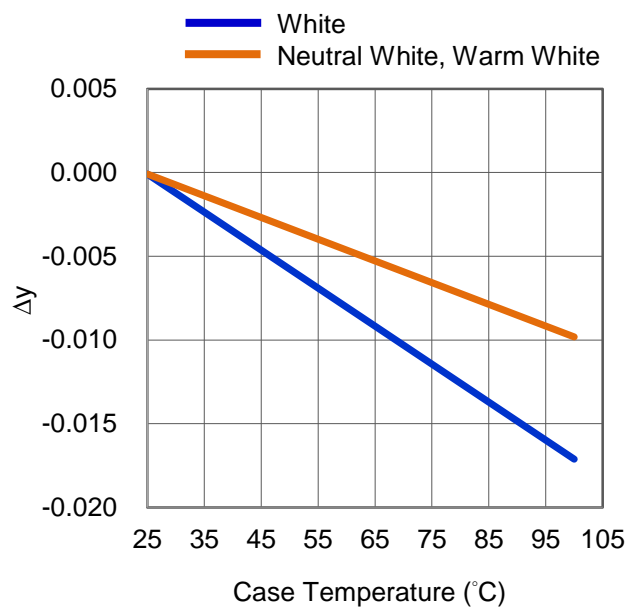


Fig 4. Case Temperature vs. Chromaticity Coordinate Δy at 540mA.

Forward Current Relative Characteristics

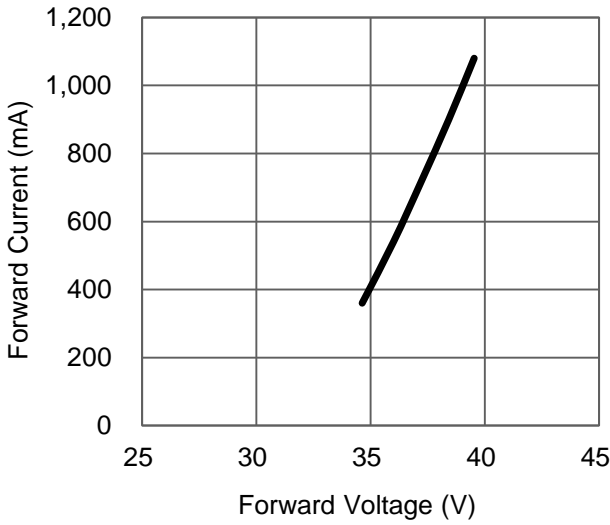


Fig 5. Forward Current vs. Forward Voltage at $T_C=25^\circ\text{C}$.

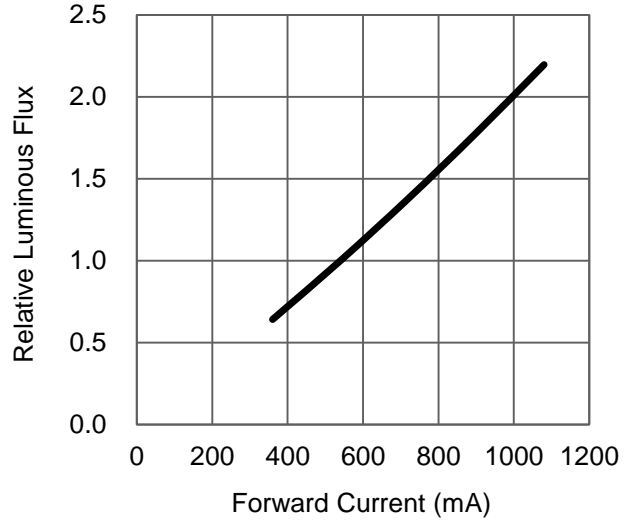


Fig 6. Forward Current vs. Relative Luminous Flux at $T_C=25^\circ\text{C}$.

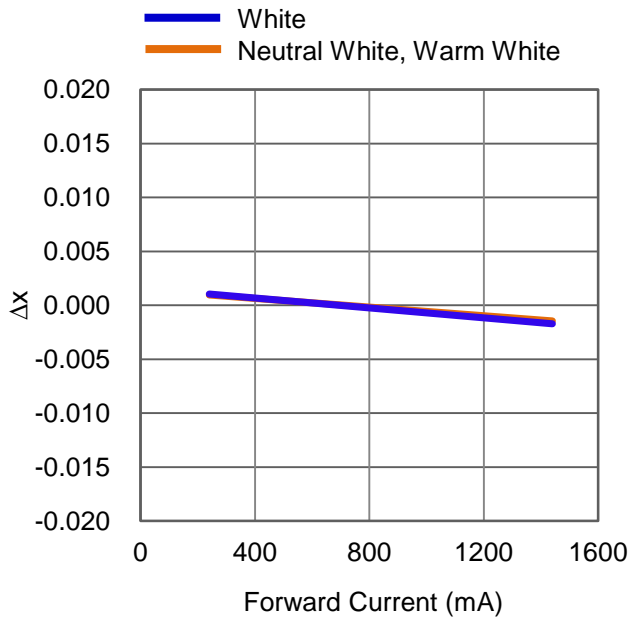


Fig 7. Forward Current vs. Chromaticity Coordinate Δx at $T_C=25^\circ\text{C}$.

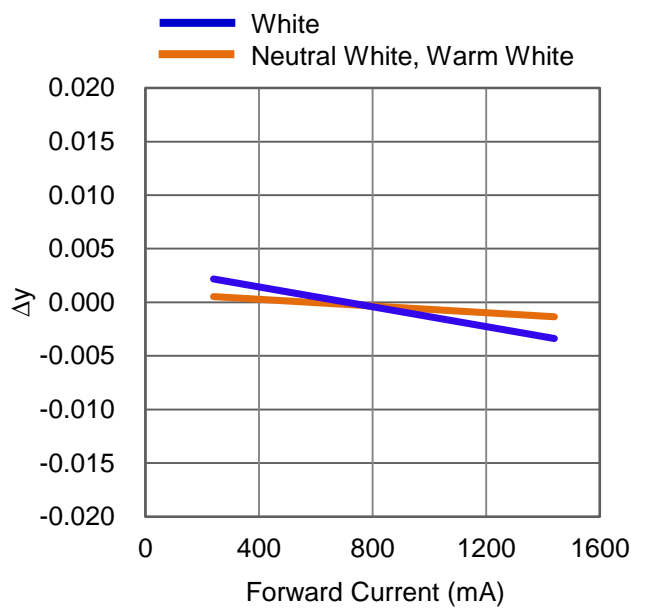


Fig 8. Forward Current vs. Chromaticity Coordinate Δy at $T_C=25^\circ\text{C}$.

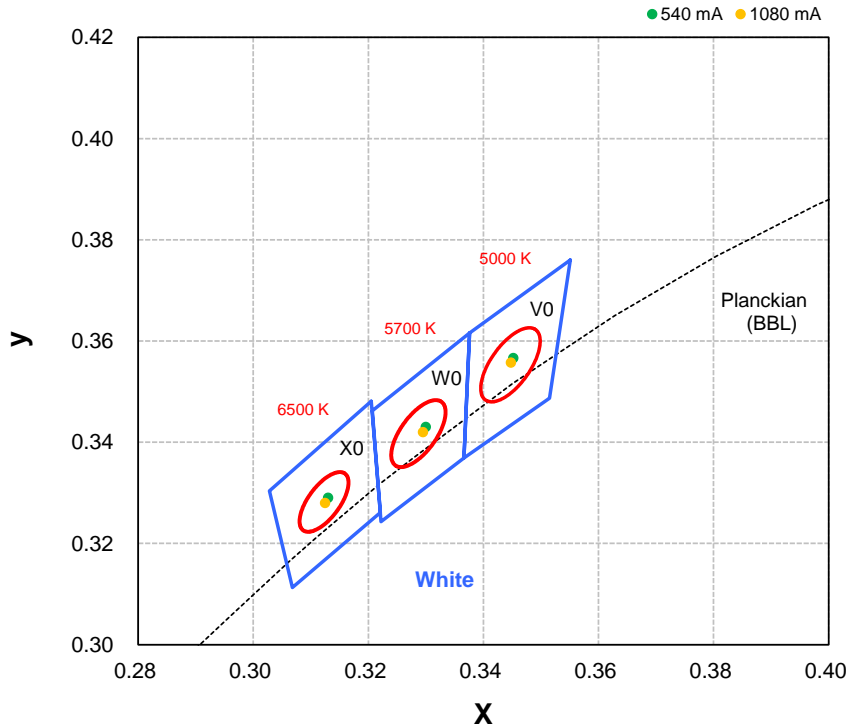
Case Temperature vs. Junction Temperature Characteristics

T _c (°C)	T _j (°C)	
	540 (mA)	1080 (mA)
0	15	30
5	20	35
10	25	40
15	30	45
20	35	50
25	40	55
30	45	60
35	50	65
40	55	70
45	60	75
50	65	80
55	70	85
60	75	90
65	80	95
70	85	100
75	90	105
80	95	110
85	100	115
90	105	120

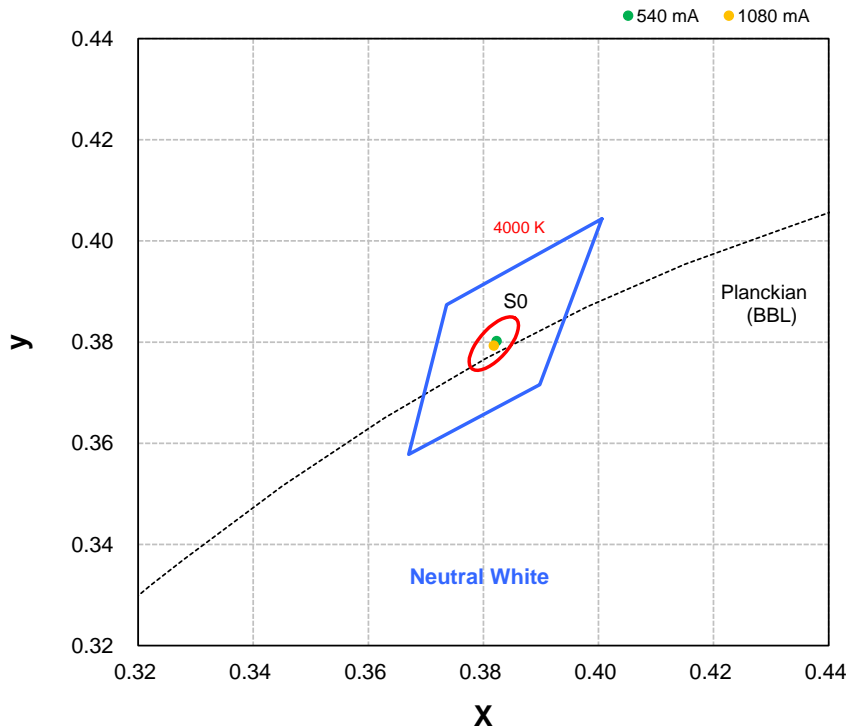
Fig 9. Case Temperature vs. Junction Temperature at 540 、1080mA.

Color Coordinate vs. Forward Current, $T_c = 25^\circ\text{C}$

White Binning Graphical Representation

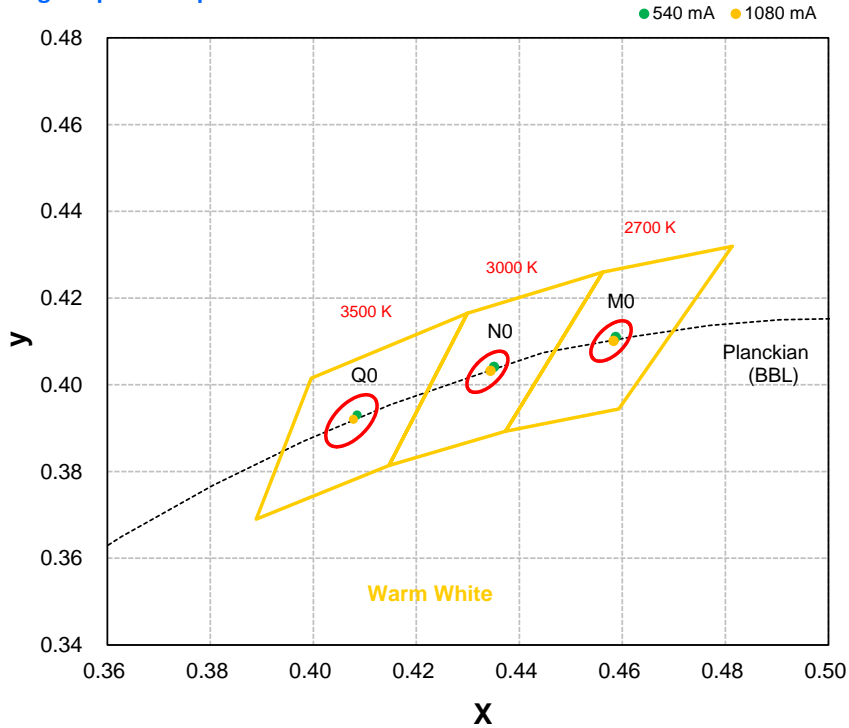


Neutral White Binning Graphical Representation



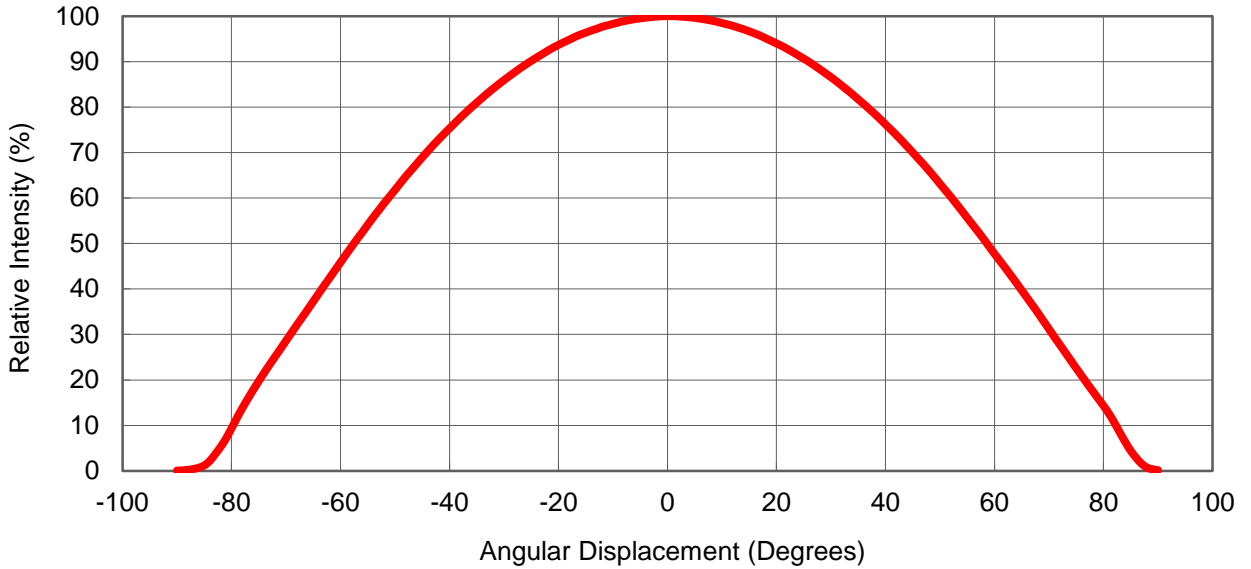
Color Coordinate vs. Forward Current, $T_c = 25^\circ\text{C}$

Warm White Binning Graphical Representation

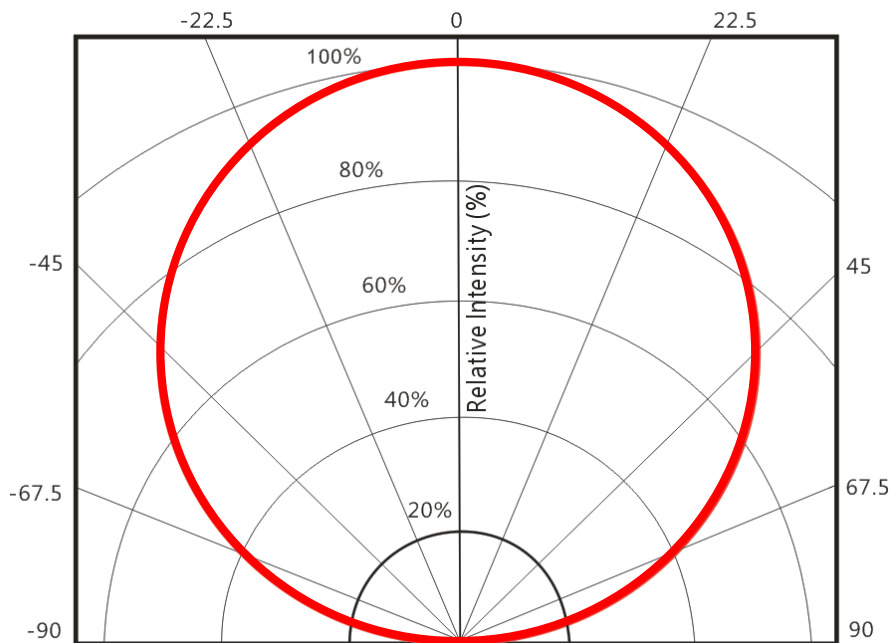


Typical Representative Spatial Radiation Pattern

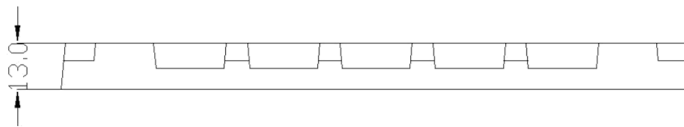
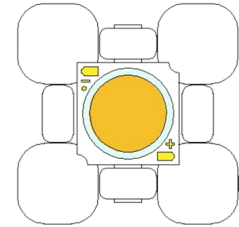
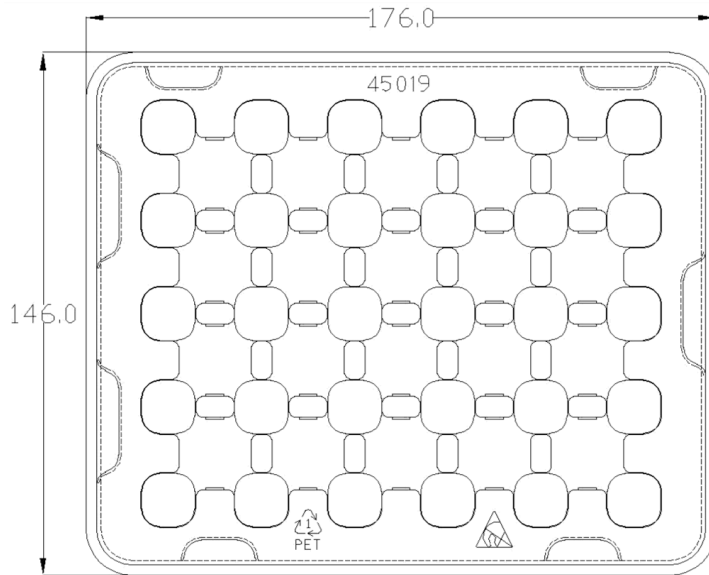
Lambertian Radiation Pattern



Polar Radiation Pattern



Packing Specifications



Product 20 pcs/tray

Notes:

1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are $\pm 0.20\text{mm}$.

Assembly note

Regarding the high power density of LED Array, it is strongly recommend to use thermal grease and screws.

In order to reduce thermal resistance at assembly, it is necessary to use TIM (thermal interface Material) uniformly and tighten screws on heatsink, otherwise the bad thermal resistance may cause the packages **burned out**.

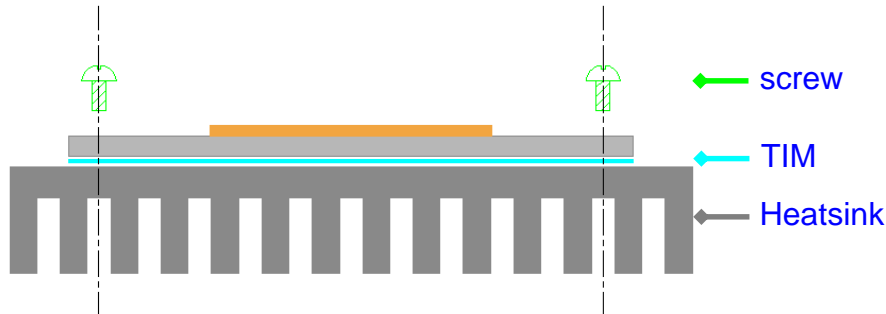


Fig 10. Reference assembly as fixing with screws

Limited Warranty : COB Light Engine Series

This limited warranty is provided by ProLight Opto described below (“Seller”) to you as the original purchaser of the LED lighting product that is identified on Seller’s invoice reflecting its original purchase (the “Product”). We warrant the identification as such on the invoice, will be free of defects in material and workmanship for a period of five (5) YEARS from the date of original purchase. This limited warranty excludes field labor and service charges related to the repair or replacement of the Product. Seller’s aggregate liability with respect to a defective product shall in any event be limited to the monies paid to seller for that defective product. The determination of whether the Product is defective shall be made by Seller in its sole discretion with consideration given to the overall performance of the Product. This limited warranty cannot be transferred to subsequent purchasers of the Product, provided that such Product is resold in new condition and in its original packaging. This limited warranty is void if the product is not used for the purpose for which it is designed.

Recommended Soldering Condition

- Please use lead free and “no clean ” solders.
- Soldering shall be implemented using a soldering tip at a temperature lower than 350 °C, and shall be finished within 3.5 seconds for each pad.
- During the soldering process, put the LEDs on materials whose conductivity is poor enough not to radiate heat of soldering.
- Properly solder tin wires before soldering them to LEDs.
- Avoid touching the silicone lens with the soldering iron.
- Please prevent flux from touching to the silicone lens.
- Please solder evenly on each pad.
- Contacts number of a soldering tip should be within twice for each pad.
- Next process of soldering should be carried out after the LEDs have return to ambient temperature.

*ProLight cannot guarantee if usage exceeds these recommended conditions.

Please use it after sufficient verification is carried out on your own risk if absolutely necessary.

Precaution for Use

- The modules light output are intense enough to cause injury to human eyes if viewed directly. Precautions must be taken to avoid looking directly at the modules with unprotected eyes.
- The modules are sensitive to electrostatic discharge. Appropriate ESD protection measures must be taken when working with the modules. Non-compliance with ESD protection measures may lead to damage or destruction of the product.
- Chemical solvents or cleaning agents must not be used to clean the modules. Mechanical stress on the Emitters must be avoided. It is best to use a soft brush, damp cloth or low-pressure compressed air.
- The products should be stored away from direct light in dry location.
- The appearance, specifications and flux bin of the product may be modified for improvement without notice. Please refer to the below website for the latest datasheets.
<http://www.prolightopto.com/>

Handling of Silicone Lens LEDs

Notes for handling of silicone lens LEDs

- Please do not use a force of over 0.3kgf impact or pressure on the silicone lens, otherwise it will cause a catastrophic failure.
- Avoid touching the silicone lens and the optical area of the COB Array especially by sharp tools such as Tweezers
- Avoid touching the silicone lens especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the silicone lens.
- Please store the LEDs away from dusty areas or seal the product against dust.
- Please do not mold over the silicone lens with another resin. (epoxy, urethane, etc)

