ProLight Opto
Technology Corporation

ProLight PAB4-50FxL-x00N
50W COB Light-Engine LEDs
Technical Datasheet
Version: 1.4

Prolight Opto ® ProEngine Series

Features

- High flux density of lighting source
- Good color uniformity
- RoHS compliant
- Engine Star binning structure
- More energy efficient than incandescent and most halogen lamps
- No UV
- Long lifetime

Main Applications

- High specification down lighting
- High profile architectural lighting
- Spot lighting
- High-Bay & Low-Bay lighting
- Grid lighting

Introduction

- The input power is 50 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 High-Bay and Low-Bay lighting, typical applications include commercial down lighting, in task lighting, spot lighting, tunnel lighting and high profile architectural lighting.

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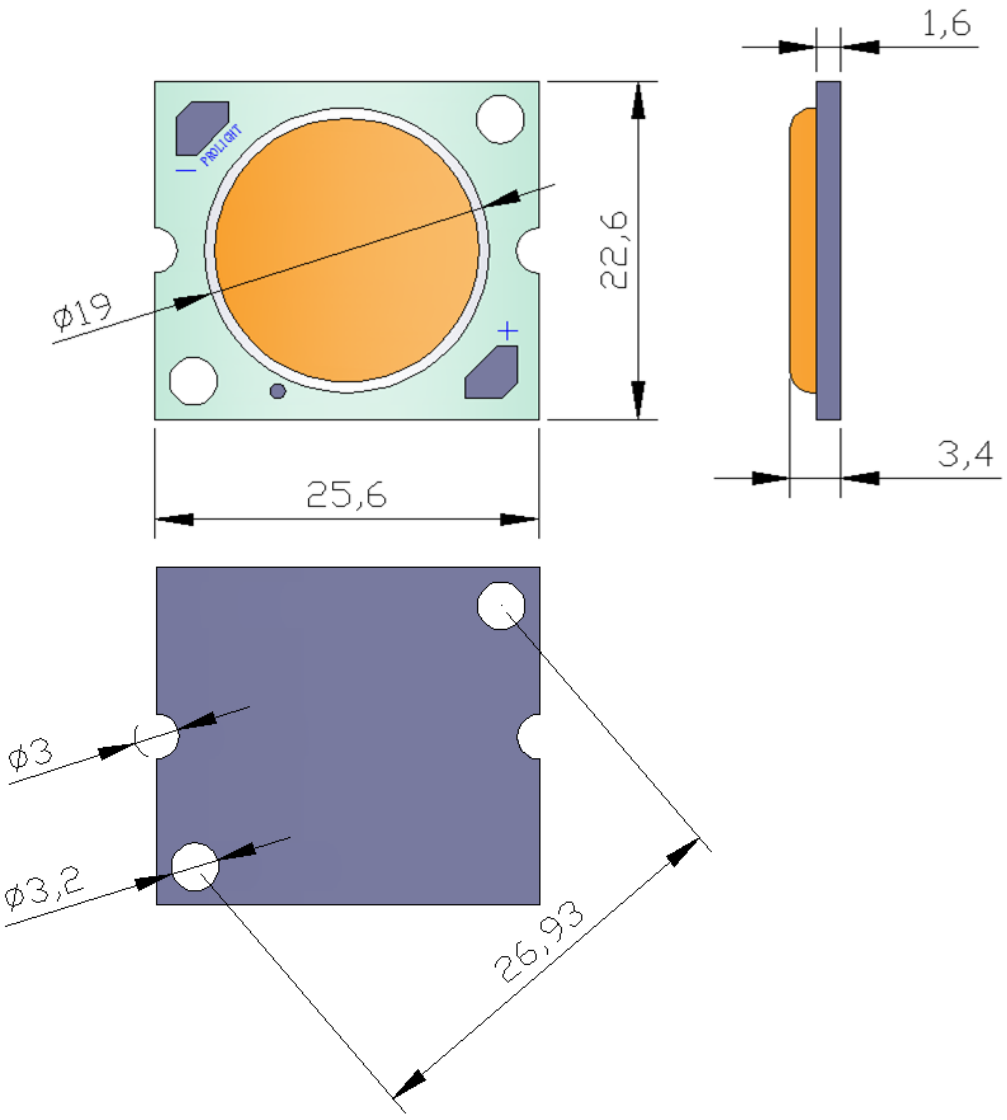
Emitter Mechanical Dimensions



Notes:
1. The cathode side of the device is denoted by the " + / - " mark on the part body.
2. Drawing not to scale.
3. All dimensions are in millimeters.
4. All dimensions without tolerances are for reference only.
5. Please do not solder the emitter by manual hand soldering, otherwise it will damage the emitter.
6. **Please do not use a force (0.3 kgf) or pressure impact 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.

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Flux Characteristics, T_j = 25°C

Radiation Pattern	Color	Part Number Emitter	DC Forward Current (mA)	Luminous Flux Φ_V (lm) Minimum	Luminous Flux Φ_V (lm) Typical	CRI Typical
Lambertian	White	PAB4-50FWL-N00N	1300	4500	4850	72
			1400*	5200	5600	
			1500	5500	5900	
	Neutral White	PAB4-50FNL-B00N	1300	3750	4200	80
			1400*	4300	4800	
			1500	4550	5100	
	Warm White	PAB4-50FVL-B00N	1300	3700	4100	80
			1400*	4350	4750	
			1500	4500	4850	
		PAB4-50FVL-D00N	1300	2500	2750	95
			1400*	2850	3150	
			1500	3050	3300	

- The mark "*" indicated product is tested and binned at the specified drive current.
- ProLight maintains a tolerance of ± 10% on flux and power measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics at 1400mA , T_j = 25°C

Color	Forward Voltage V_F (V) Min.	Typ.	Max.	Thermal Resistance Junction to Board (℃/W)
White	30.5	35.5	38.5	0.3
Neutral White	30.5	35.5	38.5	0.3
Warm White	30.5	35.5	38.5	0.3

- ProLight maintains a tolerance of ± 1 for Voltage measurements.

Optical Characteristics at 1400mA, T_j = 25°C

Radiation Pattern	Color	Color Temperature CCT Min.	Typ.	Max.	Total included Angle (degrees) $\theta_{0.90V}$	Viewing Angle (degrees) $2\theta_{1/2}$
Lambertian	White	5300 K	5700 K	6020 K	160	120
	Neutral White	3845 K	4000 K	4090 K	160	120
	Warm White	2655 K	2700 K	2785 K	160	120
		2960 K	3000 K	3115 K	160	120

- ProLight maintains a tolerance of ± 5% for CCT measurements.

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Absolute Maximum Ratings

Parameter	White/Neutral White/Warm White
Max DC Forward Current (mA)	1500
Peak Pulsed Forward Current (mA)	2000 (less than 1/10 duty cycle@1KHz)
Average Forward Current (mA)	1500
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 - 105°C
Storage Temperature	-40°C - 120°C
Reverse Voltage	Not designed to be driven in reverse bias

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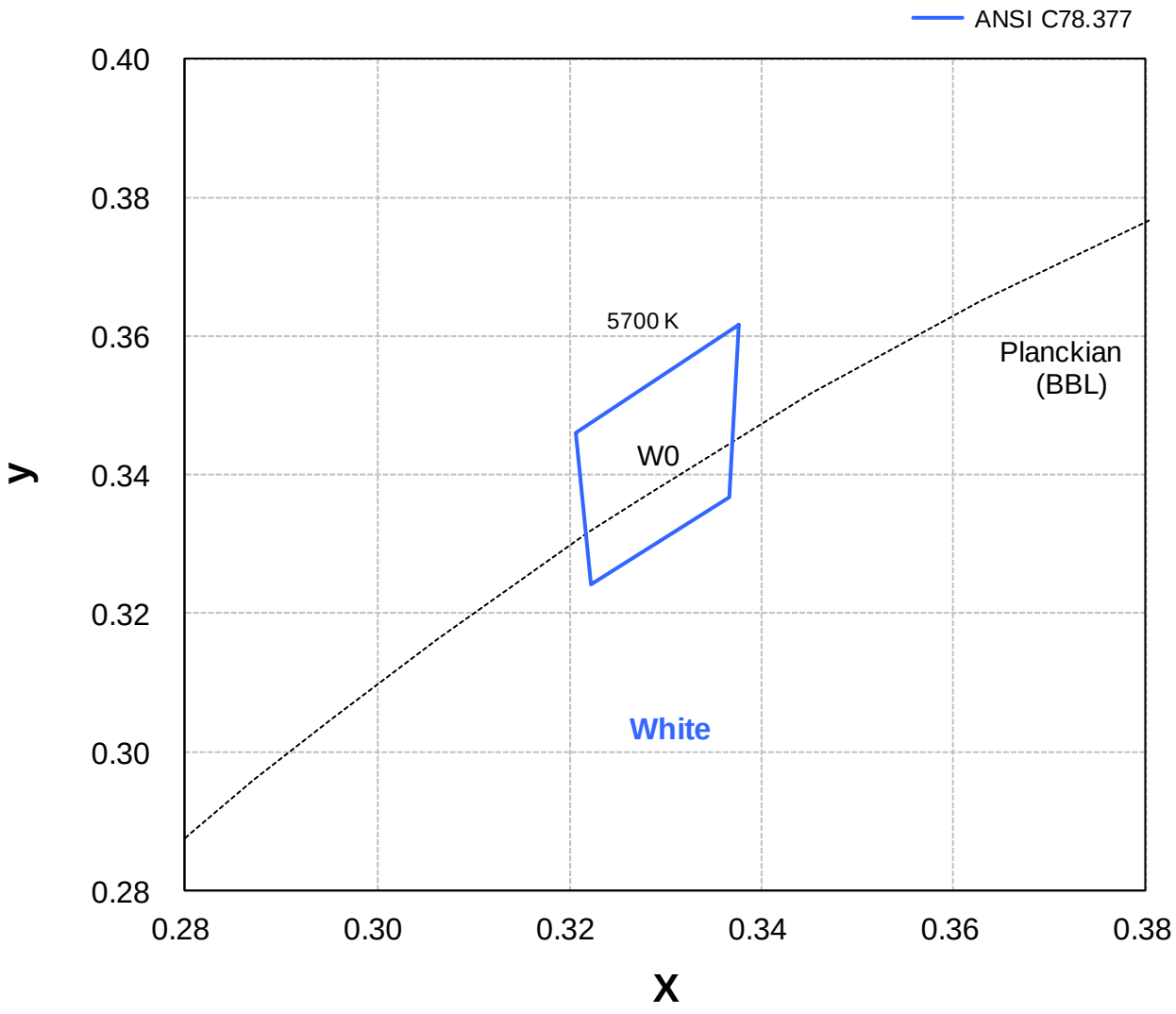
Color Bin

White Binning Structure Graphical Representation



White Bin Structure

Bin Code	x	y	Typ. CCT (K)
W0	0.338 0.321 0.322 0.337	0.362 0.346 0.324 0.337	5700

- Tolerance on each color bin (x , y) is ± 0.01

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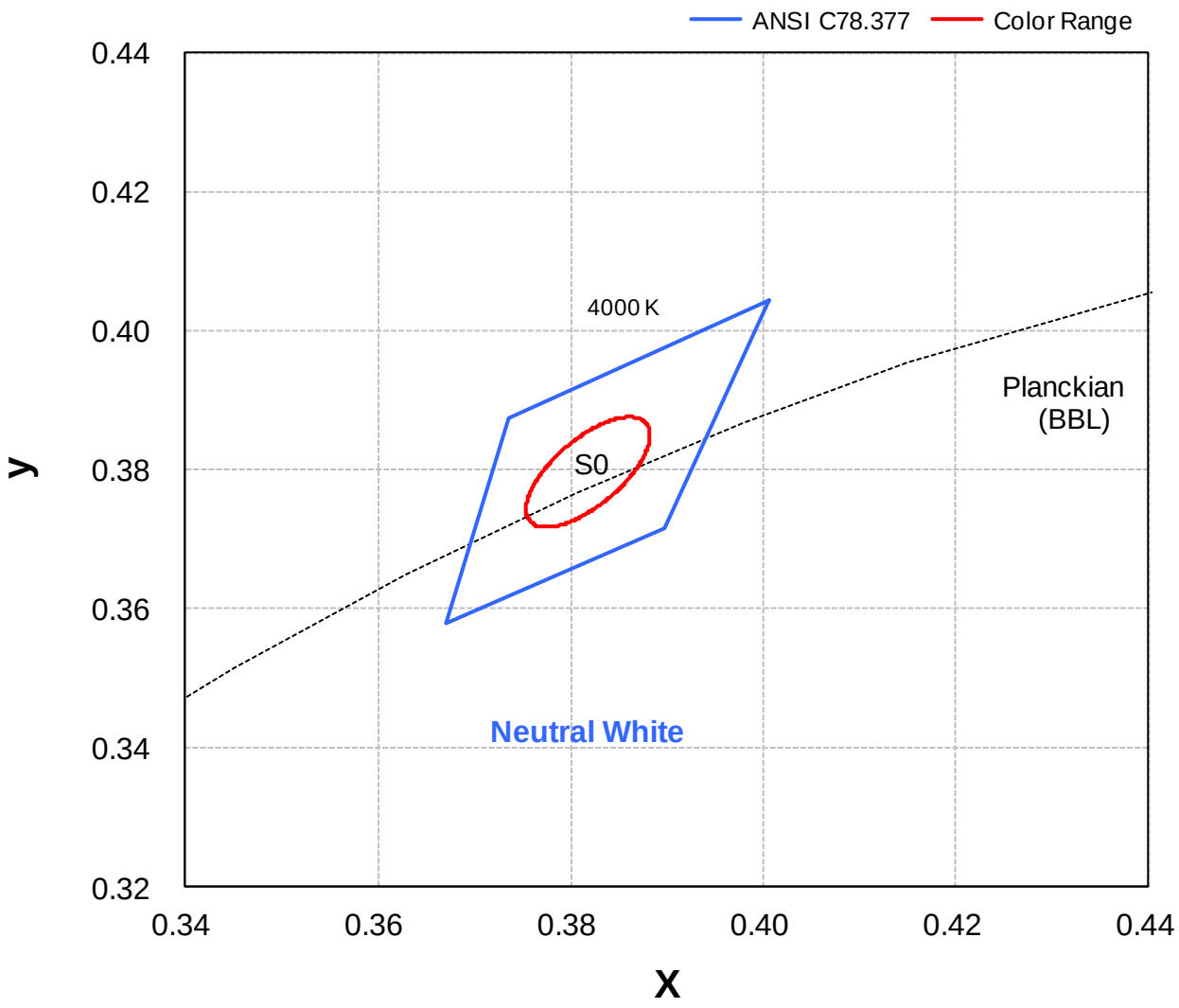
Color Bin

Neutral White Binning Structure Graphical Representation



Neutral White Bin Structure

Bin Code		Center	Oval parameter		Typ. CCT (K)
S0	x	0.382	a	0.00939	4000
	y	0.380	b	0.00402	
			θ°	54.00	

- 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 ± 0.01

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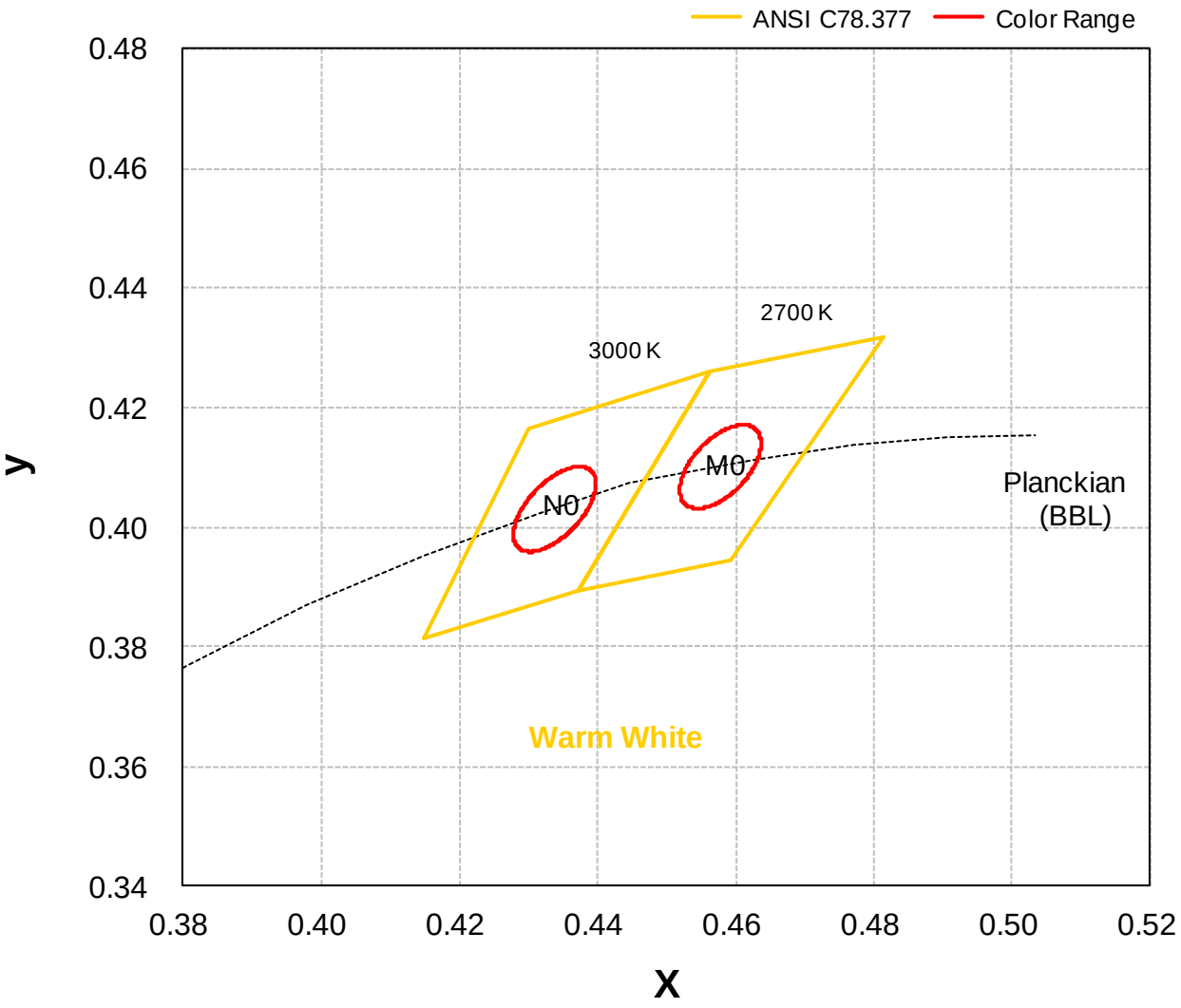
Color Bin

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	a	0.00774	2700	N0	x	0.4338	a	0.00834	3000
	y	0.4101	b	0.00411			y	0.4030	b	0.00408	
			θ°	57.28					θ°	53.17	

- 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 ± 0.01

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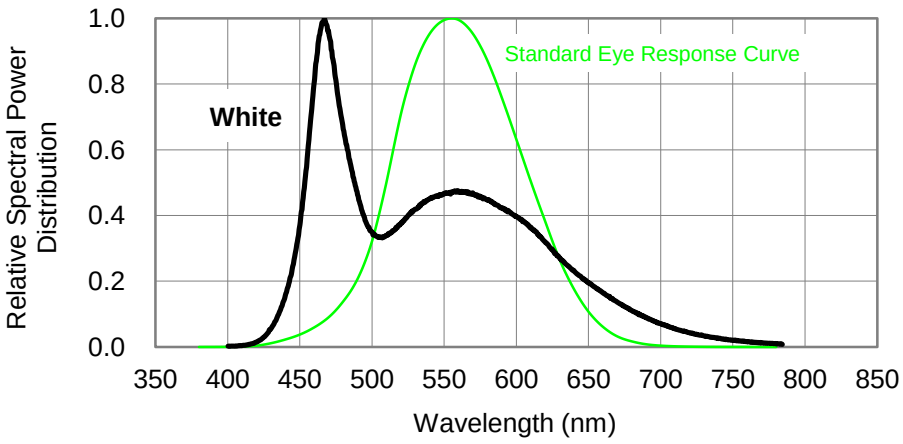
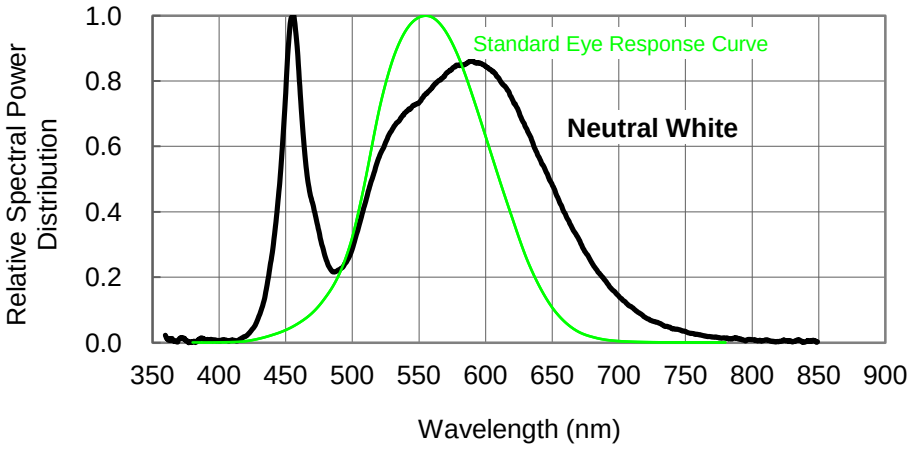
Color Spectrum, T_j = 25°C

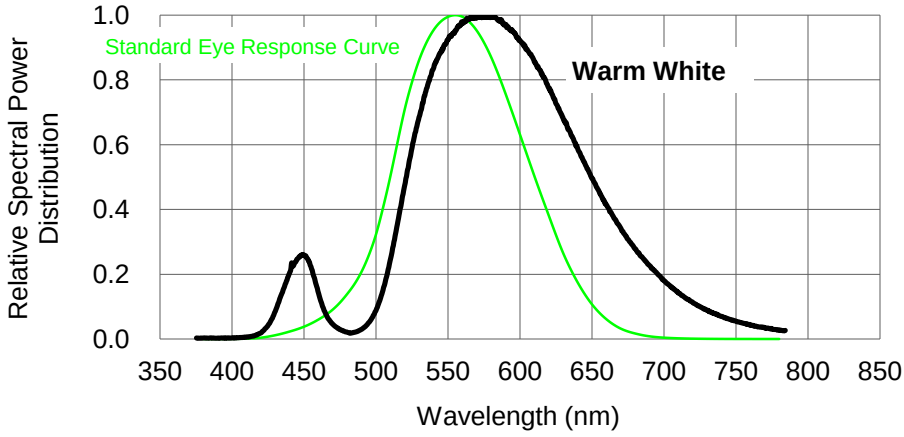
1. White



2. Neutral White



3. Warm White



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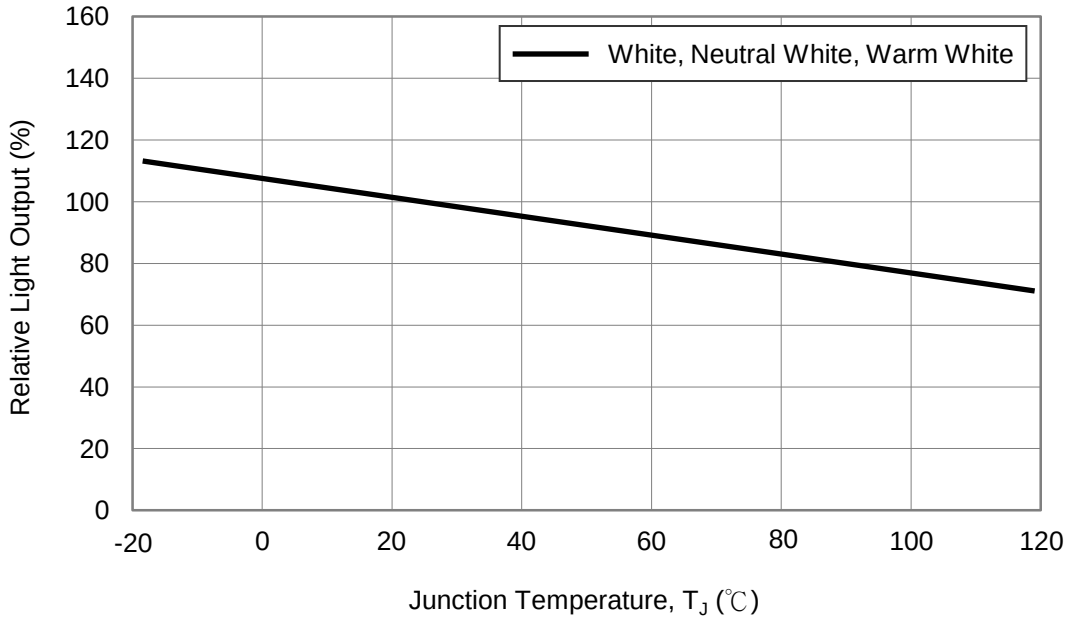
Light Output Characteristics

Relative Light Output vs. Junction Temperature at 1400mA



Forward Current Characteristics, T_J = 25°C

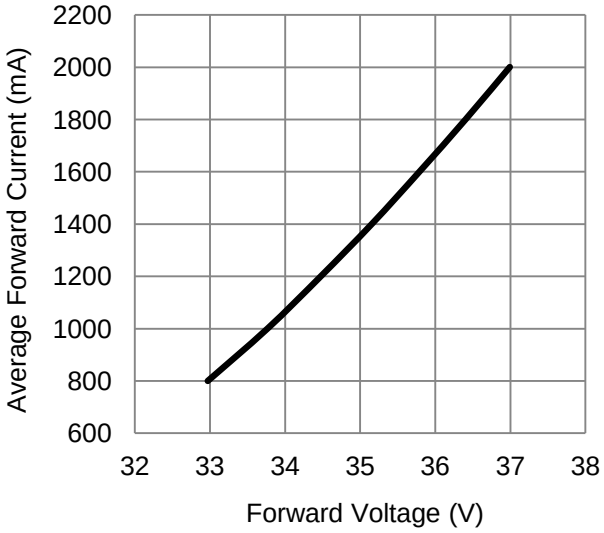


Fig 1. Forward Current vs. Forward Voltage for White , Neutral White, Warm White.

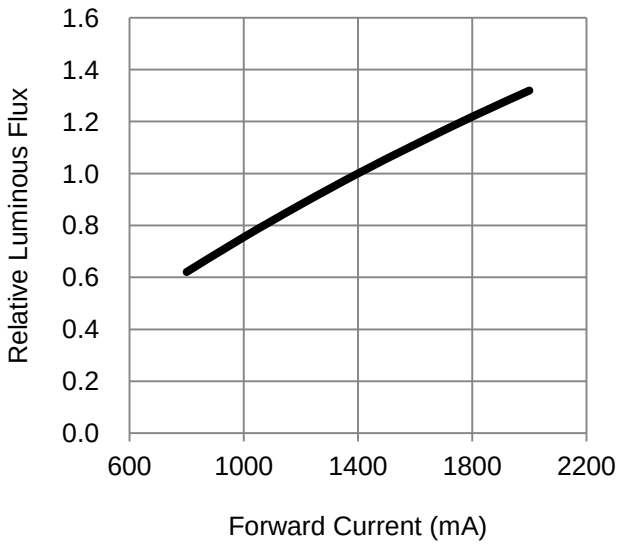


Fig 2. Relative Luminous Flux vs. Forward Current for White, Neutral White, Warm White at T_J=25 maintained.

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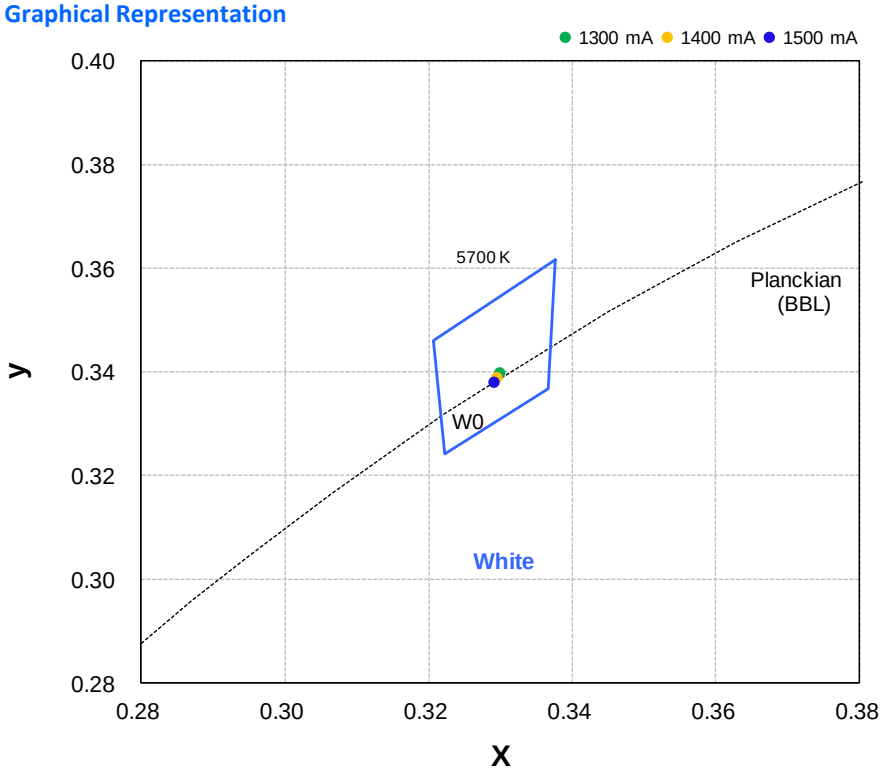
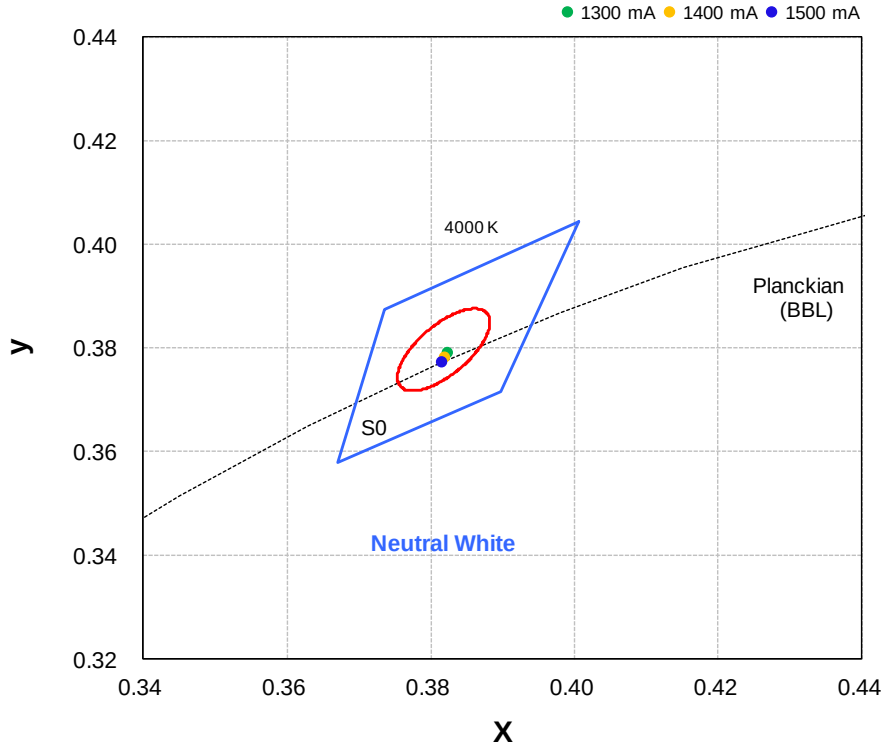
Color Coordinate vs. Forward Current, T_J = 25°C

White Binning Graphical Representation



Neutral White Binning Graphical Representation



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Color Coordinate vs. Forward Current, T_j = 25°C

Warm White Binning Graphical Representation

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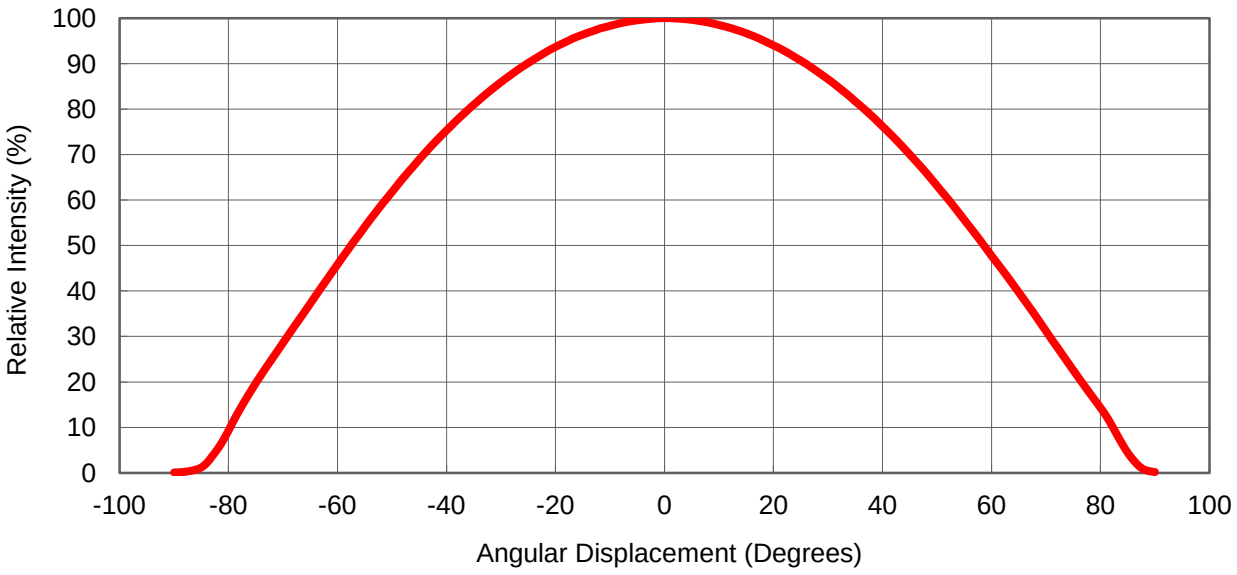
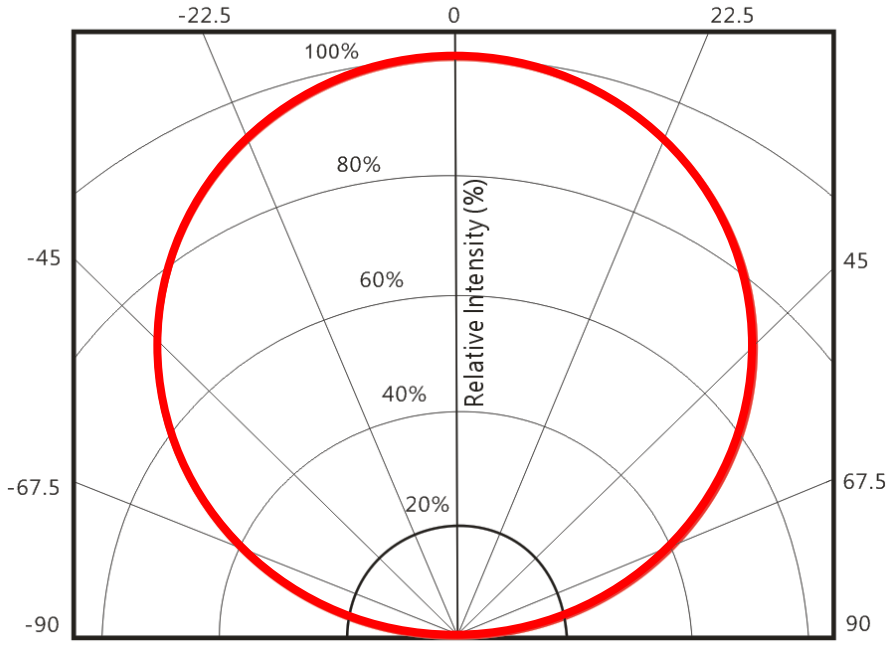
Typical Representative Spatial Radiation Pattern

Lambertian Radiation Pattern



Polar Radiation Pattern



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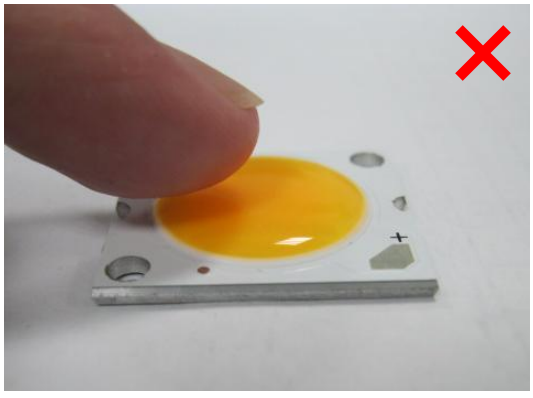
Precaution for Use

- Storage
  Please do not open the moisture barrier bag (MBB) more than one week. This may cause the leads of LED discoloration. We recommend storing ProLight's LEDs in a dry box after opening the MBB. The recommended storage conditions are temperature 5 to 30°C and humidity less than 40% RH. It is also recommended to return the LEDs to the MBB and to reseal the MBB.
- The board is is not electrically neutral. Therefore, we recommend to isolate the heat sink.
- The board is to be soldered. If not, please use the heat conductive adhesive.
- Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.
- Please avoid rapid cooling after soldering.
- Components should not be mounted on warped direction of PCB.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a heat plate should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When cleaning is required, isopropyl alcohol should be used.
- When the LEDs are illuminating, operating current should be decide after considering the package maximum temperature.
- 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.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- 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)



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