

ProLight PBMM-450FTL-N01AP
450W Power LED
Technical Datasheet
Version: 1.2

ProLight Opto ProEngine Series

Features

- High power density of lighting source
- Good color uniformity
- Compact light source
- R, G, B, W four color in one package
- RoHS compliant

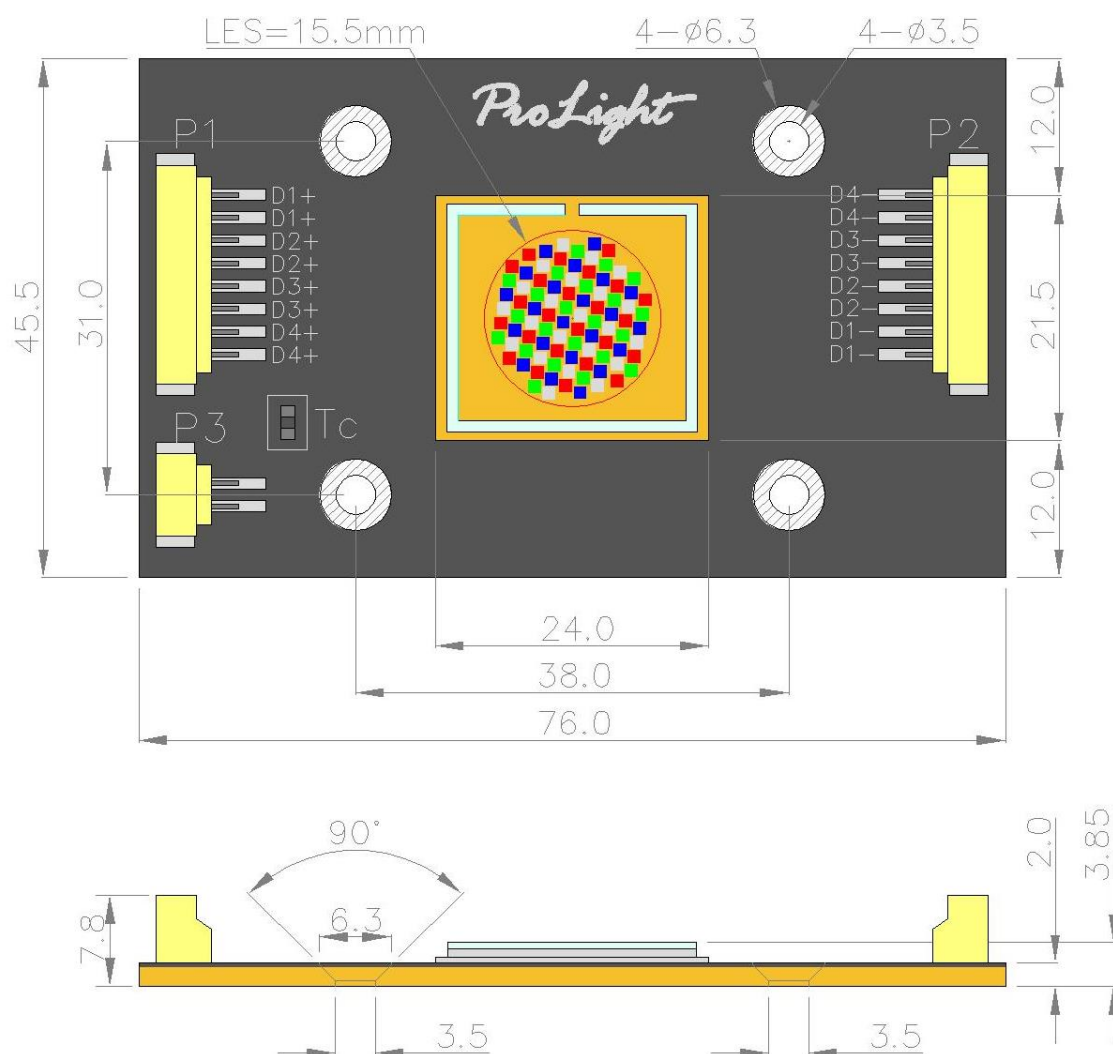
Main Applications

- Entertainment lighting (Stage lighting)
- Architectural lighting
- Mood lighting
- Outdoor lighting
- Indoor lighting

Introduction

- The input power is 450 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 spot lighting, typical applications include architectural and entertainment lighting, medical lighting, transportation, emergency vehicle lighting and machine vision.

Mechanical Dimensions



Notes:

1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are $\pm 0.15\text{mm}$.
4. Please do not solder the emitter by manual hand soldering, otherwise it will damage the emitter.
5. **Please do not use a force of over 1kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.**
6. NCP18XH103E03RB. Please see <http://www.murata.com/> for details on calculating thermistor temperature.
7. Selected JST Connector P/N. PHR-2 and PHR-8. Please see <http://www.jst-mfg.com/product/pdf/chn/cPH.pdf> for details.

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

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

Color	Part Number COB	Luminous Flux		
		Minimum	@2000mA Typical	Refer @3000mA Typical
Red	PBMM-450FTL-N01AP	2400	2900	3800
Green		3900	4800	5950
Blue		700	870	1200
White		4150	5100	6950

● **Do not use below 100mA.**

- ProLight maintains a tolerance of $\pm 7\%$ on flux and power measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics, $T_j = 25^{\circ}\text{C}$

Color	Min.	Forward Voltage V_F (V)		Refer @3000mA Typ.	Thermal Resistance Junction to Board ($^{\circ}\text{C}/\text{W}$)
		@2000mA Typ.	Max.		
Red	25.5	29.5	35.5	33.0	0.15
Green	33.0	33.5	34.0	35.5	
Blue	32.0	34.5	38.5	36.0	
White	32.0	34.5	38.5	36.0	

- ProLight maintains a tolerance of $\pm 0.5\text{V}$ for Voltage measurements.

Optical Characteristics at 2000mA, $T_j = 25^{\circ}\text{C}$

Radiation Pattern	Color	Dominant Wavelength λ_D , or Color Temperature CCT			Total included Angle (degrees) $\theta_{0.90\text{V}}$	Viewing Angle (degrees) $2\theta_{1/2}$
		Min.	Typ.	Max.	160	120
Flat	Red	620 nm	623 nm	630 nm		
	Green	520 nm	525 nm	530 nm		
	Blue	452 nm	454 nm	457 nm		
	White	6000 K	6800 K	7610 K		

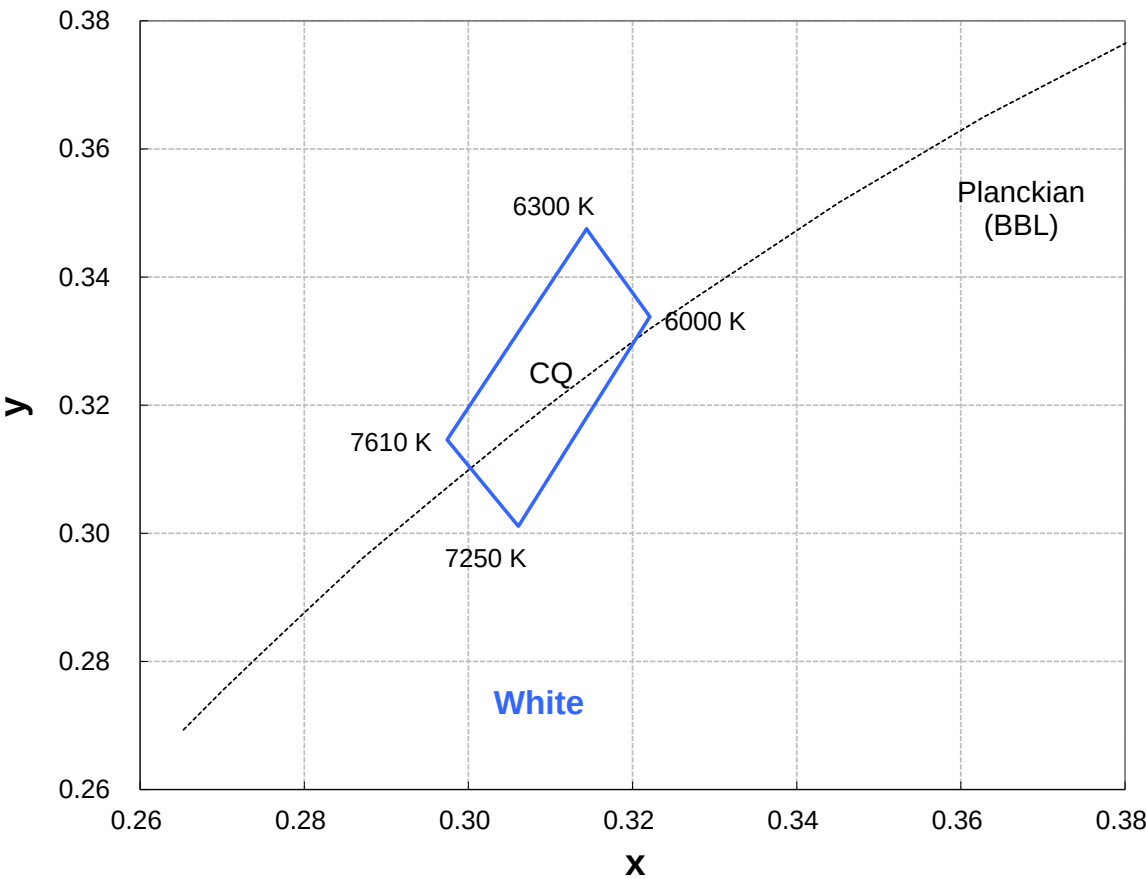
- ProLight maintains a tolerance of $\pm 1\text{nm}$ for dominant wavelength measurements.
- ProLight maintains a tolerance of $\pm 5\%$ for CCT measurements.

Absolute Maximum Ratings

Parameter	Red/Green/Blue/White
DC Forward Current (mA)	100-3000
Peak Pulsed Forward Current (mA)	3300 (less than 1/10 duty cycle@1KHz)
ESD Sensitivity (HBM per MIL-STD-883E Method 3015.7)	±2000V
LED Junction Temperature	135°C
Operating Board Temperature at Maximum DC Forward Current	-40°C - 80°C
Storage Temperature	-40°C - 120°C
Reverse Voltage	Not designed to be driven in reverse bias

Color Bin

White Binning Structure Graphical Representation



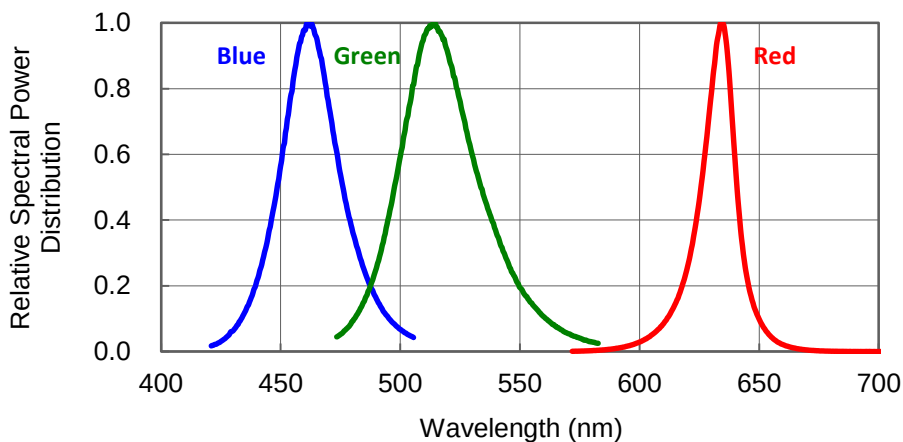
White Bin Structure

Bin Code	x	y	Typ. CCT (K)
CQ	0.3144	0.3475	6800
	0.3221	0.3338	
	0.3061	0.3011	
	0.2974	0.3146	

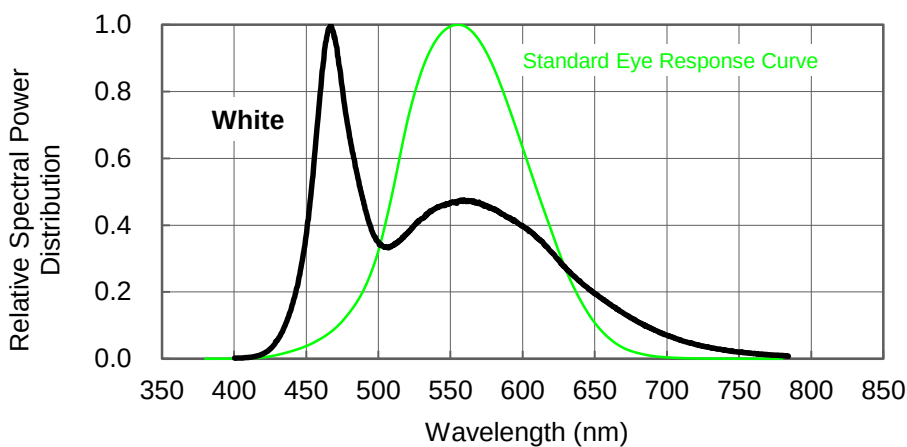
- Tolerance on each color bin (x , y) is ± 0.005

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

1. Blue 、 Green 、 Red

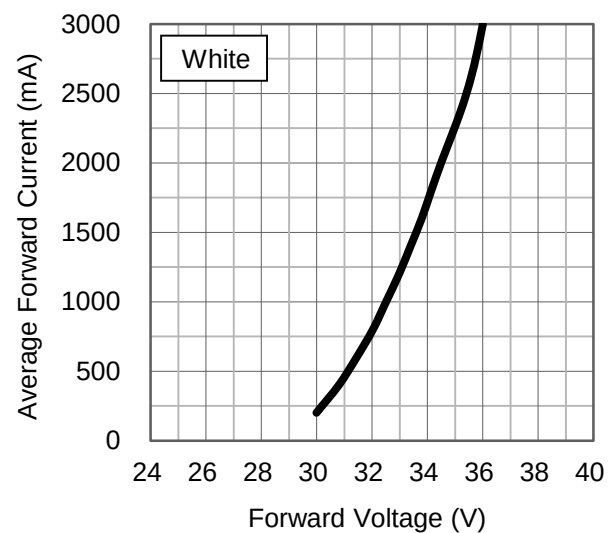
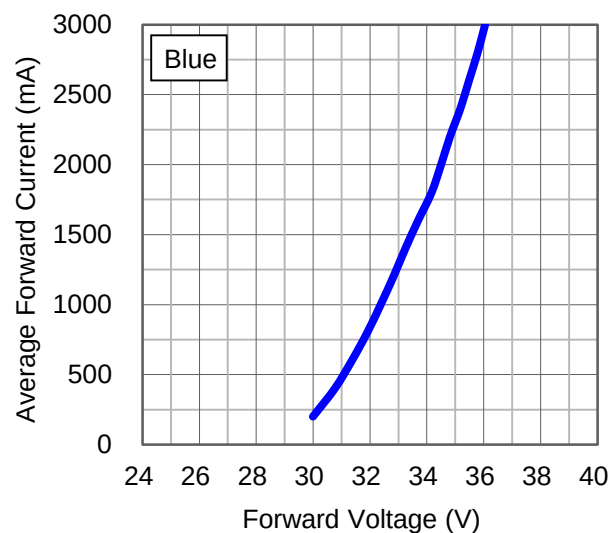
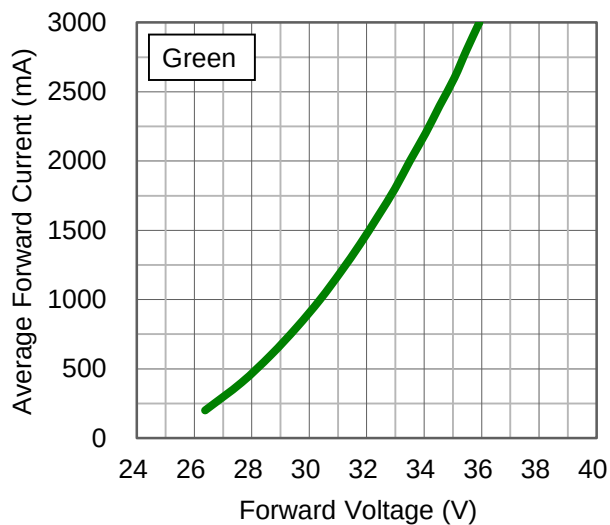
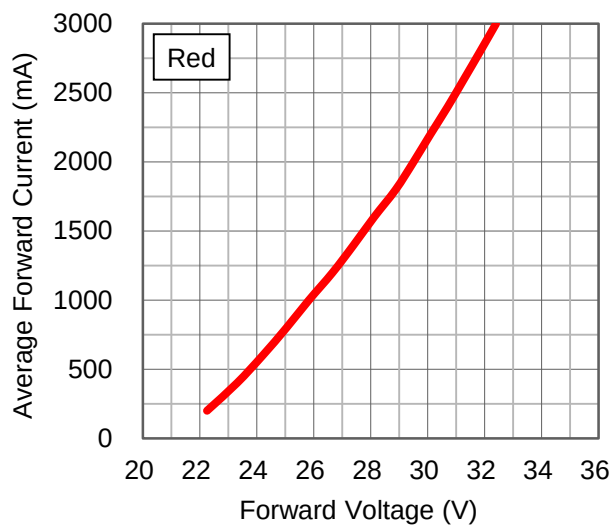


2. White



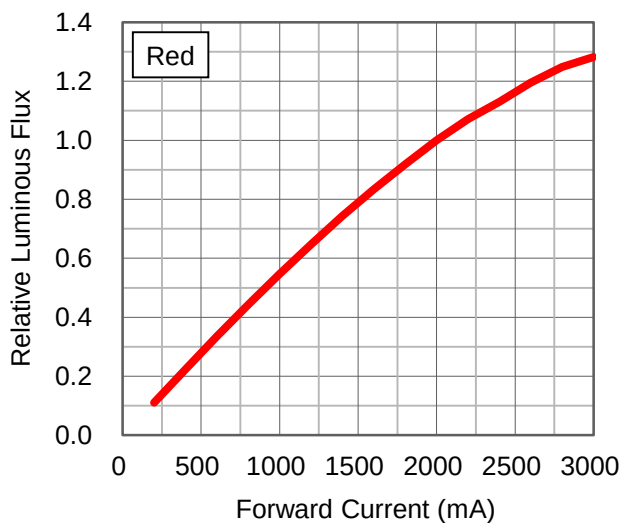
Forward Current Characteristics, $T_j = 25^{\circ}\text{C}$

1. Forward Voltage vs. Forward Current

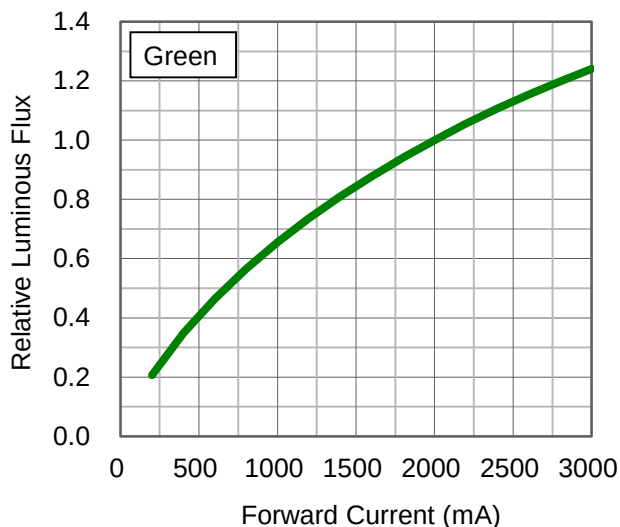


Forward Current Characteristics, $T_j = 25^\circ\text{C}$

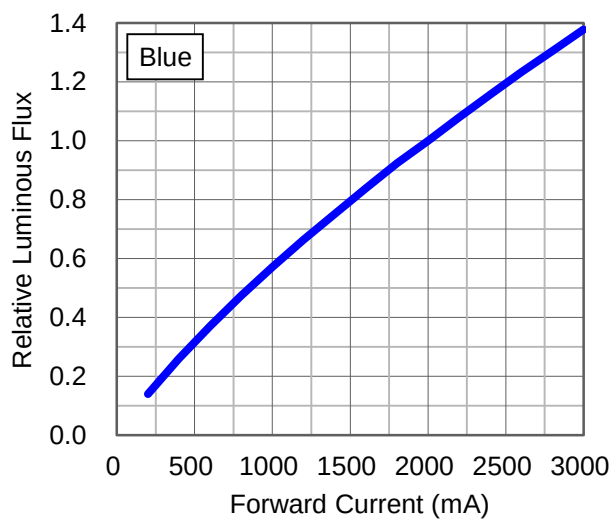
2. Forward Current vs. Normalized Relative Luminous Flux



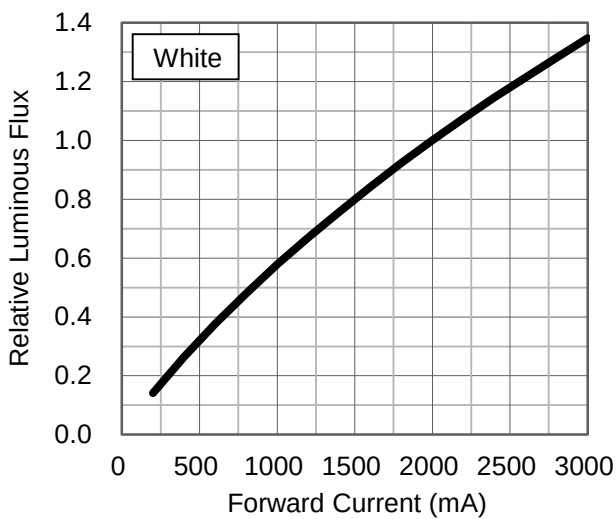
Do not use below 100mA.



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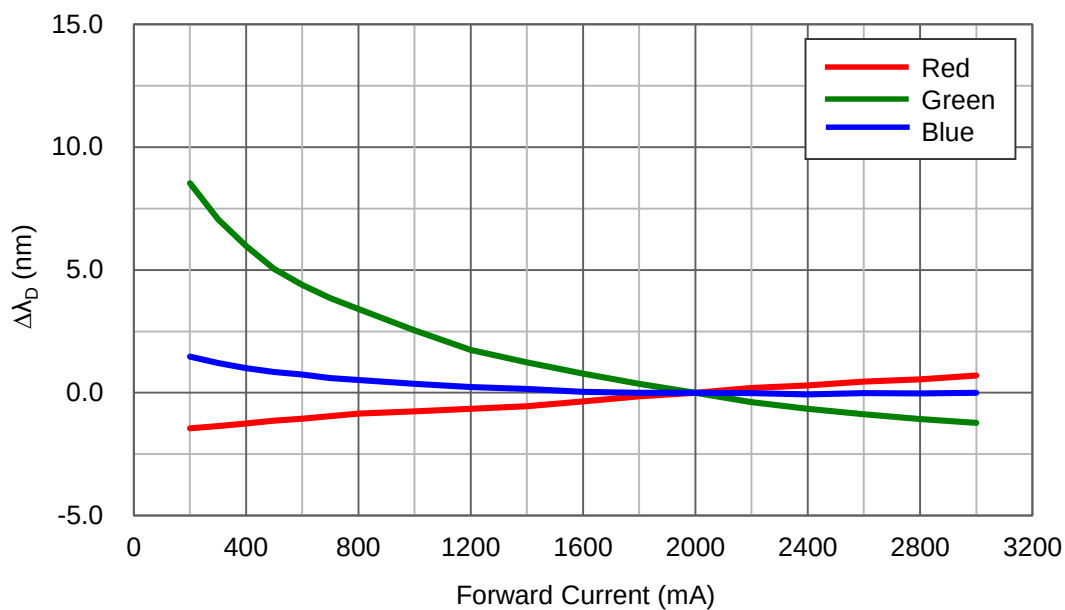
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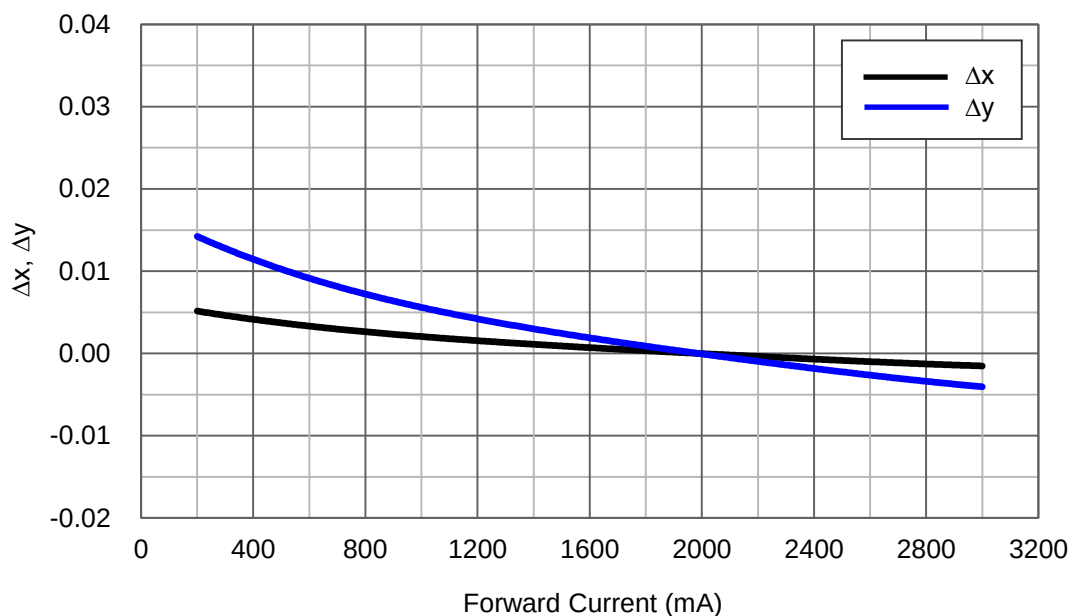
Do not use below 100mA.

Forward Current Characteristics, $T_j = 25^\circ\text{C}$

3. Forward Current vs. Dominant Wavelength Shift

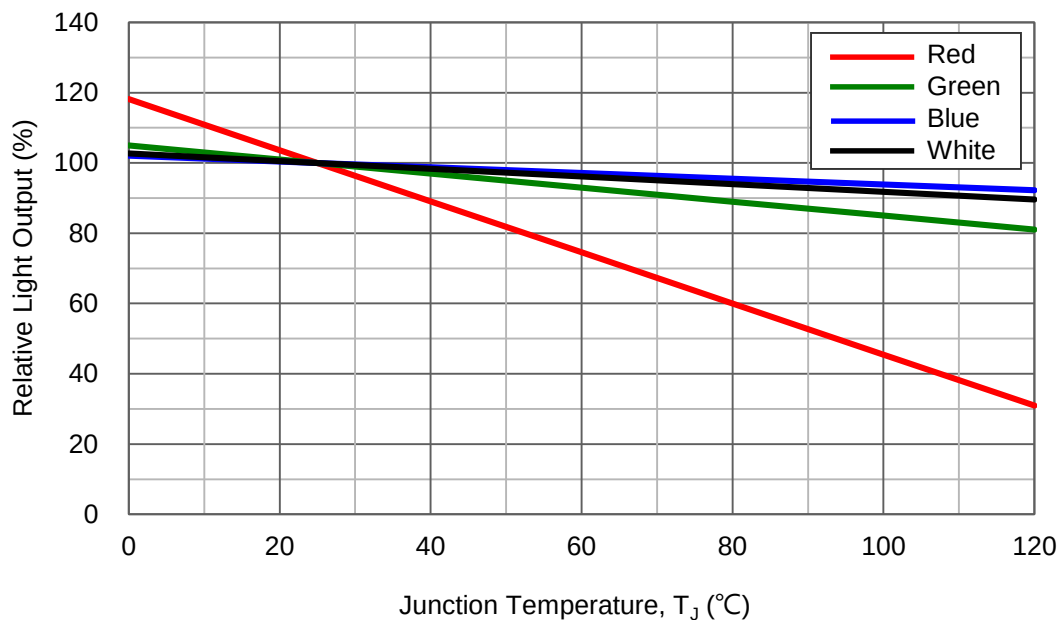


4. Forward Current vs. Chromaticity Coordinate Shift

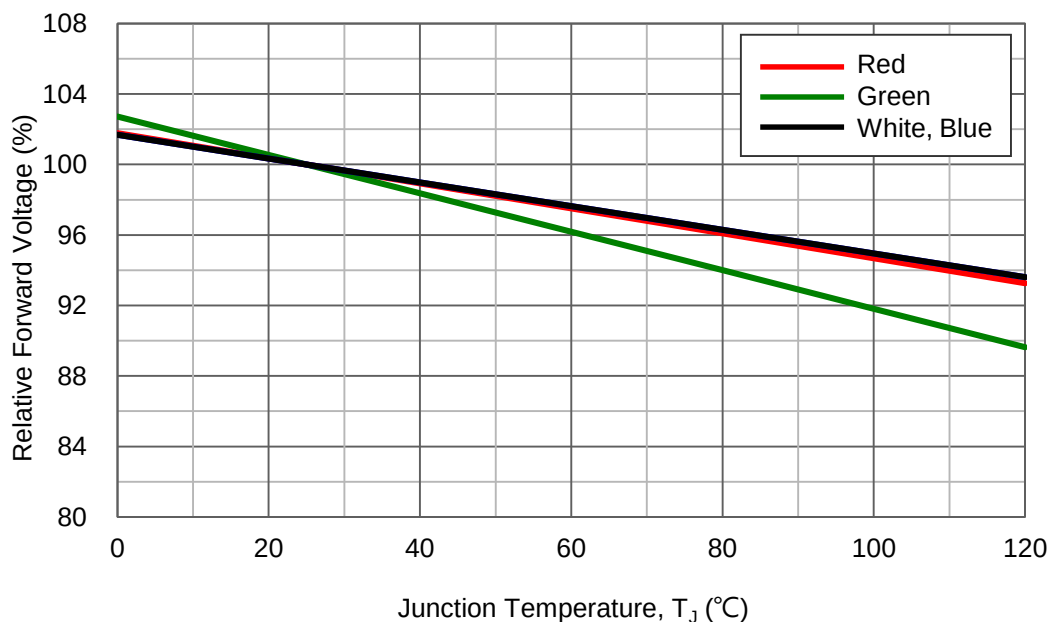


Junction Temperature Relative Characteristics

1. Junction Temperature vs. Relative Light Output at 2000mA

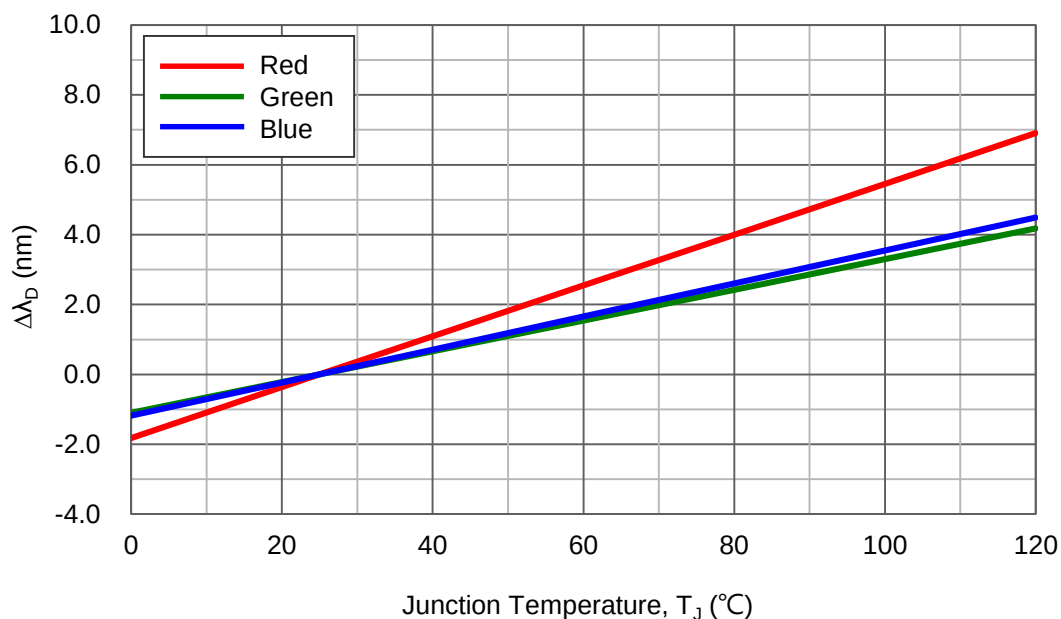


2. Junction Temperature vs. Relative Forward Voltage at 2000mA

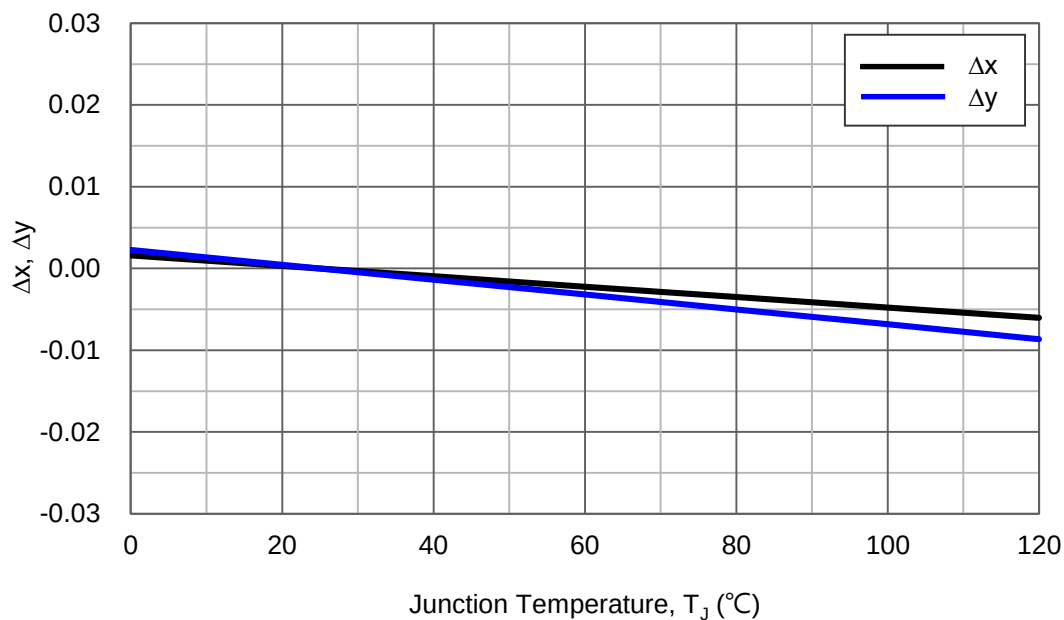


Junction Temperature Relative Characteristics

3. Junction Temperature vs. Dominant Wavelength Shift at 2000mA

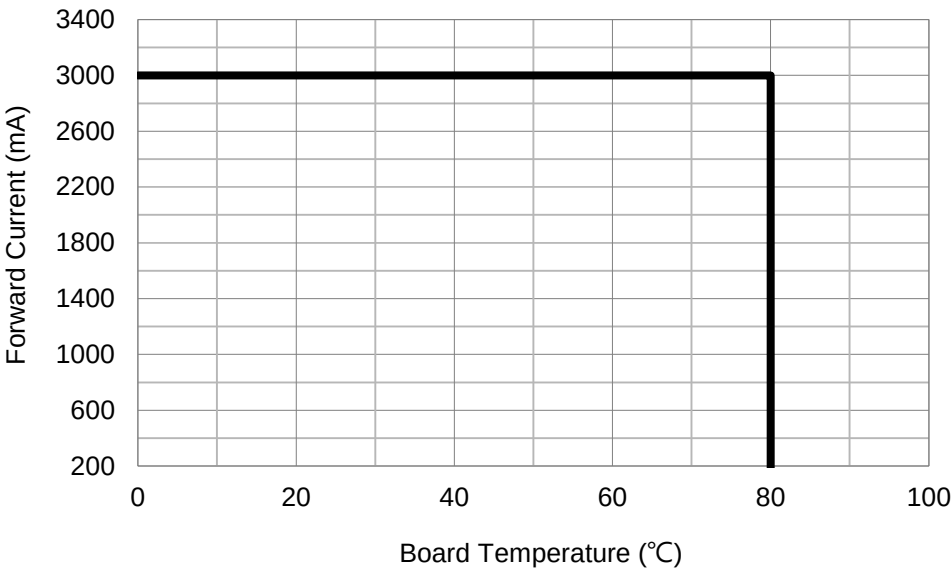


4. Junction Temperature vs. Chromaticity Coordinate Shift at 2000mA

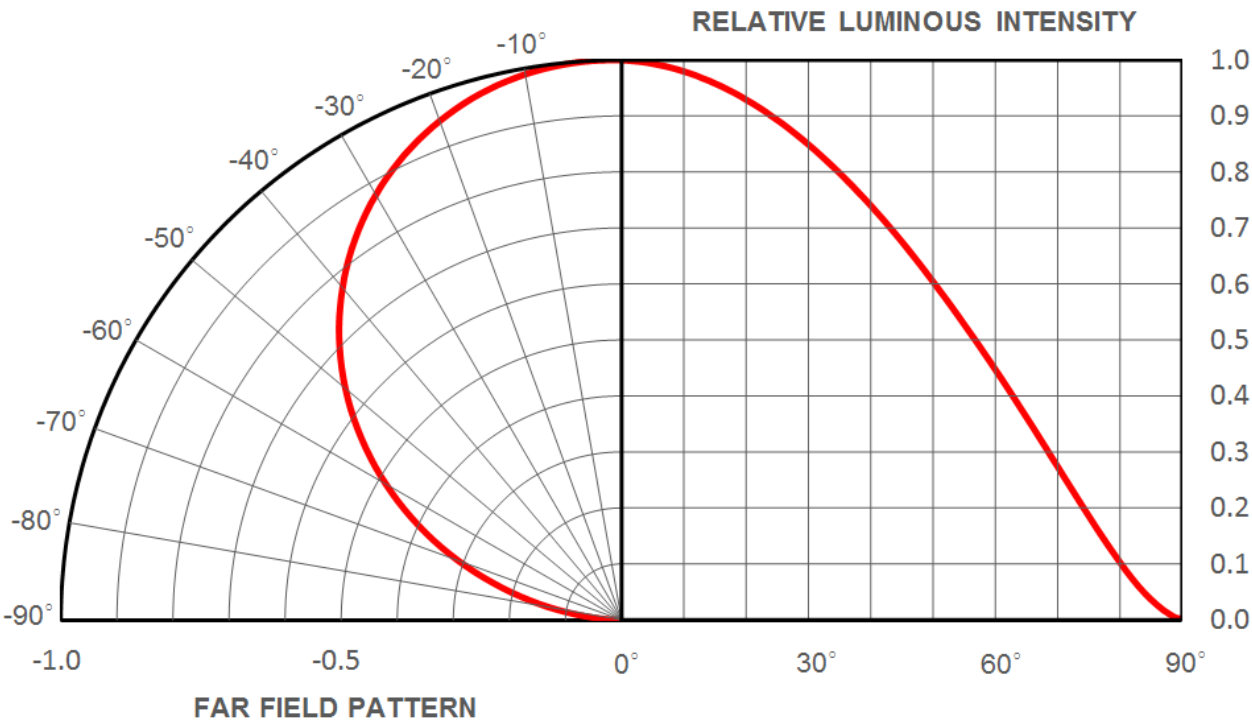


Board Temperature vs. Maximum Forward Current

Maximum Forward Current for 4 colors operated



Typical Representative Spatial Radiation Pattern



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 Glass Lens LEDs

Notes for handling of glass lens LEDs

- Please do not use a force of over 3kgf impact or pressure on the glass 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 glass lens especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the glass lens.
- Please store the LEDs away from dusty areas or seal the product against dust.
- Please do not mold over the glass lens with another resin. (epoxy, urethane, etc)