



**ProLight PASB-16FxL-EC2NSxx**  
**16W COB Light-Engine LEDs**  
**Technical Datasheet**  
**Version: 1.7**

# ProLight Opto ProEngine Series

## Features

- High flux density of lighting source
- Good color uniformity
- RoHS compliant
- More energy efficient than incandescent and most halogen lamps
- No UV
- Long lifetime
- 5 year warranty

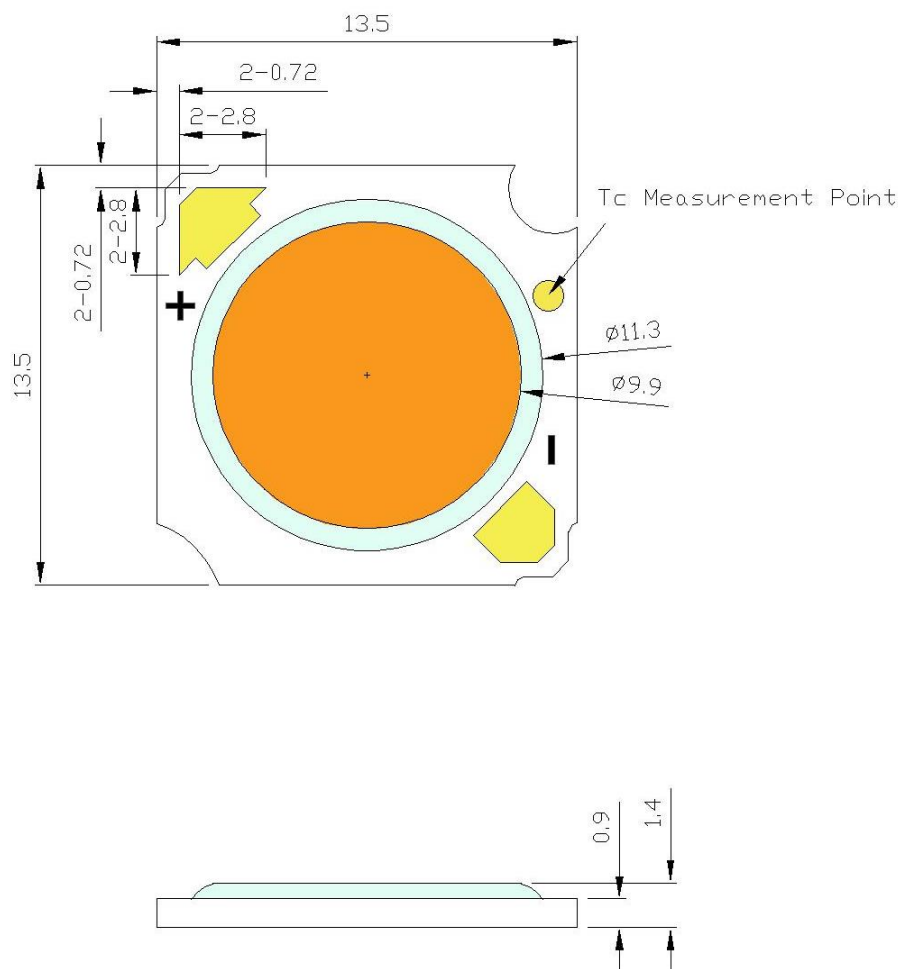
## Main Applications

- Par lighting
- Spot lighting
- Down lighting

## Introduction

The input power is 16 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.

## 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  $\pm 0.2\text{mm}$ .
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 at 200mA, $T_c = 65^\circ\text{C}$

| Radiation Pattern | Color         | Part Number<br>COB | CCT    | Luminous Flux $\Phi_v$ (lm) |      | CRI  |      |
|-------------------|---------------|--------------------|--------|-----------------------------|------|------|------|
|                   |               |                    |        | Min.                        | Typ. | Min. | Typ. |
| Lambertian        | Neutral White | PASB-16FNL-EC2NS40 | 4000 K | 725                         | 875  | 97   | 98   |
|                   | Warm White    | PASB-16FVL-EC2NS27 | 2700 K | 680                         | 820  | 97   | 98   |
|                   |               | PASB-16FVL-EC2NS30 | 3000 K | 700                         | 840  | 97   | 98   |

- ProLight maintains a tolerance of  $\pm 7\%$  on flux and power measurements.
- ProLight maintains a tolerance of  $\pm 2$  on CRI measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

## Electrical Characteristics at 200mA, $T_c = 65^\circ\text{C}$

| Color         | Forward Voltage $V_F$ (V) |      |      | Thermal Resistance<br>Junction to Board ( $^\circ\text{C/W}$ ) |
|---------------|---------------------------|------|------|----------------------------------------------------------------|
|               | Min.                      | Typ. | Max. |                                                                |
| Neutral White | 31.0                      | 33.5 | 36.0 | 1.7                                                            |
| Warm White    | 31.0                      | 33.5 | 36.0 | 1.7                                                            |

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

## Optical Characteristics at 200mA, $T_c = 65^\circ\text{C}$

| Color         | Bin Code | Color Temperature CCT |        |        | Total<br>included<br>Angle<br>(degrees)<br>$\theta_{0.90V}$ | Viewing<br>Angle<br>(degrees)<br>$2\theta_{1/2}$ |
|---------------|----------|-----------------------|--------|--------|-------------------------------------------------------------|--------------------------------------------------|
|               |          | Min.                  | Typ.   | Max.   |                                                             |                                                  |
| Neutral White | S0SI     | 3940 K                | 3985 K | 4030 K | 160                                                         | 120                                              |
|               | S0SII    | 3900 K                | 3985 K | 4070 K | 160                                                         | 120                                              |
| Warm White    | M0SI     | 2710 K                | 2725 K | 2740 K | 160                                                         | 120                                              |
|               | M0SII    | 2680 K                | 2725 K | 2770 K | 160                                                         | 120                                              |
|               | N0SI     | 3020 K                | 3045 K | 3070 K | 160                                                         | 120                                              |
|               | N0SII    | 2990 K                | 3040 K | 3090 K | 160                                                         | 120                                              |

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

## Electro-Optical Characteristics, $T_c = 65^\circ\text{C}$

| $I_F$ (mA) | $V_F$ (V) | Power (W) | PASB-16FNL-EC2NS40<br>(4000 K) |       | PASB-16FVL-EC2NS27<br>(2700 K) |       | PASB-16FVL-EC2NS30<br>(3000 K) |       |
|------------|-----------|-----------|--------------------------------|-------|--------------------------------|-------|--------------------------------|-------|
|            |           |           | Flux (lm)                      | lm/W  | Flux (lm)                      | lm/W  | Flux (lm)                      | lm/W  |
| 150        | 32.6      | 4.9       | 670                            | 136.7 | 625                            | 128.4 | 640                            | 131.5 |
| 200*       | 33.5      | 6.7       | 875                            | 130.6 | 820                            | 123.3 | 840                            | 126.3 |
| 250        | 34.0      | 8.5       | 1070                           | 125.9 | 1010                           | 118.9 | 1030                           | 121.2 |
| 300        | 34.7      | 10.4      | 1260                           | 121.2 | 1190                           | 114.6 | 1210                           | 116.5 |
| 350        | 35.6      | 12.4      | 1445                           | 116.5 | 1365                           | 109.7 | 1410                           | 113.3 |
| 400        | 36.3      | 14.5      | 1610                           | 111.0 | 1530                           | 105.4 | 1585                           | 109.2 |
| 450        | 37.0      | 16.6      | 1780                           | 107.2 | 1695                           | 101.8 | 1750                           | 105.1 |

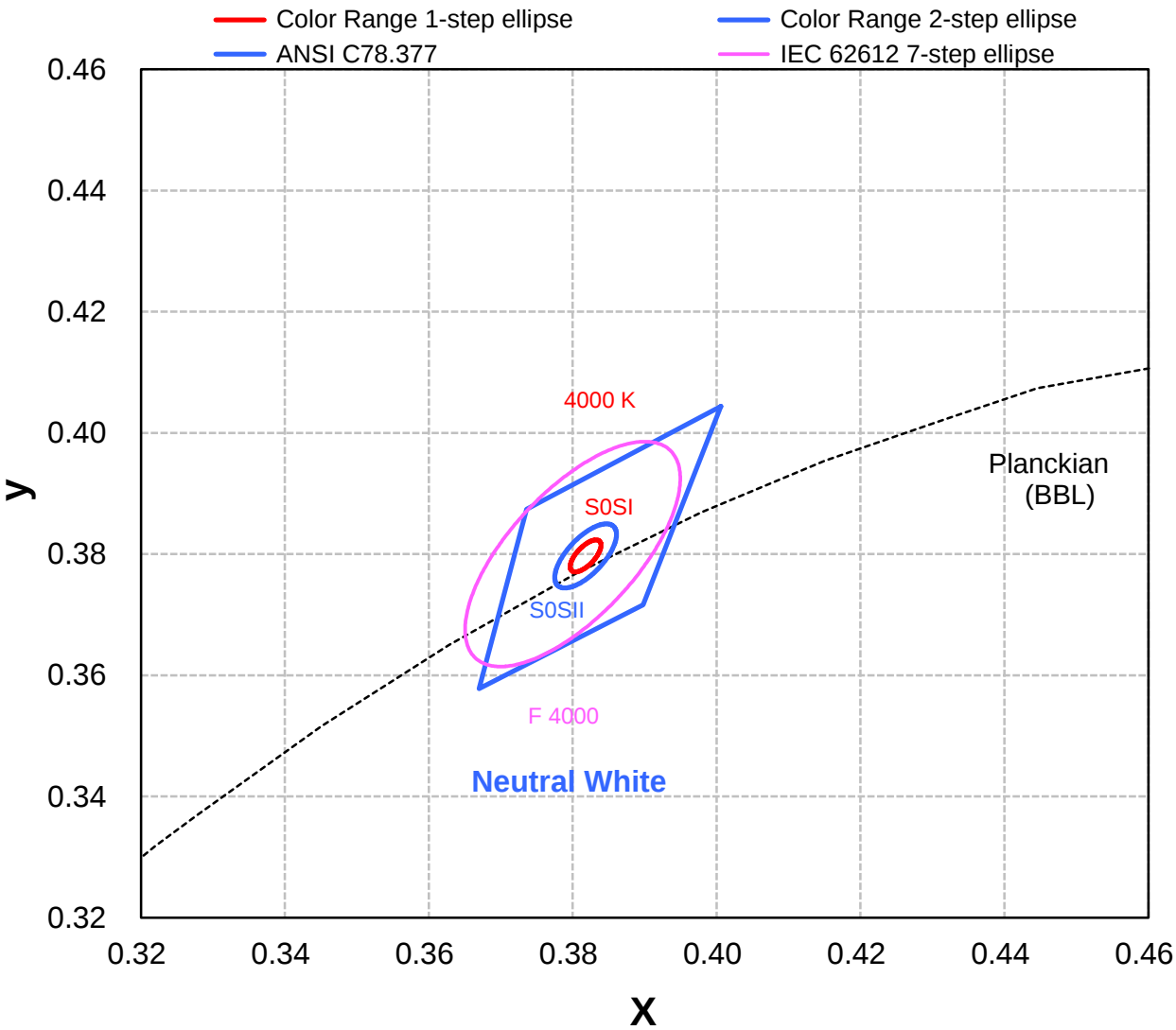
● All values are reference only.

## Absolute Maximum Ratings

| Parameter                                               | Neutral White/Warm White                  |
|---------------------------------------------------------|-------------------------------------------|
| Max DC Forward Current (mA)                             | 450                                       |
| Max Voltage at 450mA                                    | 39.5                                      |
| Peak Pulsed Forward Current (mA)                        | 450 (less than 1/10 duty cycle@1KHz)      |
| ESD Sensitivity<br>(HBM per MIL-STD-883E Method 3015.7) | $\pm 2000\text{V}$                        |
| LED Junction Temperature                                | $125^\circ\text{C}$                       |
| Operating Board Temperature                             | $-40^\circ\text{C} - 90^\circ\text{C}$    |
| at Maximum DC Forward Current                           |                                           |
| Storage Temperature                                     | $-40^\circ\text{C} - 120^\circ\text{C}$   |
| Reverse Voltage                                         | Not designed to be driven in reverse bias |

Color Bin, T<sub>c</sub> = 65°C

Neutral White Binning Structure Graphical Representation



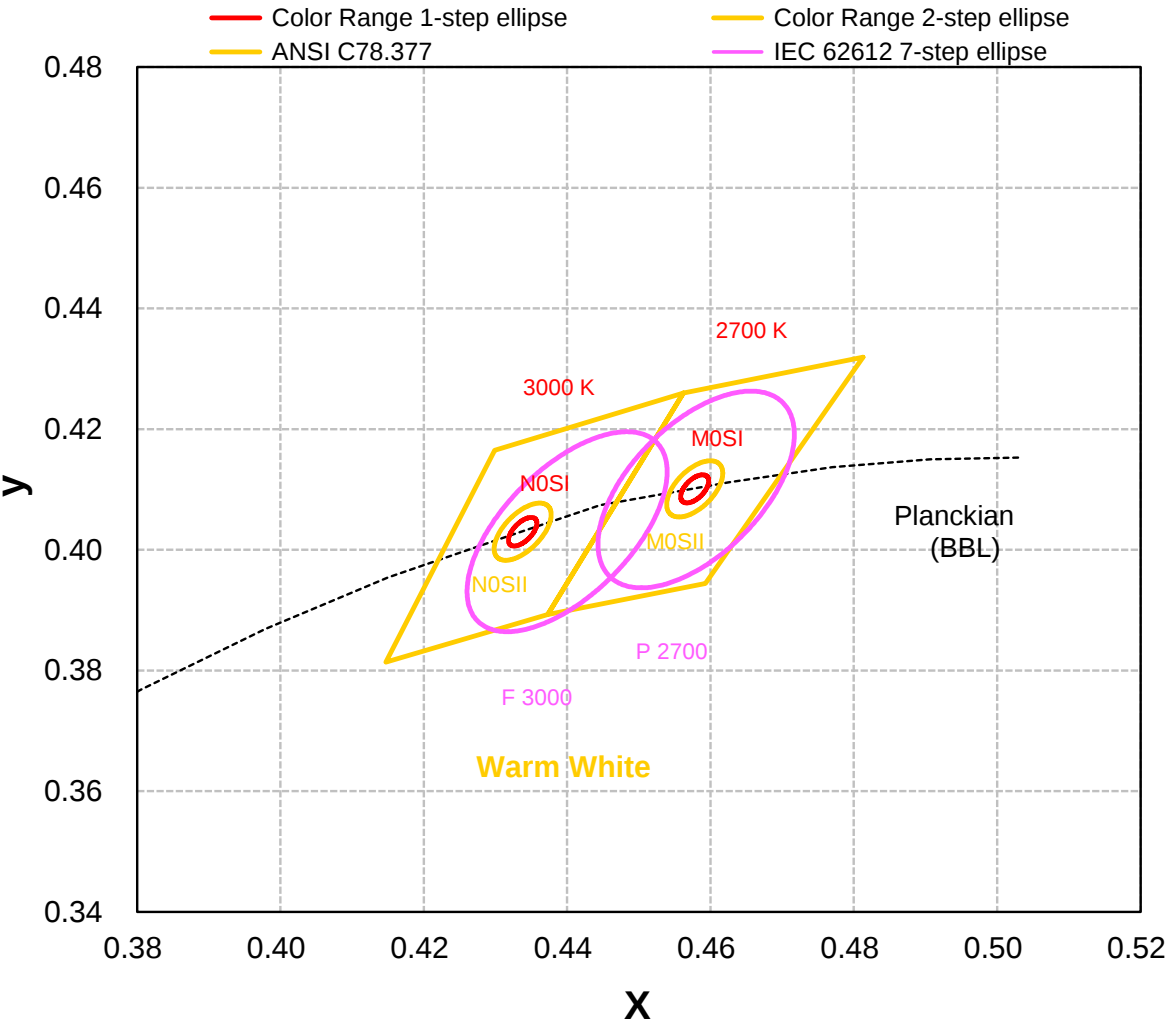
Neutral White Bin Structure

| Bin Code |   | Center |    | Oval parameter |      | Typ. CCT (K) | Bin Code |   | Center |    | Oval parameter |      | Typ. CCT (K) |
|----------|---|--------|----|----------------|------|--------------|----------|---|--------|----|----------------|------|--------------|
| S0SI     | x | 0.3818 | a  | 0.00313        | 4000 |              | S0SII    | x | 0.3818 | a  | 0.00626        | 4000 |              |
|          | y | 0.3797 | b  | 0.00134        |      |              |          | y | 0.3797 | b  | 0.00268        |      |              |
|          |   |        | Θ° | 53.72          |      |              |          |   |        | Θ° | 53.72          |      |              |
|          |   |        |    |                |      |              |          |   |        |    |                |      |              |

- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is ± 0.005

Color Bin,  $T_c = 65^{\circ}\text{C}$

Warm White Binning Structure Graphical Representation



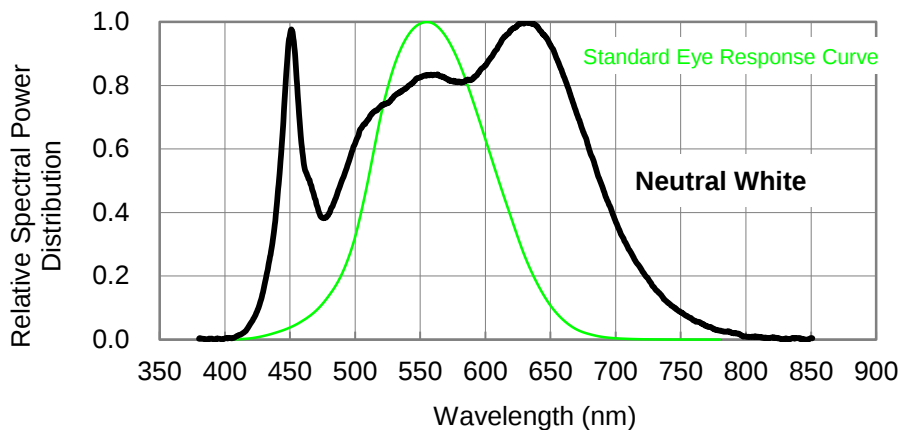
Warm White Bin Structure

| Bin Code |   | Center | Oval parameter   |        | Typ. CCT (K) | Bin Code |   | Center | Oval parameter   |         | Typ. CCT (K) |
|----------|---|--------|------------------|--------|--------------|----------|---|--------|------------------|---------|--------------|
| MOSI     | x | 0.4578 | a                | 0.0027 | 2700         | NOSI     | x | 0.4338 | a                | 0.00278 | 3000         |
|          | y | 0.4101 | b                | 0.0014 |              |          | y | 0.4030 | b                | 0.00136 |              |
|          |   |        | $\Theta^{\circ}$ | 53.70  |              |          |   |        | $\Theta^{\circ}$ | 53.22   |              |
| MOSII    | x | 0.4578 | a                | 0.0054 | 2700         | NOSII    | x | 0.4338 | a                | 0.00556 | 3000         |
|          | y | 0.4101 | b                | 0.0028 |              |          | y | 0.4030 | b                | 0.00272 |              |
|          |   |        | $\Theta^{\circ}$ | 53.70  |              |          |   |        | $\Theta^{\circ}$ | 53.22   |              |

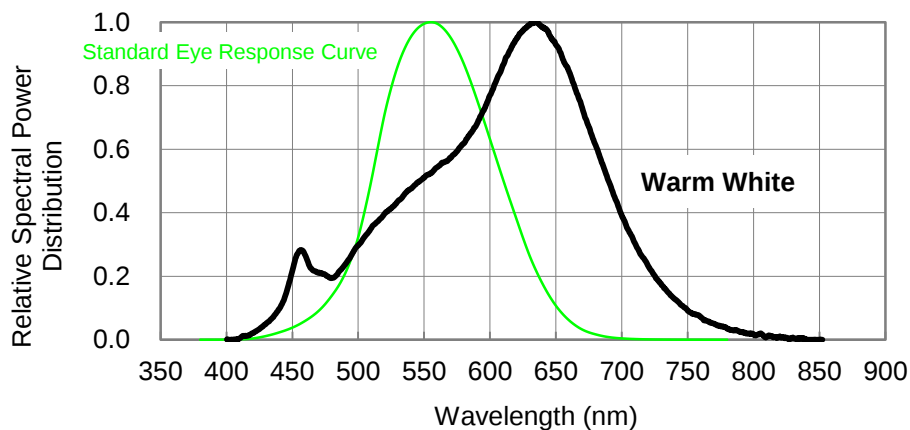
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is  $\pm 0.005$

## Color Spectrum, $T_c = 65^\circ\text{C}$

### 1. Neutral White



### 2. Warm White



## Case Temperature Relative Characteristics

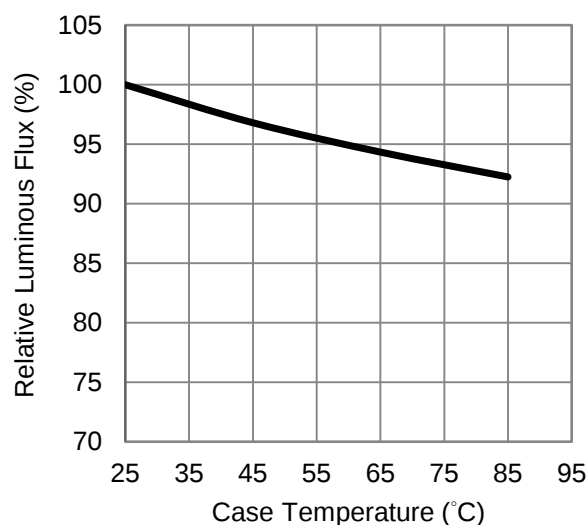


Fig 1. Case Temperature vs. Relative Luminous Flux at 200mA.

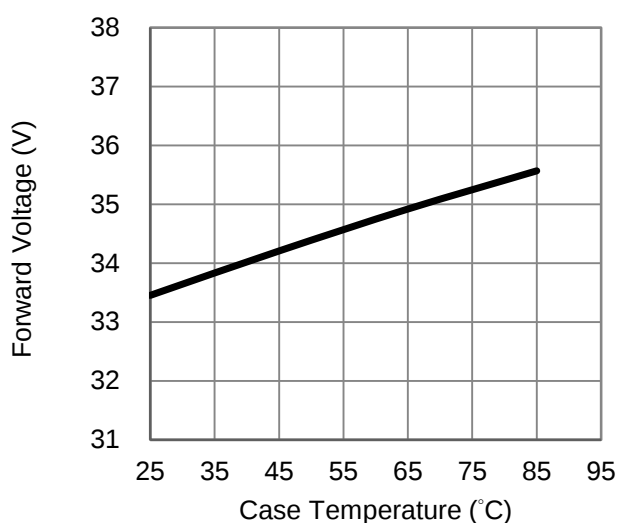


Fig 2. Case Temperature vs. Forward Voltage at 200mA.

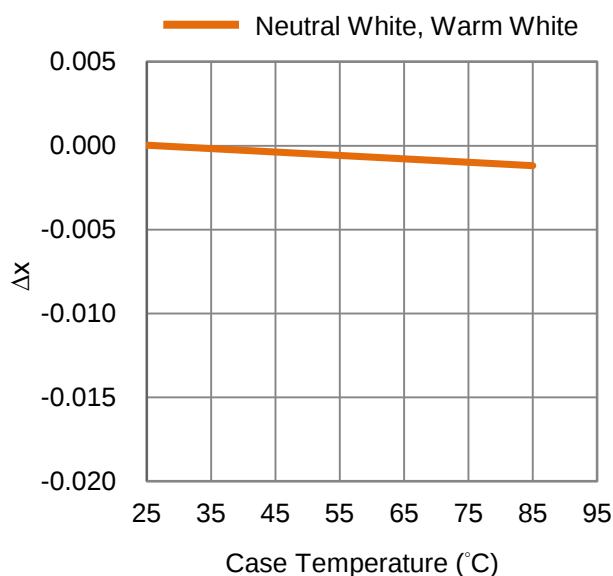


Fig 3. Case Temperature vs. Chromaticity Coordinate  $\Delta x$  at 200mA.

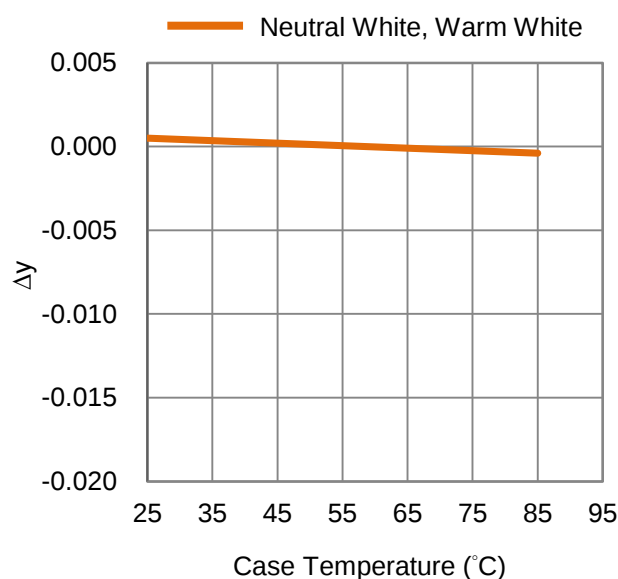


Fig 4. Case Temperature vs. Chromaticity Coordinate  $\Delta y$  at 200mA.

## Forward Current Relative Characteristics

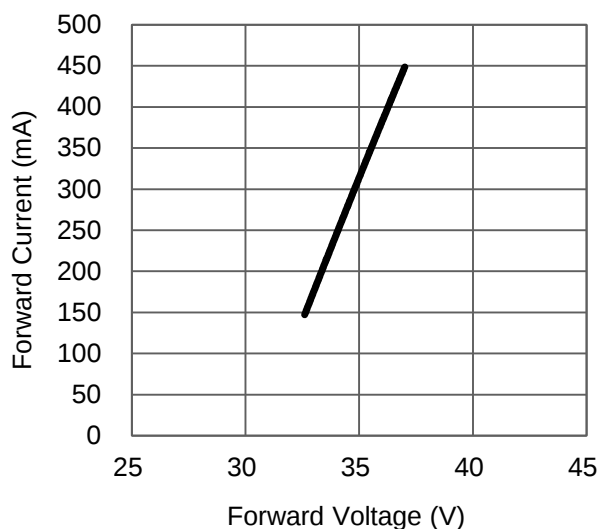


Fig 5. Forward Current vs. Forward Voltage at  $T_C=65^\circ\text{C}$ .

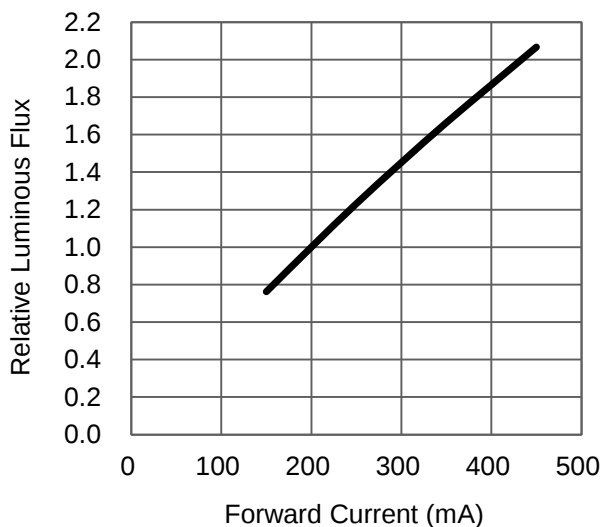


Fig 6. Forward Current vs. Relative Luminous Flux at  $T_C=65^\circ\text{C}$ .

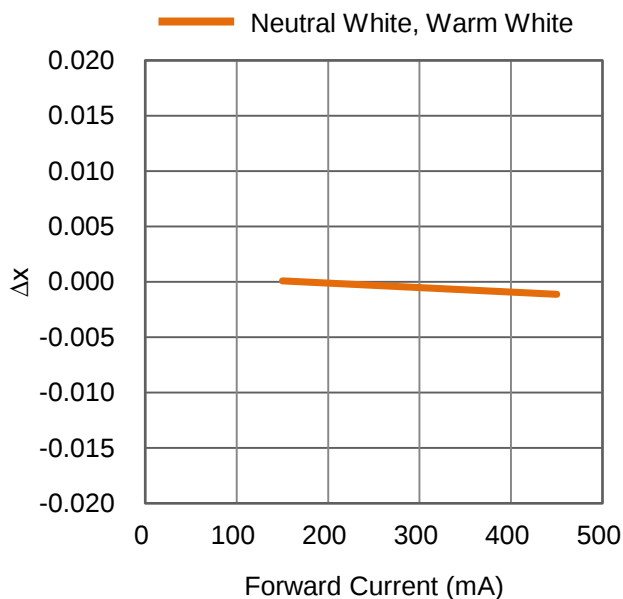


Fig 7. Forward Current vs. Chromaticity Coordinate  $\Delta x$  at  $T_C=65^\circ\text{C}$ .

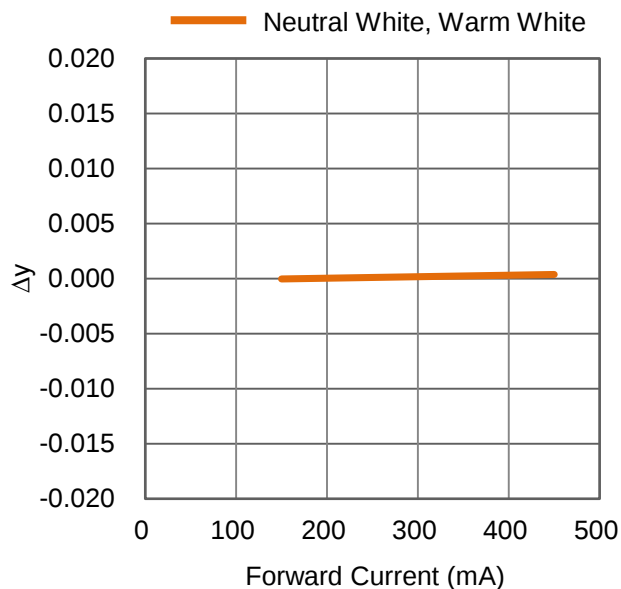


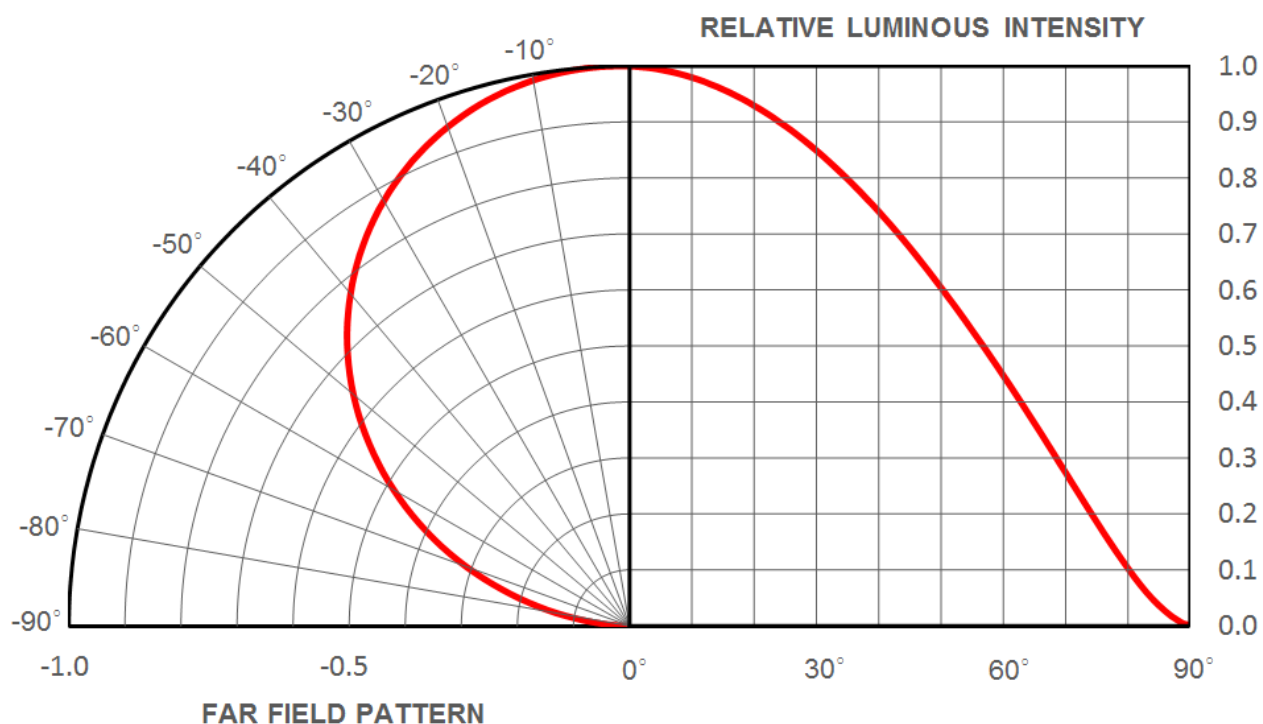
Fig 8. Forward Current vs. Chromaticity Coordinate  $\Delta y$  at  $T_C=65^\circ\text{C}$ .

## Case Temperature vs. Junction Temperature Characteristics

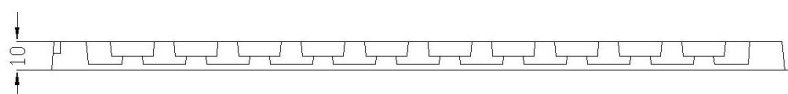
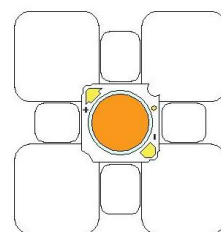
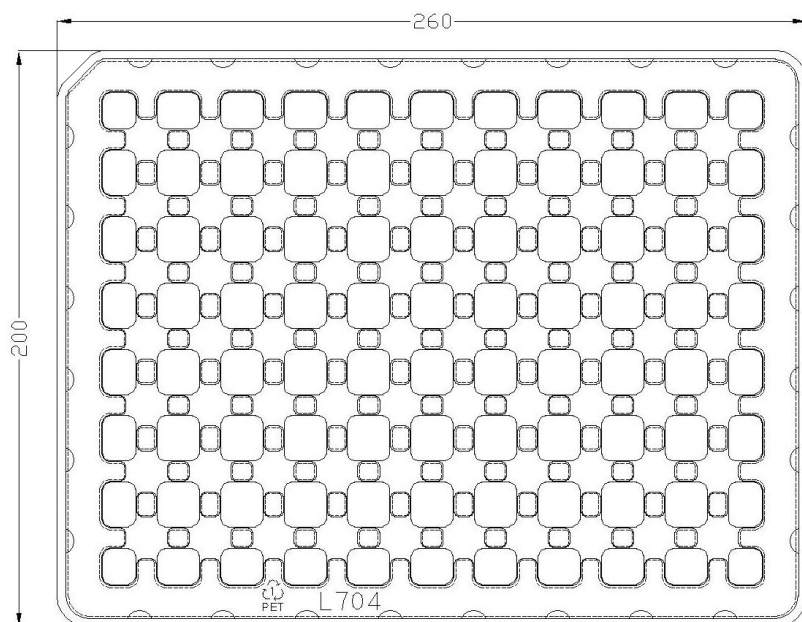
| T <sub>c</sub> (°C) | T <sub>j</sub> (°C) |          |          |
|---------------------|---------------------|----------|----------|
|                     | 200 (mA)            | 300 (mA) | 450 (mA) |
| 25                  | 36                  | 43       | 53       |
| 30                  | 41                  | 48       | 58       |
| 35                  | 46                  | 53       | 63       |
| 40                  | 51                  | 58       | 68       |
| 45                  | 56                  | 63       | 73       |
| 50                  | 61                  | 68       | 78       |
| 55                  | 66                  | 73       | 83       |
| 60                  | 71                  | 78       | 88       |
| 65                  | 76                  | 83       | 93       |
| 70                  | 81                  | 88       | 98       |
| 75                  | 86                  | 93       | 103      |
| 80                  | 91                  | 98       | 108      |
| 85                  | 96                  | 103      | 113      |
| 90                  | 101                 | 108      | 118      |
| 95                  | 106                 | 113      | 123      |
| 100                 | 111                 | 118      | -        |
| 105                 | 116                 | 123      | -        |
| 110                 | 121                 | -        | -        |

Fig 9. Case Temperature vs. Junction Temperature at 200 、300 、450mA.

## Typical Representative Spatial Radiation Pattern



## Packing Specifications



Product 70 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**.

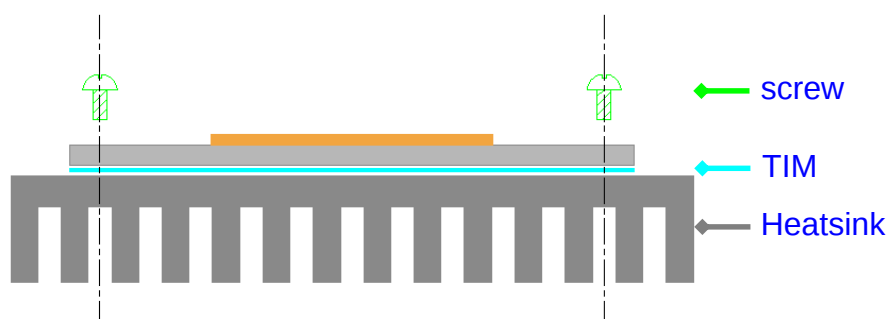


Fig 10. Reference assembly as fixing with screws

## 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)

