

# LUXEON 3030 2D Line

## High flux, hot-color targeted 6V package

LUXEON 3030 2D is a high flux, hot-color targeted mid power LED. Hot-color targeting ensures that the LEDs are within color target at application conditions—85°C. Using an industry standard packaging of 3.0mm x 3.0mm and 6V surface-mount emitter solution, LUXEON 3030 2D Line comes in all ANSI CCTs and delivers the efficacy and reliability required for both indoor and outdoor illumination markets.



### FEATURES AND BENEFITS

Industry standard package enables drop-in replacement for existing 3030 packages

1/9<sup>th</sup> micro-color binning enables tight color control

Superior luminous flux at max current for reduced LED count

Hot-color targeting ensures that color is within ANSI bin at typical application conditions, 85°C

Enables 3-, 4-, 5-step MacAdam ellipse custom binning kits

### PRIMARY APPLICATIONS

Troffers

Downlights

High Bay

Low Bay

Floodlights

[More...](#)

# Table of Contents

|                                             |           |
|---------------------------------------------|-----------|
| <b>General Product Information</b>          | <b>2</b>  |
| Product Test Conditions                     | 2         |
| Part Number Nomenclature                    | 2         |
| Lumen Maintenance                           | 2         |
| Environmental Compliance                    | 2         |
| <b>Performance Characteristics</b>          | <b>3</b>  |
| Product Selection Guide                     | 3         |
| Optical Characteristics                     | 4         |
| Electrical and Thermal Characteristics      | 4         |
| <b>Absolute Maximum Ratings</b>             | <b>4</b>  |
| <b>Characteristics Curves</b>               | <b>5</b>  |
| Spectral Power Distribution Characteristics | 5         |
| Light Output Characteristics                | 6         |
| Forward Current Characteristics             | 7         |
| Radiation Pattern Characteristics           | 8         |
| <b>Product Bin and Labeling Definitions</b> | <b>9</b>  |
| Decoding Product Bin Labeling               | 9         |
| Luminous Flux Bins                          | 9         |
| Color Bin Definitions                       | 10        |
| Forward Voltage Bins                        | 14        |
| <b>Mechanical Dimensions</b>                | <b>15</b> |
| <b>Reflow Soldering Guidelines</b>          | <b>16</b> |
| JEDEC Moisture Sensitivity                  | 16        |
| Solder Pad Design                           | 17        |
| <b>Packaging Information</b>                | <b>18</b> |
| Pocket Tape Dimensions                      | 18        |
| Reel Dimensions                             | 19        |

# General Product Information

## Product Test Conditions

LUXEON 3030 2D Line LEDs are tested with a 20ms monopulse of 120mA at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is not targeted at a  $T_j$  of 85°C.

## Part Number Nomenclature

Part numbers for LUXEON 3030 2D Line follow the convention below:

L 1 3 0 – **A A B B** 0 0 3 0 0 0 **C 2 D**

Where:

- A A** – designates nominal CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** – designates minimum CRI (70=70CRI, 80=80CRI and 90=90CRI)
- C** – designates package type (W=Round LES, X=Square LES)
- D** – designates Lumileds internal code (1, 2, 3, etc.=shares the same base part)

Therefore, the following part number is used for a LUXEON 3030 2D (Square LES), 3000K 80CRI:

L 1 3 0 – **3 0 8 0** 0 0 3 0 0 0 **X 2 1**

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 3030 2D Line is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 3030 2D Line at 120mA and 65mA at specified temperature.

| PRODUCT                     | NOMINAL CCT <sup>[1]</sup> | MINIMUM CRI <sup>[2, 3]</sup> | LUMINOUS FLUX <sup>[2, 3]</sup> (lm) |         | TYPICAL LUMINOUS EFFICACY (lm/W) | TYPICAL LUMINOUS FLUX (lm) | TYPICAL LUMINOUS EFFICACY (lm/W) | PART NUMBER        |
|-----------------------------|----------------------------|-------------------------------|--------------------------------------|---------|----------------------------------|----------------------------|----------------------------------|--------------------|
|                             |                            |                               | MINIMUM                              | TYPICAL |                                  |                            |                                  |                    |
|                             |                            |                               | 120mA                                |         |                                  |                            |                                  |                    |
| LUXEON 3030 2D (Round LES)  | 3000K                      | 70                            | 98                                   | 125     | 174                              | 71                         | 192                              | L130-3070003000W21 |
|                             | 3500K                      | 70                            | 100                                  | 126.5   | 176                              | 72                         | 195                              | L130-3570003000W21 |
|                             | 4000K                      | 70                            | 101                                  | 129.5   | 180                              | 74                         | 199                              | L130-4070003000W21 |
|                             | 5000K                      | 70                            | 101                                  | 129.5   | 180                              | 74                         | 199                              | L130-5070003000W21 |
|                             | 5700K                      | 70                            | 101                                  | 127.5   | 177                              | 73                         | 196                              | L130-5770003000W21 |
|                             | 6500K                      | 70                            | 101                                  | 126.5   | 176                              | 72                         | 195                              | L130-6570003000W21 |
|                             | 2200K                      | 80                            | 80                                   | 95      | 132                              | 54                         | 146                              | L130-2280003000W21 |
|                             | 2700K                      | 80                            | 80                                   | 110     | 153                              | 63                         | 169                              | L130-2780003000W21 |
|                             | 3000K                      | 80                            | 85                                   | 115     | 160                              | 66                         | 177                              | L130-3080003000W21 |
|                             | 3500K                      | 80                            | 85                                   | 119     | 165                              | 68                         | 183                              | L130-3580003000W21 |
|                             | 4000K                      | 80                            | 90                                   | 121.5   | 169                              | 69                         | 187                              | L130-4080003000W21 |
|                             | 5000K                      | 80                            | 90                                   | 121.5   | 169                              | 69                         | 187                              | L130-5080003000W21 |
|                             | 5700K                      | 80                            | 90                                   | 121.5   | 169                              | 69                         | 187                              | L130-5780003000W21 |
|                             | 6500K                      | 80                            | 90                                   | 120.5   | 167                              | 69                         | 185                              | L130-6580003000W21 |
|                             | 2700K                      | 90                            | 72                                   | 91      | 126                              | 52                         | 140                              | L130-2790003000W21 |
|                             | 3000K                      | 90                            | 75                                   | 92.5    | 128                              | 53                         | 142                              | L130-3090003000W21 |
|                             | 3500K                      | 90                            | 75                                   | 96      | 133                              | 55                         | 148                              | L130-3590003000W21 |
|                             | 4000K                      | 90                            | 75                                   | 100     | 139                              | 57                         | 154                              | L130-4090003000W21 |
|                             | 5000K                      | 90                            | 75                                   | 100     | 139                              | 57                         | 154                              | L130-5090003000W21 |
| LUXEON 3030 2D (Square LES) | 3000K                      | 70                            | 110                                  | 126     | 175                              | 72                         | 194                              | L130-3070003000X21 |
|                             | 3500K                      | 70                            | 111                                  | 129     | 179                              | 74                         | 198                              | L130-3570003000X21 |
|                             | 4000K                      | 70                            | 117                                  | 132     | 183                              | 75                         | 203                              | L130-4070003000X21 |
|                             | 5000K                      | 70                            | 117                                  | 132     | 183                              | 75                         | 203                              | L130-5070003000X21 |
|                             | 5700K                      | 70                            | 117                                  | 129.5   | 180                              | 74                         | 199                              | L130-5770003000X21 |
|                             | 6500K                      | 70                            | 111                                  | 128.5   | 178                              | 73                         | 198                              | L130-6570003000X21 |
|                             | 2200K                      | 80                            | 89                                   | 98      | 136                              | 56                         | 151                              | L130-2280003000X21 |
|                             | 2700K                      | 80                            | 101                                  | 112     | 156                              | 64                         | 172                              | L130-2780003000X21 |
|                             | 3000K                      | 80                            | 102                                  | 116.5   | 162                              | 66                         | 179                              | L130-3080003000X21 |
|                             | 3500K                      | 80                            | 107                                  | 117     | 163                              | 67                         | 180                              | L130-3580003000X21 |
|                             | 4000K                      | 80                            | 110                                  | 123     | 171                              | 70                         | 189                              | L130-4080003000X21 |
|                             | 5000K                      | 80                            | 110                                  | 123     | 171                              | 70                         | 189                              | L130-5080003000X21 |
|                             | 5700K                      | 80                            | 110                                  | 123     | 171                              | 70                         | 189                              | L130-5780003000X21 |
|                             | 6500K                      | 80                            | 110                                  | 122     | 169                              | 70                         | 188                              | L130-6580003000X21 |
|                             | 2700K                      | 90                            | 86                                   | 96      | 133                              | 55                         | 148                              | L130-2790003000X21 |
|                             | 3000K                      | 90                            | 88                                   | 99      | 138                              | 56                         | 152                              | L130-3090003000X21 |
|                             | 3500K                      | 90                            | 91                                   | 102     | 142                              | 58                         | 157                              | L130-3590003000X21 |
|                             | 4000K                      | 90                            | 94                                   | 106     | 147                              | 60                         | 163                              | L130-4090003000X21 |
|                             | 5000K                      | 90                            | 94                                   | 106     | 147                              | 60                         | 163                              | L130-5090003000X21 |
|                             | 5700K                      | 90                            | 94                                   | 105     | 146                              | 60                         | 162                              | L130-5790003000X21 |
|                             | 6500K                      | 90                            | 94                                   | 105     | 146                              | 60                         | 162                              | L130-6590003000X21 |

**Notes for Table 1:**

1. Correlated color temperature is hot targeted at T<sub>a</sub>=85°C.
2. Luminous flux and CRI are specified at T<sub>a</sub>=25°. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7.5% on luminous flux measurements.

## Optical Characteristics

Table 2. Optical characteristics for LUXEON 3030 2D Line at 120mA,  $T_j=25^{\circ}\text{C}$ .

| PART NUMBER        | TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup> | TYPICAL VIEWING ANGLE <sup>[2]</sup> |
|--------------------|---------------------------------------------|--------------------------------------|
| L130-xxxx003000x21 | 140°                                        | 116°                                 |

Notes for Table 2:

1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from lamp centerline where the luminous intensity is ½ of the peak value.

## Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 3030 2D Line at 120mA,  $T_j=25^{\circ}\text{C}$ .

| PART NUMBER        | FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ ) |         |         | TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C) | TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W) |
|--------------------|------------------------------------------|---------|---------|---------------------------------------------------------------------------|----------------------------------------------------------|
|                    | MINIMUM                                  | TYPICAL | MAXIMUM |                                                                           |                                                          |
| L130-xxxx003000x21 | 5.8                                      | 6.0     | 6.6     | -2.0 to -4.0                                                              | 12.0                                                     |

Notes for Table 3:

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.
2. Measured between  $25^{\circ}\text{C}$  and  $85^{\circ}\text{C}$ .

## Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 3030 2D Line.

| PARAMETER                                               | MAXIMUM PERFORMANCE |
|---------------------------------------------------------|---------------------|
| DC Forward Current <sup>[1]</sup>                       | 240mA               |
| Peak Pulsed Forward Current <sup>[2]</sup>              | 300mA               |
| ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)           | Class 2             |
| LED Junction Temperature (DC & Pulse)                   | 125°C               |
| Operating Case Temperature                              | -40°C to 105°C      |
| LED Storage Temperature                                 | -40°C to 105°C      |
| Soldering Temperature                                   | JEDEC 020D 260°C    |
| Allowable Reflow Cycles                                 | 3                   |
| Reverse Voltage ( $V_{\text{reverse}}$ ) <sup>[3]</sup> | -5V                 |

Notes for Table 4:

1. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple", are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed 25% of the maximum allowable DC forward current
2. Pulse operation with the maximum peak pulse forward current is acceptable if the pulse on time is  $\leq 5\text{ms}$  per cycle and the duty cycle is  $\leq 50\%$
3. At a maximum reverse current of  $10\mu\text{A}$ , LUXEON 3030 2D LEDs are not designed to be driven in reverse bias.

# Characteristics Curves

## Spectral Power Distribution Characteristics

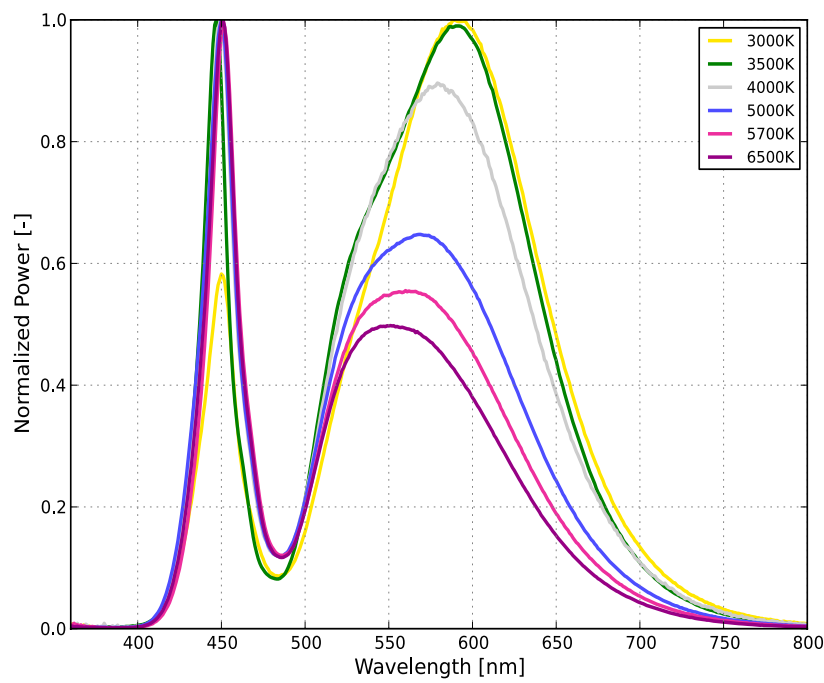


Figure 1a. Typical normalized power vs. wavelength for L130-xx70003000x21 at 120mA,  $T_j=25^{\circ}\text{C}$ .

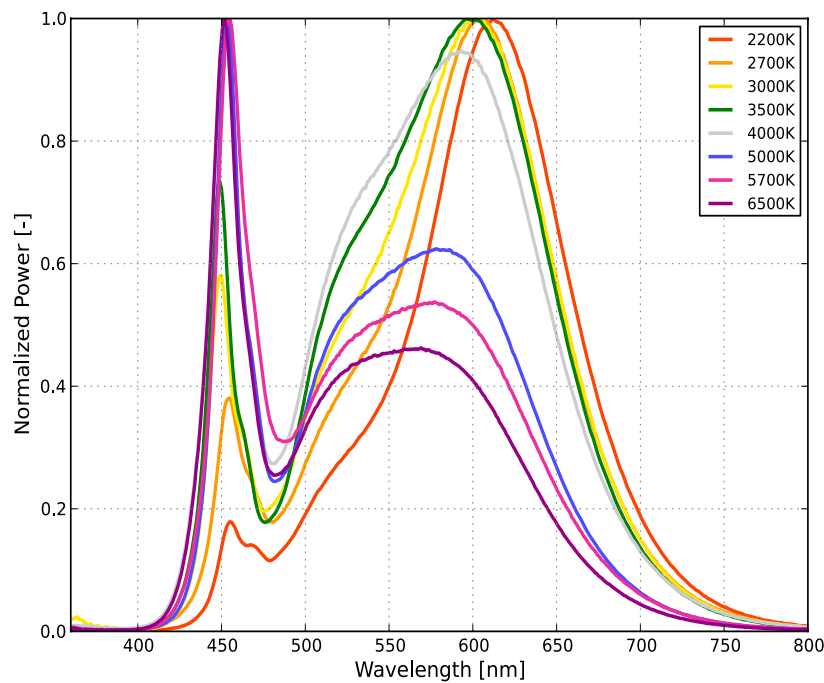


Figure 1b. Typical normalized power vs. wavelength for L130-xx80003000x21 at 120mA,  $T_j=25^{\circ}\text{C}$ .

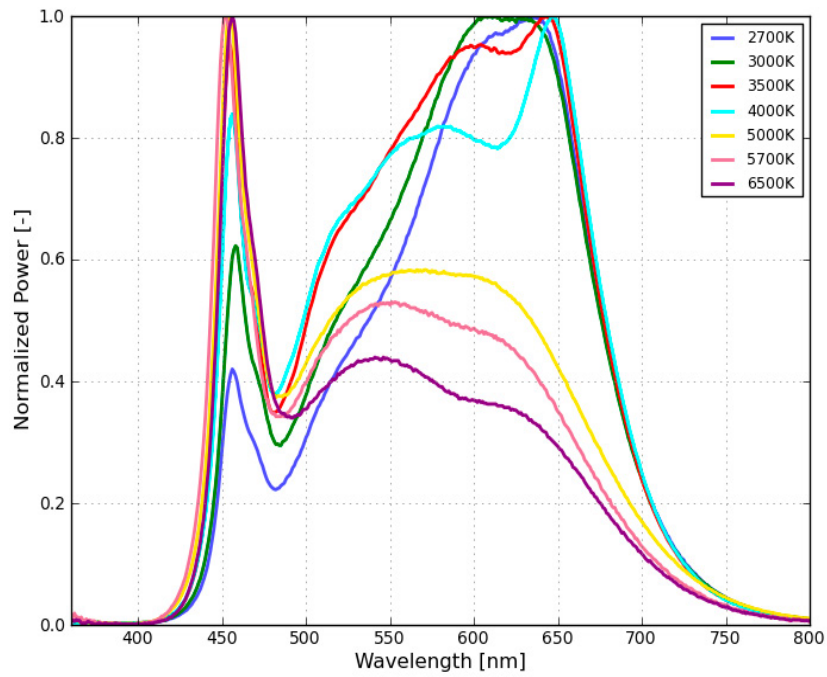


Figure 1c. Typical normalized power vs. wavelength for L130-xx90003000x21 at 120mA,  $T_j=25^{\circ}\text{C}$ .

## Light Output Characteristics

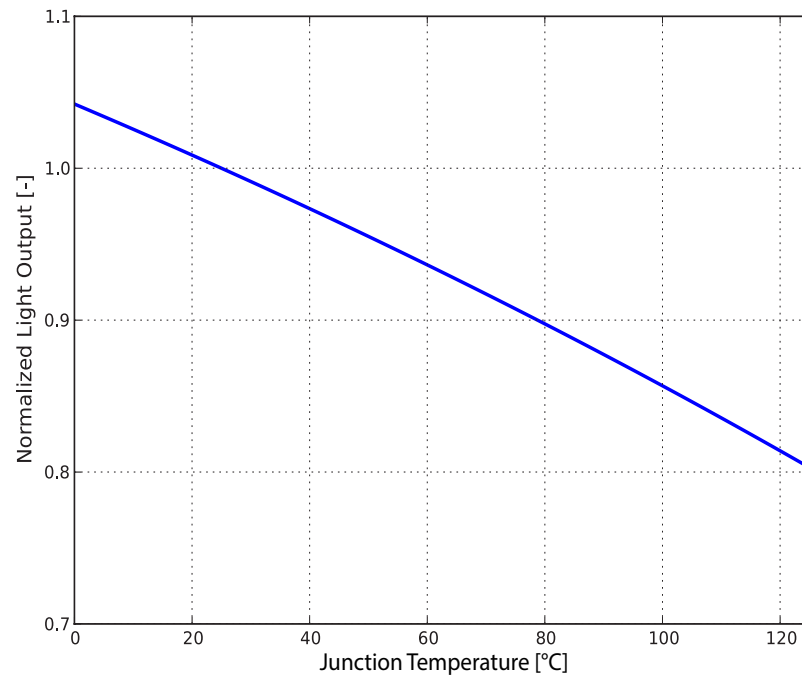
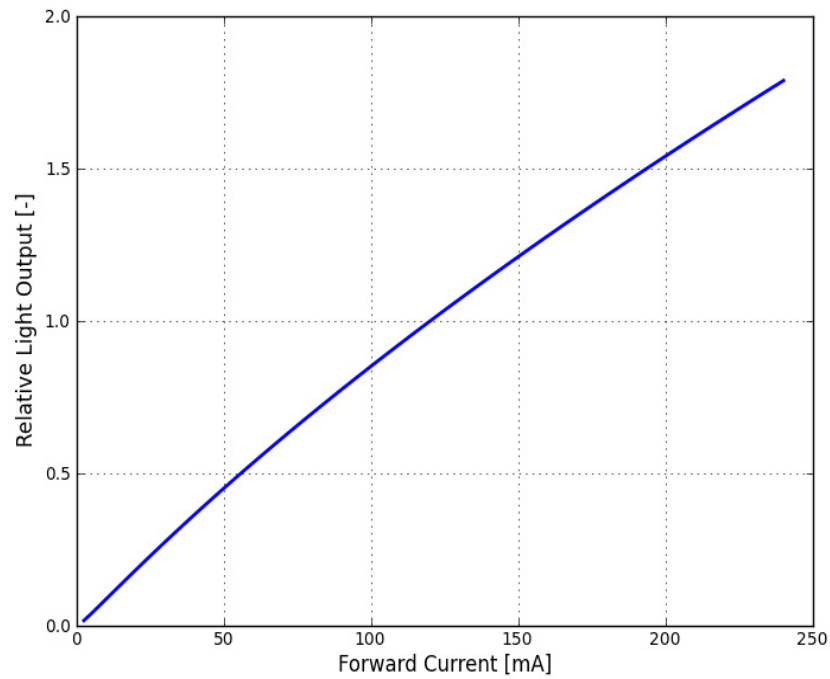


Figure 2. Typical normalized light output vs. junction temperature for L130-xxxx003000x21 at 120mA.



| ESTIMATED TYPICAL RATIO COMPARED TO FLUX AT RATED CONDITION 120mA, $T_j=25^{\circ}\text{C}$ . |      |       |       |       |
|-----------------------------------------------------------------------------------------------|------|-------|-------|-------|
| 60mA                                                                                          | 65mA | 100mA | 150mA | 200mA |
| 53%                                                                                           | 57%  | 85%   | 121%  | 154%  |

Figure 3. Typical normalized light output vs. forward current for L130-xxxx003000x21 at  $T_j=25^{\circ}\text{C}$ .

## Forward Current Characteristics

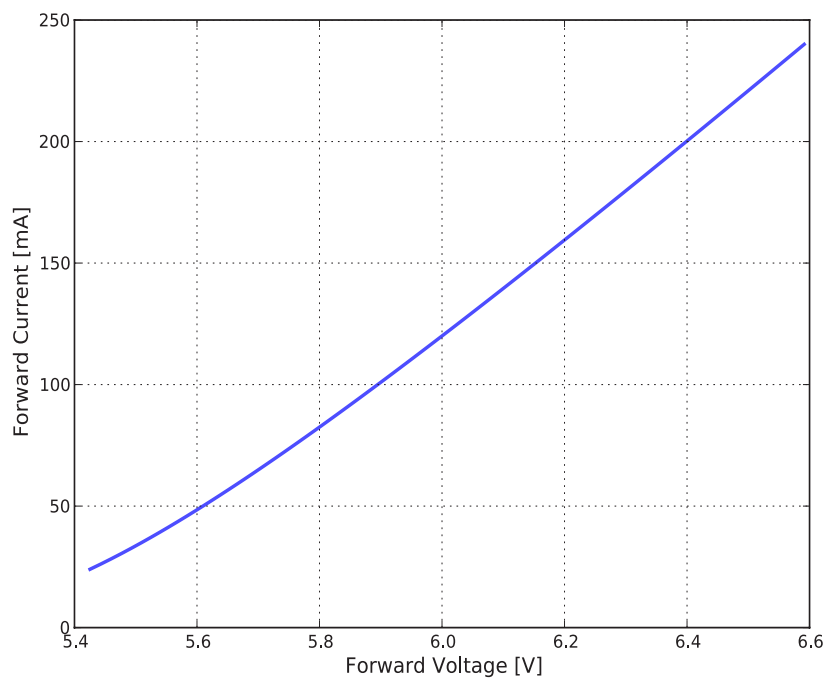


Figure 4. Typical forward current vs. forward voltage for L130-xxxx003000x21 at  $T_j=25^{\circ}\text{C}$ .



# Radiation Pattern Characteristics

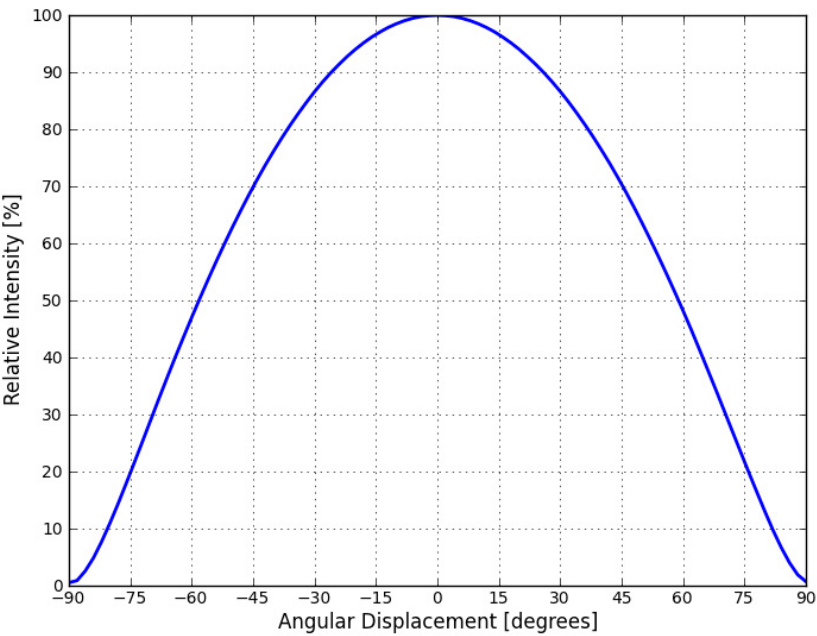


Figure 5. Typical radiation pattern for L130-xxxx003000x21 at 120mA,  $T_j=25^{\circ}\text{C}$ .

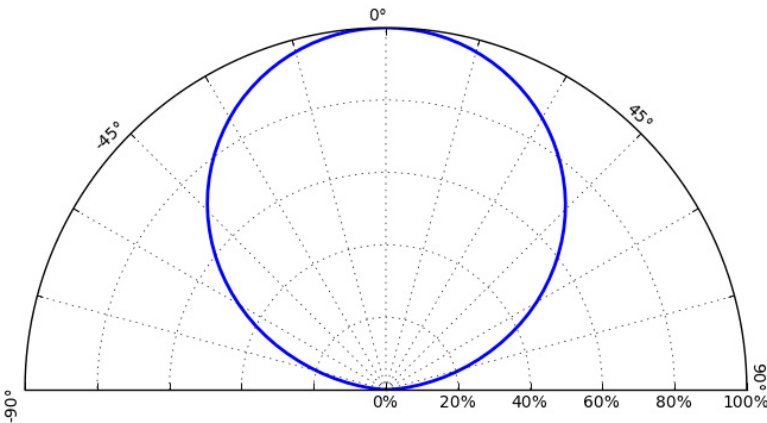


Figure 6. Typical polar radiation pattern for L130-xxxx003000x21 at 120mA,  $T_j=25^{\circ}\text{C}$ .

# Product Bin and Labeling Definitions

## Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 3030 2D Line LEDs are labeled using a 4- or 5-digit alphanumeric CAT code following the format below.

**A B C D** or **A x B C D**

- A** – designates luminous flux bin (example: H=90 to 95 lm, M=110 to 115 lm)
- x** – designates Lumileds internal code
- B C** – designates color bin (example: 7D, 7E, 7F, 7G, 7H, 7J, 7K, 7L or 7M for 3000K parts)
- D** – designates forward voltage bin (example: G=5.8 to 6.0V, J=6.2 to 6.4V)

Therefore, a LUXEON 3030 2D with a lumen range of 90 to 95 lm, color bin of 7J, and a forward voltage range of 5.8 to 6.0V has the following CAT code:

**H 7 J G**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 3030 2D Line emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 5. Luminous flux bin definitions for LUXEON 3030 2D Line at 120mA, T<sub>j</sub>=25°C.

| BIN | LUMINOUS FLUX <sup>(1)</sup> (lm) |         |
|-----|-----------------------------------|---------|
|     | MINIMUM                           | MAXIMUM |
| D   | 70                                | 75      |
| E   | 75                                | 80      |
| F   | 80                                | 85      |
| G   | 85                                | 90      |
| H   | 90                                | 95      |
| J   | 95                                | 100     |
| K   | 100                               | 105     |
| L   | 105                               | 110     |
| M   | 110                               | 115     |
| N   | 115                               | 120     |
| P   | 120                               | 125     |
| Q   | 125                               | 130     |
| R   | 130                               | 135     |
| S   | 135                               | 140     |
| T   | 140                               | 145     |

Notes for Table 5:

1. Lumileds maintains a tolerance of ±7.5% on luminous flux measurements.

# Color Bin Definitions

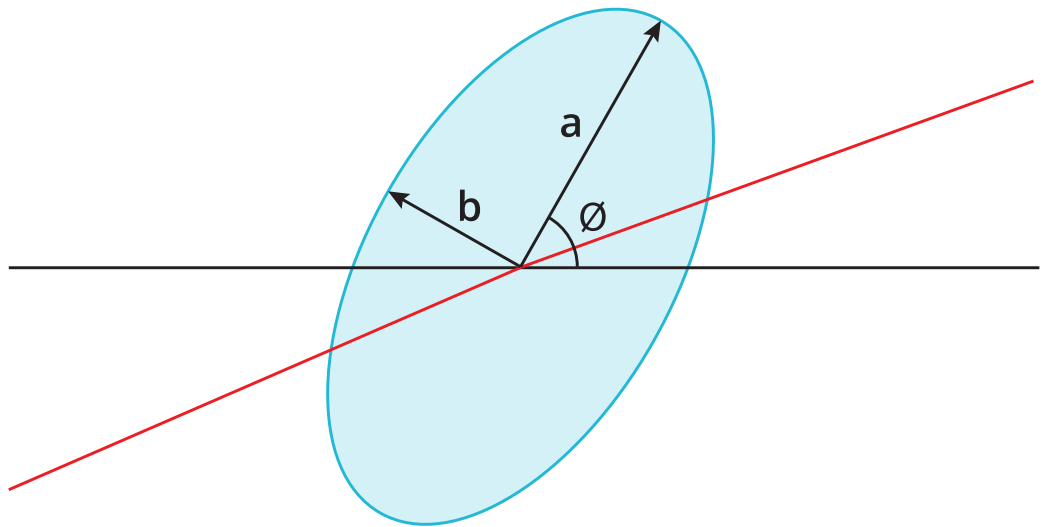


Figure 7. 3- and 5-step MacAdam ellipse illustration for Tables 6a-6h.

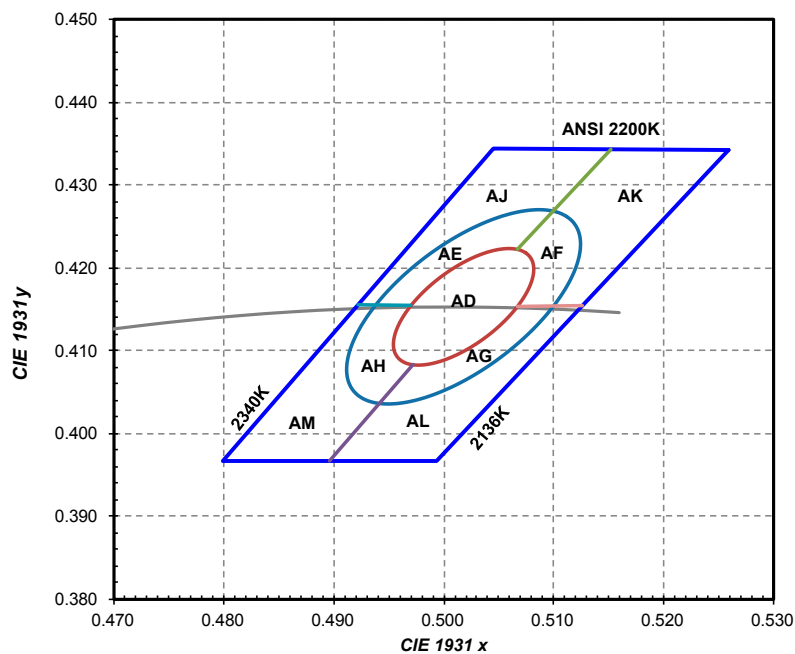


Figure 8a. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 2200K, hot-color targeted at 85°C.

Table 6a. 3- and 5-step MacAdam ellipse color bin definitions for L130-22xx003000x21 at test current, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, θ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|------------------------------|
| 2200K       | Single 3-step MacAdam ellipse | (0.5018, 0.4153)                        | 0.008625         | 0.003975         | 49.27°                       |
| 2200K       | Single 5-step MacAdam ellipse | (0.5018, 0.4153)                        | 0.014375         | 0.006625         | 49.27°                       |

Notes for Table 6a:  
1. Lumileds maintains a tolerance of ±0.007 on x and y color coordinates in the CIE 1931 color space.

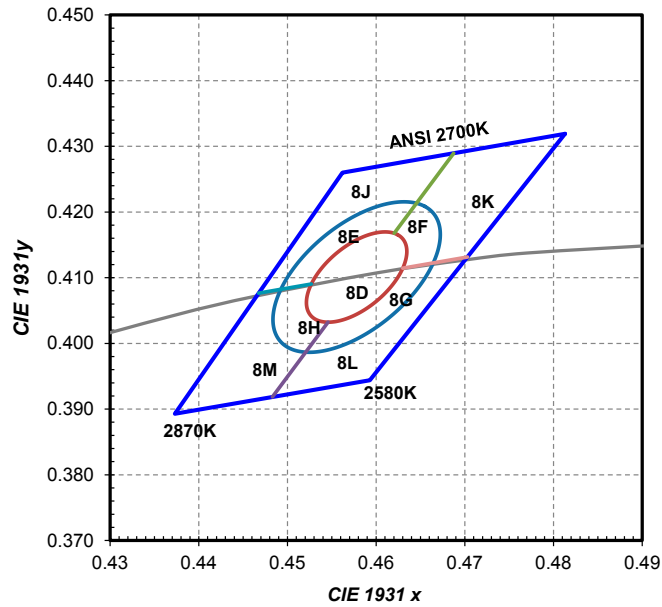


Figure 8b. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 2700K, hot-color targeted at 85°C.

Table 6b. 3- and 5-step MacAdam ellipse color bin definitions for L130-27xx003000x21 at test current, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>(1)</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 2700K       | Single 3-step MacAdam ellipse | (0.4578, 0.4101)                        | 0.00810          | 0.00420          | 53.70°                              |
| 2700K       | Single 5-step MacAdam ellipse | (0.4578, 0.4101)                        | 0.01350          | 0.00700          | 53.70°                              |

Notes for Table 6b:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

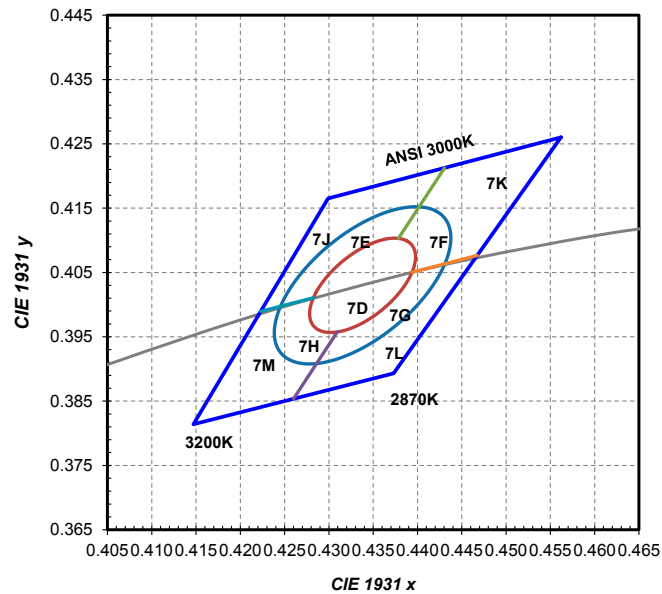


Figure 8c. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 3000K, hot-color targeted at 85°C.

Table 6c. 3- and 5-step MacAdam ellipse color bin definitions for L130-30xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>(1)</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 3000K       | Single 3-step MacAdam ellipse | (0.4338, 0.4030)                        | 0.00834          | 0.00408          | 53.22°                              |
| 3000K       | Single 5-step MacAdam ellipse | (0.4338, 0.4030)                        | 0.01390          | 0.00680          | 53.22°                              |

Notes for Table 6c:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

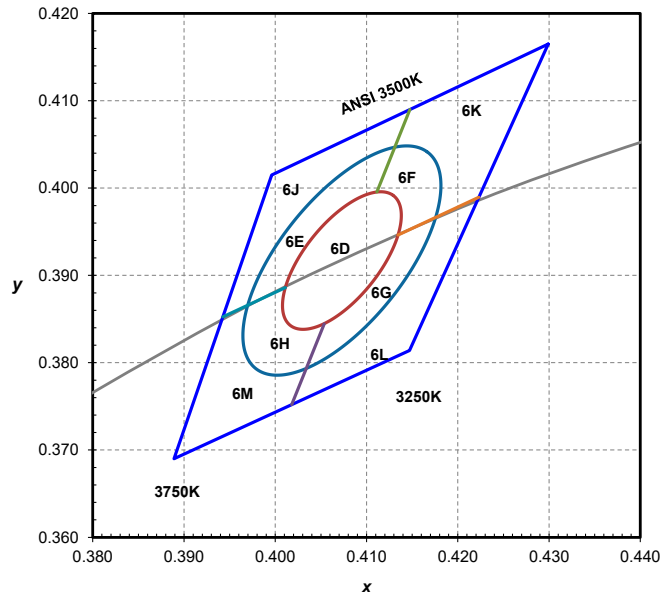


Figure 8d. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 3500K, hot-color targeted at 85°C.

Table 6d. 3- and 5-step MacAdam ellipse color bin definitions for L130-35xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 3500K       | Single 3-step MacAdam ellipse | (0.4073, 0.3917)                        | 0.00927          | 0.00414          | 54.00°                              |
| 3500K       | Single 5-step MacAdam ellipse | (0.4073, 0.3917)                        | 0.01545          | 0.00690          | 54.00°                              |

Notes for Table 6d:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

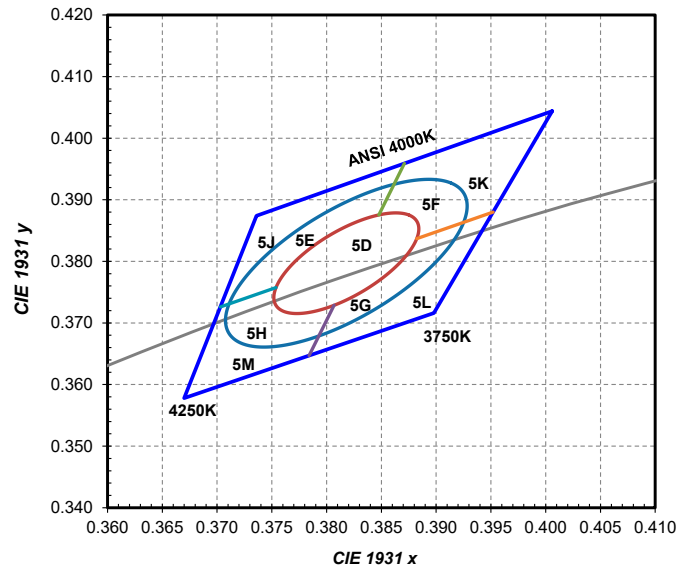


Figure 8e. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 4000K, hot-color targeted at 85°C.

Table 6e. 3- and 5-step MacAdam ellipse color bin definitions for L130-40xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 4000K       | Single 3-step MacAdam ellipse | (0.3818, 0.3797)                        | 0.00939          | 0.00402          | 53.72°                              |
| 4000K       | Single 5-step MacAdam ellipse | (0.3818, 0.3797)                        | 0.01565          | 0.00670          | 53.72°                              |

Notes for Table 6e:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

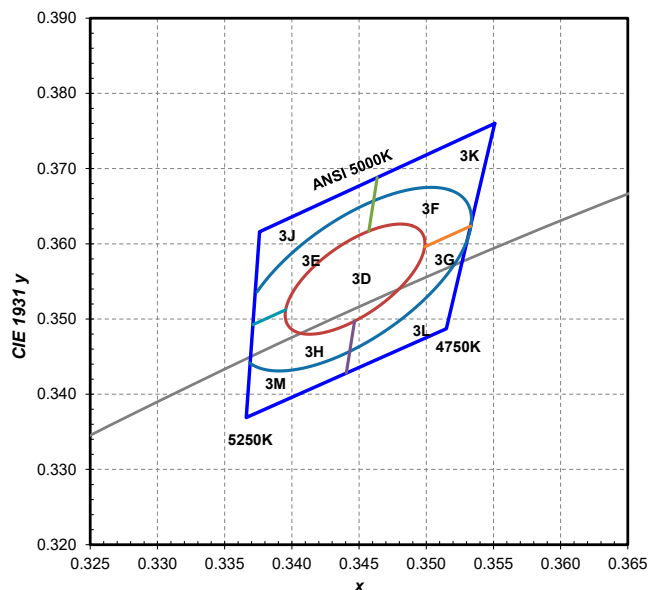


Figure 8f. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 5000K, hot-color targeted at 85°C.

Table 6f. 3- and 5-step MacAdam ellipse color bin definitions for L130-50xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 5000K       | Single 3-step MacAdam ellipse | (0.3447, 0.3553)                        | 0.00822          | 0.00354          | 59.62°                              |
| 5000K       | Single 5-step MacAdam ellipse | (0.3447, 0.3553)                        | 0.01370          | 0.00590          | 59.62°                              |

Notes for Table 6f:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

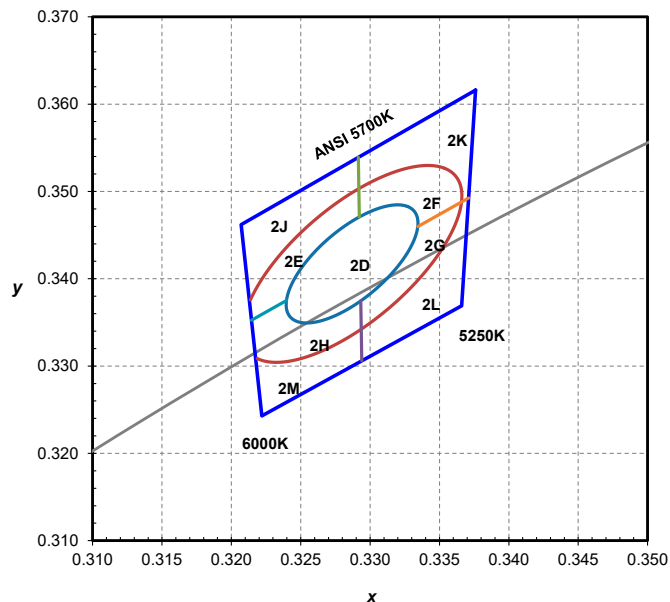


Figure 8g. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 5700K, hot-color targeted at 85°C.

Table 6g. 3- and 5-step MacAdam ellipse color bin definitions for L130-57xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 5700K       | Single 3-step MacAdam ellipse | (0.3287, 0.3417)                        | 0.00746          | 0.00320          | 59.09°                              |
| 5700K       | Single 5-step MacAdam ellipse | (0.3287, 0.3417)                        | 0.01243          | 0.00533          | 59.09°                              |

Notes for Table 6g:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

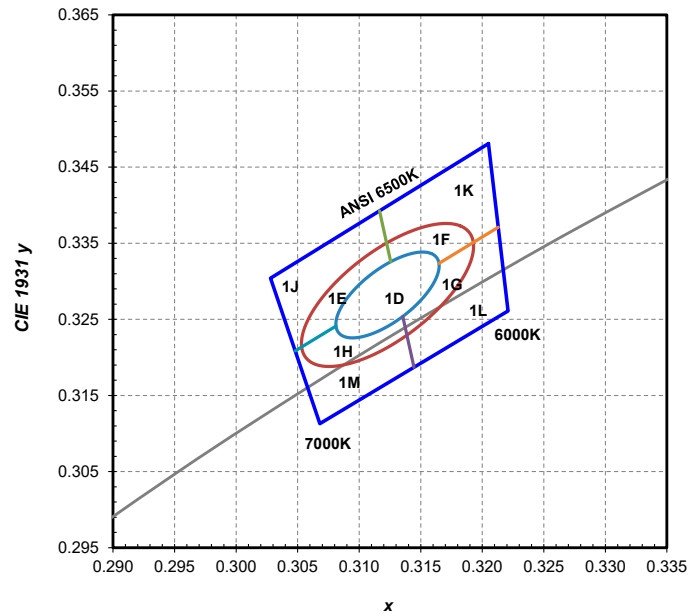


Figure 8h. 1/9<sup>th</sup> color bin structure for LUXEON 3030 2D Line 6500K, hot-color targeted at 85°C.

Table 6h. 3- and 5-step MacAdam ellipse color bin definitions for L130-65xx003000x21, hot-color targeted at 85°C.

| NOMINAL CCT | COLOR SPACE                   | CENTER POINT <sup>[1]</sup><br>(cx, cy) | MAJOR AXIS,<br>a | MINOR AXIS,<br>b | ELLIPSE ROTATION<br>ANGLE, $\theta$ |
|-------------|-------------------------------|-----------------------------------------|------------------|------------------|-------------------------------------|
| 6500K       | Single 3-step MacAdam ellipse | (0.3123, 0.3282)                        | 0.00669          | 0.00285          | 58.57°                              |
| 6500K       | Single 5-step MacAdam ellipse | (0.3123, 0.3282)                        | 0.01115          | 0.00475          | 58.57°                              |

Notes for Table 6h:

1. Lumileds maintains a tolerance of  $\pm 0.007$  on x and y color coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 3030 2D Line,  $T_j=25^\circ\text{C}$ .

| BIN | FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ ) |         |
|-----|------------------------------------------|---------|
|     | MINIMUM                                  | MAXIMUM |
| G   | 5.8                                      | 6.0     |
| H   | 6.0                                      | 6.2     |
| J   | 6.2                                      | 6.4     |
| K   | 6.4                                      | 6.6     |

Notes for Table 7:

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

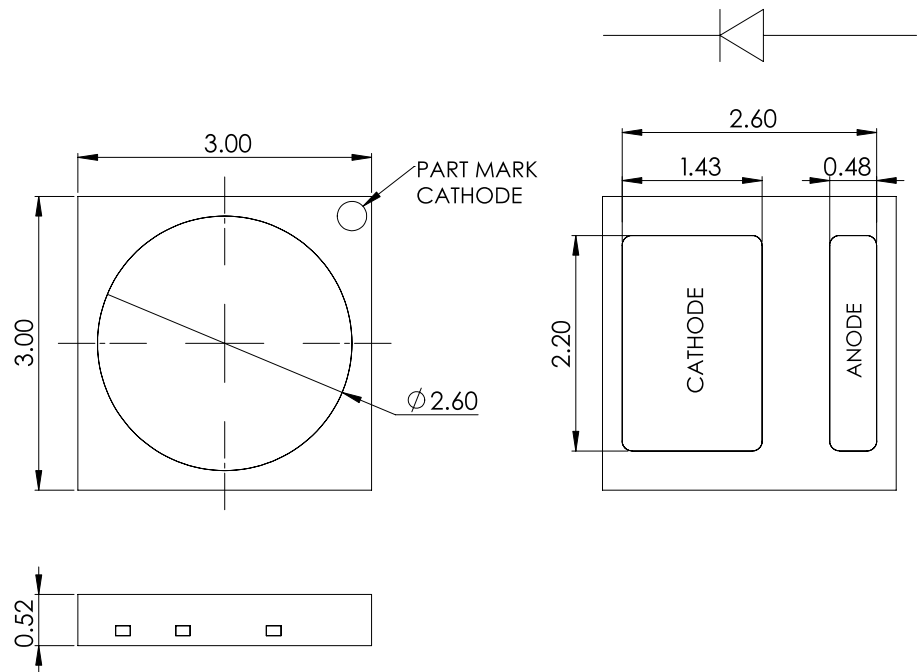


Figure 9a. Mechanical dimensions for LUXEON 3030 2D (Round LES).

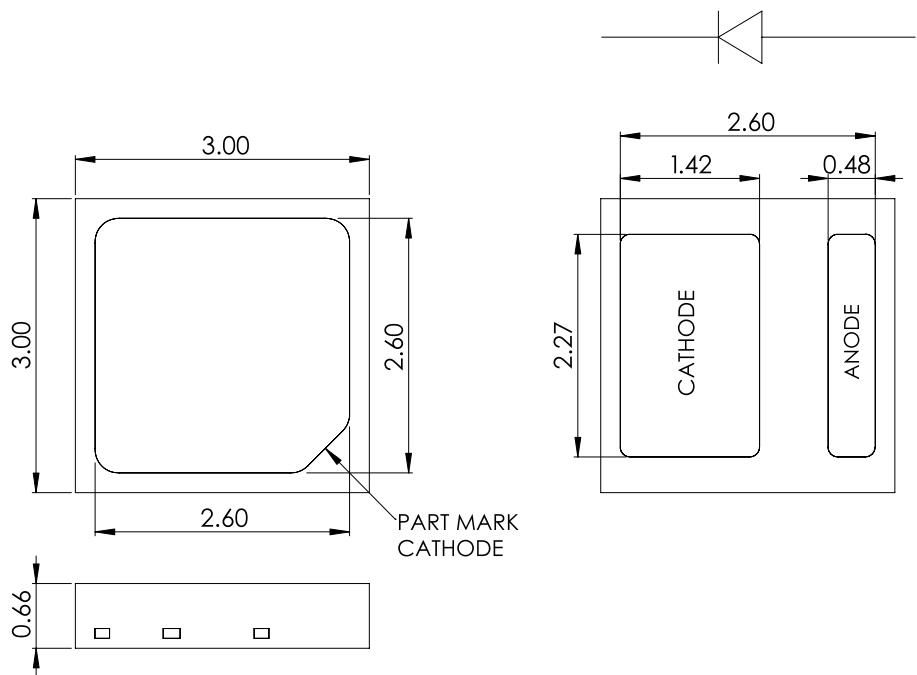


Figure 9b. Mechanical dimensions for LUXEON 3030 2D (Square LES).

Notes for Figures 9a and 9b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.  
3. Tolerance:  $\pm 0.10$ mm.



# Reflow Soldering Guidelines

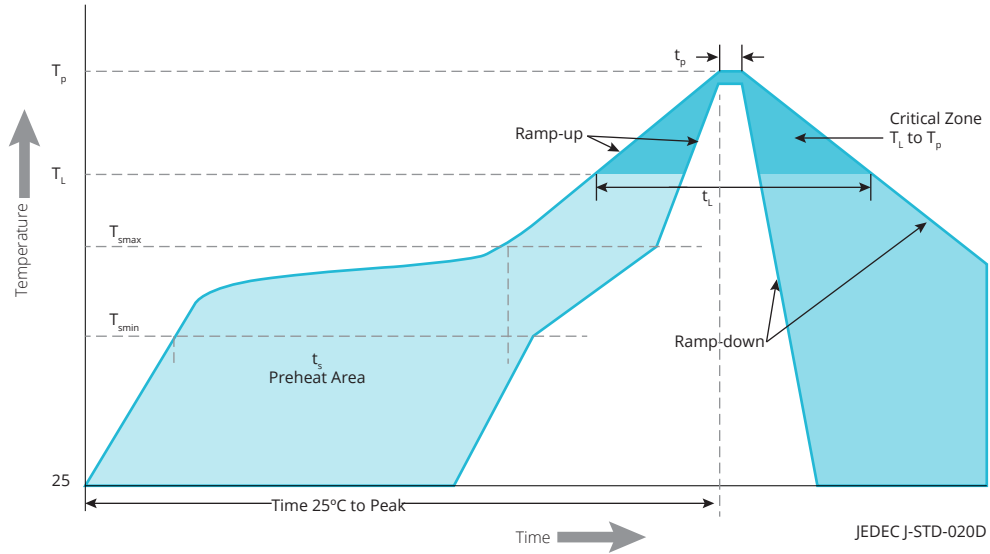


Figure 10. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 3030 2D Line.

| PROFILE FEATURE                                   | LEAD FREE ASSEMBLY   |
|---------------------------------------------------|----------------------|
| Preheat Minimum Temperature ( $T_{min}$ )         | 150°C                |
| Preheat Maximum Temperature ( $T_{max}$ )         | 200°C                |
| Preheat Time ( $t_{min}$ to $t_{max}$ )           | 60 to 120 seconds    |
| Ramp-Up Rate ( $T_L$ to $T_p$ )                   | 3°C / second maximum |
| Liquidus Temperature ( $T_L$ )                    | 217°C                |
| Time Maintained Above Temperature $T_L$ ( $t_L$ ) | 60 to 150 seconds    |
| Peak / Classification Temperature ( $T_p$ )       | 260°C                |
| Time Within 5°C of Actual Temperature ( $t_p$ )   | 20 to 40 seconds     |
| Ramp-Down Rate ( $T_p$ to $T_L$ )                 | 6°C / second maximum |
| Time 25°C to Peak Temperature                     | 8 minutes maximum    |

**Notes for Table 8:**

1. All temperatures refer to the application Printed Circuit Board (PCB), measured on the surface adjacent to the package body.

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 3030 2D Line.

| LEVEL | FLOOR LIFE |               | SOAK REQUIREMENTS STANDARD |               |
|-------|------------|---------------|----------------------------|---------------|
|       | TIME       | CONDITIONS    | TIME                       | CONDITIONS    |
| 3     | 168 Hours  | 30°C / 60% RH | 192 Hours +5 / -0          | 30°C / 60% RH |

## Solder Pad Design

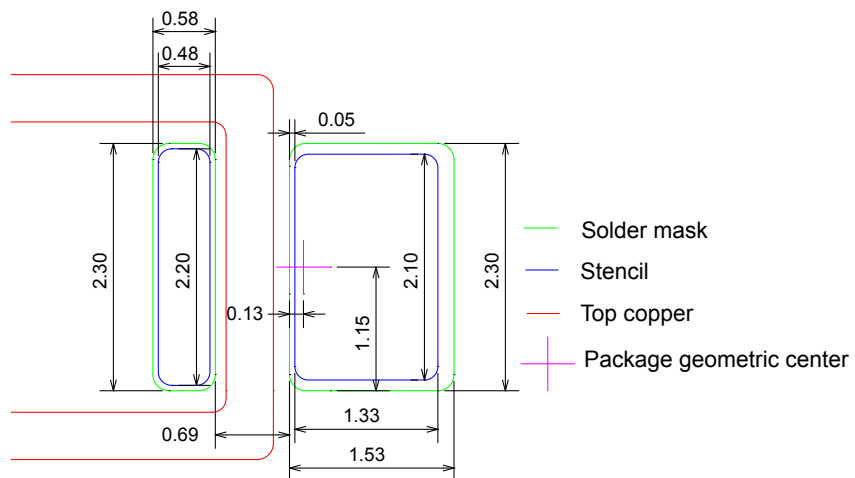


Figure 11. Recommended PCB solder pad layout for LUXEON 3030 2D Line.

### Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Packaging Information

## Pocket Tape Dimensions

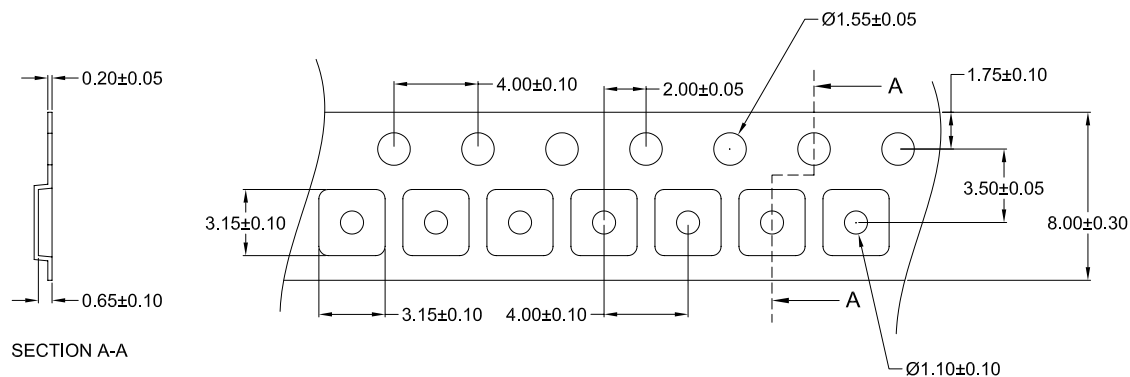


Figure 12a. Pocket tape dimensions for LUXEON 3030 2D (Round LES).

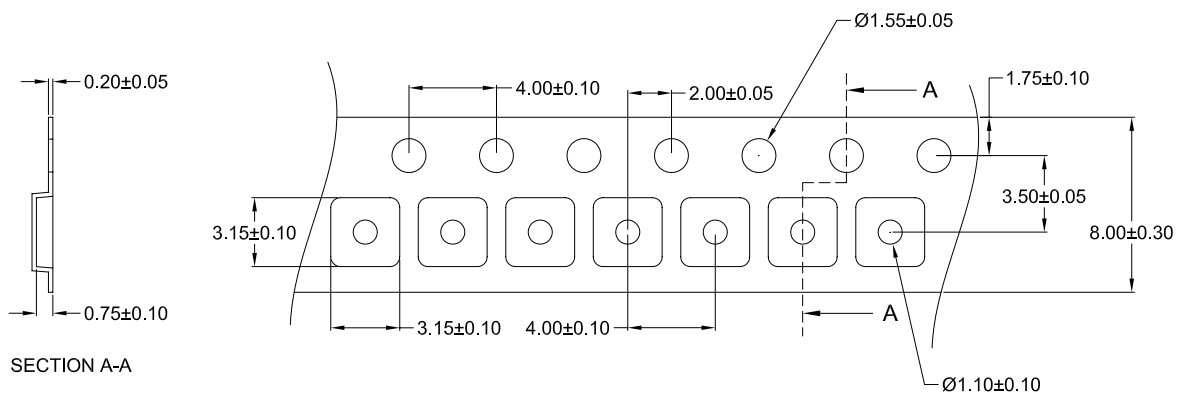


Figure 12b. Pocket tape dimensions for LUXEON 3030 2D (Square LES).

Notes for Figures 12a and 12b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.

## Reel Dimensions

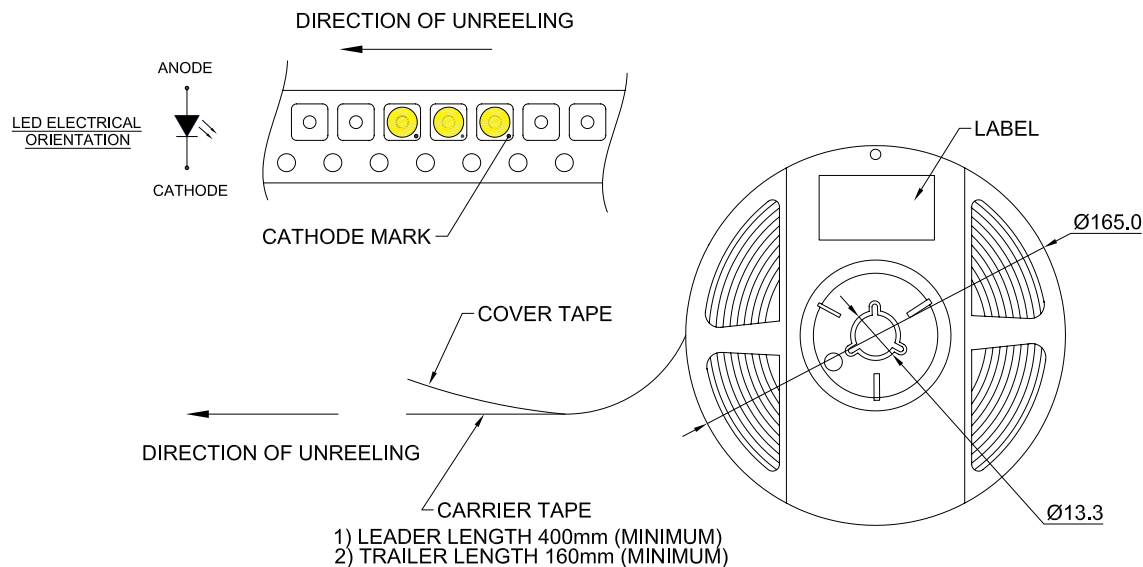


Figure 13a. Reel dimensions for LUXEON 3030 2D (Round LES).

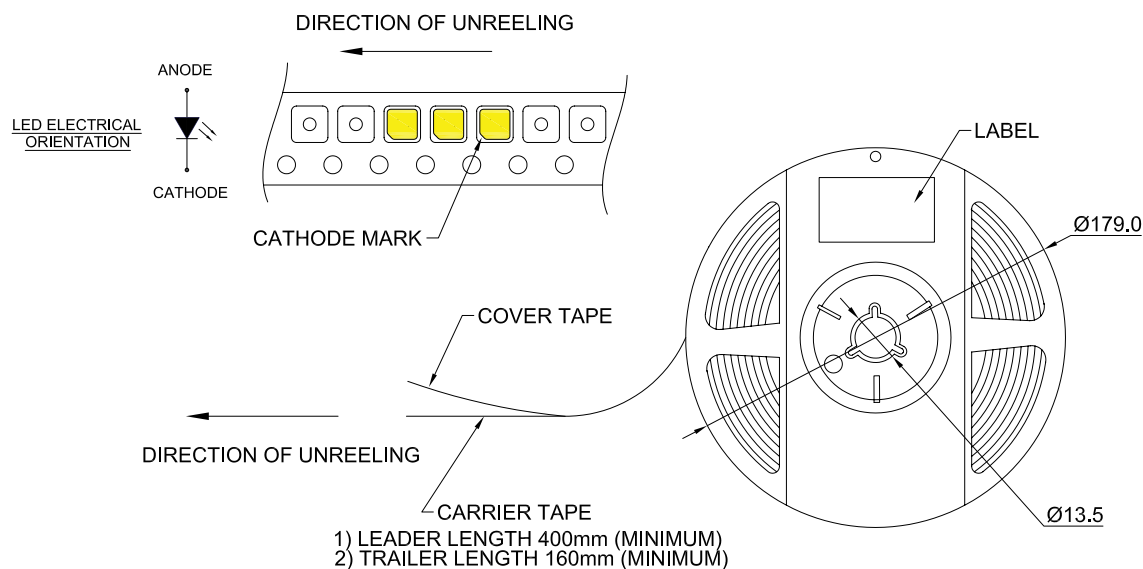


Figure 13b. Reel dimensions for LUXEON 3030 2D (Square LES).

Notes for Figures 13a and 13b:  
 1. Drawings are not to scale.  
 2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

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