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# Bridgelux ES Rectangle Array Series

## Product Data Sheet DS24

**BXRA-xxx0800, BXRA-xxx1200, BXRA-xxx2000  
BXRA-40E0950, BXRA-40E1350, BXRA-40E2200  
BXRA-xxC1100, BXRA-xxC1600, BXRA-xxC2600**

### Introduction

The Bridgelux family of LED Array products delivers high performance, compact and cost-effective solid-state lighting solutions to serve the general lighting market. These products combine the higher efficacy, lifetime, and reliability benefits of LEDs with the light output levels of many conventional lighting sources. The Bridgelux ES Array Series enables lamp and luminaire designs surpassing efficacy and quality of light requirements driven by regulatory standards with reasonable system design margins, enabling lighting product compliance to Energy Star, DLC, Title 24, Part L and other global standards.

The Bridgelux ES Array products are a high performance alternative to conventional solid state solutions, delivering between 700 and 3000 lumens under application conditions in warm, neutral and cool white color temperatures. These compact high flux density light sources deliver uniform high quality illumination without pixilation or the multiple shadow effect caused by LED component based solutions. To simplify system design for appropriate light output, Bridgelux LED Arrays are specified to deliver performance under typical use conditions.

These integrated plug and play solutions reduce system complexity and enable miniaturized cost-effective lamp and luminaire designs. Lighting system designs incorporating these LED Arrays deliver comparable performance to that of 60-200 Watt incandescent and halogen, 7-42 Watt compact fluorescent, and 18-50 Watt HID based luminaires and feature increased system level efficacy and service life. Typical applications include replacement lamps, task, accent, spot, retail, track, down light, low bay, wide area, security, wall pack and street lighting.

### Features

- Compact high flux density light source
- Uniform high quality illumination
- Minimum 70, 80 and 90 CRI options
- Streamlined thermal path
- Energy Star / ANSI compliant color binning structure with 3SDCM options
- More energy efficient than incandescent, halogen and fluorescent lamps
- Low voltage DC operation
- Instant light with unlimited dimming
- 5-Year warranty
- RoHS compliant and Pb free

### Benefits

- Enhanced optical control
- Clean white light without pixilation
- High quality true color reproduction
- Significantly reduced thermal resistance and increased operating temperatures
- Uniform consistent white light
- Lower operating costs
- UL Recognized
- Easy to use with daylight and motion detectors to enable increased energy savings
- Reduced maintenance costs
- Environmentally friendly, no disposal issue



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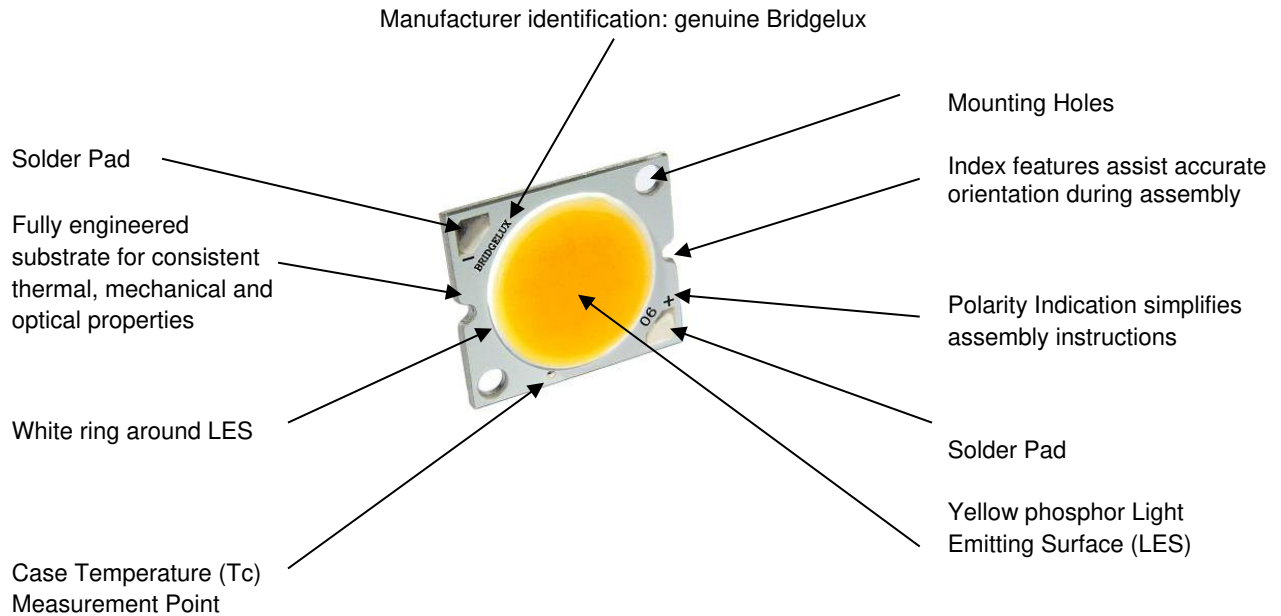
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## Typical Product Features

Bridgelux arrays are fully engineered devices that provide consistent thermal and optical performance on an engineered mechanical platform. The ES Rectangle array is a general purpose chip-on-board device serving a wide range of applications. The arrays incorporate several features to simplify design integration and assembly.

Figure 1: Array Features



Note: Part number and lot codes are scribed on back of array

## Product Nomenclature

The part number designation for Bridgelux LED Arrays is explained as follows:

BXRA – AB C DEFG – H – IJ

Where:

B X R A – Designates product family

A B – Designates the nominal ANSI color temperature; 27 = 2700K; 30 = 3000K, etc.

C - Designates minimum CRI; C = 70, E = 80, G = 90

D E F G - Designates Nominal Flux; 0800 = 800lm, 1200 = 1200lm, 2000 = 2000lm, etc.

H – Designates array configuration

I J – Designates CCT Bin options

03 = 3SDCM or 3-step

04 = 4SDCM or 4-step

00 = 7SDCM or 7-step

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## Lumen Maintenance Characteristics

Bridgelux projects that its family of LED Array products will deliver, on average, greater than 70% lumen maintenance after 50,000 hours of operation at the rated forward test current. This performance assumes constant current operation at the nominal drive current with case temperature maintained at or below 85°C. For use beyond these typical operating conditions please consult your Bridgelux sales representative for further assistance.

These projections are based on a combination of package test data, semiconductor chip reliability data, a fundamental understanding of package related degradation mechanisms, and performance observed from products installed in the field using Bridgelux die technology. Bridgelux conducts lumen maintenance tests per LM80. Observation of design limits is required in order to achieve this projected lumen maintenance.

## Environmental Compliance

Bridgelux is committed to providing environmentally friendly products to the solid state lighting market. Bridgelux LED Arrays comply with the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS directive. Bridgelux does not intentionally add the following restricted materials to LED Array products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

## UL Recognition

Bridgelux secures UL recognition for all the LED Array products. Please refer to the UL file E350613 for the latest list of UL recognized Arrays. Bridgelux uses UL recognized materials with suitable flammability ratings in the LED Array to streamline the process for customers to secure UL listing of the final luminaire product.

## CE Recognition

In accordance with the relevant European Union directives, the family of LED Array products conform to the applicable requirements of the IEC/EN 62031:2008 (LED Modules for General Lighting Safety Specifications) and IEC 62471:2006 (Photobiological Safety of Lamps and Lamp Systems). Bridgelux maintains a CE Declaration of Conformity statement on its website and displays the CE mark on product packing labels.

## Minor Product Change Policy

The rigorous qualification testing on products offered by Bridgelux provides performance assurance. Slight cosmetic changes that do not affect form, fit, or function may occur as Bridgelux continues product optimization.

## Case Temperature Measurement Point

A case temperature ( $T_c$ ) measurement point location is included on the top surface of the Bridgelux LED Arrays. The location of this measurement point is indicated in the mechanical dimensions section of this data sheet.

The purpose of this measurement point is to allow the user access to a measurement point closely linked to the true case temperature on the back surface of the LED Array. Once the LED Array is installed, it is challenging to measure the back surface of the array, or true case temperature.

Bridgelux has provided the case temperature measurement location in a manner which closely ties it to the true case temperature of the LED Array under steady state operation. Deviations between thermal measurements taken at the point indicated and the back of the LED Array differ by less than 1°C, providing a robust method to testing thermal operation once the product is installed.

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## Cautionary Statements

### CAUTION: CONTACT WITH OPTICAL AREA

Avoid any contact with the optical area. Do not touch the optical area of the LED Array or apply mechanical stress to the yellow phosphor resin area – it could damage the LED Array.

Optics and reflectors must not be mounted in contact with the yellow phosphor resin area (LES) or the white ring that surrounds the yellow phosphor area. Using the white ring to secure optics can result in damage to the LED Array as the ring is not designed to act as a mechanical locating feature. Optical devices may be mounted on the top surface of the LED Array substrate outside of the white ring maximum OD as specified in the product data sheet. Use the mechanical features of the LED Array substrate edges and/or mounting holes to locate and secure the optical device as needed.

### CAUTION: EYE SAFETY

Eye safety classification for the use of Bridgelux LED Arrays is in accordance with IEC specification EN62471; Photobiological Safety of Lamps and Lamp Systems. Bridgelux LED Arrays are classified as Risk Group 1 (Low Risk) when operated at or below their rated test current. Please use appropriate precautions. It is important that employees working with LEDs are trained to use them safely.

### CAUTION: RISK OF BURN

Do not touch the LED Array or resin area during operation. Allow the LED Array to cool for a sufficient period of time before handling. The LED Array may reach elevated temperatures such that it can burn skin when touched.

### CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in luminaire manufacturing and assembly can cause damage to the LED Array. Please consult Application Note AN11 for additional information.

## Selection Guide

The following configurations are available:

**Table 1: Selection Guide for ES Rectangular Arrays**

| Part Number <sup>[1]</sup> | CCT <sup>[2]</sup><br>(Kelvin) | CRI <sup>[3]</sup> | Test Current <sup>[5]</sup><br>(mA) | Typical Voltage<br>(V) | Typical Flux <sup>[6]</sup> (lm) |                          | Typical Power <sup>[6]</sup><br>(W) | Typical Efficacy <sup>[6]</sup><br>(lm/W) |
|----------------------------|--------------------------------|--------------------|-------------------------------------|------------------------|----------------------------------|--------------------------|-------------------------------------|---|
|                            |                                |                    |                                     |                        | T <sub>j</sub> = 25°C            | T <sub>case</sub> = 85°C |                                     |   |
| BXRA-27E0800-B-03          | 2700K                          | 80                 | 500                                 | 20.5                   | 980                              | 850                      | 10.3                                | 96  |
| BXRA-27E1200-B-03          | 2700K                          | 80                 | 500                                 | 29.3                   | 1420                             | 1230                     | 14.7                                | 97  |
| BXRA-27E2000-B-03          | 2700K                          | 80                 | 700                                 | 36.2                   | 2300                             | 2000                     | 25.3                                | 91  |
| BXRA-27G0800-B-03          | 2700K                          | 90                 | 500                                 | 20.5                   | 830                              | 720                      | 10.3                                | 81  |
| BXRA-27G1200-B-03          | 2700K                          | 90                 | 500                                 | 29.3                   | 1200                             | 1040                     | 14.7                                | 82  |
| BXRA-27G2000-B-03          | 2700K                          | 90                 | 700                                 | 36.2                   | 2020                             | 1760                     | 25.3                                | 80  |
| BXRA-30E0800-B-03          | 3000K                          | 80                 | 500                                 | 20.5                   | 1070                             | 930                      | 10.3                                | 104                                       |
| BXRA-30E1200-B-03          | 3000K                          | 80                 | 500                                 | 29.3                   | 1540                             | 1340                     | 14.7                                | 105                                       |
| BXRA-30E2000-B-03          | 3000K                          | 80                 | 700                                 | 36.2                   | 2460                             | 2140                     | 25.3                                | 97  |
| BXRA-30G0800-B-03          | 3000K                          | 90                 | 500                                 | 20.5                   | 900                              | 780                      | 10.3                                | 88  |
| BXRA-30G1200-B-03          | 3000K                          | 90                 | 500                                 | 29.3                   | 1310                             | 1140                     | 14.7                                | 89  |
| BXRA-30G2000-B-03          | 3000K                          | 90                 | 700                                 | 36.2                   | 2080                             | 1810                     | 25.3                                | 82  |
| BXRA-35E0800-B-03          | 3500K                          | 80                 | 500                                 | 20.5                   | 1130                             | 980                      | 10.3                                | 110                                       |
| BXRA-35E1200-B-03          | 3500K                          | 80                 | 500                                 | 29.3                   | 1630                             | 1420                     | 14.7                                | 111                                       |
| BXRA-35E2000-B-03          | 3500K                          | 80                 | 700                                 | 36.2                   | 2610                             | 2270                     | 25.3                                | 103                                       |
| BXRA-40E0950-B-03          | 4000K                          | 80                 | 500                                 | 20.5                   | 1200                             | 1040                     | 10.3                                | 117                                       |
| BXRA-40E1350-B-03          | 4000K                          | 80                 | 500                                 | 29.3                   | 1720                             | 1500                     | 14.7                                | 117                                       |
| BXRA-40E2200-B-03          | 4000K                          | 80                 | 700                                 | 36.2                   | 2800                             | 2430                     | 25.3                                | 110                                       |
| BXRA-50C1100-B-xx          | 5000K                          | 70                 | 500                                 | 20.5                   | 1340                             | 1170                     | 10.3                                | 131                                       |
| BXRA-50C1600-B-xx          | 5000K                          | 70                 | 500                                 | 29.3                   | 1930                             | 1680                     | 14.7                                | 132                                       |
| BXRA-50C2600-B-xx          | 5000K                          | 70                 | 700                                 | 36.2                   | 3150                             | 2740                     | 25.3                                | 124                                       |
| BXRA-56C1100-B-xx          | 5600K                          | 70                 | 500                                 | 20.5                   | 1340                             | 1170                     | 10.3                                | 131                                       |
| BXRA-56C1600-B-xx          | 5600K                          | 70                 | 500                                 | 29.3                   | 1930                             | 1680                     | 14.7                                | 132                                       |
| BXRA-56C2600-B-xx          | 5600K                          | 70                 | 700                                 | 36.2                   | 3150                             | 2740                     | 25.3                                | 124                                       |

Note for Table 1 through 5 (additional specific notes following Table 2 through 5):

1. Part numbers with "-xx" suffix are available with multiple color control options (4 SDCM or 7 SDCM for example).
2. Nominal CCT as defined by ANSI C78.377-2011.
3. Values are minimum.
4. Minimum R9 value for 90 CRI products is 50.
5. Products tested under pulsed condition (10ms pulse width) at rated test current where T<sub>junction</sub> = T<sub>case</sub> = 25°C.
6. Typical performance values are provided as a reference only and are not a guarantee of performance.
7. Bridgelux maintains a ±7% tolerance on flux measurements.
8. Operating these LED Arrays at or below the drive currents listed in Table 2 and 5, with a case temperature maintained at or below 85°C, will enable the average lumen maintenance projection outlined earlier in this Product Data Sheet.

## Typical Performance at Alternative Drive Currents

Customers may drive the LED Arrays at alternative drive currents dependent on the specific application. The typical performance at any drive current can be derived from the current vs. voltage characteristics shown in Figures 2 and 3 and from the flux versus current characteristics shown in Figure 8 and 9. The typical performance at common drive currents is summarized in Table 2.

Table 2: Typical Product Performance at Alternative Drive Currents

| Part Number <sup>[1]</sup> | CCT & CRI              | Current <sup>[9]</sup><br>(mA) | Typical Voltage <sup>[6]</sup><br>(V) | Typical Power <sup>[6]</sup><br>(W) | Typical Flux <sup>[6]</sup><br>(lm) |                          | Typical Efficacy <sup>[6]</sup><br>(lm/W) |
|----------------------------|------------------------|--------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
|                            |                        |                                | T <sub>j</sub> = 25°C                 | T <sub>j</sub> = 25°C               | T <sub>j</sub> = 25°C               | T <sub>case</sub> = 85°C | T <sub>j</sub> = 25°C                     |
| BXRA-27E0800-B-03          | 2700K<br>and 80<br>CRI | 250                            | 19.4                                  | 4.8                                 | 510                                 | 440                      | 105                                       |
|                            |                        | 350                            | 19.8                                  | 6.9                                 | 700                                 | 600                      | 101                                       |
|                            |                        | 500                            | 20.5                                  | 10.3                                | 980                                 | 850                      | 96  |
|                            |                        | 700                            | 21.3                                  | 14.9                                | 1320                                | 1150                     | 89  |
| BXRA-27E1200-B-03          | 2700K<br>and 80<br>CRI | 250                            | 27.7                                  | 6.9                                 | 730                                 | 630                      | 105                                       |
|                            |                        | 350                            | 28.3                                  | 9.9                                 | 1010                                | 870                      | 102                                       |
|                            |                        | 500                            | 29.3                                  | 14.7                                | 1420                                | 1230                     | 97  |
|                            |                        | 700                            | 30.4                                  | 21.3                                | 1920                                | 1660                     | 90  |
| BXRA-27E2000-B-03          | 2700K<br>and 80<br>CRI | 350                            | 34.2                                  | 12.0                                | 1190                                | 1030                     | 99  |
|                            |                        | 500                            | 35.1                                  | 17.6                                | 1700                                | 1470                     | 97  |
|                            |                        | 700                            | 36.2                                  | 25.3                                | 2300                                | 2000                     | 91  |
|                            |                        | 1000                           | 37.7                                  | 37.7                                | 3160                                | 2750                     | 84  |
| BXRA-27G0800-B-03          | 2700K<br>and 90<br>CRI | 250                            | 19.4                                  | 4.8                                 | 430                                 | 370                      | 89  |
|                            |                        | 350                            | 19.8                                  | 6.9                                 | 590                                 | 510                      | 85  |
|                            |                        | 500                            | 20.5                                  | 10.3                                | 830                                 | 720                      | 81  |
|                            |                        | 700                            | 21.3                                  | 14.9                                | 1120                                | 970                      | 75  |
| BXRA-27G1200-B-03          | 2700K<br>and 90<br>CRI | 250                            | 27.7                                  | 6.9                                 | 620                                 | 540                      | 89  |
|                            |                        | 350                            | 28.3                                  | 9.9                                 | 850                                 | 740                      | 86  |
|                            |                        | 500                            | 29.3                                  | 14.7                                | 1200                                | 1040                     | 82  |
|                            |                        | 700                            | 30.4                                  | 21.3                                | 1620                                | 1400                     | 76  |
| BXRA-27G2000-B-03          | 2700K<br>and 90<br>CRI | 350                            | 34.2                                  | 12.0                                | 1040                                | 910                      | 87  |
|                            |                        | 500                            | 35.1                                  | 17.6                                | 1490                                | 1300                     | 85  |
|                            |                        | 700                            | 36.2                                  | 25.3                                | 2020                                | 1760                     | 80  |
|                            |                        | 1000                           | 37.7                                  | 37.7                                | 2770                                | 2420                     | 73  |
| BXRA-30E0800-B-03          | 3000K<br>and 80<br>CRI | 250                            | 19.4                                  | 4.8                                 | 550                                 | 480                      | 113                                       |
|                            |                        | 350                            | 19.8                                  | 6.9                                 | 760                                 | 660                      | 109                                       |
|                            |                        | 500                            | 20.5                                  | 10.3                                | 1070                                | 930                      | 104                                       |
|                            |                        | 700                            | 21.3                                  | 14.9                                | 1440                                | 1250                     | 97  |
| BXRA-30E1200-B-03          | 3000K<br>and 80<br>CRI | 250                            | 27.7                                  | 6.9                                 | 790                                 | 690                      | 114                                       |
|                            |                        | 350                            | 28.3                                  | 9.9                                 | 1090                                | 950                      | 110                                       |
|                            |                        | 500                            | 29.3                                  | 14.7                                | 1540                                | 1340                     | 105                                       |
|                            |                        | 700                            | 30.4                                  | 21.3                                | 2080                                | 1810                     | 98  |



Table 2 Continued

| Part Number <sup>[1]</sup> | CCT & CRI        | Current <sup>[9]</sup><br>(mA) | Typical Voltage <sup>[6]</sup><br>(V) | Typical Power <sup>[6]</sup><br>(W) | Typical Flux <sup>[6]</sup><br>(lm) |                          | Typical Efficacy <sup>[6]</sup><br>(lm/W) |
|----------------------------|------------------|--------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
|                            |                  |                                | T <sub>j</sub> = 25°C                 | T <sub>j</sub> = 25°C               | T <sub>j</sub> = 25°C               | T <sub>case</sub> = 85°C | T <sub>j</sub> = 25°C                     |
| BXRA-30E2000-B-03          | 3000K and 80 CRI | 350                            | 34.2                                  | 12.0                                | 1270                                | 1100                     | 106                                       |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 1810                                | 1580                     | 103                                       |
|                            |                  | 700                            | 36.2                                  | 25.3                                | 2460                                | 2140                     | 97  |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 3380                                | 2940                     | 90  |
| BXRA-30G0800-B-03          | 3000K and 90 CRI | 250                            | 19.4                                  | 4.8                                 | 460                                 | 400                      | 95  |
|                            |                  | 350                            | 19.8                                  | 6.9                                 | 640                                 | 550                      | 92  |
|                            |                  | 500                            | 20.5                                  | 10.3                                | 900                                 | 780                      | 88  |
|                            |                  | 700                            | 21.3                                  | 14.9                                | 1210                                | 1050                     | 81  |
| BXRA-30G1200-B-03          | 3000K and 90 CRI | 250                            | 27.7                                  | 6.9                                 | 680                                 | 590                      | 98  |
|                            |                  | 350                            | 28.3                                  | 9.9                                 | 930                                 | 810                      | 94  |
|                            |                  | 500                            | 29.3                                  | 14.7                                | 1310                                | 1140                     | 89  |
|                            |                  | 700                            | 30.4                                  | 21.3                                | 1770                                | 1540                     | 83  |
| BXRA-30G2000-B-03          | 3000K and 90 CRI | 350                            | 34.2                                  | 12.0                                | 1070                                | 930                      | 89  |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 1530                                | 1330                     | 87  |
|                            |                  | 700                            | 36.2                                  | 25.3                                | 2080                                | 1810                     | 82  |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 2860                                | 2490                     | 76  |
| BXRA-35E0800-B-03          | 3500K and 80 CRI | 250                            | 19.4                                  | 4.8                                 | 580                                 | 510                      | 120                                       |
|                            |                  | 350                            | 19.8                                  | 6.9                                 | 800                                 | 700                      | 115                                       |
|                            |                  | 500                            | 20.5                                  | 10.3                                | 1130                                | 980                      | 110                                       |
|                            |                  | 700                            | 21.3                                  | 14.9                                | 1520                                | 1320                     | 102                                       |
| BXRA-35E1200-B-03          | 3500K and 80 CRI | 250                            | 27.7                                  | 6.9                                 | 840                                 | 730                      | 121                                       |
|                            |                  | 350                            | 28.3                                  | 9.9                                 | 1160                                | 1010                     | 117                                       |
|                            |                  | 500                            | 29.3                                  | 14.7                                | 1630                                | 1420                     | 111                                       |
|                            |                  | 700                            | 30.4                                  | 21.3                                | 2200                                | 1920                     | 103                                       |
| BXRA-35E2000-B-03          | 3500K and 80 CRI | 350                            | 34.2                                  | 12.0                                | 1350                                | 1170                     | 113                                       |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 1920                                | 1670                     | 109                                       |
|                            |                  | 700                            | 36.2                                  | 25.3                                | 2610                                | 2270                     | 103                                       |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 3590                                | 3120                     | 95  |
| BXRA-40E0950-B-03          | 4000K and 80 CRI | 250                            | 19.4                                  | 4.8                                 | 620                                 | 540                      | 128                                       |
|                            |                  | 350                            | 19.8                                  | 6.9                                 | 850                                 | 740                      | 122                                       |
|                            |                  | 500                            | 20.5                                  | 10.3                                | 1200                                | 1040                     | 117                                       |
|                            |                  | 700                            | 21.3                                  | 14.9                                | 1620                                | 1400                     | 109                                       |

Table 2 Continued

| Part Number <sup>[1]</sup> | CCT & CRI        | Current <sup>[9]</sup><br>(mA) | Typical Voltage <sup>[6]</sup><br>(V) | Typical Power <sup>[6]</sup><br>(W) | Typical Flux <sup>[6]</sup><br>(lm) |                          | Typical Efficacy <sup>[6]</sup><br>(lm/W) |
|----------------------------|------------------|--------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
|                            |                  |                                | T <sub>j</sub> = 25°C                 | T <sub>j</sub> = 25°C               | T <sub>j</sub> = 25°C               | T <sub>case</sub> = 85°C | T <sub>j</sub> = 25°C                     |
| BXRA-40E1350-B-03          | 4000K and 80 CRI | 250                            | 27.7                                  | 6.9                                 | 890                                 | 770                      | 128                                       |
|                            |                  | 350                            | 28.3                                  | 9.9                                 | 1220                                | 1070                     | 123                                       |
|                            |                  | <b>500</b>                     | <b>29.3</b>                           | <b>14.7</b>                         | <b>1720</b>                         | <b>1500</b>              | <b>117</b>                                |
|                            |                  | 700                            | 30.4                                  | 21.3                                | 2320                                | 2020                     | 109                                       |
| BXRA-40E2200-B-03          | 4000K and 80 CRI | 350                            | 34.2                                  | 12.0                                | 1440                                | 1250                     | 120                                       |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 2060                                | 1790                     | 117                                       |
|                            |                  | <b>700</b>                     | <b>36.2</b>                           | <b>25.3</b>                         | <b>2800</b>                         | <b>2430</b>              | <b>110</b>                                |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 3850                                | 3340                     | 102                                       |
| BXRA-50C1100-B-xx          | 5000K and 70 CRI | 250                            | 19.4                                  | 4.8                                 | 690                                 | 600                      | 142                                       |
|                            |                  | 350                            | 19.8                                  | 6.9                                 | 950                                 | 830                      | 137                                       |
|                            |                  | <b>500</b>                     | <b>20.5</b>                           | <b>10.3</b>                         | <b>1340</b>                         | <b>1170</b>              | <b>131</b>                                |
|                            |                  | 700                            | 21.3                                  | 14.9                                | 1810                                | 1580                     | 121                                       |
| BXRA-50C1600-B-xx          | 5000K and 70 CRI | 250                            | 27.7                                  | 6.9                                 | 1000                                | 870                      | 144                                       |
|                            |                  | 350                            | 28.3                                  | 9.9                                 | 1370                                | 1190                     | 138                                       |
|                            |                  | <b>500</b>                     | <b>29.3</b>                           | <b>14.7</b>                         | <b>1930</b>                         | <b>1680</b>              | <b>132</b>                                |
|                            |                  | 700                            | 30.4                                  | 21.3                                | 2600                                | 2270                     | 122                                       |
| BXRA-50C2600-B-xx          | 5000K and 70 CRI | 350                            | 34.2                                  | 12.0                                | 1620                                | 1410                     | 135                                       |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 2320                                | 2020                     | 132                                       |
|                            |                  | <b>700</b>                     | <b>36.2</b>                           | <b>25.3</b>                         | <b>3150</b>                         | <b>2740</b>              | <b>124</b>                                |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 4330                                | 3760                     | 115                                       |
| BXRA-56C1100-B-xx          | 5600K and 70 CRI | 250                            | 19.4                                  | 4.8                                 | 690                                 | 600                      | 142                                       |
|                            |                  | 350                            | 19.8                                  | 6.9                                 | 950                                 | 830                      | 137                                       |
|                            |                  | <b>500</b>                     | <b>20.5</b>                           | <b>10.3</b>                         | <b>1340</b>                         | <b>1170</b>              | <b>131</b>                                |
|                            |                  | 700                            | 21.3                                  | 14.9                                | 1810                                | 1580                     | 121                                       |
| BXRA-56C1600-B-xx          | 5600K and 70 CRI | 250                            | 27.7                                  | 6.9                                 | 1000                                | 870                      | 144                                       |
|                            |                  | 350                            | 28.3                                  | 9.9                                 | 1370                                | 1190                     | 138                                       |
|                            |                  | <b>500</b>                     | <b>29.3</b>                           | <b>14.7</b>                         | <b>1930</b>                         | <b>1680</b>              | <b>132</b>                                |
|                            |                  | 700                            | 30.4                                  | 21.3                                | 2600                                | 2270                     | 122                                       |
| BXRA-56C2600-B-xx          | 5600K and 70 CRI | 350                            | 34.2                                  | 12.0                                | 1620                                | 1410                     | 135                                       |
|                            |                  | 500                            | 35.1                                  | 17.6                                | 2320                                | 2020                     | 132                                       |
|                            |                  | <b>700</b>                     | <b>36.2</b>                           | <b>25.3</b>                         | <b>3150</b>                         | <b>2740</b>              | <b>124</b>                                |
|                            |                  | 1000                           | 37.7                                  | 37.7                                | 4330                                | 3760                     | 115                                       |

Notes for Table 2:

9. Values in **bold** correspond to rated test currents from Table 1. Alternate values are provided for reference only and are not guaranteed.

## Flux Characteristics

Table 3: Flux Characteristics

| Part Number <sup>[1]</sup> | CCT <sup>[2]</sup><br>(Kelvin) | CRI <sup>[3]</sup> | Test<br>Current <sup>[5]</sup><br>(mA) | Minimum<br>Flux <sup>[5]</sup><br>(lm) | Minimum<br>Flux <sup>[10]</sup><br>(lm) | Typical<br>Flux <sup>[6]</sup><br>(lm) | Typical<br>CBCP <sup>[11]</sup><br>(cd) |
|----------------------------|--------------------------------|--------------------|--|--|---|--|---|
|                            |                                |                    |  | T <sub>j</sub> = 25°C                  | T <sub>case</sub> = 85°C                | T <sub>case</sub> = 85°C               | T <sub>j</sub> = 25°C                   |
| BXRA-27E0800-B-03          | 2700K                          | 80                 | 500                                    | 870                                    | 750                                     | 850                                    | 310                                     |
| BXRA-27E1200-B-03          | 2700K                          | 80                 | 500                                    | 1250                                   | 1080                                    | 1230                                   | 450                                     |
| BXRA-27E2000-B-03          | 2700K                          | 80                 | 700                                    | 2030                                   | 1770                                    | 2000                                   | 730                                     |
| BXRA-27G0800-B-03          | 2700K                          | 90                 | 500                                    | 740                                    | 640                                     | 720                                    | 260                                     |
| BXRA-27G1200-B-03          | 2700K                          | 90                 | 500                                    | 1060                                   | 920                                     | 1040                                   | 380                                     |
| BXRA-27G2000-B-03          | 2700K                          | 90                 | 700                                    | 1780                                   | 1550                                    | 1760                                   | 640                                     |
| BXRA-30E0800-B-03          | 3000K                          | 80                 | 500                                    | 950                                    | 830                                     | 930                                    | 340                                     |
| BXRA-30E1200-B-03          | 3000K                          | 80                 | 500                                    | 1360                                   | 1180                                    | 1340                                   | 490                                     |
| BXRA-30E2000-B-03          | 3000K                          | 80                 | 700                                    | 2170                                   | 1890                                    | 2140                                   | 780                                     |
| BXRA-30G0800-B-03          | 3000K                          | 90                 | 500                                    | 800                                    | 690                                     | 780                                    | 290                                     |
| BXRA-30G1200-B-03          | 3000K                          | 90                 | 500                                    | 1160                                   | 1010                                    | 1140                                   | 420                                     |
| BXRA-30G2000-B-03          | 3000K                          | 90                 | 700                                    | 1850                                   | 1610                                    | 1810                                   | 660                                     |
| BXRA-35E0800-B-03          | 3500K                          | 80                 | 500                                    | 1000                                   | 870                                     | 980                                    | 360                                     |
| BXRA-35E1200-B-03          | 3500K                          | 80                 | 500                                    | 1440                                   | 1250                                    | 1420                                   | 520                                     |
| BXRA-35E2000-B-03          | 3500K                          | 80                 | 700                                    | 2300                                   | 2000                                    | 2270                                   | 830                                     |
| BXRA-40E0950-B-03          | 4000K                          | 80                 | 500                                    | 1060                                   | 920                                     | 1040                                   | 380                                     |
| BXRA-40E1350-B-03          | 4000K                          | 80                 | 500                                    | 1520                                   | 1330                                    | 1500                                   | 550                                     |
| BXRA-40E2200-B-03          | 4000K                          | 80                 | 700                                    | 2470                                   | 2140                                    | 2430                                   | 890                                     |
| BXRA-50C1100-B-xx          | 5000K                          | 70                 | 500                                    | 1180                                   | 1030                                    | 1170                                   | 430                                     |
| BXRA-50C1600-B-xx          | 5000K                          | 70                 | 500                                    | 1700                                   | 1480                                    | 1680                                   | 610                                     |
| BXRA-50C2600-B-xx          | 5000K                          | 70                 | 700                                    | 2780                                   | 2420                                    | 2740                                   | 1000                                    |
| BXRA-56C1100-B-xx          | 5600K                          | 70                 | 500                                    | 1180                                   | 1030                                    | 1170                                   | 430                                     |
| BXRA-56C1600-B-xx          | 5600K                          | 70                 | 500                                    | 1700                                   | 1480                                    | 1680                                   | 610                                     |
| BXRA-56C2600-B-xx          | 5600K                          | 70                 | 700                                    | 2780                                   | 2420                                    | 2740                                   | 1000                                    |

Notes for Table 3:

10. Minimum flux values at elevated temperatures are provided for reference only and are not guaranteed by 100% production testing. Based on Bridgelux test setup, values may vary depending on the thermal design of the luminaire and/or the environment in which the product is operated.
11. Center beam candle power is a calculated value based on a Lambertian radiation pattern at the rated test current.

## Electrical Characteristics

Table 4: Electrical Characteristics

| Part Number <sup>[1]</sup> | Test Current <sup>[5]</sup><br>(mA) | Operating Voltage<br>$T_j = 25^\circ\text{C}$ <sup>[5, 12]</sup><br>(V) |         |         | Typical Coefficient of Forward Voltage <sup>[13]</sup><br>(mV/°C)<br>$\Delta V_f/\Delta T_j$ | Typical Thermal Resistance Junction to Case<br>(°C/W)<br>$R_{\theta j-c}$ |
|----------------------------|-------------------------------------|---|---------|---------|--|---|
|                            |                                     | Minimum   | Typical | Maximum |  |   |
| BXRA-27E0800-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-27E1200-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-27E2000-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-27G0800-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-27G1200-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-27G2000-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-30E0800-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-30E1200-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-30E2000-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-30G0800-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-30G1200-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-30G2000-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-35E0800-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-35E1200-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-35E2000-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-40E0950-B-03          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-40E1350-B-03          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-40E2200-B-03          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-50C1100-B-xx          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-50C1600-B-xx          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-50C2600-B-xx          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |
| BXRA-56C1100-B-xx          | 500                                 | 18.4  | 20.5    | 22.5    | -7 to -21  | 0.95  |
| BXRA-56C1600-B-xx          | 500                                 | 26.3  | 29.3    | 32.2    | -10 to -30   | 0.80  |
| BXRA-56C2600-B-xx          | 700                                 | 32.6  | 36.2    | 39.8    | -12 to -36   | 0.65  |

Notes for Table 4:

12. Bridgelux maintains a tester tolerance of  $\pm 0.10$  V on forward voltage measurements. Voltage minimum and maximum values at the rated test current are guaranteed by 100% test.

13. Typical Coefficient of Forward Voltage maintains a tolerance of  $\pm 0.1$  from nominal current.

## Absolute Maximum Ratings

Table 5: Maximum Current and Reverse Voltage Ratings

| CCT <sup>[2]</sup><br>(Kelvin) | Part Number <sup>[1]</sup> | DC Forward Current for<br>LM-80 (mA) <sup>[4,5,6]</sup> | Maximum Peak<br>Pulsed Current<br>(mA) <sup>[14, 16]</sup> | Maximum Reverse<br>Voltage<br>(V <sub>r</sub> ) <sup>[15]</sup> |
|--------------------------------|----------------------------|---|--|---|
| 2700K                          | BXRA-27E0800-B-03          | 700   | 1400   | -35   |
|                                | BXRA-27G0800-B-03          | 700   | 1400   | -35   |
|                                | BXRA-27E1200-B-03          | 700   | 1400   | -50   |
|                                | BXRA-27G1200-B-03          | 700   | 1400   | -50   |
|                                | BXRA-27E2000-B-03          | 700   | 1400   | -60   |
|                                | BXRA-27G2000-B-03          | 700   | 1400   | -60   |
| 3000K                          | BXRA-30E0800-B-03          | 700   | 1400   | -35   |
|                                | BXRA-30G0800-B-03          | 700   | 1400   | -35   |
|                                | BXRA-30E1200-B-03          | 700   | 1400   | -50   |
|                                | BXRA-30G1200-B-03          | 700   | 1400   | -50   |
|                                | BXRA-30E2000-B-03          | 700   | 1400   | -60   |
|                                | BXRA-30G2000-B-03          | 700   | 1400   | -60   |
| 3500K                          | BXRA-35E0800-B-03          | 700   | 1400   | -35   |
|                                | BXRA-35E1200-B-03          | 700   | 1400   | -50   |
|                                | BXRA-35E2000-B-03          | 700   | 1400   | -60   |
| 4000K                          | BXRA-40E0950-B-03          | 700   | 1400   | -35   |
|                                | BXRA-40E1350-B-03          | 700   | 1400   | -50   |
|                                | BXRA-40E2200-B-03          | 700   | 1400   | -60   |
| 5000K                          | BXRA-50C1100-B-xx          | 700   | 1400   | -35   |
|                                | BXRA-50C1600-B-xx          | 700   | 1400   | -50   |
|                                | BXRA-50C2600-B-xx          | 700   | 1400   | -60   |
| 5600K                          | BXRA-56C1100-B-xx          | 700   | 1400   | -35   |
|                                | BXRA-56C1600-B-xx          | 700   | 1400   | -50   |
|                                | BXRA-56C2600-B-xx          | 700   | 1400   | -60   |

### Notes for Table 5:

14. Bridgelux recommends a maximum duty cycle of 10% when operating LED Arrays at the maximum peak pulsed current specified.
15. Light emitting diodes are not designed to be driven in reverse voltage.
16. Maximum peak pulsed currents are values at which the LED Array can be driven without catastrophic failures.
17. DC Forward Current for LM-80 are the maximum drive currents for which LM-80 data is currently available
18. Lumen maintenance (L70) and lifetime predictions are valid for drive current and case temperature conditions used for LM-80 testing as included in the applicable LM-80 test report for these arrays.
19. Arrays can be driven at higher currents but lumen maintenance may be reduced

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Table 6: Maximum Ratings

| Parameter                            | Maximum Rating                              |
|--------------------------------------|---|
| LED Junction Temperature             | 150°C                                       |
| Storage Temperature                  | -40°C to +105°C                             |
| Operating Case Temperature           | 105°C                                       |
| Soldering Temperature <sup>[1]</sup> | 350°C or lower for a maximum of 3.5 seconds |

Note for Table 6:

20. Refer to Bridgelux Application Note AN15: Reflow soldering of Bridgelux LED Arrays for solder procedure ([www.Bridgelux.com](http://www.Bridgelux.com))

## Forward Current Characteristics

Figure 2: Typical Current vs. Voltage

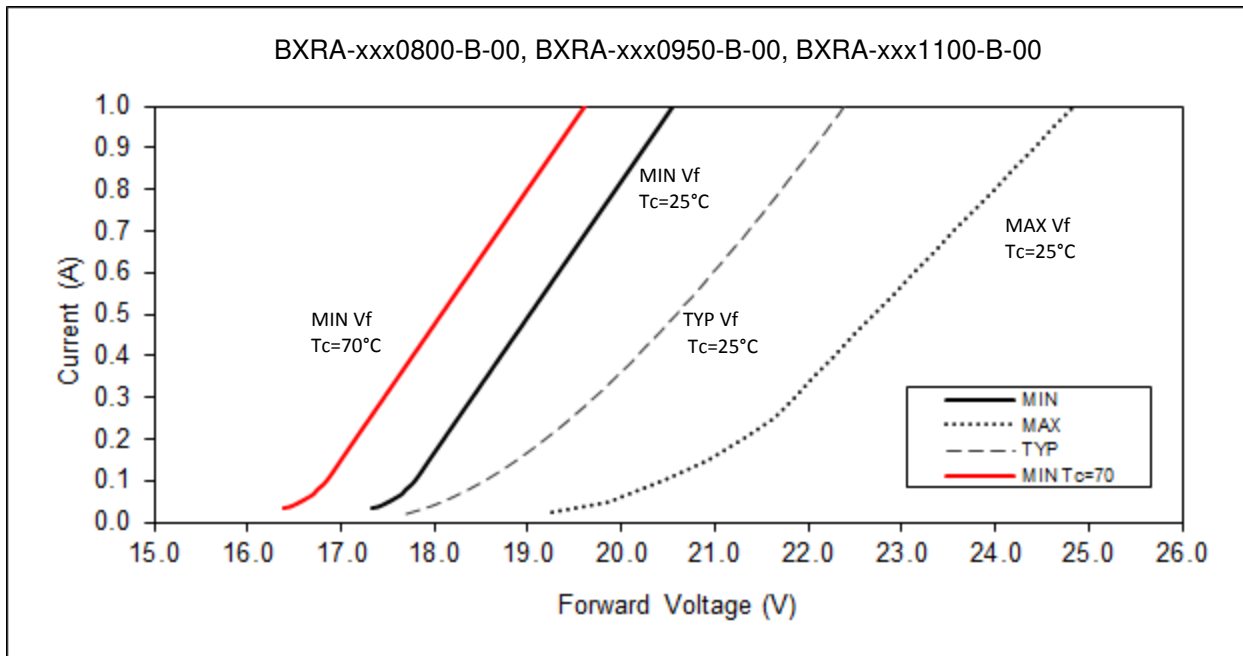
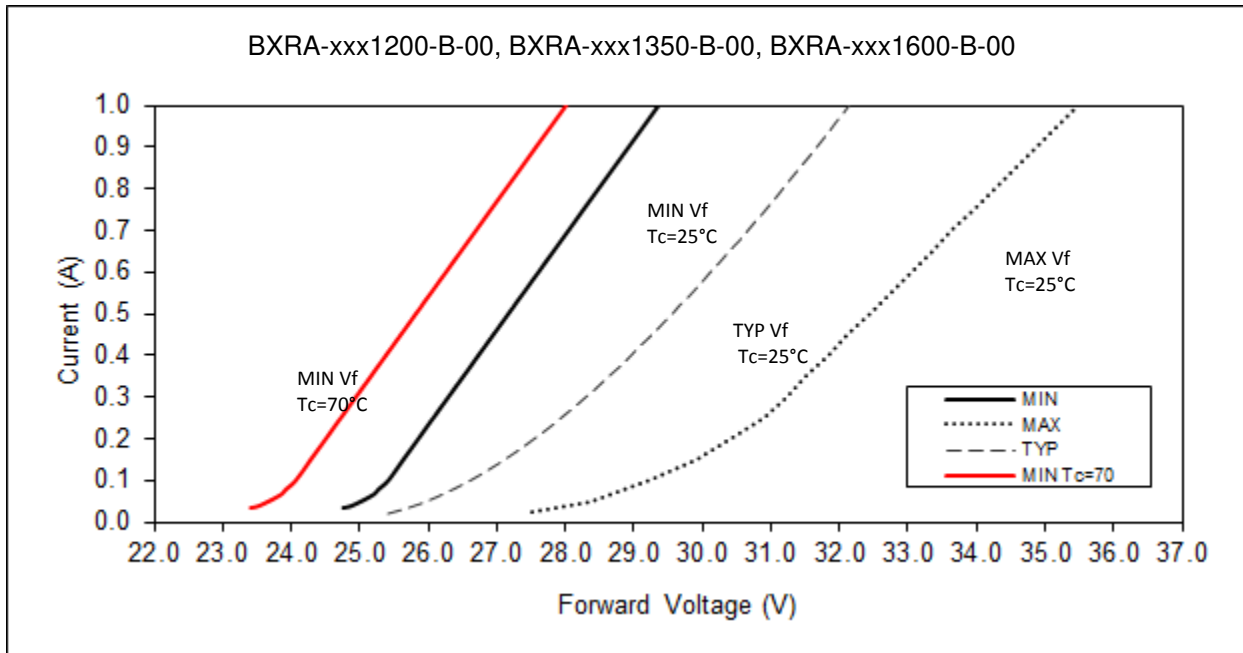
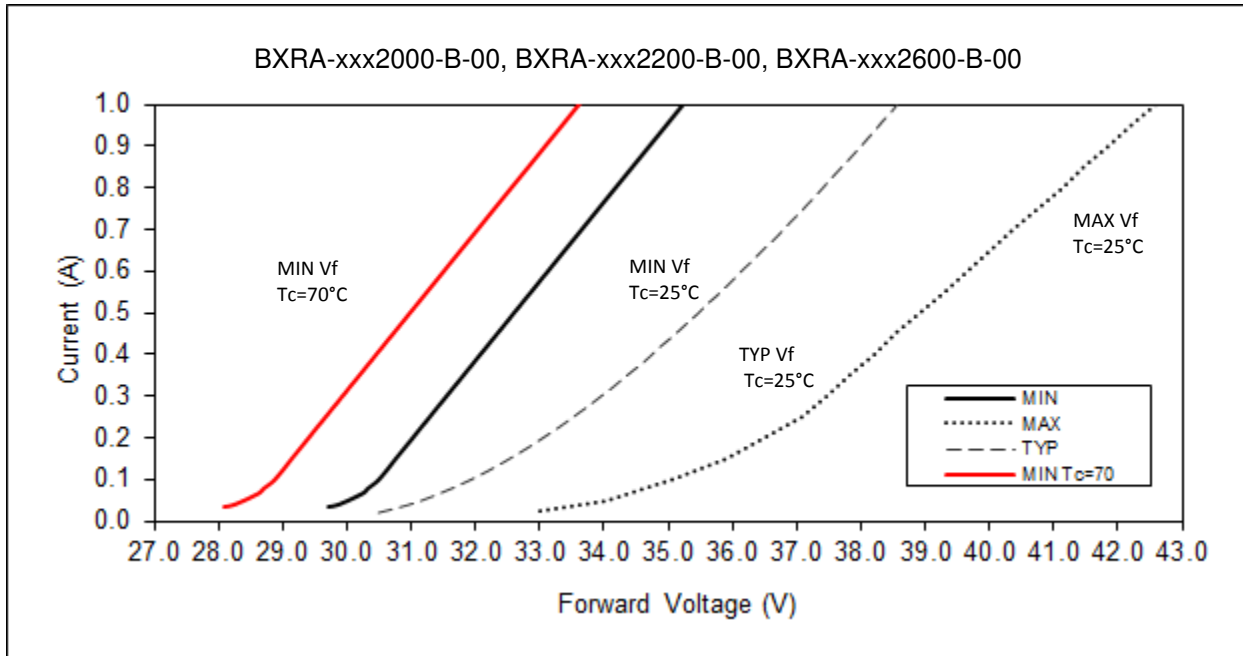


Figure 3: Typical Current vs. Voltage



Forward Current Characteristics (continued)

Figure 4: Typical Current vs. Voltage





## Typical Relative Luminous Flux vs. Current

Typical performance at any drive current can be derived from the current versus voltage characteristics shown in Figures 2, 3, and 4 and the flux versus current characteristics shown in Figures 5 and 6. Figure 5 and 6 represent typical performance when pulsed at a junction temperature of 25 degrees Celsius.

Figure 5: Typical Flux vs. Current

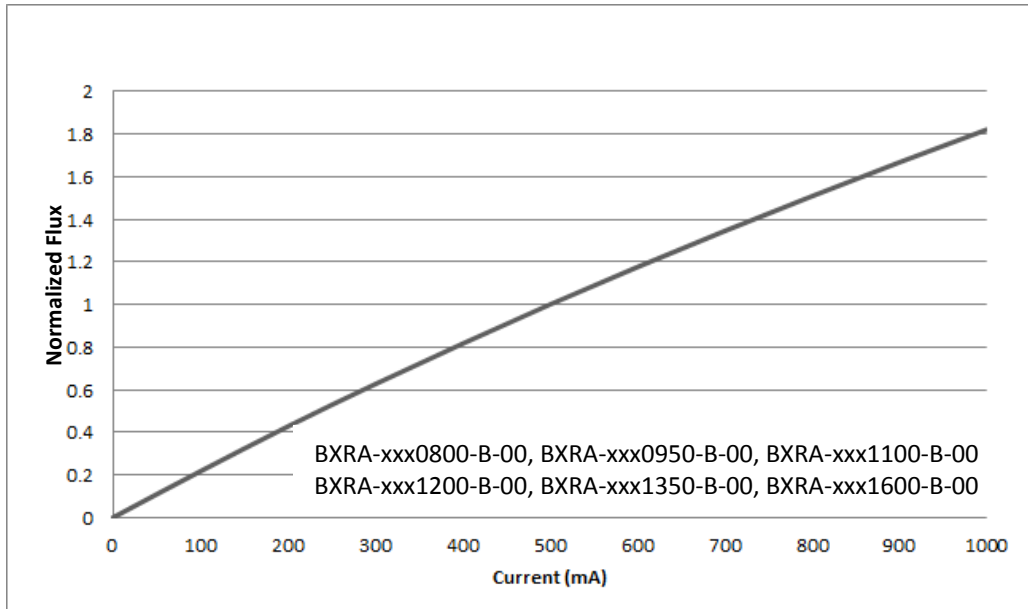
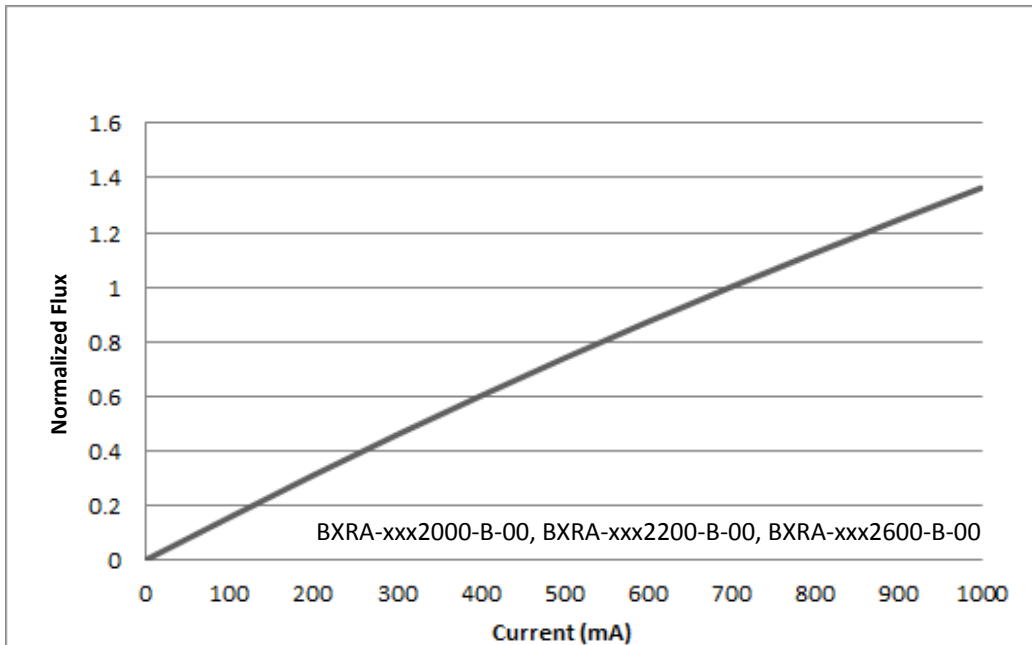
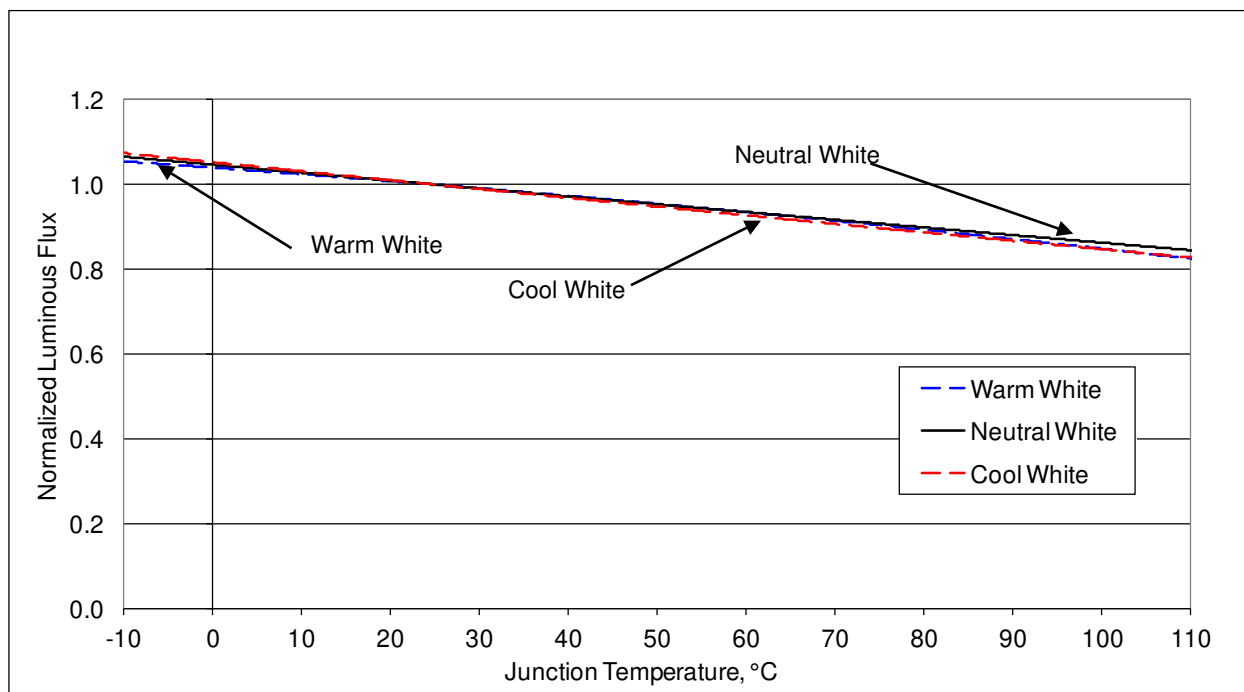


Figure 6: Typical Flux vs. Current



## Typical Chromaticity Characteristics (continued)

Figure 7: Typical Flux vs. Junction Temperature



Note for Figures 7, 8 and 9:

1. Characteristics shown for Warm White 3000K 80CRI
2. Characteristics shown for Neutral White 4000K 80CRI
3. Characteristics shown for Neutral White 5000K 70CRI

Typical Chromaticity Characteristics (continued)

Figure 8: Typical Flux vs. Junction Temperature

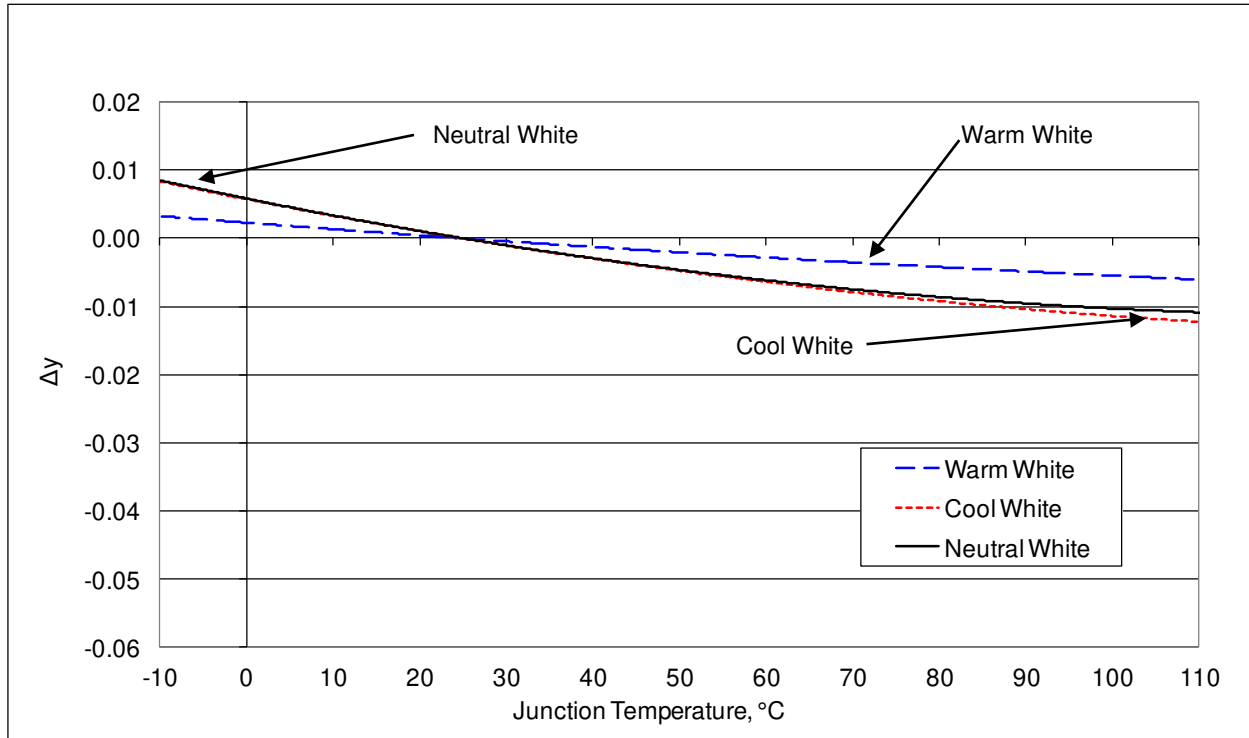
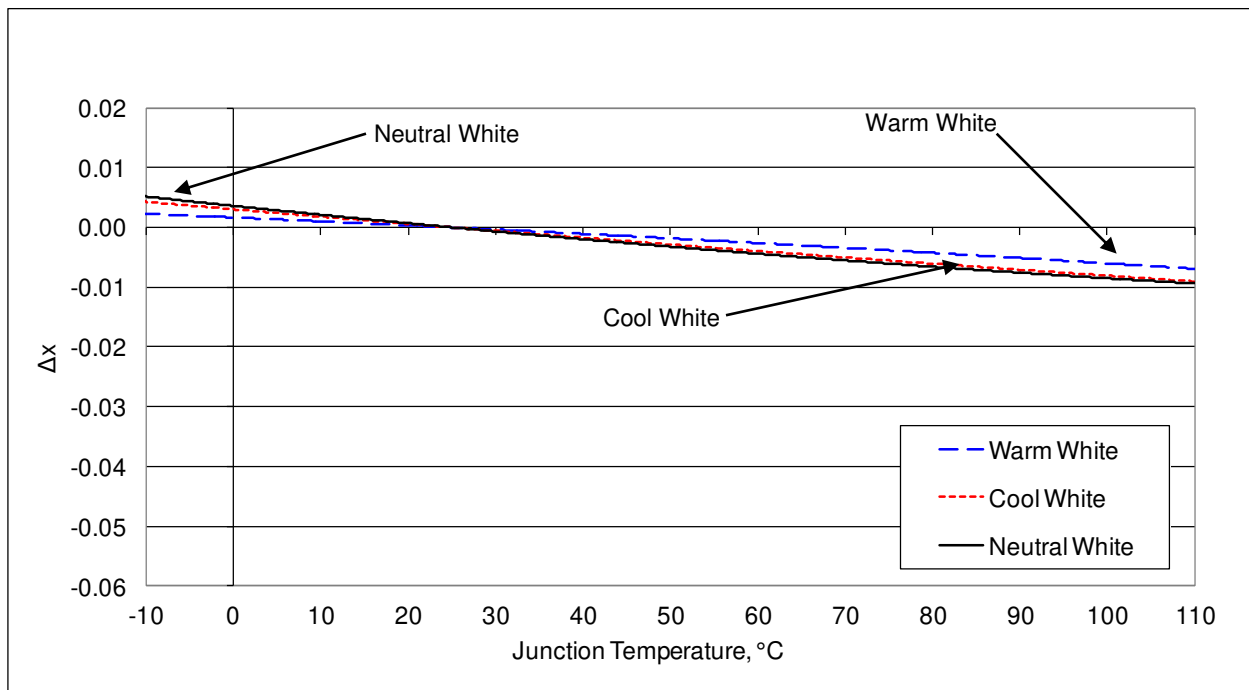
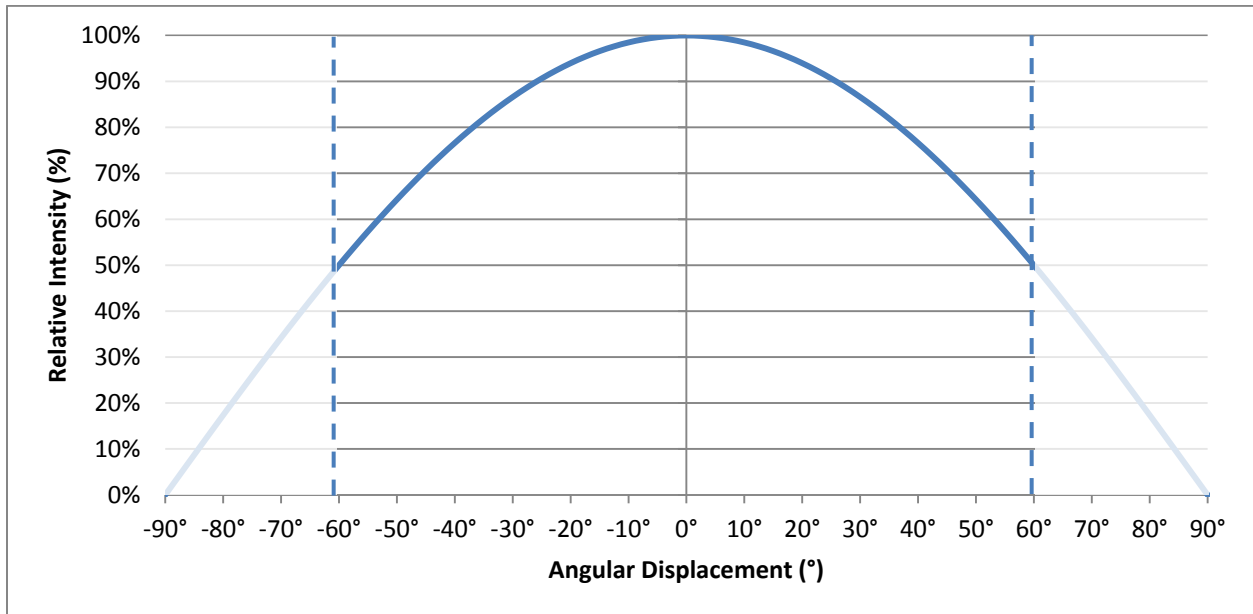


Figure 9: Typical Flux vs. Junction Temperature



## Typical Radiation Pattern

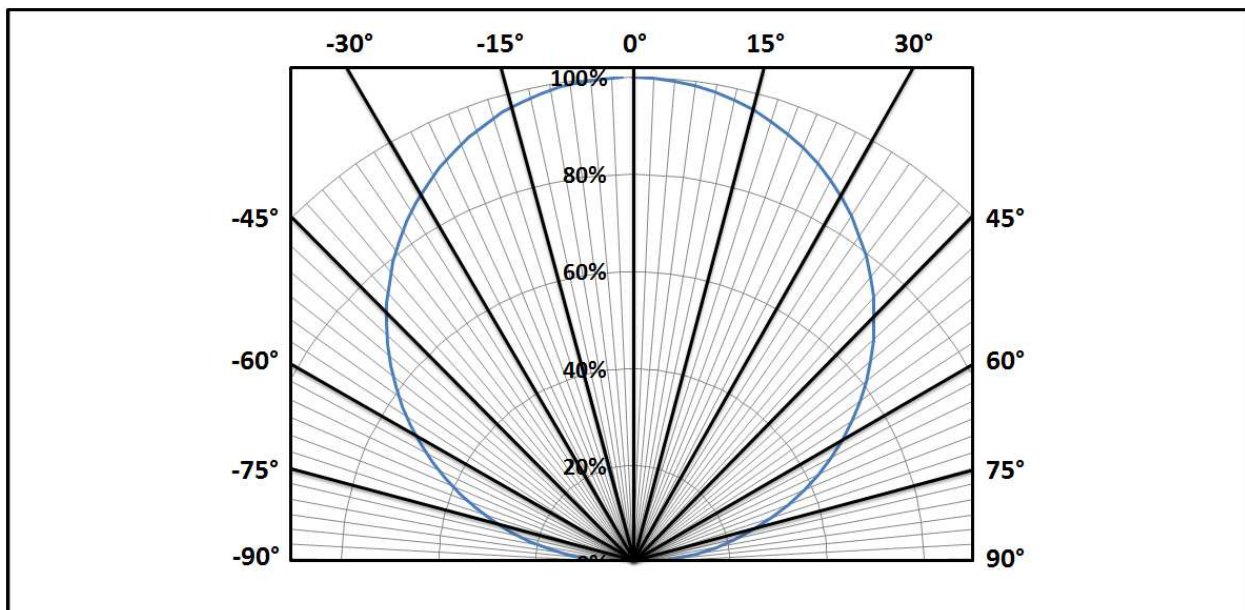
Figure 10: Typical Spatial Radiation Pattern



Notes for figure 10:

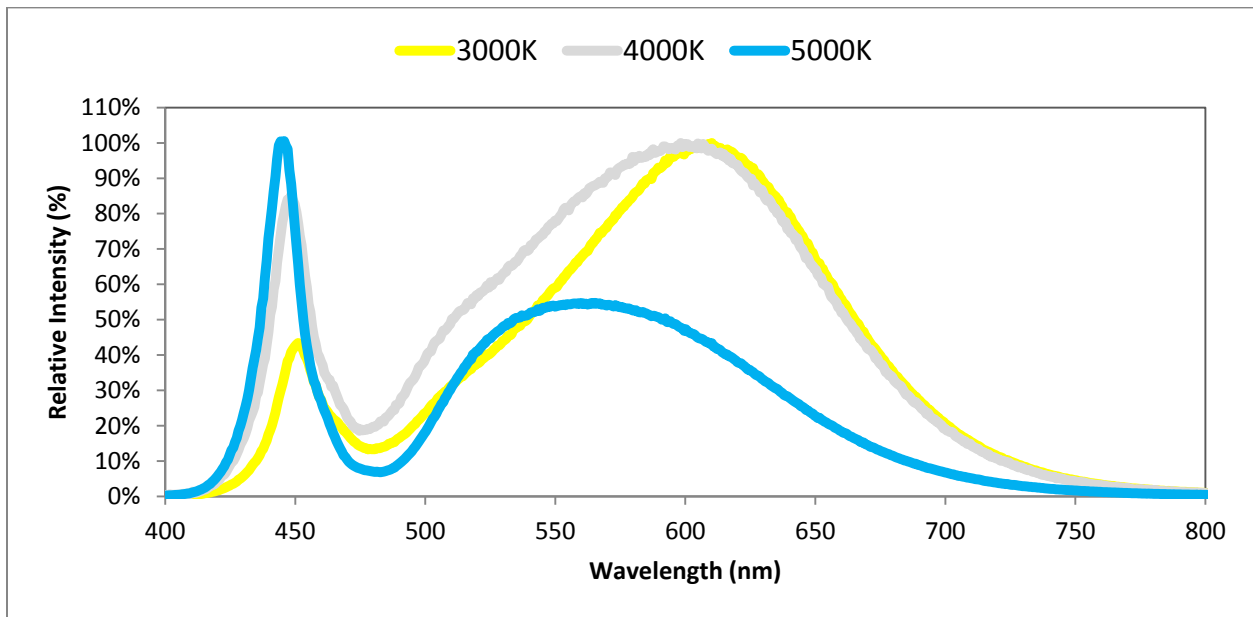
1. Typical viewing angle is 120°
2. Viewing angle is defined as the off axis angle from the centerline where vertical intensity is ½ of the peak intensity value.

Figure 11: Typical Polar Radiation Pattern



## Typical Spectral Characteristics

Figure 12: Typical Color Spectrum

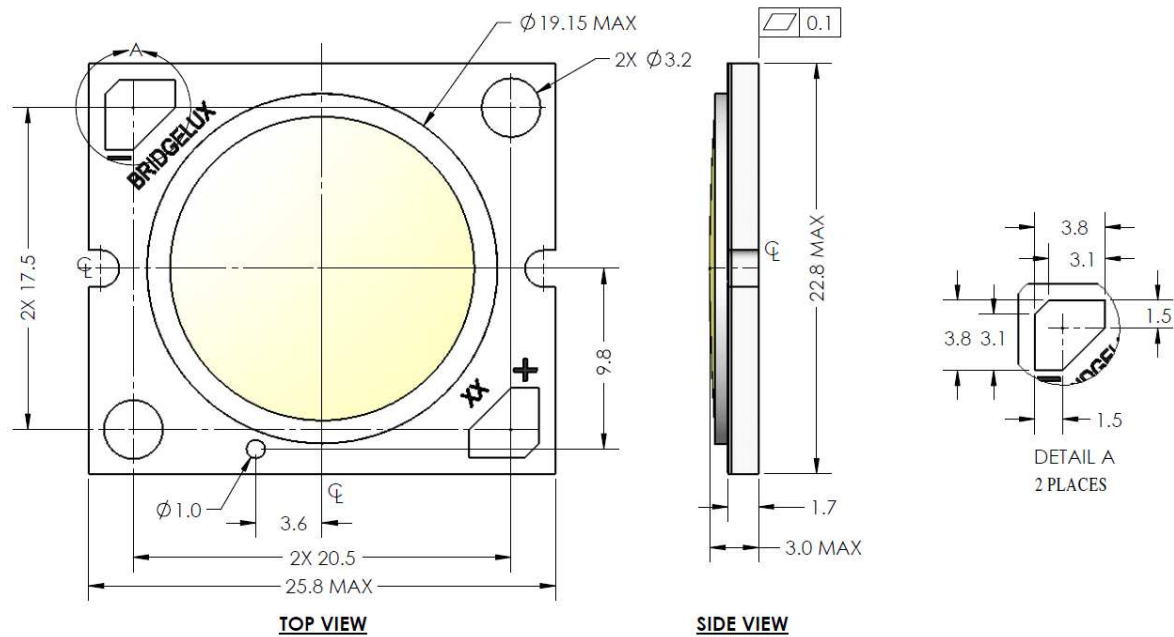


Notes for Figure 12:

1. Color spectra measured at rated current and  $T_j = 25^\circ\text{C}$ .
2. Color spectrum shown for warm white is 3000K and 80 CRI.
3. Color spectrum shown for neutral white is 4000K and 80 CRI.
4. Color spectrum shown for cool white is 5000K and 70 CRI.

## Mechanical Dimensions

Figure 13: Drawing for ES Rectangular Arrays

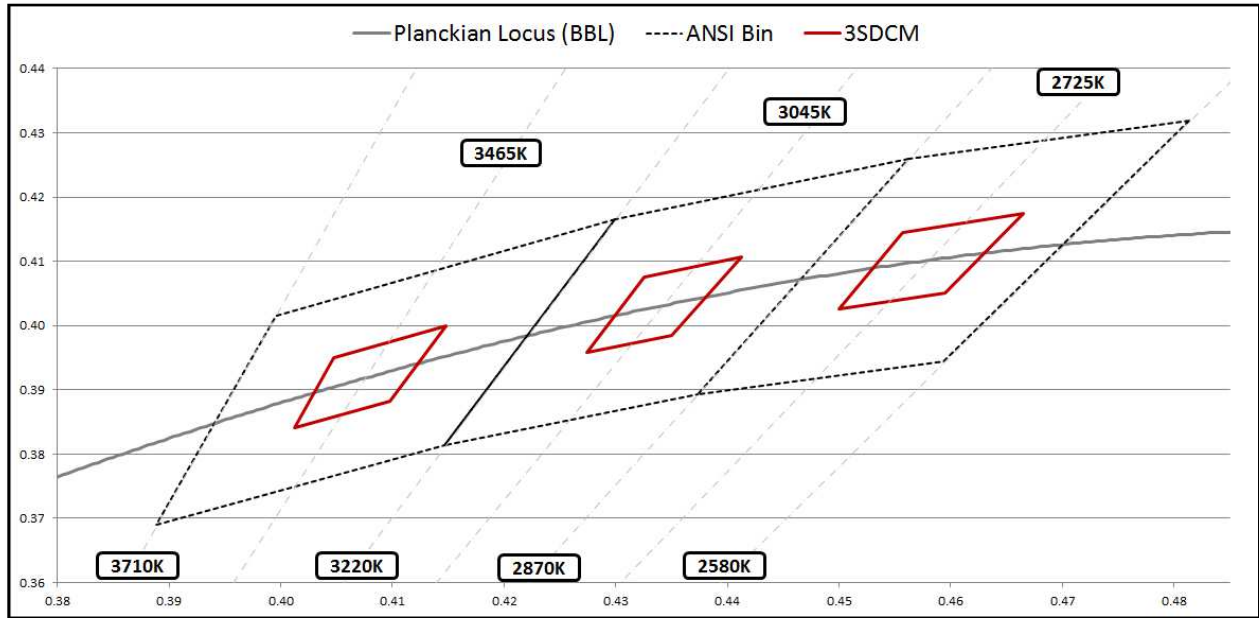


### Notes for Figure 13:

1. Mounting holes are for M2.5 or #4 screws.
2. Solder pads are labeled "+" and "-" to denote positive and negative, respectively.
3. It is not necessary to provide electrical connections to both sets of solder pads. Either set may be used depending on application specific design requirements.
4. Drawings are not to scale.
5. Drawing dimensions are in millimeters.
6. Unless otherwise specified, tolerances are  $\pm 0.10$ mm.
7. The optical center of the LED Array is nominally defined by the mechanical center of the array. The light emitting surface (LES) is centered on the mechanical center of the array to a tolerance of  $\pm 0.45$  mm
8. Bridgelux maintains a flatness of 0.1 mm across the mounting surface of the array. Refer to Application Notes AN10 and AN11 for product handling, mounting and heat sink recommendations.

## Color Binning Information

Figure 14: Graph of Warm White Test Bins in xy Color Space



Note: 3SDCM bins are shown inside standard ANSI bins for comparison purposes.

Table 7: Warm White xy Bin Coordinates and Associated Typical CCT

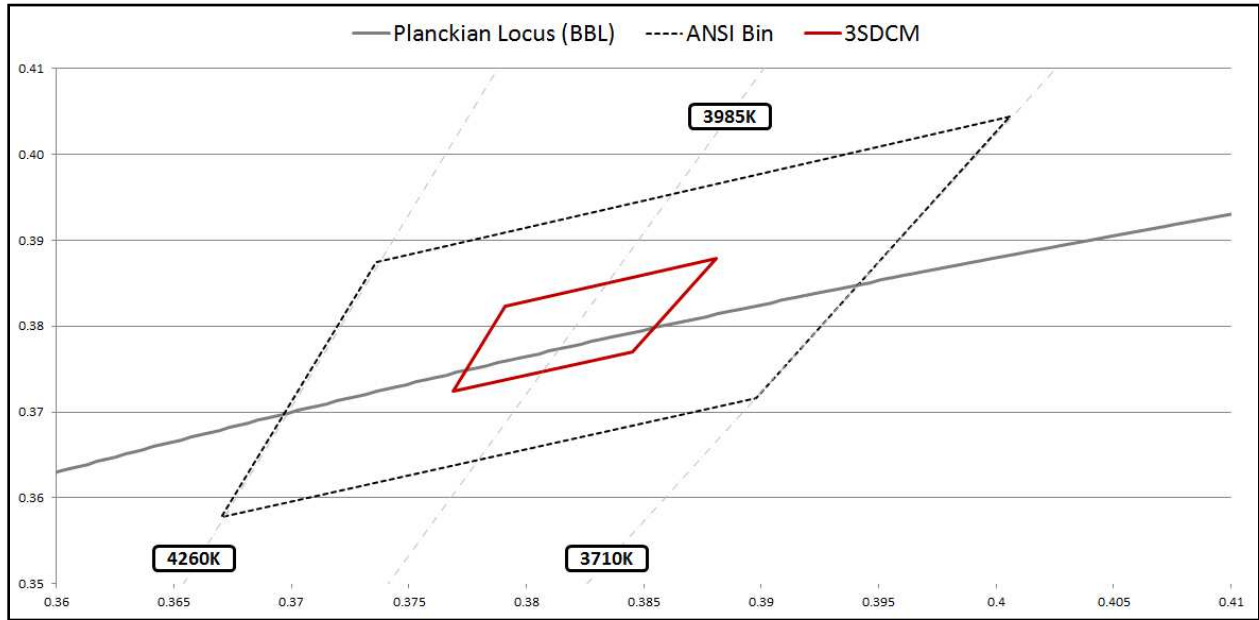
| Bin Code      | x      | y      | CCT (K) |
|---------------|--------|--------|---------|
| X3<br>(3SDCM) | 0.4148 | 0.4000 | 3500    |
|               | 0.4047 | 0.3950 |         |
|               | 0.4012 | 0.3841 |         |
|               | 0.4098 | 0.3883 |         |
|               | 0.4148 | 0.4000 |         |

| Bin Code      | x      | y      | CCT (K) |
|---------------|--------|--------|---------|
| X3<br>(3SDCM) | 0.4413 | 0.4107 | 3000    |
|               | 0.4325 | 0.4075 |         |
|               | 0.4274 | 0.3958 |         |
|               | 0.4350 | 0.3984 |         |
|               | 0.4413 | 0.4107 |         |

| Bin Code      | x      | y      | CCT (K) |
|---------------|--------|--------|---------|
| X3<br>(3SDCM) | 0.4665 | 0.4175 | 2700    |
|               | 0.4557 | 0.4145 |         |
|               | 0.4500 | 0.4026 |         |
|               | 0.4595 | 0.4050 |         |
|               | 0.4665 | 0.4175 |         |

Color Binning Information (continued)

Figure 15: Graph of Neutral White Test Bins in xy Color Space



Note: 3SDCM bins are shown inside standard ANSI bins for comparison purposes.

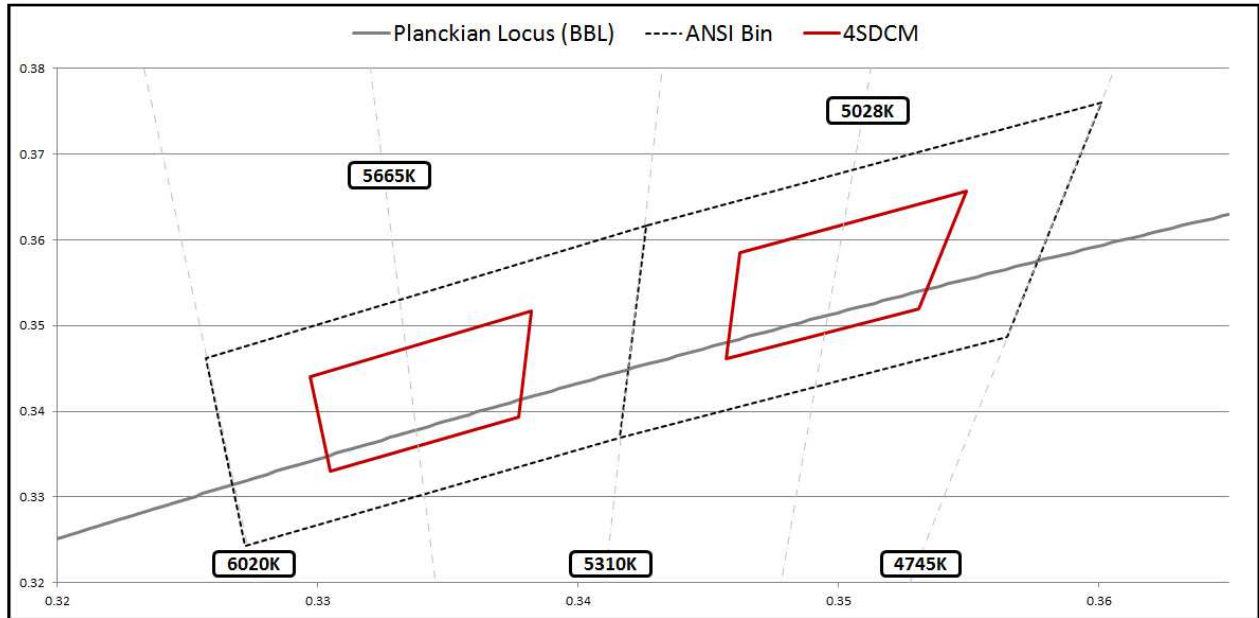
Table 8: Neutral White xy Bin Coordinates and Associated Typical CCT

| Bin Code    | X                                    | Y                                   | CCT (K) |
|-------------|--------------------------------------|-------------------------------------|---------|
| X3<br>3SDCM | 0.3881<br>0.3791<br>0.3769<br>0.3845 | 0.3879<br>0.3823<br>0.3724<br>0.377 | 4000    |



Color Binning Information (continued)

Figure 16: Graph of Cool White Test Bins in xy Color Space



Note: 4SDCM bins are shown inside standard ANSI bins for comparison purposes.

Table 9: Cool White xy Bin Coordinates and Associated Typical CCT

| Bin Code | X      | Y      | ANSI CCT (K) | Bin Code | X      | Y      | ANSI CCT (K) |
|----------|--------|--------|--------------|----------|--------|--------|--------------|
| G3       | 0.3376 | 0.3616 | 5000         | E3       | 0.3215 | 0.3353 | 5600         |
|          | 0.3464 | 0.3688 |              |          | 0.3293 | 0.3423 |              |
|          | 0.3452 | 0.3558 |              |          | 0.3292 | 0.3539 |              |
|          | 0.3371 | 0.3493 |              |          | 0.3207 | 0.3462 |              |
| G4       | 0.3371 | 0.3493 | 5000         | E4       | 0.3222 | 0.3243 | 5600         |
|          | 0.3452 | 0.3558 |              |          | 0.3294 | 0.3306 |              |
|          | 0.3441 | 0.3428 |              |          | 0.3293 | 0.3423 |              |
|          | 0.3366 | 0.3369 |              |          | 0.3215 | 0.3353 |              |
| H3       | 0.3464 | 0.3688 | 5000         | F3       | 0.3292 | 0.3539 | 5600         |
|          | 0.3551 | 0.376  |              |          | 0.3293 | 0.3423 |              |
|          | 0.3533 | 0.3624 |              |          | 0.3371 | 0.3493 |              |
|          | 0.3452 | 0.3558 |              |          | 0.3376 | 0.3616 |              |

|               |        |        |      |
|---------------|--------|--------|------|
| H4            | 0.3452 | 0.3558 | 5000 |
|               | 0.3533 | 0.3624 |      |
|               | 0.3515 | 0.3487 |      |
|               | 0.3441 | 0.3428 |      |
| X4<br>(4SDCM) | 0.3499 | 0.3657 | 5000 |
|               | 0.3412 | 0.3585 |      |
|               | 0.3407 | 0.3461 |      |
|               | 0.3481 | 0.3520 |      |

|               |        |        |      |
|---------------|--------|--------|------|
| F4            | 0.3294 | 0.3306 | 5600 |
|               | 0.3366 | 0.3369 |      |
|               | 0.3371 | 0.3493 |      |
|               | 0.3293 | 0.3423 |      |
| X4<br>(4SDCM) | 0.3332 | 0.3517 | 5600 |
|               | 0.3247 | 0.3440 |      |
|               | 0.3255 | 0.3330 |      |
|               | 0.3327 | 0.3393 |      |