# Cree® XLamp® CXB1507 LED


## PRODUCT DESCRIPTION

The XLamp® CXB1507 LED Array is a member of the second generation of the CXA family that delivers up to 30% higher efficacy and up to 20% higher lumens than the first generation in the same LES. The higher performance second generation CXA LED Arrays are compatible with the first generation, providing a drop-in performance upgrade to existing CXA LED designs to shorten the luminaire design cycle and improve time to market. Available in 2-step, 3-step and 5-step EasyWhite® bins, the CXB1507 LED delivers high lumen output and high efficacy in a single, easy-to-use package that eliminates the need for reflow soldering, enabling lighting manufacturers to rapidly address small form factor lighting applications.

The CX Family LED Design Guide provides basic information on the requirements to use the CXB1507 LED successfully in luminaire designs.

## FEATURES

- 9-mm optical source
- Mechanical and optical design consistent with other CXA15 and CXB15 LEDs
- Available in 70-, 80-and 90-minimum CRI options
- Cree EasyWhite® 2-, 3- and 5-step binning
- Forward voltage options: 18-V class & 36-V class
- 85 °C binning and characterization
- Extremely uniform color over viewing angle
- Top-side solder connections
- Thermocouple attach point
- NEMA SSL-3 2011 standard flux bins
- RoHS- and REACh-compliant
- UL® recognized component (E349212)

## TABLE OF CONTENTS







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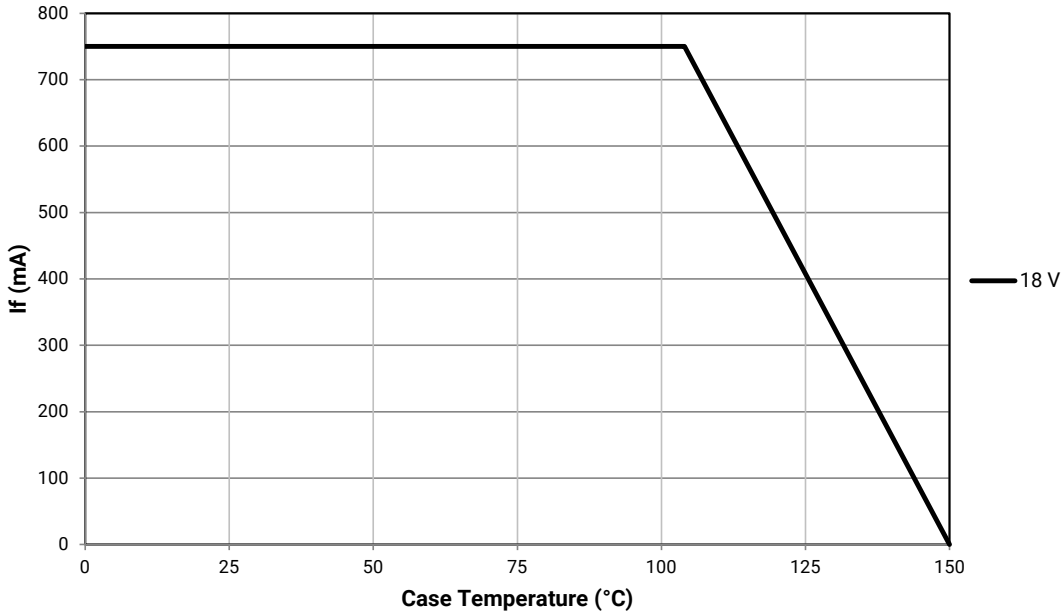
## CHARACTERISTICS

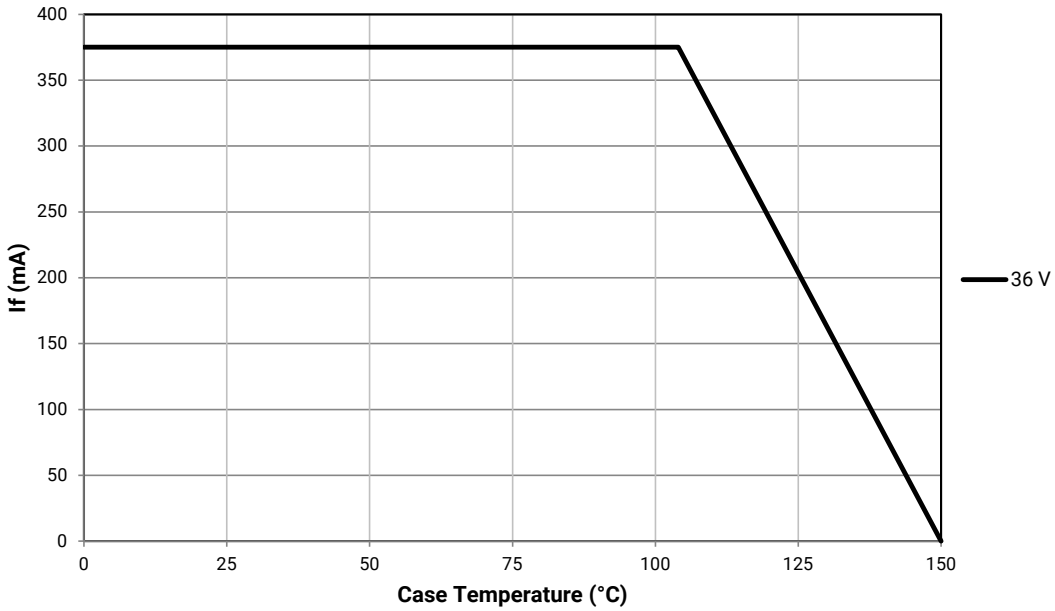
| Characteristics | Unit | Minimum | Typical | Maximum |
|---|---|---|---|---|
| Viewing angle (FWHM) | degrees | | 115 | |
| ESD withstand voltage (HBM per Mil-Std-883D) | V | | | 8000 |
| DC forward current (18 V) | mA | | | 750* |
| DC forward current (36 V) | mA | | | 375* |
| Reverse current 18 V, 36 V) | mA | | | 0.1 |
| Forward voltage (18 V, 400 mA, 85 °C) | V | | 17.3 | 19 |
| Forward voltage (36 V, 200 mA, 85 °C) | V | | 34.5 | 38 |

* Refer to the Operating Limits section.

## OPERATING LIMITS

The maximum current rating of the CXB1507 is dependent on the case temperature (Tc) when the LED has reached thermal equilibrium under steady-state operation. The graphs shown below assume that the system design employs good thermal management (thermal interface material and heat sink) and may vary when poor thermal management is employed. Please refer to the Mechanical Dimensions section on page 15 for the location of the Tc measurement point.



## FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 18 V ($I_F$ = 400 mA, $T_J$ = 85 °C)

The following table provides order codes for XLamp CXB1507 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 15).

| Nominal CCT | CRI* | | Minimum Luminous Flux | | | 2-Step | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C** | Group | Order Code | Group | Order Code | Group | Order Code |
| 6500 K | 70 | --- | H4 | 970 | 1080 | | | | | 65E | CXB1507-0000-000F0BH465E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0BJ265E |
| | 80 | --- | H4 | 970 | 1080 | | | | | 65E | CXB1507-0000-000F0HH465E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0HJ265E |
| 5700 K | 70 | --- | H4 | 970 | 1080 | | | | | 57E | CXB1507-0000-000F0BH457E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0BJ257E |
| | 80 | --- | H4 | 970 | 1080 | | | | | 57E | CXB1507-0000-000F0HH457E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0HJ257E |
| 5000 K | 70 | --- | H4 | 970 | 1080 | | | | | 50E | CXB1507-0000-000F0BH450E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0BJ250E |
| | 80 | --- | H4 | 970 | 1080 | | | 50G | CXB1507-0000-000F0HH450G | 50E | CXB1507-0000-000F0HH450E |
| | | | J2 | 1040 | 1158 | | | | CXB1507-0000-000F0HJ250G | | CXB1507-0000-000F0HJ250E |
| | 90 | 92 | G4 | 840 | 935 | | | 50G | CXB1507-0000-000F0UG450G | | |
| | | | H2 | 900 | 1002 | | | | CXB1507-0000-000F0UH250G | | |
| 4000 K | 70 | --- | H4 | 970 | 1080 | | | | | 40E | CXB1507-0000-000F0BH440E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000F0BJ240E |
| | 80 | --- | H2 | 900 | 1002 | 40H | CXB1507-0000-000F0HH240H | 40G | CXB1507-0000-000F0HH240G | | |
| | | | H4 | 970 | 1080 | | CXB1507-0000-000F0HH440H | | CXB1507-0000-000F0HH440G | | |
| | 90 | 92 | G2 | 780 | 869 | 40H | CXB1507-0000-000F0UG240H | 40G | CXB1507-0000-000F0UG240G | | |
| | | | G4 | 840 | 935 | | CXB1507-0000-000F0UG440H | | CXB1507-0000-000F0UG440G | | |

Notes

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 21).
- Cree XLamp CXB1507 LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

* For 80 CRI minimum LEDs, CRI R9 minimum is 0 with a ±2 tolerance. For 90 CRI minimum LEDs, CRI R9 typical is 60.

** Flux values @ 25 °C are calculated and for reference only.

## FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 18 V ($I_F$ = 400 mA, $T_J$ = 85 °C) - CONTINUED

| Nominal CCT | CRI* | | Minimum Luminous Flux | | | 2-Step | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C** | Group | Order Code | Group | Order Code | Group | Order Code |
| 3500 K | 80 | --- | H2 | 900 | 1002 | 35H | CXB1507-0000-000F0HH235H | 35G | CXB1507-0000-000F0HH235G | | |
| | | | H4 | 970 | 1080 | | CXB1507-0000-000F0HH435H | | CXB1507-0000-000F0HH435G | | |
| | 90 | 92 | G2 | 780 | 869 | 35H | CXB1507-0000-000F0UG235H | 35G | CXB1507-0000-000F0UG235G | | |
| | | | G4 | 840 | 935 | | CXB1507-0000-000F0UG435H | | CXB1507-0000-000F0UG435G | | |
| 3000 K | 80 | --- | G4 | 840 | 935 | 30H | CXB1507-0000-000F0HG430H | 30G | CXB1507-0000-000F0HG430G | | |
| | | | H2 | 900 | 1002 | | CXB1507-0000-000F0HH230H | | CXB1507-0000-000F0HH230G | | |
| | 90 | 92 | F4 | 730 | 813 | 30H | CXB1507-0000-000F0UF430H | 30G | CXB1507-0000-000F0UF430G | | |
| | | | G2 | 780 | 869 | | CXB1507-0000-000F0UG230H | | CXB1507-0000-000F0UG230G | | |
| 2700 K | 80 | --- | G4 | 840 | 935 | 27H | CXB1507-0000-000F0HG427H | 27G | CXB1507-0000-000F0HG427G | | |
| | | | H2 | 900 | 1002 | | CXB1507-0000-000F0HH227H | | CXB1507-0000-000F0HH227G | | |
| | 90 | 92 | F2 | 680 | 757 | 27H | CXB1507-0000-000F0UF227H | 27G | CXB1507-0000-000F0UF227G | | |
| | | | F4 | 730 | 813 | | CXB1507-0000-000F0UF427H | | CXB1507-0000-000F0UF427G | | |

Notes

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 21).
- Cree XLamp CXB1507 LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

* For 80 CRI minimum LEDs, CRI R9 minimum is 0 with a ±2 tolerance. For 90 CRI minimum LEDs, CRI R9 typical is 60.

** Flux values @ 25 °C are calculated and for reference only.

## FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 36 V ($I_F$ = 200 mA, $T_J$ = 85 °C)

The following table provides order codes for XLamp CXB1507 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 15).

| Nominal CCT | CRI* | | Minimum Luminous Flux | | | 2-Step | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C** | Group | Order Code | Group | Order Code | Group | Order Code |
| 6500 K | 70 | --- | H4 | 970 | 1080 | | | | | 65E | CXB1507-0000-000N0BH465E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0BJ265E |
| | 80 | --- | H4 | 970 | 1080 | | | | | 65E | CXB1507-0000-000N0HH465E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0HJ265E |
| 5700 K | 70 | --- | H4 | 970 | 1080 | | | | | 57E | CXB1507-0000-000N0BH457E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0BJ257E |
| | 80 | --- | H4 | 970 | 1080 | | | | | 57E | CXB1507-0000-000N0HH457E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0HJ257E |
| 5000 K | 70 | --- | H4 | 970 | 1080 | | | | | 50E | CXB1507-0000-000N0BH450E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0BJ250E |
| | 80 | --- | H4 | 970 | 1080 | | | 50G | CXB1507-0000-000N0HH450G | 50E | CXB1507-0000-000N0HH450E |
| | | | J2 | 1040 | 1158 | | | | CXB1507-0000-000N0HJ250G | | CXB1507-0000-000N0HJ250E |
| | 90 | 92 | G4 | 840 | 935 | | | 50G | CXB1507-0000-000N0UG450G | | |
| | | | H2 | 900 | 1002 | | | | CXB1507-0000-000N0UH250G | | |
| 4000 K | 70 | --- | H4 | 970 | 1080 | | | | | 40E | CXB1507-0000-000N0BH440E |
| | | | J2 | 1040 | 1158 | | | | | | CXB1507-0000-000N0BJ240E |
| | 80 | --- | H2 | 900 | 1002 | 40H | CXB1507-0000-000N0HH240H | 40G | CXB1507-0000-000N0HH240G | | |
| | | | H4 | 970 | 1080 | | CXB1507-0000-000N0HH440H | | CXB1507-0000-000N0HH440G | | |
| | 90 | 92 | G2 | 780 | 869 | 40H | CXB1507-0000-000N0UG240H | 40G | CXB1507-0000-000N0UG240G | | |
| | | | G4 | 840 | 935 | | CXB1507-0000-000N0UG440H | | CXB1507-0000-000N0UG440G | | |

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** Flux values @ 25 °C are calculated and for reference only.

## FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 36 V ($I_F$ = 200 mA, $T_J$ = 85 °C) - CONTINUED

| Nominal CCT | CRI* | | Minimum Luminous Flux | | | 2-Step | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C** | Group | Order Code | Group | Order Code | Group | Order Code |
| 3500 K | 80 | --- | H2 | 900 | 1002 | 35H | CXB1507-0000-000N0HH235H | 35G | CXB1507-0000-000N0HH235G | | |
| | | | H4 | 970 | 1080 | | CXB1507-0000-000N0HH435H | | CXB1507-0000-000N0HH435G | | |
| | 90 | 92 | G2 | 780 | 869 | 35H | CXB1507-0000-000N0UG235H | 35G | CXB1507-0000-000N0UG235G | | |
| | | | G4 | 840 | 935 | | CXB1507-0000-000N0UG435H | | CXB1507-0000-000N0UG435G | | |
| 3000 K | 80 | --- | G4 | 840 | 935 | 30H | CXB1507-0000-000N0HG430H | 30G | CXB1507-0000-000N0HG430G | | |
| | | | H2 | 900 | 1002 | | CXB1507-0000-000N0HH230H | | CXB1507-0000-000N0HH230G | | |
| | 90 | 92 | F4 | 730 | 813 | 30H | CXB1507-0000-000N0UF430H | 30G | CXB1507-0000-000N0UF430G | | |
| | | | G2 | 780 | 869 | | CXB1507-0000-000N0UG230H | | CXB1507-0000-000N0UG230G | | |
| 2700 K | 80 | --- | G4 | 840 | 935 | 27H | CXB1507-0000-000N0HG427H | 27G | CXB1507-0000-000N0HG427G | | |
| | | | H2 | 900 | 1002 | | CXB1507-0000-000N0HH227H | | CXB1507-0000-000N0HH227G | | |
| | 90 | 92 | F2 | 680 | 757 | 27H | CXB1507-0000-000N0UF227H | 27G | CXB1507-0000-000N0UF227G | | |
| | | | F4 | 730 | 813 | | CXB1507-0000-000N0UF427H | | CXB1507-0000-000N0UF427G | | |

Notes

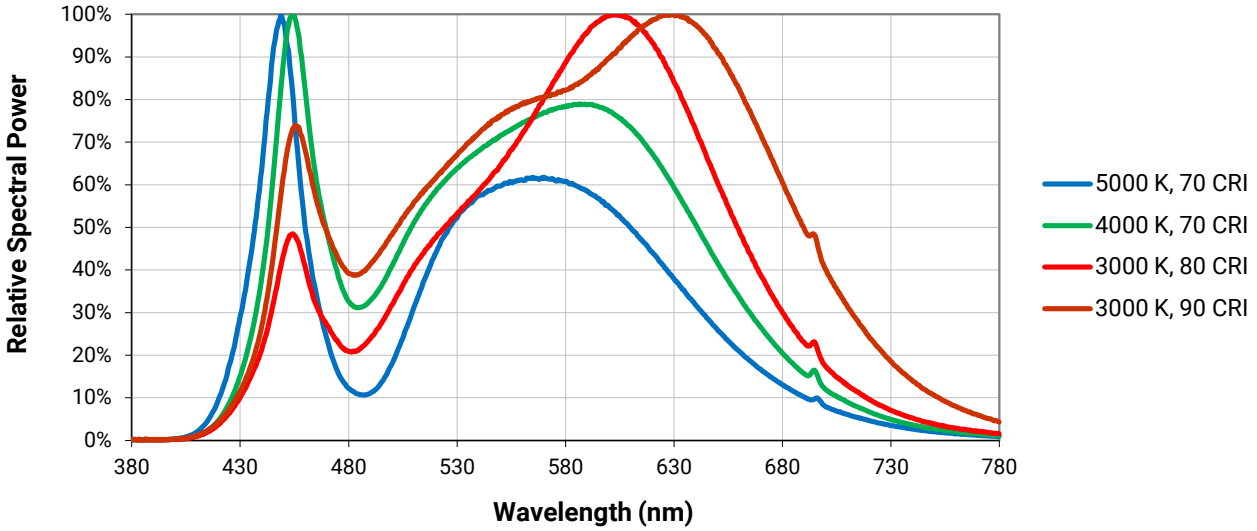
- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 21).
- Cree XLamp CXB1507 LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

* For 80 CRI minimum LEDs, CRI R9 minimum is 0 with a ±2 tolerance. For 90 CRI minimum LEDs, CRI R9 typical is 60.

** Flux values @ 25 °C are calculated and for reference only.

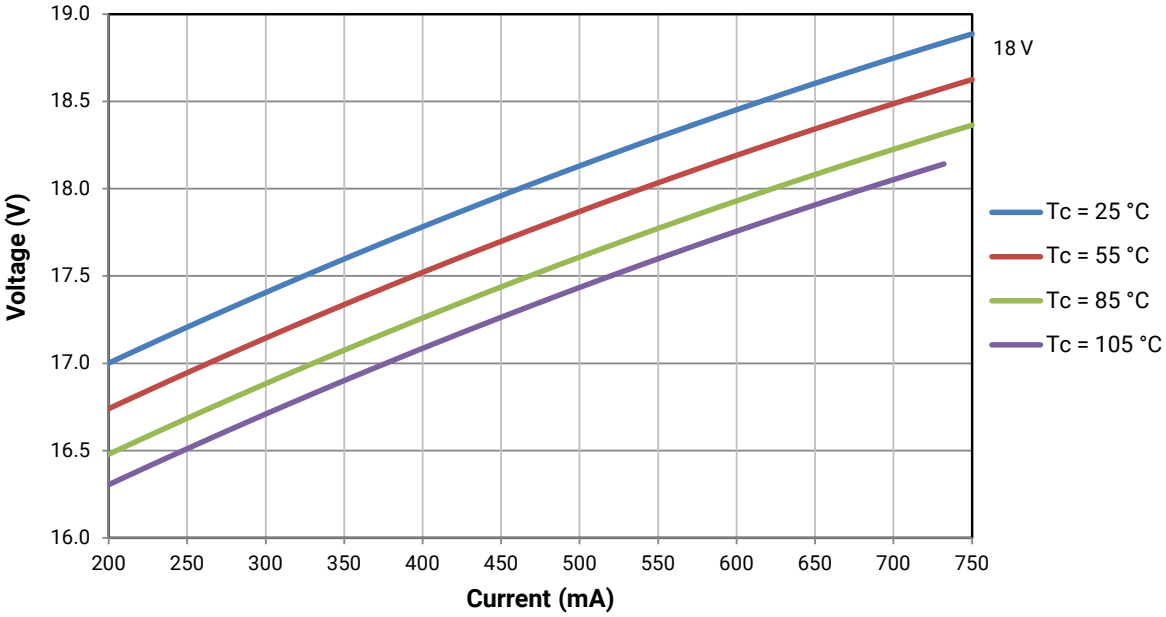
## RELATIVE SPECTRAL POWER DISTRIBUTION

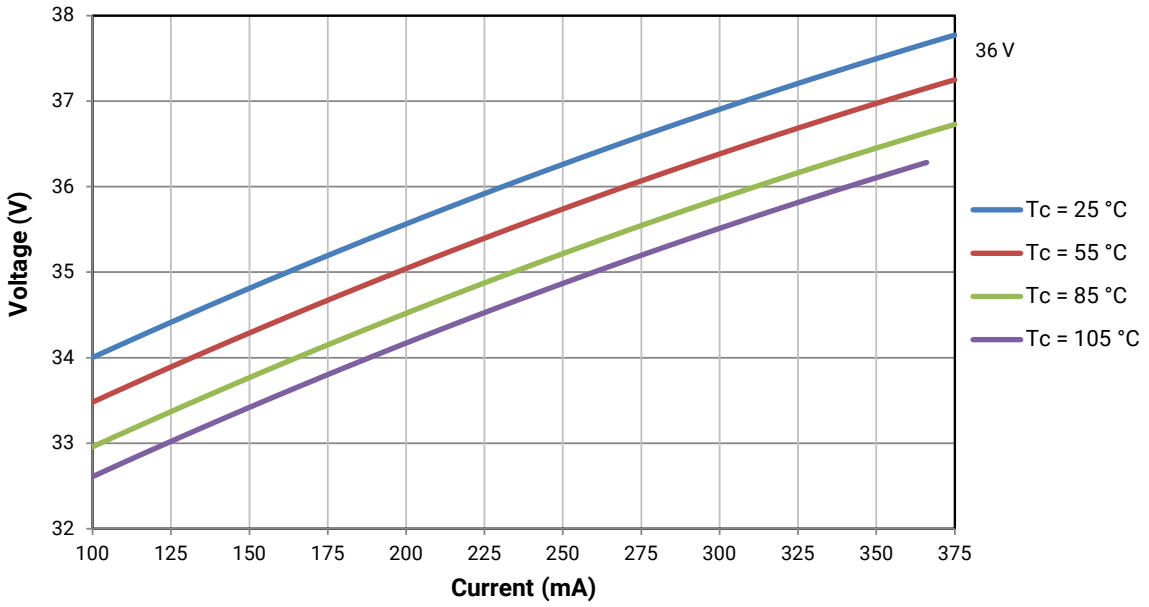
The following graph is the result of a series of pulsed measurements at 400 mA for the 18-V CXB1507 LED and 200 mA for the 36-V CXB1507 LED and $T_J$ = 85 °C.



## ELECTRICAL CHARACTERISTICS

The following graphs are the result of a series of steady-state measurements.

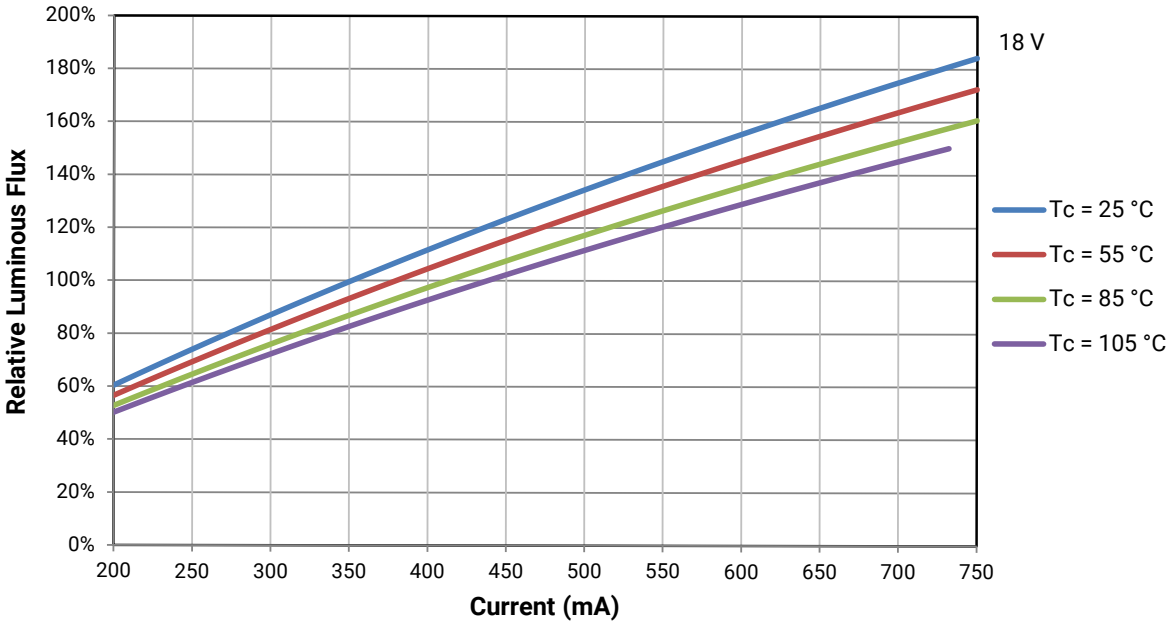


## RELATIVE LUMINOUS FLUX

The relative luminous flux values provided below are the ratio of measurements of the CXB1507 LED at steady-state operation at the given conditions, divided by flux measured during binning, which is a pulsed measurement at 400 mA at $T_J$ = 85 °C for the 18-V CXB1507 LED.

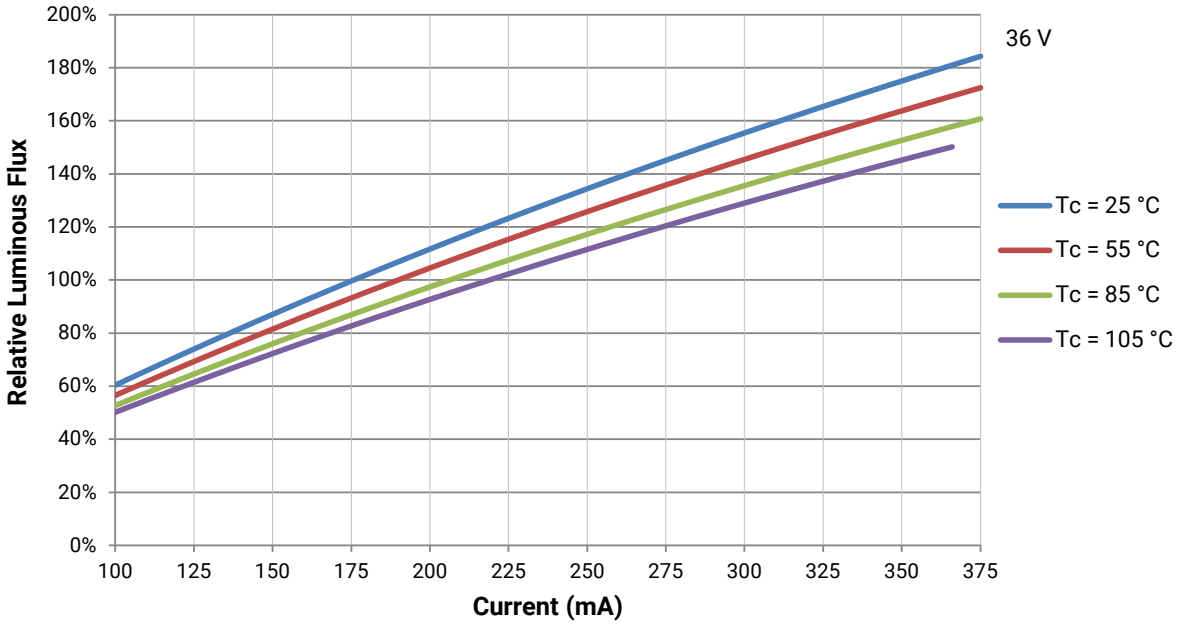
Using the 18-V CXB1507 LED as an example, at steady-state operation of Tc = 105 °C, $I_F$ = 550 mA, the relative luminous flux ratio is 120% in the chart below. A CXB1507 LED that measures 900 lm during binning will deliver 1080 lm (900 * 1.2) at steady-state operation of Tc = 105 °C, $I_F$ = 550 mA.



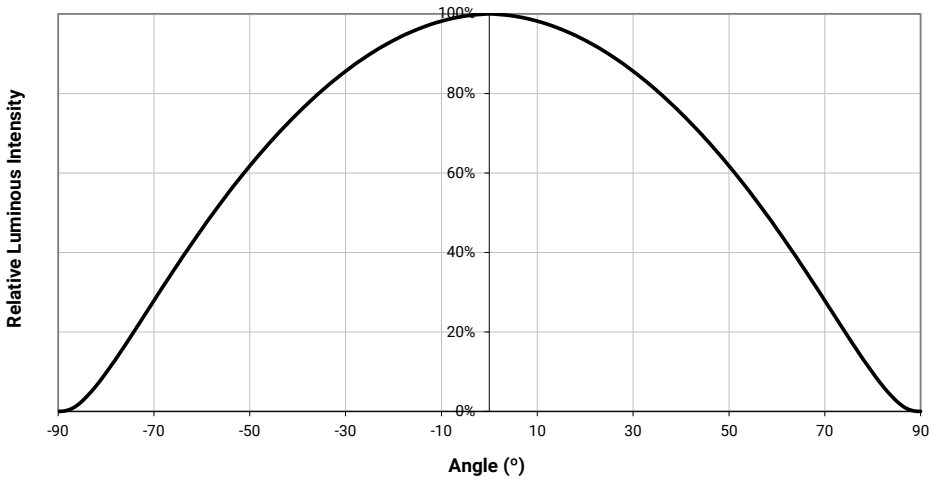
## RELATIVE LUMINOUS FLUX - CONTINUED

The relative luminous flux values provided below are the ratio of measurements of the CXB1507 LED at steady-state operation at the given conditions, divided by flux measured during binning, which is a pulsed measurement at 200 mA at $T_J$ = 85 °C for the 36-V CXB1507 LED.

Using the 36-V CXB1507 LED as an example, at steady-state operation of Tc = 105 °C, $I_F$ = 275 mA, the relative luminous flux ratio is 120% in the chart below. A CXB1507 LED that measures 900 lm during binning will deliver 1080 lm (900 * 1.2) at steady-state operation of Tc = 105 °C, $I_F$ = 275 mA.



## TYPICAL SPATIAL DISTRIBUTION




## PERFORMANCE GROUPS - BRIGHTNESS (18 V, $I_F$ = 400 mA; 36 V, $I_F$ = 200 mA, $T_J$ = 85 °C)

XLamp CXB1507 LEDs are tested for luminous flux and placed into one of the following bins.

| Group Code | Minimum Luminous Flux | Maximum Luminous Flux |
|---|---|---|
| F2 | 680 | 730 |
| F4 | 730 | 780 |
| G2 | 780 | 840 |
| G4 | 840 | 900 |
| H2 | 900 | 970 |
| H4 | 970 | 1040 |
| J2 | 1040 | 1120 |
| J4 | 1120 | 1200 |

## PERFORMANCE GROUPS - CHROMATICITY ($T_J$ = 85 °C)

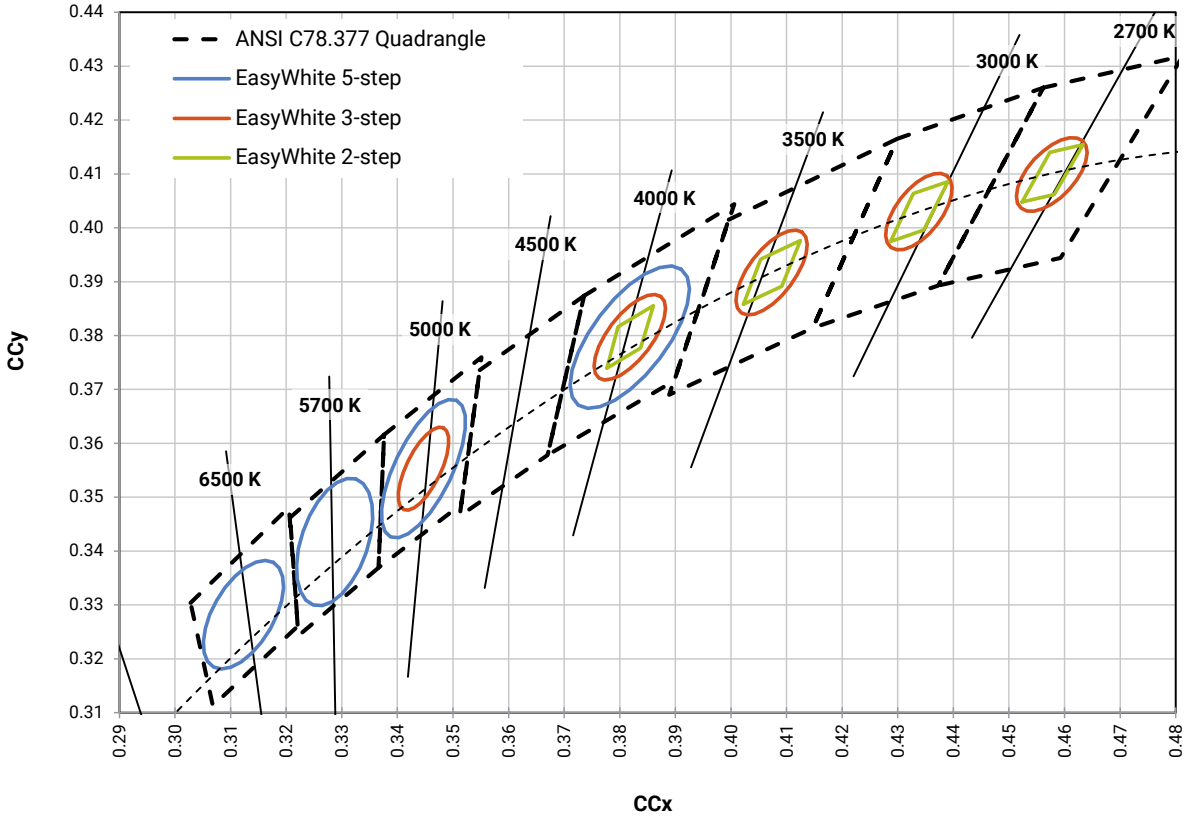
XLamp CXB1507 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

| EasyWhite Color Temperatures – 2-Step | | | |
|---|---|---|---|
| Code | CCT | x | y |
| 40H | 4000 K | 0.3777 | 0.3739 |
| | | 0.3797 | 0.3816 |
| | | 0.3861 | 0.3855 |
| | | 0.3838 | 0.3777 |
| 35H | 3500 K | 0.4022 | 0.3858 |
| | | 0.4053 | 0.3942 |
| | | 0.4125 | 0.3977 |
| | | 0.4091 | 0.3891 |
| 30H | 3000 K | 0.4287 | 0.3975 |
| | | 0.4328 | 0.4064 |
| | | 0.4390 | 0.4086 |
| | | 0.4347 | 0.3996 |
| 27H | 2700 K | 0.4524 | 0.4048 |
| | | 0.4574 | 0.4140 |
| | | 0.4633 | 0.4154 |
| | | 0.4581 | 0.4062 |

| EasyWhite Color Temperatures – 3-Step Ellipse | | | | | | |
|---|---|---|---|---|---|---|
| Bin Code | CCT | Center Point | | Major Axis | Minor Axis | Rotation Angle (°) |
| | | x | y | a | b | |
| 50G | 5000 K | 0.3447 | 0.3553 | 0.00840 | 0.00312 | 65.0 |
| 40G | 4000 K | 0.3818 | 0.3797 | 0.00939 | 0.00402 | 53.7 |
| 35G | 3500 K | 0.4073 | 0.3917 | 0.00927 | 0.00414 | 54.0 |
| 30G | 3000 K | 0.4338 | 0.4030 | 0.00834 | 0.00408 | 53.2 |
| 27G | 2700 K | 0.4577 | 0.4099 | 0.00834 | 0.00420 | 48.5 |

| EasyWhite Color Temperatures – 5-Step Ellipse | | | | | | |
|---|---|---|---|---|---|---|
| Bin Code | CCT | Center Point | | Major Axis | Minor Axis | Rotation Angle (°) |
| | | x | y | a | b | |
| 65E | 6500 K | 0.3123 | 0.3282 | 0.01110 | 0.00550 | 61.0 |
| 57E | 5700 K | 0.3287 | 0.3417 | 0.01230 | 0.00600 | 72.0 |
| 50E | 5000 K | 0.3447 | 0.3553 | 0.01400 | 0.00520 | 65.0 |
| 40E | 4000 K | 0.3818 | 0.3797 | 0.01565 | 0.00670 | 53.7 |

## CREE EASYWHITE® BINS PLOTTED ON THE 1931 CIE CURVE



## BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

**Order Code**

SSSSSCC-HHHH-HHHGGNNNNNN

- Series = CXB15
- Internal code
- CRI Specification
  - B = 70 min CRI
  - H = 80 min CRI
  - U = 90 min CRI
- Kit code
- Vf class:
  - F0 = 18-V class
  - N0 = 36-V class
- Performance class

**Bin Code**

SSSSSCC-WWW-FF-GGR-AAAAA

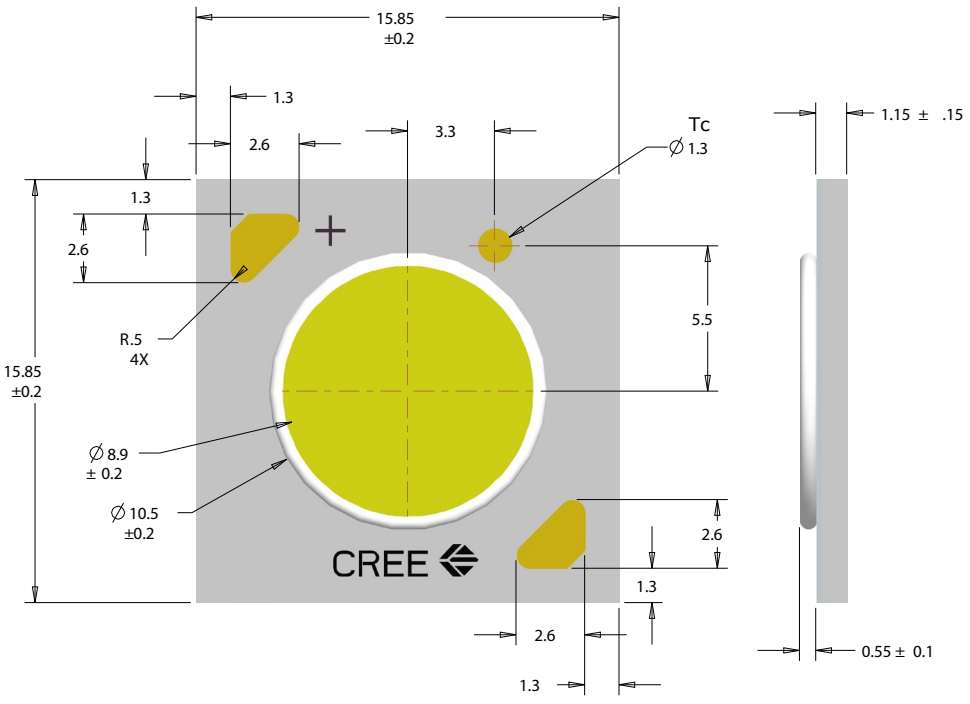
- Series = CXB15
- Chromaticity bin
- Vf class:
  - F0 = 18-V class
  - N0 = 36-V class
- Internal code
- CRI Specification
  - B = 70 min CRI
  - H = 80 min CRI
  - U = 90 min CRI
- Flux bin
- Performance class

## MECHANICAL DIMENSIONS

Dimensions are in mm.

Tolerances unless otherwise specified: ±.13

x° ±1°



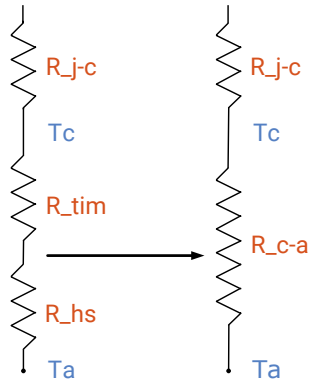
## THERMAL DESIGN

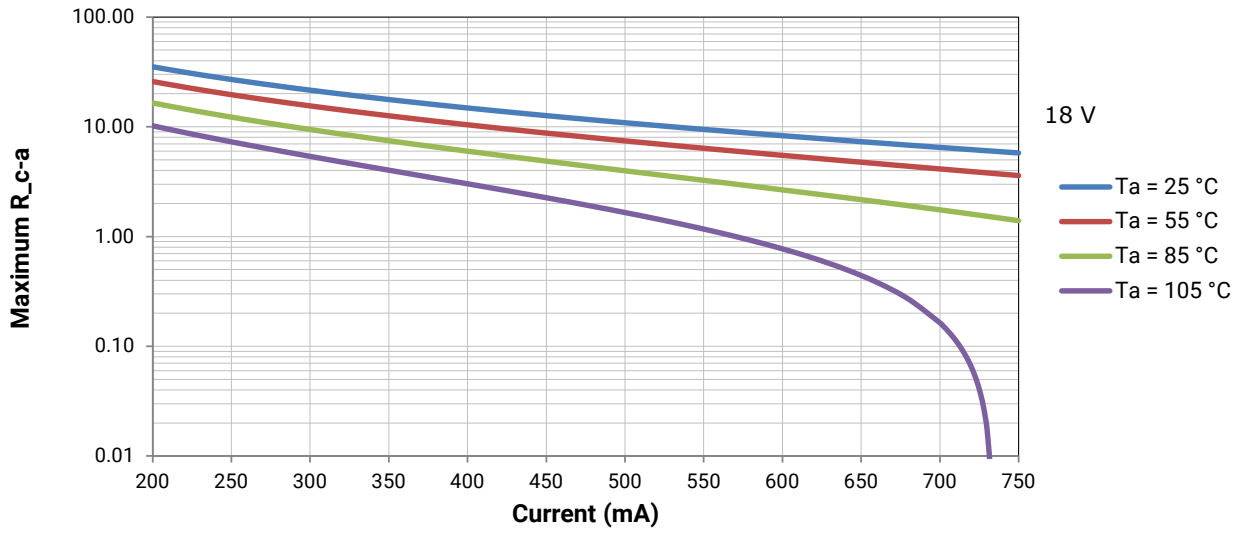
The CXB family of LED arrays can include over a hundred different LED die inside one package, and thus over a hundred different junction temperatures ($T_J$). Cree has intentionally removed junction-temperature-based operating limits and replaced the commonplace maximum $T_J$ calculations with maximum ratings based on forward current ($I_F$) and case temperature (Tc). No additional calculations are required to ensure the CXB LED is being operated within its designed limits. Please refer to page 3 for the Operating Limit specification.

There is no need to calculate for $T_J$ inside the package, as the thermal management design process, specifically from solder point ($T_{SP}$) to ambient ($T_a$), remains identical to any other LED component. For more information on thermal management of Cree XLamp LEDs, please refer to the Thermal Management application note. For CXB soldering recommendations and more information on thermal interface materials (TIM) and connection methods, please refer to the Cree CX Family LEDs soldering and handling document. The CX Family LED Design Guide provides basic information on the requirements to use Cree XLamp CXB LEDs successfully in luminaire designs.

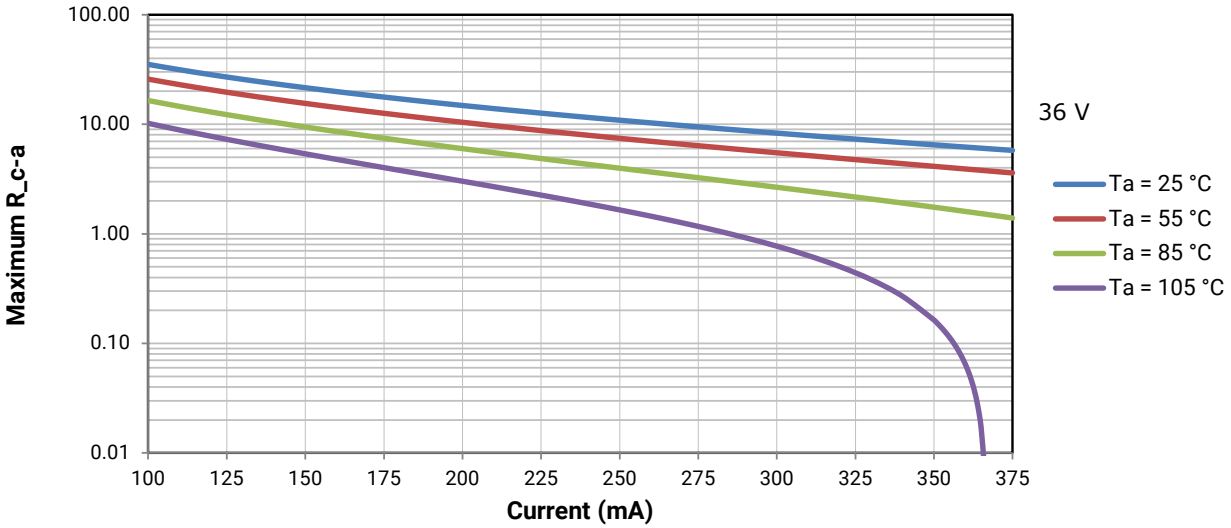
To keep the CXB1507 LED at or below the maximum rated Tc, the case to ambient temperature thermal resistance (R_c-a) must be at or below the maximum R_c-a value shown on the following graphs, depending on the operating environment. The y-axis in the graphs is a base 10 logarithmic scale.

As the figure at right shows, the R_c-a value is the sum of the thermal resistance of the TIM (R_tim) plus the thermal resistance of the heat sink (R_hs).



## THERMAL DESIGN - CONTINUED



## NOTES

### Measurements

The luminous flux, radiant power, chromaticity and CRI measurements in this document are binning specifications only and solely represent product measurements as of the date of shipment. These measurements will change over time based on a number of factors that are not within Cree's control and are not intended or provided as operational specifications for the products. Calculated values are provided for informational purposes only and are not intended as specifications.

### Pre-Release Qualification Testing

Please read the LED Reliability Overview for details of the qualification process Cree applies to ensure long-term reliability for XLamp LEDs and details of Cree's pre-release qualification testing for XLamp LEDs.

### Lumen Maintenance

Cree now uses standardized IES LM-80-08 and TM-21-11 methods for collecting long-term data and extrapolating LED lumen maintenance. For information on the specific LM-80 data sets available for this LED, refer to the public LM-80 results document.

Please read the Long-Term Lumen Maintenance application note for more details on Cree's lumen maintenance testing and forecasting. Please read the Thermal Management application note for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

### RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree representative or from the Product Documentation sections of www.cree.com.

### REACh Compliance

REACh substances of very high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Cree representative to insure you get the most up-to-date REACh Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

### UL® Recognized Component

Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

### Vision Advisory

WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.

## PACKAGING

Cree CXB1507 LEDs are packaged in trays of 20. Five trays are sealed in an anti-static bag and placed inside a carton, for a total of 100 LEDs per carton. Each carton contains 100 LEDs from the same performance bin.

Dimensions are in inches.
Tolerances: ±13
x° ±1°