

## Cree® J Series® 2835 6-V, 9-V & 18-V LEDs



### PRODUCT DESCRIPTION

J Series® LEDs extend Cree's industry-leading portfolio of lighting-class LEDs to a broader set of applications. The J Series 2835 LEDs combine high efficacy and excellent value in a reliable package. The J Series 2835 LEDs are optimized for low-density lighting applications where high efficacy and smooth appearance are critical, such as downlights, troffers, and panel lights.

### FEATURES

- Industry-compatible size : 2.8 x 3.5 x 0.7 mm
- 6-V, 9-V & 18-V configurations
- Flux binned at 25 °C, chromaticity binned at 85 °C
- 6500 K–2200 K ANSI CCTs available
- 70, 80 & 90 CRI minimum available at 6500 K–2700 K
- 80 & 90 CRI minimum available at 2200 K
- RoHS and REACH compliant
- UL® recognized component (E495478)

### PRODUCT SUMMARY

| Product             | Power Class | Test Temperature | Test Current | Typical Forward Voltage | 4000 K, 70 CRI |                  | 3000 K, 80 CRI |                  | Maximum Current |
|---------------------|-------------|------------------|--------------|-------------------------|----------------|------------------|----------------|------------------|-----------------|
|                     |             |                  |              |                         | Typical Flux   | Typical Efficacy | Typical Flux   | Typical Efficacy |                 |
| JK2835 6-V P Class  | 1.0 W       | 25 °C            | 150 mA       | 6 V                     | 156 lm         | 173 LPW          | 143 lm         | 159 LPW          | 200 mA          |
| JK2835B 6-V W Class | 1.0 W       | 25 °C            | 150 mA       | 6.35 V                  | 143 lm         | 150 LPW          | 131 lm         | 138 LPW          | 200 mA          |
| JK2835B 9-V W Class | 1.0 W       | 25 °C            | 100 mA       | 9.2 V                   | 136 lm         | 148 LPW          | 123 lm         | 134 LPW          | 120 mA          |
| JK2835 18-V X Class | 1.0 W       | 25 °C            | 50 mA        | 18.2 V                  | 132 lm         | 145 LPW          | 119 lm         | 131 LPW          | 60 mA           |



J Series® Products are sold exclusively by Cree Venture LED Company Limited ("Cree Venture"), regardless of geography. Any orders for J Series Products that are submitted to Cree, Inc. or any of its other subsidiaries will be directed to Cree Venture for acknowledgement and order fulfillment.

## TABLE OF CONTENTS

|                                                                 |    |                                       |    |
|-----------------------------------------------------------------|----|---------------------------------------|----|
| Order Code & Bin Code Formats .....                             | 3  | Reflow Soldering Characteristics..... | 35 |
| Characteristics - JK2835 6-V P Class .....                      | 4  | Notes .....                           | 36 |
| Operating Limits - JK2835 6-V P Class.....                      | 4  | Mechanical Dimensions .....           | 38 |
| Flux Characteristics, Order Codes and Bins - JK2835 6-V         |    | Tape & Reel.....                      | 39 |
| P Class .....                                                   | 5  | Packaging.....                        | 41 |
| Relative Luminous Flux vs. Current - JK2835 6-V P Class .....   | 6  |                                       |    |
| Electrical Characteristics - JK2835 6-V P Class.....            | 6  |                                       |    |
| Relative Chromaticity vs. Current - JK2835 6-V P Class .....    | 7  |                                       |    |
| Relative Chromaticity vs. Temperature - JK2835 6-V P Class..... | 7  |                                       |    |
| Characteristics - JK2835B 6-V W Class.....                      | 8  |                                       |    |
| Operating Limits - JK2835B 6-V W Class .....                    | 8  |                                       |    |
| Flux Characteristics, Order Codes and Bins - JK2835B 6-V        |    |                                       |    |
| W Class .....                                                   | 9  |                                       |    |
| Relative Luminous Flux vs. Current - JK2835B 6-V W Class .....  | 10 |                                       |    |
| Electrical Characteristics - JK2835B 6-V W Class .....          | 10 |                                       |    |
| Relative Chromaticity vs. Current - JK2835B 6-V W Class .....   | 11 |                                       |    |
| Relative Chromaticity vs. Temperature - JK2835B 6-V W Class ..  | 11 |                                       |    |
| Characteristics - JK2835B 9-V W Class.....                      | 12 |                                       |    |
| Operating Limits - JK2835B 9-V W Class .....                    | 12 |                                       |    |
| Flux Characteristics, Order Codes and Bins - JK2835B 9-V        |    |                                       |    |
| W Class .....                                                   | 13 |                                       |    |
| Relative Luminous Flux vs. Current - JK2835B 9-V W Class .....  | 14 |                                       |    |
| Electrical Characteristics - JK2835B 9-V W Class .....          | 14 |                                       |    |
| Relative Chromaticity vs. Current - JK2835B 9-V W Class .....   | 15 |                                       |    |
| Relative Chromaticity vs. Temperature - JK2835B 9-V W Class ..  | 15 |                                       |    |
| Characteristics - JK2835 18-V X Class.....                      | 16 |                                       |    |
| Operating Limits - JK2835 18-V X Class .....                    | 16 |                                       |    |
| Flux Characteristics, Order Codes and Bins - JK2835 18-V        |    |                                       |    |
| X Class .....                                                   | 17 |                                       |    |
| Relative Luminous Flux vs. Current - JK2835 18-V X Class .....  | 18 |                                       |    |
| Electrical Characteristics - JK2835 18-V X Class .....          | 18 |                                       |    |
| Relative Chromaticity vs. Current - JK2835 18-V X Class .....   | 19 |                                       |    |
| Relative Chromaticity vs. Temperature - JK2835 18-V X Class ..  | 19 |                                       |    |
| Relative Spectral Power Distribution .....                      | 20 |                                       |    |
| Relative Luminous Flux vs. Junction Temperature.....            | 21 |                                       |    |
| Typical Spatial Distribution.....                               | 22 |                                       |    |
| Performance Groups - Luminous Flux.....                         | 22 |                                       |    |
| Performance Groups - Forward Voltage.....                       | 24 |                                       |    |
| Performance Groups - Chromaticity .....                         | 25 |                                       |    |

## ORDER CODE & BIN CODE FORMATS

Order codes and bin codes for J Series 2835 LEDs are configured in the following manner:



## CHARACTERISTICS - JK2835 6-V P CLASS

| Characteristics                              | Unit    | Minimum | Typical | Maximum |
|----------------------------------------------|---------|---------|---------|---------|
| Thermal resistance, junction to solder point | °C/W    |         | 12      |         |
| Viewing angle (FWHM)                         | degrees |         | 120     |         |
| Temperature coefficient of voltage           | mV/°C   |         | -1.7    |         |
| ESD withstand voltage (JEDEC JS-001-2012)    | V       |         | Class 2 |         |
| DC forward current                           | mA      |         |         | 200     |
| Reverse voltage                              | V       |         |         | 5       |
| Forward voltage (@ 150 mA, 25 °C)            | V       |         | 6       | 6.4     |
| LED junction temperature                     | °C      |         |         | 125     |
| Operating temperature                        | °C      | -40     |         | 105     |

## OPERATING LIMITS - JK2835 6-V P CLASS

The maximum forward current is determined by the thermal resistance between the LED junction and ambient.



## FLUX CHARACTERISTICS, ORDER CODES AND BINS - JK2835 6-V P CLASS ( $I_F = 150 \text{ mA}$ , $T_J = 25^\circ \text{C}$ )

The following table provides order codes for J Series 2835 6-V P Class LEDs. For a complete description of the order code nomenclature, please see the Order Code and Bin Code Formats section (page 3). For definitions of the chromaticity kits, please see the Performance Groups - Chromaticity section (page 25).

| Nominal CCT | Minimum CRI <sup>†</sup> | Minimum Flux (lm) @ 25 °C | Typical Flux (lm) @ 25 °C | Typical Flux (lm) @ 85 °C* | Kitted 3-Step Order Code**     |
|-------------|--------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|
| 6500 K      | 70                       | 150                       | 156                       | 135                        | JK2835AWT-P-B65EB0000-N0000001 |
|             | 80                       | 145                       | 151                       | 131                        | JK2835AWT-P-H65EB0000-N0000001 |
|             | 90                       | 120                       | 128                       | 111                        | JK2835AWT-P-U65EB0000-N0000001 |
| 5700 K      | 70                       | 150                       | 156                       | 135                        | JK2835AWT-P-B57EB0000-N0000001 |
|             | 80                       | 145                       | 151                       | 131                        | JK2835AWT-P-H57EB0000-N0000001 |
|             | 90                       | 120                       | 128                       | 111                        | JK2835AWT-P-U57EB0000-N0000001 |
| 5000 K      | 70                       | 150                       | 156                       | 135                        | JK2835AWT-P-B50EB0000-N0000001 |
|             | 80                       | 145                       | 151                       | 131                        | JK2835AWT-P-H50EB0000-N0000001 |
|             | 90                       | 120                       | 128                       | 111                        | JK2835AWT-P-U50EB0000-N0000001 |
| 4500 K      | 70                       | 150                       | 156                       | 135                        | JK2835AWT-P-B45EB0000-N0000001 |
|             | 80                       | 145                       | 151                       | 131                        | JK2835AWT-P-H45EB0000-N0000001 |
|             | 90                       | 120                       | 128                       | 111                        | JK2835AWT-P-U45EB0000-N0000001 |
| 4000 K      | 70                       | 150                       | 156                       | 135                        | JK2835AWT-P-B40EB0000-N0000001 |
|             | 80                       | 145                       | 151                       | 131                        | JK2835AWT-P-H40EB0000-N0000001 |
|             | 90                       | 120                       | 128                       | 111                        | JK2835AWT-P-U40EB0000-N0000001 |
| 3500 K      | 70                       | 145                       | 152                       | 131                        | JK2835AWT-P-B35EB0000-N0000001 |
|             | 80                       | 140                       | 147                       | 127                        | JK2835AWT-P-H35EB0000-N0000001 |
|             | 90                       | 115                       | 124                       | 107                        | JK2835AWT-P-U35EB0000-N0000001 |
| 3000 K      | 70                       | 140                       | 148                       | 128                        | JK2835AWT-P-B30EB0000-N0000001 |
|             | 80                       | 135                       | 143                       | 124                        | JK2835AWT-P-H30EB0000-N0000001 |
|             | 90                       | 115                       | 121                       | 105                        | JK2835AWT-P-U30EB0000-N0000001 |
| 2700 K      | 70                       | 135                       | 142                       | 123                        | JK2835AWT-P-B27EB0000-N0000001 |
|             | 80                       | 130                       | 137                       | 118                        | JK2835AWT-P-H27EB0000-N0000001 |
|             | 90                       | 110                       | 116                       | 100                        | JK2835AWT-P-U27EB0000-N0000001 |

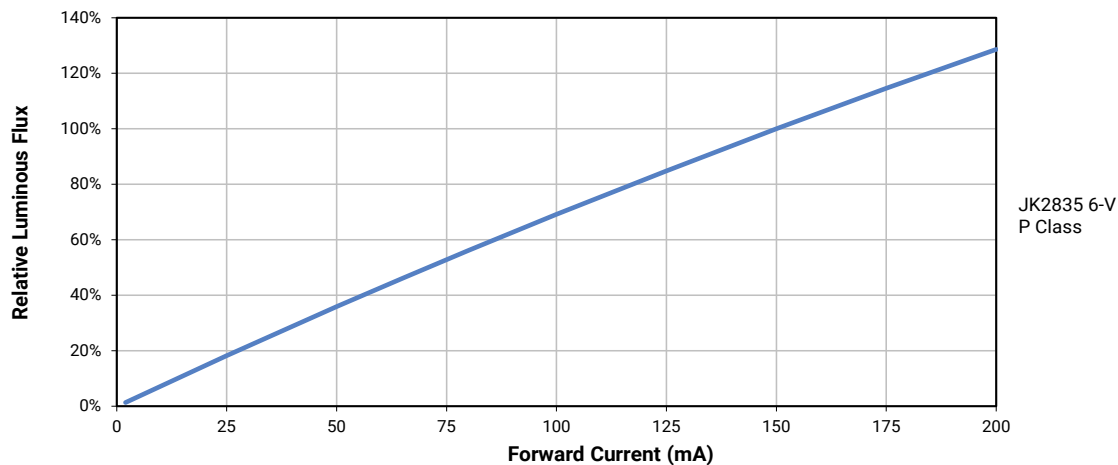


The order codes shown here are in a recently released order code format that is different than the previous format. Customers are strongly encouraged to use this new order code format; the previous format will soon be unavailable. See [CVL-PCN-1904](#).

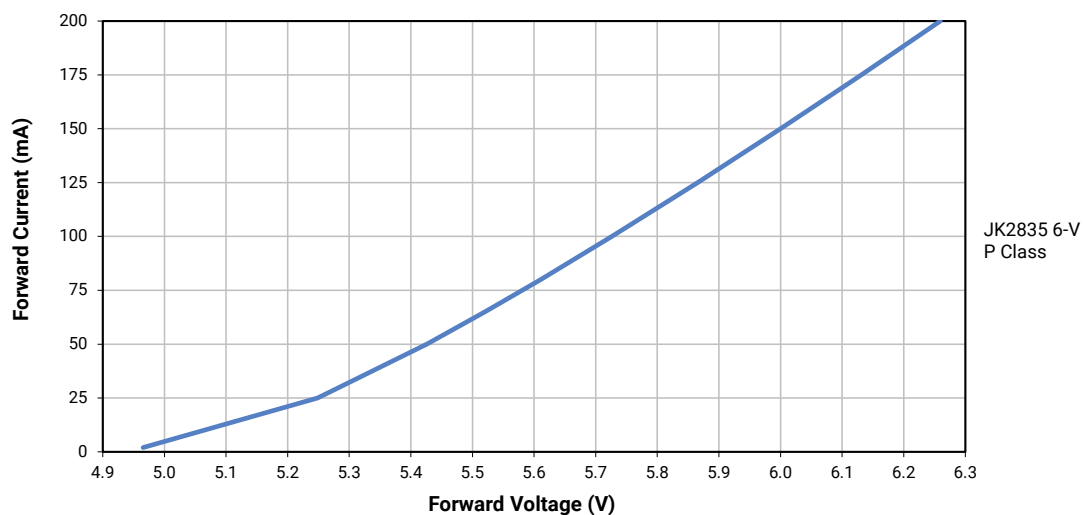
### Notes:

- Cree Venture maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and  $\pm 2$  on CRI measurements. See the Measurements section (page 36).
- Cree Venture J Series 2835 LED order codes specify only a minimum flux bin and not a maximum. Cree Venture 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 restrictions specified by the order code.
- ◊ CRI R9 minimum is 0 for 80 CRI minimum LEDs and 50 for 90 CRI minimum LEDs, with a  $\pm 3$  tolerance.
- \* Flux values @ 85 °C are calculated and for reference only.
- \*\* Contact your Cree sales representative for kitted 3-step order code details.

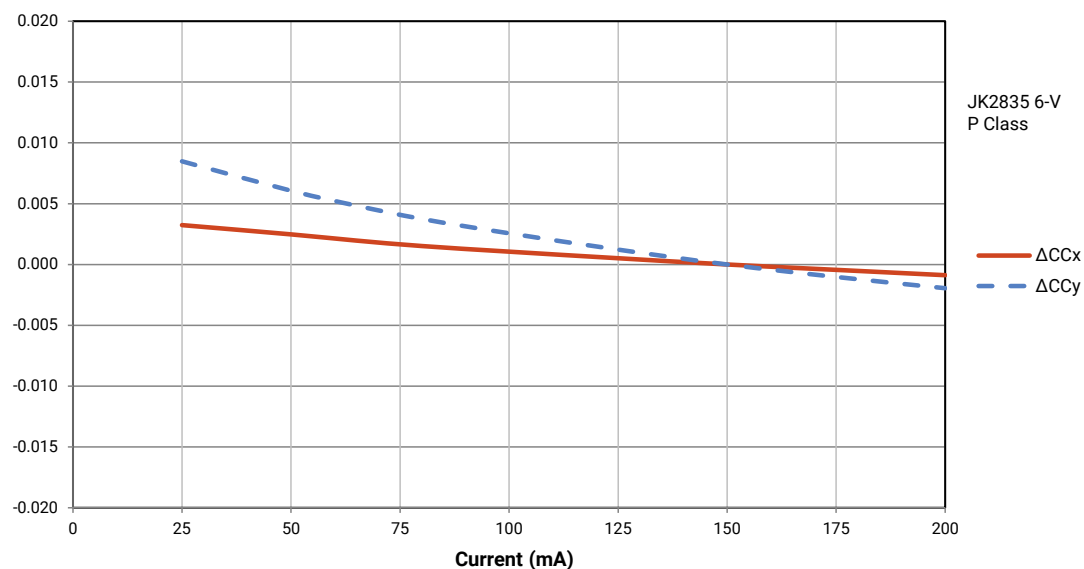
## RELATIVE LUMINOUS FLUX VS. CURRENT - JK2835 6-V P CLASS



## ELECTRICAL CHARACTERISTICS - JK2835 6-V P CLASS



## RELATIVE CHROMATICITY VS. CURRENT - JK2835 6-V P CLASS



## RELATIVE CHROMATICITY VS. TEMPERATURE - JK2835 6-V P CLASS



## CHARACTERISTICS - JK2835B 6-V W CLASS

| Characteristics                              | Unit    | Minimum | Typical | Maximum |
|----------------------------------------------|---------|---------|---------|---------|
| Thermal resistance, junction to solder point | °C/W    |         | 20      |         |
| Viewing angle (FWHM)                         | degrees |         | 120     |         |
| Temperature coefficient of voltage           | mV/°C   |         | -3.3    |         |
| ESD withstand voltage (JEDEC JS-001-2012)    |         |         | Class 2 |         |
| DC forward current                           | mA      |         |         | 200     |
| Reverse voltage                              | V       |         |         | 5       |
| Forward voltage (@ 150 mA, 25 °C)            | V       |         | 6.35    | 6.6     |
| LED junction temperature                     | °C      |         |         | 125     |
| Operating temperature                        | °C      | -40     |         | 105     |

## OPERATING LIMITS - JK2835B 6-V W CLASS

The maximum forward current is determined by the thermal resistance between the LED junction and ambient.



## FLUX CHARACTERISTICS, ORDER CODES AND BINS - JK2835B 6-V W CLASS ( $I_F = 150 \text{ mA}$ , $T_J = 25^\circ \text{C}$ )

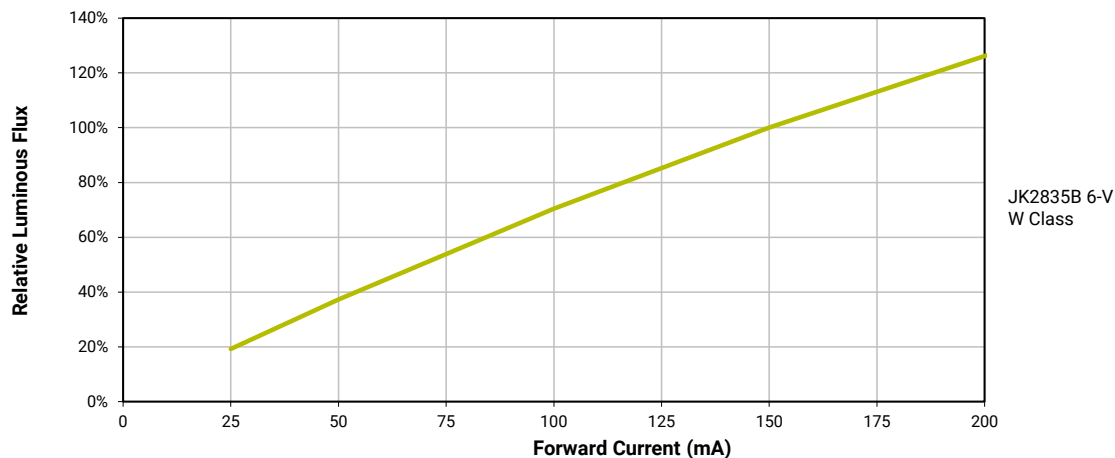
The following table provides order codes for J Series 2835B 6-V W Class LEDs. For a complete description of the order code nomenclature, please see the Order Code and Bin Code Formats section (page 3). For definitions of the chromaticity kits, please see the Performance Groups - Chromaticity section (page 25).

| Nominal CCT | Minimum CRI <sup>†</sup> | Minimum Flux (lm) @ 25 °C | Typical Flux (lm) @ 25 °C | Typical Flux (lm) @ 85 °C* | Kitted 3-Step Order Code**     |
|-------------|--------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|
| 6500 K      | 70                       | 135                       | 143                       | 125                        | JK2835BWT-W-B65EB0000-N0000001 |
|             | 80                       | 130                       | 137                       | 120                        | JK2835BWT-W-H65EB0000-N0000001 |
|             | 90                       | 110                       | 118                       | 103                        | JK2835BWT-W-U65EB0000-N0000001 |
| 5700 K      | 70                       | 135                       | 143                       | 125                        | JK2835BWT-W-B57EB0000-N0000001 |
|             | 80                       | 130                       | 137                       | 120                        | JK2835BWT-W-H57EB0000-N0000001 |
|             | 90                       | 110                       | 118                       | 103                        | JK2835BWT-W-U57EB0000-N0000001 |
| 5000 K      | 70                       | 135                       | 143                       | 125                        | JK2835BWT-W-B50EB0000-N0000001 |
|             | 80                       | 130                       | 137                       | 120                        | JK2835BWT-W-H50EB0000-N0000001 |
|             | 90                       | 110                       | 118                       | 103                        | JK2835BWT-W-U50EB0000-N0000001 |
| 4000 K      | 70                       | 135                       | 143                       | 125                        | JK2835BWT-W-B40EB0000-N0000001 |
|             | 80                       | 130                       | 137                       | 120                        | JK2835BWT-W-H40EB0000-N0000001 |
|             | 90                       | 110                       | 118                       | 103                        | JK2835BWT-W-U40EB0000-N0000001 |
| 3500 K      | 70                       | 135                       | 139                       | 122                        | JK2835BWT-W-B35EB0000-N0000001 |
|             | 80                       | 125                       | 133                       | 117                        | JK2835BWT-W-H35EB0000-N0000001 |
|             | 90                       | 105                       | 113                       | 99                         | JK2835BWT-W-U35EB0000-N0000001 |
| 3000 K      | 70                       | 130                       | 136                       | 119                        | JK2835BWT-W-B30EB0000-N0000001 |
|             | 80                       | 125                       | 131                       | 115                        | JK2835BWT-W-H30EB0000-N0000001 |
|             | 90                       | 105                       | 111                       | 97                         | JK2835BWT-W-U30EB0000-N0000001 |
| 2700 K      | 70                       | 125                       | 130                       | 114                        | JK2835BWT-W-B27EB0000-N0000001 |
|             | 80                       | 120                       | 125                       | 110                        | JK2835BWT-W-H27EB0000-N0000001 |
|             | 90                       | 100                       | 107                       | 94                         | JK2835BWT-W-U27EB0000-N0000001 |

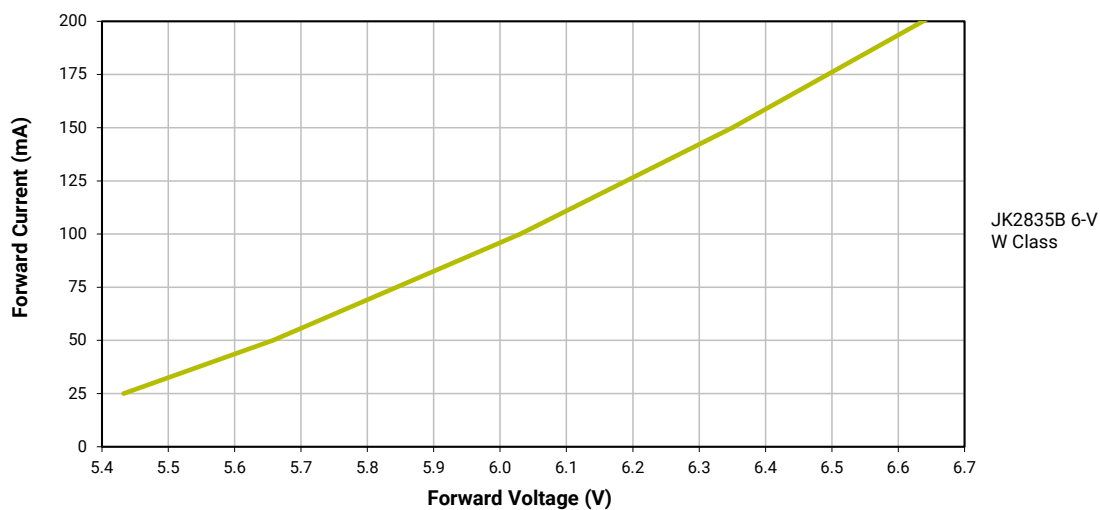
### Notes:

- Cree Venture maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and  $\pm 2$  on CRI measurements. See the Measurements section (page 36).
- Cree Venture J Series 2835 LED order codes specify only a minimum flux bin and not a maximum. Cree Venture 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 restrictions specified by the order code.
- ◊ CRI R9 minimum is 0 for 80 CRI minimum LEDs and 50 for 90 CRI minimum LEDs, with a  $\pm 3$  tolerance.
- \* Flux values @ 85 °C are calculated and for reference only.
- \*\* Contact your Cree sales representative for kitted 3-step order code details.

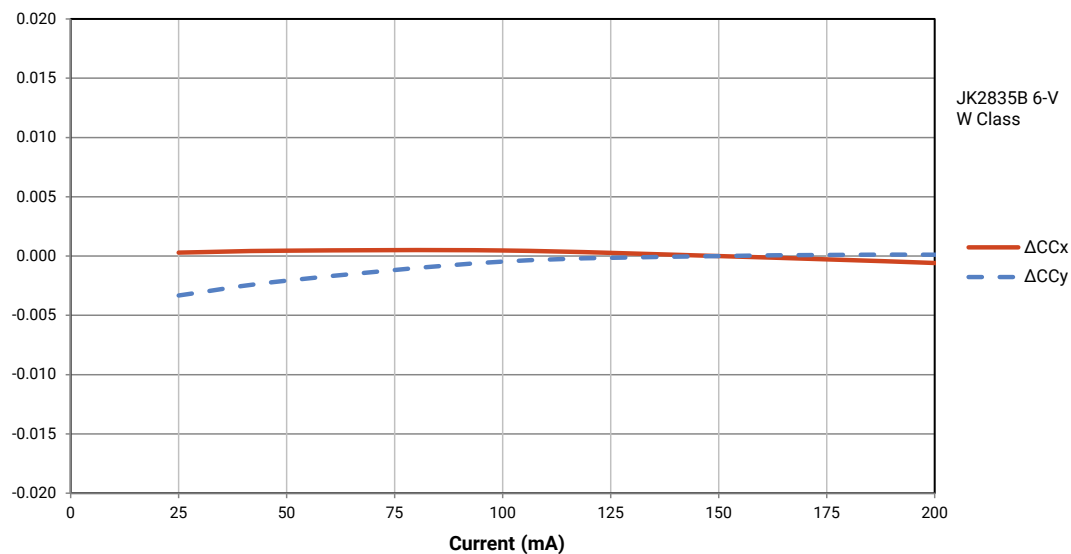
## RELATIVE LUMINOUS FLUX VS. CURRENT - JK2835B 6-V W CLASS



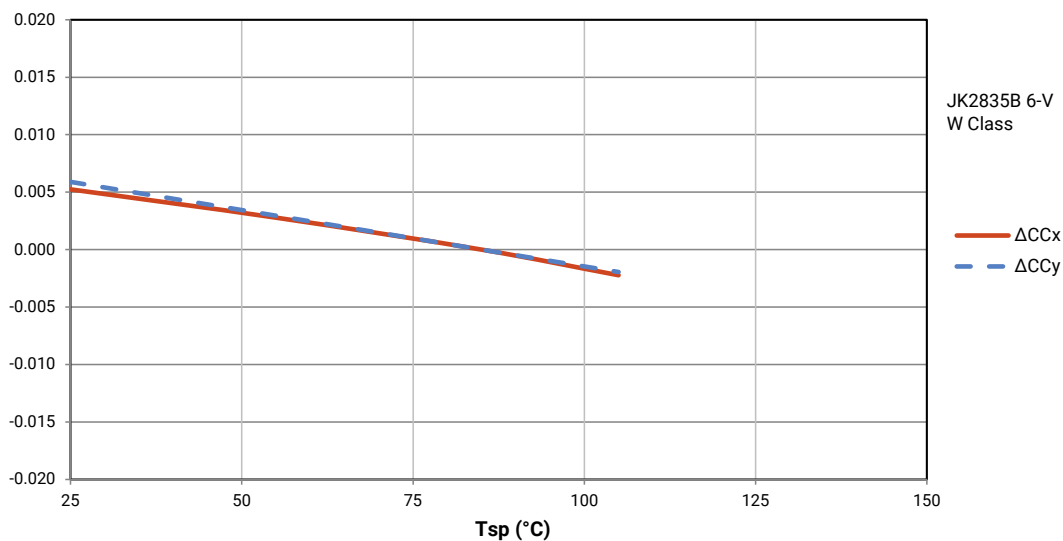
## ELECTRICAL CHARACTERISTICS - JK2835B 6-V W CLASS



## RELATIVE CHROMATICITY VS. CURRENT - JK2835B 6-V W CLASS



## RELATIVE CHROMATICITY VS. TEMPERATURE - JK2835B 6-V W CLASS



## CHARACTERISTICS - JK2835B 9-V W CLASS

| Characteristics                              | Unit    | Minimum | Typical | Maximum |
|----------------------------------------------|---------|---------|---------|---------|
| Thermal resistance, junction to solder point | °C/W    |         | 18.5    |         |
| Viewing angle (FWHM)                         | degrees |         | 120     |         |
| Temperature coefficient of voltage           | mV/°C   |         | -5.1    |         |
| ESD withstand voltage (JEDEC JS-001-2012)    |         |         | Class 2 |         |
| DC forward current                           | mA      |         |         | 120     |
| Reverse voltage                              | V       |         |         | 5       |
| Forward voltage (@ 100 mA, 25 °C)            | V       |         | 9.2     | 9.6     |
| LED junction temperature                     | °C      |         |         | 125     |
| Operating temperature                        | °C      | -40     |         | 105     |

## OPERATING LIMITS - JK2835B 9-V W CLASS

The maximum forward current is determined by the thermal resistance between the LED junction and ambient.



## FLUX CHARACTERISTICS, ORDER CODES AND BINS - JK2835B 9-V W CLASS ( $I_F = 100 \text{ mA}$ , $T_J = 25^\circ \text{C}$ )

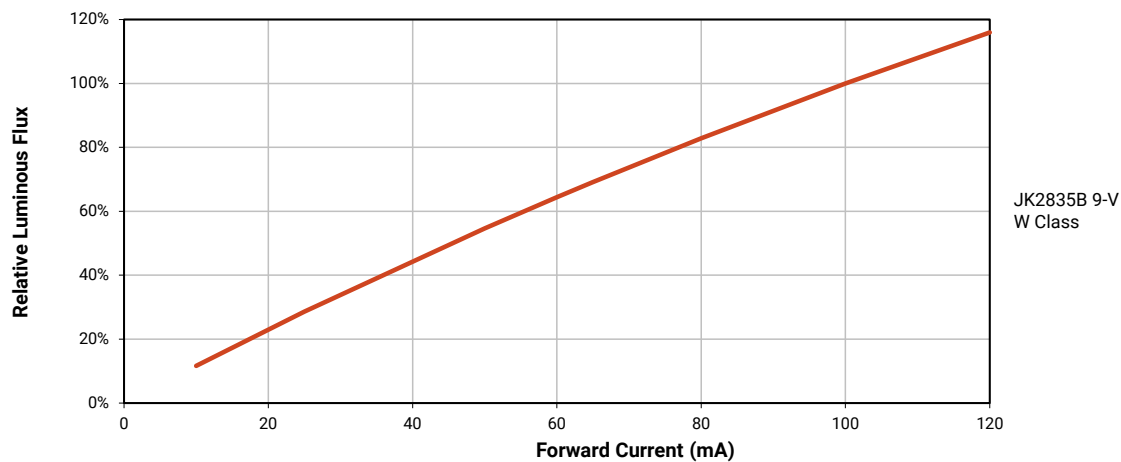
The following table provides order codes for J Series JK2835B 9-V W Class LEDs. For a complete description of the order code nomenclature, please see the Order Code and Bin Code Formats section (page 3). For definitions of the chromaticity kits, please see the Performance Groups - Chromaticity section (page 25).

| Nominal CCT | Minimum CRI <sup>†</sup> | Minimum Flux (lm) @ 25 °C | Typical Flux (lm) @ 25 °C | Typical Flux (lm) @ 85 °C* | Kitted 3-Step Order Code**     |
|-------------|--------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|
| 6500 K      | 70                       | 130                       | 136                       | 118                        | JK2835BWT-W-B65EC0000-N0000001 |
|             | 80                       | 125                       | 131                       | 114                        | JK2835BWT-W-H65EC0000-N0000001 |
|             | 90                       | 105                       | 111                       | 97                         | JK2835BWT-W-U65EC0000-N0000001 |
| 5700 K      | 70                       | 130                       | 136                       | 118                        | JK2835BWT-W-B57EC0000-N0000001 |
|             | 80                       | 125                       | 131                       | 114                        | JK2835BWT-W-H57EC0000-N0000001 |
|             | 90                       | 105                       | 111                       | 97                         | JK2835BWT-W-U57EC0000-N0000001 |
| 5000 K      | 70                       | 130                       | 136                       | 118                        | JK2835BWT-W-B50EC0000-N0000001 |
|             | 80                       | 125                       | 131                       | 114                        | JK2835BWT-W-H50EC0000-N0000001 |
|             | 90                       | 105                       | 111                       | 97                         | JK2835BWT-W-U50EC0000-N0000001 |
| 4000 K      | 70                       | 130                       | 136                       | 118                        | JK2835BWT-W-B40EC0000-N0000001 |
|             | 80                       | 125                       | 131                       | 114                        | JK2835BWT-W-H40EC0000-N0000001 |
|             | 90                       | 105                       | 111                       | 97                         | JK2835BWT-W-U40EC0000-N0000001 |
| 3500 K      | 70                       | 125                       | 132                       | 115                        | JK2835BWT-W-B35EC0000-N0000001 |
|             | 80                       | 120                       | 128                       | 111                        | JK2835BWT-W-H35EC0000-N0000001 |
|             | 90                       | 100                       | 107                       | 93                         | JK2835BWT-W-U35EC0000-N0000001 |
| 3000 K      | 70                       | 120                       | 129                       | 112                        | JK2835BWT-W-B30EC0000-N0000001 |
|             | 80                       | 115                       | 123                       | 107                        | JK2835BWT-W-H30EC0000-N0000001 |
|             | 90                       | 95                        | 104                       | 90                         | JK2835BWT-W-U30EC0000-N0000001 |
| 2700 K      | 70                       | 115                       | 123                       | 107                        | JK2835BWT-W-B27EC0000-N0000001 |
|             | 80                       | 115                       | 119                       | 103                        | JK2835BWT-W-H27EC0000-N0000001 |
|             | 90                       | 95                        | 101                       | 88                         | JK2835BWT-W-U27EC0000-N0000001 |
| 2200 K      | 80                       | 100                       | 104                       | 90                         | JK2835BWT-W-H22EC0000-N0000001 |
|             | 90                       | 80                        | 86                        | 75                         | JK2835BWT-W-U22EC0000-N0000001 |

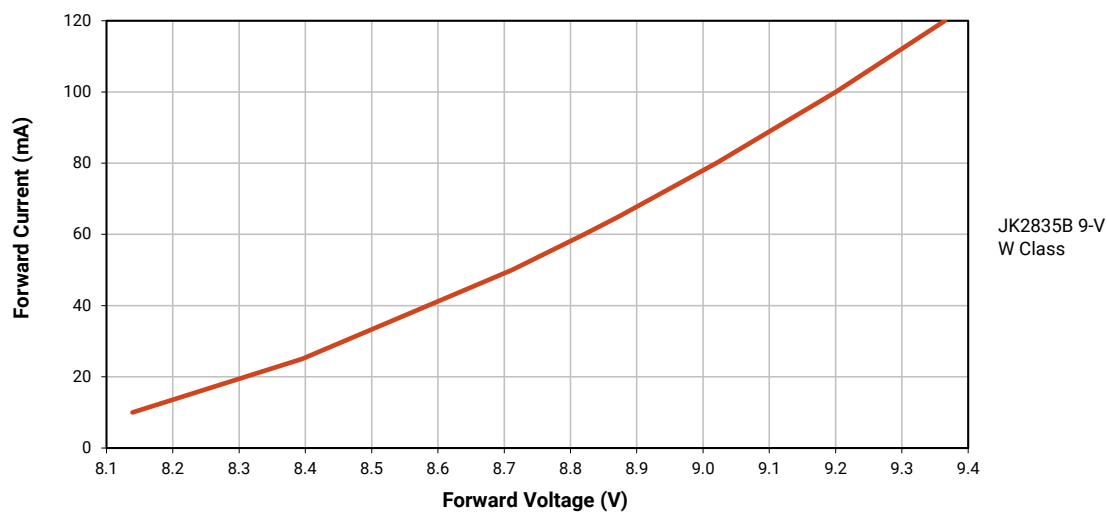
### Notes:

- Cree Venture maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and  $\pm 2$  on CRI measurements. See the Measurements section (page 36).
- Cree Venture J Series 2835 LED order codes specify only a minimum flux bin and not a maximum. Cree Venture 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 restrictions specified by the order code.
- ◊ CRI R9 minimum is 0 for 80 CRI minimum LEDs and 50 for 90 CRI minimum LEDs, with a  $\pm 3$  tolerance.
- \* Flux values @ 85 °C are calculated and for reference only.
- \*\* Contact your Cree sales representative for kitted 3-step order code details.

## RELATIVE LUMINOUS FLUX VS. CURRENT - JK2835B 9-V W CLASS



## ELECTRICAL CHARACTERISTICS - JK2835B 9-V W CLASS



## RELATIVE CHROMATICITY VS. CURRENT - JK2835B 9-V W CLASS



## RELATIVE CHROMATICITY VS. TEMPERATURE - JK2835B 9-V W CLASS

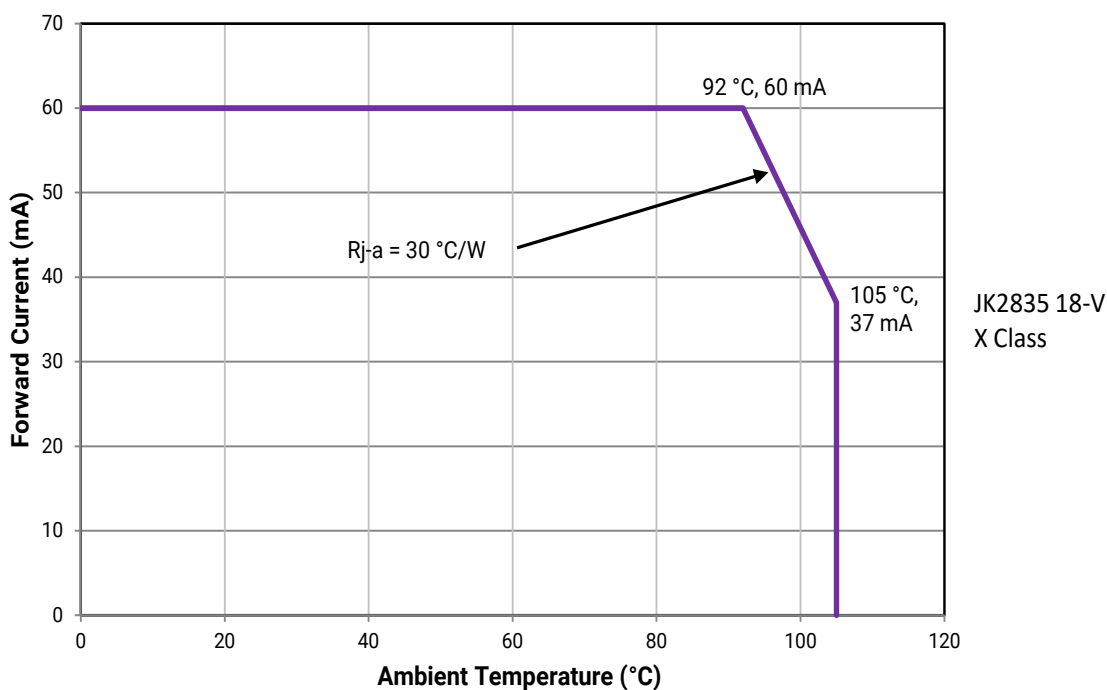


## CHARACTERISTICS - JK2835 18-V X CLASS

| Characteristics                              | Unit    | Minimum | Typical | Maximum |
|----------------------------------------------|---------|---------|---------|---------|
| Thermal resistance, junction to solder point | °C/W    |         | 22      |         |
| Viewing angle (FWHM)                         | degrees |         | 120     |         |
| Temperature coefficient of voltage           | mV/°C   |         | -9.6    |         |
| ESD withstand voltage (JEDEC JS-001-2012)    |         |         | Class 2 |         |
| DC forward current                           | mA      |         |         | 60      |
| Reverse voltage                              | V       |         |         | 5       |
| Forward voltage (@ 50 mA, 25 °C)             | V       |         | 18.2    | 19.5    |
| LED junction temperature                     | °C      |         |         | 125     |
| Operating temperature                        | °C      | -40     |         | 105     |

## OPERATING LIMITS - JK2835 18-V X CLASS

The maximum forward current is determined by the thermal resistance between the LED junction and ambient.



## FLUX CHARACTERISTICS, ORDER CODES AND BINS - JK2835 18-V X CLASS ( $I_F = 50 \text{ mA}$ , $T_J = 25^\circ \text{C}$ )

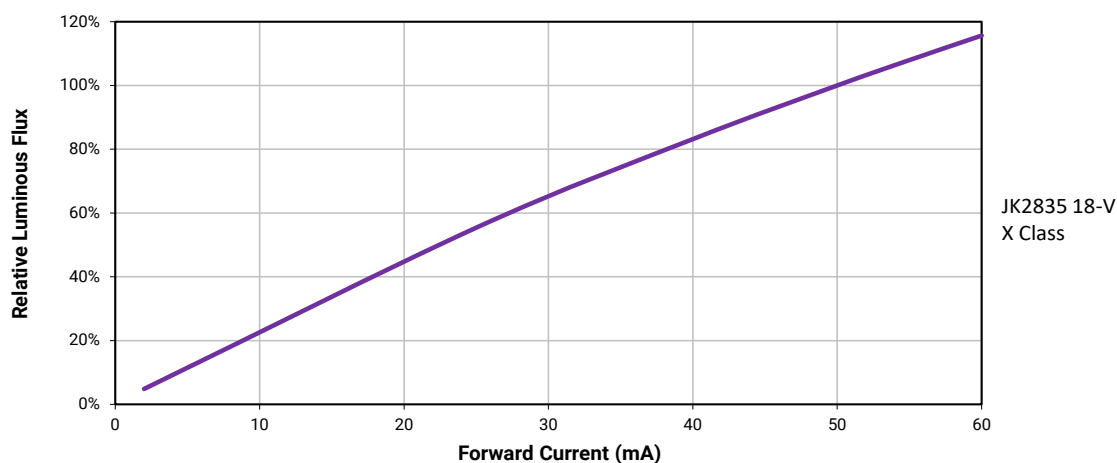
The following table provides order codes for J Series 2835 18-V X Class LEDs. For a complete description of the order code nomenclature, please see the Order Code and Bin Code Formats section (page 3). For definitions of the chromaticity kits, please see the Performance Groups - Chromaticity section (page 25).

| Nominal CCT | Minimum CRI <sup>†</sup> | Minimum Flux (lm) @ 25 °C | Typical Flux (lm) @ 25 °C | Typical Flux (lm) @ 85 °C* | Kitted 3-Step Order Code**     |
|-------------|--------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|
| 6500 K      | 70                       | 125                       | 132                       | 115                        | JK2835AWT-X-B65EF0000-N0000001 |
|             | 80                       | 115                       | 126                       | 110                        | JK2835AWT-X-H65EF0000-N0000001 |
|             | 90                       | 95                        | 107                       | 93                         | JK2835AWT-X-U65EF0000-N0000001 |
| 5700 K      | 70                       | 125                       | 132                       | 115                        | JK2835AWT-X-B57EF0000-N0000001 |
|             | 80                       | 115                       | 126                       | 110                        | JK2835AWT-X-H57EF0000-N0000001 |
|             | 90                       | 95                        | 107                       | 93                         | JK2835AWT-X-U57EF0000-N0000001 |
| 5000 K      | 70                       | 125                       | 132                       | 115                        | JK2835AWT-X-B50EF0000-N0000001 |
|             | 80                       | 115                       | 126                       | 110                        | JK2835AWT-X-H50EF0000-N0000001 |
|             | 90                       | 95                        | 107                       | 93                         | JK2835AWT-X-U50EF0000-N0000001 |
| 4000 K      | 70                       | 125                       | 132                       | 115                        | JK2835AWT-X-B40EF0000-N0000001 |
|             | 80                       | 115                       | 126                       | 110                        | JK2835AWT-X-H40EF0000-N0000001 |
|             | 90                       | 95                        | 107                       | 93                         | JK2835AWT-X-U40EF0000-N0000001 |
| 3500 K      | 70                       | 120                       | 128                       | 112                        | JK2835AWT-X-B35EF0000-N0000001 |
|             | 80                       | 110                       | 122                       | 106                        | JK2835AWT-X-H35EF0000-N0000001 |
|             | 90                       | 95                        | 104                       | 91                         | JK2835AWT-X-U35EF0000-N0000001 |
| 3000 K      | 70                       | 115                       | 125                       | 109                        | JK2835AWT-X-B30EF0000-N0000001 |
|             | 80                       | 105                       | 119                       | 104                        | JK2835AWT-X-H30EF0000-N0000001 |
|             | 90                       | 90                        | 101                       | 88                         | JK2835AWT-X-U30EF0000-N0000001 |
| 2700 K      | 70                       | 115                       | 121                       | 105                        | JK2835AWT-X-B27EF0000-N0000001 |
|             | 80                       | 105                       | 115                       | 100                        | JK2835AWT-X-H27EF0000-N0000001 |
|             | 90                       | 90                        | 97                        | 84                         | JK2835AWT-X-U27EF0000-N0000001 |
| 2200 K      | 80                       | 90                        | 97                        | 84                         | JK2835AWT-X-H22EF0000-N0000001 |
|             | 90                       | 75                        | 82                        | 71                         | JK2835AWT-X-U22EF0000-N0000001 |

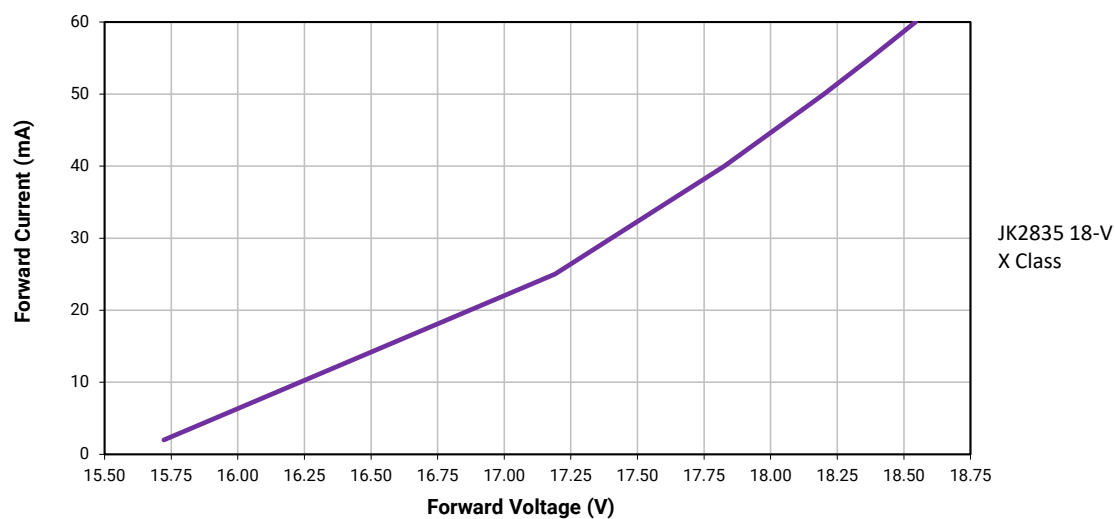
### Notes:

- Cree Venture maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and  $\pm 2$  on CRI measurements. See the Measurements section (page 36).
- Cree Venture J Series 2835 LED order codes specify only a minimum flux bin and not a maximum. Cree Venture 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 restrictions specified by the order code.
- ◊ CRI R9 minimum is 0 for 80 CRI minimum LEDs and 50 for 90 CRI minimum LEDs, with a  $\pm 3$  tolerance.
- \* Flux values @ 85 °C are calculated and for reference only.
- \*\* Contact your Cree sales representative for kitted 3-step order code details.

## RELATIVE LUMINOUS FLUX VS. CURRENT - JK2835 18-V X CLASS



## ELECTRICAL CHARACTERISTICS - JK2835 18-V X CLASS



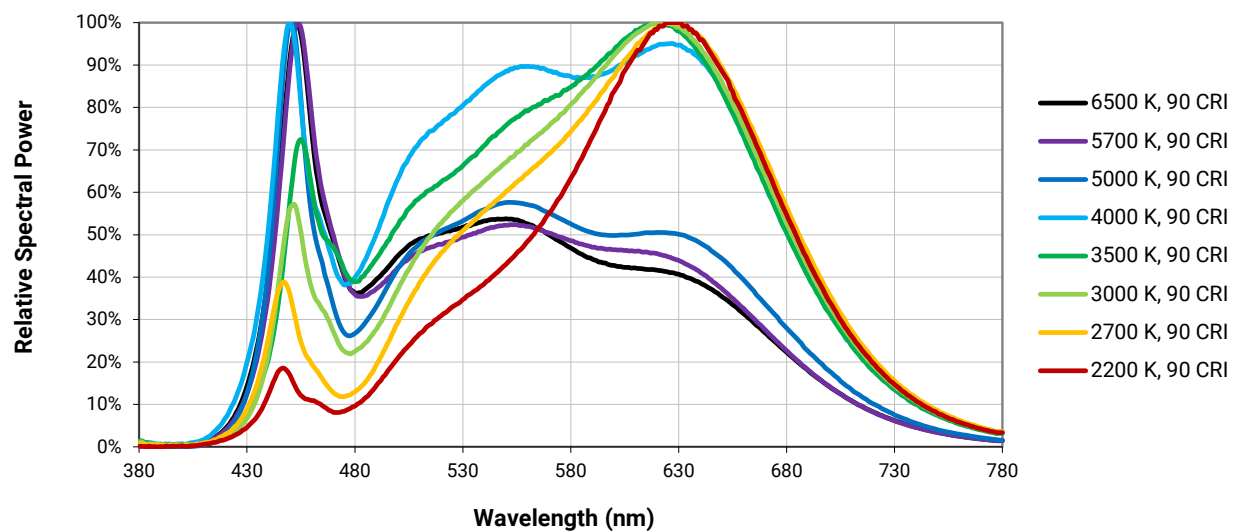
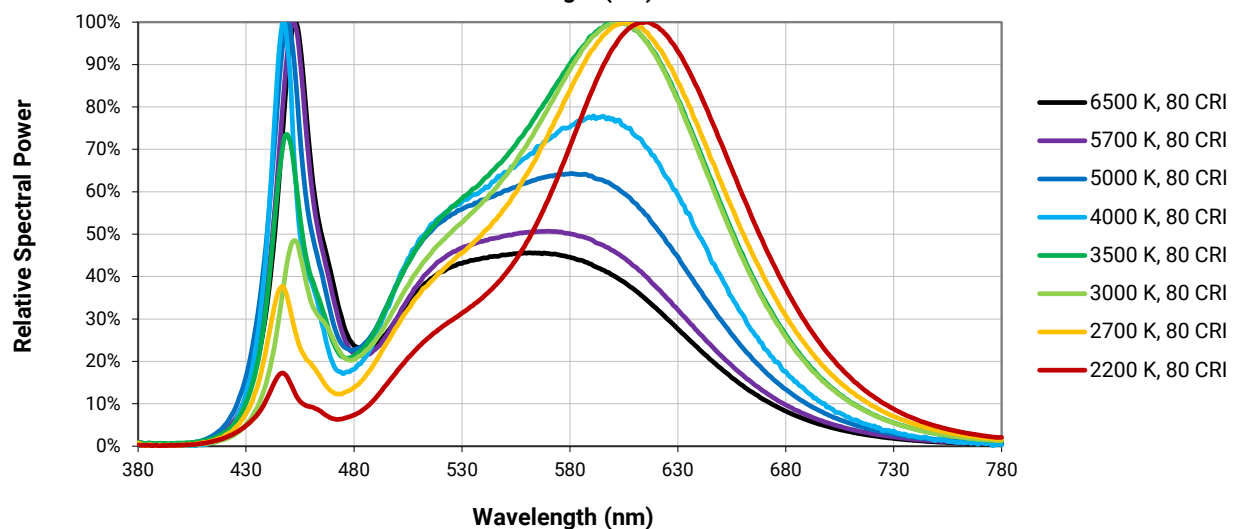
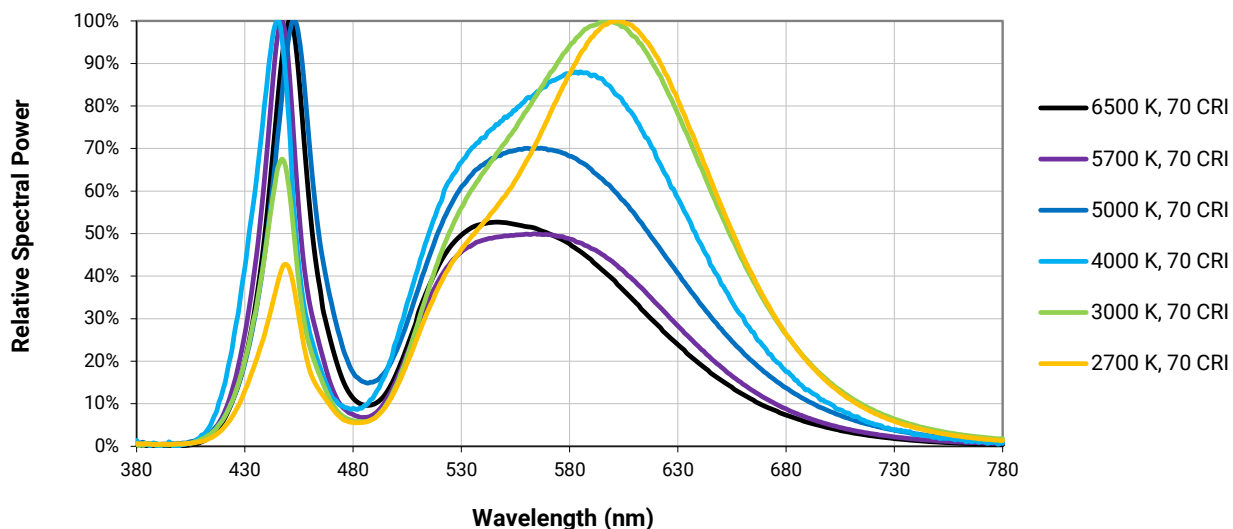
## RELATIVE CHROMATICITY VS. CURRENT - JK2835 18-V X CLASS



## RELATIVE CHROMATICITY VS. TEMPERATURE - JK2835 18-V X CLASS



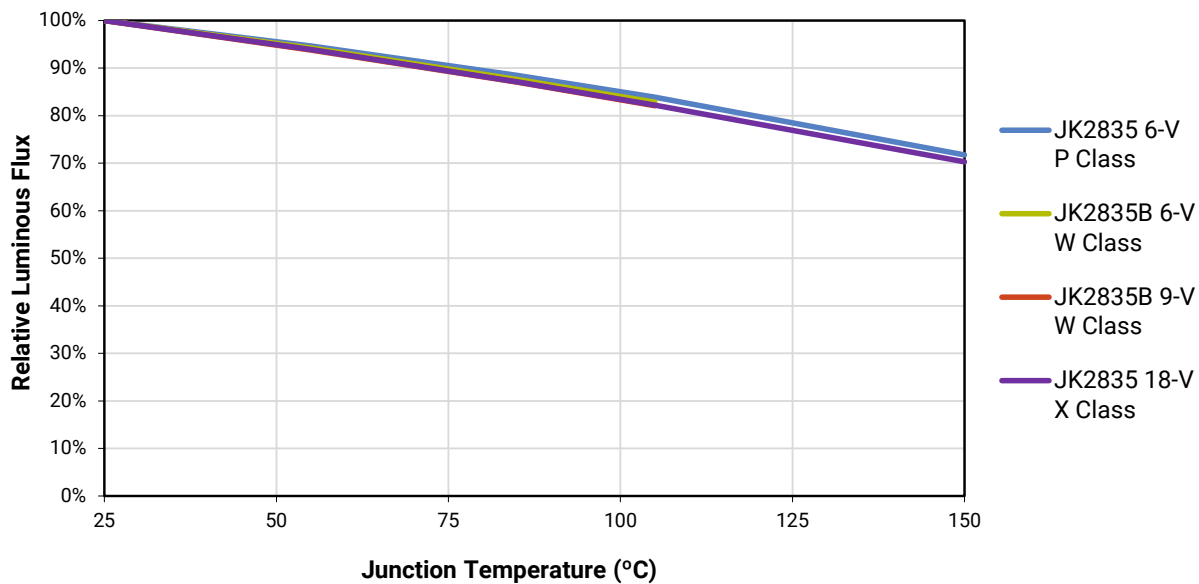
## RELATIVE SPECTRAL POWER DISTRIBUTION



## RELATIVE SPECTRAL POWER DISTRIBUTION - CONTINUED



## RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE



## TYPICAL SPATIAL DISTRIBUTION



## PERFORMANCE GROUPS - LUMINOUS FLUX ( $T_j = 25\text{ °C}$ )

J Series JK2835 and JK2835B LEDs are tested for luminous flux at the following current levels.

| LED                 | Tested For Luminous Flux At |
|---------------------|-----------------------------|
| JK2835 6-V P Class  | 150 mA                      |
| JK2835B 6-V W Class | 150 mA                      |
| JK2835B-9-V W Class | 100 mA                      |
| JK2835 18-V X Class | 50 mA                       |

Once tested, J Series JK2835 and JK2835B LEDs are placed into one of the following luminous-flux groups.

| Group Code | Minimum Luminous Flux (lm) | Maximum Luminous Flux (lm) |
|------------|----------------------------|----------------------------|
| F4         | 75                         | 80                         |
| G2         | 80                         | 85                         |
| G4         | 85                         | 90                         |
| H2         | 90                         | 95                         |
| H4         | 95                         | 100                        |
| J2         | 100                        | 105                        |
| J4         | 105                        | 110                        |
| K2         | 110                        | 115                        |
| K4         | 115                        | 120                        |
| L2         | 120                        | 125                        |
| L4         | 125                        | 130                        |
| M2         | 130                        | 135                        |
| M4         | 135                        | 140                        |
| N2         | 140                        | 145                        |
| N4         | 145                        | 150                        |
| P2         | 150                        | 155                        |
| P4         | 155                        | 160                        |

## PERFORMANCE GROUPS - FORWARD VOLTAGE ( $T_j = 25\text{ }^{\circ}\text{C}$ )

J Series 2835 LEDs are tested for forward voltage and placed into one of the following voltage bins.

The following voltage bins are indicated in the Forward Voltage Bin field in the bin code for JK2835 6-V P Class and JK2835B 6-V W Class LEDs.

| Voltage Bin | Minimum Forward Voltage (V) | Maximum Forward Voltage (V) |
|-------------|-----------------------------|-----------------------------|
| BP          | 5.8                         | 6.0                         |
| BQ          | 6.0                         | 6.2                         |
| BR          | 6.2                         | 6.4                         |
| BS          | 6.4                         | 6.6                         |

The following voltage bins are indicated in the Forward Voltage Bin field in the bin code for JK2835B 9-V W Class LEDs.

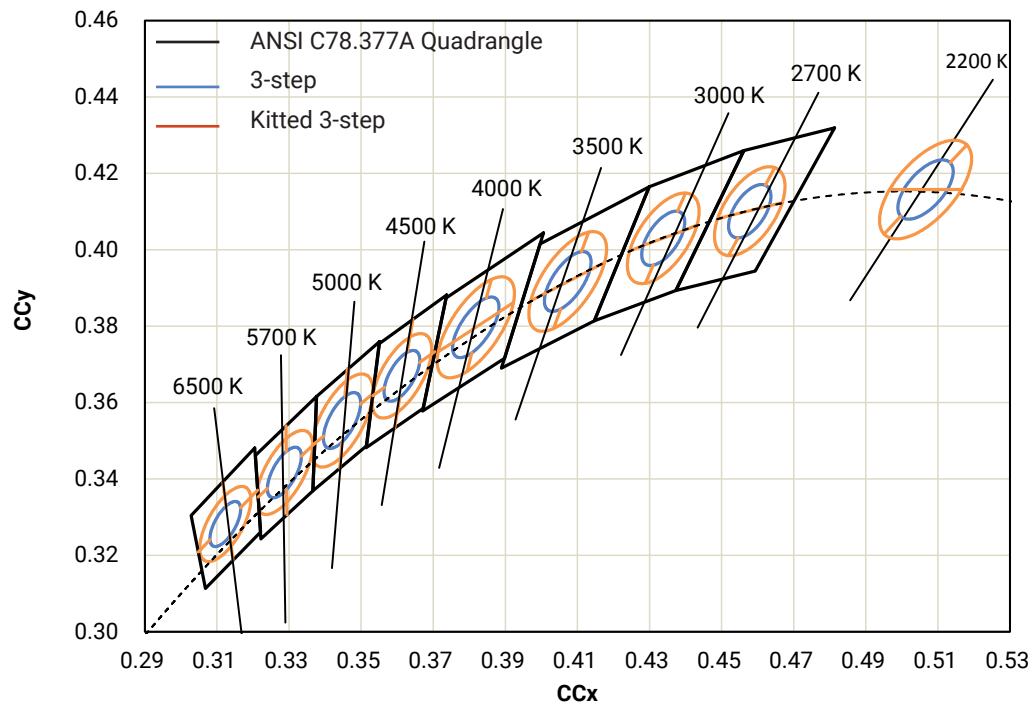
| Voltage Bin | Minimum Forward Voltage (V) | Maximum Forward Voltage (V) |
|-------------|-----------------------------|-----------------------------|
| CF          | 8.7                         | 9.0                         |
| CG          | 9.0                         | 9.3                         |
| CH          | 9.3                         | 9.6                         |

The following voltage bins are indicated in the Forward Voltage Bin field in the bin code for JK2835 18-V X Class LEDs.

| Voltage Bin | Minimum Forward Voltage (V) | Maximum Forward Voltage (V) |
|-------------|-----------------------------|-----------------------------|
| FU          | 17.5                        | 18.0                        |
| FV          | 18.0                        | 18.5                        |
| FW          | 18.5                        | 19.0                        |
| FY          | 19.0                        | 19.5                        |

## PERFORMANCE GROUPS - CHROMATICITY ( $T_i = 85^\circ\text{C}$ )

J Series 2835 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.



PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85^\circ\text{C}$ )



| CCT    | MacAdam Ellipse | Included Bins                 | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|-------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                               | x            | y      | a          | b          |                    |
| 6500 K | 3-step          | 1G0                           | 0.3123       | 0.3282 | 0.00669    | 0.00285    | 58.57              |
|        | Kitted 3-step   | 1G0,<br>1EA, 1EB,<br>1EC, 1ED | 0.3123       | 0.3282 | 0.01115    | 0.00475    | 58.57              |

PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85\text{ °C}$ )



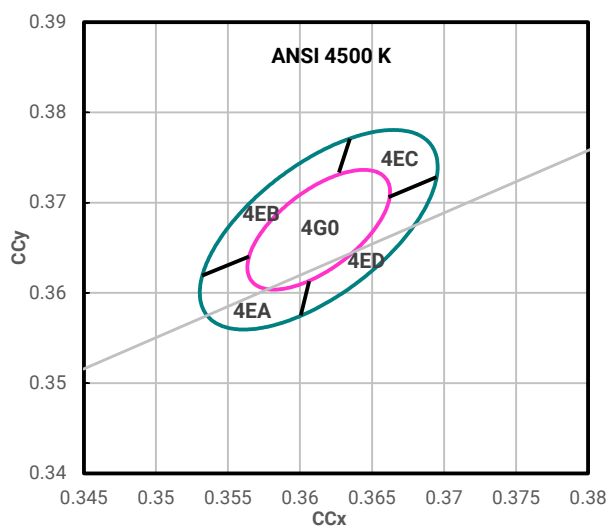
| CCT    | MacAdam Ellipse | Included Bins                 | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|-------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                               | x            | y      | a          | b          |                    |
| 5700 K | 3-step          | 2G0                           | 0.3287       | 0.3417 | 0.00746    | 0.00320    | 59.09              |
|        | Kitted 3-step   | 2G0,<br>2EA, 2EB,<br>2EC, 2ED | 0.3287       | 0.3417 | 0.01243    | 0.00533    | 59.09              |

PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85\text{ °C}$ )



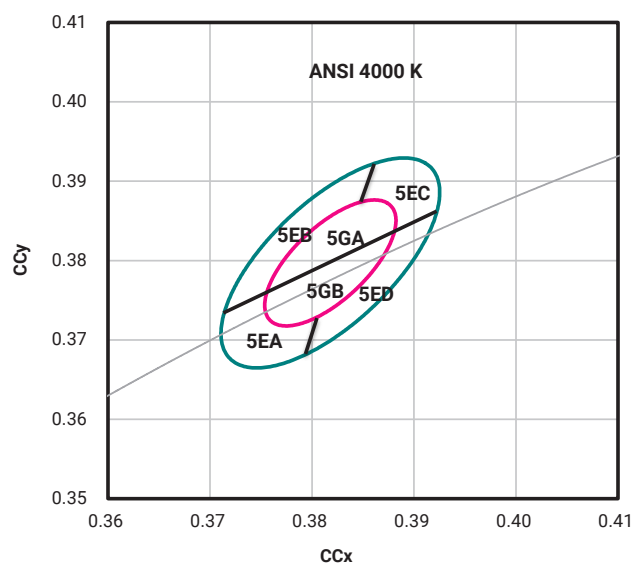
| CCT    | MacAdam Ellipse | Included Bins                 | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|-------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                               | x            | y      | a          | b          |                    |
| 5000 K | 3-step          | 3G0                           | 0.3447       | 0.3553 | 0.00822    | 0.00354    | 59.62              |
|        | Kitted 3-step   | 3G0,<br>3EA, 3EB,<br>3EC, 3ED | 0.3447       | 0.3553 | 0.01370    | 0.00590    | 59.62              |

### PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85\text{ }^{\circ}\text{C}$ )



| CCT    | MacAdam Ellipse | Included Bins                 | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|-------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                               | x            | y      | a          | b          |                    |
| 4500 K | 3-step          | 4G0                           | 0.3613       | 0.3670 | 0.00756    | 0.00338    | 57.58              |
|        | Kitted 3-step   | 4G0,<br>4EA, 4EB,<br>4EC, 4ED | 0.3613       | 0.3670 | 0.01260    | 0.00563    | 57.58              |

PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85^\circ\text{C}$ )



| CCT    | MacAdam Ellipse | Included Bins                      | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|------------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                                    | x            | y      | a          | b          |                    |
| 4000 K | 3-step          | 5GA, 5GB                           | 0.3818       | 0.3797 | 0.00939    | 0.00402    | 53.72              |
|        | Kitted 3-step   | 5GA, 5GB,<br>5EA, 5EB,<br>5EC, 5ED | 0.3818       | 0.3797 | 0.01565    | 0.00670    | 53.72              |

PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85\text{ }^{\circ}\text{C}$ )



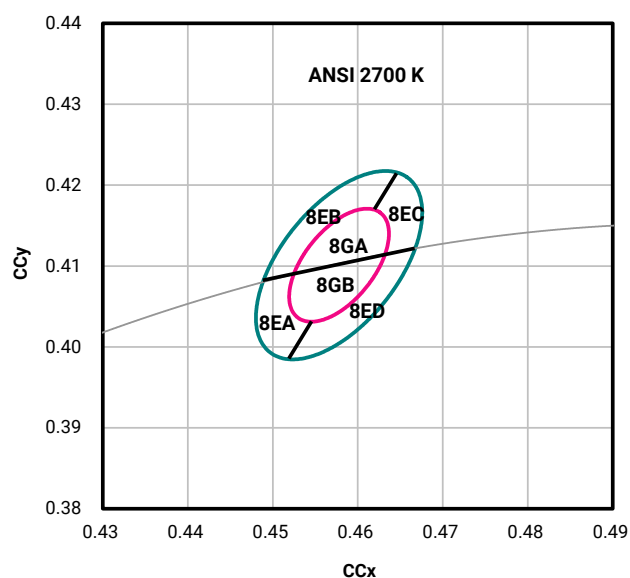
| CCT    | MacAdam Ellipse | Included Bins                      | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|------------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                                    | x            | y      | a          | b          |                    |
| 3500 K | 3-step          | 6GA, 6GB                           | 0.4073       | 0.3917 | 0.00927    | 0.00414    | 53.22              |
|        | Kitted 3-step   | 6GA, 6GB,<br>6EA, 6EB,<br>6EC, 6ED | 0.4073       | 0.3917 | 0.01545    | 0.00690    | 53.22              |

## PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85^\circ\text{C}$ )



| CCT    | MacAdam Ellipse | Included Bins                | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                              | x            | y      | a          | b          |                    |
| 3000 K | 3-step          | 7GA, 7GB                     | 0.4338       | 0.4030 | 0.00834    | 0.00408    | 53.22              |
|        | Kitted 3-step   | 7GA, 7GB, 7EA, 7EB, 7EC, 7ED | 0.4338       | 0.4030 | 0.01390    | 0.00680    | 53.22              |

## PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85^\circ\text{C}$ )



| CCT    | MacAdam Ellipse | Included Bins                | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                              | x            | y      | a          | b          |                    |
| 2700 K | 3-step          | 8GA, 8GB                     | 0.4578       | 0.4101 | 0.00810    | 0.00420    | 53.70              |
|        | Kitted 3-step   | 8GA, 8GB, 8EA, 8EB, 8EC, 8ED | 0.4578       | 0.4101 | 0.01350    | 0.00700    | 53.70              |

## PERFORMANCE GROUPS - CHROMATICITY - CONTINUED ( $T_j = 85^\circ\text{C}$ )

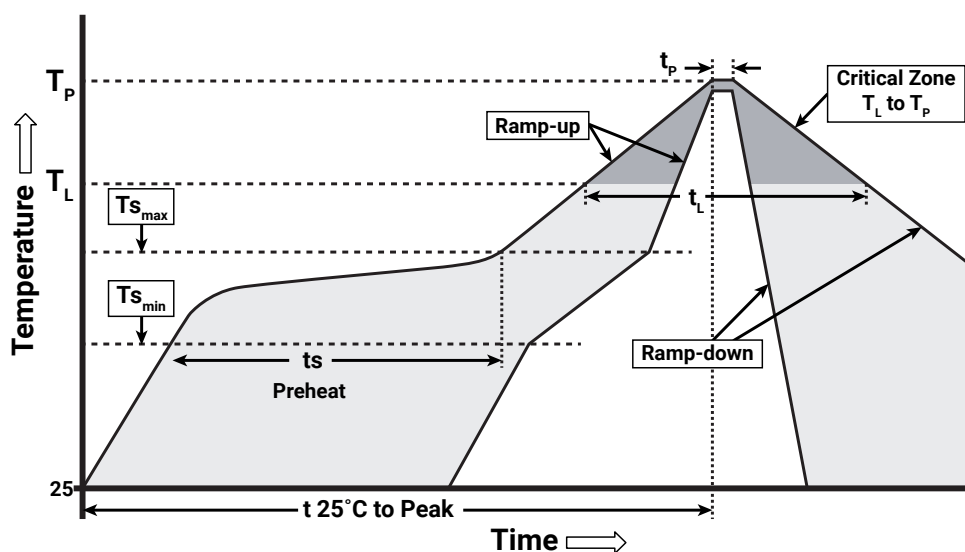


| CCT    | MacAdam Ellipse | Included Bins                | Center Point |        | Major Axis | Minor Axis | Rotation Angle (°) |
|--------|-----------------|------------------------------|--------------|--------|------------|------------|--------------------|
|        |                 |                              | x            | y      | a          | b          |                    |
| 2200 K | 3-step          | AGA, AGB                     | 0.5066       | 0.4158 | 0.0098     | 0.0048     | 45.5               |
|        | Kitted 3-step   | AGA, AGB, AEA, AEB, AEC, AED | 0.5066       | 0.4158 | 0.0163     | 0.0080     | 45.5               |

## REFLOW SOLDERING CHARACTERISTICS

In testing, Cree Venture has found J Series 2835 LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree Venture recommends that users follow the recommended soldering profile provided by the manufacturer of the solder paste used, and therefore it is the lamp or luminaire manufacturer's responsibility to determine applicable soldering requirements.

Note that this general guideline may not apply to all PCB designs and configurations of reflow soldering equipment.



IPC/JEDEC J-STD-020C

| Profile Feature                                                                  | Lead-Free Solder |
|----------------------------------------------------------------------------------|------------------|
| Temperature Min. ( $T_{s_{min}}$ )                                               | 150 °C           |
| Temperature Max. ( $T_{s_{max}}$ )                                               | 200 °C           |
| Time (ts) from $T_{s_{min}}$ to $T_{s_{max}}$                                    | 60-120 seconds   |
| Ramp-Up Rate ( $T_l$ to $T_p$ )                                                  | 3 °C/second      |
| Liquidus Temperature ( $T_l$ )                                                   | 217 °C           |
| Time ( $t_l$ ) Maintained Above $T_l$                                            | 60-150 seconds   |
| Peak Package Body Temperature ( $T_p$ )                                          | 260 °C max.      |
| Time ( $t_p$ ) Within 5 °C of the Specified Classification Temperature ( $T_c$ ) | 30 seconds max.  |
| Ramp-Down Rate ( $T_p$ to $T_l$ )                                                | 6 °C/second max. |
| Time 25 °C to Peak Temperature                                                   | 8 minutes max.   |

Note: All temperatures refer to the topside of the package, measured on the package body surface.

## NOTES

### Measurements

The luminous flux, radiant power, chromaticity, forward voltage 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 Venture'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 or provided as specifications.

### Pre-Release Qualification Testing

Please read the [J Series Reliability Overview](#) for the details of the pre-release qualification testing for J Series LEDs.

### Lumen Maintenance

Cree Venture 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 [J Series LM-80 results document](#).

Please read the [Thermal Management application note](#) for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

### Moisture Sensitivity

Cree Venture recommends keeping J Series 2835 LEDs in the provided, resealable moisture-barrier packaging (MBP) until immediately prior to soldering. Unopened MBP that contains J Series 2835 LEDs does not need special storage for moisture sensitivity.

Once the MBP is opened, J Series 2835 LEDs should be handled and stored as MSL 3 per JEDEC J-STD-033, meaning they have limited exposure time before damage to the LED may occur during the soldering operation. The table on the right specifies the maximum exposure time in days depending on temperature and humidity conditions. LEDs with exposure time longer than the specified maximums must be baked according to the baking conditions listed below.

| Moisture Sensitivity Level | Temp. | Maximum Percent Relative Humidity |     |     |     |     |
|----------------------------|-------|-----------------------------------|-----|-----|-----|-----|
|                            |       | 50%                               | 60% | 70% | 80% | 90% |
| Level 3                    | 35 °C | 8                                 | 5   | 1   | 0.5 | 0.5 |
| Level 3                    | 30 °C | 11                                | 7   | 1   | 1   | 1   |
| Level 3                    | 25 °C | 14                                | 10  | 2   | 1   | 1   |
| Level 3                    | 20 °C | 20                                | 13  | 2   | 1   | 1   |

### Baking Conditions

It is not necessary to bake all J Series 2835 LEDs. Only the LEDs that meet all of the following criteria must be baked:

1. LEDs that have been removed from the original MBP.
2. LEDs that have been exposed to a humid environment longer than listed in the Moisture Sensitivity section above.
3. LEDs that have not been soldered.

LEDs should be baked at 60 °C for 24 hours. LEDs may be baked in the original reels. Remove LEDs from the MBP before baking. Do not bake parts at temperatures higher than 60 °C. This baking operation resets the exposure time as defined in the Moisture Sensitivity section above.

## NOTES - CONTINUED

---

### **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 Ecology](#) section of the Cree website.

### **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 SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

### **UL® Recognized Component**

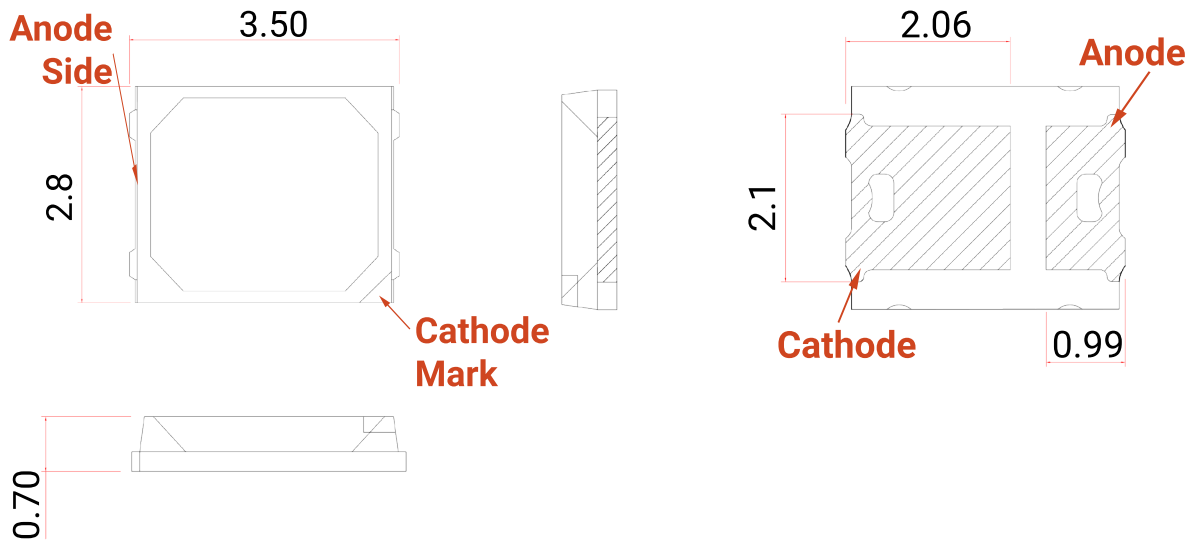
This product meets the requirements to be considered a UL Recognized Component with Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

### **Vision Advisory**

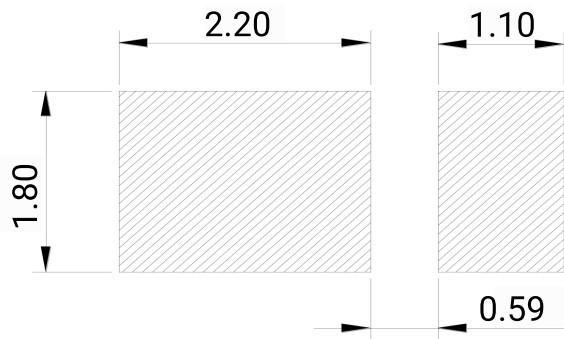
**WARNING:** Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the [J Series LED Eye Safety application note](#).

## MECHANICAL DIMENSIONS

Thermal vias, if present, are not shown on these drawings.  
All measurements are  $\pm 0.1$  mm unless otherwise indicated.



All measurements are  $\pm 0.1$  mm unless otherwise indicated.

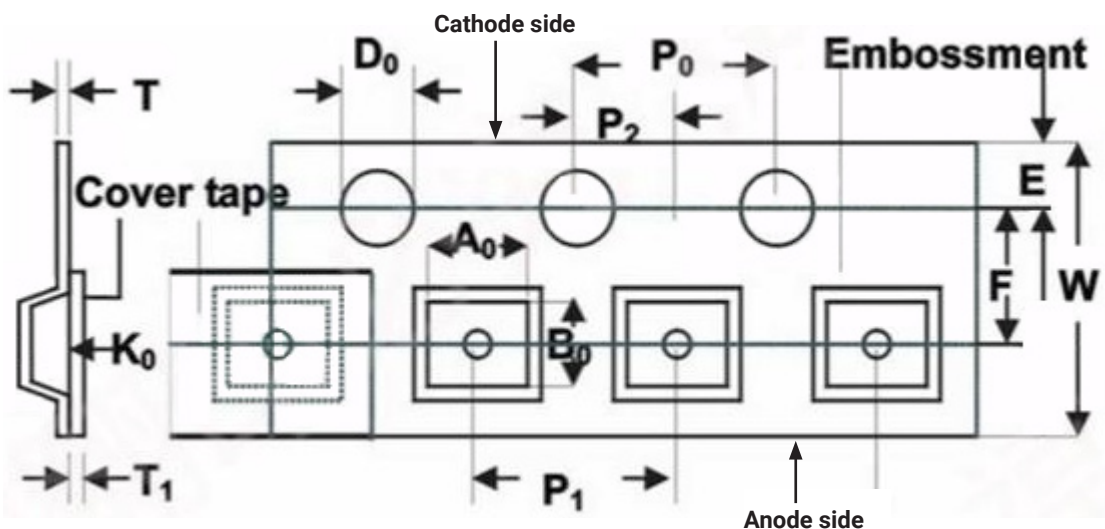


**Recommended Solder Pad**

## TAPE & REEL

All Cree Venture carrier tapes conform to EIA-481D, Automated Component Handling Systems Standard.

All dimensions in mm.



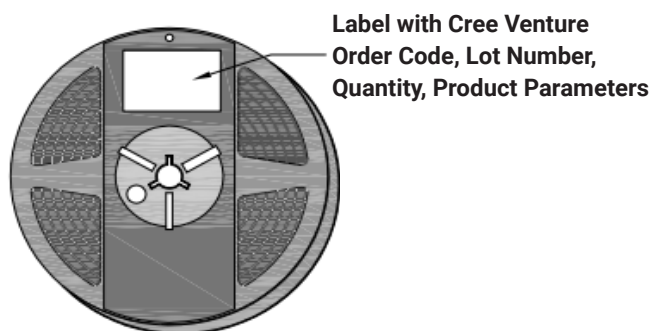
| Symbol | Specification   | Symbol | Specification   |
|--------|-----------------|--------|-----------------|
| W      | $8.00 \pm 0.10$ | $A_0$  | $3.00 \pm 0.10$ |
| E      | $1.75 \pm 0.10$ | $B_0$  | $3.70 \pm 0.10$ |
| F      | $3.50 \pm 0.05$ | $K_0$  | $1.05 \pm 0.10$ |
| $D_0$  | $1.55 \pm 0.10$ |        |                 |
| $P_0$  | $4.00 \pm 0.10$ |        |                 |
| $P_1$  | $4.00 \pm 0.10$ |        |                 |
| $P_2$  | $2.00 \pm 0.05$ |        |                 |
| T      | $0.20 \pm 0.05$ |        |                 |
| T1     | $0.05 \pm 0.01$ |        |                 |



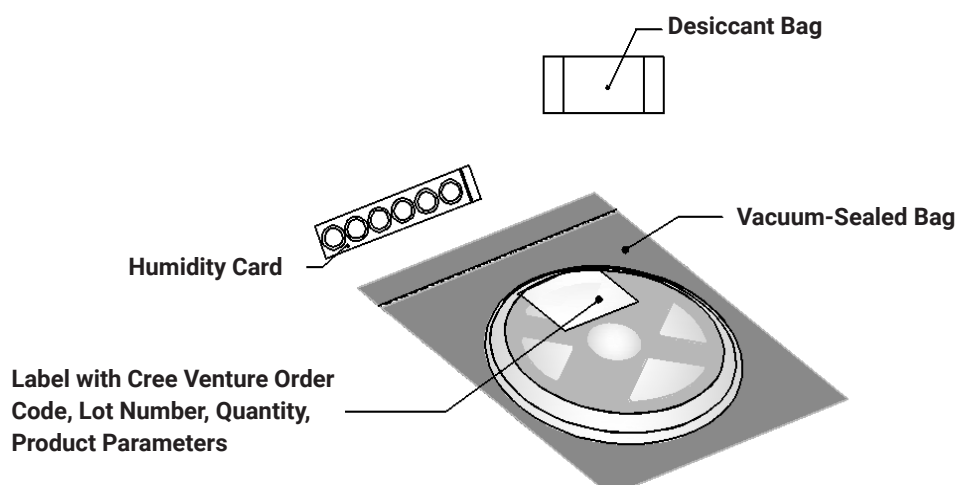


## PACKAGING

### Unpackaged Reel



### Packaged Reel



## PACKAGING - CONTINUED

J Series 2835 LEDs are packaged in boxes for shipment. Box sizes and the number of reels per box are as follows.

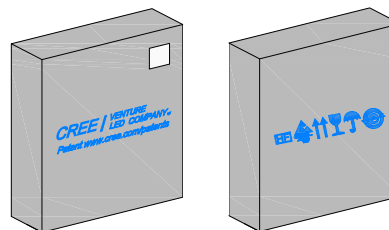
| Box | Box Dimensions     | Maximum Number of Reels per Box |
|-----|--------------------|---------------------------------|
| 1   | 250 x 210 x 30 mm  | 2                               |
| 2   | 250 x 210 x 50 mm  | 4                               |
| 3   | 530 x 230 x 275 mm | 42                              |
| 4   | 530 x 443 x 275 mm | 84                              |

Each box has at least one label (shown as a white square in the diagrams below) showing the order code, lot number, quantity, and product parameters.

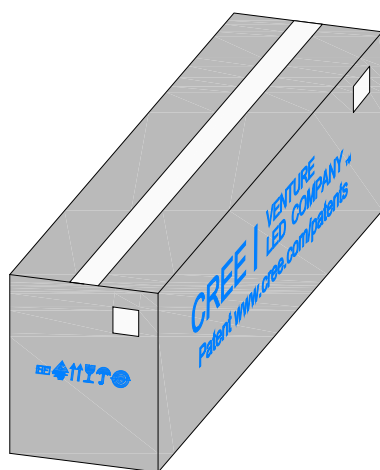
**Box 1**



**Box 2**



**Box 3**



**Box 4**

