

Cree® P4 LED CP41B-RDS/ADS CP41B-RFS/AFS CP41B-RHS/AHS



PRODUCT DESCRIPTION

This revolutionary package design allows the lighting designer to reduce the number of LEDs required and provide a more uniform and unique illuminated appearance than with other LED solutions.

This is possible through the efficient optical-package design and high-current capabilities. The low-profile package can be easily coupled with reflectors or lenses to efficiently distribute light and provide the desired lit appearance. This product family employs green and blue LED materials, which allows designers to match the color of many lighting applications such as vehicle signal lamps and amusement lighting.

FEATURES

- Size (mm): 7.6 x 7.6
- Color and Typical Dominant Wavelength:
Red (628nm)
Amber(591nm)
- Luminous Flux (mlm)

CP41B-RDS:(4400-11000)
CP41B-RFS:(4400-11000)
CP41B-RHS:(4400-13200)
CP41B-ADS:(4400-11000)
CP41B-AFS:(5500-13200)
CP41B-AHS:(5500-13200)
- Lead - Free
- RoHS Compliant

APPLICATIONS

- Channel Letter
- Amusement

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

| Items | Symbol | Absolute Maximum Rating | Unit |
|---|-----------|---|------------------|
| | | Red/Amber | |
| Forward Current | I_F | 70 ^{Note1} | mA |
| Peak Forward Current ^{Note2} | I_{FP} | 200 | mA |
| Reverse Voltage | V_R | 5 | V |
| Power Dissipation | P_D | 210 | mW |
| Operation Temperature | T_{opr} | -40 ~ +100 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -40 ~ +100 | $^\circ\text{C}$ |
| Lead Soldering Temperature | T_{sol} | Max. 260 $^\circ\text{C}$ for 5 sec. max. (3 mm from the base of the epoxy bulb) | |
| Electrostatic Discharge Classification (MIL-STD-883E) | ESD | Class 2 | |

Note:

1. A heat sink is recommended if the device is operated at ambient temperatures higher than 25 $^\circ\text{C}$.
2. Pulse width ≤ 0.1 msec, duty $\leq 1/10$.

TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

| Characteristics | Color | Symbol | Condition | Unit | Minimum | Typical | Maximum |
|---------------------|---------------|------------------------|---------------|---------------|---------|---------|---------|
| Forward Voltage | Red/Amber | V_F | $I_F = 70$ mA | V | | 2.5 | 3.0 |
| Reverse Current | Red/Amber | I_R | $V_R = 5$ V | μA | | | 100 |
| Dominant Wavelength | Red | λ_D | $I_F = 70$ mA | nm | 620 | 628 | 637 |
| | Amber | λ_D | $I_F = 70$ mA | nm | 584 | 591 | 599 |
| Luminous Flux | Red | CP41B-RDS (40 degree) | Φ_v | $I_F = 70$ mA | mIm | 4400 | 7000 |
| | | CP41B-RFS (70 degree) | Φ_v | $I_F = 70$ mA | mIm | 4400 | 7500 |
| | | CP41B-RHS (100 degree) | Φ_v | $I_F = 70$ mA | mIm | 4400 | 8000 |
| | Amber | CP41B-ADS (40 degree) | Φ_v | $I_F = 70$ mA | mIm | 4400 | 6500 |
| | | CP41B-AFS (70 degree) | Φ_v | $I_F = 70$ mA | mIm | 5500 | 7500 |
| | | CP41B-AHS (100 degree) | Φ_v | $I_F = 70$ mA | mIm | 5500 | 8000 |
| 50% Power Angle | CP41B-RDS/ADS | $2\theta_{1/2}$ | $I_F = 70$ mA | deg | | 40 | |
| | CP41B-RFS/AFS | $2\theta_{1/2}$ | $I_F = 70$ mA | deg | | 70 | |
| | CP41B-RHS/AHS | $2\theta_{1/2}$ | $I_F = 70$ mA | deg | | 100 | |

Note: Continuous reverse voltage can cause LED damage.

FLUX BIN LIMIT ($I_F = 70 \text{ mA}$)

Red

CP41B-RDS/RFS (40/70 degree)

| Bin Code | Min.(mlm) | Max.(mlm) |
|----------|-----------|-----------|
| LO | 4400 | 5500 |
| M0 | 5500 | 6600 |
| N0 | 6600 | 8730 |
| P0 | 8730 | 11000 |

CP41B-RHS (100 degree)

| Bin Code | Min.(mlm) | Max.(mlm) |
|----------|-----------|-----------|
| LO | 4400 | 5500 |
| M0 | 5500 | 6600 |
| N0 | 6600 | 8730 |
| P0 | 8730 | 11000 |
| Q0 | 11000 | 13200 |

Amber

CP41B-ADS (40 degree)

| Bin Code | Min.(mlm) | Max.(mlm) |
|----------|-----------|-----------|
| LO | 4400 | 5500 |
| M0 | 5500 | 6600 |
| N0 | 6600 | 8730 |
| P0 | 8730 | 11000 |

CP41B-AFS/AHS (70/100 degree)

| Bin Code | Min.(mlm) | Max.(mlm) |
|----------|-----------|-----------|
| M0 | 5500 | 6600 |
| N0 | 6600 | 8730 |
| P0 | 8730 | 11000 |
| Q0 | 11000 | 13200 |

- Tolerance of measurement of luminous flux is $\pm 15\%$

COLOR BIN LIMIT ($I_F = 70 \text{ mA}$)

Red

| Bin Code | Min.(nm) | Max.(nm) |
|----------|----------|----------|
| RE | 620 | 637 |

Amber

| Bin Code | Min.(nm) | Max.(nm) |
|----------|----------|----------|
| A2 | 584 | 587 |
| A3 | 587 | 590 |
| A4 | 590 | 593 |
| A5 | 593 | 596 |
| A6 | 596 | 599 |

- Tolerance of measurement of dominant wavelength is $\pm 1 \text{ nm}$

VF BIN LIMIT ($I_F = 70 \text{ mA}$)

Red

| Bin Code | Min.(V) | Max.(V) |
|----------|---------|---------|
| 23 | 2.0 | 2.2 |
| 24 | 2.2 | 2.4 |
| 25 | 2.4 | 2.6 |
| 26 | 2.6 | 2.8 |
| 27 | 2.8 | 3.0 |

Amber

| Bin Code | Min.(V) | Max.(V) |
|----------|---------|---------|
| 23 | 2.0 | 2.2 |
| 24 | 2.2 | 2.4 |
| 25 | 2.4 | 2.6 |
| 26 | 2.6 | 2.8 |
| 27 | 2.8 | 3.0 |

- Tolerance of measurement of VF is $\pm 0.05\text{V}$.

ORDER CODE TABLE*

| Color | Kit Number | Viewing Angle | Luminous Flux (mlm) | | Dominant Wavelength | | | |
|-------|--------------------|---------------|---------------------|-------|---------------------|-----------|-----------|-----------|
| | | | Min. | Max. | Color Bin | Min. (nm) | Color Bin | Max. (nm) |
| Red | CP41B-RDS-CL0P0EE4 | 40 | 4400 | 11000 | RE | 620 | RE | 637 |
| Red | CP41B-RDS-CM0P0EE4 | 40 | 5500 | 11000 | RE | 620 | RE | 637 |

| Color | Kit Number | Viewing Angle | Luminous Flux (mlm) | | Dominant Wavelength | | | |
|-------|--------------------|---------------|---------------------|-------|---------------------|-----------|-----------|-----------|
| | | | Min. | Max. | Color Bin | Min. (nm) | Color Bin | Max. (nm) |
| Red | CP41B-RFS-CL0P0EE4 | 70 | 4400 | 11000 | RE | 620 | RE | 637 |
| Red | CP41B-RFS-CM0P0EE4 | 70 | 5500 | 11000 | RE | 620 | RE | 637 |
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| Red | CP41B-RHS-CL0Q0EE4 | 100 | 4400 | 13200 | RE | 620 | RE | 637 |
| Red | CP41B-RHS-CM0Q0EE4 | 100 | 5500 | 13200 | RE | 620 | RE | 637 |
| Red | CP41B-RHS-CN0Q0EE4 | 100 | 6600 | 13200 | RE | 620 | RE | 637 |

ORDER CODE TABLE*

| Color | Kit Number | Viewing Angle | Luminous Flux (mlm) | | Dominant Wavelength | | | |
|-------|--------------------|---------------|---------------------|-------|---------------------|-----------|-----------|-----------|
| | | | Min. | Max. | Color Bin | Min. (nm) | Color Bin | Max. (nm) |
| Amber | CP41B-ADS-CL0P0264 | 40 | 4400 | 11000 | A2 | 584 | A6 | 599 |
| Amber | CP41B-ADS-CM0P0354 | 40 | 5500 | 11000 | A3 | 587 | A5 | 596 |
| Amber | CP41B-ADS-CM0P0454 | 40 | 5500 | 11000 | A4 | 590 | A5 | 596 |

| Color | Kit Number | Viewing Angle | Luminous Flux (mlm) | | Dominant Wavelength | | | |
|-------|--------------------|---------------|---------------------|-------|---------------------|-----------|-----------|-----------|
| | | | Min. | Max. | Color Bin | Min. (nm) | Color Bin | Max. (nm) |
| Amber | CP41B-AFS-CM0Q0264 | 70 | 5500 | 13200 | A2 | 584 | A6 | 599 |
| Amber | CP41B-AFS-CN0Q0354 | 70 | 6600 | 13200 | A3 | 587 | A5 | 596 |
| Amber | CP41B-AFS-CN0Q0454 | 70 | 6600 | 13200 | A4 | 590 | A5 | 596 |

| Color | Kit Number | Viewing Angle | Luminous Flux (mlm) | | Dominant Wavelength | | | |
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| | | | Min. | Max. | Color Bin | Min. (nm) | Color Bin | Max. (nm) |
| Amber | CP41B-AHS-CM0Q0264 | 100 | 5500 | 13200 | A2 | 584 | A6 | 599 |
| Amber | CP41B-AHS-CN0Q0354 | 100 | 6600 | 13200 | A3 | 587 | A5 | 596 |
| Amber | CP41B-AHS-CN0Q0454 | 100 | 6600 | 13200 | A4 | 590 | A5 | 596 |

Notes:

- The above kit numbers represent order codes which include multiple flux-bin and color-bin codes. Only one flux-bin code and one color-bin code will be shipped on each reel. And single flux-bin code, single color bin-codes will not be orderable.
- Please refer to the "Cree LED Lamp Reliability Test Standards" document #1 for reliability test conditions.
- Please refer to the "Cree LED Lamp Soldering & Handling" document #2 for information about how to use this LED product safely.

#1: Refer to http://www.cree.com/led-components/media/documents/LED_Lamp_Reliability_Test_Standard.pdf

#2: Refer to <http://www.cree.com/led-components/media/documents/sh-HB.pdf>

GRAPHS



FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

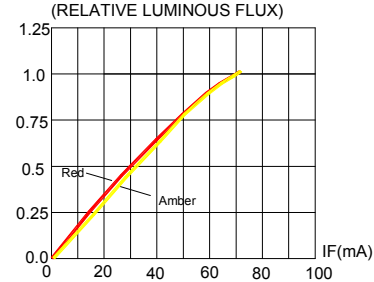


FIG.2 RELATIVE LUMINOUS FLUX VS. FORWARD CURRENT



FIG.3 Red & Amber REVERSE CURRENT VS. REVERSE VOLTAGE.

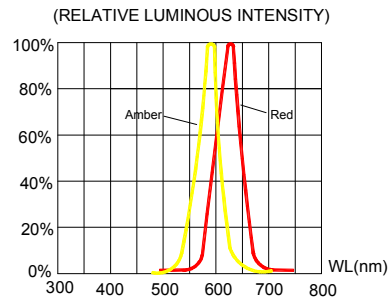


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

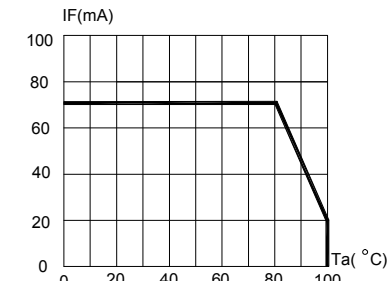


FIG.5 Red & Amber MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE (Tjmax=120°C)

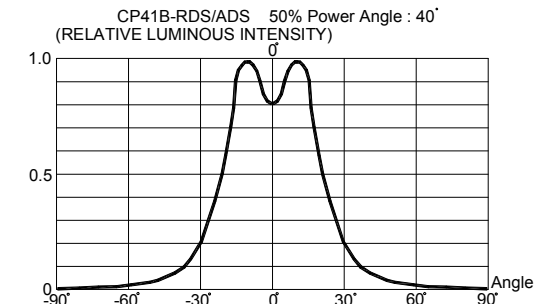


FIG.6 FAR FIELD PATTERN

The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

GRAPHS



FIG.7 FAR FIELD PATTERN



FIG.8 FAR FIELD PATTERN



FIG.9 FAR FIELD PATTERN

The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

MECHANICAL DIMENSIONS

All dimensions are in mm. Tolerance is ± 0.25 mm unless otherwise noted.

An epoxy meniscus extend about 1.5 mm down the leads.

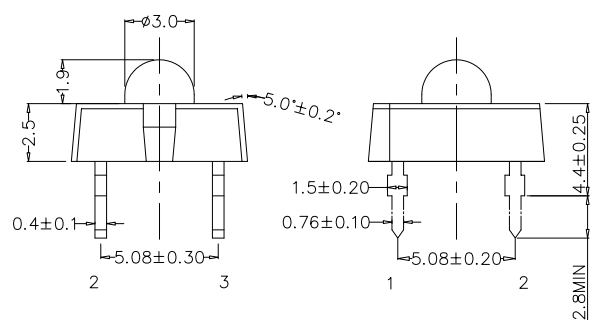
All metal burr dimension is 0.2 mm max.

CP41B-RDS/ADS:

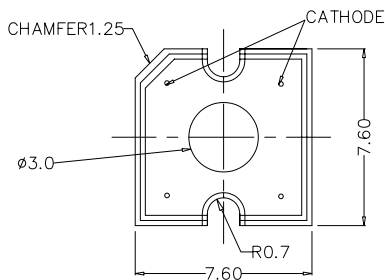


2.3: ANODE
 1.4: CATHODE

CP41B-RFS/AFS:



2.3: ANODE
 1.4: CATHODE



NOTES

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 by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863/EU.

RoHS Declarations for this product can be obtained from your Cree representative or from the Product Ecology section of the Cree website.

Vision Advisory Claim

Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.

MECHANICAL DIMENSIONS

All dimensions are in mm. Tolerance is ± 0.25 mm unless otherwise noted.

An epoxy meniscus extend about 1.5 mm down the leads.

All metal burr dimension is 0.2 mm max.

CP41B-RHS/AHS:



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KIT NUMBER SYSTEM

All dimensions in mm. Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping and packaging options.

Cree LEDs are sold by order codes in combinations of bins called kits. Order codes are configured in the following manner:



REFLOW SOLDERING

The LED soldering specification is shown below (suitable for both leaded solder & lead-free solder):

| Manual Soldering | | Solder Dipping | |
|------------------|--|-------------------------|--|
| Soldering iron | 35 W max | Preheat | 110 °C max |
| Temperature | 300 °C max | Preheat time | 60 seconds max |
| | | Solder-bath temperature | 260 °C Max |
| Soldering time | 3 seconds max | Dipping time | 5 seconds max |
| Position | Not less than 3 mm from the base of the package. | Position | Not less than 3 mm from the base of the package. |

- Manual soldering onto the PCB is not recommended because soldering time is uncontrollable.
- The recommended wave soldering is as below:



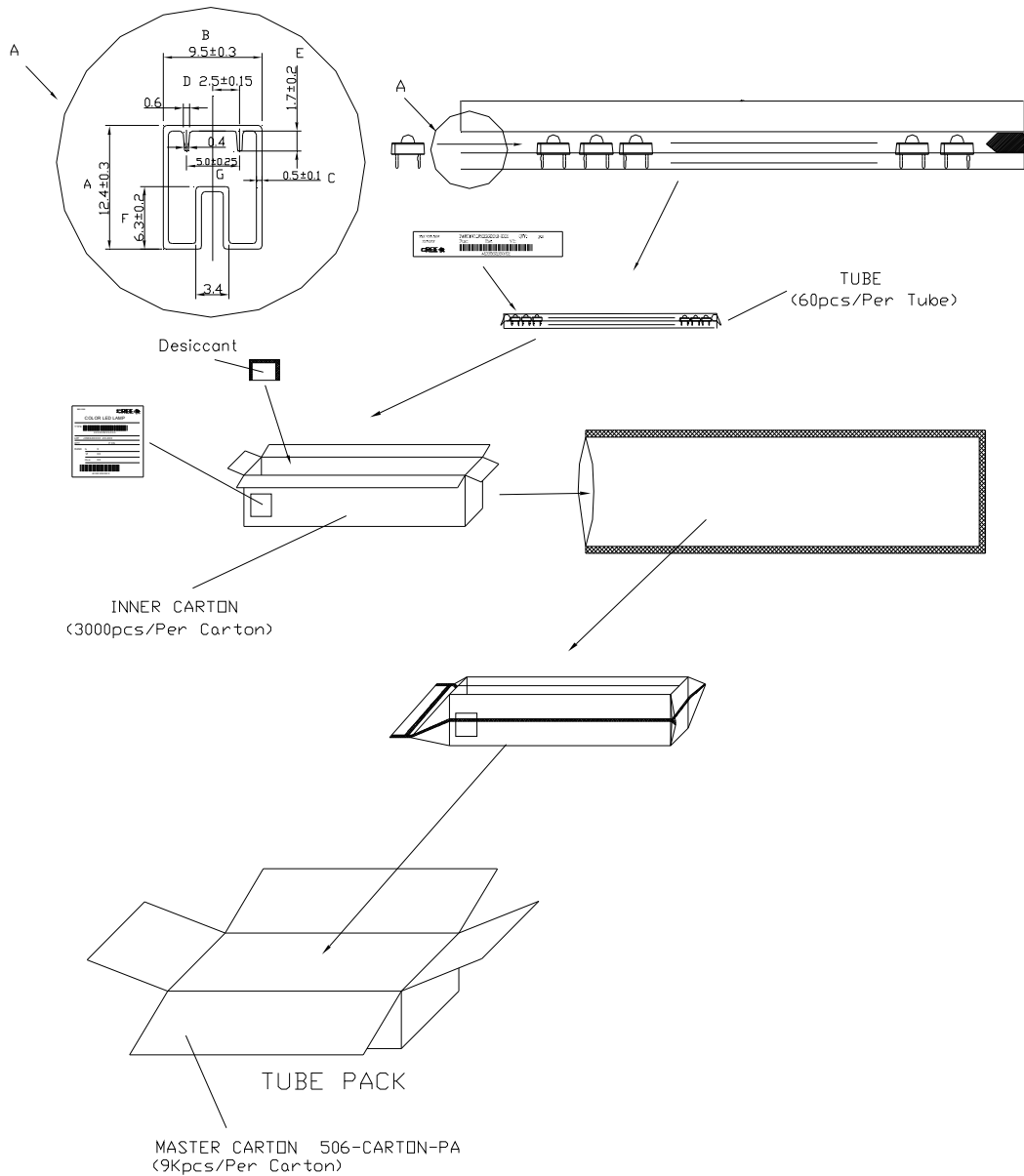
- Do not apply any stress to the LED package, particularly when heated.
- Only bottom preheat is suggested & should not preheat on top in order to reduce thermal stress experienced by the LEDs.
- The LEDs must not be re used once they have been extracted from PCB.
- After soldering the LEDs, the package should be protected from mechanical shock or vibration until the LEDs have reached 40 °C or below.
- Precautions must be taken as mechanical stress on the LEDs may be caused by PCB warpage or from the clinching and cutting of the LED leads.
- When it is necessary to clam the LEDs during soldering, it is important to ensure no mechanical stress is exerted on the LEDs.
- Cut the LED lead at normal room temperature. Lead cutting at high temperature may cause failure of the LEDs.

Refer to "<http://www.cree.com/led-components/media/documents/sh-HB.pdf>" for soldering & handling details.

PACKAGING

Features:

- The LEDs are packed in cardboard boxes after packaging in normal or anti-electrostatic bags.
- Cardboard boxes will be used to protect the LEDs from mechanical shock during transportation.
- The boxes are not water resistant, and they must be kept away from water and moisture.
- The Tube Pack type of packaging.
- Max 60 pcs per tube.





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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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