Cree® PLCC6 3 in 1 SMD LED
CLX6F-PKW

PRODUCT DESCRIPTION
These SMD LEDs are packaged in an industry standard PLCC6 package. These high reliability and high brightness LEDs are designed to work in a wide range of environmental condition and are ideally suited for use in illumination applications.

Its wide viewing angle makes these LEDs ideally suited for channel letter, or general backlighting and illumination applications. The flat top emitting surface makes it easy for these LEDs to mate with light pipes.

FEATURES
• Size (mm): 3.5 x 3.4 x 2.8
• Luminous Intensity (mcd)
  PC Amber (6300-11300)
• Moisture Sensitivity Level: 5a
• Lead-Free
• RoHS Compliant

APPLICATIONS
• Architecture Lighting
• Channel Letter
• Backlight
# Absolute Maximum Ratings (T<sub>A</sub> = 25°C)

<table>
<thead>
<tr>
<th>Items</th>
<th>Symbol</th>
<th>Absolute Maximum Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current Note 1</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;</td>
<td>3 x 70</td>
<td>mA</td>
</tr>
<tr>
<td>Peak Forward Current Note 2</td>
<td>I&lt;sub&gt;FP&lt;/sub&gt;</td>
<td>3 x 200</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V&lt;sub&gt;R&lt;/sub&gt;</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P&lt;sub&gt;D&lt;/sub&gt;</td>
<td>3 x 280</td>
<td>mW</td>
</tr>
<tr>
<td>Operation Temperature</td>
<td>T&lt;sub&gt;op&lt;/sub&gt;</td>
<td>-40 ~ +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T&lt;sub&gt;stg&lt;/sub&gt;</td>
<td>-40 ~ +100</td>
<td>°C</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>T&lt;sub&gt;J&lt;/sub&gt;</td>
<td>110</td>
<td>°C</td>
</tr>
<tr>
<td>Junction/ambient 1 chip on</td>
<td>R&lt;sub&gt;THJA&lt;/sub&gt;</td>
<td>220</td>
<td>°C/W</td>
</tr>
<tr>
<td>Junction/solder point 1 chip on</td>
<td>R&lt;sub&gt;THJS&lt;/sub&gt;</td>
<td>140</td>
<td>°C/W</td>
</tr>
<tr>
<td>Electrostatic Discharge</td>
<td>ESD</td>
<td>1000 V</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
2. Pulse width ≤0.1 msec, duty ≤1/10.

# Typical Electrical & Optical Characteristics (T<sub>A</sub> = 25°C)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Condition</th>
<th>Symbol</th>
<th>Values</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral bandwidth at 50% I&lt;sub&gt;REL&lt;/sub&gt; max</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 3 x 35 mA</td>
<td>Δλ</td>
<td>81</td>
<td>nm</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 3 x 35 mA</td>
<td>V&lt;sub&gt;F(avg)&lt;/sub&gt;</td>
<td>3.3</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V&lt;sub&gt;F(max)&lt;/sub&gt;</td>
<td>4.0</td>
<td>V</td>
</tr>
<tr>
<td>Luminous Intensity</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 3 x 35 mA</td>
<td>I&lt;sub&gt;V(min)&lt;/sub&gt;</td>
<td>6300</td>
<td>mcd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I&lt;sub&gt;V(avg)&lt;/sub&gt;</td>
<td>9000</td>
<td>mcd</td>
</tr>
<tr>
<td>Luminous Flux(Reference)</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 3 x 35 mA</td>
<td>Φ&lt;sub&gt;V(avg)&lt;/sub&gt;</td>
<td>23</td>
<td>lm</td>
</tr>
<tr>
<td>Reverse Current (max)</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 5 V</td>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>10</td>
<td>μA</td>
</tr>
</tbody>
</table>

**Note:** Continuous reverse voltage can cause LED damage.
INTENSITY BIN LIMIT ($I_f = 3 \times 35 \, mA$)

**PC Amber**

<table>
<thead>
<tr>
<th>Bin Code</th>
<th>Min.(mcd)</th>
<th>Max.(mcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1k1m</td>
<td>6300</td>
<td>8000</td>
</tr>
<tr>
<td>X</td>
<td>7100</td>
<td>9000</td>
</tr>
<tr>
<td>1n1p</td>
<td>8000</td>
<td>10100</td>
</tr>
<tr>
<td>Y</td>
<td>9000</td>
<td>11300</td>
</tr>
</tbody>
</table>

- Tolerance of measurement of luminous intensity is ±10%.

COLOR BIN LIMIT ($I_f = 3 \times 35 \, mA$)

**PC Amber**

<table>
<thead>
<tr>
<th>Bin Code</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>V0</td>
<td>0.5622</td>
<td>0.4372</td>
</tr>
<tr>
<td></td>
<td>0.5843</td>
<td>0.4152</td>
</tr>
<tr>
<td></td>
<td>0.5705</td>
<td>0.4111</td>
</tr>
<tr>
<td></td>
<td>0.5499</td>
<td>0.4249</td>
</tr>
</tbody>
</table>

- Tolerance of measurement of the color coordinates is ±0.02.

CIE CHROMATICITY DIAGRAM

[Graph showing the CIE chromaticity diagram with a yellow line for Bin V0]
## ORDER CODE TABLE*

<table>
<thead>
<tr>
<th>Kit Number</th>
<th>Color</th>
<th>Luminous Intensity (mcd)</th>
<th>Dominant Wavelength (nm)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLX6F-PKW-C1k1mYV0V03</td>
<td>PC Amber</td>
<td>6300</td>
<td>11300</td>
<td>V0</td>
</tr>
</tbody>
</table>

Notes:
1. The above kit numbers represent the order codes which include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each reel. Single intensity-bin code and single color-bin code will be orderable in certain quantities. For example, intensity bin from 1k1m - Y means intensity bin from (1k1m or X or 1n1p or Y) will be shipped by Cree.
2. Please refer to the “Cree LED Lamp Reliability Test Standards” document #1 for reliability test conditions.
3. Please refer to the “Cree LED Lamp Soldering & Handling” document #2 for information about how to use this LED product safely.

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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.
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MECHANICAL DIMENSIONS

All dimensions are in mm.

NOTES

RoHS Compliance

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise 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 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended through April 21, 2006.

Vision Advisory Claim

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

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:

- **C** - Product Series
- **D** - Color
- **G** - Option
  - S: Standoff
  - N: No Standoff
  - B: Black Face
  - W: White Face
  - A: Black Body
- **T** - Packaging Type
  - 1: Bulk Pack
  - 2: Ammow Pack
  - 3: Tape & Reel (Roll Pack)
  - 4: Tube Pack

**Example Order Code:**

```
C C C C C - D X G - X H H J J K K L L M M N N T
```

- **C C C C C** - Product Series
- **D** - Color
- **X G** - Option
  - S: Standoff
  - N: No Standoff
  - B: Black Face
  - W: White Face
  - A: Black Body
- **X H H J J K K L L M M N N T** - Packaging Type
  - 1: Bulk Pack
  - 2: Ammow Pack
  - 3: Tape & Reel (Roll Pack)
  - 4: Tube Pack

- **H** - Red Color Min. Intensity Bin
- **H** - Red Color Max. Intensity Bin
- **J** - Green Color Min. Intensity Bin
- **J** - Green Color Max. Intensity Bin
- **K** - Blue Color Min. Intensity Bin
- **K** - Blue Color Max. Intensity Bin
- **N** - Blue Color Max. Wavelength Range
- **N** - Blue Color Min. Wavelength Range
- **M** - Green Color Max. Wavelength Range
- **M** - Green Color Min. Wavelength Range
- **L** - Red Color Max. Wavelength Range
- **L** - Red Color Min. Wavelength Range
**REFLOW SOLDERING**

- The CLX6F-PKW is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.

![Temperature-Time Graph]

**Use only with CLX6F-PKW**

<table>
<thead>
<tr>
<th>Solder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average ramp-up rate = 4°C/s max</td>
</tr>
<tr>
<td>Preheat temperature = 150°C ~200°C</td>
</tr>
<tr>
<td>Preheat time = 120s max</td>
</tr>
<tr>
<td>Ramp-down rate = 6°C/s max</td>
</tr>
<tr>
<td>Peak temperature = 250°C max</td>
</tr>
<tr>
<td>Time within 5°C of actual Peak Temperature = 10s max</td>
</tr>
<tr>
<td>Duration above 217°C is 60s max</td>
</tr>
</tbody>
</table>

NOTES

• The packaging sizes of these SMD products are very small and the resin is still soft after solidification. Users are required to handle with care. Never touch the resin surface of SMD products.

• To avoid damaging the product’s surface and interior device, it is recommended to choose a special nozzle to pick up the SMD products during the process of SMT production. If handling is necessary, take special care when picking up these products. The following method is necessary:
PACKAGING

- The boxes are not water resistant and they must be kept away from water and moisture.
- 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 shocks during transportation.
- The reel pack is applied in SMD LED.
- Max 2800 pcs per reel.