

**RoHS
Compliant**



Description:

The XM-L LED is the industry's highest performance, single-die white lighting-class LED. The XM-L LED is 20% more efficient than the XP-G LED at the same current, and can deliver 1,000 lumens with 100 lumens per watt efficacy. The XM-L LED offers Cree's industry-leading features: wide viewing angle, symmetrical package, unlimited floor life and electrically neutral thermal path.

XM-L LEDs can enable LED light into new applications that require tens of thousands of lumens, such as high bay and high output area lighting. The XM-L is also the ideal choice for lighting applications where high light output and maximum efficacy are required, such as LED light bulbs, outdoor lighting, portable lighting, indoor lighting and solar-powered lighting.

Features:

| | |
|---------------------------|-----------|
| Max. drive current | : 3,000mA |
| Low thermal resistance | : 2.5°C/W |
| Max. junction temperature | : 150°C |
| Viewing angle | : 125° |

- Available in cool white, 80-CRI min. neutral white and 80-CRI, 85-CRI and 90-CRI warm white
- ANSI-compatible chromaticity bins
- Unlimited floor life at ≤30°C/85% RH
- Reflow solderable - JEDEC J-STD-020C
- Electrically neutral thermal path

Characteristics:

| Characteristics | Unit | Minimum | Typical | Maximum |
|--|---------|---------|---------|---------|
| Thermal resistance, junction to solder point | °C/W | | 2.5 | |
| Viewing angle (FWHM) | Degrees | | 125 | |
| Temperature coefficient of voltage | mV/°C | | -2.1 | |
| ESD withstand voltage (HBM per Mil-Std-883D) | V | | | 8,000 |
| DC forward current | mA | | | 3,000 |
| Reverse voltage | V | | | 5 |
| Forward voltage (@ 700mA) | V | | 2.9 | 3.5 |
| Forward voltage (@ 1,500mA) | V | | 3.1 | |
| Forward voltage (@ 3,000mA) | V | | 3.35 | |
| LED junction temperature | °C | | | 150 |

Flux Characteristics (T_J = 25 °C)

| Colour | CCT Range | | Min. Luminous Flux @ 700mA | | Calculated Minimum Luminous Flux (lm)* | | | Part Number |
|------------|-----------|--------|----------------------------|-----------|--|---------|---------|-------------------------------|
| | Min. | Max. | Group | Flux (lm) | 1,000mA | 1,500mA | 2,000mA | |
| Cool White | 5,000K | 8,300K | T5 | 260 | 360 | 511 | 643 | XMLAWT-00-0000-0000T5051-STAR |

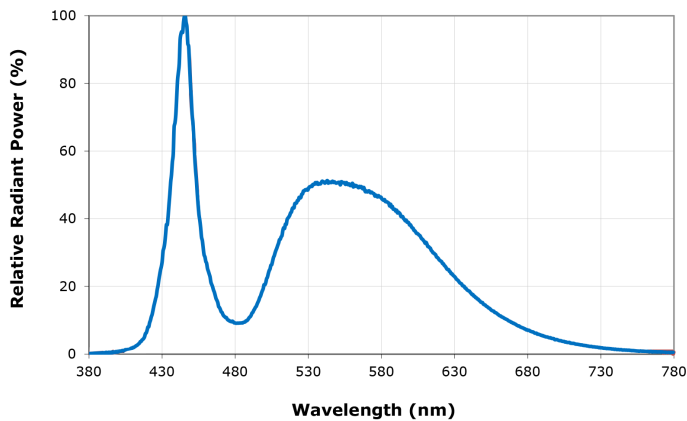
Note:

Maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CC_x, CC_y) measurements and ±2 on CRI measurements.

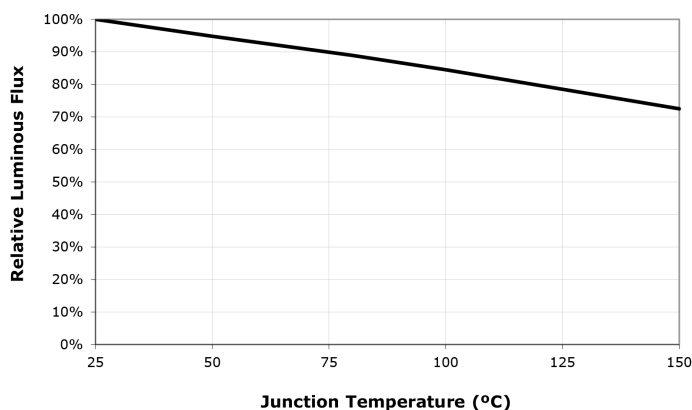
Typical CRI for Cool White (5000 K – 8300 K CCT) is 65

*Calculated flux values are for reference only.

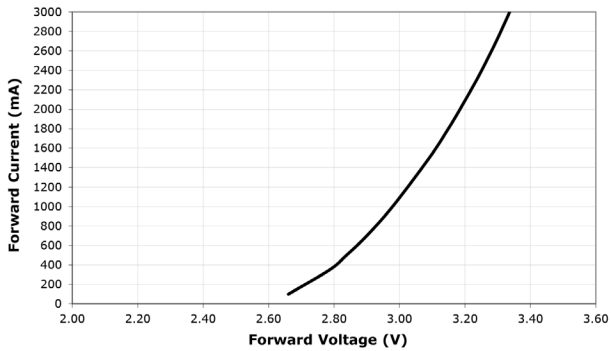
Relative Spectral Power Distribution:



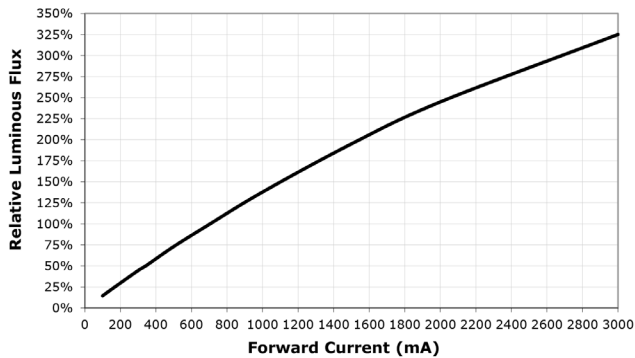
Relative Flux vs. Junction Temperature (I_F = 700mA):



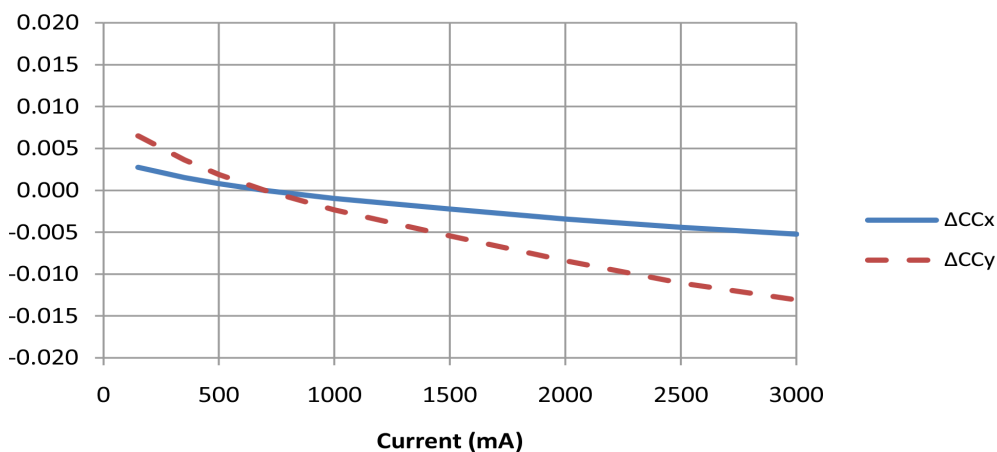
Electrical Characteristics ($T_J = 25^\circ\text{C}$)



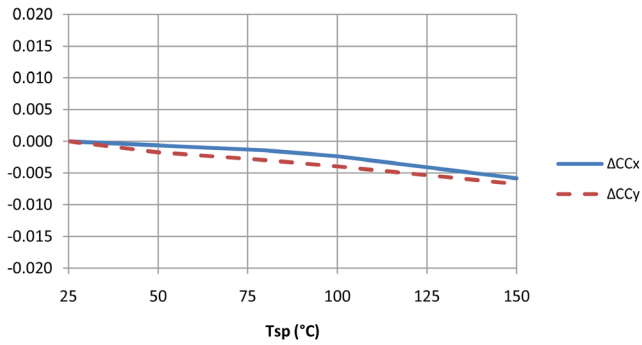
Relative Flux vs. Current ($T_J = 25^\circ\text{C}$)



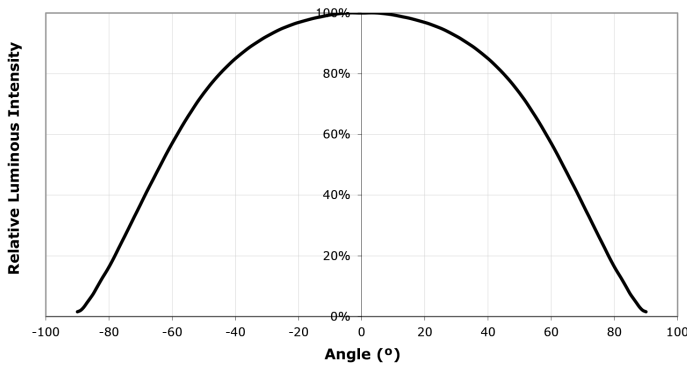
Relative Chromaticity vs. Current (Cool White)



Relative Chromaticity vs. Temperature (Cool White)



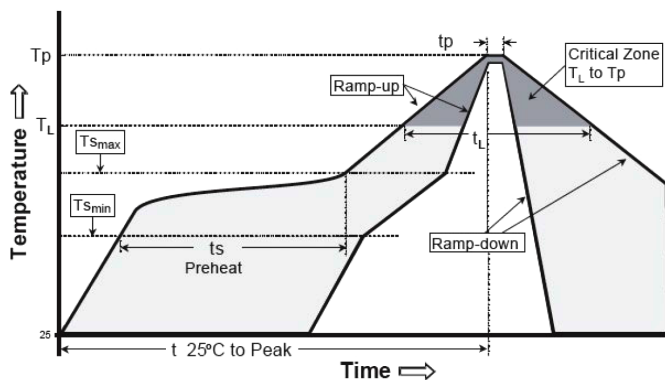
Typical Spatial Distribution



Reflow Soldering Characteristics:

In testing, it has found XM-L LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree recommends that users follow the recommended soldering profile provided by the manufacturer of solder paste used.

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



XM-L Starboard LED



| Profile Feature | Lead-Based Solder | Lead-Free Solder |
|---|-------------------|------------------|
| Average Ramp-Up Rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat: Temperature Min (T _{smin}) | 100°C | 150°C |
| Preheat: Temperature Max (T _{smax}) | 150°C | 200°C |
| Preheat: Time (t _{smin} to t _{smax}) | 60-120 seconds | 60-180 seconds |
| Time Maintained Above: Temperature (T _L) | 183°C | 217°C |
| Time Maintained Above: Time (t _L) | 60-150 seconds | 60-150 seconds |
| Peak/Classification Temperature (T _p) | 215°C | 260°C |
| Time Within 5 °C of Actual Peak Temperature (t _p) | 10-30 seconds | 20-40 seconds |
| Ramp-Down Rate | 6 °C/second max. | 6 °C/second max. |
| Time 25°C to Peak Temperature | 6 minutes max. | 8 minutes max. |

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

Part Number Table

| Description | Part Number |
|------------------------------------|-------------------------------|
| Star Led Module, Cool White, 260LM | XMLAWT-00-0000-0000T5051-STAR |

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