# American Opto Plus LED
# L-513NPWC-30D

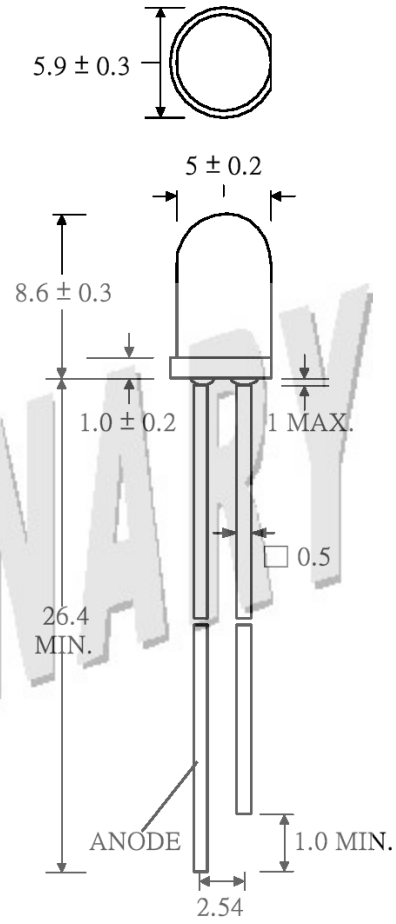
**5mm Dia LED LAMP - WATER CLEAR**

- **5.0mm DIA LED LAMP**
- **NON-PHOSPHOR WHITE**
- **LOW POWER CONSUMPTION**
- **HIGH LUMINOUS INTENSITY**

*PRELIMINARY*

## DESCRIPTION

- Super bright LED Lamp
- Round type
- T1-3/4 (5mm) diameter
- Lens color: Water clear
- With flange
- Solder leads without stand-off




Notes:
1. All dimensions are in millimeter.
2. Lead spacing is measured where the lead emerge from the package.

## FEATURES

- Emitted color: White
- High luminous intensity
- Technology: InGaN / Sapphire
- Non-phosphor white LED
- Viewing angle: 30°

## SELECTION GUIDE

| Chip Material | Chip Emitted | Lens Color | Viewing Angle |
|---|---|---|---|
| InGaN / Sapphire | White | Water Clear | 30° |

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## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| Parameter | Symbol | Max Rating | Unit |
|---|---|---|---|
| Power Dissipation | $P_D$ | 120 | mW |
| Pulse Forward Current (1/10 Duty Cycle @1KHz ) | $I_{PF}$ | 100 | mA |
| Forward Current | $I_F$ | 30 | mA |
| Reverse Voltage | $V_R$ | 5.0 | V |
| Operating Temperature Range | $T_{OPR}$ | -40 ~ +80 | °C |
| Storage Temperature Range | $T_{STG}$ | -40 ~ +100 | °C |
| Lead soldering temperature [1.6 mm (0.063 inch) from body]: 260°C for 5 seconds | | | |

## OPTICAL-ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Luminous Intensity | $I_V$ | $I_F$ = 20mA | 5800 | 9500 | | mcd |
| Forward Voltage | $V_F$ | $I_F$ = 20mA | | 3.5 | 4.0 | V |
| Reverse Current | $I_R$ | $V_R$ = 5V | | | 10 | μA |
| Viewing Angle | 2θ1/2 | $I_F$ = 20mA | | 30 | | deg. |
| Chromaticity Coordinates | X | $I_F$ = 20mA | | 0.31 | | |
| | Y | | | 0.32 | | |

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## ELECTRICAL CHARACTERISTICS (Ta=25°C)

| Symbol | $I_V$ | | $V_F$ | | Color |
|---|---|---|---|---|---|
| Parameter | Luminous Intensity | | Forward Voltage | | |
| Condition | $I_F$ = 20mA | | $I_F$ = 20mA | | $I_F$ = 20mA |
| Unit | mcd | | V | | Color Range |
| Binning | Grade | Range | Grade | Range | Grade |
| | Bin 1 | 5800 - 8100 | Q0 | 2.5 - 3.0 | W1 |
| | Bin 2 | 8100 - 11300 | Q1 | 3.0 - 3.5 | W2 |
| | Bin 3 | 11300 - 15800 | Q2 | 3.5 - 4.0 | W3 |
| | | | | | W4 |
| | | | | | W5 |
| | | | | | W6 |
| | | | | | W7 |
| | | | | | W8 |
| | | | | | W9 |
| | | | | | W10 |

Intensity: Tolerance of minimum and maximum = ± 15%
$V_F$: Tolerance of minimum and maximum = ± 0.05V
Color coordinates: Uncertainty = ± 0.01

Notes: Static electricity and surge damages the LED. It is recommended to use an anti-static wrist band or anti-electrostatic glove when handling LEDs. All devices, equipment and machinery must be properly grounded.

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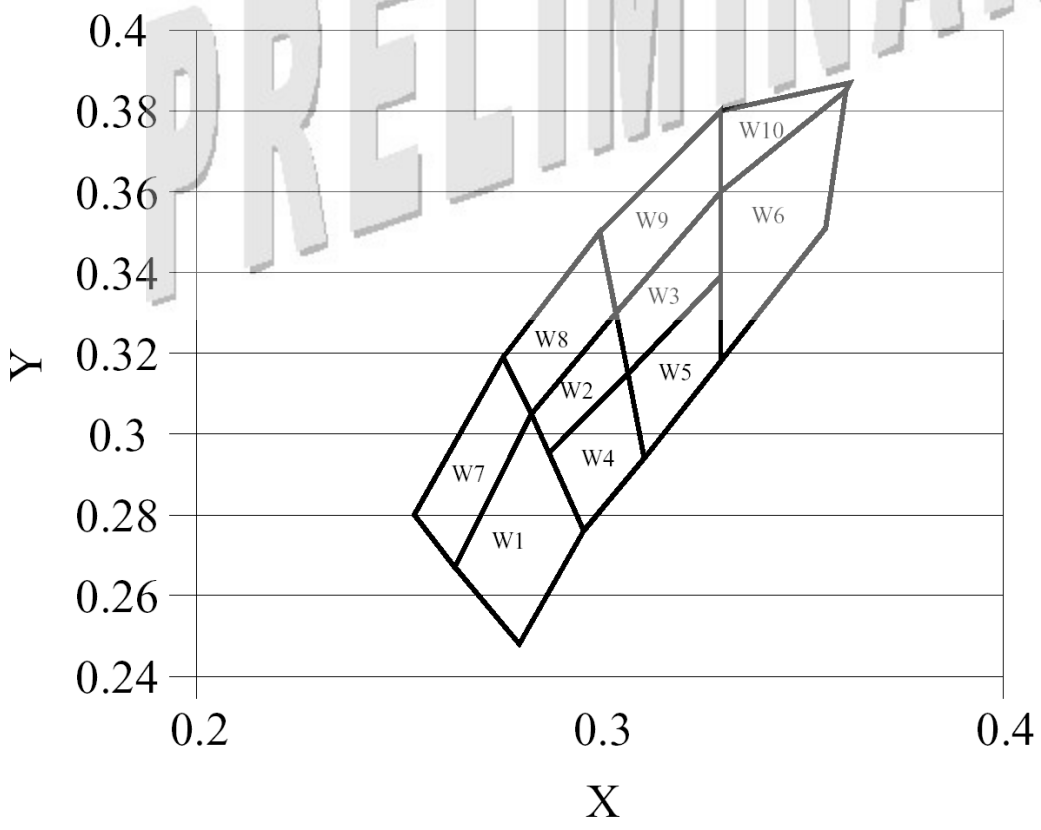
## CHROMATICITY COORDINATES BINNING

| Rank | | W1 | | | | W2 | | | | W3 | | | | W4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromaticity | X | 0.280 | 0.264 | 0.283 | 0.296 | 0.287 | 0.283 | 0.304 | 0.307 | 0.307 | 0.304 | 0.330 | 0.330 | 0.296 | 0.287 | 0.307 | 0.311 |
| Coordinates | Y | 0.248 | 0.267 | 0.305 | 0.276 | 0.295 | 0.305 | 0.330 | 0.315 | 0.315 | 0.330 | 0.360 | 0.339 | 0.276 | 0.295 | 0.315 | 0.294 |
| Rank | | W5 | | | | W6 | | | | W7 | | | | W8 | | | |
| Chromaticity | X | 0.311 | 0.307 | 0.330 | 0.330 | 0.330 | 0.330 | 0.361 | 0.356 | 0.264 | 0.254 | 0.276 | 0.283 | 0.283 | 0.276 | 0.300 | 0.304 |
| Coordinates | Y | 0.294 | 0.315 | 0.339 | 0.318 | 0.318 | 0.360 | 0.385 | 0.351 | 0.267 | 0.280 | 0.319 | 0.305 | 0.305 | 0.319 | 0.350 | 0.330 |
| Rank | | W9 | | | | W10 | | | | | | | | | | | |
| Chromaticity | X | 0.304 | 0.300 | 0.330 | 0.330 | 0.330 | 0.330 | 0.362 | 0.361 | | | | | | | | |
| Coordinates | Y | 0.330 | 0.350 | 0.380 | 0.360 | 0.360 | 0.380 | 0.387 | 0.385 | | | | | | | | |



## CIE CHROMATICITY DIAGRAM



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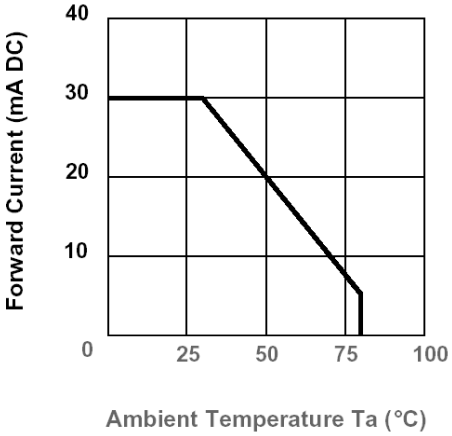
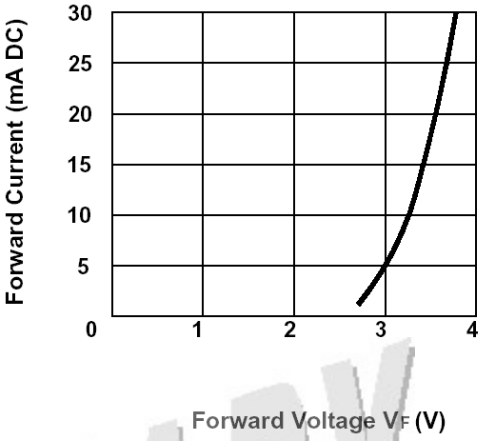
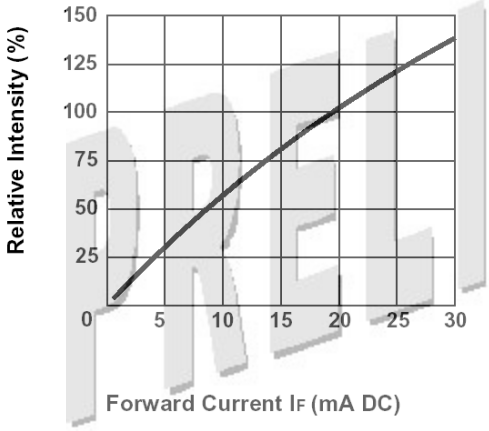
Forward Current vs. Ambient Temperature



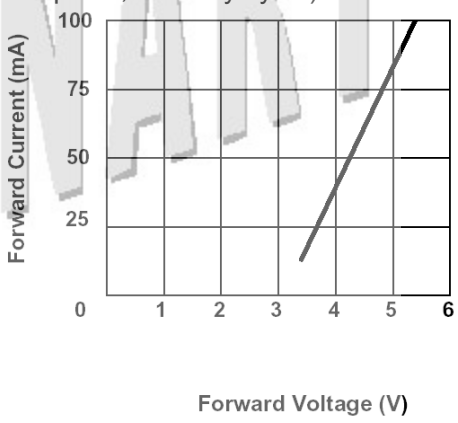

Forward Current vs. Forward Voltage



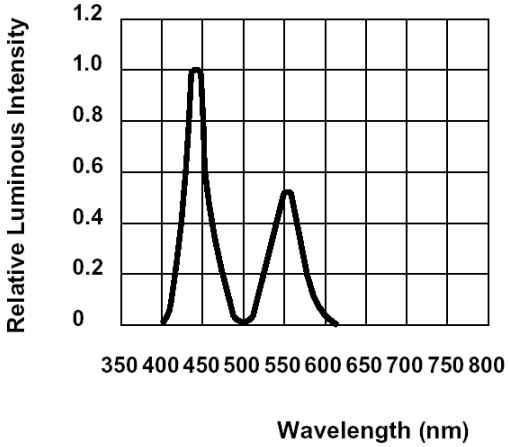

Relative Intensity vs. Forward Current




Peak Forward Voltage vs. Forward Current
(100μs test pulse, 1% duty cycle)




Relative Intensity vs. Wavelength




Radiation Diagram