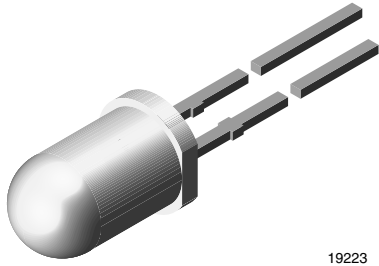


# Ultrabright White LED, Ø 5 mm Untinted Non-Diffused Package



19223

## DESCRIPTION

The VLHW5100 is a clear, non-diffused 5 mm LED for high end applications where supreme luminous intensity required.

These lamps with clear untinted plastic case utilize the highly developed ultrabright InGaN technologies.

The lens and the viewing angle is optimized to achieve best performance of light output and visibility.

## PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity:  $\pm 10^\circ$

## FEATURES

- Untinted non-diffused lens
- Utilizing ultrabright InGaN technology
- High luminous intensity
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage: up to 4 kV according to JESD22-A114-B
- Circuit protection by Zener diode
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

## APPLICATIONS

- Interior and exterior lighting
- Outdoor LED panels
- Instrumentation and front panel indicators
- Replaces incandescent lamps
- Light guide compatible

## PARTS TABLE

| PART     | COLOR | LUMINOUS INTENSITY (mcd) |      |        | at I <sub>F</sub> (mA) | COORDINATE (x, y) |            |      | at I <sub>F</sub> (mA) | FORWARD VOLTAGE (V) |      |      | at I <sub>F</sub> (mA) | TECHNOLOGY          |
|----------|-------|--------------------------|------|--------|------------------------|-------------------|------------|------|------------------------|---------------------|------|------|------------------------|---------------------|
|          |       | MIN.                     | TYP. | MAX.   |                        | MIN.              | TYP.       | MAX. |                        | MIN.                | TYP. | MAX. |                        |                     |
| VLHW5100 | White | 5600                     | -    | 11 200 | 20                     | -                 | 0.33, 0.33 | -    | 20                     | 2.8                 | -    | 3.6  | 20                     | InGaN and converter |

## ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                              | TEST CONDITION                    | SYMBOL            | VALUE       | UNIT |
|--|-----------------------------------|-------------------|-------------|------|
| Reverse voltage                        |                                   | V <sub>R</sub>    | 5           | V    |
| DC forward current                     |                                   | I <sub>F</sub>    | 30          | mA   |
| Peak forward current                   | at 1 kHz, t <sub>p</sub> /T = 0.1 | I <sub>FSM</sub>  | 0.1         | A    |
| Power dissipation                      |                                   | P <sub>V</sub>    | 100         | mW   |
| Zener reverse current                  |                                   | I <sub>Z</sub>    | 100         | mA   |
| Junction temperature                   |                                   | T <sub>j</sub>    | 100         | °C   |
| Operating temperature range            |                                   | T <sub>amb</sub>  | -40 to +100 | °C   |
| Storage temperature range              |                                   | T <sub>stg</sub>  | -40 to +100 | °C   |
| Soldering temperature                  | t ≤ 5 s                           | T <sub>sd</sub>   | 260         | °C   |
| Thermal resistance junction-to-ambient |                                   | R <sub>thJA</sub> | 400         | K/W  |



| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                      |          |            |      |          |        |               |
|--|----------------------|----------|------------|------|----------|--------|---------------|
| <b>WHITE VLHW5100</b>  |                      |          |            |      |          |        |               |
| PARAMETER  | TEST CONDITION       | PART     | SYMBOL     | MIN. | TYP.     | MAX.   | UNIT          |
| Luminous intensity   | $I_F = 20\text{ mA}$ | VLHW5100 | $I_V$      | 5600 | -        | 11 200 | mcd           |
| Chromaticity coordinate x acc. to CIE 1931   | $I_F = 20\text{ mA}$ |          | x          | -    | 0.33     | -      |               |
| Chromaticity coordinate y acc. to CIE 1931   | $I_F = 20\text{ mA}$ |          | y          | -    | 0.33     | -      |               |
| Angle of half intensity  | $I_F = 20\text{ mA}$ |          | $\phi$     | -    | $\pm 10$ | -      | $^{\circ}$    |
| Forward voltage  | $I_F = 20\text{ mA}$ |          | $V_F$      | 2.8  | -        | 3.6    | V             |
| Reverse current  | $V_R = 5\text{ V}$   |          | $I_R$      | -    | -        | 50     | $\mu\text{A}$ |
| Temperature coefficient of $V_F$   | $I_F = 20\text{ mA}$ |          | $TC_{V_F}$ | -    | -4       | -      | mV/K          |
| Temperature coefficient of $I_V$   | $I_F = 20\text{ mA}$ |          | $TC_{I_V}$ | -    | -0.5     | -      | % / K         |

| <b>CHROMATICITY COORDINATED CLASSIFICATION</b> |        |        |                    |                    |
|--|--------|--------|--------------------|--------------------|
| GROUP  | X      |        | Y                  |                    |
|  | MIN.   | MAX.   | MIN.               | MAX.               |
| 3A   | 0.2900 | 0.3025 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 3B   | 0.3025 | 0.3150 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 3C   | 0.2900 | 0.3025 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |
| 3D   | 0.3025 | 0.3150 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |
| 4A   | 0.3150 | 0.3275 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 4B   | 0.3275 | 0.3400 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 4C   | 0.3150 | 0.3275 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |
| 4D   | 0.3275 | 0.3400 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |
| 5A   | 0.3400 | 0.3525 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 5B   | 0.3525 | 0.3650 | $y = 1.4x - 0.121$ | $y = 1.4x - 0.071$ |
| 5C   | 0.3400 | 0.3525 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |
| 5D   | 0.3525 | 0.3650 | $y = 1.4x - 0.171$ | $y = 1.4x - 0.121$ |

**Note**

- Chromaticity coordinate groups are tested with a tolerance of  $\pm 0.01$

| <b>LUMINOUS INTENSITY CLASSIFICATION</b> |                       |        |
|--|-----------------------|--------|
| GROUP                                    | LIGHT INTENSITY (mcd) |        |
|  | MIN.                  | MAX.   |
| DB                                       | 5600                  | 7100   |
| EA                                       | 7100                  | 9000   |
| EB                                       | 9000                  | 11 200 |

**Note**

- Luminous intensity is tested with an accuracy of  $\pm 11\%$ .  
The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel). In order to ensure availability, single brightness groups will not be orderable.  
In a similar manner for colors where color groups are measured and binned, single color groups will be shipped on any one reel. In order to ensure availability, single color groups will not be orderable

| <b>FORWARD VOLTAGE CLASSIFICATION</b> |                     |      |
|---------------------------------------|---------------------|------|
| GROUP                                 | FORWARD VOLTAGE (V) |      |
|                                       | MIN.                | MAX. |
| 0                                     | 2.8                 | 3.0  |
| 1                                     | 3.0                 | 3.2  |
| 2                                     | 3.2                 | 3.4  |
| 3                                     | 3.4                 | 3.6  |

**Note**

- Forward voltage is tested with an accuracy of  $\pm 0.1\text{ V}$

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

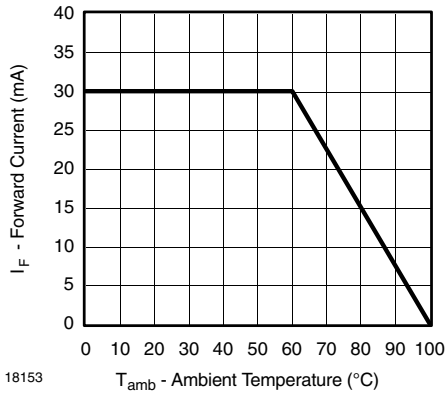


Fig. 1 - Forward Current vs. Ambient Temperature

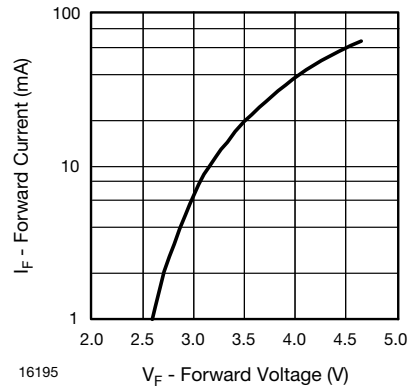


Fig. 4 - Forward Current vs. Forward Voltage

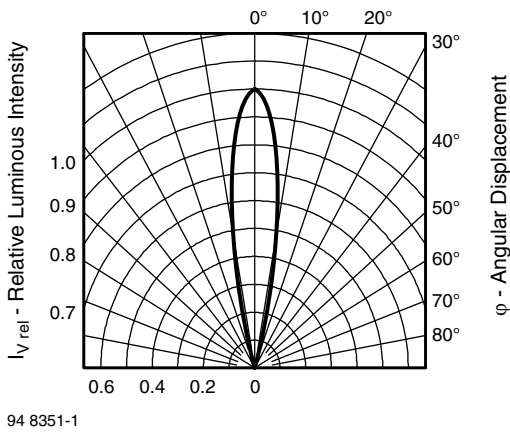


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

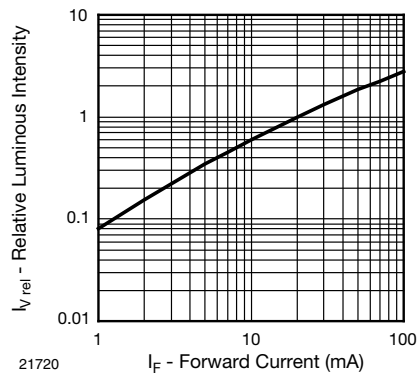


Fig. 5 - Relative Luminous Flux vs. Forward Current

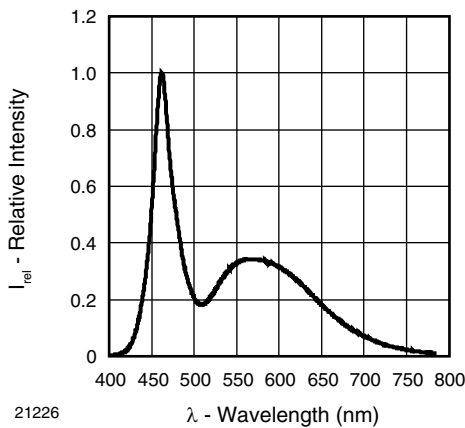


Fig. 3 - Relative Intensity vs. Wavelength

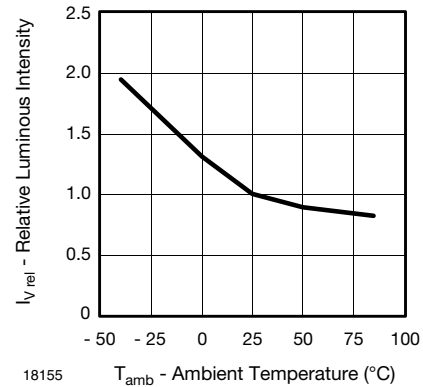


Fig. 6 - Relative Luminous Intensity vs. Ambient Temperature

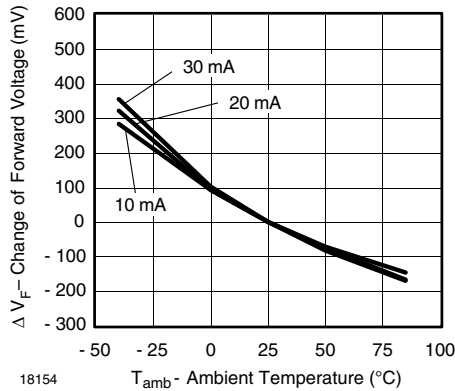


Fig. 7 - Change of Forward Voltage vs. Ambient Temperature

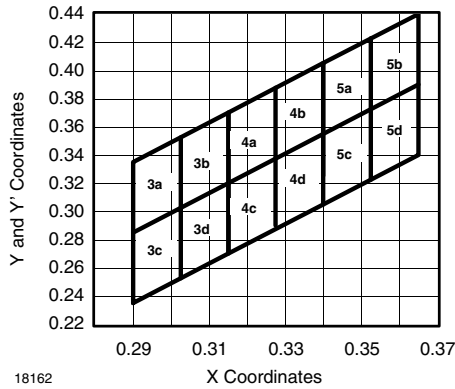


Fig. 8 - Coordinates of Colorgroups

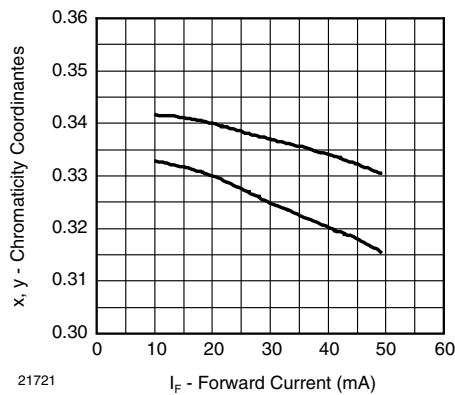


Fig. 9 - Chromaticity Coordinate Shift vs. Forward Current





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