



**VLHW5100**

Vishay Semiconductors

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



**DESCRIPTION**

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

**APPLICATIONS**

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



PART	COLOR	LUMINOUS INTENSITY (mcd)			at $I_f$ (mA)	COORDINATE (x, y)			at $I_f$ (mA)	FORWARD VOLTAGE (V)			at $I_f$ (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLHW5100	White	5600	-	11200	20	0.33	0.33	-	20	2.8	-	3.6	20	InGaN and converter

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ C$ , unless otherwise specified)				
VLHW5100				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
DC forward current		$I_f$	30	mA
Peak forward current	at 1 kHz, $I_f/T = 0.1$	$I_{fSM}$	0.1	A
Power dissipation		$P_D$	100	mW
Zener reverse current		$I_Z$	100	mA
Junction temperature		$T_J$	100	$^\circ C$
Operating temperature range		$T_{amb}$	-40 to +100	$^\circ C$
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ C$
Soldering temperature	$t \leq 5$ s	$T_{sd}$	260	$^\circ C$
Thermal resistance junction-to-ambient		$R_{\theta JA}$	400	K/W

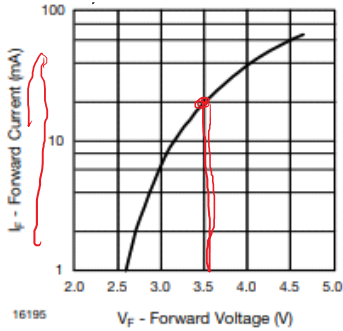


Fig. 4 - Forward Current vs. Forward Voltage

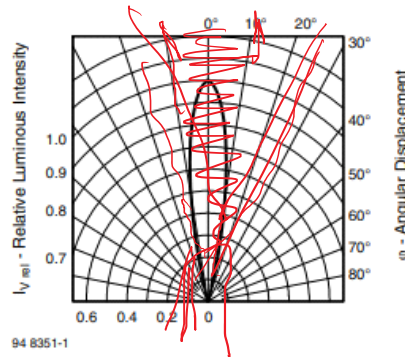


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

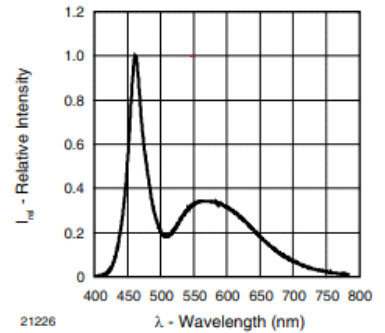


Fig. 3 - Relative Intensity vs. Wavelength

**Quick Details**



Type	High Power LED	Chip Material	INGAN
Emitting Color	Natural White	Luminous Flux(lm)	110-120lm
Optical Attenuation(%)	0.001	Power	3W
Power Dissipation	0.001	Viewing Angle( $^\circ$ )	120
Color Rendering Index(Ra)	70	Color Temperature	5000-5500K
Operating Temperature(u2103)	-45 - 80	Storage Temperature(u2103)	-45 - 80
Place of Origin	China	Brand Name	LZ
Certification	ce, RoHS	Voltage	3.0-3.4V
Current	700mA	warranty	3 years
lifespan	50000H	lumen	110-120lm
chip brand	Epistar	Material	Gold wire + copper holder
power	3W	color	Natural White

LED 'EXYOS'

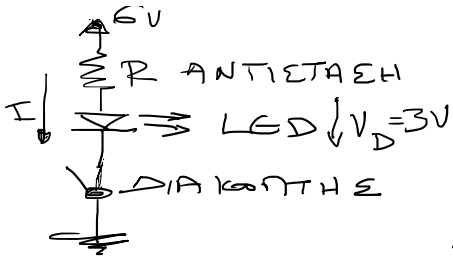
ΑΠΟΔΟΣΗ LED

90lm → 1W

ΓΙΑ 1W ΕΞΥ ΕΞΥ

90lm → 3W ΕΞΥ ΕΞΥ

ΕΞΕΛΙΑΣΗ ΑΠΟΡΝ ΚΥΚΛΩΜΑΤΩΝ ΔΑΤΗΣΗΣ LED



ΘΕΛΟΥ  $I = 700 \mu A$ ,  $V_D \approx 3V$

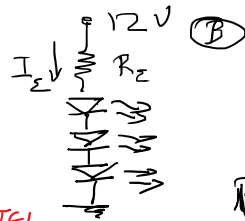
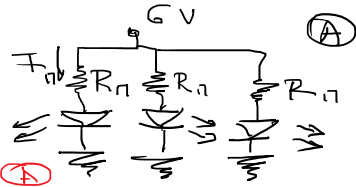
$$I = 0.7 = \frac{6-3}{R} \Rightarrow R = \frac{3}{0.7} = 4.28 \Omega \Rightarrow 5 \Omega$$

$$P_R = RI^2 = 4.28 \times 0.7^2 = 2.01 W$$

$$P_{LED} = 3 \times 0.7 = 2.1 W$$

ΥΠΟΔΟΣΗ ΚΥΚΛΩΜΑΤΟΣ  $\frac{P_{LED}}{P_{\text{πηγή}}} \times 100 = \frac{2.1}{6 \times 0.7} \times 100 = 29.1\%$

ΠΟΙΟ ΚΥΚΛΩΜΑ ΕΙΝΑΙ ΑΠΟΔΟΤΙΚΟΤΕΡΟ; (ΝΑ ΚΑΝΕΤΕ ΥΠΟΛΟΓΙΣΜΟΥΣ)



ΥΠΟΛΟΓΙΣΜΟΣ ΓΙΑ ΤΟ Β

$$I_2 = \frac{12 - 3 \times 3}{R_2} = 0.7 A \Rightarrow R_2 = 4.28 \Omega$$

$$P_{LEDs} = 3 \times 3 \times 0.7 = 6.3 W \Rightarrow P(\text{φως}) = \frac{3 \times \frac{110}{80} \times 100}{12 \times 0.7} = 43.65\%$$

ΕΧΕΙ ΜΕΛΗ ΥΠΟΛΟΓΙΣΤΕΙ ΑΠΟΔΟΣΗ = 29.1%

ΑΠΟΔΟΤΙΚΟΤΕΡΟ ΕΙΝΑΙ ΤΟ Β