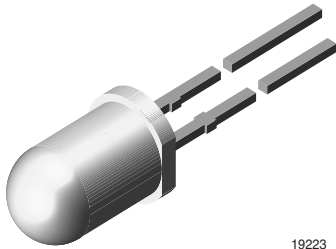


## Ultrabright LED, $\varnothing$ 5 mm Untinted Non-Diffused



19223

### FEATURES

- Untinted non diffused lens
- Utilizing ultrabright AllnGaP (AS)
- High luminous intensity
- High operating temperature:  
 $T_j$  (chip junction temperature) up to 125 °C for AllnGaP devices
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage:  
 up to 2 kV according to JESD22-A114-B
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### DESCRIPTION

The VLCPG5100 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 AllnGaP (AS).

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: Ultrabright
- Angle of half intensity:  $\pm 9^\circ$

### APPLICATIONS

- Interior and exterior lighting
- Outdoor LED panels
- Instrumentation and front panel indicators
- Central high mounted stop lights (CHMSL) for motor vehicles
- Replaces incandescent lamps
- Traffic signals
- Light guide design

### PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLCPG5100	Pure green, $I_V \geq 430$ mcd	AllnGaP on GaAs

ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> VLCPG5100				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>2)</sup>		$V_R$	5	V
DC Forward current	$T_{amb} \leq 85\text{ }^\circ\text{C}$	$I_F$	50	mA
Surge forward current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	1	A
Power dissipation		$P_V$	135	mW
Junction temperature		$T_j$	125	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5\text{ s, 2 mm from body}$	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient		$R_{thJA}$	300	K/W

Note:

<sup>1)</sup>  $T_{amb} = 25\text{ }^\circ\text{C}$ , unless otherwise specified

<sup>2)</sup> Driving the LED in reverse direction is suitable for a short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLCPG5100, PURE GREEN							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN	TYP.	MAX	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 50\text{ mA}$	VLCPG5100	$I_V$	430	1250		mcd
Dominant wavelength	$I_F = 50\text{ mA}$		$\lambda_d$	555	562	567	nm
Peak wavelength	$I_F = 50\text{ mA}$		$\lambda_p$		563		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	$I_F = 50\text{ mA}$		$\Delta\lambda$		20		nm
Angle of half intensity	$I_F = 50\text{ mA}$		$\varphi$		$\pm 9$		deg
Forward voltage	$I_F = 50\text{ mA}$		$V_F$		2.2	2.7	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	5			V
Temperature coefficient of $V_F$	$I_F = 50\text{ mA}$		$TC_{V_F}$		- 3.5		mV/K
Temperature coefficient of $\lambda_d$	$I_F = 50\text{ mA}$		$TC_{\lambda_d}$		0.1		nm/K

Note:

<sup>1)</sup>  $T_{amb} = 25\text{ }^\circ\text{C}$ , unless otherwise specified

<sup>2)</sup> In one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 2.0$



LUMINOUS INTENSITY CLASSIFICATION		
GROUP STANDARD	LUMINOUS INTENSITY (MCD)	
	MIN	MAX
BB	430	860
CC	575	1150
DD	750	1500
EE	1000	2000
FF	1350	2700
GG	1800	3600
HH	2400	4800
II	3200	6400
KK	4300	8600
LL	5750	11 500
MM	7500	15 000
NN	10 000	20 000
PP	13 500	27 000
QQ	18 000	36 000
RR	24 000	48 000
SS	32 000	64 000
TT	43 000	86 000
UU	57 500	115 000

Note:  
Luminous intensity is tested at a current pulse duration of 25 ms and 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 bag (there will be no mixing of two groups on each bag).  
In order to ensure availability, single brightness groups will not be orderable.  
In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped in any one bag.  
In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION		
GROUP	DOM. WAVELENGTH (NM)	
	PURE GREEN	
	MIN.	MAX.
0	555	559
1	558	561
2	560	563
3	562	565
4	564	567

Note:  
Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of  $\pm 1$  nm.

## TYPICAL CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

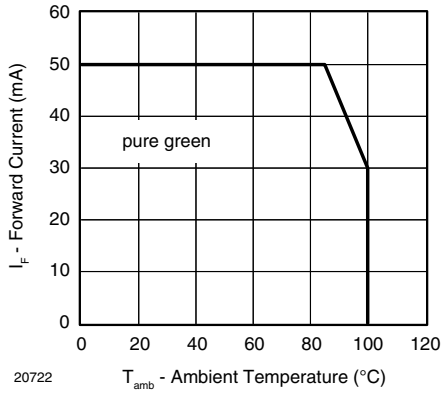


Figure 1. Forward Current vs. Ambient Temperature

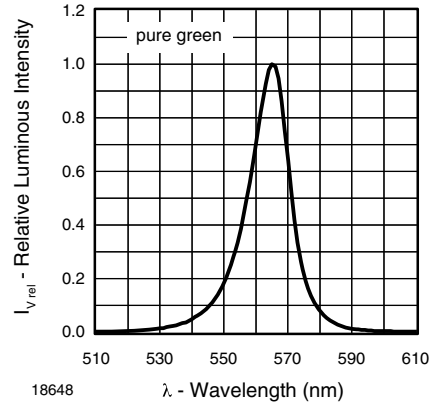


Figure 4. Relative Intensity vs. Wavelength

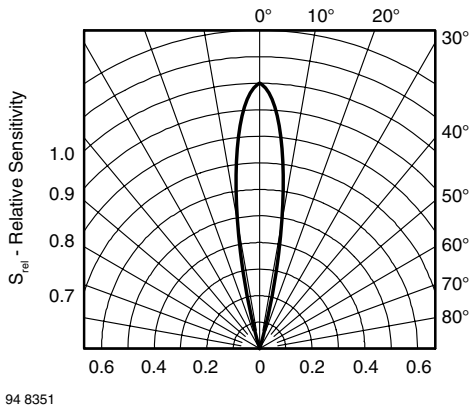


Figure 2. Relative Radiant Sensitivity vs. Angular Displacement

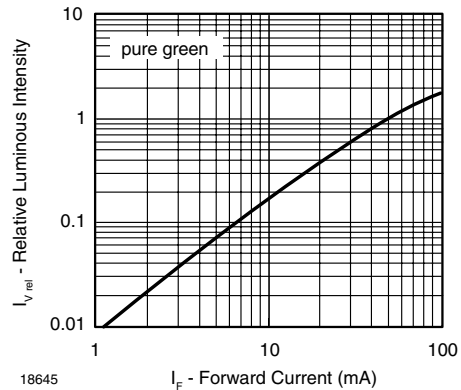


Figure 5. Relative Luminous Flux vs. Forward Current

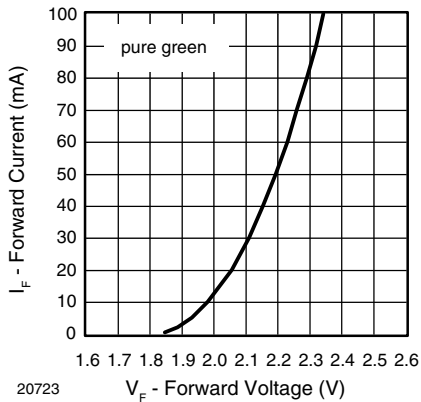


Figure 3. Forward Current vs. Forward Voltage

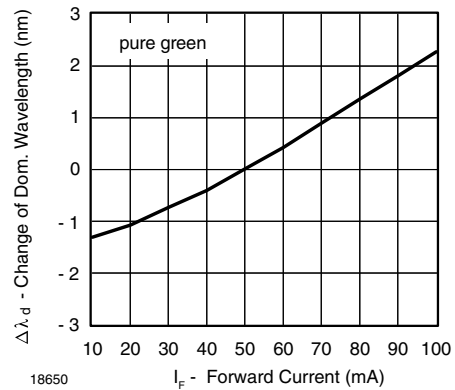


Figure 6. Change of Dominant Wavelength vs. Forward Current

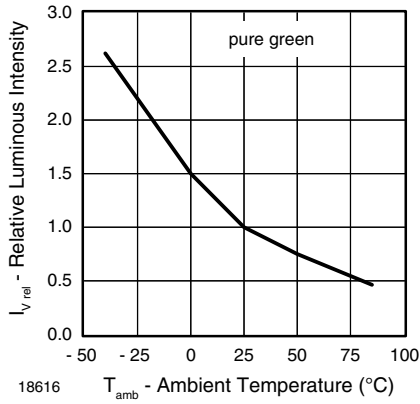


Figure 7. Relative Luminous Intensity vs. Ambient Temperature

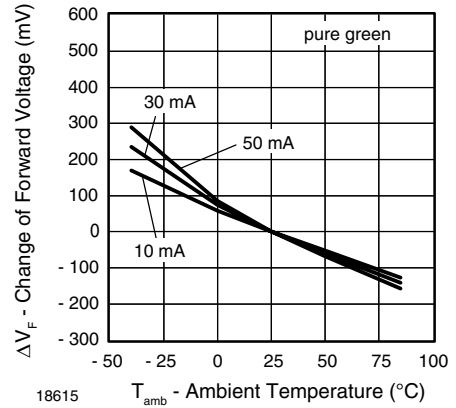


Figure 9. Change of Forward Voltage vs. Ambient Temperature

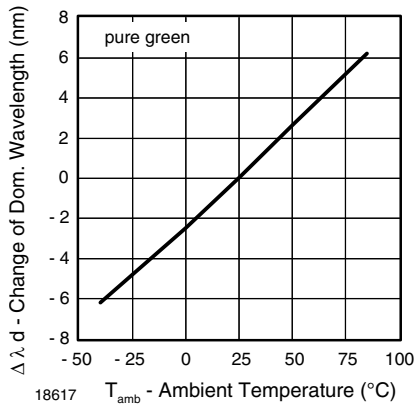
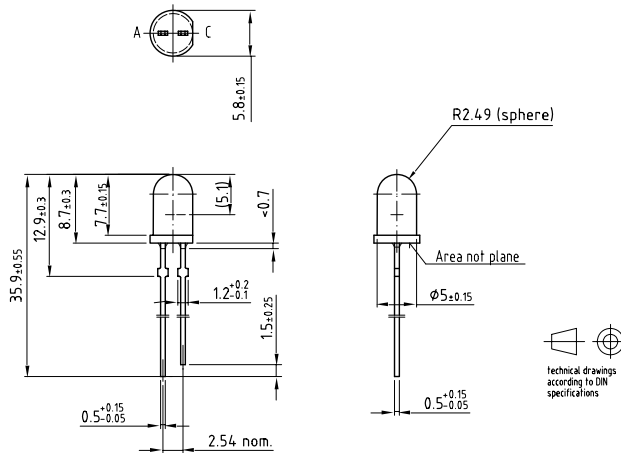


Figure 8. Change of Dominant Wavelength vs. Ambient Temperature

**PACKAGE DIMENSIONS** in millimeters



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9612121

### **OZONE DEPLETING SUBSTANCES POLICY STATEMENT**

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design  
and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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