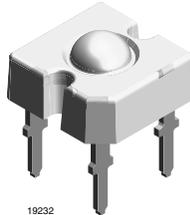


## TELUX™



### DESCRIPTION

The VLWTG9600 is a clear, non diffused LED for applications where high luminous flux is required.

It is designed in an industry standard 7.62 mm square package utilizing highly developed InGaN technology.

The supreme heat dissipation of VLWTG9600 allows applications at high ambient temperatures.

All packing units are binned for luminous flux, forward voltage and color to achieve the most homogenous light appearance in application.

### FEATURES

- High luminous flux
- Supreme heat dissipation:  $R_{thJP} = 90 \text{ K/W}$
- High operating temperature:  
 $T_{amb} = -40 \text{ °C to } +110 \text{ °C}$
- Packed in tubes for automatic insertion
- Luminous flux, forward voltage and color categorized for each tube
- Small mechanical tolerances allow precise usage of external reflectors or light guides
- Lead (Pb)-free device - RoHS compliant
- ESD-withstand voltage: up to 1 kV accordance to JESD22-A114-B
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Compatible with wave solder processes according to CECC 00802 and J-STD-020C
- Automotive qualified



### APPLICATIONS

- Exterior lighting
- Replacement of small incandescent lamps
- Traffic signals and signs

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: TELUX™
- Product series: power
- Angle of half intensity:  $\pm 30^\circ$

PARTS TABLE		
PART	COLOR, LUMINOUS FLUX	TECHNOLOGY
VLWTG9600	True green, $\phi_V = 2500 \text{ mlm (typ.)}$	InGaN on SiC



ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> VLWTG9600				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	5	V
DC Forward current	$T_{\text{amb}} \leq 50 \text{ }^\circ\text{C}$	$I_F$	50	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	$I_{\text{FSM}}$	0.1	A
Power dissipation		$P_V$	230	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{\text{amb}}$	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		$T_{\text{stg}}$	- 55 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5 \text{ s}$ , 1.5 mm from body preheat temperature 100 $^\circ\text{C}$ /30 sec.	$T_{\text{sd}}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient	with cathode heatsink of 70 $\text{mm}^2$	$R_{\text{thJA}}$	200	K/W
Thermal resistance junction/pin		$R_{\text{thJP}}$	90	K/W

Note:

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

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLWTG9600, TRUE GREEN						
PARAMETER	TEST CONDITION	SYMBOL	MIN	TYP.	MAX	UNIT
Total flux	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$\phi_V$	2000	2500		mlm
Luminous intensity/total flux	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$I_V/\phi_V$		0.7		mcd/mlm
Dominant wavelength	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$\lambda_d$	509	523	535	nm
Peak wavelength	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$\lambda_p$		518		nm
Angle of half intensity	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$\varphi$		$\pm 30$		deg
Total included angle	90 % of Total Flux Captured	$\varphi$		100		deg
Forward voltage	$I_F = 50 \text{ mA}$ , $R_{\text{thJA}} = 200 \text{ }^\circ\text{K/W}$	$V_F$		3.9	4.7	V
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	5	10		V
Junction capacitance	$V_R = 0$ , $f = 1 \text{ MHz}$	$C_j$		50		pF
Temperature coefficient of $\lambda_{\text{dom}}$	$I_F = 30 \text{ mA}$	$\text{TC}\lambda_{\text{dom}}$		0.02		nm/K

Note:

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

LUMINOUS FLUX CLASSIFICATION		
GROUP	TRUE GREEN	
	LUMINOUS FLUX (MLM)	
	MIN.	MAX.
D	2000	3000
E	2500	3600
F	3000	4200

Note:

Luminous flux is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 11 \%$ .

The above type numbers represent the order group which include only a few brightness groups. Only one group will be shipped in one tube (there will be no mixing of two groups on each tube). 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 tube. In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION		
GROUP	TRUE GREEN	
	DOM. WAVELENGTH (NM)	
	MIN.	MAX.
2	509	517
3	515	523
4	521	529
5	527	535

Note:

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

**TYPICAL CHARACTERISTICS**

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

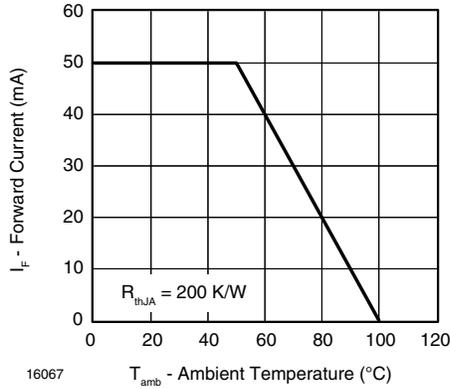


Figure 1. Forward Current vs. Ambient Temperature for InGaN

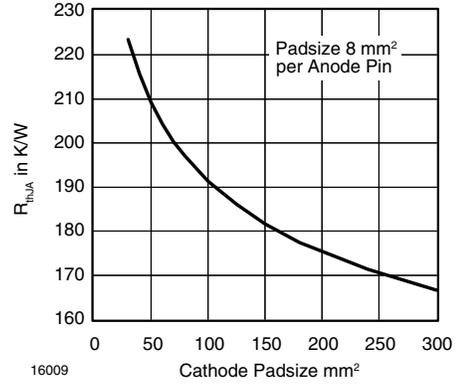


Figure 4. Thermal Resistance Junction Ambient vs. Cathode Padsize

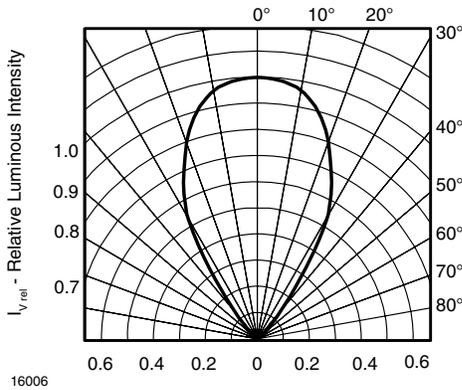


Figure 2. Rel. Luminous Intensity vs. Angular Displacement

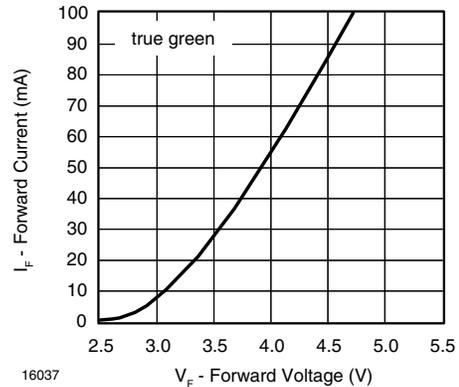


Figure 5. Forward Current vs. Forward Voltage

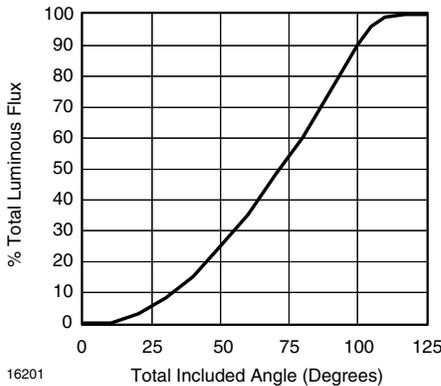


Figure 3. Percentage Total Luminous Flux vs. Total Included Angle for 90° Emission Angle

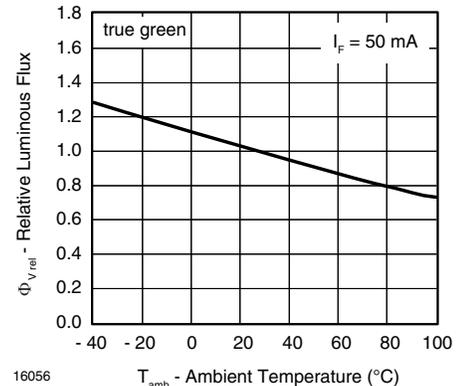


Figure 6. Rel. Luminous Flux vs. Ambient Temperature

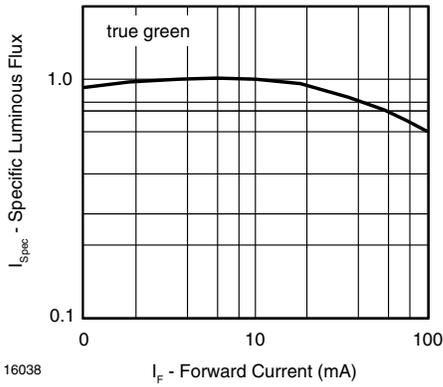


Figure 7. Specific Luminous Flux vs. Forward Current

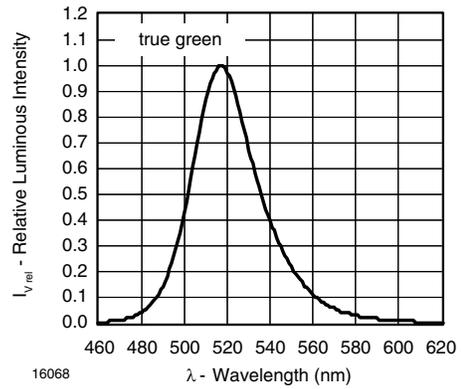


Figure 9. Relative Intensity vs. Wavelength

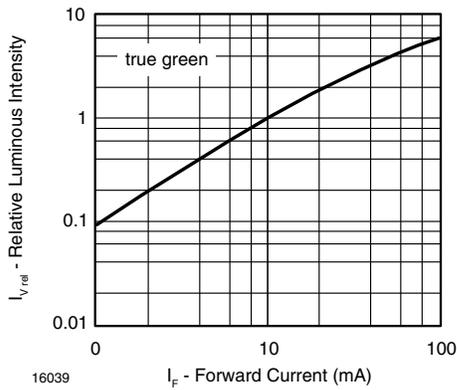


Figure 8. Relative Luminous Intensity vs. Forward Current

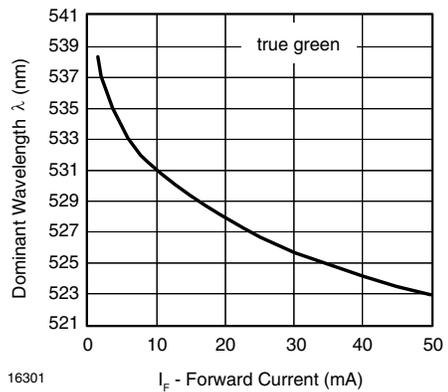
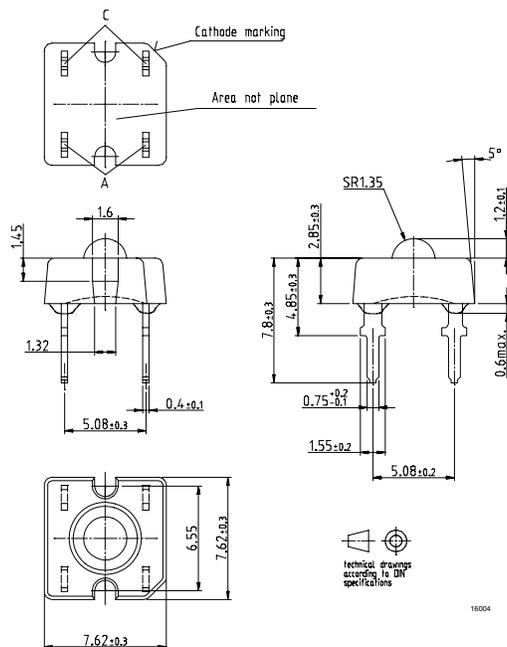
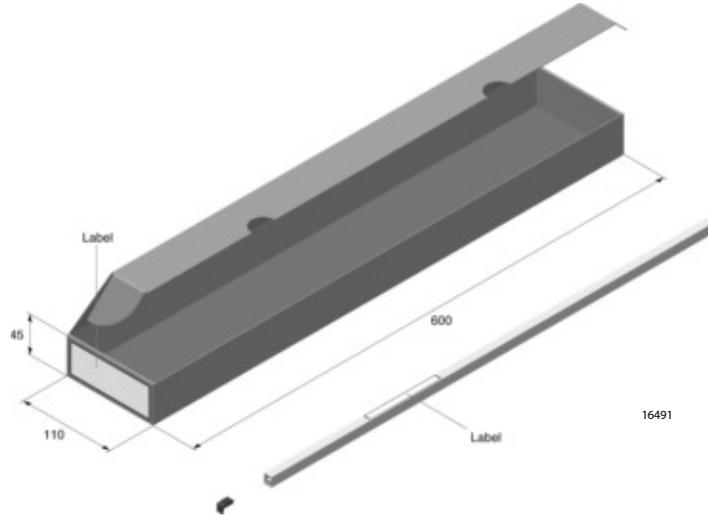


Figure 10. Dominant Wavelength vs. Forward Current

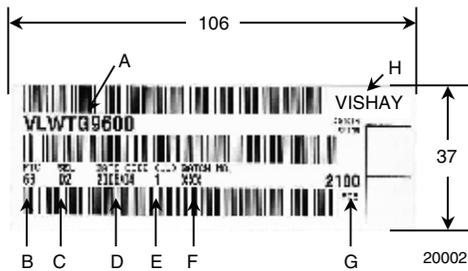
**PACKAGE DIMENSIONS** in millimeters



**FAN FOLD BOX** Dimensions in millimeters

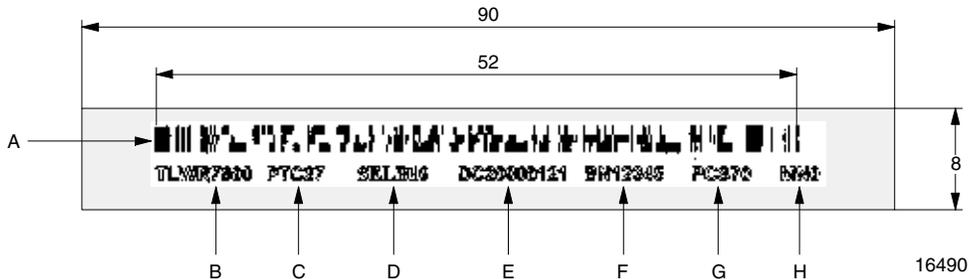


**LABEL OF FAN FOLD BOX**



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):  
e.g.: D = code for luminous intensity group  
2 = code for color group
- D) Date code year/week
- E) Day code (e.g. 1: Monday)
- F) Batch no.
- G) Total quantity
- H) Company code

**EXAMPLE FOR TELUX TUBE LABEL** Dimensions in millimeters



- A) Bar code
- B) Type of component
- C) Manufacturing plant
- D) SEL - selection code (bin)  
Digit1 - code for luminous flux group  
Digit2 - code for dominant wavelength group  
Digit3 - code for forward voltage group
- E) Date code
- F) Batch no.
- G) Total quantity
- H) Company code

**TUBE WITH BAR CODE LABEL** Dimensions in millimeters

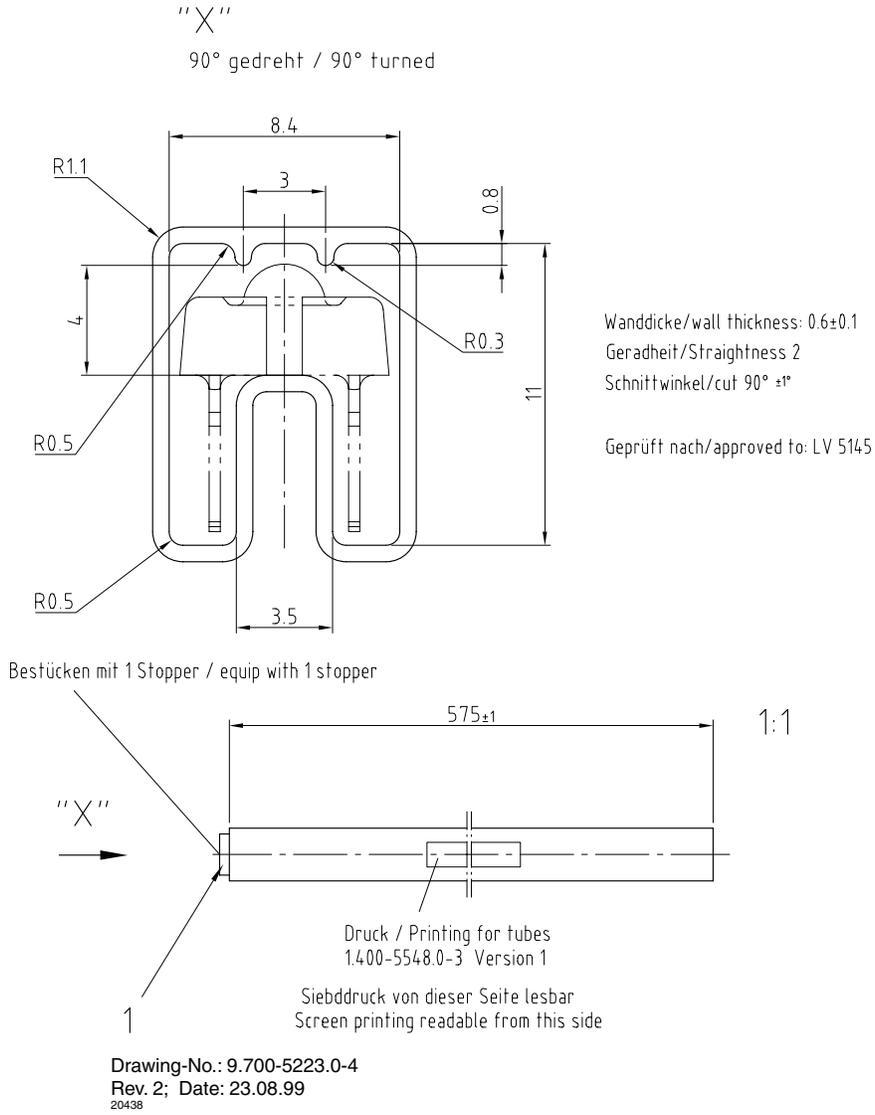


Figure 9. Drawing Proportions not Scaled

**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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany



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