

## High Intensity LED in $\varnothing$ 3 mm Tinted Diffused Package

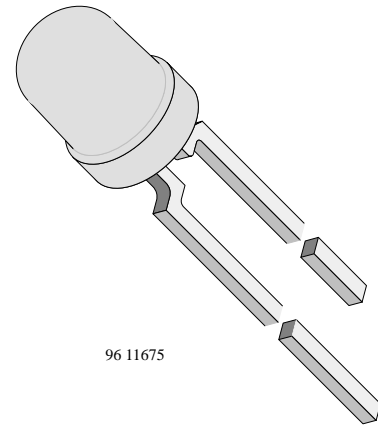
Color	Type	Technology	Angle of Half Intensity $\pm\varphi$
Red	TLHK4600	AllnGaP on GaAs	60°

### Description

This device has been designed to meet the increasing demand for AllnGaP technology.

It is housed in a 3 mm clear plastic package. The wide viewing angle of these devices provides a high on-off contrast.

All LEDs are categorized in luminous intensity groups. That allows users to assemble LEDs with uniform appearance.



### Features

- AllnGaP technology
- Standard  $\varnothing$  3 mm (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very wide viewing angle
- Luminous intensity categorized

### Applications

Status lights  
OFF / ON indicator  
Background illumination  
Readout lights  
Maintenance lights  
Legend light

### Absolute Maximum Ratings

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

#### TLHK4600

Parameter	Test Conditions	Symbol	Value	Unit
Reverse voltage		$V_R$	5	V
DC forward current	$T_{amb} \leq 60^{\circ}\text{C}$	$I_F$	30	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	$I_{FSM}$	0.1	A
Power dissipation	$T_{amb} \leq 60^{\circ}\text{C}$	$P_V$	80	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	-40 to +100	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-55 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		$R_{thJA}$	400	K/W

### Optical and Electrical Characteristics

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

#### Red (TLHK4600)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	$I_F = 10 \text{ mA}$		$I_V$	6.3	15		mcd
Dominant wavelength	$I_F = 10 \text{ mA}$		$\lambda_d$		630		nm
Peak wavelength	$I_F = 10 \text{ mA}$		$\lambda_p$		643		nm
Angle of half intensity	$I_F = 10 \text{ mA}$		$\phi$		$\pm 60$		deg
Forward voltage	$I_F = 20 \text{ mA}$		$V_F$		1.9	2.6	V
Reverse voltage	$I_R = 10 \mu\text{A}$		$V_R$	5			V
Junction capacitance	$V_R = 0$ , $f = 1 \text{ MHz}$		$C_j$		15		pF

### Typical Characteristics ( $T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified)

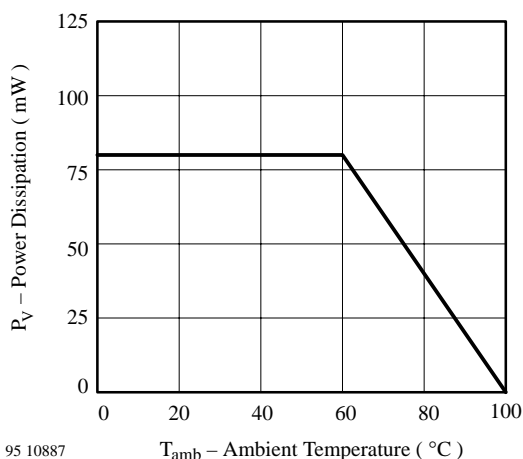


Figure 1 Power Dissipation vs. Ambient Temperature

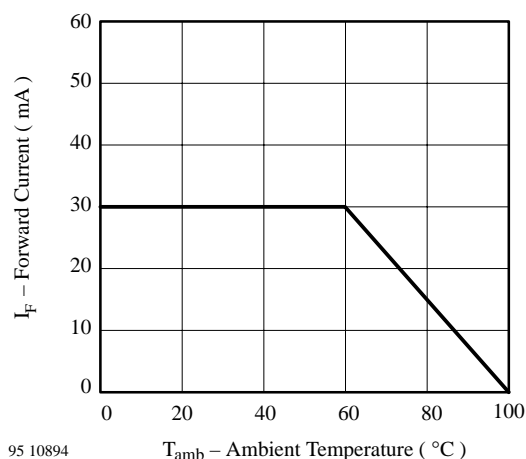


Figure 2 Forward Current vs. Ambient Temperature

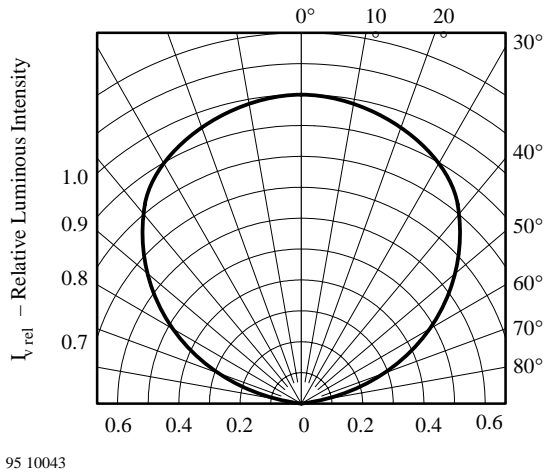


Figure 3 Rel. Luminous Intensity vs. Angular Displacement

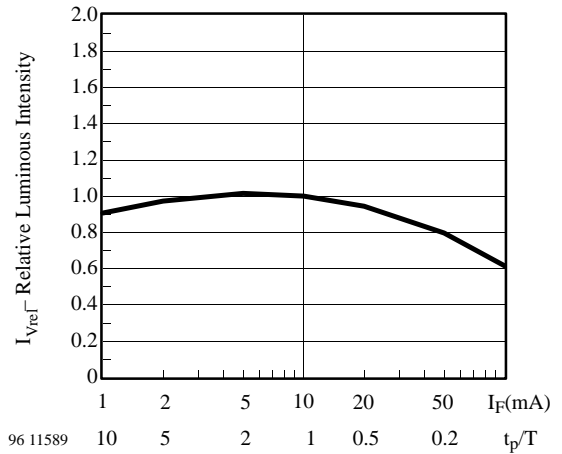


Figure 6 Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

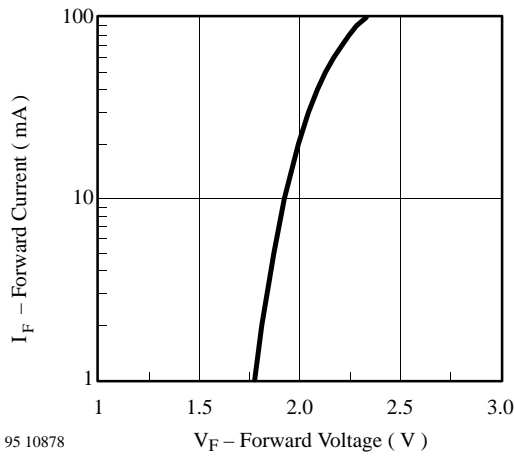


Figure 4 Forward Current vs. Forward Voltage

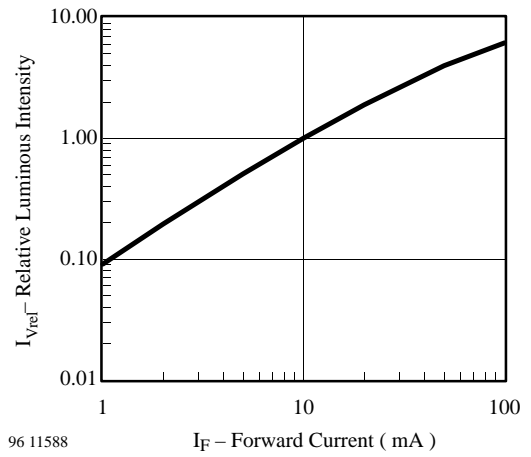


Figure 7 Relative Luminous Intensity vs. Forward Current

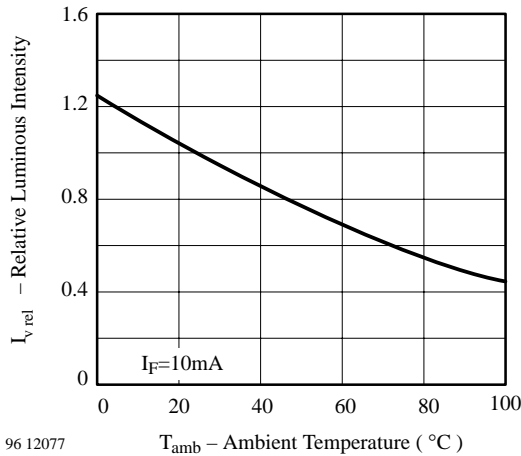


Figure 5 Rel. Luminous Intensity vs. Ambient Temperature

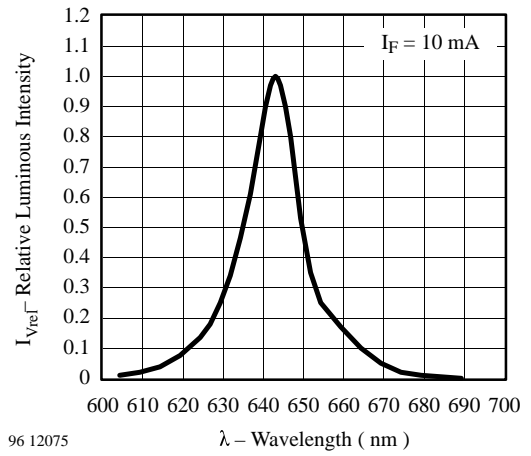
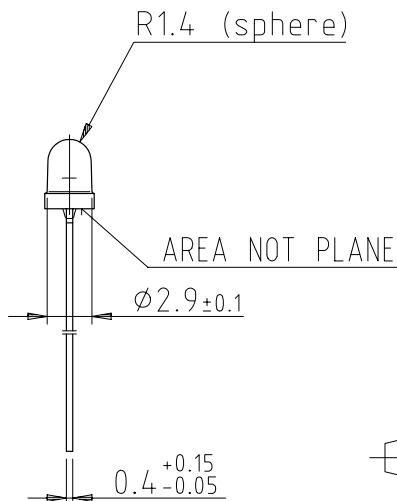
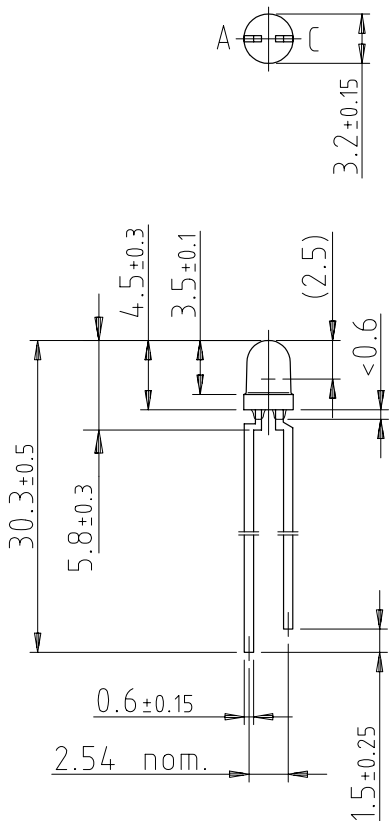


Figure 8 Relative Luminous Intensity vs. Wavelength

### Dimensions in mm



95 10913

technical drawings  
according to DIN  
specifications



## **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-Telefunken products for any unintended or unauthorized application, the buyer shall indemnify Vishay-Telefunken 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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