

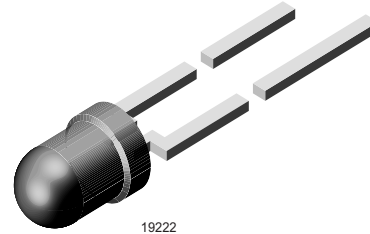
## High Intensity LED in $\varnothing$ 3 mm Tinted Diffused Package

### Description

This device has been designed to meet the increasing demand for AlInGaP 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 packing units are categorized in luminous intensity groups. That allows users to assemble LEDs with uniform appearance.



### Features

- AlInGaP 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
- Lead-free device

### Applications

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

### Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity ( $\pm\phi$ )	Technology
TLHK4600	Red, $I_V > 6.3$ mcd	60 °	AlInGaP on GaAs

### Absolute Maximum Ratings

$T_{amb} = 25$  °C, unless otherwise specified

#### TLHK4600

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		$V_R$	5	V
DC Forward current	$T_{amb} \leq 60$ °C	$I_F$	30	mA
Surge forward current	$t_p \leq 10$ $\mu$ s	$I_{FSM}$	0.1	A
Power dissipation	$T_{amb} \leq 60$ °C	$P_V$	80	mW
Junction temperature		$T_j$	100	°C
Operating temperature range		$T_{amb}$	- 40 to + 100	°C
Storage temperature range		$T_{stg}$	- 55 to + 100	°C
Soldering temperature	$t \leq 5$ s, 2 mm from body	$T_{sd}$	260	°C
Thermal resistance junction/ambient		$R_{thJA}$	400	K/W

### Optical and Electrical Characteristics

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

#### Red

#### TLHK4600

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	$I_V$	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
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	$C_j$		15		pF
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5			V

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

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

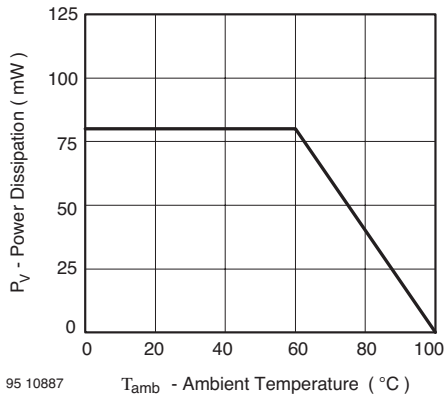


Figure 1. Power Dissipation vs. Ambient Temperature

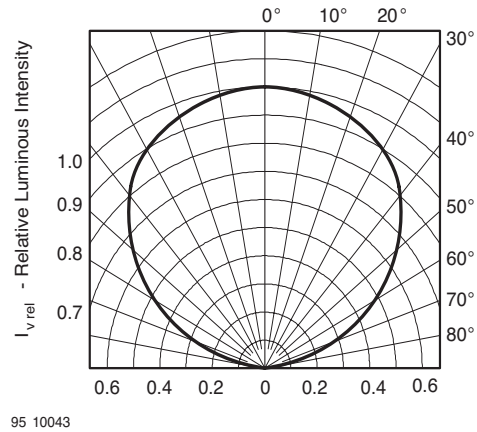


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

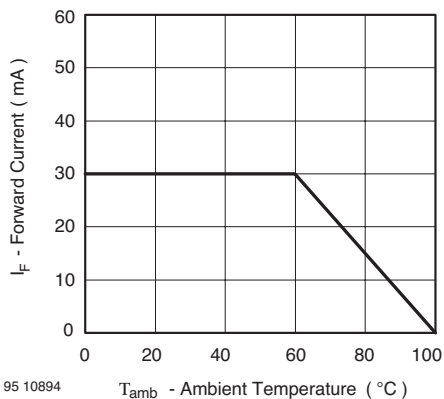


Figure 2. Forward Current vs. Ambient Temperature for InGaN

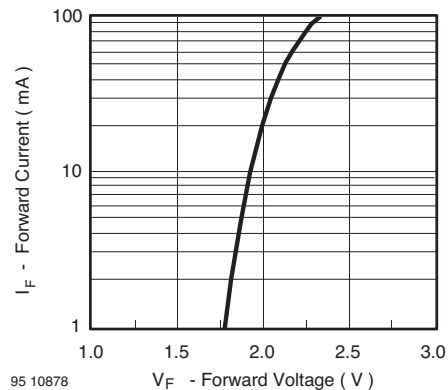


Figure 4. Forward Current vs. Forward Voltage

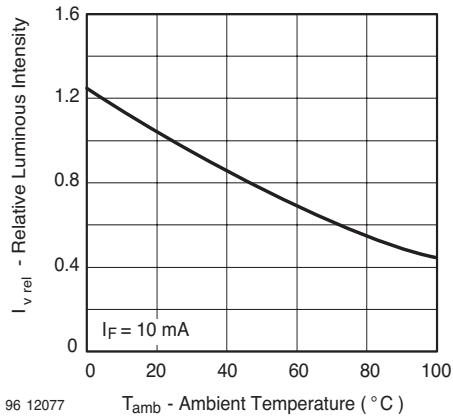


Figure 5. Rel. Luminous Intensity vs. Ambient Temperature

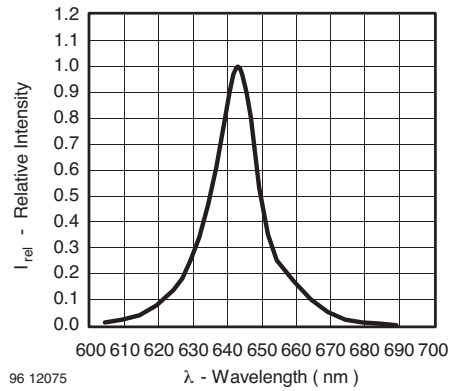


Figure 8. Relative Intensity vs. Wavelength

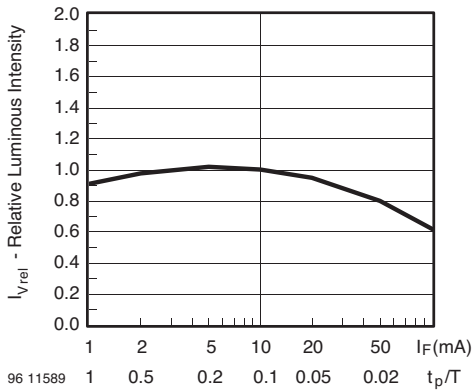


Figure 6. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

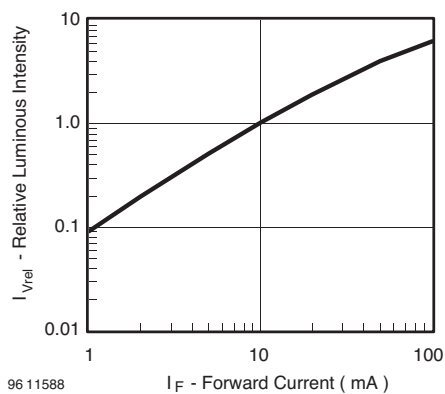


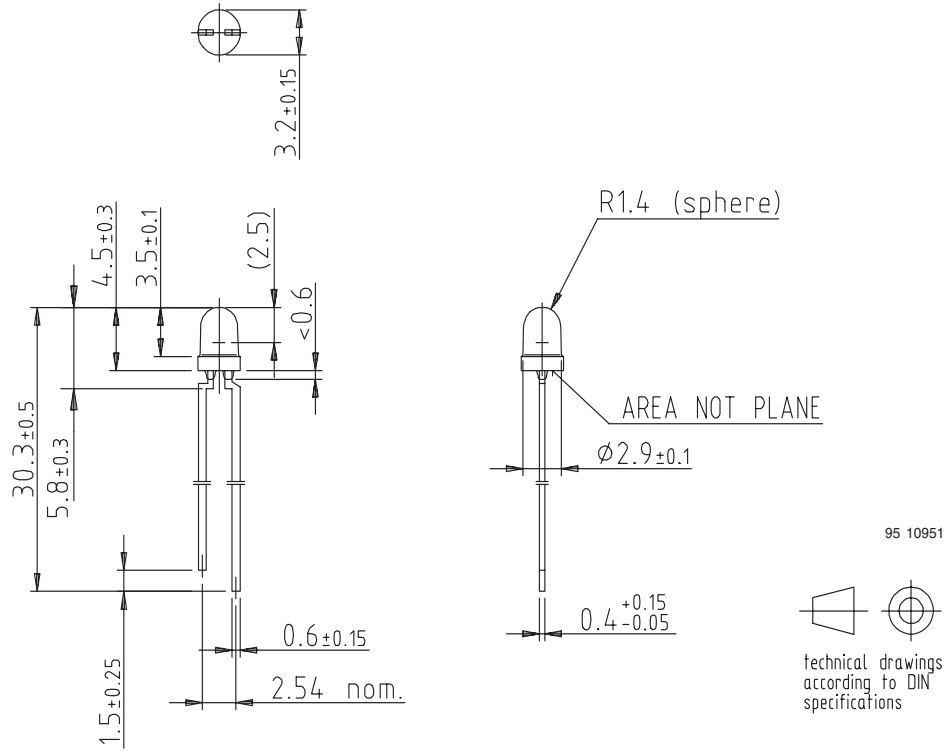
Figure 7. Relative Luminous Intensity vs. Forward Current

# TLHK4600

Vishay Semiconductors



## Package Dimensions in mm



## **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.

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