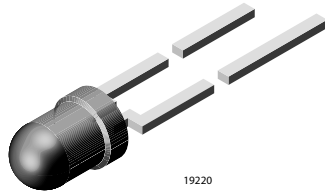


## Universal LED in $\varnothing$ 3 mm Tinted Diffused Package



### FEATURES

- For DC and pulse operation
- Luminous intensity categorized
- Standard  $\varnothing$  3 mm (T-1) package
- Lead (Pb)-free device
- Component in acc. to RoHS 2002/95/EC and WEEE 2002/96/EC
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B



### APPLICATIONS

- General indicating and lighting purposes

### PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	ANGLE OF HALF INTENSITY ( $\pm \phi$ )	TECHNOLOGY
TLUR4400	Red, $I_V > 4$ mcd	30°	GaAsP on GaAs
TLUR4401	Red, $I_V = (4 \text{ to } 32)$ mcd	30°	GaAsP on GaAs

### ABSOLUTE MAXIMUM RATINGS<sup>1)</sup>, TLUR44..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>2)</sup>		$V_R$	6	V
DC Forward current		$I_F$	20	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	$I_{FSM}$	0.5	A
Power dissipation		$P_V$	60	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		$R_{thJA}$	500	K/W

Note:

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

2) Driving the LED in reverse direction is suitable for a short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> , TLUR44.., RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN	TYP.	MAX	UNIT
Luminous intensity	$I_F = 10 \text{ mA}$	TLUR4400	$I_V$	4	15		mcd
		TLUR4401	$I_V$	4		32	mcd
Dominant wavelength	$I_F = 10 \text{ mA}$		$\lambda_d$		630		nm
Peak wavelength	$I_F = 10 \text{ mA}$		$\lambda_p$		640		nm
Angle of half intensity	$I_F = 10 \text{ mA}$		$\varphi$		$\pm 30$		deg
Forward voltage	$I_F = 20 \text{ mA}$		$V_F$		2	3	V
Reverse voltage	$I_R = 10 \mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0, f = 1 \text{ MHz}$		$C_j$		50		pF

Note:

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

LUMINOUS INTENSITY CLASSIFICATION		
GROUP	LIGHT INTENSITY [MCD]	
	STANDARD	MIN
P	4	8
Q	6.3	12.5
R	10	20
S	16	32
T	25	50
U	40	80
V	63	125
W	100	200
X	130	260
Y	180	360
Z	240	480

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 on any one bag.

In order to ensure availability, single wavelength groups will not be orderable.

## TYPICAL CHARACTERISTICS

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

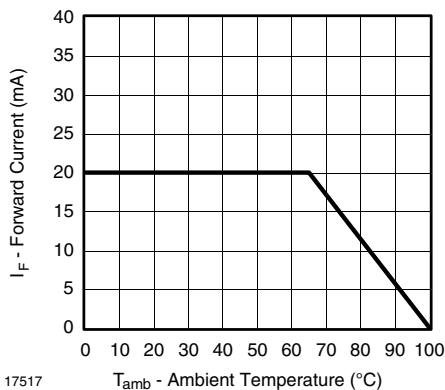


Figure 1. Forward Current vs. Ambient Temperature

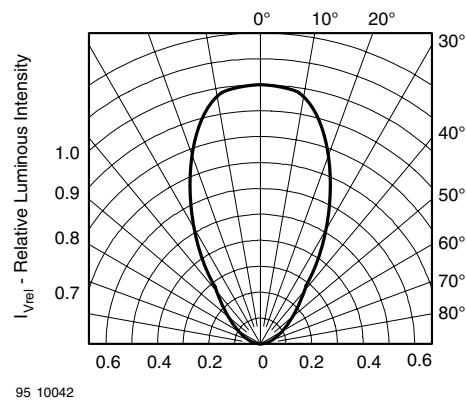


Figure 2. Rel. Luminous Intensity vs. Angular Displacement

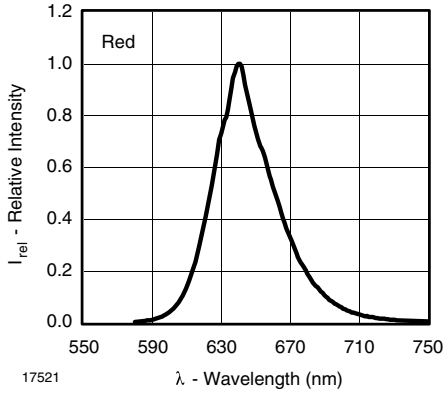


Figure 3. Relative Intensity vs. Wavelength

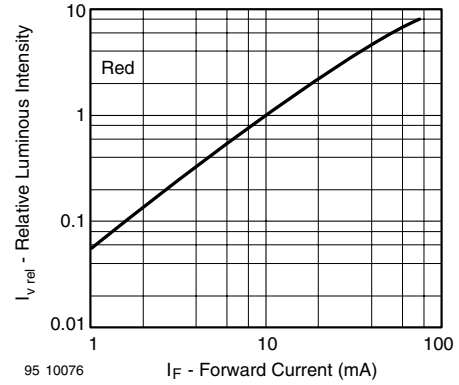


Figure 5. Relative Luminous Intensity vs. Forward Current

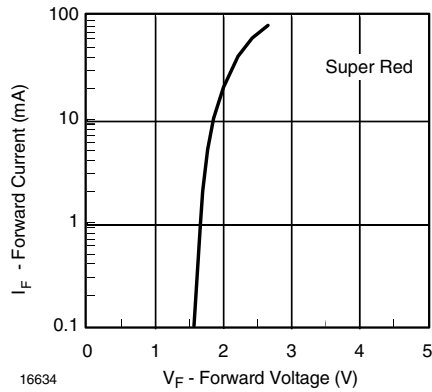


Figure 4. Forward Current vs. Forward Voltage

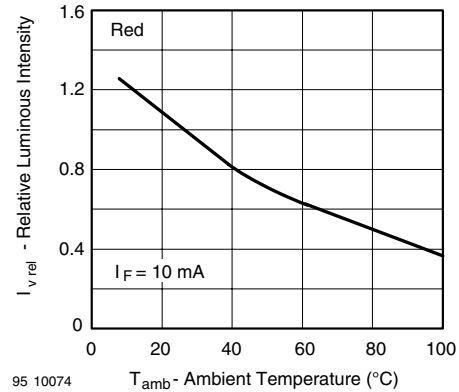
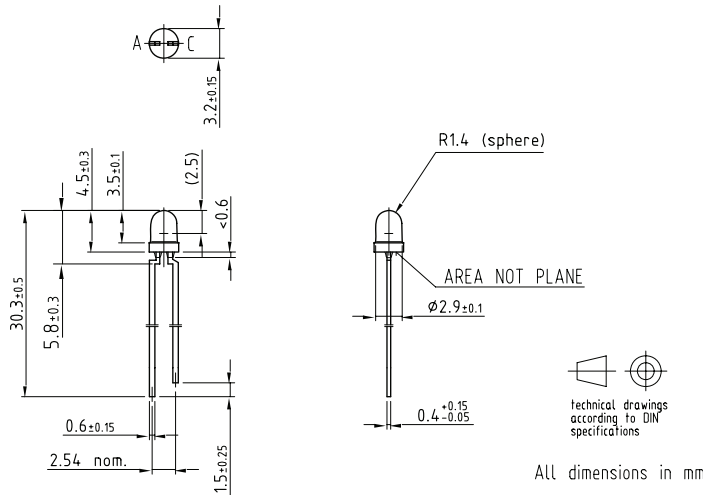


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

**PACKAGE DIMENSIONS**



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Issue: 5; 08.11.99

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## Vishay Semiconductors

### **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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