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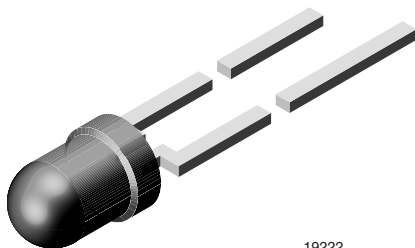
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## High Intensity LED in Ø 3 mm Tinted Diffused Package



19222

### DESCRIPTION

This device has been designed to meet the increasing demand for AlInGaP technology general indicating and lighting purposes.

It is housed in a 3 mm diffused plastic package. The wide viewing angle of these devices provides a high brightness across a large field of view.

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

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity:  $\pm 30^\circ$

### FEATURES

- AllInGaP technology
- Standard Ø 3 mm (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Very high intensity
- Luminous intensity categorized
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- Status lights
- Off/on indicator
- Background illumination
- Readout lights
- Maintenance lights
- Legend light

### PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I <sub>F</sub> (mA)	WAVELENGTH (nm)			at I <sub>F</sub> (mA)	FORWARD VOLTAGE (V)			at I <sub>F</sub> (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLHK4400L	Red	16	70	-	10	626	630	639	10	-	1.9	2.6	20	AlInGaP on GaAs
TLHK4400L-PSZ	Red	16	70	-	10	626	630	639	10	-	1.9	2.6	20	AlInGaP on GaAs

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>(1)</sup>		V <sub>R</sub>	5	V
DC forward current	T <sub>amb</sub> ≤ 60 °C	I <sub>F</sub>	30	mA
Surge forward current	t <sub>p</sub> ≤ 10 μs	I <sub>FSM</sub>	0.1	A
Power dissipation		P <sub>V</sub>	80	mW
Junction temperature		T <sub>j</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	-40 to +100	°C
Storage temperature range		T <sub>stg</sub>	-55 to +100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T <sub>sd</sub>	260	°C
Thermal resistance junction/ambient		R <sub>thJA</sub>	400	K/W

### Note

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

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLHK4400L, RED**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	$I_F = 10\text{ mA}$	$I_V$	16	70	-	mcd
Dominant wavelength	$I_F = 10\text{ mA}$	$\lambda_d$	626	630	639	nm
Peak wavelength	$I_F = 10\text{ mA}$	$\lambda_p$	-	643	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$	$\varphi$	-	$\pm 30$	-	deg
Forward voltage	$I_F = 20\text{ mA}$	$V_F$	-	1.9	2.6	V
Reverse current	$V_R = 5\text{ V}$	$I_R$	-	-	10	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_j$	-	15	-	pF

**LUMINOUS INTENSITY CLASSIFICATION**

GROUP	LIGHT INTENSITY (mcd)	
	MIN.	MAX.
S	16	32
T	25	50
U	40	80
V	63	125
W	100	200
X	130	260
Y	180	360
Z	240	480
AA	320	640
BB	430	860

**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 reel (there will be no mixing of two groups on each reel).  
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 reel.  
In order to ensure availability, single wavelength groups will not be orderable.

**COLOR CLASSIFICATION**

GROUP	RED	
	DOM. WAVELENGTH (nm)	
	MIN.	MAX.
1	626	629
2	628	631
3	630	633
4	632	635
5	634	637
6	636	639

**Note**

- Wavelengths are tested at a current pulse duration of 25 ms.

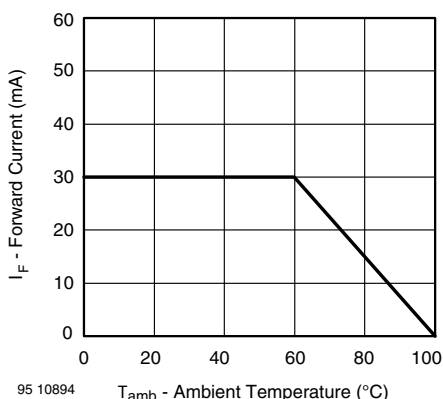
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

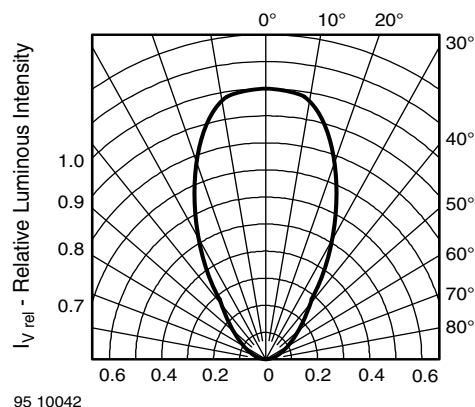


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

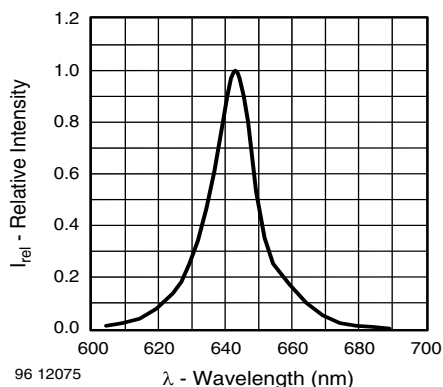


Fig. 3 - Relative Intensity vs. Wavelength

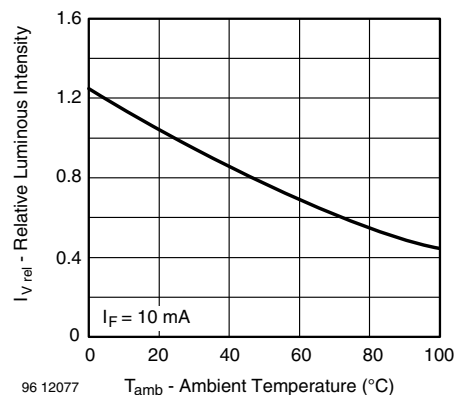


Fig. 6 - Relative Luminous Intensity vs. Ambient Temperature

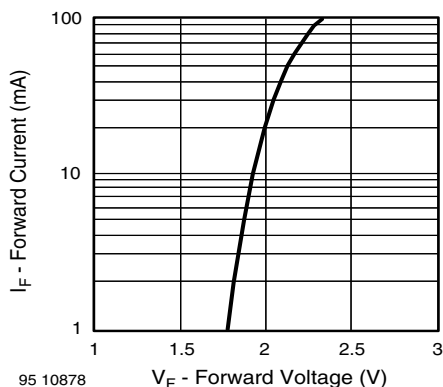


Fig. 4 - Forward Current vs. Forward Voltage

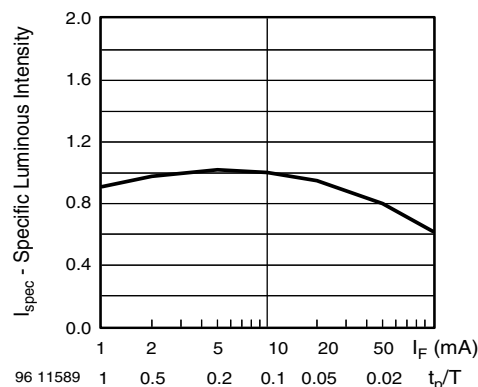


Fig. 7 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

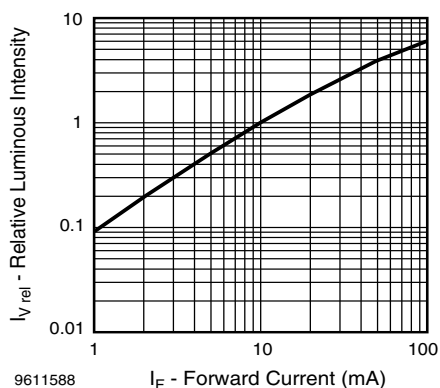
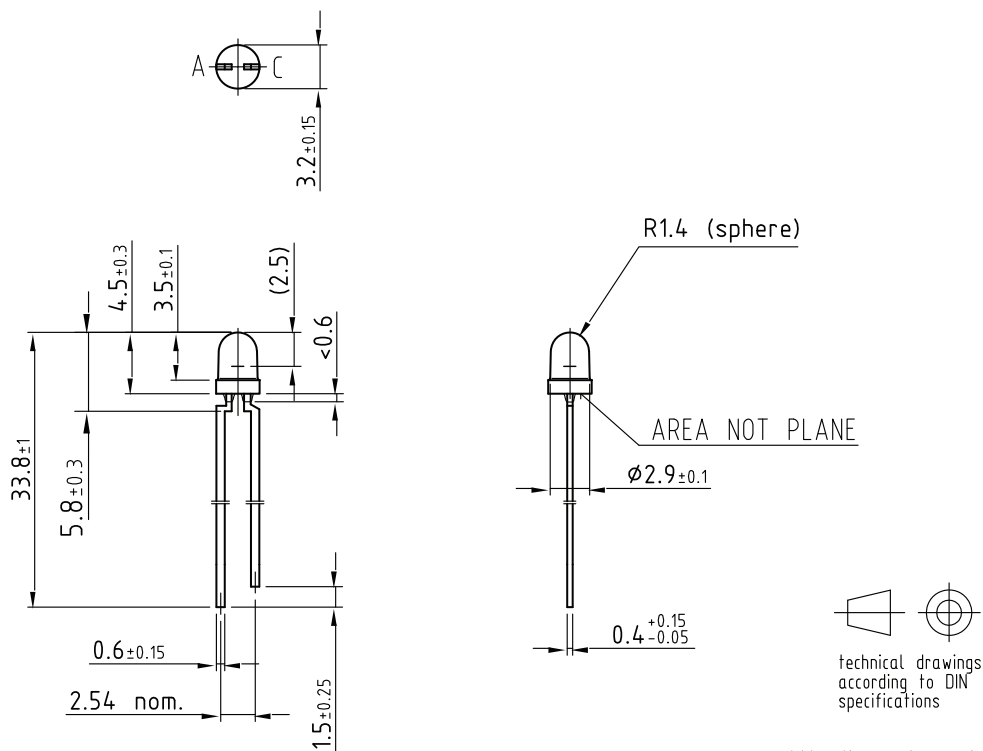


Fig. 5 - Relative Luminous Intensity vs. Forward Current

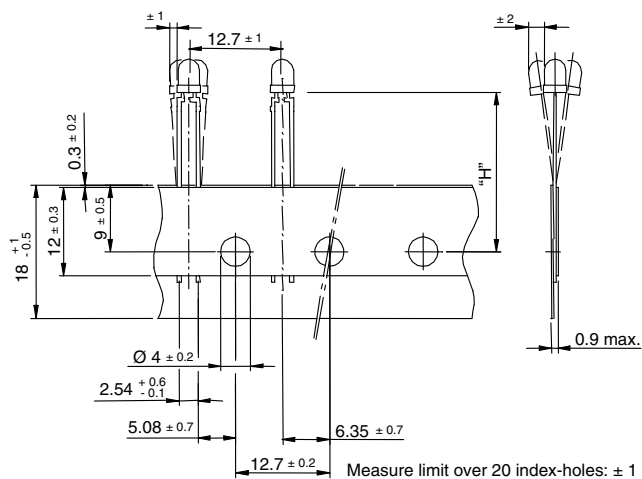
**PACKAGE DIMENSIONS** in millimeters


Drawing refers to following types: TLHK 4400 L

Drawing-No.: 6.544-5255.05-4

Issue: 1; 10.08.06

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Fig. 8 - Tape Dimensions  $\phi 3$  mm Devices

**TAPE DIMENSIONS  
FOR  $\phi 3$  mm TLHK4400L-PSZ**

OPTION	DIMENSION H $\pm 0.5$ mm
PS	28.5

**Explanation:**

Z - Ammopack



AMMOPACK

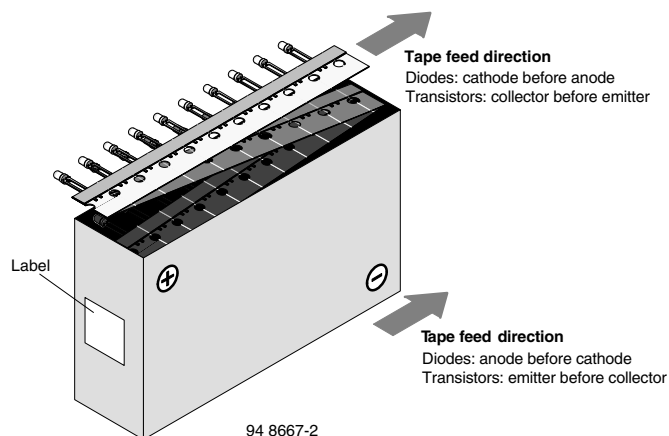


Fig. 9 - Tape Direction

Note

- The new nomenclature for ammopack is ASZ only, without suffix for the LED orientation. The carton box has to be turned to the desired position: “+” for anode first, or “-” for cathode first. AS12Z and AS21Z are still valid for already existing types, BUT NOT FOR NEW DESIGN.

PACKING METHOD	
BULK	AMMOPACK (Z)
1 x 5000 pcs	5 x 2000 pcs



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