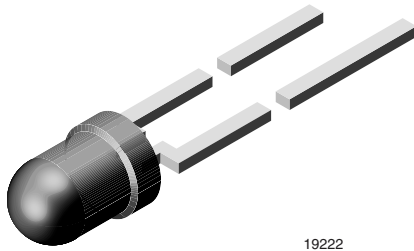


## High Intensity LED in Ø 3 mm Tinted Diffused Package



19222

### DESCRIPTION

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

All packing units are categorized in luminous intensity and color groups. That allows users to assemble LEDs with uniform appearance developed for standard applications like general indicating and lighting purposes.

### FEATURES

- AllnGaP 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 color categorized
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

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

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity:  $\pm 60^\circ$

### 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. |                        |                 |
| TLHE4600 | Yellow | 10                       | 26   | -    | 10                     | 581             | 588  | 594  | 10                     | -                   | 1.9  | 2.6  | 20                     | AllnGaP on GaAs |

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

#### TLHE4600

| PARAMETER                           | TEST CONDITION           | SYMBOL            | VALUE       | UNIT |
|-------------------------------------|--------------------------|-------------------|-------------|------|
| Reverse voltage                     |                          | 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                   | T <sub>amb</sub> ≤ 60 °C | 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  |



| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)<br><b>TLHE4600, YELLOW</b> |   |             |     |          |     |      |
|---|---|-------------|-----|----------|-----|------|
| PARAMETER   | TEST CONDITION                          | SYMBOL      | MIN | TYP.     | MAX | UNIT |
| Luminous intensity <sup>(1)</sup>   | $I_F = 10\text{ mA}$                    | $I_V$       | 10  | 26       | -   | mcd  |
| Dominant wavelength   | $I_F = 10\text{ mA}$                    | $\lambda_d$ | 581 | 588      | 594 | nm   |
| Peak wavelength   | $I_F = 10\text{ mA}$                    | $\lambda_p$ | -   | 590      | -   | 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   | $I_R = 10\text{ }\mu\text{A}$           | $V_R$       | 5   | -        | -   | V    |
| Junction capacitance  | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ | $C_j$       | -   | 15       | -   | pF   |

**Note**

(1) In one packing unit  $I_{Vmin}/I_{Vmax} \leq 0.5$ .

| <b>LUMINOUS INTENSITY CLASSIFICATION</b> |                       |      |
|--|-----------------------|------|
| GROUP                                    | LIGHT INTENSITY (mcd) |      |
|  | MIN.                  | MAX. |
| 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. These 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 are 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 are not be orderable.

| <b>COLOR CLASSIFICATION</b> |                      |      |
|-----------------------------|----------------------|------|
| GROUP                       | YELLOW               |      |
|                             | DOM. WAVELENGTH (nm) |      |
|                             | MIN.                 | MAX. |
| 1                           | 581                  | 584  |
| 2                           | 583                  | 586  |
| 3                           | 585                  | 588  |
| 4                           | 587                  | 590  |
| 5                           | 589                  | 592  |
| 6                           | 591                  | 594  |

**Note**

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

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

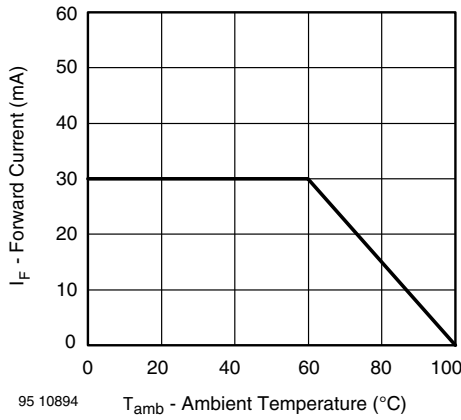


Fig. 1 - Forward Current vs. Ambient Temperature for InGaN

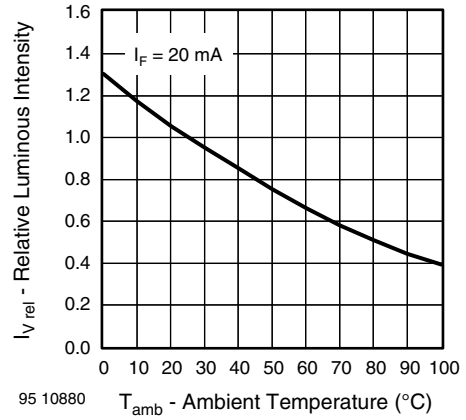


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

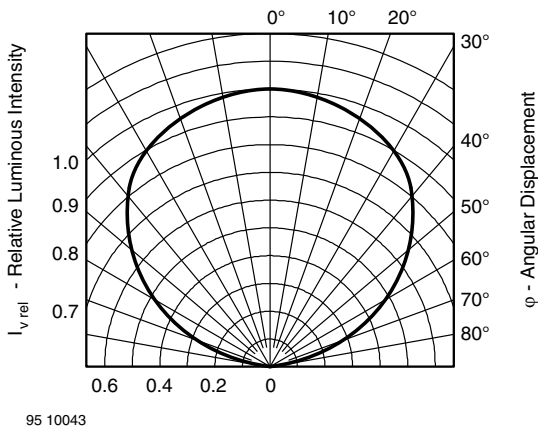


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

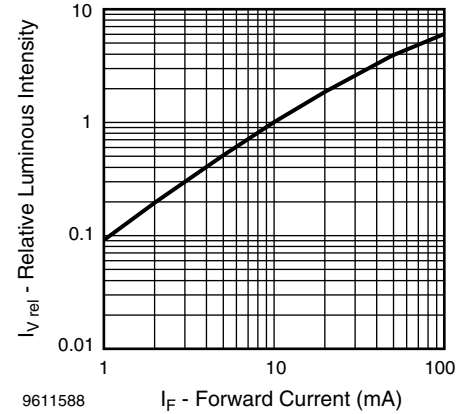


Fig. 5 - Relative Luminous Intensity vs. Forward Current

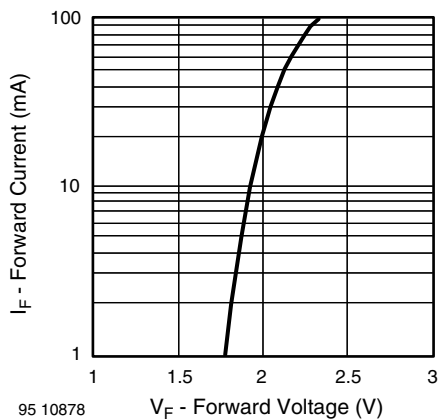


Fig. 3 - Forward Current vs. Forward Voltage

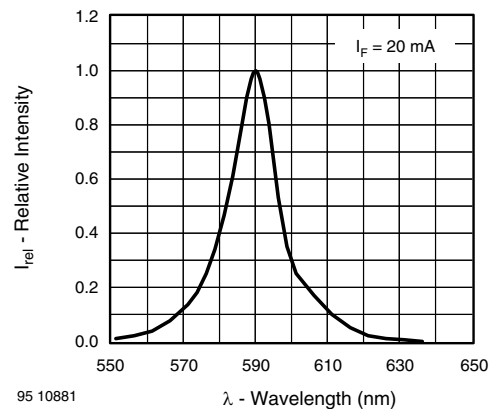
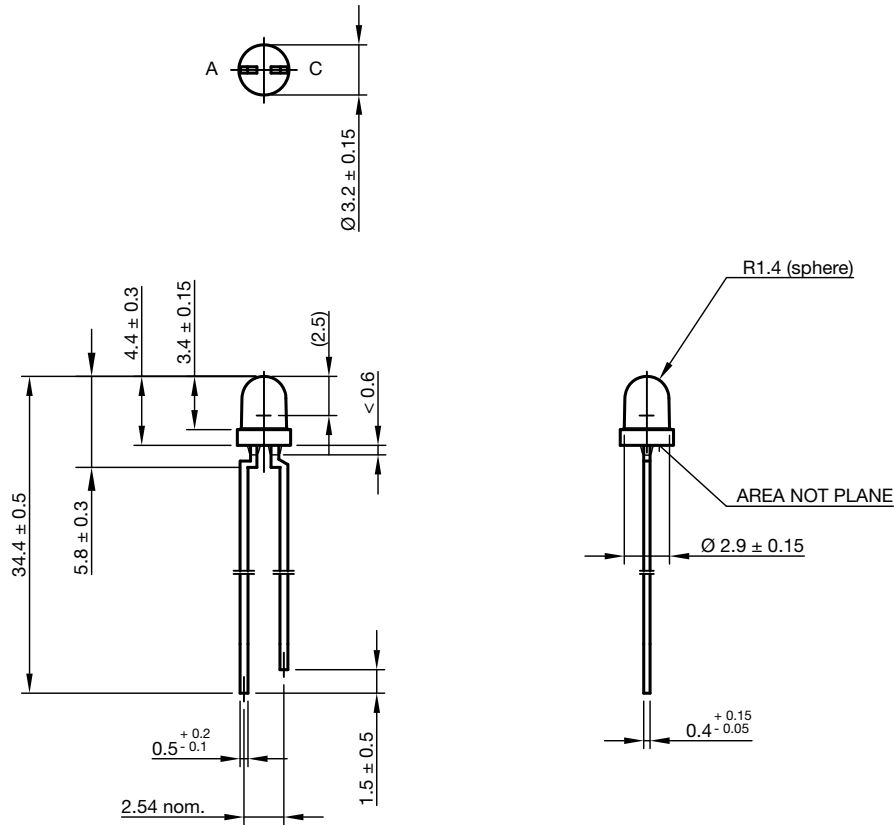
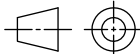


Fig. 6 - Relative Intensity vs. Wavelength



**PACKAGE DIMENSIONS** in millimeters



  
technical drawings  
according to DIN  
specifications

Drawing-No.: 6.544-5255.01-4  
Issue: 9; 28.07.14



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