

## High Intensity LED, Ø 5 mm Untinted Non-Diffused Package



19223

### DESCRIPTION

This device has been designed to meet the increasing demand for extremely bright red LEDs.

It is housed in a 5 mm untinted non-diffused plastic package. The very small viewing angle of this device provides a very high luminous intensity.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity:  $\pm 4^\circ$

### FEATURES

- AllnGaP technology
- Standard T-1 $\frac{3}{4}$  package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very small viewing angle
- Very high intensity
- Luminous intensity categorized
- ESD-withstand voltage up to 2 kV according to JESD22-A114-B
- 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 indicators
- Lightpipes
- Outdoor displays
- Medical instruments
- Maintenance lights
- Legend lights

### 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. |                        |                 |
| TLHK5800 | Red   | 1000                     | 5500 | -    | 20                     | -               | 630  | -    | 10                     | -                   | 1.9  | 2.6  | 20                     | AllnGaP on GaAs |

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified) TLHK5800

| PARAMETER                           | TEST CONDITION           | SYMBOL            | VALUE         | UNIT |
|-------------------------------------|--------------------------|-------------------|---------------|------|
| Reverse voltage                     |                          | V <sub>R</sub>    | 5             | V    |
| DC forward current                  | T <sub>amb</sub> ≤ 65 °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> ≤ 65 °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> | 350           | K/W  |



| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                      |             |      |         |      |      |
|--|--------------------------------------|-------------|------|---------|------|------|
| <b>TLHK5800, RED</b>   |                                      |             |      |         |      |      |
| PARAMETER  | TEST CONDITION                       | SYMBOL      | MIN. | TYP.    | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>  | $I_F = 20\text{ mA}$                 | $I_V$       | 1000 | 5500    | -    | 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  | $I_F = 10\text{ mA}$                 | $\varphi$   | -    | $\pm 4$ | -    | 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**

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

| <b>LUMINOUS INTENSITY CLASSIFICATION</b> |                          |         |
|--|--------------------------|---------|
| GROUP                                    | LUMINOUS INTENSITY (mcd) |         |
|  | MIN.                     | MAX.    |
| STANDARD                                 |                          |         |
| BB                                       | 430                      | 860     |
| CC                                       | 575                      | 1150    |
| DD                                       | 750                      | 1500    |
| EE                                       | 1000                     | 2000    |
| FF                                       | 1350                     | 2700    |
| GG                                       | 1800                     | 3600    |
| HH                                       | 2400                     | 4800    |
| II                                       | 3200                     | 6400    |
| KK                                       | 4300                     | 8600    |
| LL                                       | 5750                     | 11 500  |
| MM                                       | 7500                     | 15 000  |
| NN                                       | 10 000                   | 20 000  |
| PP                                       | 13 500                   | 27 000  |
| QQ                                       | 18 000                   | 36 000  |
| RR                                       | 24 000                   | 48 000  |
| SS                                       | 32 000                   | 64 000  |
| TT                                       | 43 000                   | 86 000  |
| UU                                       | 57 500                   | 115 000 |

**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 in 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)

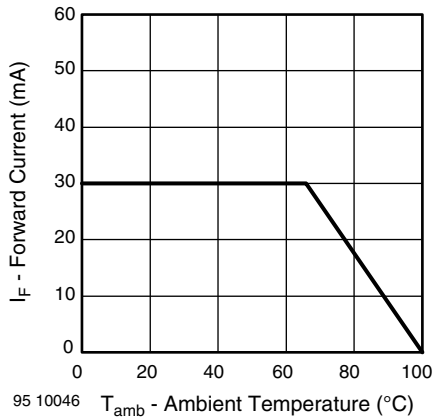


Fig. 1 - Forward Current vs. Ambient Temperature



Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

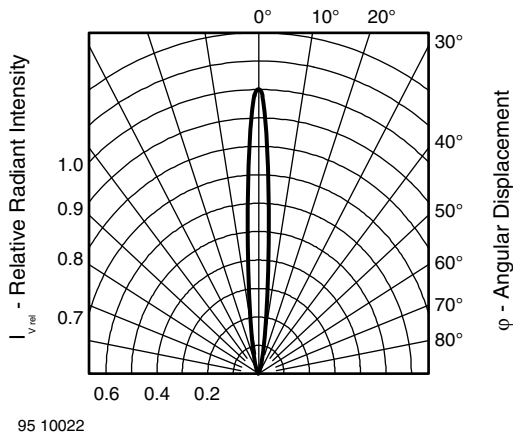


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

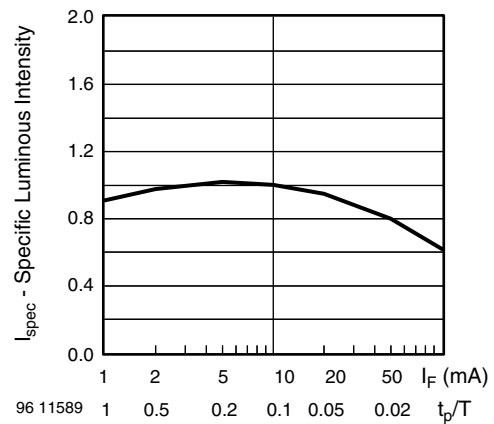


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

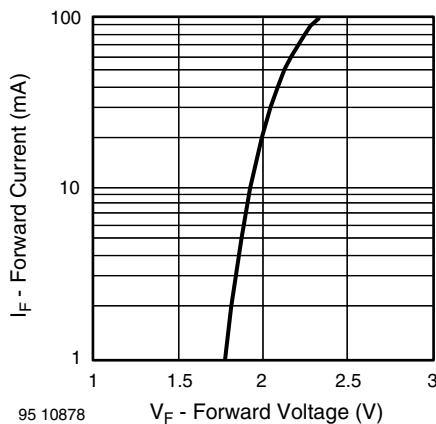


Fig. 3 - Forward Current vs. Forward Voltage

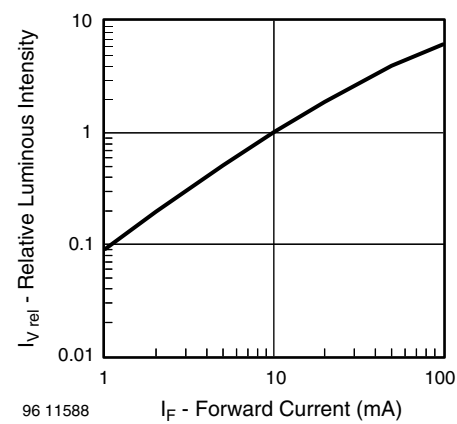


Fig. 6 - Relative Luminous Intensity vs. Forward Current

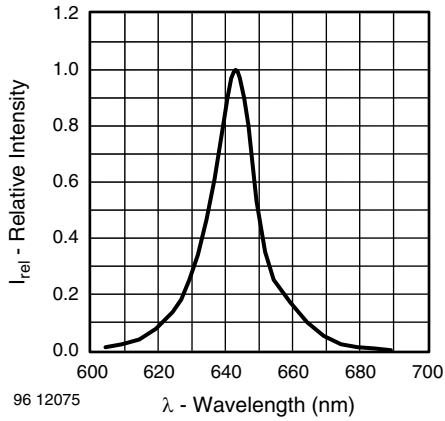
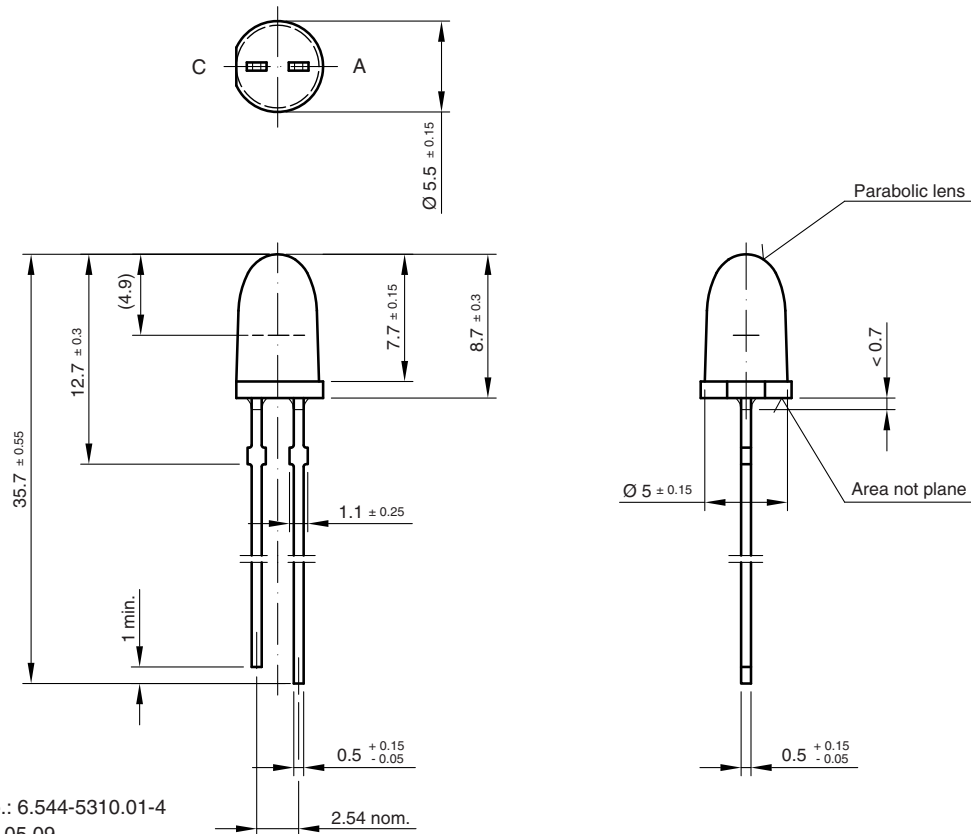


Fig. 7 - Relative Intensity vs. Wavelength

**PACKAGE DIMENSIONS** in millimeters



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 95 11476

technical drawings  
 according to DIN  
 specifications



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