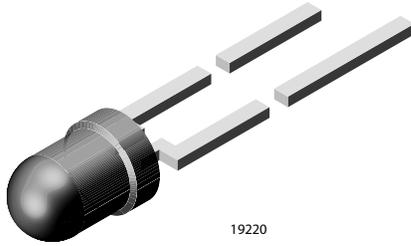


## High Efficiency LED, Ø 3 mm Tinted Total Diffused Package



### DESCRIPTION

The TLHA44.. series was developed for applications which need a very wide radiation angle like backlighting, general indicating and lighting purposes.

It is housed in a 3 mm tinted total diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.

All LEDs are categorized in luminous intensity groups.

### PRODUCT GROUP AND PACKAGE DATA

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

### FEATURES

- AllnGaP technology
- Standard Ø 3 (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Very high intensity
- Luminous intensity categorized
- ESD-withstand voltage: up to 2 kV HBM according to JESD22-A114-B
- 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

### 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. |                        |                 |
| TLHA44R1S2 | Amber | 112                      | -    | 280  | 20                     | 612             | 617  | 625  | 20                     | -                   | 2    | 2.6  | 20                     | AllnGaP on GaAs |

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

#### TLHA44R1S2

| 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>  | 0.5         | 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-to-ambient |                          | R <sub>thJA</sub> | 400         | K/W  |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLHA44R1S2, AMBER**

| PARAMETER                         | TEST CONDITION                       | PART       | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|-----------------------------------|--------------------------------------|------------|-------------|------|----------|------|------|
| Luminous intensity <sup>(1)</sup> | $I_F = 20\text{ mA}$                 | TLHA44R1S2 | $I_V$       | 112  | -        | 280  | mcd  |
| Dominant wavelength               | $I_F = 20\text{ mA}$                 |            | $\lambda_d$ | 612  | 617      | 625  | nm   |
| Peak wavelength                   | $I_F = 20\text{ mA}$                 |            | $\lambda_p$ | -    | 624      | -    | nm   |
| Angle of half intensity           | $I_F = 20\text{ mA}$                 |            | $\varphi$   | -    | $\pm 30$ | -    | deg  |
| Forward voltage                   | $I_F = 20\text{ mA}$                 |            | $V_F$       | -    | 2        | 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  $I_{Vmin}/I_{Vmax} \leq 0.5$

**LUMINOUS INTENSITY CLASSIFICATION**

| GROUP | LIGHT INTENSITY (mcd) |      |      |
|-------|-----------------------|------|------|
|       | STANDARD              | MIN. | MAX. |
| R1    | 112                   | 140  |      |
| R2    | 140                   | 180  |      |
| S1    | 180                   | 224  |      |
| S2    | 224                   | 280  |      |

**Note**

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ . These 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.

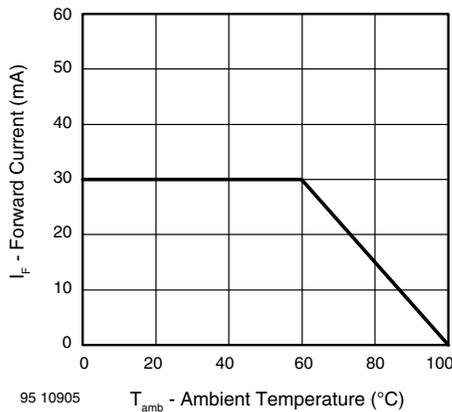
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

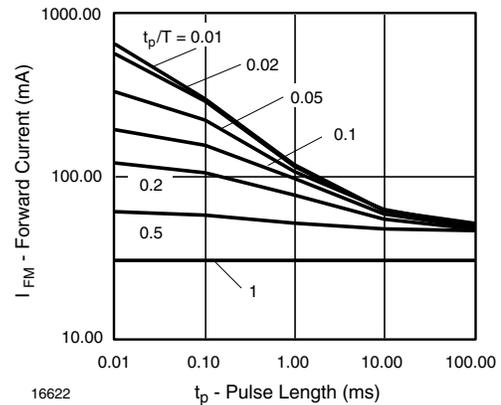


Fig. 2 - Forward Current vs. Pulse Length

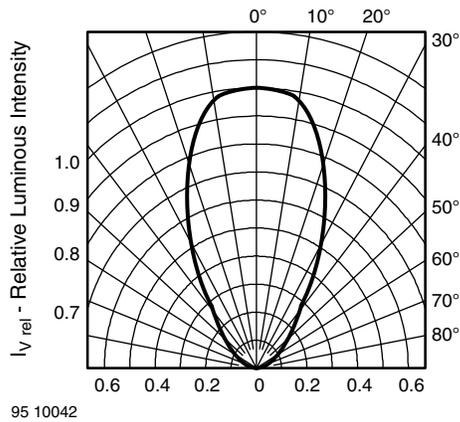


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

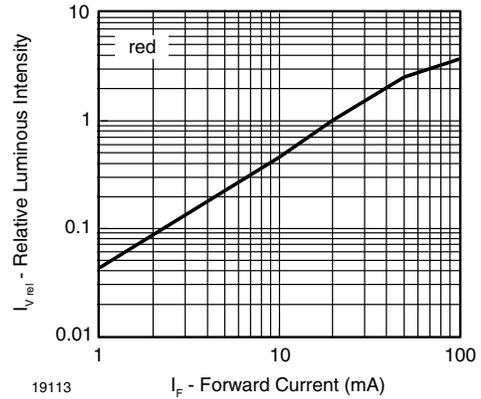


Fig. 6 - Relative Luminous Intensity vs. Forward Current

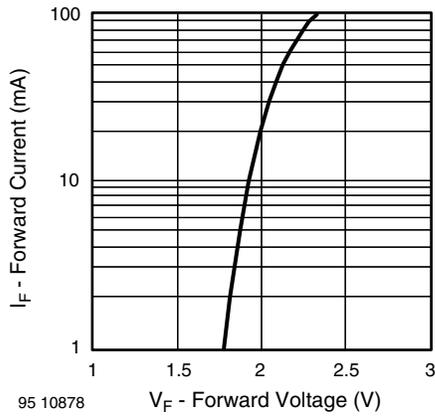


Fig. 4 - Forward Current vs. Forward Voltage

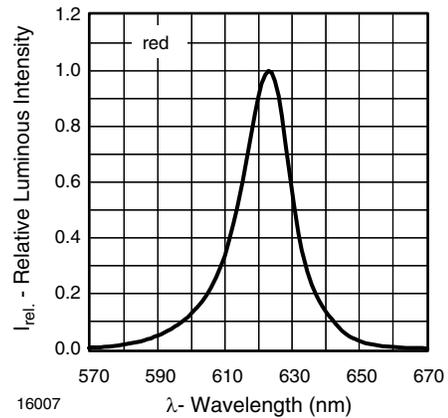


Fig. 7 - Relative Intensity vs. Wavelength

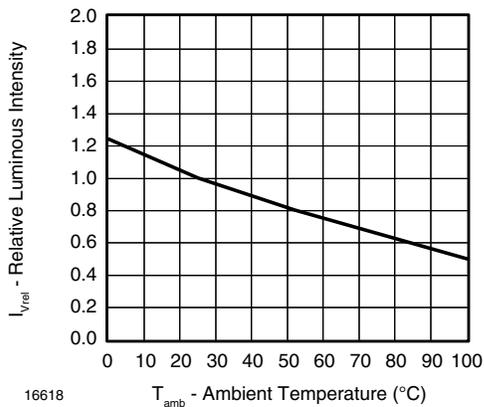
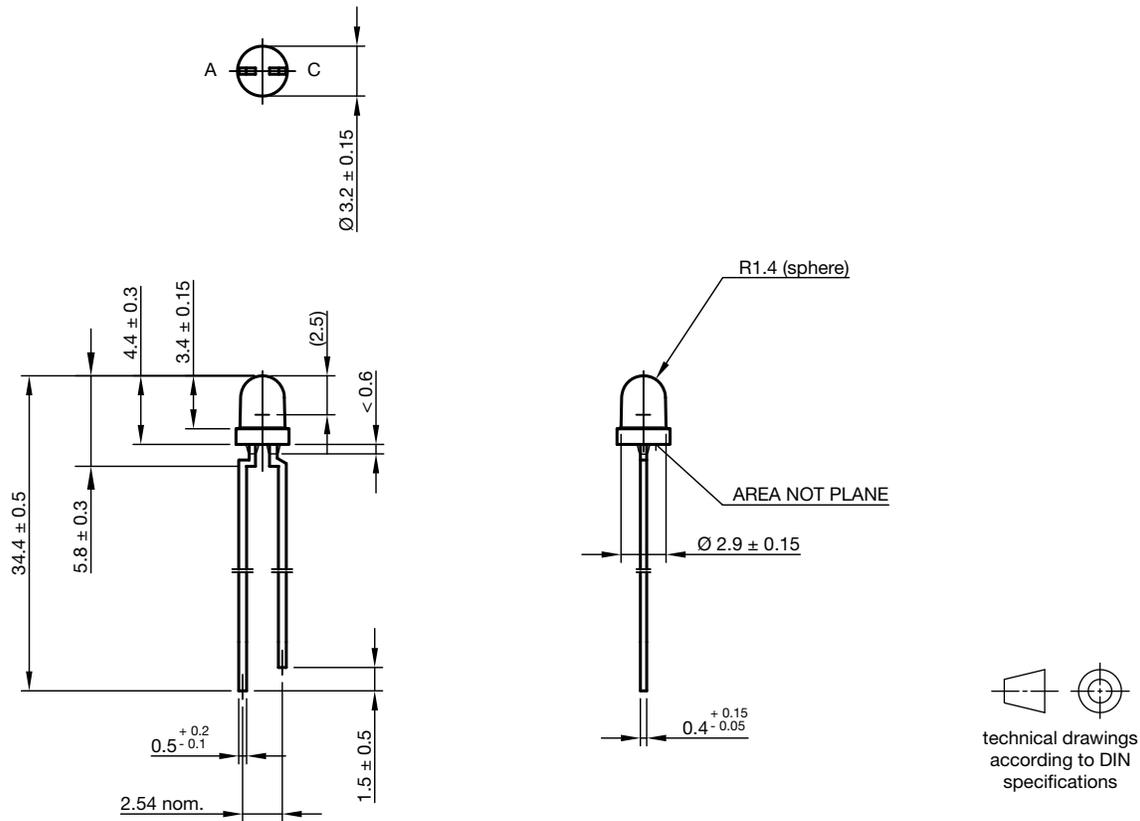


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature



**PACKAGE DIMENSIONS** in millimeters



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