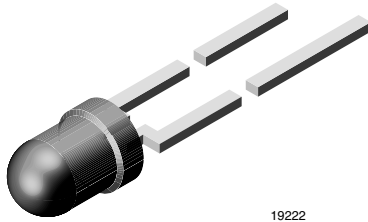




THE DATASHEET OF TLHB4400



High Efficiency Blue LED, \varnothing 3 mm Tinted Diffused Package



DESCRIPTION

This device has been redesigned in 1998 replacing SiC by GaN technology to meet the increasing demand for high efficiency blue LEDs.

It is housed in a 3 mm tinted diffused plastic package. All packing units are categorized in luminous intensity groups. That allows users to assemble LEDs with uniform appearance.

FEATURES

- GaN on SiC technology
- Standard \varnothing 3 mm (T-1) package
- Small mechanical tolerances
- Wide viewing angle
- Very high intensity
- Luminous intensity categorized
- ESD class 1
- Lead (Pb)-free device

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: $\pm 40^\circ$

| PARTS TABLE | | |
|-------------|---------------------------------------|------------|
| PART | COLOR, LUMINOUS INTENSITY | TECHNOLOGY |
| TLHB4400 | Blue, $I_V > 6.3$ mcd | GaN on SiC |
| TLHB4401 | Blue, $I_V = (10 \text{ to } 32)$ mcd | GaN on SiC |

| ABSOLUTE MAXIMUM RATINGS ¹⁾ TLHB440. | | | | |
|---|---------------------------------|------------|---------------|------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage | | V_R | 5 | V |
| DC Forward current | $T_{amb} \leq 60^\circ\text{C}$ | I_F | 20 | mA |
| Surge forward current | $t_p \leq 10 \mu\text{s}$ | I_{FSM} | 0.1 | A |
| Power dissipation | $T_{amb} \leq 60^\circ\text{C}$ | P_V | 100 | mW |
| Junction temperature | | T_j | 100 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | - 40 to + 100 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^\circ\text{C}$ |
| Soldering temperature | $t \leq 5$ s, 2 mm from body | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | | R_{thJA} | 400 | K/W |

Note:

¹⁾ $T_{amb} = 25^\circ\text{C}$, unless otherwise specified

| OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾ TLHB440., BLUE | | | | | | | |
|---|------------------------|----------|-------------|-----|----------|-----|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN | TYP. | MAX | UNIT |
| Luminous intensity ¹⁾ | $I_F = 20 \text{ mA}$ | TLHB4400 | I_V | 6.3 | 15 | | mcd |
| | | TLHB4401 | I_V | 10 | | 32 | mcd |
| Dominant wavelength | $I_F = 10 \text{ mA}$ | | λ_d | | 466 | | nm |
| Peak wavelength | $I_F = 10 \text{ mA}$ | | λ_p | | 428 | | nm |
| Angle of half intensity | $I_F = 10 \text{ mA}$ | | ϕ | | ± 30 | | deg |
| Forward voltage | $I_F = 20 \text{ mA}$ | | V_F | | 3.9 | 4.5 | V |
| Reverse voltage | $I_R = 10 \mu\text{A}$ | | V_R | 5 | | | V |

Note:

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

2) in one packing unit $I_{Vmax}/I_{Vmin} \leq 0.5$

TYPICAL CHARACTERISTICS

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

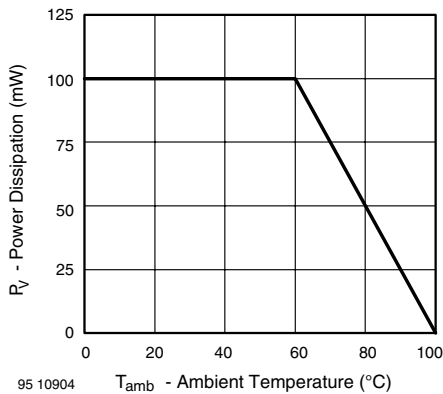


Figure 1. Power Dissipation vs. Ambient Temperature

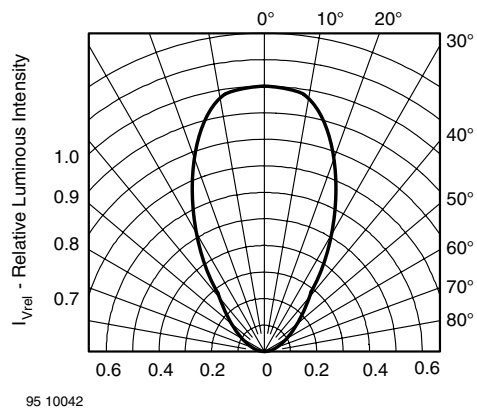


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

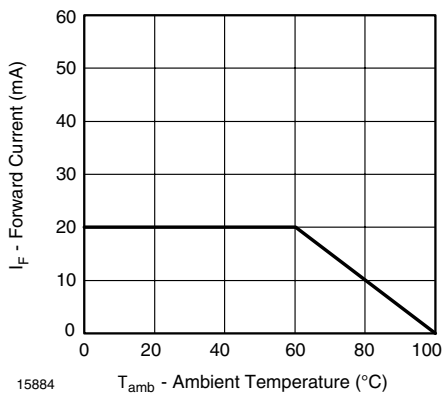


Figure 2. Forward Current vs. Ambient Temperature for InGaN

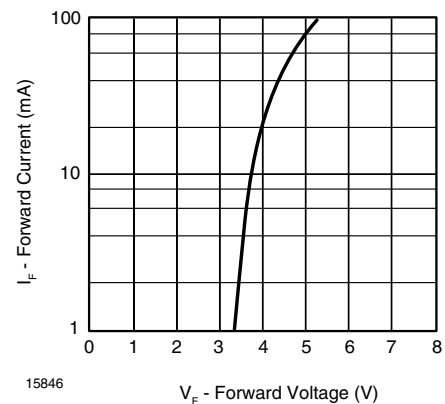


Figure 4. Forward Current vs. Forward Voltage

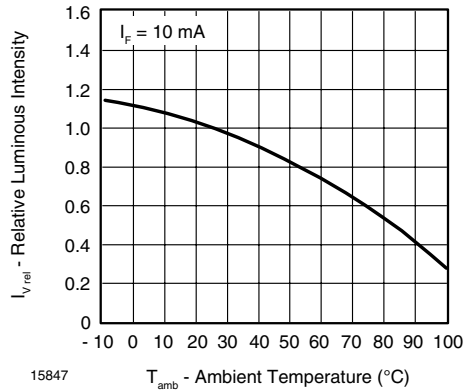


Figure 5. Rel. Luminous Flux vs. Ambient Temperature

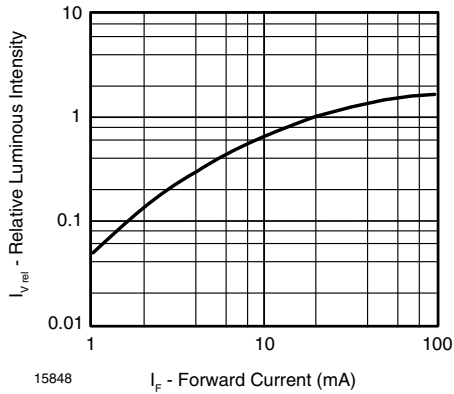


Figure 6. Relative Luminous Flux vs. Forward Current

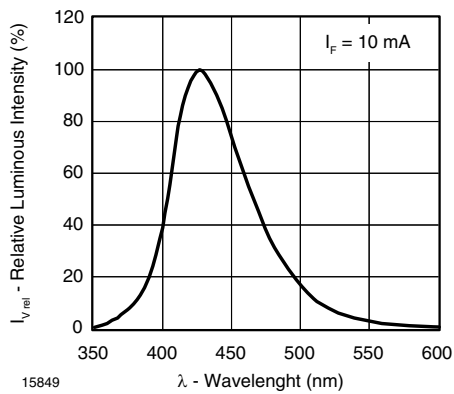


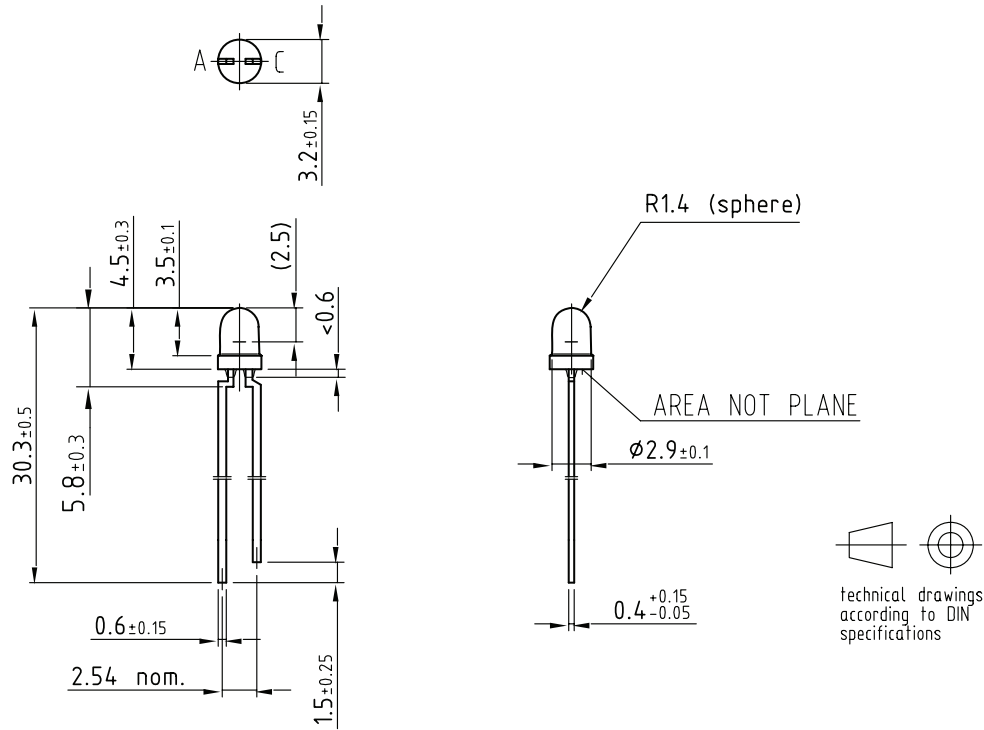
Figure 7. Relative Intensity vs. Wavelength

TLHB440.

Vishay Semiconductors



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5255.01-4

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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.

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