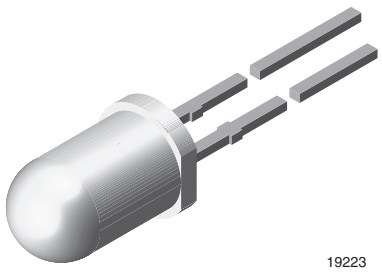
# High Efficiency Blue LED, Ø 5 mm Untinted Non-Diffused Package



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## FEATRUES

- GaN on SiC technology
- Standard Ø 5 mm T-1¾ package
- Small mechanical tolerances
- Small viewing angle
- Very high intensity
- Luminous intensity categorized
- ESD class 1
- Material categorization:
  For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

## DESCRIPTION

This device has been designed in GaN on SiC technology to meet the increasing demand for high efficiency blue LEDs.

It is housed in a 5 mm waterclear plastic package.

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: 5 mm
- Product series: standard
- Angle of half intensity: ± 9°

## APPLICATIONS

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

## PARTS TABLE

| PART | COLOR | LUMINOUS INTENSITY (mcd) | | | at $I_F$ (mA) | WAVELENGTH (nm) | | | at $I_F$ (mA) | FORWARD VOLTAGE (V) | | | at $I_F$ (mA) | TECHNOLOGY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MIN. | TYP. | MAX. | | MIN. | TYP. | MAX. | | MIN. | TYP. | MAX. | | |
| TLHB5100 | Blue | 63 | 250 | - | 20 | - | 466 | - | 10 | - | 3.9 | 4.5 | 20 | GaN on SiC |
| TLHB5102 | Blue | 130 | - | 360 | 20 | - | 466 | - | 10 | - | 3.9 | 4.5 | 20 | GaN on SiC |

## ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °C, unless otherwise specified)

**TLHB510.**

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Reverse voltage | | $V_R$ | 5 | V |
| DC forward current | $T_{amb} \leq 65$ °C | $I_F$ | 20 | mA |
| Surge forward current | $t_p \leq 10$ µs | $I_{FSM}$ | 0.1 | A |
| Power dissipation | $T_{amb} \leq 65$ °C | $P_V$ | 100 | mW |
| Junction temperature | | $T_j$ | 100 | °C |
| Operating temperature range | | $T_{amb}$ | - 40 to + 100 | °C |
| Storage temperature range | | $T_{stg}$ | - 40 to + 100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm from body | $T_{sd}$ | 260 | °C |
| Thermal resistance junction/ambient | | $R_{thJA}$ | 350 | K/W |

## OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified)
## TLHB5100, TLHB5102, BLUE

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Luminous intensity (1) | $I_F$ = 20 mA | TLHB5100 | $I_V$ | 63 | 250 | - | mcd |
| | | TLHB5102 | $I_V$ | 130 | - | 360 | mcd |
| Dominant wavelength | $I_F$ = 10 mA | | $\lambda_d$ | - | 466 | - | nm |
| Peak wavelength | $I_F$ = 10 mA | | $\lambda_p$ | - | 428 | - | nm |
| Angle of half intensity | $I_F$ = 10 mA | | $\varphi$ | - | ± 9 | - | deg |
| Forward voltage | $I_F$ = 20 mA | | $V_F$ | - | 3.9 | 4.5 | V |
| Reverse voltage | $I_R$ = 10 µA | | $V_R$ | 5 | - | - | V |

**Note**

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

## LUMINOUS INTENSITY CLASSIFICATION

| GROUP | LUMINOUS INTENSITY (mcd) | |
|---|---|---|
| STANDARD | MIN. | MAX. |
| 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 ± 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 °C, unless otherwise specified)

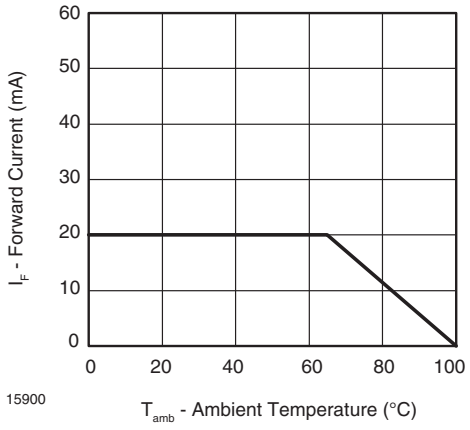



Fig. 1 - Forward Current vs. Ambient Temperature

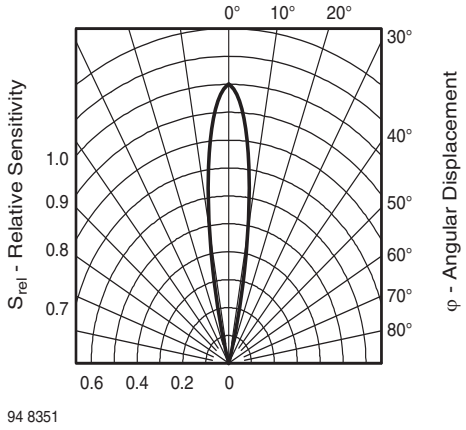



Fig. 2 - Relative Radiant Sensitivity vs. Angular Displacement

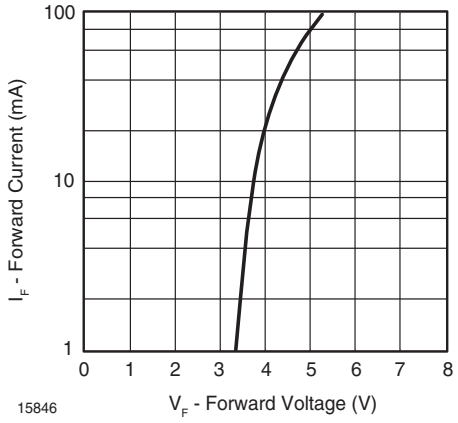



Fig. 3 - Forward Current vs. Forward Voltage

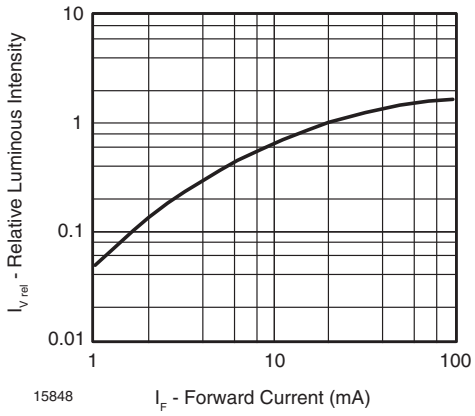



Fig. 5 - Relative Luminous Flux vs. Forward Current

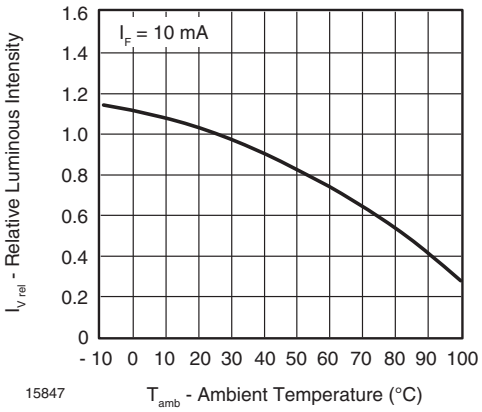



Fig. 4 - Rel. Luminous Flux vs. Ambient Temperature

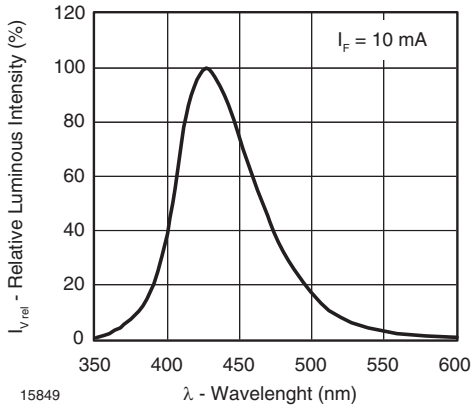
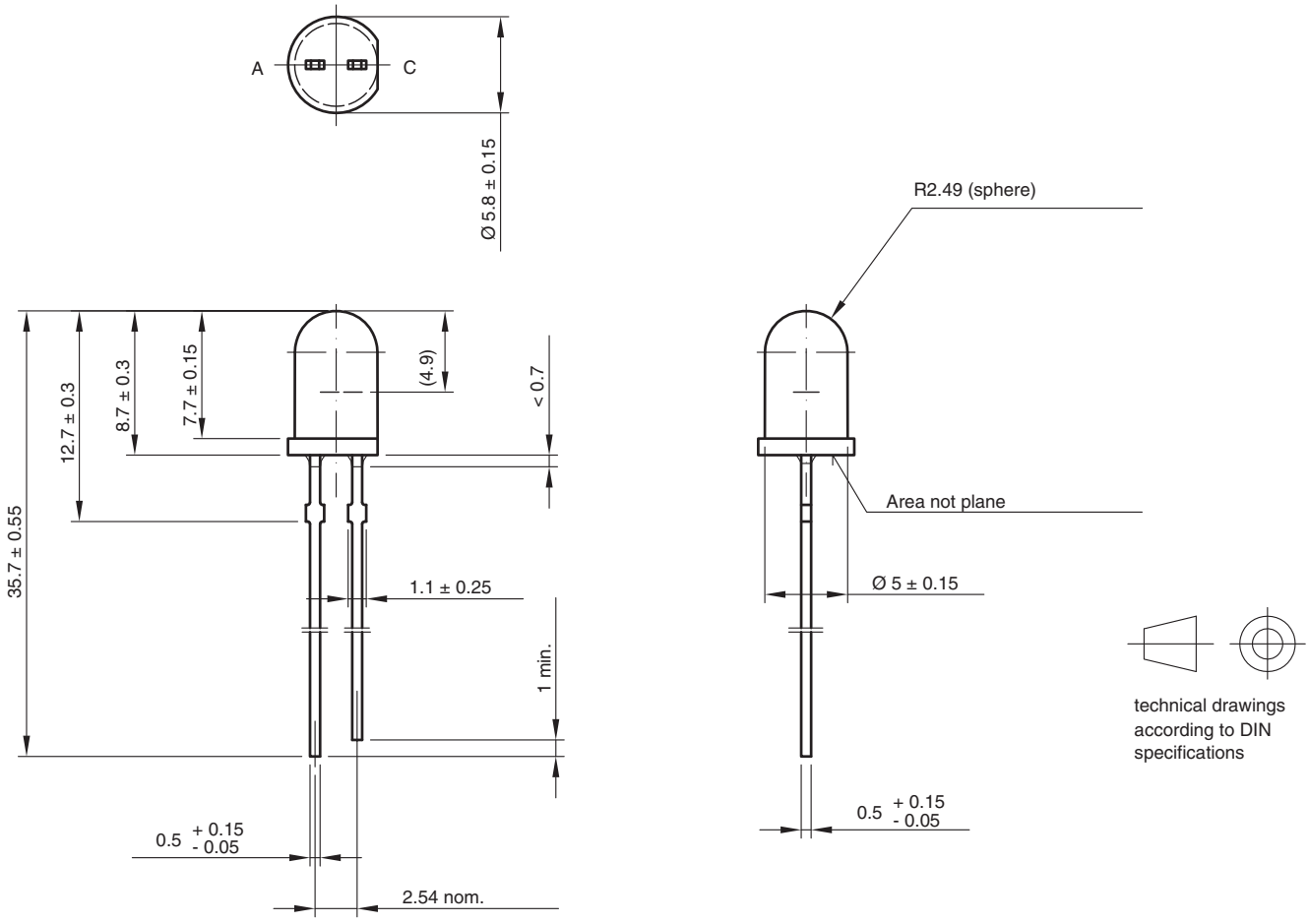



Fig. 6 - Relative Intensity vs. Wavelength

**PACKAGE DIMENSIONS** in millimeters

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