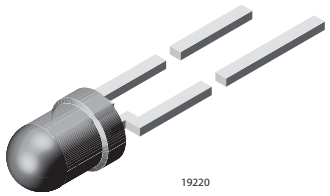
# Universal LED in Ø 3 mm Tinted Diffused Package




## FEATURES

- For DC and pulse operation
- Luminous intensity categorized
- Standard Ø 3 mm (T-1) package
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B

Pb-free

e8

RoHS COMPLIANT

GREEN (5-2008)**

## PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity: ± 30°

## APPLICATIONS

- General indicating and lighting purposes

| PARTS TABLE | | |
|---|---|---|
| **PART** | **COLOR, LUMINOUS INTENSITY** | **TECHNOLOGY** |
| TLUR4400 | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-AS12 | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-AS21 | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-BT12 | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-BT12Z | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-KS12 | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4400-KS12Z | Red, $I_V$ > 4 mcd | GaAsP on GaAs |
| TLUR4401 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-AS12 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-AS12Z | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-AS21 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-BT12 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-KS12Z | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-LS12 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-MS12 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |
| TLUR4401-MS21 | Red, $I_V$ = (4 to 32) mcd | GaAsP on GaAs |

| **ABSOLUTE MAXIMUM RATINGS** ($T_{amb}$ = 25 °C, unless otherwise specified) **TLUR44..** | | | | |
|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **VALUE** | **UNIT** |
| Reverse voltage[1)] | | $V_R$ | 6 | V |
| DC forward current | | $I_F$ | 20 | mA |
| Surge forward current | $t_p \leq 10$ µs | $I_{FSM}$ | 0.5 | A |
| Power dissipation | | $P_V$ | 60 | mW |
| Junction temperature | | $T_j$ | 100 | °C |
| Operating temperature range | | $T_{amb}$ | - 40 to + 100 | °C |
| Storage temperature range | | $T_{stg}$ | - 55 to + 100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm from body | $T_{sd}$ | 260 | °C |
| Thermal resistance junction/ ambient | | $R_{thJA}$ | 500 | K/W |

Note:
[1)] Driving the LED in reverse direction is suitable for a short term application

** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified) TLUR44.., RED | | | | | | | |
|---|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **PART** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Luminous intensity | $I_F$ = 10 mA | TLUR4400 | $I_V$ | 4 | 15 | | mcd |
| | | TLUR4401 | $I_V$ | 4 | | 32 | mcd |
| Dominant wavelength | $I_F$ = 10 mA | | $\lambda_d$ | | 630 | | nm |
| Peak wavelength | $I_F$ = 10 mA | | $\lambda_p$ | | 640 | | nm |
| Angle of half intensity | $I_F$ = 10 mA | | $\varphi$ | | ± 30 | | deg |
| Forward voltage | $I_F$ = 20 mA | | $V_F$ | | 2 | 3 | V |
| Reverse voltage | $I_R$ = 10 µA | | $V_R$ | 6 | 15 | | V |
| Junction capacitance | $V_R$ = 0, f = 1 MHz | | $C_j$ | | 50 | | pF |

| LUMINOUS INTENSITY CLASSIFICATION | | |
|---|---|---|
| **GROUP** | **LIGHT INTENSITY (mcd)** | |
| **STANDARD** | **MIN.** | **MAX.** |
| P | 4 | 8 |
| Q | 6.3 | 12.5 |
| 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 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 on any one bag.

In order to ensure availability, single wavelength groups will not be orderable.

## TYPICAL CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified)

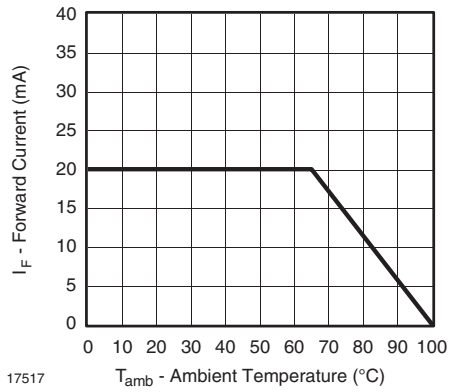



Figure 1. Forward Current vs. Ambient Temperature

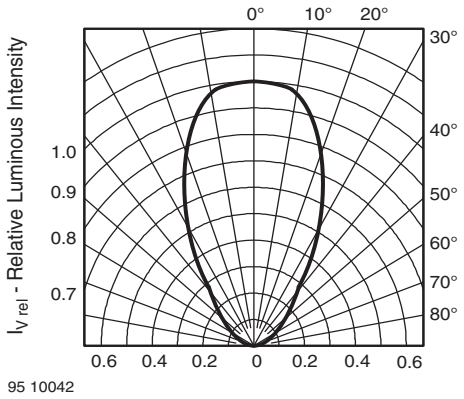



Figure 2. Rel. Luminous Intensity vs. Angular Displacement

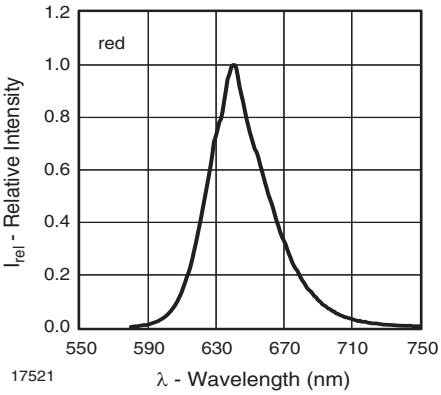



Figure 3. Relative Intensity vs. Wavelength

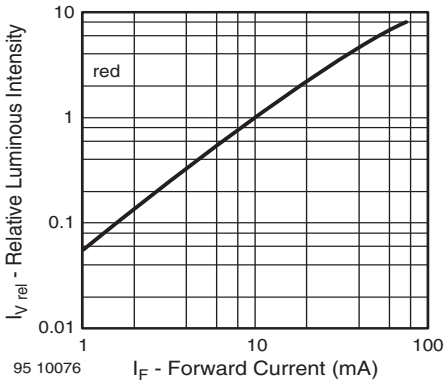



Figure 5. Relative Luminous Intensity vs. Forward Current

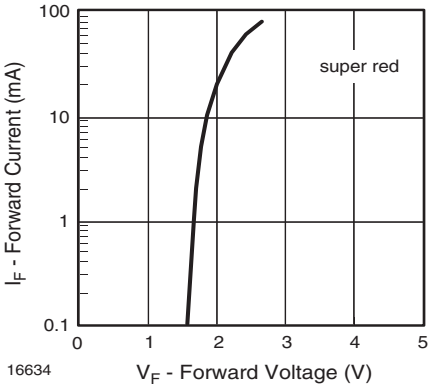



Figure 4. Forward Current vs. Forward Voltage

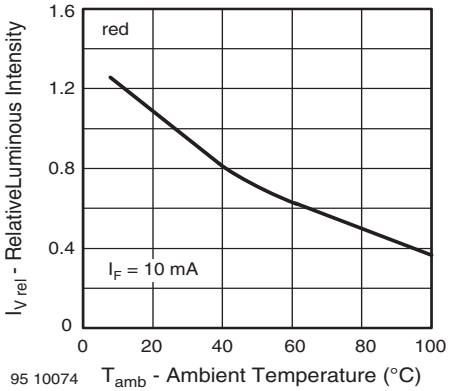
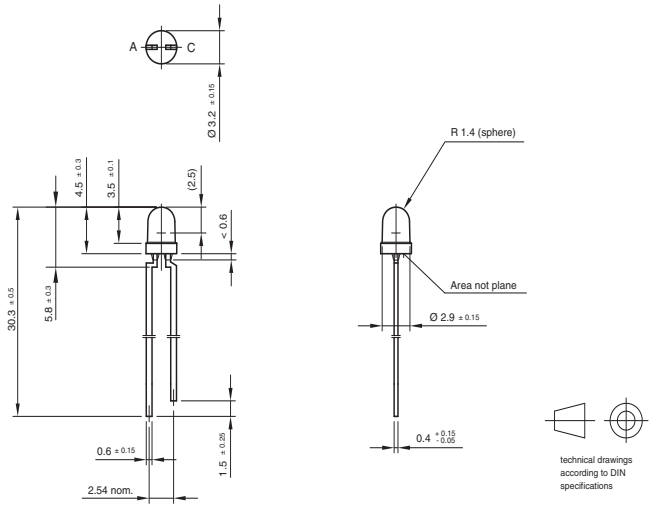



Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

## **PACKAGE DIMENSIONS** in millimeters

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Issue: 7; 25.09.08
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## REEL DIMENSIONS in millimeters

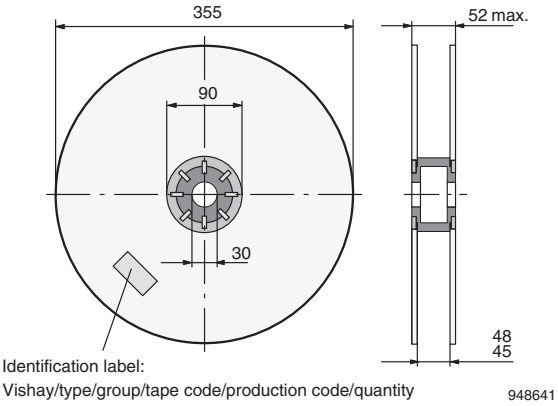



Figure 7. Reel Dimensions

AS12 = cathode leaves tape first

AS21 = anode leaves tape first

## TAPE

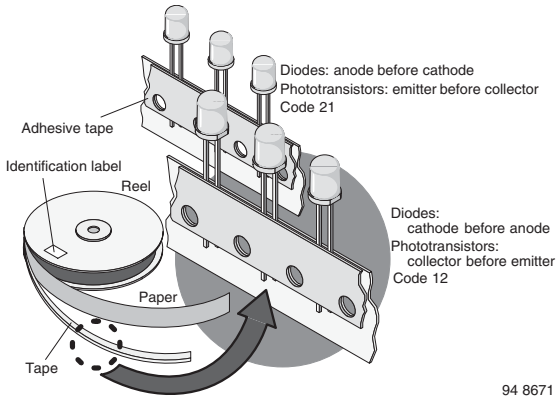



Figure 8. LED in Tape

## AMMOPACK

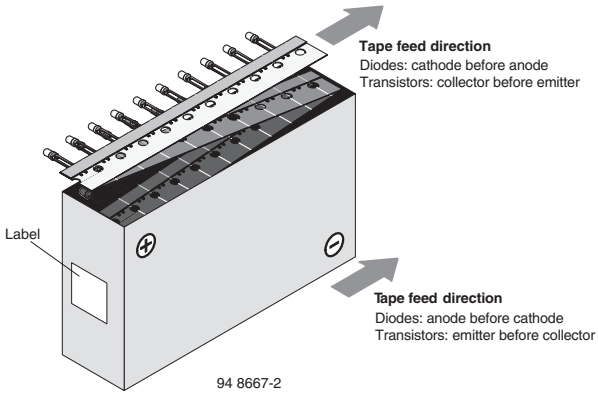
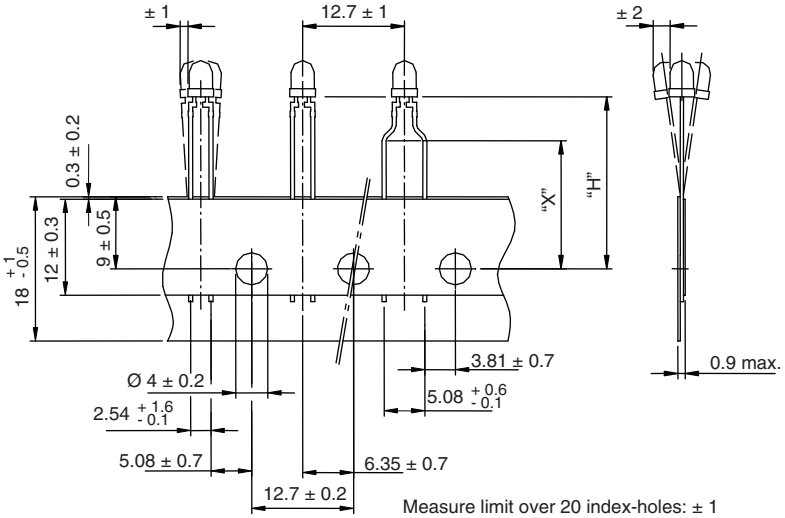



Figure 9. Tape Direction

Note:
The new nomenclature for ammopack is ASZ only, without suffix for the LED orientation. The carton box has to be turned to the desired position: “+” for anode first, or “-“ for cathode first. AS12Z and AS21Z are still valid for already existing types, BUT NOT FOR NEW DESIGN.

## **TAPE DIMENSIONS** in millimeters




| Quantity per: | Reel (Mat.-no. 1764) |
|---|---|
| | 2000 |

21885

| Option | Dim. “H” ± 0.5 mm | Dim. “X” ± 0.5 mm |
|---|---|---|
| AS | 17.3 | - |
| KS | 19.3 | - |
| LS | 21 | - |
| MS | 25.5 | - |
| BT | 20 | 16 |

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