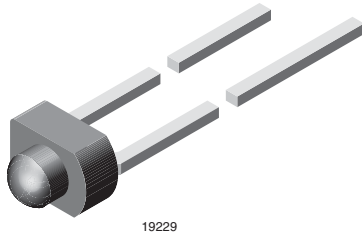


Universal LED, Ø 1.8 mm Tinted Diffused Miniplast Package



19229

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 1.8 mm (miniplast)
- Product series: standard
- Angle of half intensity: $\pm 20^\circ$

FEATURES

- Three colors
- For DC and pulse operation
- Luminous intensity categorized
- End-to-end stackable in centre-to-centre spacing of 0.1" (2.54 mm)
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
[5-2008]**

APPLICATIONS

- General indicating and lighting purposes

PARTS TABLE

| PART | COLOR, LUMINOUS INTENSITY | TECHNOLOGY |
|----------------|--|--------------|
| TLUO2400 | Red, $I_V > 1.6$ mcd | GaAsP on GaP |
| TLUO2401 | Red, $I_V = (4 \text{ to } 20)$ mcd | GaAsP on GaP |
| TLUO2401-AS12 | Red, $I_V = (4 \text{ to } 20)$ mcd | GaAsP on GaP |
| TLUY2400 | Yellow, $I_V > 1$ mcd | GaAsP on GaP |
| TLUY2400-AS12 | Yellow, $I_V > 1$ mcd | GaAsP on GaP |
| TLUY2401 | Yellow, $I_V = (2.5 \text{ to } 12.5)$ mcd | GaAsP on GaP |
| TLUY2401-AS12 | Yellow, $I_V = (2.5 \text{ to } 12.5)$ mcd | GaAsP on GaP |
| TLUY2401-AS12Z | Yellow, $I_V = (2.5 \text{ to } 12.5)$ mcd | GaAsP on GaP |
| TLUG2400 | Green, $I_V > 1.6$ mcd | GaP on GaP |
| TLUG2400-AS12Z | Green, $I_V > 1.6$ mcd | GaP on GaP |
| TLUG2400-ASZ | Green, $I_V > 1.6$ mcd | GaP on GaP |
| TLUG2400-MS12Z | Green, $I_V > 1.6$ mcd | GaP on GaP |
| TLUG2400-MS21Z | Green, $I_V > 1.6$ mcd | GaP on GaP |
| TLUG2401 | Green, $I_V = (4 \text{ to } 20)$ mcd | GaP on GaP |
| TLUG2401-AS12 | Green, $I_V = (4 \text{ to } 20)$ mcd | GaP on GaP |
| TLUG2401-AS12Z | Green, $I_V = (4 \text{ to } 20)$ mcd | GaP on GaP |

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

| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) TLUO240., TLUY240., TLUG240. | | | | | |
|---|---|----------|------------|---------------|--------------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | VALUE | UNIT |
| Reverse voltage | | | V_R | 6 | V |
| DC forward current | | TLUO240. | I_F | 30 | mA |
| | | TLUY240. | I_F | 30 | mA |
| | | TLUG240. | I_F | 30 | mA |
| Surge forward current | $t_p \leq 10\text{ }\mu\text{s}$ | | I_{FSM} | 1 | A |
| Power dissipation | $T_{amb} \leq 55\text{ }^{\circ}\text{C}$ | TLUO240. | P_V | 100 | mW |
| | | TLUY240. | P_V | 100 | mW |
| | | TLUG240. | 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} | - 55 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature | $t \leq 3\text{ s}$, 2 mm from body | | T_{sd} | 260 | $^{\circ}\text{C}$ |
| | $t \leq 5\text{ s}$, 4 mm from body | | T_{sd} | 260 | $^{\circ}\text{C}$ |
| Thermal resistance junction/ ambient | | TLUO240. | R_{thJA} | 450 | K/W |
| | | TLUY240. | R_{thJA} | 450 | K/W |
| | | TLUG240. | R_{thJA} | 450 | K/W |

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) TLUO240., RED | | | | | | | |
|--|--------------------------------|----------|-------------|------|----------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity ¹⁾ | $I_F = 10\text{ mA}$ | TLUO2400 | I_V | 1.6 | 2 | | mcd |
| | | TLUO2401 | I_V | 4 | 5 | 20 | mcd |
| Dominant wavelength | $I_F = 10\text{ mA}$ | | λ_d | 612 | | 625 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | | 630 | | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | φ | | ± 20 | | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | | 2 | 3 | V |
| Reverse voltage | $I_R = 10\text{ }\mu\text{A}$ | | V_R | 6 | 15 | | V |
| Junction capacitance | $V_R = 0$, $f = 1\text{ MHz}$ | | C_j | | 50 | | pF |

Note:

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

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) TLUY240., YELLOW | | | | | | | |
|---|--------------------------------|----------|-------------|------|----------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity ¹⁾ | $I_F = 10\text{ mA}$ | TLUY2400 | I_V | 1 | 4 | | mcd |
| | | TLUY2401 | I_V | 2.5 | 8 | 12.5 | mcd |
| Dominant wavelength | $I_F = 10\text{ mA}$ | | λ_d | 581 | | 594 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | | 585 | | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | φ | | ± 20 | | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | | 2.4 | 3 | V |
| Reverse voltage | $I_R = 10\text{ }\mu\text{A}$ | | V_R | 6 | 15 | | V |
| Junction capacitance | $V_R = 0$, $f = 1\text{ MHz}$ | | C_j | | 50 | | pF |

Note:

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

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|-------------------------------|----------|-------------|------|----------|------|------|
| TLUG240., GREEN | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity ¹⁾ | $I_F = 10\text{ mA}$ | TLUG2400 | I_V | 1.6 | 5 | | mcd |
| | | TLUG2401 | I_V | 4 | 12 | 20 | mcd |
| Dominant wavelength | $I_F = 10\text{ mA}$ | | λ_d | 562 | | 575 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | | 565 | | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | ϕ | | ± 20 | | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | | 2.4 | 3 | V |
| Reverse voltage | $I_R = 10\text{ }\mu\text{A}$ | | V_R | 6 | 15 | | V |
| Junction capacitance | $V_R = 0, f = 1\text{ MHz}$ | | C_j | | 50 | | pF |

Note:

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

| LUMINOUS INTENSITY CLASSIFICATION | | |
|-----------------------------------|-----------------------|------|
| GROUP | LIGHT INTENSITY (mcd) | |
| | MIN. | MAX. |
| L | 1 | 2 |
| M | 1.6 | 3.2 |
| N | 2.5 | 5 |
| P | 4 | 8 |
| Q | 6.3 | 12.5 |

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.

| COLOR CLASSIFICATION | | | | |
|----------------------|----------------------|------|-------|------|
| GROUP | DOM. WAVELENGTH (nm) | | | |
| | YELLOW | | GREEN | |
| | MIN. | MAX. | MIN. | MAX. |
| 1 | 581 | 584 | | |
| 2 | 583 | 586 | | |
| 3 | 585 | 588 | 562 | 565 |
| 4 | 587 | 590 | 564 | 567 |
| 5 | 589 | 592 | 566 | 569 |
| 6 | 591 | 594 | 568 | 571 |
| 7 | | | 570 | 573 |
| 8 | | | 572 | 575 |

Note:

Wavelengths are tested at a current pulse duration of 25 ms.

TYPICAL CHARACTERISTICS

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

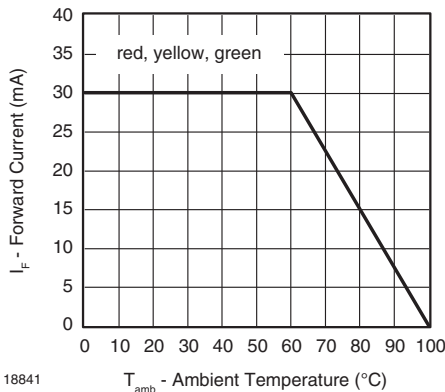


Figure 1. Forward Current vs. Ambient Temperature

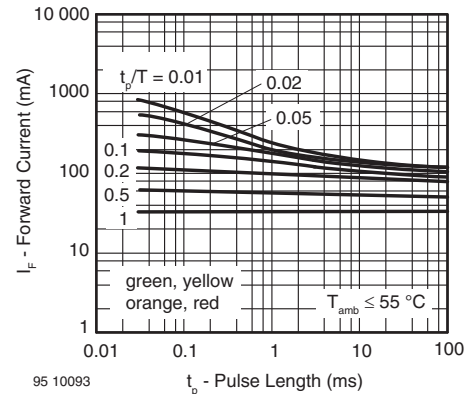


Figure 2. Forward Current vs. Pulse Length

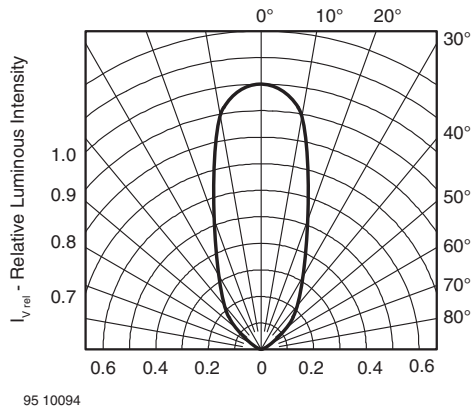


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

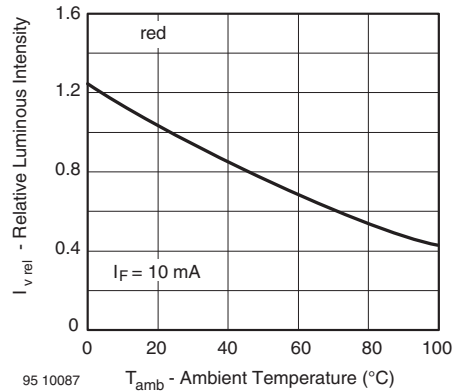


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

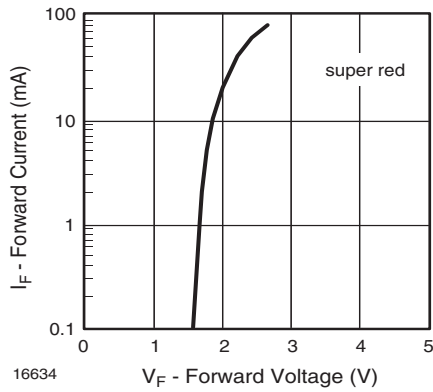


Figure 4. Forward Current vs. Forward Voltage

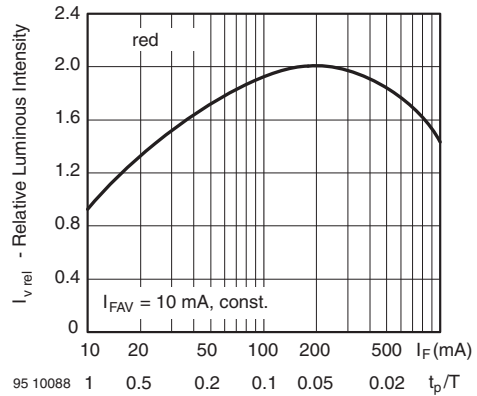


Figure 7. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

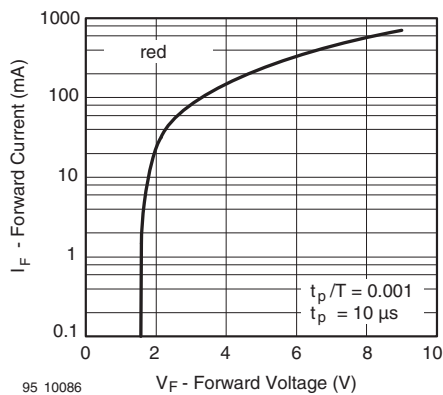


Figure 5. Forward Current vs. Forward Voltage

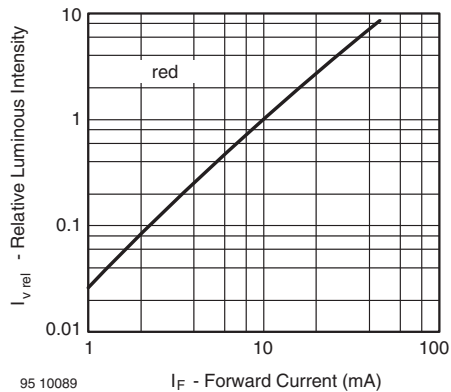


Figure 8. Relative Luminous Intensity vs. Forward Current

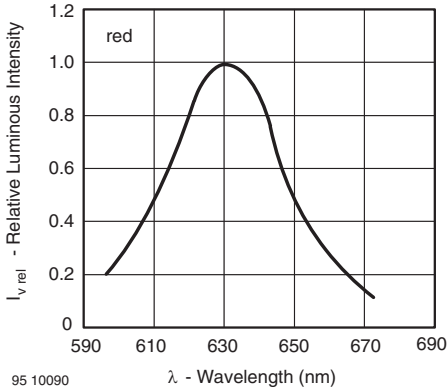


Figure 9. Relative Intensity vs. Wavelength

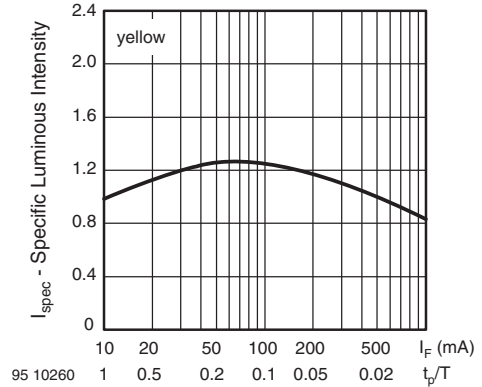


Figure 12. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

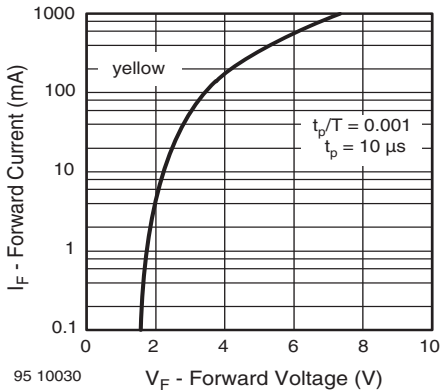


Figure 10. Forward Current vs. Forward Voltage

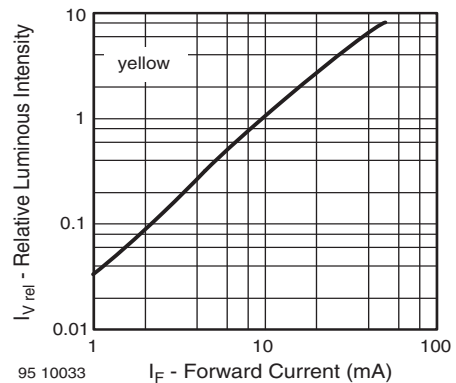


Figure 13. Relative Luminous Intensity vs. Forward Current

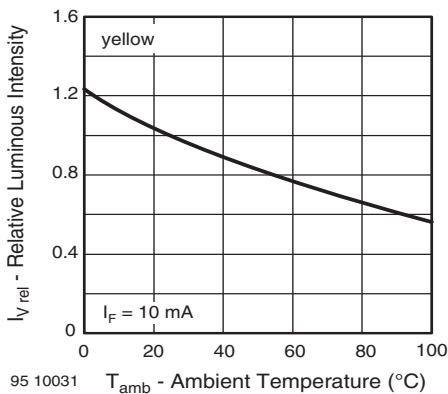


Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

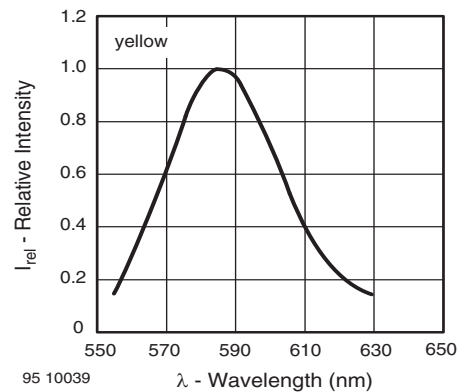


Figure 14. Relative Intensity vs. Wavelength

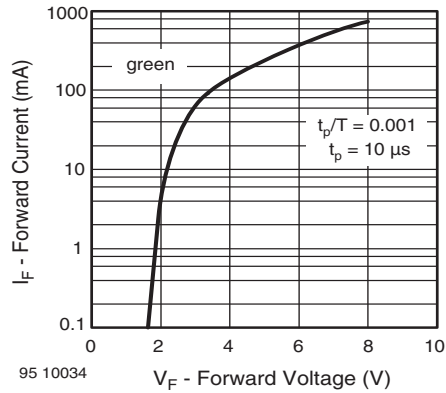


Figure 15. Forward Current vs. Forward Voltage

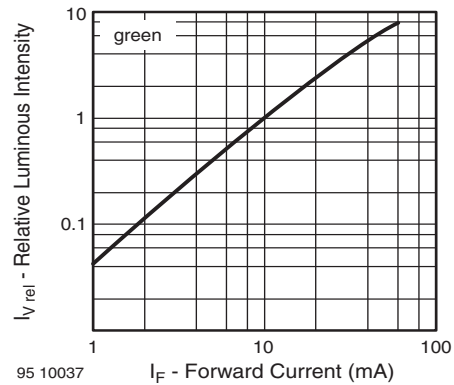


Figure 18. Relative Luminous Intensity vs. Forward Current

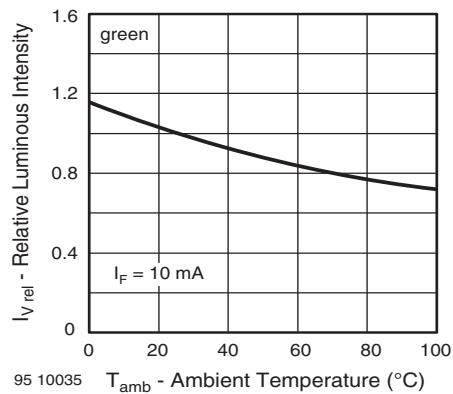


Figure 16. Rel. Luminous Intensity vs. Ambient Temperature

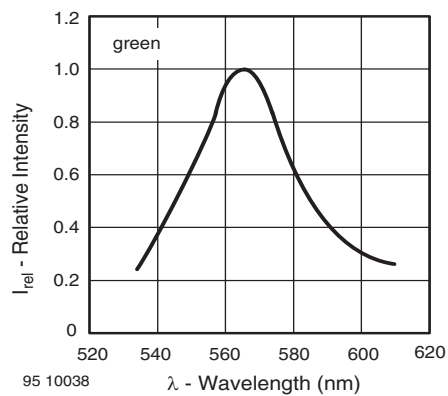


Figure 19. Relative Intensity vs. Wavelength

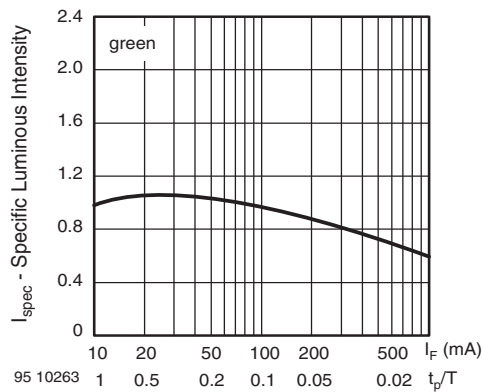
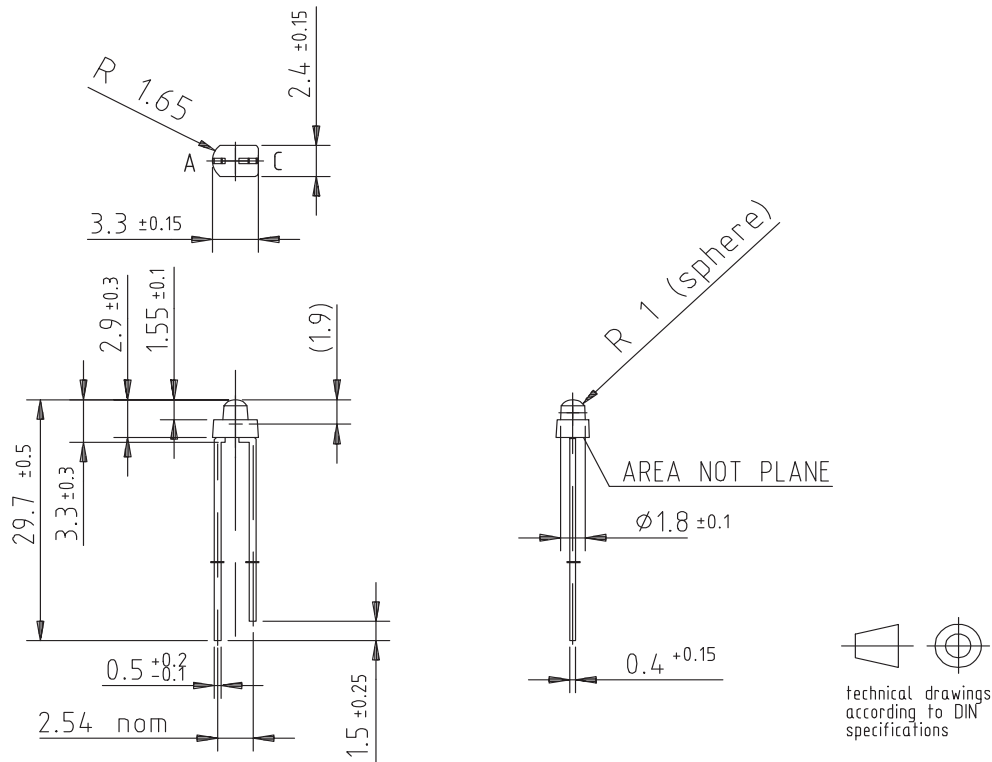


Figure 17. Specific Luminous Intensity vs. Forward Current



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5052.01-4
Issue: 1; 12.10.95
95 11262

REEL DIMENSIONS in millimeters

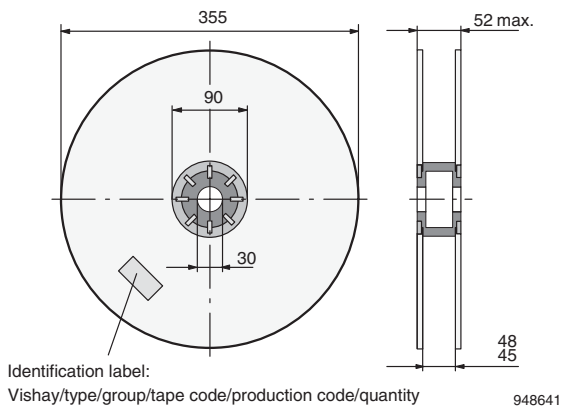


Figure 20. Reel

TAPE

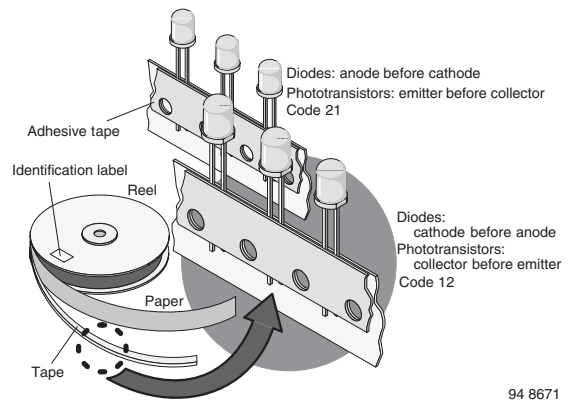


Figure 21. LED in Tape

AMMOPACK

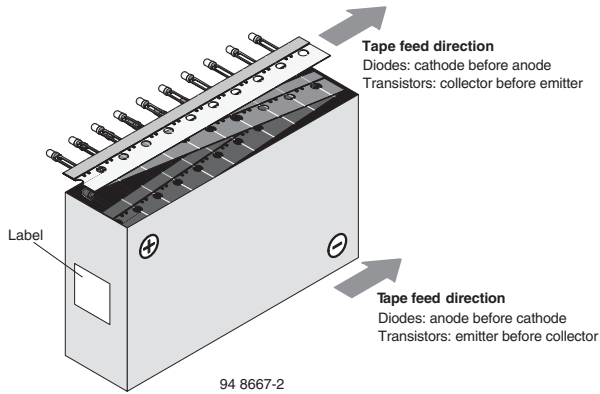
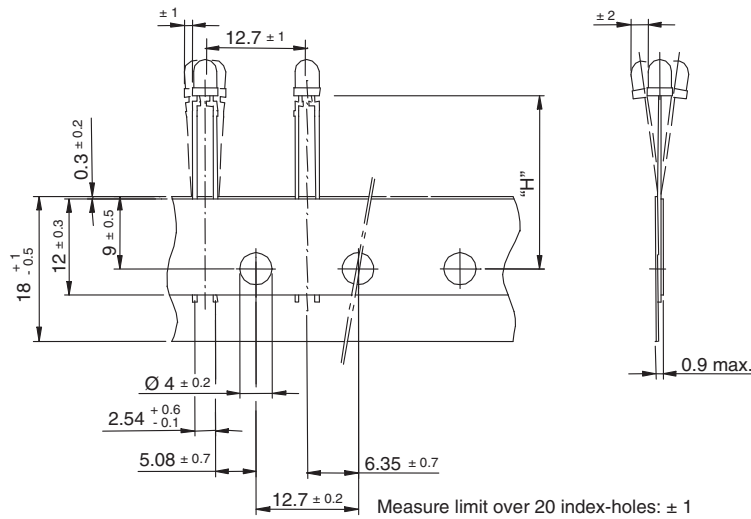


Figure 22. Tape Direction

Note:

The new nomenclature for ammpack 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 |

94 8171

| Option | Dim. “H” ± 0.5 mm |
|--------|-------------------|
| AS | 17.3 |
| MS | 25.5 |



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