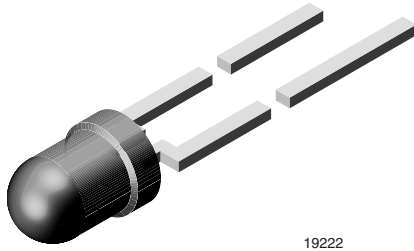




High Efficiency LED in Ø 3 mm Clear Package



DESCRIPTION

The TLH.4900 series was developed for applications where high light output is required.

It is housed in a 3 mm clear plastic package. The small viewing angle of these devices provides a high brightness.

All LEDs are categorized in luminous intensity groups. The green and yellow LEDs are categorized additionally in wavelength groups.

That allows users to assemble LEDs with uniform appearance.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity: $\pm 16^\circ$

FEATURES

- Choice of three bright colors
- Standard Ø 3 mm (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very small viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- Material categorization: for definitions of compliance please see 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 _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. | | |
| TLHR4900 | Red | 6.3 | 25 | - | 10 | 612 | - | 625 | 10 | - | 2 | 3 | 20 | GaAsP on GaP |
| TLHY4900 ⁽¹⁾ | Yellow | 10 | 26 | - | 10 | 581 | - | 594 | 10 | - | 2.4 | 3 | 20 | GaAsP on GaP |
| TLHG4900 | Green | 16 | 37 | - | 10 | 562 | - | 575 | 10 | - | 2.4 | 3 | 20 | GaP on GaP |

Note

⁽¹⁾ Not for new designs

| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) TLHG4900, TLHR4900, TLHY4900 | | | | |
|-----------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|-------------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage | | V _R | 6 | V |
| DC forward current | T _{amb} ≤ 60 °C | I _F | 30 | mA |
| Surge forward current | t _p ≤ 10 μs | I _{FSM} | 1 | A |
| Power dissipation | T _{amb} ≤ 60 °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} | -55 to +100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm from body | T _{sd} | 260 | °C |
| Thermal resistance junction to ambient | | R _{thJA} | 400 | K/W |



OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
TLHR4900, RED

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|-----------------------------------------|-------------|------|----------|------|------------|
| Luminous intensity ⁽¹⁾ | $I_F = 10\text{ mA}$ | I_V | 6.3 | 25 | - | mcd |
| Dominant wavelength | $I_F = 10\text{ mA}$ | λ_d | 612 | - | 625 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | λ_p | - | 635 | - | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | ϕ | - | ± 16 | - | $^{\circ}$ |
| 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 | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$ | 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)
TLHY4900, YELLOW, NOT FOR NEW DESIGNS

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|-----------------------------------------|-------------|------|----------|------|------------|
| Luminous intensity ⁽¹⁾ | $I_F = 10\text{ mA}$ | I_V | 10 | 26 | - | 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 | - | ± 16 | - | $^{\circ}$ |
| 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 | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$ | 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)
TLHG4900, GREEN

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|-----------------------------------------|-------------|------|----------|------|------------|
| Luminous intensity ⁽¹⁾ | $I_F = 10\text{ mA}$ | I_V | 16 | 37 | - | 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 | - | ± 16 | - | $^{\circ}$ |
| 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 | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$ | C_j | - | 50 | - | pF |

Note

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

LUMINOUS INTENSITY CLASSIFICATION

| GROUP | LUMINOUS INTENSITY (mcd) | |
|-------|--------------------------|------|
| | MIN. | MAX. |
| Q | 6.3 | 12.5 |
| R | 10 | 20 |
| S | 16 | 32 |
| T | 25 | 50 |
| U | 40 | 80 |
| V | 63 | 125 |

Note

- The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel or bulk (there will be no mixing of two groups on one reel/bulk). 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 reel/bulk. In order to ensure availability, single wavelength groups will not be orderable

COLOR CLASSIFICATION

| GROUP | DOM. WAVELENGTH (nm) | | | |
|-------|----------------------|------|-------|------|
| | YELLOW | | GREEN | |
| | MIN. | MAX. | MIN. | MAX. |
| 0 | | | | |
| 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)

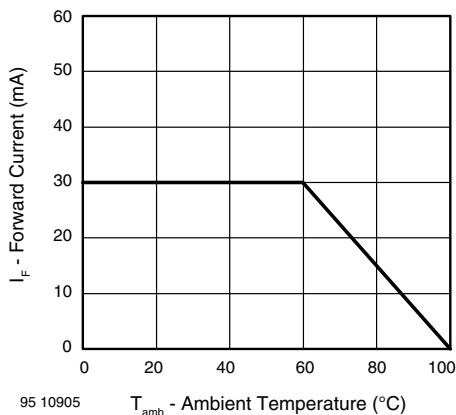


Fig. 1 - Forward Current vs. Ambient Temperature

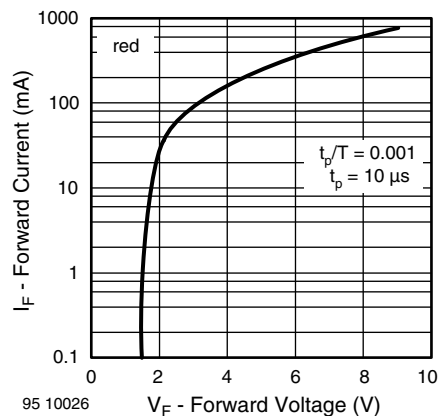


Fig. 4 - Forward Current vs. Forward Voltage

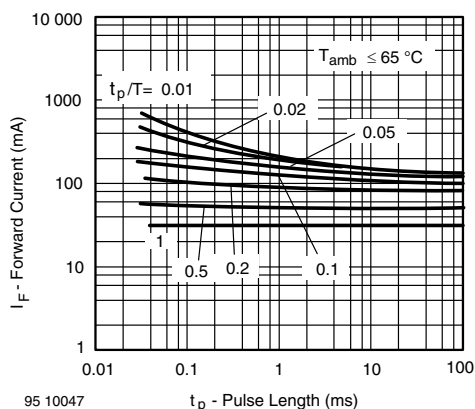


Fig. 2 - Forward Current vs. Pulse Length

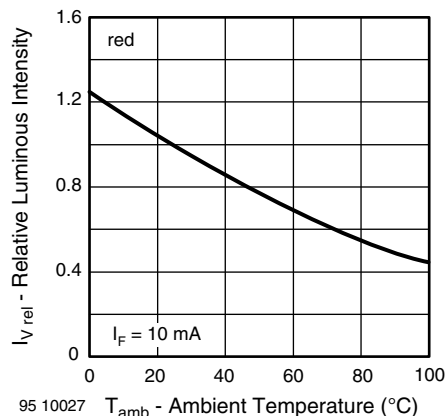


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

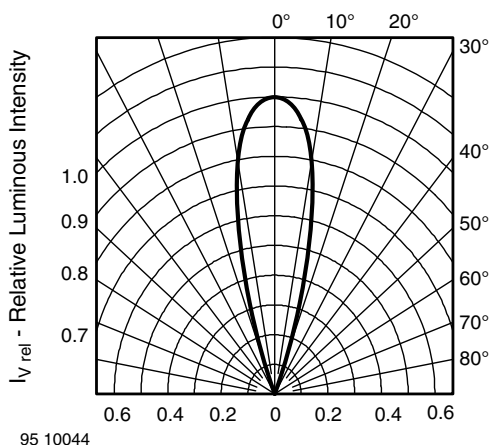


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

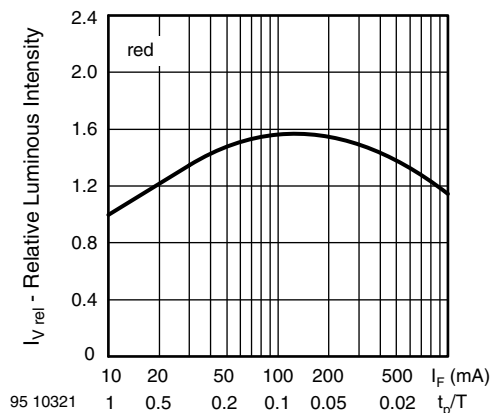


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle



Fig. 7 - Relative Luminous Intensity vs. Forward Current



Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature



Fig. 8 - Relative Intensity vs. Wavelength

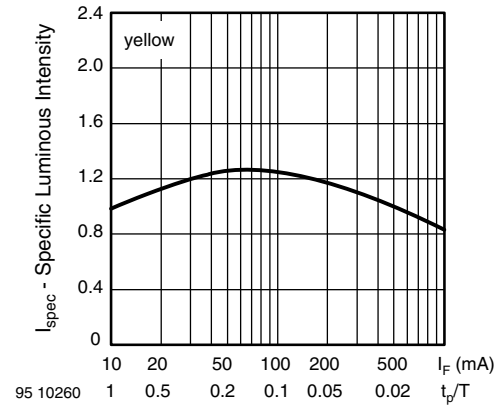


Fig. 11 - Relative Luminous Intensity vs. Forward Current/Duty Cycle



Fig. 9 - Forward Current vs. Forward Voltage

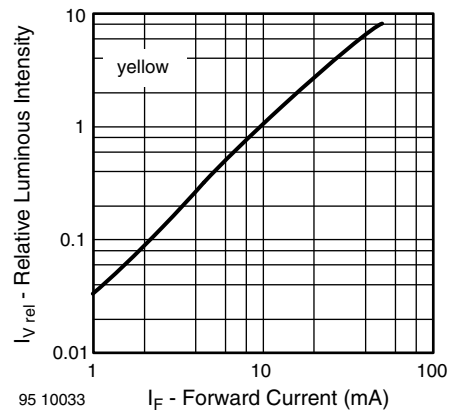


Fig. 12 - Relative Luminous Intensity vs. Forward Current



Fig. 13 - Relative Intensity vs. Wavelength

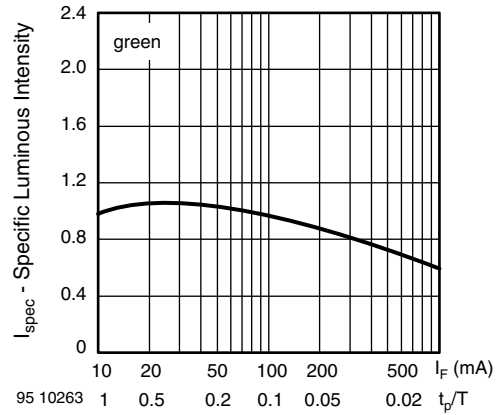


Fig. 16 - Specific Luminous Intensity vs. Forward Current

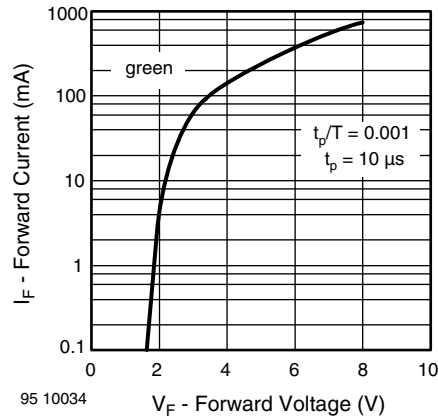


Fig. 14 - Forward Current vs. Forward Voltage

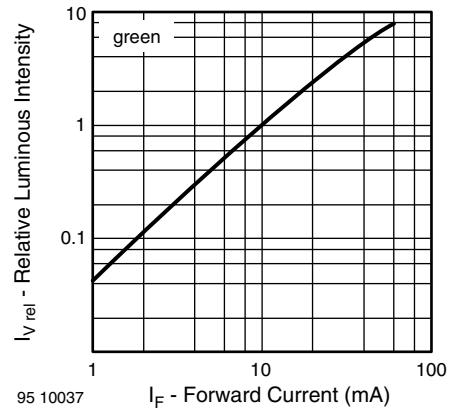


Fig. 17 - Relative Luminous Intensity vs. Forward Current

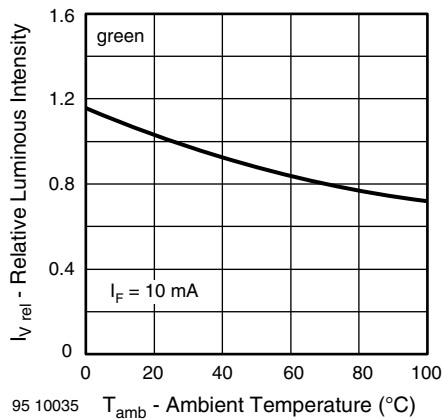


Fig. 15 - Rel. Luminous Intensity vs. Ambient Temperature

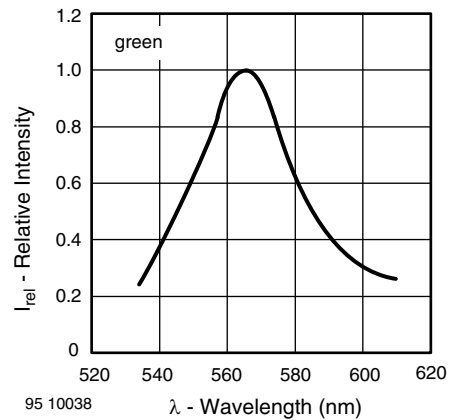
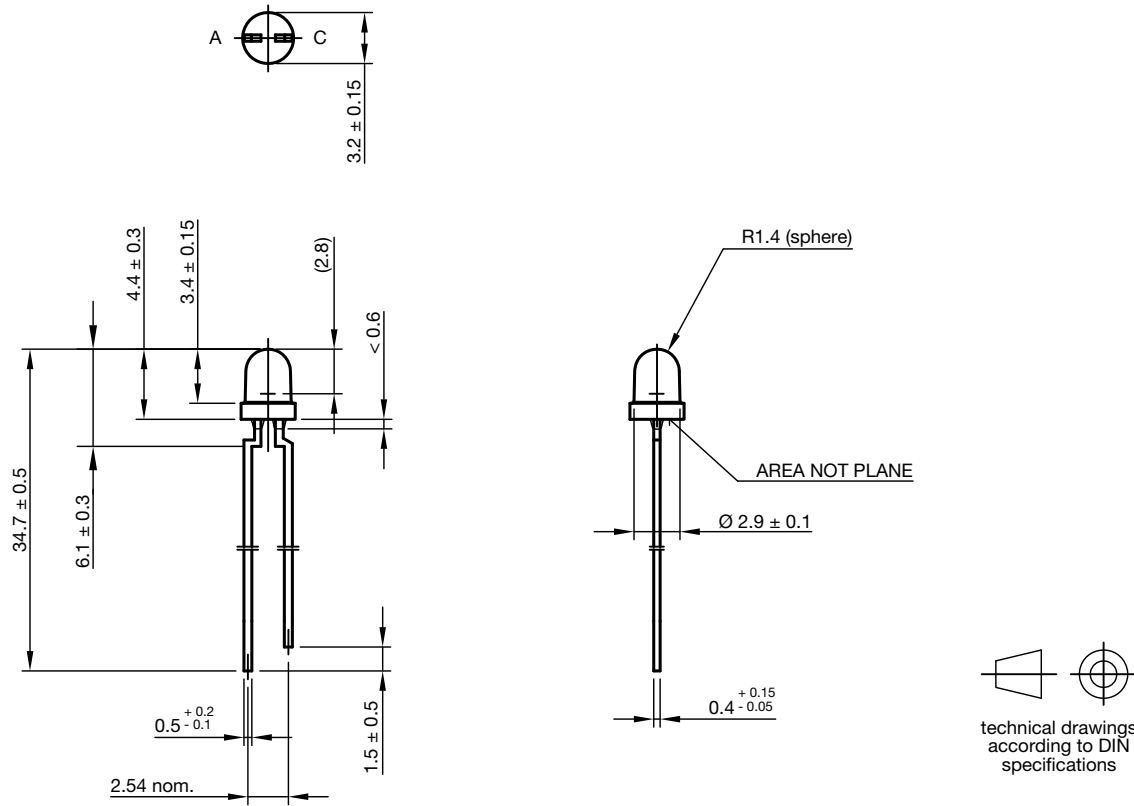


Fig. 18 - Relative Intensity vs. Wavelength



PACKAGE DIMENSIONS in millimeters



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