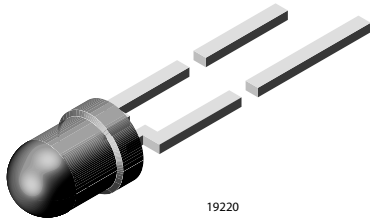




## High Efficiency LED in Ø 3 mm Tinted Diffused Package



### DESCRIPTION

The TLH.44.. series was developed for standard applications like general indicating and lighting purposes.

It is housed in a 3 mm tinted diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.

Several selection types with different luminous intensities are offered. 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:  $\pm 30^\circ$

### FEATURES

- Standard Ø 3 mm (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- Material categorization:

For definitions of compliance please see [www.vishay.com/doc?99912](http://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 <sub>F</sub> (mA) | WAVELENGTH (nm) |      |      | FORWARD VOLTAGE (V) |      |      | at I <sub>F</sub> (mA) | TECHNOLOGY   |
|                |            | MIN.                     | TYP. | MAX. |                        | MIN.            | TYP. | MAX. | MIN.                | TYP. | MAX. |                        |              |
| TLHP4401       | Pure green | 1                        | 4    | -    | 10                     | 555             | -    | 565  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHP4401-AS12Z | Pure green | 1                        | 4    | -    | 10                     | 555             | -    | 565  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHG4400       | Green      | 2.5                      | 13   | -    | 10                     | 562             | -    | 575  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHG4400-MS12  | Green      | 2.5                      | 13   | -    | 10                     | 562             | -    | 575  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHG4401       | Green      | 4                        | 14   | -    | 10                     | 562             | -    | 575  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHG4405       | Green      | 6.3                      | 15   | -    | 10                     | 562             | -    | 575  | -                   | 2.4  | 3    | 20                     | GaP on GaP   |
| TLHY4400       | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-AS12Z | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-AS21  | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-AS21Z | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-BT12  | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-CS12  | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4400-MS12  | Yellow     | 1.6                      | 10   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4401       | Yellow     | 2.5                      | 10.5 | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4401-AS12  | Yellow     | 2.5                      | 10.5 | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4401-AS12Z | Yellow     | 2.5                      | 10.5 | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4401-AS21  | Yellow     | 2.5                      | 10.5 | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4405       | Yellow     | 6.3                      | 11   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4405-AS12  | Yellow     | 6.3                      | 11   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4405-AS12Z | Yellow     | 6.3                      | 11   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |



| PARTS TABLE    |             |                          |      |      |                        |                 |      |      |                     |      |      |                        |              |
|----------------|-------------|--------------------------|------|------|------------------------|-----------------|------|------|---------------------|------|------|------------------------|--------------|
| PART           | COLOR       | LUMINOUS INTENSITY (mcd) |      |      | at I <sub>F</sub> (mA) | WAVELENGTH (nm) |      |      | FORWARD VOLTAGE (V) |      |      | at I <sub>F</sub> (mA) | TECHNOLOGY   |
|                |             | MIN.                     | TYP. | MAX. |                        | MIN.            | TYP. | MAX. | MIN.                | TYP. | MAX. |                        |              |
| TLHY4405-BT12Z | Yellow      | 6.3                      | 11   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4405-MS12  | Yellow      | 6.3                      | 11   | -    | 10                     | 581             | -    | 594  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4438       | Yellow      | 6.3                      | 11   | 20   | 10                     | 583             | -    | 586  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHY4442-MS12  | Yellow      | 6.3                      | 11   | 20   | 10                     | 585             | -    | 590  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHO4400       | Soft orange | 1.6                      | 13   | -    | 10                     | 598             | -    | 611  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHO4400-AS12Z | Soft orange | 1.6                      | 13   | -    | 10                     | 598             | -    | 611  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHO4400-MS12Z | Soft orange | 1.6                      | 13   | -    | 10                     | 598             | -    | 611  | -                   | 2.4  | 3    | 20                     | GaAsP on GaP |
| TLHR4400       | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4400-AS12  | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4400-AS21  | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4400-AS12Z | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4400-AS21Z | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4400-MS12Z | Red         | 1.6                      | 13   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4401       | Red         | 2.5                      | 14   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4401-AS12Z | Red         | 2.5                      | 14   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4401-LS12Z | Red         | 2.5                      | 14   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4405       | Red         | 6.3                      | 15   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4405-AS12  | Red         | 6.3                      | 15   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4405-AS21  | Red         | 6.3                      | 15   | -    | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4407       | Red         | 4                        | -    | 12.5 | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |
| TLHR4407-MS12Z | Red         | 4                        | -    | 12.5 | 10                     | 612             | -    | 625  | -                   | 2    | 3    | 20                     | GaAsP on GaP |

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)<br>TLHG440., TLHO440., TLHP440., TLHR440., TLHY440. |                          |                   |               |      |
|---|--------------------------|-------------------|---------------|------|
| PARAMETER   | TEST CONDITION           | SYMBOL            | VALUE         | UNIT |
| Reverse voltage   |                          | V <sub>R</sub>    | 6             | V    |
| DC forward current  |                          | I <sub>F</sub>    | 30            | mA   |
| Surge forward current   | t <sub>p</sub> ≤ 10 μs   | I <sub>FSM</sub>  | 1             | A    |
| Power dissipation   | T <sub>amb</sub> ≤ 60 °C | P <sub>V</sub>    | 100           | mW   |
| Junction temperature  |                          | T <sub>j</sub>    | 100           | °C   |
| Operating temperature range   |                          | T <sub>amb</sub>  | - 40 to + 100 | °C   |
| Storage temperature range   |                          | T <sub>stg</sub>  | - 55 to + 100 | °C   |
| Soldering temperature   | t ≤ 5 s, 2 mm from body  | T <sub>sd</sub>   | 260           | °C   |
| Thermal resistance junction/ambient   |                          | R <sub>thJA</sub> | 400           | K/W  |

| OPTICAL AND ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)<br>TLHR440., RED |                                 |          |                |      |      |      |      |
|--|---------------------------------|----------|----------------|------|------|------|------|
| PARAMETER  | TEST CONDITION                  | PART     | SYMBOL         | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>  | I <sub>F</sub> = 10 mA          | TLHR4400 | I <sub>V</sub> | 1.6  | 13   | -    | mcd  |
|  |                                 | TLHR4401 | I <sub>V</sub> | 2.5  | 14   | -    | mcd  |
|  |                                 | TLHR4405 | I <sub>V</sub> | 6.3  | 15   | -    | mcd  |
|  |                                 | TLHR4407 | I <sub>V</sub> | 4    | -    | 12.5 | mcd  |
| Dominant wavelength  | I <sub>F</sub> = 10 mA          |          | λ <sub>d</sub> | 612  | -    | 625  | nm   |
| Peak wavelength  | I <sub>F</sub> = 10 mA          |          | λ <sub>p</sub> | -    | 635  | -    | nm   |
| Angle of half intensity  | I <sub>F</sub> = 10 mA          |          | φ              | -    | ± 30 | -    | deg  |
| Forward voltage  | I <sub>F</sub> = 20 mA          |          | V <sub>F</sub> | -    | 2    | 3    | V    |
| Reverse voltage  | I <sub>R</sub> = 10 μA          |          | V <sub>R</sub> | 6    | 15   | -    | V    |
| Junction capacitance   | V <sub>R</sub> = 0 V, f = 1 MHz |          | C <sub>j</sub> | -    | 50   | -    | pF   |

**Note**

<sup>(1)</sup> In one packing unit I<sub>Vmin</sub>/I<sub>Vmax</sub> ≤ 0.5



| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |          |             |      |          |      |      |
|--|---|----------|-------------|------|----------|------|------|
| <b>TLHO440., SOFT ORANGE</b>   |   |          |             |      |          |      |      |
| PARAMETER  | TEST CONDITION                          | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>  | $I_F = 10\text{ mA}$                    | TLHO4400 | $I_V$       | 1.6  | 13       | -    | mcd  |
| Dominant wavelength  | $I_F = 10\text{ mA}$                    |          | $\lambda_d$ | 598  | -        | 611  | nm   |
| Peak wavelength  | $I_F = 10\text{ mA}$                    |          | $\lambda_p$ | -    | 605      | -    | nm   |
| Angle of half intensity  | $I_F = 10\text{ mA}$                    |          | $\phi$      | -    | $\pm 30$ | -    | 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   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ |          | $C_j$       | -    | 15       | -    | pF   |

**Note**

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

| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |          |             |      |          |      |      |
|--|---|----------|-------------|------|----------|------|------|
| <b>TLHY440., YELLOW</b>  |   |          |             |      |          |      |      |
| PARAMETER  | TEST CONDITION                          | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>  | $I_F = 10\text{ mA}$                    | TLHY4400 | $I_V$       | 1.6  | 10       | -    | mcd  |
|  |   | TLHY4401 | $I_V$       | 2.5  | 10.5     | -    | mcd  |
|  |   | TLHY4405 | $I_V$       | 6.3  | 11       | -    | mcd  |
|  |   | TLHY4438 | $I_V$       | 6.3  | -        | 20   | mcd  |
|  |   | TLHY4442 | $I_V$       | 6.3  | -        | 20   | mcd  |
| Dominant wavelength  | $I_F = 10\text{ mA}$                    | TLHY4400 | $\lambda_d$ | 581  | -        | 594  | nm   |
|  |   | TLHY4401 | $\lambda_d$ | 581  | -        | 594  | nm   |
|  |   | TLHY4405 | $\lambda_d$ | 581  | -        | 594  | nm   |
|  |   | TLHY4438 | $\lambda_d$ | 583  | -        | 590  | nm   |
|  |   | TLHY4442 | $\lambda_d$ | 585  | -        | 592  | nm   |
| Peak wavelength  | $I_F = 10\text{ mA}$                    |          | $\lambda_p$ | -    | 585      | -    | nm   |
| Angle of half intensity  | $I_F = 10\text{ mA}$                    |          | $\phi$      | -    | $\pm 30$ | -    | 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   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ |          | $C_j$       | -    | 50       | -    | pF   |

**Note**

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

| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |          |             |      |          |      |      |
|--|---|----------|-------------|------|----------|------|------|
| <b>TLHG440., GREEN</b>   |   |          |             |      |          |      |      |
| PARAMETER  | TEST CONDITION                          | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>  | $I_F = 10\text{ mA}$                    | TLHG4400 | $I_V$       | 2.5  | 13       | -    | mcd  |
|  |   | TLHG4401 | $I_V$       | 4    | 14       | -    | mcd  |
|  |   | TLHG4405 | $I_V$       | 6.3  | 15       | -    | mcd  |
| Dominant wavelength  | $I_F = 10\text{ mA}$                    |          | $\lambda_d$ | 562  | -        | 575  | nm   |
| Peak wavelength  | $I_F = 10\text{ mA}$                    |          | $\lambda_p$ | -    | 565      | -    | nm   |
| Angle of half intensity  | $I_F = 10\text{ mA}$                    |          | $\phi$      | -    | $\pm 30$ | -    | 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   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ |          | $C_j$       | -    | 50       | -    | pF   |

**Note**

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



| OPTICAL AND ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)<br>TLHP440., PURE GREEN |                                 |          |                |      |      |      |      |
|---|---------------------------------|----------|----------------|------|------|------|------|
| PARAMETER   | TEST CONDITION                  | PART     | SYMBOL         | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity <sup>(1)</sup>   | I <sub>F</sub> = 10 mA          | TLHP4401 | I <sub>V</sub> | 1    | 4    | -    | mcd  |
| Dominant wavelength   | I <sub>F</sub> = 10 mA          |          | λ <sub>d</sub> | 555  | -    | 565  | nm   |
| Peak wavelength   | I <sub>F</sub> = 10 mA          |          | λ <sub>p</sub> | -    | 555  | -    | nm   |
| Angle of half intensity   | I <sub>F</sub> = 10 mA          |          | φ              | -    | ± 30 | -    | deg  |
| Forward voltage   | I <sub>F</sub> = 20 mA          |          | V <sub>F</sub> | -    | 2.4  | 3    | V    |
| Reverse voltage   | I <sub>R</sub> = 10 μA          |          | V <sub>R</sub> | 6    | 15   | -    | V    |
| Junction capacitance  | V <sub>R</sub> = 0 V, f = 1 MHz |          | C <sub>j</sub> | -    | 50   | -    | pF   |

**Note**

<sup>(1)</sup> In one packing unit I<sub>Vmin</sub>/I<sub>Vmax</sub> ≤ 0.5

| LUMINOUS INTENSITY CLASSIFICATION |                       |      |
|-----------------------------------|-----------------------|------|
| GROUP                             | LIGHT INTENSITY (mcd) |      |
| STANDARD                          | MIN.                  | MAX. |
| L                                 | 1                     | 2    |
| M                                 | 1.6                   | 3.2  |
| N                                 | 2.5                   | 5    |
| P                                 | 4                     | 8    |
| Q                                 | 6.3                   | 12.5 |
| R                                 | 10                    | 20   |
| S                                 | 16                    | 32   |
| T                                 | 25                    | 50   |
| U                                 | 40                    | 80   |

**Note**

- Luminous intensity is tested at a current pulse duration of 25 ms. 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.

| COLOR CLASSIFICATION |                      |      |       |      |            |      |
|----------------------|----------------------|------|-------|------|------------|------|
| GROUP                | DOM. WAVELENGTH (nm) |      |       |      |            |      |
|                      | YELLOW               |      | GREEN |      | PURE GREEN |      |
|                      | MIN.                 | MAX. | MIN.  | MAX. | MIN.       | MAX. |
| 0                    | -                    | -    | -     | -    | 555        | 559  |
| 1                    | 581                  | 584  | -     | -    | 558        | 561  |
| 2                    | 583                  | 586  | -     | -    | 560        | 563  |
| 3                    | 585                  | 588  | 562   | 565  | 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 for InGaN



Fig. 4 - Forward Current vs. Forward Voltage

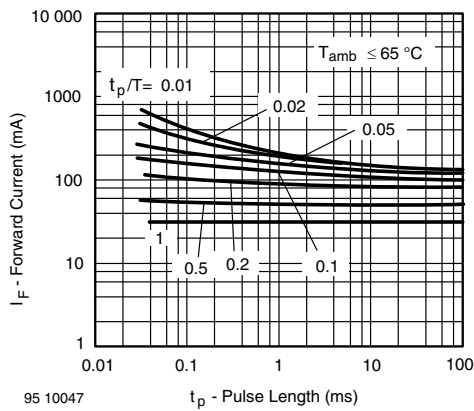


Fig. 2 - Forward Current vs. Pulse Length



Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

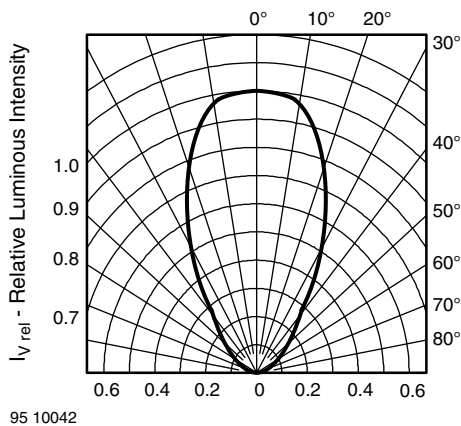


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

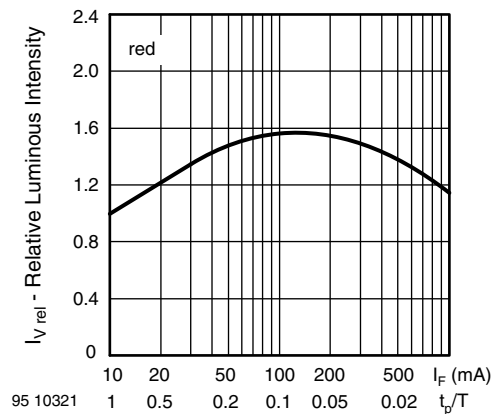


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

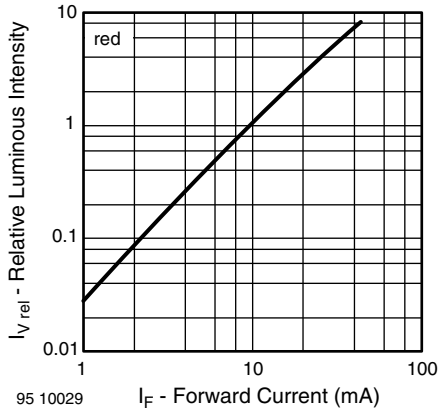


Fig. 7 - Relative Luminous Intensity vs. Forward Current



Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

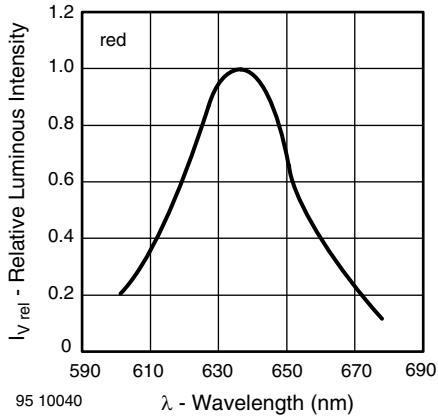


Fig. 8 - Relative Intensity vs. Wavelength

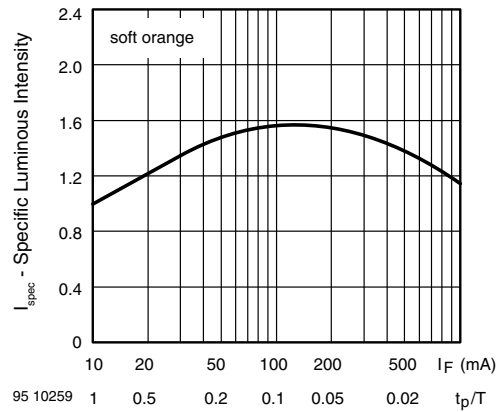


Fig. 11 - Relative Luminous Intensity vs. Forward Current/Duty Cycle



Fig. 9 - Forward Current vs. Forward Voltage

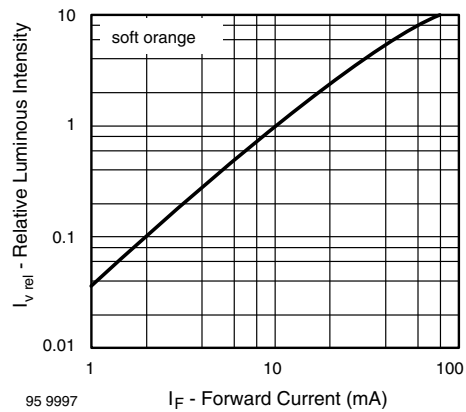


Fig. 12 - Relative Luminous Intensity vs. Forward Current

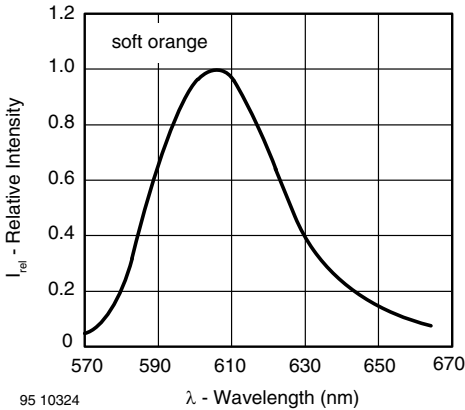


Fig. 13 - Relative Intensity vs. Wavelength

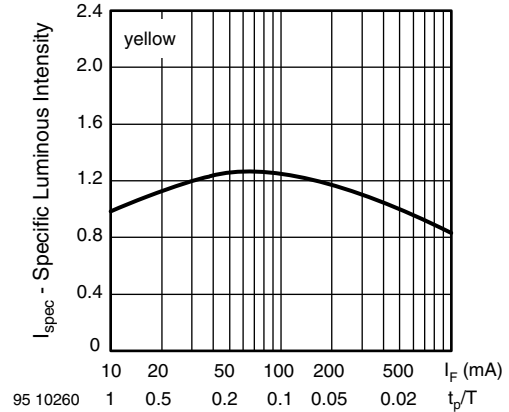


Fig. 16 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

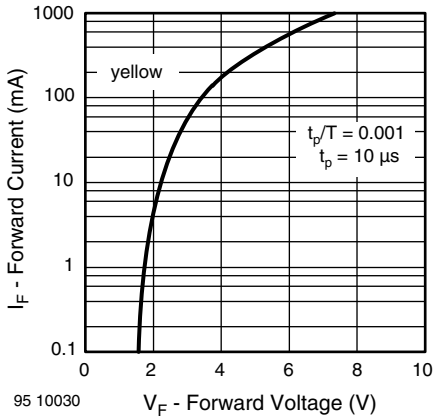


Fig. 14 - Forward Current vs. Forward Voltage



Fig. 17 - Relative Luminous Intensity vs. Forward Current

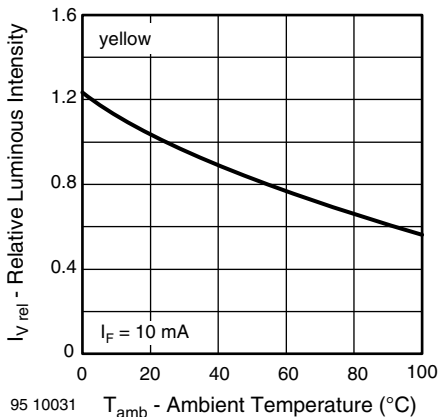


Fig. 15 - Relative Luminous Intensity vs. Ambient Temperature

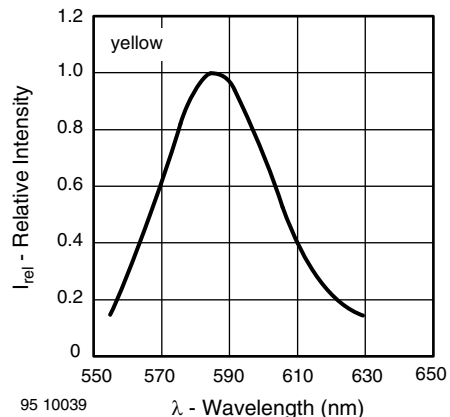


Fig. 18 - Relative Intensity vs. Wavelength



Fig. 19 - Forward Current vs. Forward Voltage



Fig. 22 - Relative Luminous Intensity vs. Forward Current



Fig. 20 - Relative Luminous Intensity vs. Ambient Temperature

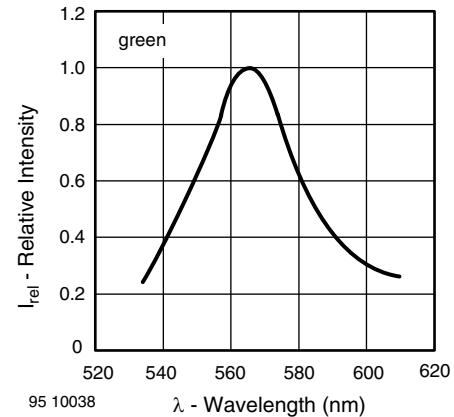


Fig. 23 - Relative Intensity vs. Wavelength

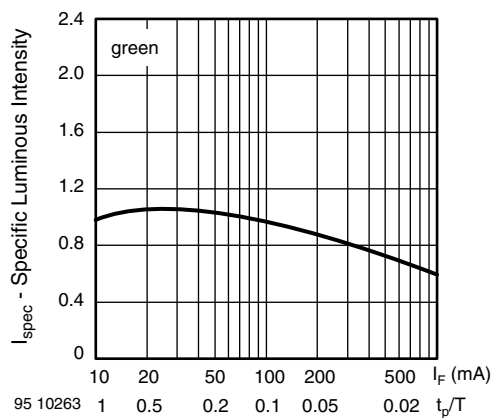


Fig. 21 - Specific Luminous Intensity vs. Forward Current



Fig. 24 - Forward Current vs. Forward Voltage





Fig. 25 - Relative Luminous Intensity vs. Ambient Temperature

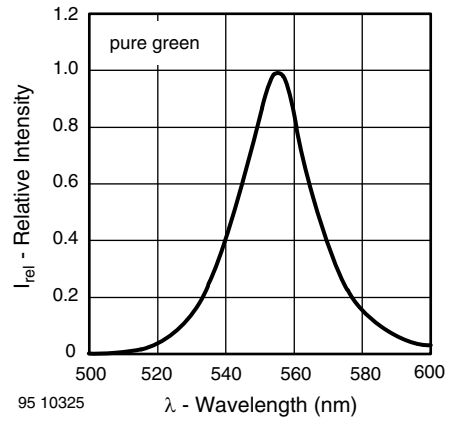


Fig. 28 - Relative Intensity vs. Wavelength

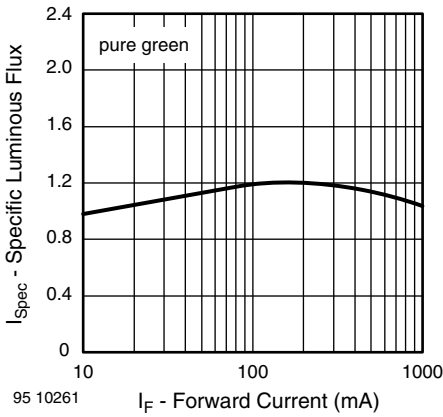


Fig. 26 - Specific Luminous Intensity vs. Forward Current

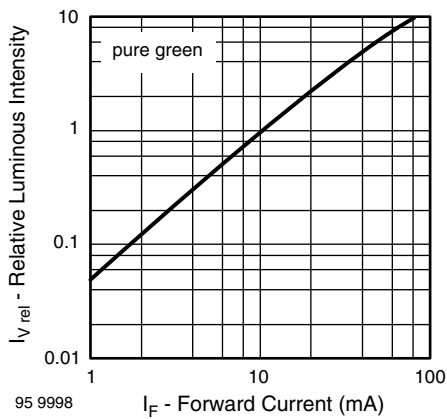


Fig. 27 - Relative Luminous Intensity vs. Forward Current



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5255.01-4  
Issue: 7; 25.09.08  
95 10913

REEL DIMENSIONS in millimeters

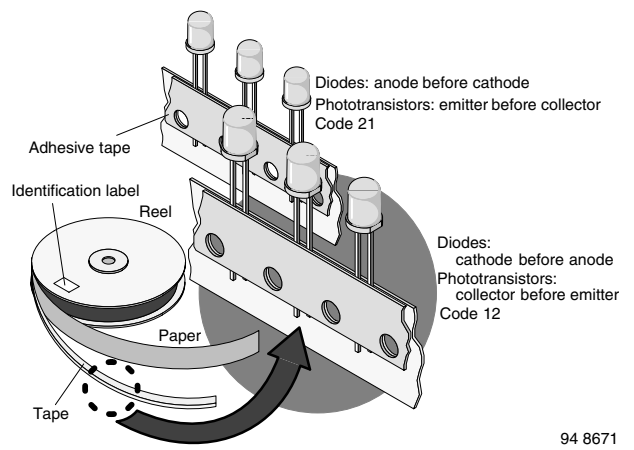


Identification label:  
Vishay/type/group/tape code/production code/quantity

948641

Fig. 29 - Reel

TAPE



94 8671

Fig. 30 - LED in Tape

**AMMOPACK**

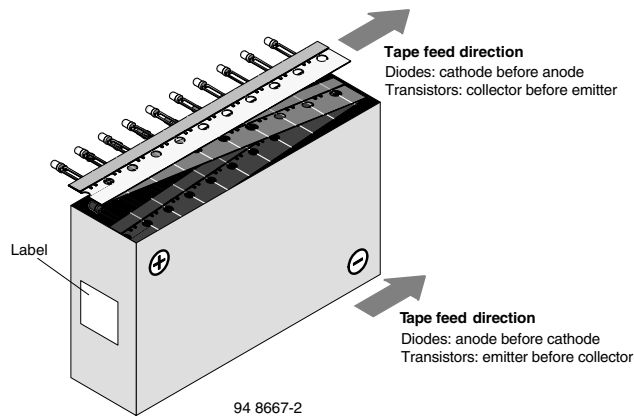
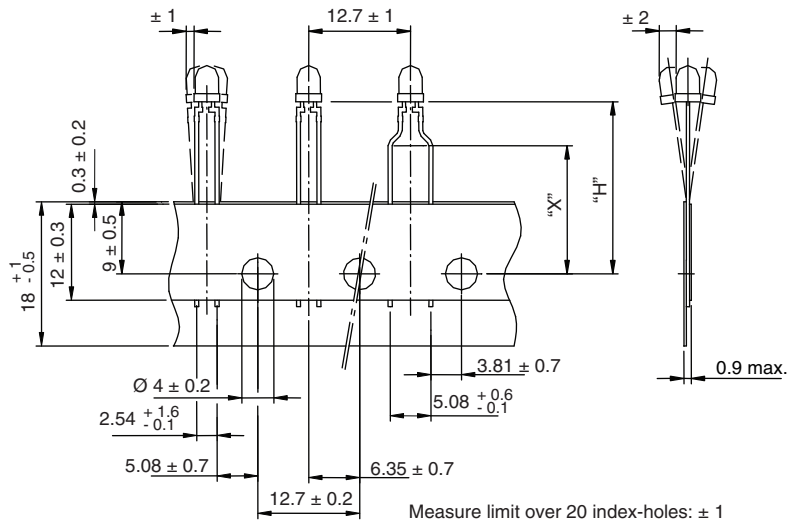


Fig. 31 - Tape Direction

**Note**

- AS12Z and AS21Z still valid for already existing types BUT NOT FOR NEW DESIGN

**TAPE DIMENSIONS** in millimeters



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

21885

| OPTION | DIMENSION "H" ± 0.5 mm | DIMENSION "X" ± 0.5 mm |
|--------|------------------------|------------------------|
| AS     | 17.3                   | -                      |
| MS     | 25.5                   | -                      |
| CS     | 22.0                   | -                      |
| LS     | 21.0                   | -                      |
| BT     | 20.0                   | 16.0                   |



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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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