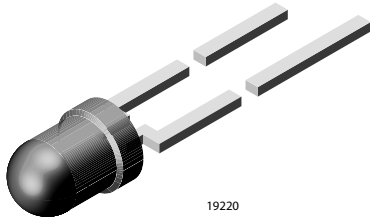


High Intensity LED in Ø 3 mm Tinted Diffused Package



DESCRIPTION

This LED contains the double heterojunction (DH) GaAlAs on GaAs technology.

This deep red LED can be utilized over a wide range of drive current. It can be DC or pulse driven to achieve desired light output.

The device is available in a 3 mm tinted diffused package.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity: $\pm 40^\circ$

FEATURES

- Exceptional brightness
- Very high intensity even at low drive currents
- Wide viewing angle
- Low forward voltage
- 3 mm (T-1) tinted diffused package
- Deep red color
- Categorized for luminous intensity
- Outstanding material efficiency
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- Bright ambient lighting conditions
- Battery powered equipment
- Indoor and outdoor information displays
- Portable equipment
- Telecommunication indicators
- General use

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. | | |
| TLDR4400 | Red | 25 | 45 | - | 20 | - | 648 | - | 20 | - | 1.8 | 2.2 | 20 | GaAlAs on GaAs |
| TLDR4401 | Red | 25 | - | 50 | 20 | - | 648 | - | 20 | - | 1.8 | 2.2 | 20 | GaAlAs on GaAs |

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) TLDR440.

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--------------------------|-------------------|-------------|------|
| Reverse voltage | | V _R | 6 | V |
| DC forward current | T _{amb} ≤ 60 °C | I _F | 50 | 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/ambient | | R _{thJA} | 400 | K/W |



| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|--------------------------------------|----------|-----------------|------|----------|------|---------------|
| TLDR440., RED | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity ⁽¹⁾ | $I_F = 20\text{ mA}$ | TLDR4400 | I_V | 25 | 45 | - | mcd |
| | | TLDR4401 | I_V | 25 | - | 50 | mcd |
| Luminous intensity | $I_F = 1\text{ mA}$ | | I_V | - | 2 | | mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | - | 648 | - | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 650 | - | nm |
| Spectral line half width | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 20 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | ϕ | - | ± 40 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | - | 1.8 | 2.2 | V |
| Reverse current | $V_R = 6\text{ V}$ | | I_R | - | - | 10 | μA |
| Junction capacitance | $V_R = 0\text{ V}, f = 1\text{ MHz}$ | | C_j | - | 30 | - | pF |

Note

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

| LUMINOUS INTENSITY CLASSIFICATION | | | |
|-----------------------------------|-----------------------|------|------|
| GROUP | LIGHT INTENSITY (mcd) | | |
| | STANDARD | MIN. | MAX. |
| 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 $\pm 11\%$. 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

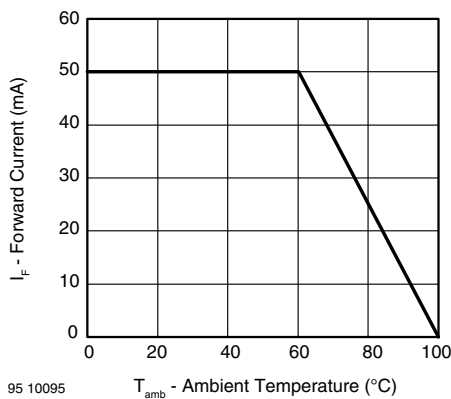


Fig. 1 - Forward Current vs. Ambient Temperature for InGaN

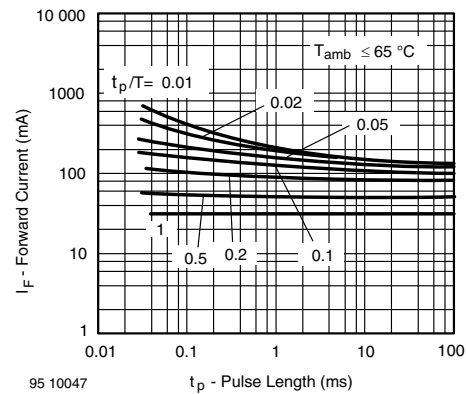


Fig. 2 - Forward Current vs. Pulse Length

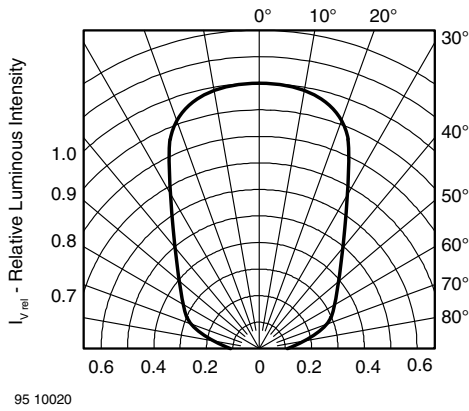


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

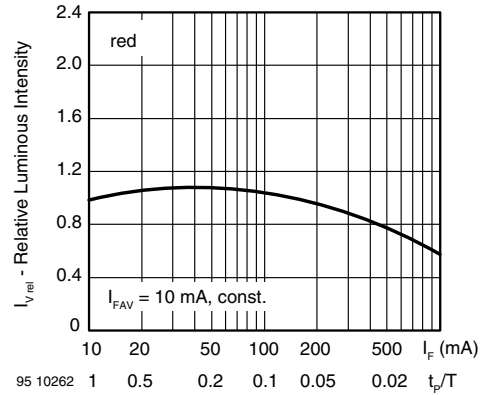


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

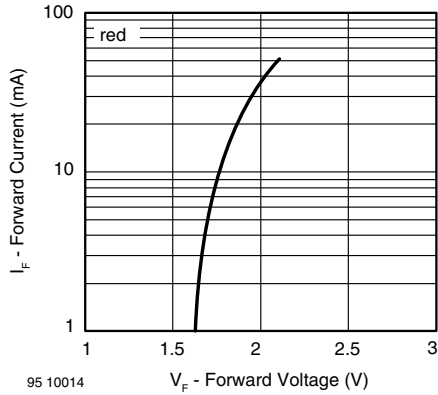


Fig. 4 - Forward Current vs. Forward Voltage

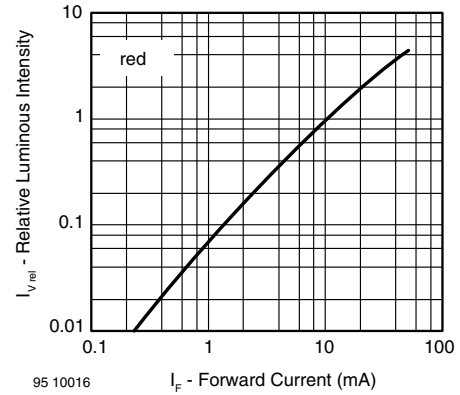


Fig. 7 - Relative Luminous Intensity vs. Forward Current

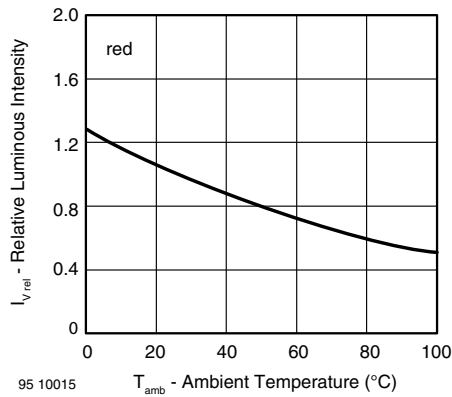


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

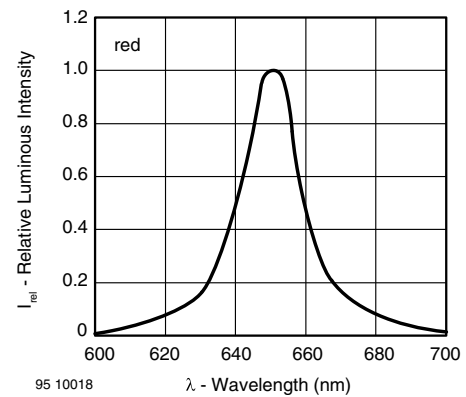
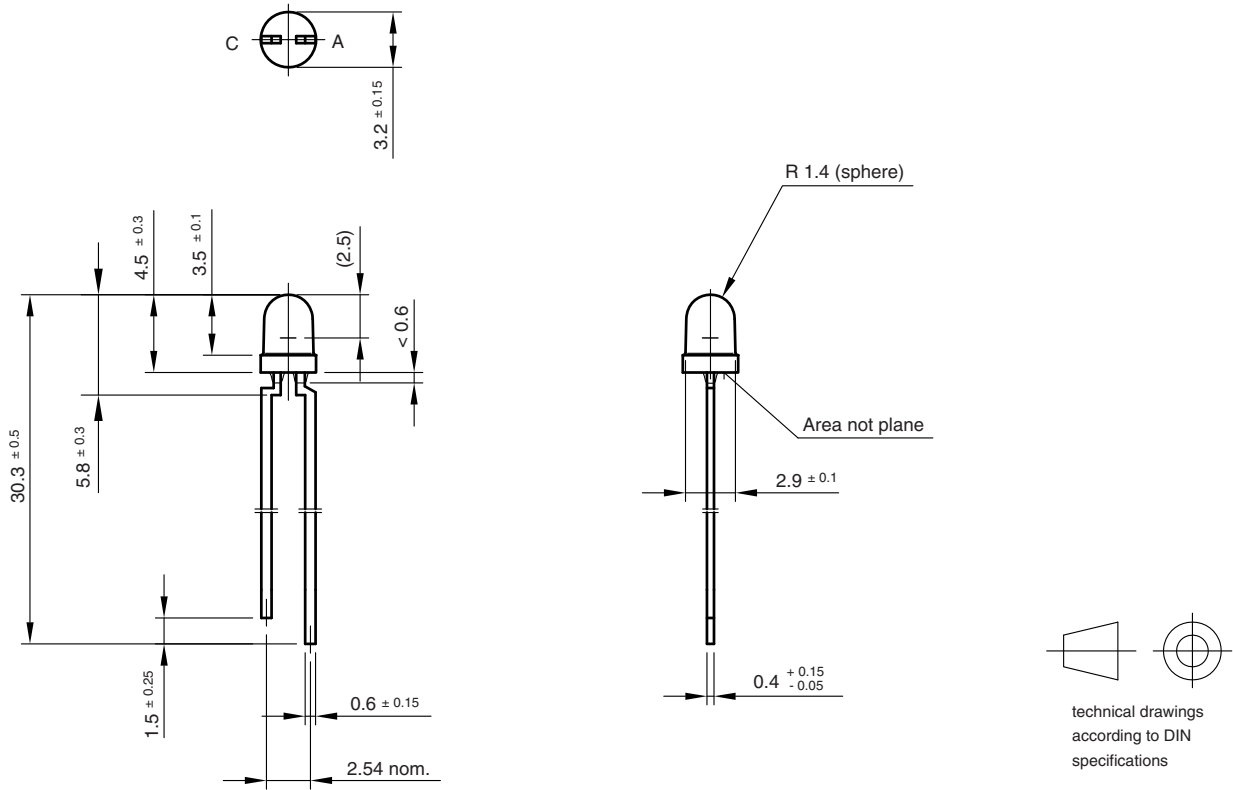


Fig. 8 - Relative Intensity vs. Wavelength



PACKAGE DIMENSIONS in millimeters



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