

Ultrabright LED, Ø 5 mm Untinted Non-Diffused Package



19223

DESCRIPTION

The VLCPG5100 is a clear, non-diffused 5 mm LED for high end applications where supreme luminous intensity required.

These lamps with clear untinted plastic case utilize the highly developed ultrabright AlInGaP (AS).

The lens and the viewing angle is optimized to achieve best performance of light output and visibility.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: ultrabright
- Angle of half intensity: $\pm 9^\circ$

FEATURES

- Untinted non-diffused lens
- Utilizing ultrabright AlInGaP (AS)
- High luminous intensity
- High operating temperature: T_j (chip junction temperature) up to 125 °C for AlInGaP devices
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Interior and exterior lighting
- Outdoor LED panels
- Instrumentation and front panel indicators
- Central high mounted stop lights (CHMSL) for motor vehicles
- Replaces incandescent lamps
- Traffic signals
- Light guide design

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. | | |
| VLCPG5100 | Pure green | 430 | 1250 | - | 50 | 555 | 562 | 567 | 50 | - | 2.2 | 2.7 | 50 | AllInGaP on GaAs |

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

VLCPG5100

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|---------------------------------------|------------|---------------|------------------|
| Reverse voltage ⁽¹⁾ | | V_R | 5 | V |
| DC forward current | $T_{amb} \leq 85^\circ\text{C}$ | I_F | 50 | mA |
| Surge forward current | $t_p \leq 10 \mu\text{s}$ | I_{FSM} | 1 | A |
| Power dissipation | | P_V | 135 | mW |
| Junction temperature | | T_j | 125 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | - 40 to + 100 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^\circ\text{C}$ |
| Soldering temperature | $t \leq 5 \text{ s}$, 2 mm from body | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | | R_{thJA} | 300 | K/W |

Note

- ⁽¹⁾ Driving the LED in reverse direction is suitable for a short term application

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
VLCPG5100, PURE GREEN

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--|-------------------------------|-----------|------------------|------|---------|------|------|
| Luminous intensity ⁽¹⁾ | $I_F = 50\text{ mA}$ | VLCPG5100 | I_V | 430 | 1250 | - | mcd |
| Dominant wavelength | $I_F = 50\text{ mA}$ | | λ_d | 555 | 562 | 567 | nm |
| Peak wavelength | $I_F = 50\text{ mA}$ | | λ_p | - | 563 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 50\text{ mA}$ | | $\Delta\lambda$ | - | 20 | - | nm |
| Angle of half intensity | $I_F = 50\text{ mA}$ | | ϕ | - | ± 9 | - | deg |
| Forward voltage | $I_F = 50\text{ mA}$ | | V_F | - | 2.2 | 2.7 | V |
| Reverse voltage | $I_R = 10\text{ }\mu\text{A}$ | | V_R | 5 | - | - | V |
| Temperature coefficient of V_F | $I_F = 50\text{ mA}$ | | TC_{V_F} | - | - 3.5 | - | mV/K |
| Temperature coefficient of λ_d | $I_F = 50\text{ mA}$ | | TC_{λ_d} | - | 0.1 | - | nm/K |

Note

(1) In one packing unit $I_{Vmax}/I_{Vmin.} \leq 2.0$

LUMINOUS INTENSITY CLASSIFICATION

| GROUP STANDARD | LUMINOUS INTENSITY (mcd) | |
|-------------------|--------------------------|---------|
| | MIN. | MAX. |
| BB | 430 | 860 |
| CC | 575 | 1150 |
| DD | 750 | 1500 |
| EE | 1000 | 2000 |
| FF | 1350 | 2700 |
| GG | 1800 | 3600 |
| HH | 2400 | 4800 |
| II | 3200 | 6400 |
| KK | 4300 | 8600 |
| LL | 5750 | 11 500 |
| MM | 7500 | 15 000 |
| NN | 10 000 | 20 000 |
| PP | 13 500 | 27 000 |
| QQ | 18 000 | 36 000 |
| RR | 24 000 | 48 000 |
| SS | 32 000 | 64 000 |
| TT | 43 000 | 86 000 |
| UU | 57 500 | 115 000 |

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 in any one bag.
In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION

| GROUP | DOM. WAVELENGTH (nm) | |
|-------|----------------------|------|
| | PURE GREEN | |
| | MIN. | MAX. |
| 0 | 555 | 559 |
| 1 | 558 | 561 |
| 2 | 560 | 563 |
| 3 | 562 | 565 |
| 4 | 564 | 567 |

Note

- Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of $\pm 1\text{ nm}$.

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

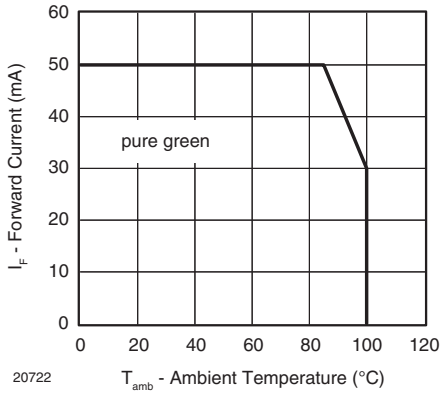


Fig. 1 - Forward Current vs. Ambient Temperature

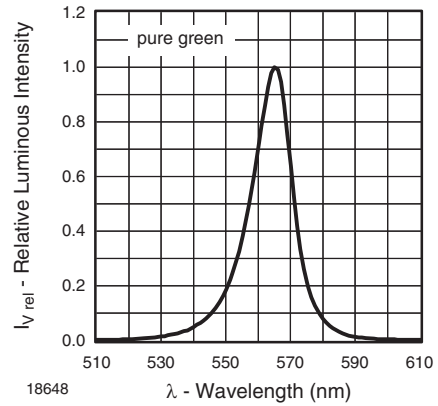


Fig. 4 - Relative Intensity vs. Wavelength

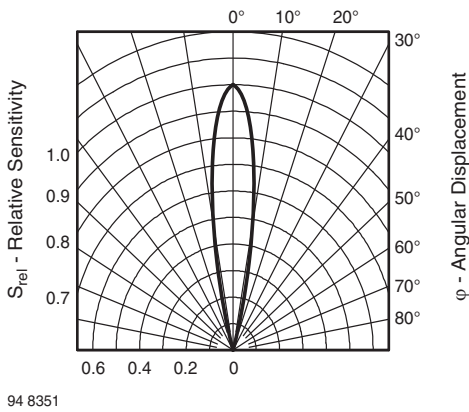


Fig. 2 - Relative Radiant Sensitivity vs. Angular Displacement

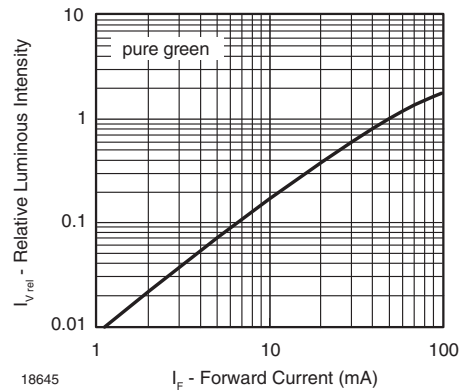


Fig. 5 - Relative Luminous Flux vs. Forward Current

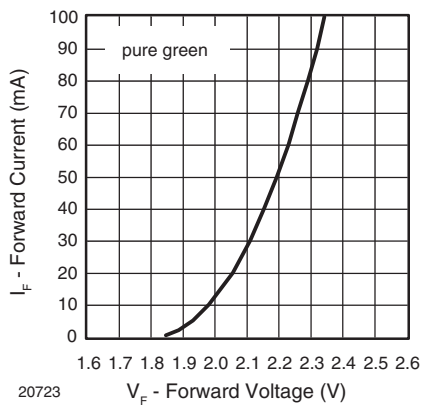


Fig. 3 - Forward Current vs. Forward Voltage

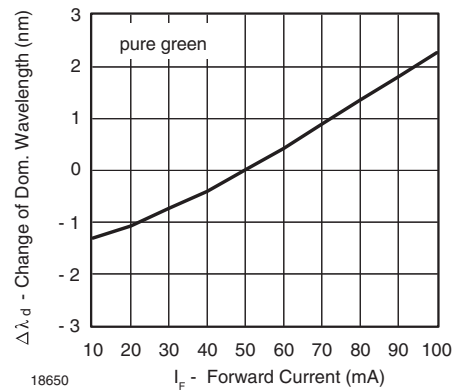


Fig. 6 - Change of Dominant Wavelength vs. Forward Current

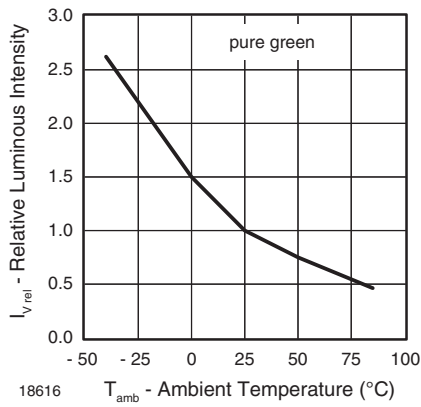


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

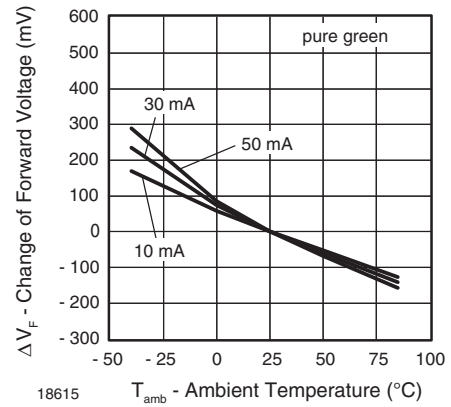


Fig. 9 - Change of Forward Voltage vs. Ambient Temperature

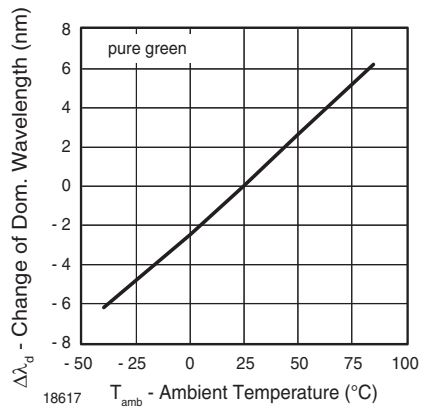
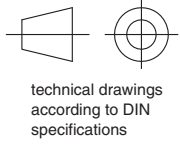
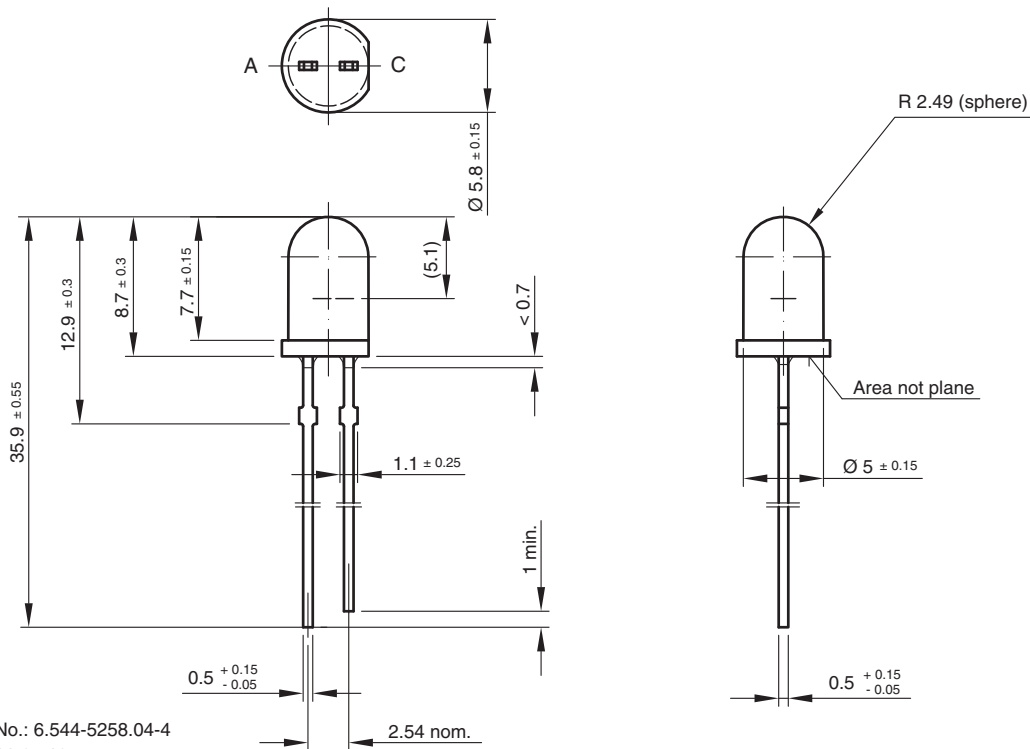


Fig. 8 - Change of Dominant Wavelength vs. Ambient Temperature



PACKAGE DIMENSIONS in millimeters



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