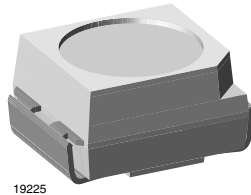


## Standard SMD LED PLCC-2



### FEATURES

- SMD LED with exceptional brightness
- Luminous intensity categorized
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Compatible with IR reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020B
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: excellent for coupling to light pipes and backlighting
- Low power consumption
- Luminous intensity ratio in one packaging unit  $I_{Vmax}/I_{Vmin} \leq 1.6$
- Lead (Pb)-free device
- Preconditioning: acc. to JEDEC level 2a
- ESD-withstand voltage: > 1 kV acc. to MIL STD 883 D, Method 3015.7



### DESCRIPTION

This device has been designed to meet the increasing demand for InGaN technology.

The package of the VLMB/BG/TG31.. is the PLCC-2. It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2
- Product series: standard
- Angle of half intensity:  $\pm 60^\circ$

### APPLICATIONS

- Automotive: backlighting in dashboards and switches
- Telecommunication: indicator and backlighting in telephone and fax
- Indicator and backlight for audio and video equipment
- Indicator and backlight in office equipment
- Flat backlight for LCDs, switches and symbols
- General use

| PARTS TABLE    |                             |              |
|----------------|-----------------------------|--------------|
| PART           | COLOR, LUMINOUS INTENSITY   | TECHNOLOGY   |
| VLMB3140-GS08  | Blue, $I_V > 45$ mcd        | InGaN on SiC |
| VLMB3140-GS18  | Blue, $I_V > 45$ mcd        | InGaN on SiC |
| VLMBG3100-GS08 | Blue green, $I_V > 140$ mcd | InGaN on SiC |
| VLMBG3100-GS18 | Blue green, $I_V > 140$ mcd | InGaN on SiC |
| VLMTG3100-GS08 | True green, $I_V > 180$ mcd | InGaN on SiC |
| VLMTG3100-GS18 | True green, $I_V > 180$ mcd | InGaN on SiC |

| <b>ABSOLUTE MAXIMUM RATINGS<sup>1)</sup> VLMB3140, VLMBG3100, VLMTG3100</b> |   |            |               |      |
|---|---|------------|---------------|------|
| PARAMETER   | TEST CONDITION  | SYMBOL     | VALUE         | UNIT |
| Reverse voltage <sup>2)</sup>   |   | $V_R$      | 5             | V    |
| DC Forward current  | $T_{amb} \leq 80\text{ °C}$                             | $I_F$      | 20            | mA   |
| Surge forward current   | $t_p \leq 10\ \mu\text{s}$                              | $I_{FSM}$  | 0.2           | A    |
| Power dissipation   |   | $P_V$      | 84            | mW   |
| Junction temperature  |   | $T_j$      | 110           | °C   |
| Operating temperature range   |   | $T_{amb}$  | - 40 to + 100 | °C   |
| Storage temperature range   |   | $T_{stg}$  | - 40 to + 100 | °C   |
| Thermal resistance junction/ambient   | mounted on PC board<br>(pad size > 16 mm <sup>2</sup> ) | $R_{thJA}$ | 350           | K/W  |

Note:

<sup>1)</sup>  $T_{amb} = 25\text{ °C}$ , unless otherwise specified

<sup>2)</sup> Driving LED in reverse direction is suitable for short term application

| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS<sup>1)</sup> VLMB3140, BLUE</b> |                         |             |     |          |     |      |
|---|-------------------------|-------------|-----|----------|-----|------|
| PARAMETER   | TEST CONDITION          | SYMBOL      | MIN | TYP      | MAX | UNIT |
| Luminous intensity <sup>2)</sup>  | $I_F = 20\text{ mA}$    | $I_V$       | 45  | 100      |     | mcd  |
| Dominant wavelength   | $I_F = 20\text{ mA}$    | $\lambda_d$ | 462 | 470      | 476 | nm   |
| Peak wavelength   | $I_F = 20\text{ mA}$    | $\lambda_p$ |     | 464      |     | nm   |
| Angle of half intensity   | $I_F = 20\text{ mA}$    | $\varphi$   |     | $\pm 60$ |     | deg  |
| Forward voltage   | $I_F = 20\text{ mA}$    | $V_F$       |     | 3        | 4.2 | V    |
| Reverse voltage   | $I_R = 10\ \mu\text{A}$ | $V_R$       | 5   |          |     | V    |
| Temperature coefficient of $V_F$  | $I_F = 20\text{ mA}$    | $TC_V$      |     | - 4      |     | mV/K |
| Temperature coefficient of $I_V$  | $I_F = 20\text{ mA}$    | $TC_I$      |     | - 0.4    |     | %/K  |

Note:

<sup>1)</sup>  $T_{amb} = 25\text{ °C}$ , unless otherwise specified

<sup>2)</sup> in one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 1.6$

| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS<sup>1)</sup> VLMBG3100, BLUE GREEN</b> |                         |             |     |          |     |      |
|--|-------------------------|-------------|-----|----------|-----|------|
| PARAMETER  | TEST CONDITION          | SYMBOL      | MIN | TYP      | MAX | UNIT |
| Luminous intensity <sup>2)</sup>   | $I_F = 20\text{ mA}$    | $I_V$       | 140 | 220      |     | mcd  |
| Dominant wavelength  | $I_F = 20\text{ mA}$    | $\lambda_d$ | 496 | 505      | 514 | nm   |
| Peak wavelength  | $I_F = 20\text{ mA}$    | $\lambda_p$ |     | 502      |     | nm   |
| Angle of half intensity  | $I_F = 20\text{ mA}$    | $\varphi$   |     | $\pm 60$ |     | deg  |
| Forward voltage  | $I_F = 20\text{ mA}$    | $V_F$       |     | 3        | 4.2 | V    |
| Reverse voltage  | $I_R = 10\ \mu\text{A}$ | $V_R$       | 5   |          |     | V    |
| Temperature coefficient of $V_F$   | $I_F = 20\text{ mA}$    | $TC_V$      |     | - 4      |     | mV/K |
| Temperature coefficient of $I_V$   | $I_F = 20\text{ mA}$    | $TC_I$      |     | - 0.2    |     | %/K  |

Note:

<sup>1)</sup>  $T_{amb} = 25\text{ °C}$ , unless otherwise specified

<sup>2)</sup> in one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 1.6$

| <b>OPTICAL AND ELECTRICAL CHARACTERISTICS<sup>1)</sup> VLMTG3100, TRUE GREEN</b> |                        |                 |     |       |     |      |
|--|------------------------|-----------------|-----|-------|-----|------|
| PARAMETER  | TEST CONDITION         | SYMBOL          | MIN | TYP   | MAX | UNIT |
| Luminous intensity <sup>2)</sup>   | I <sub>F</sub> = 20 mA | I <sub>V</sub>  | 180 | 300   |     | mcd  |
| Dominant wavelength  | I <sub>F</sub> = 20 mA | λ <sub>d</sub>  | 515 | 528   | 541 | nm   |
| Peak wavelength  | I <sub>F</sub> = 20 mA | λ <sub>p</sub>  |     | 522   |     | nm   |
| Angle of half intensity  | I <sub>F</sub> = 20 mA | φ               |     | ± 60  |     | deg  |
| Forward voltage  | I <sub>F</sub> = 20 mA | V <sub>F</sub>  |     | 3     | 4.2 | V    |
| Reverse voltage  | I <sub>R</sub> = 10 μA | V <sub>R</sub>  | 5   |       |     | V    |
| Temperature coefficient of V <sub>F</sub>  | I <sub>F</sub> = 20 mA | TC <sub>V</sub> |     | - 3.5 |     | mV/K |
| Temperature coefficient of I <sub>V</sub>  | I <sub>F</sub> = 20 mA | TC <sub>I</sub> |     | - 0.3 |     | %/K  |

Note:

<sup>1)</sup> T<sub>amb</sub> = 25 °C, unless otherwise specified

<sup>2)</sup> In one Packing Unit I<sub>Vmax</sub>/I<sub>Vmin</sub> ≤ 1.6

| <b>LUMINOUS INTENSITY CLASSIFICATION</b> |                       |     |     |
|--|-----------------------|-----|-----|
| GROUP                                    | LIGHT INTENSITY (MCD) |     |     |
| STANDARD                                 | OPTIONAL              | MIN | MAX |
| P  | 1                     | 45  | 56  |
|  | 2                     | 56  | 71  |
| Q  | 1                     | 71  | 90  |
|  | 2                     | 90  | 112 |
| R  | 1                     | 112 | 140 |
|  | 2                     | 140 | 180 |
| S  | 1                     | 180 | 224 |
|  | 2                     | 224 | 280 |
| T  | 1                     | 280 | 355 |
|  | 2                     | 355 | 450 |
| U  | 1                     | 450 | 560 |
|  | 2                     | 560 | 710 |

Note:

Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 11 %.

The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel).

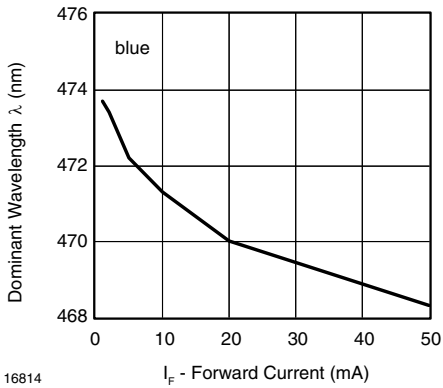
In order to ensure availability, single brightness groups will not be orderable.

In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped on any one reel.

In order to ensure availability, single wavelength groups will not be orderable.

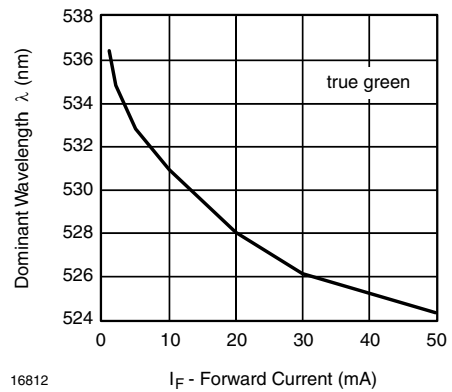
| <b>CROSSING TABLE</b> |        |
|-----------------------|--------|
| VISHAY                | OSRAM  |
| VLMB3140              | LBT673 |
| VLMBG3100             | LVT673 |
| VLMTG3100             | LTT673 |

| <b>COLOR CLASSIFICATION</b> |                      |      |            |      |            |      |
|-----------------------------|----------------------|------|------------|------|------------|------|
| GROUP                       | BLUE                 |      | BLUE GREEN |      | TRUE GREEN |      |
|                             | DOM. WAVELENGTH (NM) |      |            |      |            |      |
|                             | MIN.                 | MAX. | MIN.       | MAX. | MIN.       | MAX. |
| 2                           | 458                  | 464  |            |      |            |      |
| 3                           | 462                  | 468  | 496        | 502  | 515        | 523  |
| 4                           | 466                  | 472  | 500        | 506  | 521        | 529  |
| 5                           | 470                  | 476  | 504        | 510  | 527        | 535  |
| 6                           | 474                  | 480  | 508        | 514  | 533        | 541  |



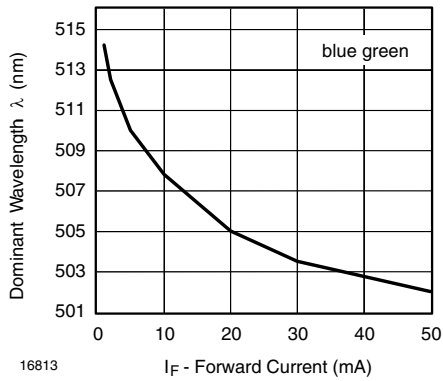
16814

Figure 7. Dominant Wavelength vs. Forward Current



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Figure 9. Dominant Wavelength vs. Forward Current



16813

Figure 8. Dominant Wavelength vs. Forward Current

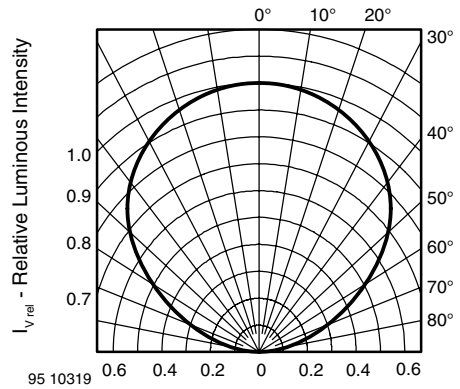
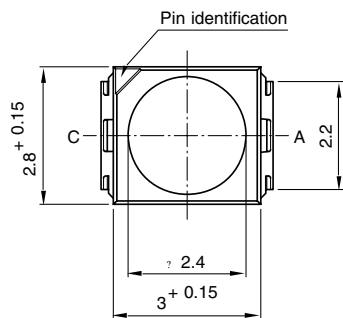
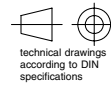
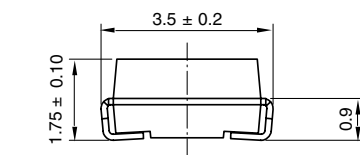
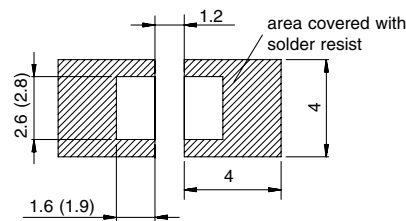


Figure 10. Relative Luminous Intensity

**PACKAGE DIMENSIONS** in millimeters



**Mounting Pad Layout**



Drawing-No.: 6.541-5025.01-4  
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