

Low Current SMD LED



FEATURES

- SMD LED with exceptional brightness
- 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-020
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: excellent for coupling to light pipes and backlighting
- Very low power consumption
- Luminous intensity ratio in one packaging unit $I_{Vmax}/I_{Vmin.} \leq 1.6$
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B
- Preconditioning: according to JEDEC level 2a
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


RoHS
COMPLIANT

DESCRIPTION

These new devices have been designed to meet the increasing demand for AlInGaP based low current SMD LEDs.

The package of the VLM.30.. is the PLCC-2 package. 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: low current
- 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 for battery driven equipment
- Indicator and backlight in office equipment
- Flat backlight for LCDs, switches and symbols
- General use

| PARTS TABLE | | |
|-----------------|---|------------|
| PART | COLOR, LUMINOUS INTENSITY | TECHNOLOGY |
| VLMS3000-GS08 | Super red, $I_V > 2.8$ mcd | AlInGaP |
| VLMS3000-GS18 | Super red, $I_V > 2.8$ mcd | AlInGaP |
| VLMS30J1K2-GS08 | Super red, $I_V = (4.5 \text{ to } 11.2)$ mcd | AlInGaP |
| VLMS30J1K2-GS18 | Super red, $I_V = (4.5 \text{ to } 11.2)$ mcd | AlInGaP |
| VLMS30K1L2-GS08 | Super red, $I_V = (7.1 \text{ to } 18)$ mcd | AlInGaP |
| VLMS30K1L2-GS18 | Super red, $I_V = (7.1 \text{ to } 18)$ mcd | AlInGaP |

| PARTS TABLE | | |
|-----------------|---|------------|
| PART | COLOR, LUMINOUS INTENSITY | TECHNOLOGY |
| VLMS30J1L2-GS08 | Super red, $I_V = (4.5 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMS30J1L2-GS18 | Super red, $I_V = (4.5 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMS30J2K2-GS08 | Super red, $I_V = (5.6 \text{ to } 11.2) \text{ mcd}$ | AllnGaP |
| VLMS30J2K2-GS18 | Super red, $I_V = (5.6 \text{ to } 11.2) \text{ mcd}$ | AllnGaP |
| VLMS30K2L2-GS08 | Super red, $I_V = (9 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMO3000-GS08 | Orange, $I_V > 5.6 \text{ mcd}$ | AllnGaP |
| VLMO3000-GS18 | Orange, $I_V > 5.6 \text{ mcd}$ | AllnGaP |
| VLMO30K1L2-GS08 | Orange, $I_V = (7.1 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMO30K1L2-GS18 | Orange, $I_V = (7.1 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMO30L1M2-GS08 | Orange, $I_V = (11.2 \text{ to } 28) \text{ mcd}$ | AllnGaP |
| VLMO30L1M2-GS18 | Orange, $I_V = (11.2 \text{ to } 28) \text{ mcd}$ | AllnGaP |
| VLMO30K1M2-GS08 | Orange, $I_V = (7.1 \text{ to } 28) \text{ mcd}$ | AllnGaP |
| VLMO30K1M2-GS18 | Orange, $I_V = (7.1 \text{ to } 28) \text{ mcd}$ | AllnGaP |
| VLMY3000-GS08 | Yellow, $I_V > 4.5 \text{ mcd}$ | AllnGaP |
| VLMY3000-GS18 | Yellow, $I_V > 4.5 \text{ mcd}$ | AllnGaP |
| VLMY3001GS08 | Yellow, $I_V = (7.1 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMY3001-GS18 | Yellow, $I_V = (7.1 \text{ to } 18) \text{ mcd}$ | AllnGaP |
| VLMY30J2L1-GS08 | Yellow, $I_V = (5.6 \text{ to } 14) \text{ mcd}$ | AllnGaP |
| VLMY30J2L1-GS18 | Yellow, $I_V = (5.6 \text{ to } 14) \text{ mcd}$ | AllnGaP |
| VLMY30K2M1-GS08 | Yellow, $I_V = (9 \text{ to } 22.4) \text{ mcd}$ | AllnGaP |
| VLMY30K2M1-GS18 | Yellow, $I_V = (9 \text{ to } 22.4) \text{ mcd}$ | AllnGaP |
| VLMY30J2M1-GS08 | Yellow, $I_V = (5.6 \text{ to } 22.4) \text{ mcd}$ | AllnGaP |
| VLMY30J2M1-GS18 | Yellow, $I_V = (5.6 \text{ to } 22.4) \text{ mcd}$ | AllnGaP |

| ABSOLUTE MAXIMUM RATINGS ¹⁾ VLM30.. | | | | |
|--|---|------------|---------------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage ²⁾ | | V_R | 6 | V |
| DC forward current | | I_F | 15 | mA |
| Surge forward current | $t_p \leq 10 \mu\text{s}$ | I_{FSM} | 0.1 | A |
| Power dissipation | | P_V | 40 | mW |
| Junction temperature | | T_j | 125 | °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 (pad size > 16 mm ²) | R_{thJA} | 400 | K/W |

Note:

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

²⁾ Driving the LED in reverse direction is suitable for short term application

**OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾ VLMS30..., RED**

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------------|------------|-------------|------|----------|------|------|
| Luminous intensity ²⁾ | $I_F = 2 \text{ mA}$ | VLMS3000 | I_V | 2.8 | | | mcd |
| | $I_F = 10 \text{ mA}$ | VLMS3000 | I_V | | 20 | | mcd |
| | $I_F = 2 \text{ mA}$ | VLMS30J1K2 | I_V | 4.5 | | 11.2 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMS30K1L2 | I_V | 7.1 | | 18 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMS30J1L2 | I_V | 4.5 | | 18 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMS30J2K2 | I_V | 5.6 | | 11.2 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMS30K2L2 | I_V | 9 | | 18 | mcd |
| Dominant wavelength | $I_F = 2 \text{ mA}$ | | λ_d | 624 | | 636 | nm |
| Peak wavelength | $I_F = 2 \text{ mA}$ | | λ_p | | 635 | | nm |
| Angle of half intensity | $I_F = 2 \text{ mA}$ | | ϕ | | ± 60 | | deg |
| Forward voltage | $I_F = 2 \text{ mA}$ | | V_F | | 1.8 | 2.2 | V |
| Reverse voltage | $I_R = 10 \mu\text{A}$ | | V_R | 6 | 15 | | V |

Note:

¹⁾ $T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified²⁾ In one packing unit $I_{Vmax}/I_{Vmin} \leq 1.6$ **OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾ VLMO30..., ORANGE**

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------------|------------|-------------|------|----------|------|------|
| Luminous intensity ²⁾ | $I_F = 2 \text{ mA}$ | VLMO3000 | I_V | 5.6 | | | mcd |
| | $I_F = 10 \text{ mA}$ | VLMO3000 | I_V | | 50 | | mcd |
| | $I_F = 2 \text{ mA}$ | VLMO30K1L2 | I_V | 7.1 | | 18 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMO30L1M2 | I_V | 11.2 | | 28 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMO30K1M2 | I_V | 7.1 | | 28 | mcd |
| Dominant wavelength | $I_F = 2 \text{ mA}$ | | λ_d | 600 | | 609 | nm |
| Peak wavelength | $I_F = 2 \text{ mA}$ | | λ_p | | 610 | | nm |
| Angle of half intensity | $I_F = 2 \text{ mA}$ | | ϕ | | ± 60 | | deg |
| Forward voltage | $I_F = 2 \text{ mA}$ | | V_F | | 1.8 | 2.2 | V |
| Reverse voltage | $I_R = 10 \mu\text{A}$ | | V_R | 6 | 15 | | V |

Note:

¹⁾ $T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified²⁾ In one packing unit $I_{Vmax}/I_{Vmin} \leq 1.6$ **OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾ VLMY30..., YELLOW**

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------------|------------|-------------|------|----------|------|------|
| Luminous intensity ²⁾ | $I_F = 2 \text{ mA}$ | VLMY3000 | I_V | 4.5 | | | mcd |
| | $I_F = 10 \text{ mA}$ | VLMY3000 | I_V | | 50 | | mcd |
| | $I_F = 10 \text{ mA}$ | VLMY3001 | I_V | 7.1 | | 18 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMY30J2L1 | I_V | 5.6 | | 14 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMY30K2M1 | I_V | 9 | | 22.4 | mcd |
| | $I_F = 2 \text{ mA}$ | VLMY30J2M1 | I_V | 5.6 | | 22.4 | mcd |
| Dominant wavelength | $I_F = 2 \text{ mA}$ | | λ_d | 581 | | 594 | nm |
| Peak wavelength | $I_F = 2 \text{ mA}$ | | λ_p | | 585 | | nm |
| Angle of half intensity | $I_F = 2 \text{ mA}$ | | ϕ | | ± 60 | | deg |
| Forward voltage | $I_F = 2 \text{ mA}$ | | V_F | | 1.8 | 2.2 | V |
| Reverse voltage | $I_R = 10 \mu\text{A}$ | | V_R | 6 | 15 | | V |

Note:

¹⁾ $T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified²⁾ In one packing unit $I_{Vmax}/I_{Vmin} \leq 1.6$



| LUMINOUS INTENSITY CLASSIFICATION | | | |
|-----------------------------------|-----------------------|------|------|
| GROUP | LIGHT INTENSITY (mcd) | | |
| STANDARD | OPTIONAL | MIN. | MAX. |
| H | 1 | 2.8 | 3.55 |
| | 2 | 3.55 | 4.5 |
| J | 1 | 4.5 | 5.6 |
| | 2 | 5.6 | 7.1 |
| K | 1 | 7.1 | 9.0 |
| | 2 | 9.0 | 11.2 |
| L | 1 | 11.2 | 14.0 |
| | 2 | 14.0 | 18.0 |
| M | 1 | 18.0 | 22.4 |
| | 2 | 22.4 | 28.0 |

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

| COLOR CLASSIFICATION | | | | |
|----------------------|----------------------|------|--------|------|
| GROUP | YELLOW | | ORANGE | |
| | DOM. WAVELENGTH (nm) | | | |
| | MIN. | MAX. | MIN. | MAX. |
| 1 | 581 | 584 | | |
| 2 | 583 | 586 | 600 | 603 |
| 3 | 585 | 588 | 602 | 605 |
| 4 | 587 | 590 | 604 | 607 |
| 5 | 589 | 592 | 606 | 609 |
| 6 | 591 | 594 | | |

Note:

Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm.

| CROSSING TABLE | |
|----------------|-------------|
| VISHAY | OSRAM |
| VLMO30K1L2 | LOT67K-K1L2 |
| VLMO30K1M2 | LOT67K-K1M2 |
| VLMO30L1M2 | LOT67K-L1M2 |
| VLMS30J1K2 | LST67K-J1K2 |
| VLMS30J1L2 | LST67K-J1L2 |
| VLMS30K1L2 | LST67K-K1L2 |
| VLMY30J2L1 | LYT67K-J2L1 |
| VLMY30J2M1 | LYT67K-J2M1 |
| VLMY30K2M1 | LYT67K-K2M1 |

TYPICAL CHARACTERISTICS

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



Figure 1. Forward Current vs. Ambient Temperature



Figure 2. Forward Current vs. Pulse Length



Figure 3. Rel. Luminous Intensity vs. Angular Displacement



Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

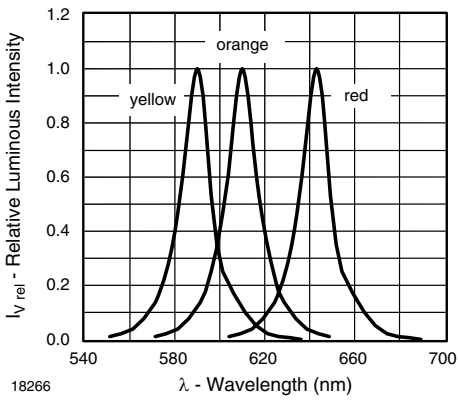


Figure 4. Relative Intensity vs. Wavelength

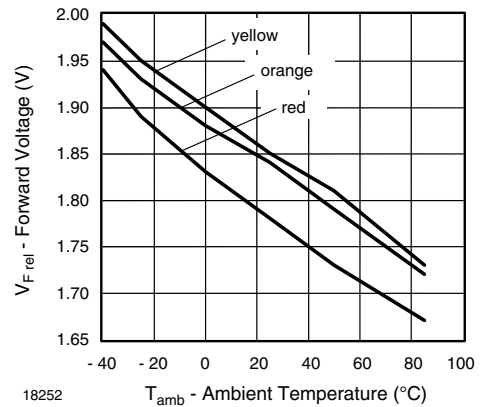


Figure 7. Forward Voltage vs. Ambient Temperature



Figure 5. Forward Current vs. Forward Voltage

PACKAGE DIMENSIONS in millimeters



technical drawings
according to DIN
specifications



Mounting Pad Layout



Drawing-No.: 6.541-5067.01-4
Issue: 5; 04.11.08
20541

METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLM.3 - SERIES)

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDS, TAPE OPTION GS08 (= 1500 PCS.)

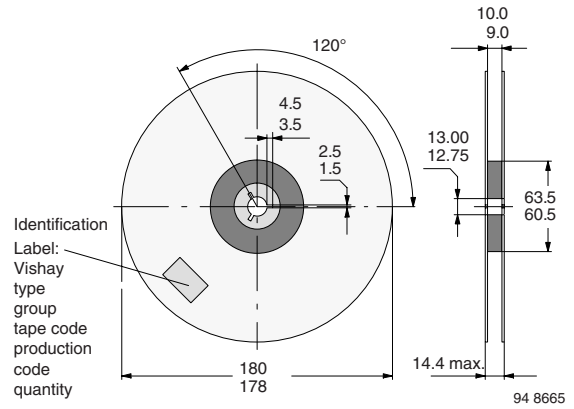


Figure 9. Reel Dimensions - GS08

TAPING OF VLM.3...



Figure 8. Tape Dimensions in mm for PLCC-2

REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDS, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED

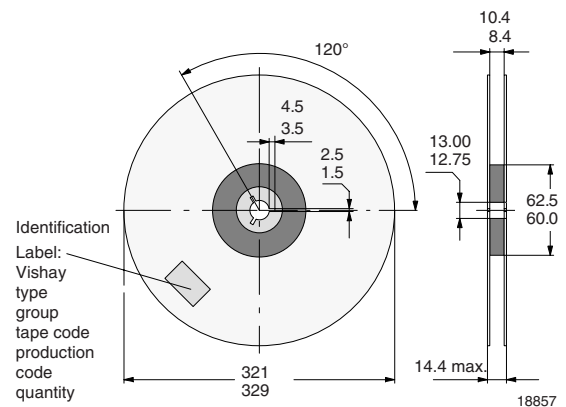


Figure 10. Reel Dimensions - GS18

SOLDERING PROFILE

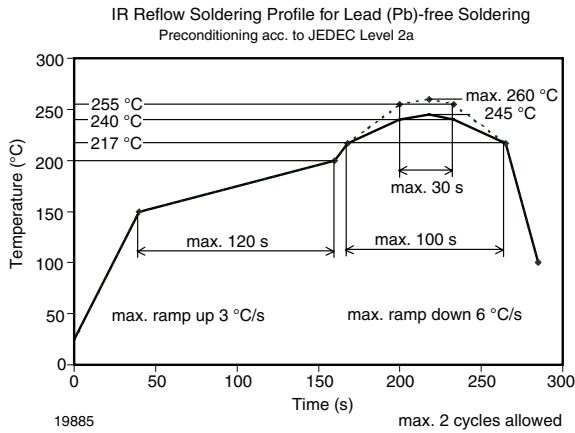


Figure 11. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

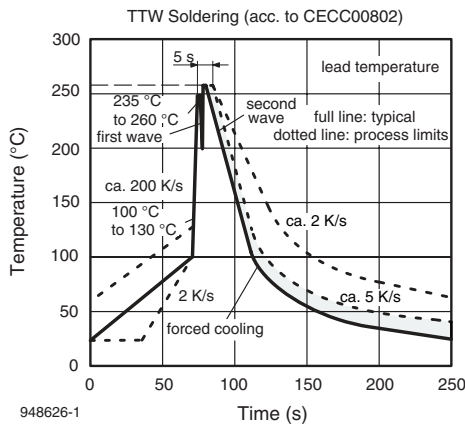
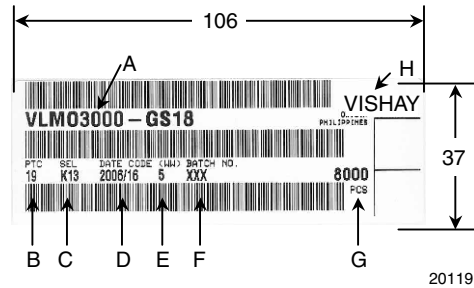


Figure 12. Double Wave Soldering of Opto Devices (all Packages)

BAR CODE PRODUCT LABEL EXAMPLE:



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):
e.g.: K1 = code for luminous intensity group
3 = code for color group
- D) Date code year/week
- E) Day code (e.g. 5: Friday)
- F) Batch no.
- G) Total quantity
- H) Company code



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9