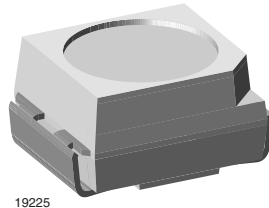


## Power SMD LED in PLCC-2 Package



19225

### DESCRIPTION

The VLMK33.. series is an advanced modification of the Vishay VLMK33.. series. It is designed to incorporate larger chips, therefore, capable of withstanding a 50 mA drive current.

The package of the VLMK33.. is the PLCC-2 (equivalent to a size B tantalum capacitor).

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: power
- Angle of half intensity:  $\pm 60^\circ$

### FEATURES

- Available in 8 mm tape
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Compatible with IR reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020C
- Preconditioning: acc. to JEDEC level 2a
- Automotive qualified
- Lead (Pb)-free device
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### APPLICATIONS

- Interior and exterior lighting
- Indicator and backlighting purposes for audio, video, LCDs, switches, symbols, illuminated advertising etc.
- Illumination purpose, alternative to incandescent lamps
- Automotive qualified
- General use

### PARTS TABLE

| PART            | COLOR, LUMINOUS INTENSITY                      | TECHNOLOGY      |
|-----------------|--|-----------------|
| VLMK33Q2T1-GS08 | Red, $I_V > (90 \text{ to } 355) \text{ mcd}$  | AllnGaP on GaAs |
| VLMK33Q2T1-GS18 | Red, $I_V > (90 \text{ to } 355) \text{ mcd}$  | AllnGaP on GaAs |
| VLMK33R1S2-GS08 | Red, $I_V = (112 \text{ to } 280) \text{ mcd}$ | AllnGaP on GaAs |
| VLMK33R1S2-GS18 | Red, $I_V = (112 \text{ to } 280) \text{ mcd}$ | AllnGaP on GaAs |
| VLMK33S1T1-GS08 | Red, $I_V = (180 \text{ to } 355) \text{ mcd}$ | AllnGaP on GaAs |
| VLMK33S1T1-GS18 | Red, $I_V = (180 \text{ to } 355) \text{ mcd}$ | AllnGaP on GaAs |

| ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> VLMK33.. |  |            |               |      |
|---|--|------------|---------------|------|
| PARAMETER                                       | TEST CONDITION                                       | SYMBOL     | VALUE         | UNIT |
| Reverse voltage <sup>2)</sup>                   |  | $V_R$      | 5             | V    |
| DC Forward current                              |  | $I_F$      | 50            | mA   |
| Power dissipation                               |  | $P_V$      | 130           | 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   |
| Soldering temperature                           | $t \leq 5$ s   | $T_{sd}$   | 260           | °C   |
| Thermal resistance junction/ambient             | mounted on PC board (pad size > 16 mm <sup>2</sup> ) | $R_{thJA}$ | 400           | K/W  |

Note:

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

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

| OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMK33.., RED |                |            |                 |     |      |     |         |
|--|----------------|------------|-----------------|-----|------|-----|---------|
| PARAMETER  | TEST CONDITION | PART       | SYMBOL          | MIN | TYP. | MAX | UNIT    |
| Luminous intensity   | $I_F = 20$ mA  | VLMK33Q2T1 | $I_V$           | 90  |      | 355 | mcd     |
|  |                | VLMK33R1S2 | $I_V$           | 112 |      | 280 | mcd     |
|  |                | VLMK33S1T1 | $I_V$           | 180 |      | 355 | mcd     |
| Luminous flux/Luminous intensity                                   |                |            | $\phi_V/I_V$    |     | 3.14 |     | mlm/mcd |
| Dominant wavelength  | $I_F = 20$ mA  |            | $\lambda_d$     | 611 | 617  | 624 | nm      |
| Peak wavelength  | $I_F = 20$ mA  |            | $\lambda_p$     |     | 624  |     | nm      |
| Spectral bandwidth at 50 % $I_{rel\ max}$                          | $I_F = 20$ mA  |            | $\Delta\lambda$ |     | 18   |     | nm      |
| Angle of half intensity  | $I_F = 20$ mA  |            | $\phi$          |     | ± 60 |     | deg     |
| Forward voltage  | $I_F = 20$ mA  |            | $V_F$           |     | 1.9  | 2.5 | V       |
| Reverse current  | $V_R = 5$ V    |            | $V_R$           |     | 0.01 | 10  | μA      |

Note:

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

| LUMINOUS INTENSITY CLASSIFICATION |                          |     |
|-----------------------------------|--------------------------|-----|
| GROUP                             | LUMINOUS INTENSITY (MCD) |     |
|                                   | MIN                      | MAX |
| Q1                                | 71                       | 90  |
| Q2                                | 90                       | 112 |
| R1                                | 112                      | 140 |
| R2                                | 140                      | 180 |
| S1                                | 180                      | 224 |
| S2                                | 224                      | 280 |
| T1                                | 280                      | 355 |
| T2                                | 355                      | 450 |

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 be not 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 be not orderable.

| COLOR CLASSIFICATION |                          |     |
|----------------------|--------------------------|-----|
| GROUP                | DOMINANT WAVELENGTH (NM) |     |
|                      | RED                      |     |
|                      | MIN                      | MAX |
| 1                    | 611                      | 618 |
| 2                    | 614                      | 622 |
| 3                    |                          |     |
| 4                    |                          |     |
| 5                    |                          |     |
| 6                    |                          |     |

Note:

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

| CROSSING TABLE |             |
|----------------|-------------|
| VISHAY         | OSRAM       |
| VLMK33Q2T1     | LAT676-Q2T1 |
| VLMK33R1S2     | LAT676-R1S2 |
| VLMK33S1T1     | LAT676-S1T1 |

**TYPICAL CHARACTERISTICS**

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

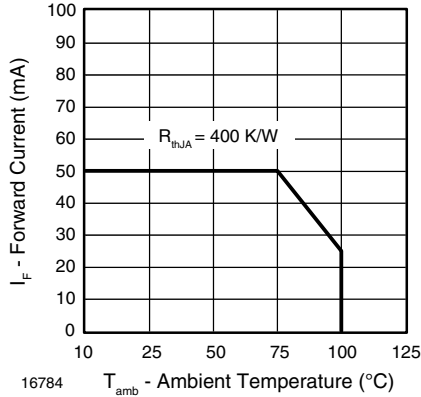


Figure 1. Forward Current vs. Ambient Temperature

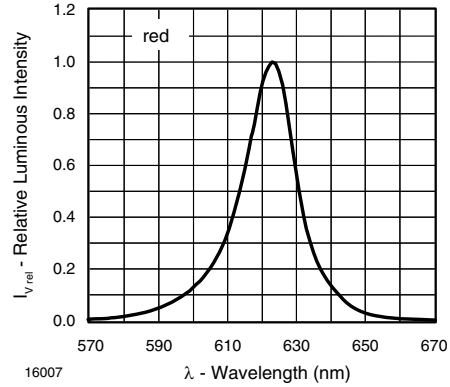


Figure 4. Rel. Luminous Intensity vs. Angular Displacement

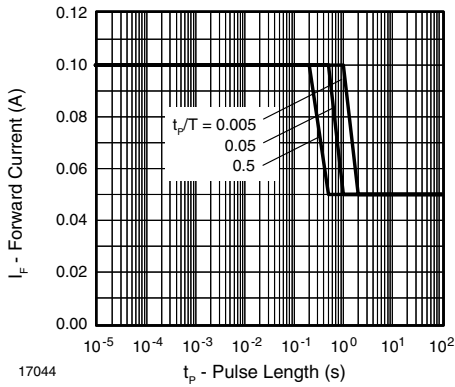


Figure 2. Forward Current vs. Pulse Length

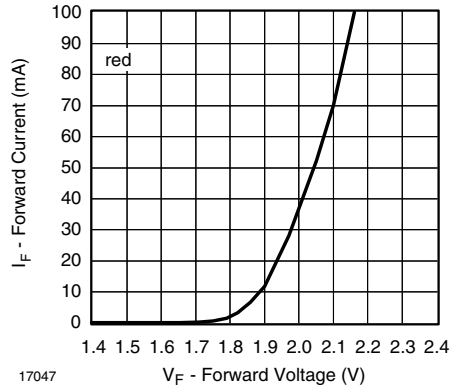


Figure 5. Forward Current vs. Forward Voltage

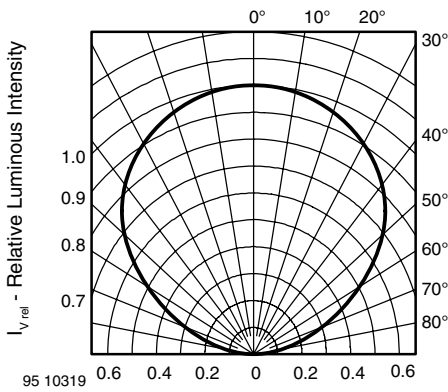


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

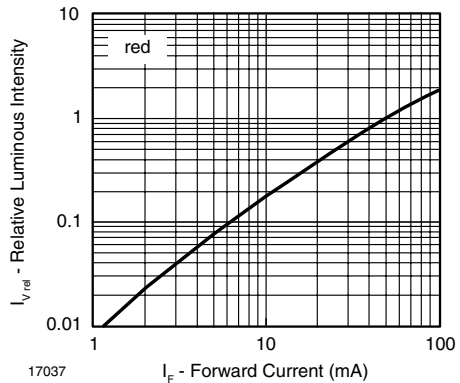


Figure 6. Change of Dominant Wavelength vs. Forward Current

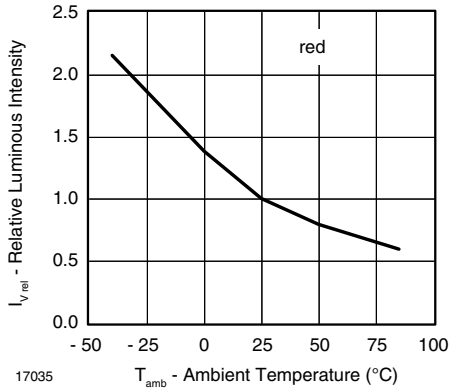


Figure 7. Relative Luminous Intensity vs. Amb. Temperature

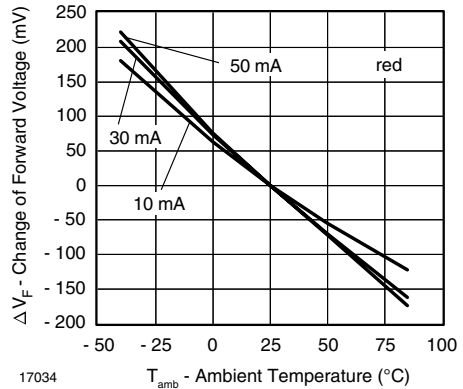


Figure 9. Change of Forward Voltage vs. Ambient Temperature

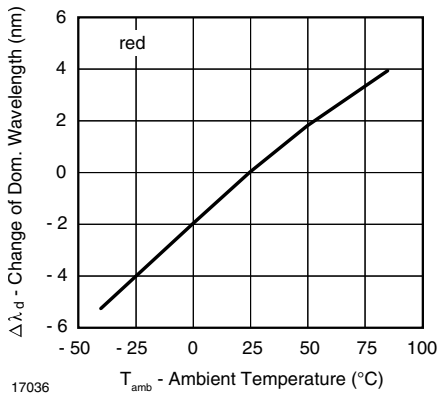
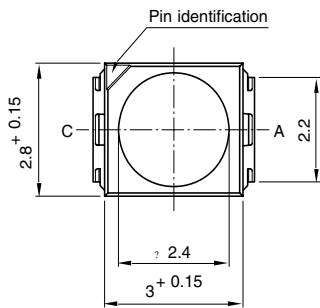
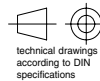
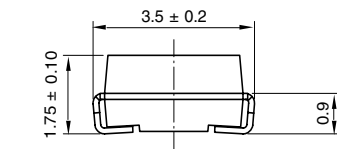
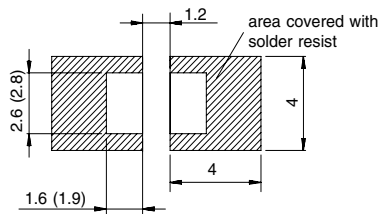


Figure 8. Change of Dominant Wavelength vs. Ambient Temperature

**PACKAGE DIMENSIONS** in millimeters



**Mounting Pad Layout**



Drawing-No.: 6.541-5025.01-4  
 Issue: 8; 22.11.05  
 95 11314-1

**METHOD OF TAPING/POLARITY AND TAPE AND REEL**
**SMD LED (VLM3 - 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.

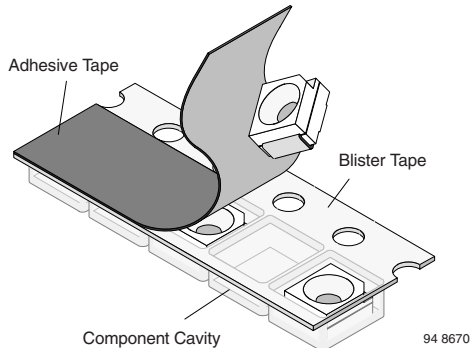
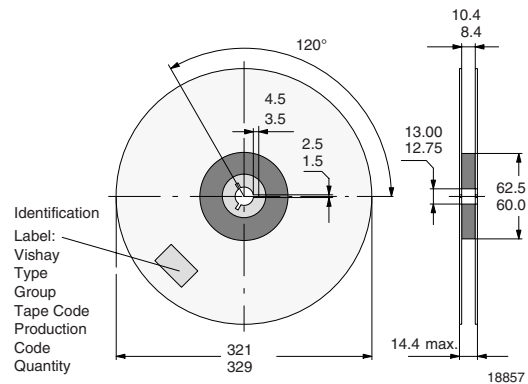

**REEL PACKAGE DIMENSION IN MM FOR SMD LEDs, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED**


Figure 12. Reel dimensions - GS18

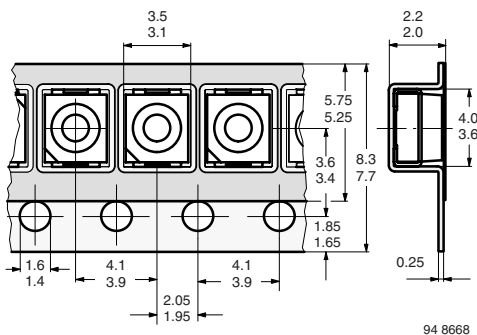
**TAPING OF VLM.3..**


Figure 10. Tape Dimensions in mm for PLCC-2

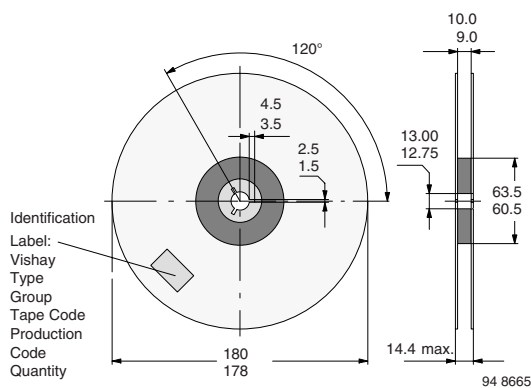
**REEL PACKAGE DIMENSION IN MM FOR SMD LEDs, TAPE OPTION GS08 (= 1500 PCS.)**


Figure 11. Reel Dimensions - GS08

**SOLDERING PROFILE**

IR Reflow Soldering Profile for lead (Pb)-free soldering  
Preconditioning acc. to JEDEC Level 2a

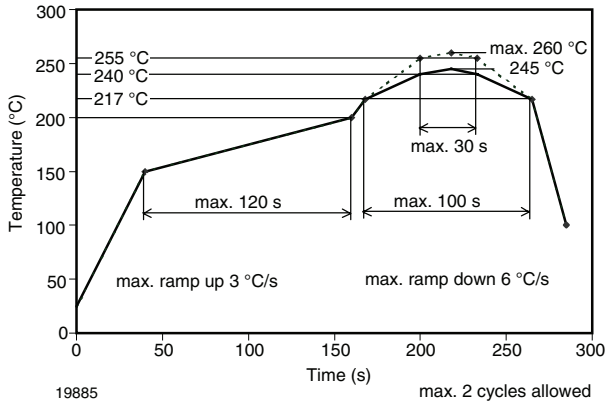


Figure 13. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

TTW Soldering (acc. to CECC00802) 948626-1

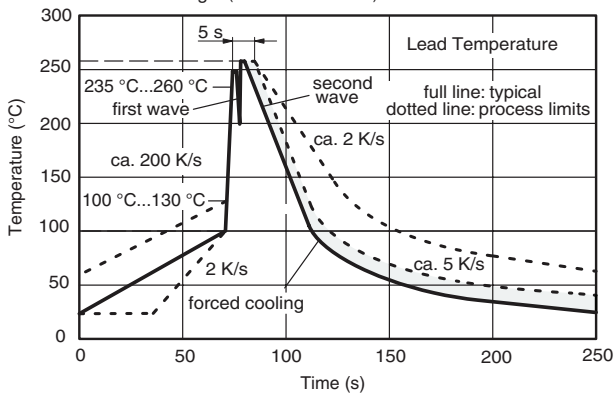


Figure 14. Double Wave Soldering of Opto Devices (all Packages)

**BAR CODE PRODUCT LABEL EXAMPLE:**



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):  
e.g.: Q2 = code for luminous intensity group
- D) Date code year/week
- E) Day code (e.g. 2: Tuesday)
- F) Batch no.
- G) Total quantity
- H) Company code



**OZONE DEPLETING SUBSTANCES POLICY STATEMENT**

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany



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- 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.)

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«FORSTAR» (основан в 1998 г.)

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

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Web: <http://oceanchips.ru/>

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