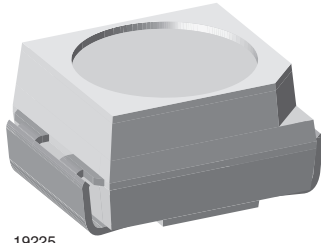




Power SMD LED PLCC-2



19225

DESCRIPTION

The VLM.333.. series is an advanced modification of the Vishay VLM.31.. series. It is designed to incorporate larger chips, therefore, capable of withstanding a 50 mA drive current.

The package of the VLM.333.. 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: power
- Angle of half intensity: $\pm 60^\circ$

FEATURES

- Utilizing latest advanced AllnGaP technology
- Available in 8 mm tape
- Luminous intensity and color categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax}/I_{Vmin} \leq 1.6$
- Thermal resistance $R = 400 \text{ K/W}$
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- Preconditioning according to JEDEC level 2a
- Compatible with reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- Traffic signals and signs
- Interior and exterior lighting
- Dashboard illumination
- Indicator and backlighting purposes for audio, video, LCDs switches, symbols, illuminated advertising etc

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. | | |
| VLMS333T2V2-GS08 | Super red | 355 | 550 | 1120 | 20 | 626 | 630 | 639 | 20 | 1.8 | 2 | 2.6 | 20 | AllnGaP on Si |
| VLMS333T2V2-GS18 | Super red | 355 | 550 | 1120 | 20 | 626 | 630 | 639 | 20 | 1.8 | 2 | 2.6 | 20 | AllnGaP on Si |
| VLMR333U1AA-GS08 | Red | 450 | 750 | 1400 | 20 | 619 | 625 | 631 | 20 | 1.8 | 2 | 2.6 | 20 | AllnGaP on Si |
| VLMR333U1AA-GS18 | Red | 450 | 750 | 1400 | 20 | 619 | 625 | 631 | 20 | 1.8 | 2 | 2.6 | 20 | AllnGaP on Si |
| VLMK333U2AB-GS08 | Amber | 560 | 850 | 1800 | 20 | 611 | 616 | 622 | 20 | 1.8 | 2.1 | 2.6 | 20 | AllnGaP on Si |
| VLMK333U2AB-GS18 | Amber | 560 | 850 | 1800 | 20 | 611 | 616 | 622 | 20 | 1.8 | 2.1 | 2.6 | 20 | AllnGaP on Si |
| VLMO333U2AB-GS08 | Soft orange | 560 | 950 | 1800 | 20 | 600 | 605 | 611 | 20 | 1.8 | 2.1 | 2.6 | 20 | AllnGaP on Si |
| VLMO333U2AB-GS18 | Soft orange | 560 | 950 | 1800 | 20 | 600 | 605 | 611 | 20 | 1.8 | 2.1 | 2.6 | 20 | AllnGaP on Si |
| VLMY333U1AA-GS08 | Yellow | 450 | 750 | 1400 | 20 | 583 | 589 | 594 | 20 | 1.8 | 2.15 | 2.6 | 20 | AllnGaP on Si |
| VLMY333U1AA-GS18 | Yellow | 450 | 750 | 1400 | 20 | 583 | 589 | 594 | 20 | 1.8 | 2.15 | 2.6 | 20 | AllnGaP on Si |

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

VLM.333...

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--|-------------------|---------------|------|
| Reverse voltage ⁽¹⁾ | Short term application only | V _R | 5 | V |
| DC forward current | T _{amb} ≤ 73 °C (400 K/W) | 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 |
| Thermal resistance junction/ambient | Mounted on PC board (pad size > 16 mm ²) | R _{thJA} | 400 | 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) | | | | | | | |
|--|----------------------|-------------|-----------------|------|----------|------|---------------|
| VLMS333.., SUPER RED | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 20\text{ mA}$ | VLMS333T2V2 | I_V | 355 | 550 | 1120 | mcd |
| Luminous flux/luminous intensity | | | ϕ_V/I_V | - | 3 | - | mlm/mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | 626 | 630 | 639 | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 639 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 18 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | φ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | 1.8 | 2 | 2.6 | V |
| Reverse current | $V_R = 5\text{ V}$ | | I_R | - | 0.01 | 10 | μA |

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|----------------------|-------------|-----------------|------|----------|------|---------------|
| VLMR333.., RED | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 20\text{ mA}$ | VLMR333U1AA | I_V | 450 | 750 | 1400 | mcd |
| Luminous flux/luminous intensity | | | ϕ_V/I_V | - | 3 | - | mlm/mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | 619 | 625 | 631 | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 632 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 18 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | φ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | 1.8 | 2 | 2.6 | V |
| Reverse current | $V_R = 5\text{ V}$ | | I_R | - | 0.01 | 10 | μA |

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|----------------------|-------------|-----------------|------|----------|------|---------------|
| VLMK333.., AMBER | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 20\text{ mA}$ | VLMK333U2AB | I_V | 560 | 850 | 1800 | mcd |
| Luminous flux/luminous intensity | | | ϕ_V/I_V | - | 3 | - | mlm/mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | 611 | 616 | 622 | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 622 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 18 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | φ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | 1.8 | 2.1 | 2.6 | V |
| Reverse current | $V_R = 5\text{ V}$ | | I_R | - | 0.01 | 10 | μA |

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|----------------------|-------------|-----------------|------|----------|------|---------------|
| VLMO333.., SOFT ORANGE | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 20\text{ mA}$ | VLMO333U2AB | I_V | 560 | 950 | 1800 | mcd |
| Luminous flux/luminous intensity | | | ϕ_V/I_V | - | 3 | - | mlm/mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | 600 | 605 | 611 | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 611 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 17 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | φ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | 1.8 | 2.1 | 2.6 | V |
| Reverse current | $V_R = 5\text{ V}$ | | I_R | - | 0.01 | 10 | μA |



| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|----------------------|-------------|-----------------|------|----------|------|---------------|
| VLMY333.., YELLOW | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 20\text{ mA}$ | VLMY333U1AA | I_V | 450 | 750 | 1400 | mcd |
| Luminous flux/luminous intensity | | | ϕ_V/I_V | - | 3 | - | mlm/mcd |
| Dominant wavelength | $I_F = 20\text{ mA}$ | | λ_d | 583 | 589 | 594 | nm |
| Peak wavelength | $I_F = 20\text{ mA}$ | | λ_p | - | 591 | - | nm |
| Spectral bandwidth at 50 % $I_{rel\ max.}$ | $I_F = 20\text{ mA}$ | | $\Delta\lambda$ | - | 17 | - | nm |
| Angle of half intensity | $I_F = 20\text{ mA}$ | | φ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | 1.8 | 2.15 | 2.6 | V |
| Reverse current | $V_R = 5\text{ V}$ | | I_R | - | 0.01 | 10 | μA |

| COLOR CLASSIFICATION | | | | | | |
|-----------------------------|----------------------|------|-------------|------|--------|------|
| GROUP | DOM. WAVELENGTH (nm) | | | | | |
| | AMBER | | SOFT ORANGE | | YELLOW | |
| | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. |
| 1 | 611 | 618 | | | | |
| 2 | 614 | 622 | 600 | 603 | 583 | 586 |
| 3 | | | 602 | 605 | 585 | 588 |
| 4 | | | 604 | 607 | 587 | 590 |
| 5 | | | 606 | 609 | 589 | 592 |
| 6 | | | 608 | 611 | 591 | 594 |

Note

- Wavelengths are tested at a current pulse duration of 25 ms.

| LUMINOUS INTENSITY CLASSIFICATION | | | |
|--|-----------------------|----------|-------------|
| GROUP | LIGHT INTENSITY (mcd) | | |
| | STANDARD | OPTIONAL | MIN. / MAX. |
| T | 2 | | 355 / 450 |
| U | 1 | | 450 / 560 |
| | 2 | | 560 / 710 |
| V | 1 | | 710 / 900 |
| | 2 | | 900 / 1120 |
| A | A | | 1120 / 1400 |
| | B | | 1400 / 1800 |

| CROSSING TABLE | |
|-----------------------|-------------------|
| VISHAY | OSRAM |
| VLMS333T2V2 | LS T67F-T2V2-1-1 |
| VLMR333U1AA | LR T67F-U1AA-1-1 |
| VLMK333U2AB | LA T67F-U2AB-24-1 |
| VLMO333U2AB | LO T67F-U2AB-24-1 |
| VLMY333U1AA | LY T67F-U1AA-36-1 |

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 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.



TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

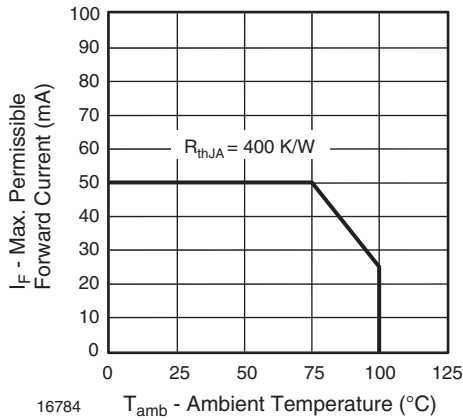


Fig. 1 - Maximum Permissible Forward Current vs. Ambient Temperature

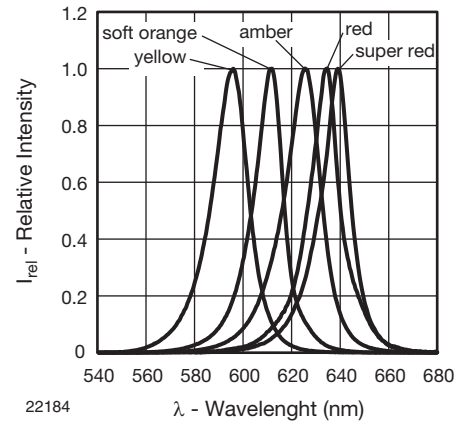


Fig. 4 - Relative Intensity vs. Wavelength

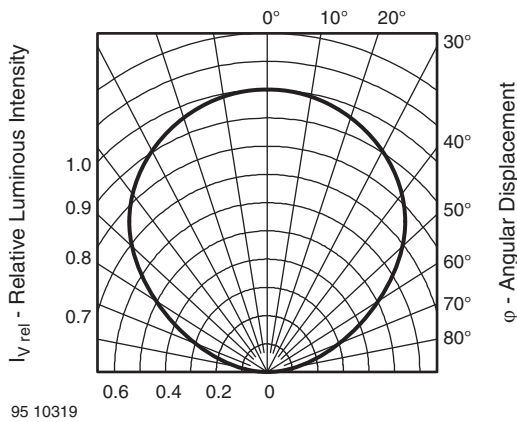


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

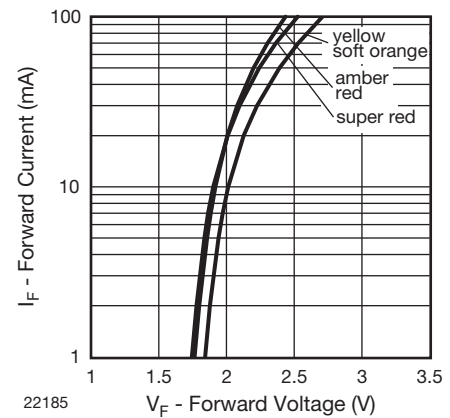


Fig. 5 - Forward Current vs. Forward Voltage

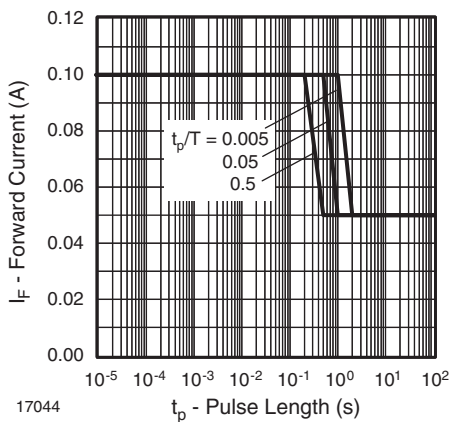


Fig. 3 - Forward Current vs. Pulse Length

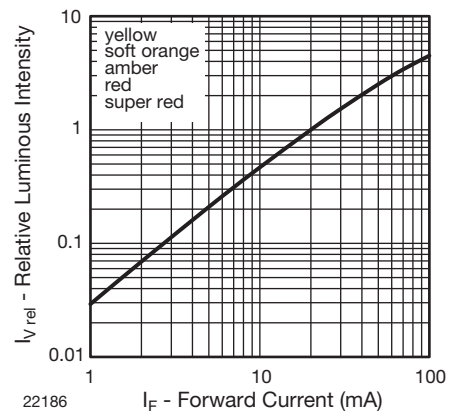


Fig. 6 - Relative Luminous Intensity vs. Forward Current

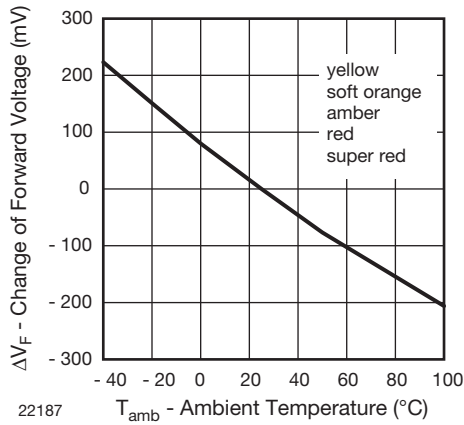


Fig. 7 - Change of Forward Voltage vs. Ambient Temperature

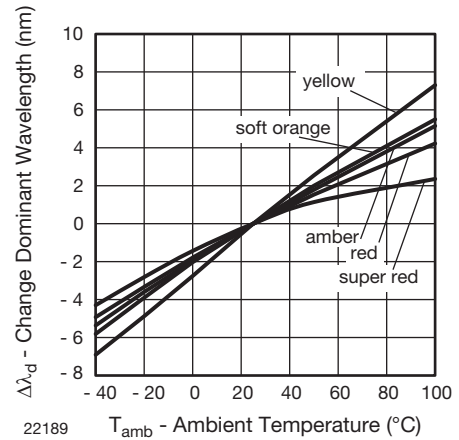


Fig. 9 - Change of Dominant Wavelength vs. Ambient Temperature

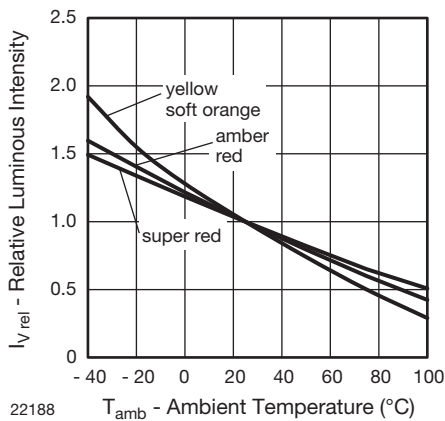
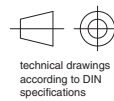
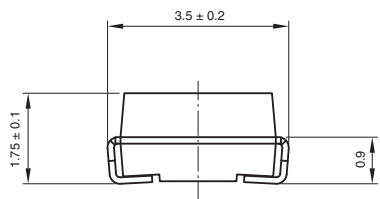
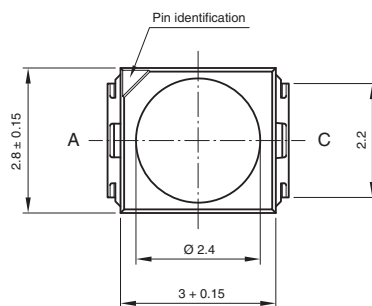


Fig. 8 - Relative Luminous Intensity vs. Ambient Temperature

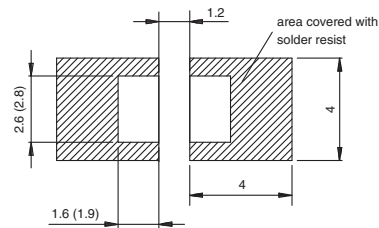
PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications



Mounting Pad Layout



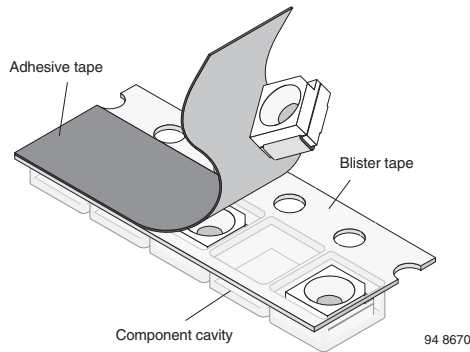
Drawing-No.: 6.541-5067.02-4
Issue: 4; 19.07.10
20767



METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLMx333..-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 GS18 (= 8000 PCS.) PREFERRED

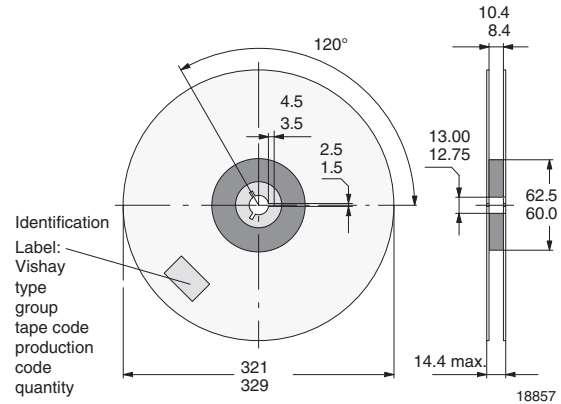


Fig. 12 - Reel Dimensions - GS18

TAPING OF VLMx333..

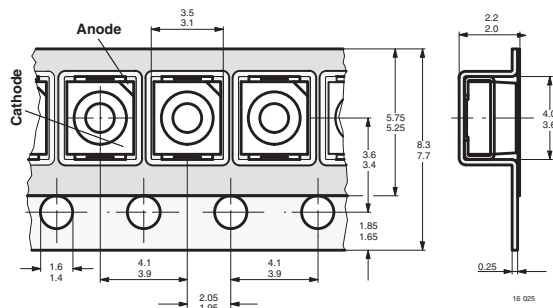


Fig. 10 - Tape Dimensions in mm for PLCC-2

SOLDERING PROFILE

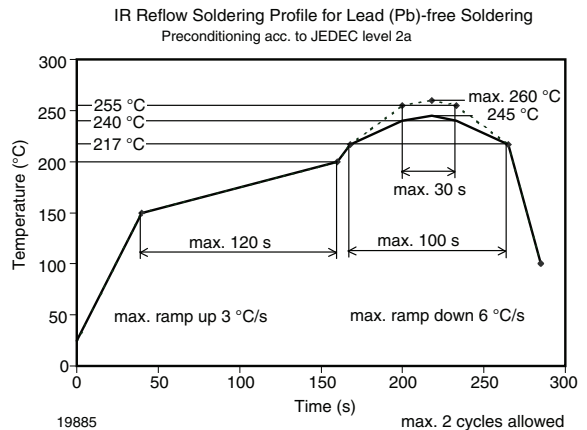


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

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

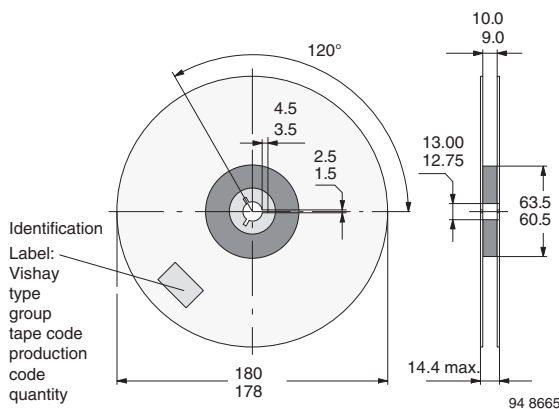


Fig. 11 - Reel Dimensions - GS08

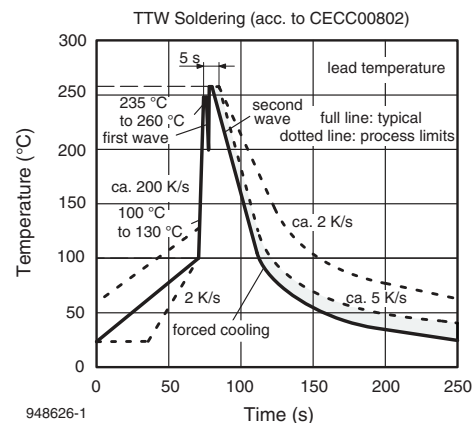
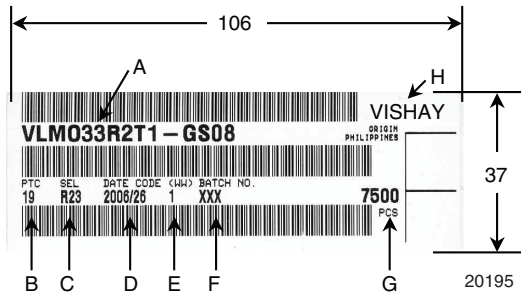


Fig. 14 - Double Wave Soldering of Opto Devices (all Packages)



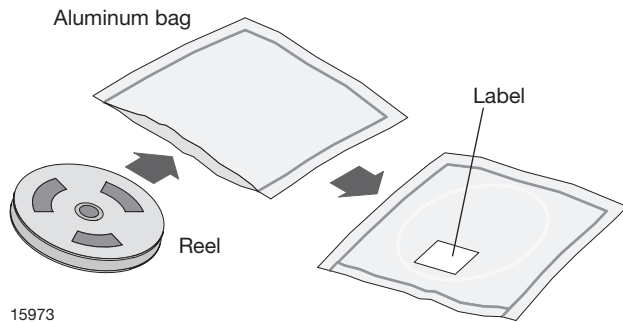
BAR CODE PRODUCT LABEL (example)



- A. Type of component
B. Manufacturing plant
C. SEL - selection code (bin)
D. Date code year/week
E. Day code (e.g. 1: Monday)
F. Batch no.
G. Total quantity
H. Company code

DRY PACKING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

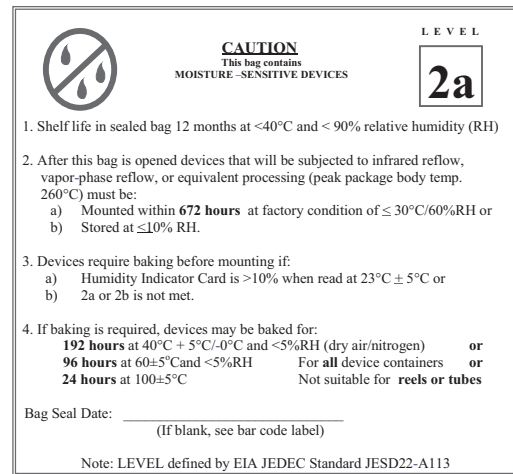
Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
Storage humidity ≤ 60 % RH max.

After more than 672 h under these conditions moisture content will be too high for reflow soldering.

In case of moisture absorption, the devices will recover to the former condition by drying under the following condition: 192 h at 40 °C + 5 °C/- 0 °C and < 5 % RH (dry air/nitrogen) or 96 h at 60 °C + 5 °C and < 5 % RH for all device containers or 24 h at 100 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC standard JESD22-A112 level 2a label is included on all dry bags.



Example of JESD22-A112 level 2a label

ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electro-static sensitive devices warning labels are on the packaging.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABEL

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

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Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

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