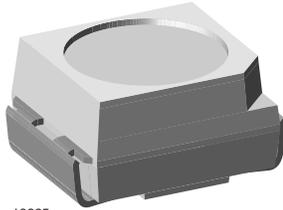


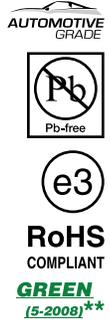
Standard SMD LED PLCC-2



19225

FEATURES

- High efficient InGaN technology
- EIA and ICE standard package
- Compatible with IR reflow, vapor phase and wave solder processes acc. to CECC 00802 and J-STD-020
- Available in 8 mm tape reel
- Preconditioning: according to JEDEC level 2a
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- ESD-withstand voltage: up to 2 kV HBM according to JESD22-A114-B



DESCRIPTION

This device has been designed to meet the increasing demand for InGaN true green SMD LED.

The package of the VLMTG41.. is the PLCC-2.

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled 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
- Backlighting for audio and video equipment
- Backlighting in office equipment
- Indoor and outdoor message boards
- Flat backlight for LCDs, switches and symbols
- Illumination purposes, alternative to incandescent lamps
- General use

PARTS TABLE

| PART | COLOR, LUMINOUS INTENSITY | TECHNOLOGY |
|------------------|---|-------------------|
| VLMTG41S2U1-GS08 | True green, $I_V = (224 \text{ to } 560) \text{ mcd}$ | InGaN on Sapphire |
| VLMTG41S2U1-GS18 | True green, $I_V = (224 \text{ to } 560) \text{ mcd}$ | InGaN on Sapphire |

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified) VLMTG41..

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--|------------|---------------|------------------|
| DC forward current | $T_{amb} \leq 80^\circ\text{C}$ | I_F | 20 | mA |
| Surge forward current | $t_p \leq 10 \mu\text{s}$ | I_{FSM} | 0.1 | A |
| Power dissipation | | P_V | 84 | mW |
| Junction temperature | | T_j | 110 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | - 40 to + 100 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Mounted on PC board (pad size > 16 mm ²) | R_{thJA} | 360 | K/W |

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
VLMTG41.., TRUE GREEN

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|----------------------|-------------|-------------|------|----------|------|------|
| Luminous intensity | $I_F = 10\text{ mA}$ | VLMTG41S2U1 | I_V | 224 | 380 | 560 | mcd |
| Dominant wavelength | $I_F = 10\text{ mA}$ | | λ_d | 515 | 530 | 541 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | | 520 | | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | ϕ | | ± 60 | | deg |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | | 3.2 | 4.2 | V |
| Temperature coefficient of V_F | $I_F = 10\text{ mA}$ | | TC_{VF} | | -4 | | mV/K |
| Temperature coefficient of I_V | $I_F = 10\text{ mA}$ | | TC_{IV} | | -0.25 | | %/K |

Note:
 Not designed for reverse operation

LUMINOUS INTENSITY CLASSIFICATION

| GROUP | LIGHT INTENSITY (mcd) | | | |
|-------|-----------------------|----------|------|------|
| | STANDARD | OPTIONAL | MIN. | MAX. |
| S | 2 | 224 | 280 | |
| T | 1 | 280 | 355 | |
| | 2 | 355 | 450 | |
| U | 1 | 450 | 560 | |

Note:
 Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of $\pm 11\%$.
 These 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 are 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 are not be orderable.

COLOR CLASSIFICATION

| GROUP | TRUE GREEN | |
|-------|----------------------|------|
| | DOM. WAVELENGTH (nm) | |
| | MIN. | MAX. |
| 3 | 515 | 523 |
| 4 | 521 | 529 |
| 5 | 527 | 535 |
| 6 | 533 | 541 |

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

CROSSING TABLE

| VISHAY | OSRAM |
|-------------|------------|
| VLMTG41S2U1 | LTT67CS2U1 |

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

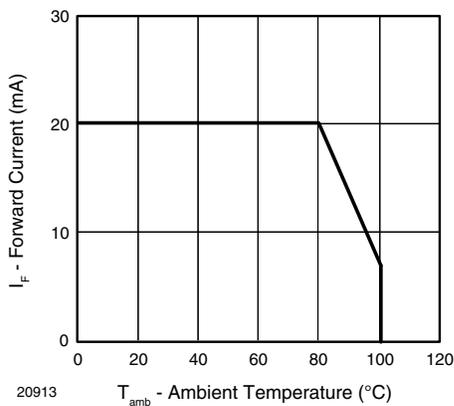


Figure 1. Forward Current vs. Ambient Temperature

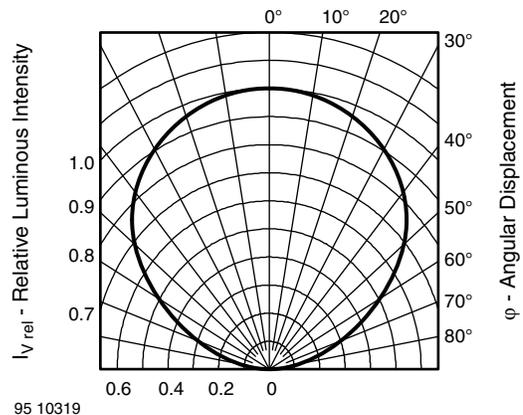


Figure 2. Rel. Luminous Intensity vs. Angular Displacement

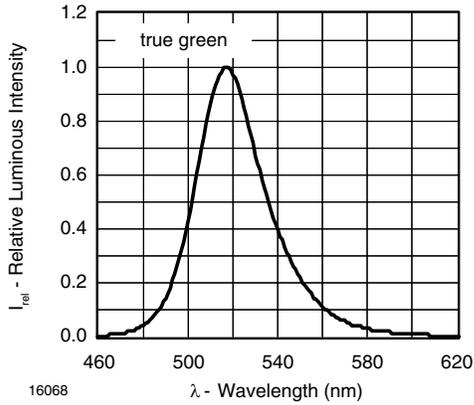


Figure 3. Relative Luminous Intensity vs. Wavelength

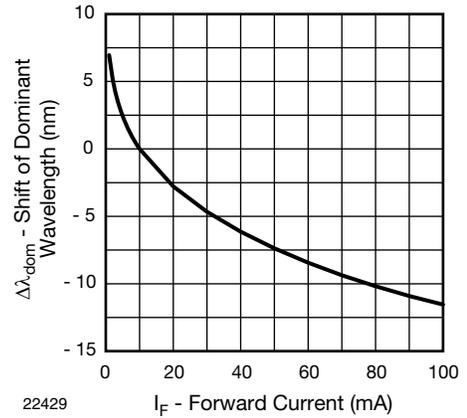


Figure 6. Shift of Dominant Wavelength vs. Forward Current

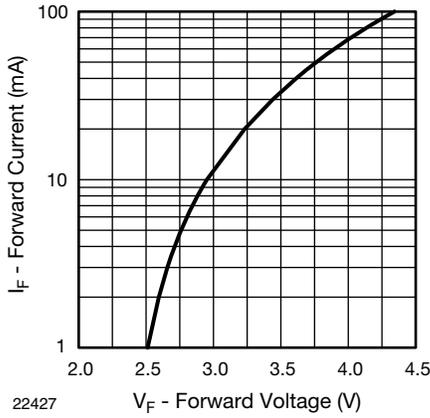


Figure 4. Forward Current vs. Forward Voltage

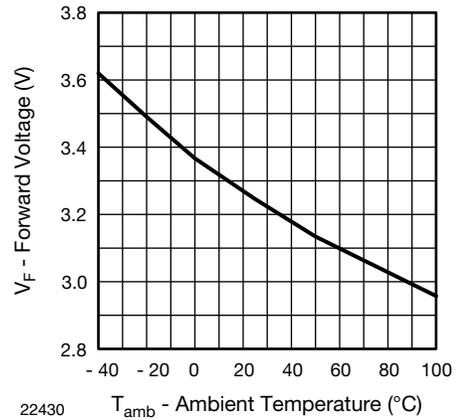


Figure 7. Forward Voltage vs. Ambient Temperature

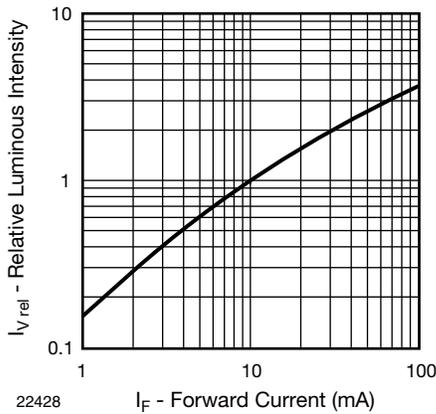


Figure 5. Relative Luminous Intensity vs. Forward Current

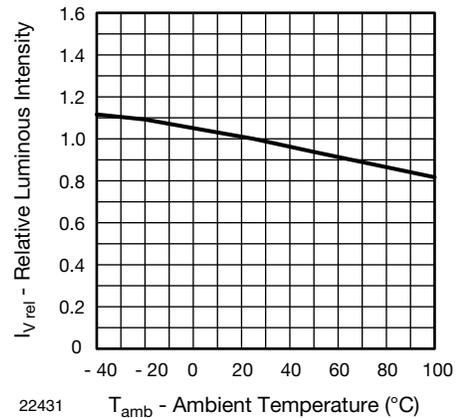


Figure 8. Rel. Luminous Intensity vs. Ambient Temperature

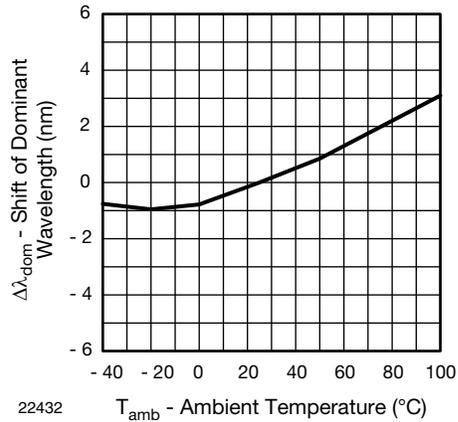
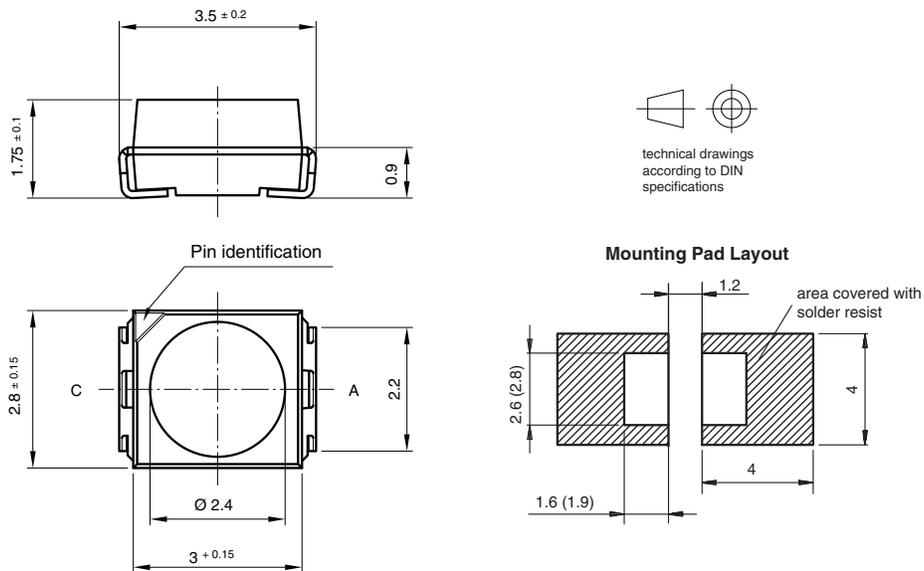
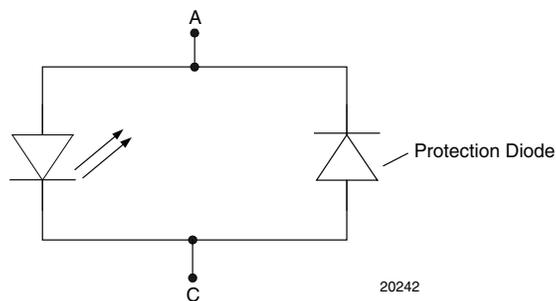


Figure 9. Shift of Dominant Wavelength vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



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

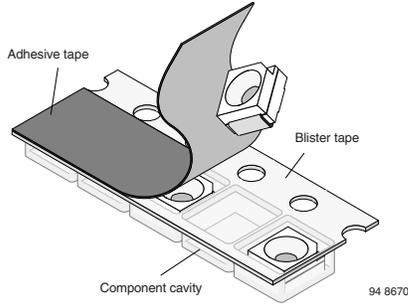


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METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLM.3.../4... - 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.



TAPING OF VLM.3.../4...

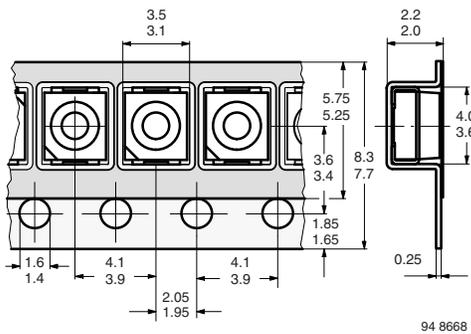


Figure 10. Tape Dimensions in mm for PLCC-2

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

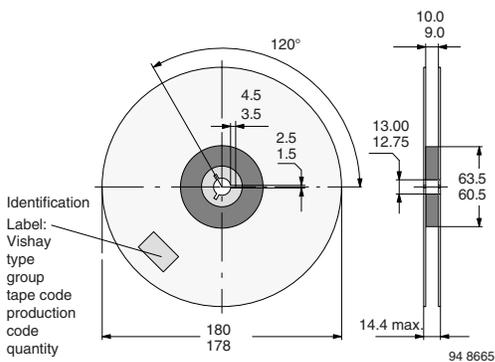


Figure 11. Reel Dimensions - GS08

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

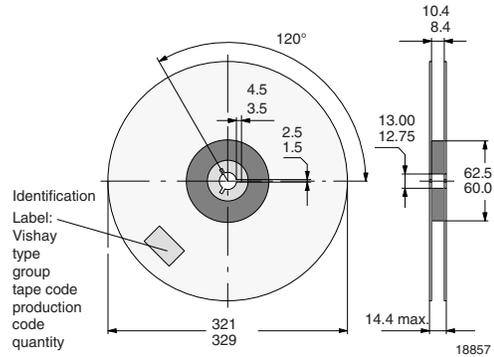


Figure 12. Reel Dimensions - GS18

SOLDERING PROFILE

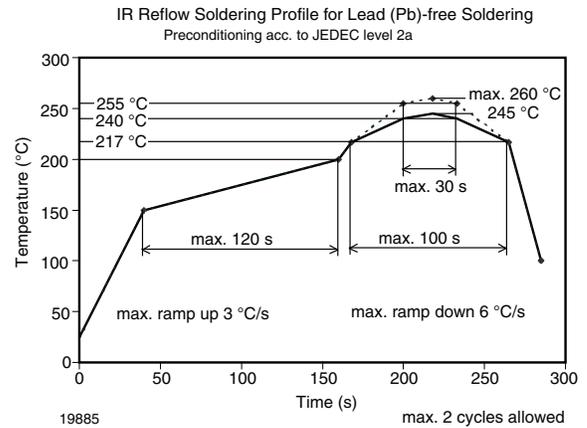


Figure 13. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

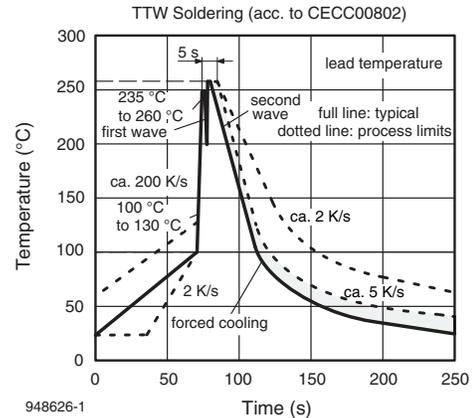
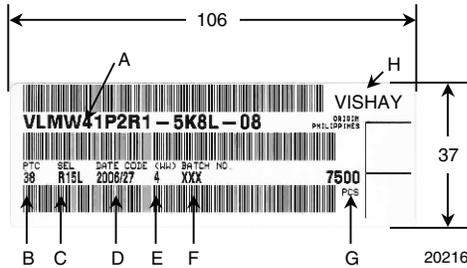


Figure 14. Double Wave Soldering of Opto Devices (all Packages)

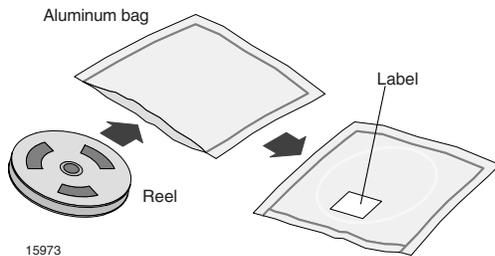
BAR CODE PRODUCT LABEL EXAMPLE:



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):
e.g.: R1 = code for luminous intensity group
5L = code for chrom. coordinate group
- D) Date code year/week
- E) Day code (e.g. 4: Thursday)
- 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:

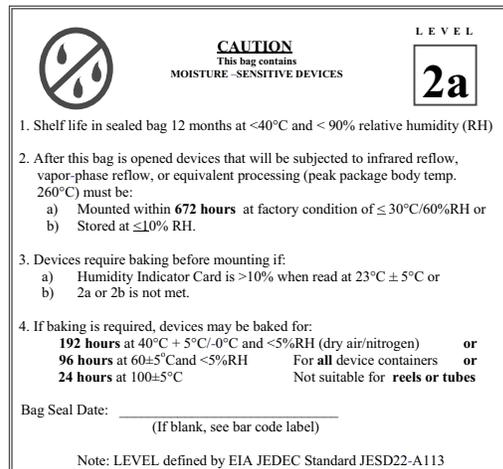
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

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 LABELS

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.



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