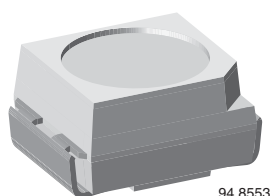


## Standard SMD LED PLCC-2



### DESCRIPTION

These devices have been designed to meet the increasing demand for surface mounting technology.

The package of the VLM.310. is the PLCC-2.

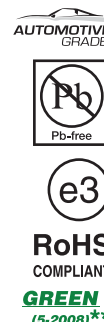
It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

### PRODUCT GROUP AND PACKAGE DATA

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

### FEATURES

- SMD LEDs with exceptional brightness
- Luminous intensity categorized
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Compatible with infrared, 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
- Low power consumption
- Luminous intensity ratio in one packaging unit  $I_{Vmax}/I_{Vmin.} \leq 1.6$
- Preconditioning: acc. to JEDEC level 2a
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- AEC-Q101 qualified



### 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   |
|---------------|-------------------------------------------------|--------------|
| VLMH3100-GS08 | Red, $I_V > 2.8$ mcd                            | GaAsP on GaP |
| VLMH3100-GS18 | Red, $I_V > 2.8$ mcd                            | GaAsP on GaP |
| VLMH3101-GS08 | Red, $I_V = (4.5 \text{ to } 11.2)$ mcd         | GaAsP on GaP |
| VLMH3101-GS18 | Red, $I_V = (4.5 \text{ to } 11.2)$ mcd         | GaAsP on GaP |
| VLMH3102-GS08 | Red, $I_V = (7.1 \text{ to } 18)$ mcd           | GaAsP on GaP |
| VLMH3102-GS18 | Red, $I_V = (7.1 \text{ to } 18)$ mcd           | GaAsP on GaP |
| VLMO3100-GS08 | Soft orange, $I_V > 2.8$ mcd                    | GaAsP on GaP |
| VLMO3100-GS18 | Soft orange, $I_V > 2.8$ mcd                    | GaAsP on GaP |
| VLMO3101-GS08 | Soft orange, $I_V = (4.5 \text{ to } 11.2)$ mcd | GaAsP on GaP |
| VLMO3101-GS18 | Soft orange, $I_V = (4.5 \text{ to } 11.2)$ mcd | GaAsP on GaP |
| VLMY3100-GS08 | Yellow, $I_V > 2.8$ mcd                         | GaAsP on GaP |
| VLMY3100-GS18 | Yellow, $I_V > 2.8$ mcd                         | GaAsP on GaP |
| VLMY3101-GS08 | Yellow, $I_V = (4.5 \text{ to } 11.2)$ mcd      | GaAsP on GaP |
| VLMY3101-GS18 | Yellow, $I_V = (4.5 \text{ to } 11.2)$ mcd      | GaAsP on GaP |

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?999902](http://www.vishay.com/doc?999902)

# PARTS TABLE

| PART          | COLOR, LUMINOUS INTENSITY                             | TECHNOLOGY   |
|---------------|-------------------------------------------------------|--------------|
| VLMY3102-GS08 | Yellow, $I_V = (7.1 \text{ to } 18) \text{ mcd}$      | GaAsP on GaP |
| VLMY3102-GS18 | Yellow, $I_V = (7.1 \text{ to } 18) \text{ mcd}$      | GaAsP on GaP |
| VLMG3100-GS08 | Green, $I_V > 4.5 \text{ mcd}$                        | GaP on GaP   |
| VLMG3100-GS18 | Green, $I_V > 4.5 \text{ mcd}$                        | GaP on GaP   |
| VLMG3102-GS08 | Green, $I_V = (11.2 \text{ to } 18) \text{ mcd}$      | GaP on GaP   |
| VLMG3102-GS18 | Green, $I_V = (11.2 \text{ to } 18) \text{ mcd}$      | GaP on GaP   |
| VLMG3105-GS08 | Green, $I_V = (7.1 \text{ to } 18) \text{ mcd}$       | GaP on GaP   |
| VLMG3105-GS18 | Green, $I_V = (7.1 \text{ to } 18) \text{ mcd}$       | GaP on GaP   |
| VLMP3100-GS08 | Pure green, $I_V > 1.12 \text{ mcd}$                  | GaP on GaP   |
| VLMP3100-GS18 | Pure green, $I_V > 1.12 \text{ mcd}$                  | GaP on GaP   |
| VLMP3101-GS08 | Pure green, $I_V = (1.8 \text{ to } 4.5) \text{ mcd}$ | GaP on GaP   |
| VLMP3101-GS18 | Pure green, $I_V = (1.8 \text{ to } 4.5) \text{ mcd}$ | GaP on GaP   |
| VLMP3107-GS08 | Pure green, $I_V = (2.8 \text{ to } 5.6) \text{ mcd}$ | GaP on GaP   |
| VLMP3107-GS18 | Pure green, $I_V = (2.8 \text{ to } 5.6) \text{ mcd}$ | GaP on GaP   |
| VLMP3102-GS08 | Pure green, $I_V = (2.8 \text{ to } 7.1) \text{ mcd}$ | GaP on GaP   |
| VLMP3102-GS18 | Pure green, $I_V = (2.8 \text{ to } 7.1) \text{ mcd}$ | GaP on GaP   |

# ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> VLMG310., VLMH310., VLMO310., VLMP310., VLMY310.

| PARAMETER                           | TEST CONDITION                                       | SYMBOL     | VALUE         | UNIT             |
|-------------------------------------|------------------------------------------------------|------------|---------------|------------------|
| Reverse voltage                     |                                                      | $V_R$      | 6             | V                |
| DC forward current                  | $T_{amb} \leq 60^\circ\text{C}$                      | $I_F$      | 30            | mA               |
| Surge forward current               | $t_p \leq 10 \mu\text{s}$                            | $I_{FSM}$  | 0.5           | A                |
| Power dissipation                   | $T_{amb} \leq 60^\circ\text{C}$                      | $P_V$      | 100           | mW               |
| Junction temperature                |                                                      | $T_j$      | 100           | $^\circ\text{C}$ |
| Operating temperature range         |                                                      | $T_{amb}$  | - 40 to + 100 | $^\circ\text{C}$ |
| Storage temperature range           |                                                      | $T_{stg}$  | - 40 to + 100 | $^\circ\text{C}$ |
| Soldering temperature               | $t \leq 5 \text{ s}$                                 | $T_{sd}$   | 260           | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Mounted on PC board (pad size > 16 mm <sup>2</sup> ) | $R_{thJA}$ | 400           | K/W              |

Note:

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

# OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMH310., RED

| PARAMETER                        | TEST CONDITION               | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|----------------------------------|------------------------------|----------|-------------|------|----------|------|------|
| Luminous intensity <sup>2)</sup> | $I_F = 10 \text{ mA}$        | VLMH3100 | $I_V$       | 2.8  | 10       |      | mcd  |
|                                  |                              | VLMH3101 | $I_V$       | 4.5  |          | 11.2 | mcd  |
|                                  |                              | VLMH3102 | $I_V$       | 7.1  |          | 18   | mcd  |
| Dominant wavelength              | $I_F = 10 \text{ mA}$        |          | $\lambda_d$ | 612  |          | 625  | nm   |
| Peak wavelength                  | $I_F = 10 \text{ mA}$        |          | $\lambda_p$ |      | 635      |      | nm   |
| Angle of half intensity          | $I_F = 10 \text{ mA}$        |          | $\varphi$   |      | $\pm 60$ |      | deg  |
| Forward voltage                  | $I_F = 20 \text{ mA}$        |          | $V_F$       |      | 2        | 2.8  | V    |
| Reverse voltage                  | $I_R = 10 \mu\text{A}$       |          | $V_R$       | 6    | 15       |      | V    |
| Junction capacitance             | $V_R = 0, f = 1 \text{ MHz}$ |          | $C_j$       |      | 15       |      | pF   |

Notes:

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

<sup>2)</sup> In one packing unit  $I_{Vmax}/I_{Vmin.} \leq 1.6$

**OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMO310., SOFT ORANGE**

| PARAMETER                        | TEST CONDITION               | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|----------------------------------|------------------------------|----------|-------------|------|----------|------|------|
| Luminous intensity <sup>2)</sup> | $I_F = 10 \text{ mA}$        | VLMO3100 | $I_V$       | 2.8  | 8        |      | mcd  |
|                                  |                              | VLMO3101 | $I_V$       | 4.5  |          | 11.2 | mcd  |
| Dominant wavelength              | $I_F = 10 \text{ mA}$        |          | $\lambda_d$ | 598  |          | 611  | nm   |
| Peak wavelength                  | $I_F = 10 \text{ mA}$        |          | $\lambda_p$ |      | 605      |      | nm   |
| Angle of half intensity          | $I_F = 10 \text{ mA}$        |          | $\phi$      |      | $\pm 60$ |      | deg  |
| Forward voltage                  | $I_F = 20 \text{ mA}$        |          | $V_F$       |      | 2        | 2.8  | V    |
| Reverse voltage                  | $I_R = 10 \mu\text{A}$       |          | $V_R$       | 6    | 15       |      | V    |
| Junction capacitance             | $V_R = 0, f = 1 \text{ MHz}$ |          | $C_j$       |      | 15       |      | pF   |

Notes:

<sup>1)</sup>  $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified<sup>2)</sup> In one packing unit  $I_{V\text{max.}}/I_{V\text{min.}} \leq 1.6$ **OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMY310., YELLOW**

| PARAMETER                        | TEST CONDITION               | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|----------------------------------|------------------------------|----------|-------------|------|----------|------|------|
| Luminous intensity <sup>2)</sup> | $I_F = 10 \text{ mA}$        | VLMY3100 | $I_V$       | 2.8  | 10       |      | mcd  |
|                                  |                              | VLMY3101 | $I_V$       | 4.5  |          | 11.2 | mcd  |
|                                  |                              | VLMY3102 | $I_V$       | 7.1  |          | 18   | mcd  |
| Dominant wavelength              | $I_F = 10 \text{ mA}$        |          | $\lambda_d$ | 581  |          | 594  | nm   |
| Peak wavelength                  | $I_F = 10 \text{ mA}$        |          | $\lambda_p$ |      | 585      |      | nm   |
| Angle of half intensity          | $I_F = 10 \text{ mA}$        |          | $\phi$      |      | $\pm 60$ |      | deg  |
| Forward voltage                  | $I_F = 20 \text{ mA}$        |          | $V_F$       |      | 2.1      | 2.8  | V    |
| Reverse voltage                  | $I_R = 10 \mu\text{A}$       |          | $V_R$       | 6    | 15       |      | V    |
| Junction capacitance             | $V_R = 0, f = 1 \text{ MHz}$ |          | $C_j$       |      | 15       |      | pF   |

Notes:

<sup>1)</sup>  $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified<sup>2)</sup> In one packing unit  $I_{V\text{max.}}/I_{V\text{min.}} \leq 1.6$ **OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMG310., GREEN**

| PARAMETER                        | TEST CONDITION               | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|----------------------------------|------------------------------|----------|-------------|------|----------|------|------|
| Luminous intensity <sup>2)</sup> | $I_F = 10 \text{ mA}$        | VLMG3100 | $I_V$       | 4.5  | 16       |      | mcd  |
|                                  |                              | VLMG3102 | $I_V$       | 11.2 |          | 18   | mcd  |
|                                  |                              | VLMG3105 | $I_V$       | 7.1  |          | 18   | mcd  |
| Dominant wavelength              | $I_F = 10 \text{ mA}$        |          | $\lambda_d$ | 562  |          | 575  | nm   |
| Peak wavelength                  | $I_F = 10 \text{ mA}$        |          | $\lambda_p$ |      | 565      |      | nm   |
| Angle of half intensity          | $I_F = 10 \text{ mA}$        |          | $\phi$      |      | $\pm 60$ |      | deg  |
| Forward voltage                  | $I_F = 20 \text{ mA}$        |          | $V_F$       |      | 2.2      | 2.8  | V    |
| Reverse voltage                  | $I_R = 10 \mu\text{A}$       |          | $V_R$       | 6    | 15       |      | V    |
| Junction capacitance             | $V_R = 0, f = 1 \text{ MHz}$ |          | $C_j$       |      | 15       |      | pF   |

Notes:

<sup>1)</sup>  $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified<sup>2)</sup> In one packing unit  $I_{V\text{max.}}/I_{V\text{min.}} \leq 1.6$

**OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> VLMP310., PURE GREEN**

| PARAMETER                        | TEST CONDITION               | PART     | SYMBOL      | MIN. | TYP.     | MAX. | UNIT |
|----------------------------------|------------------------------|----------|-------------|------|----------|------|------|
| Luminous intensity <sup>2)</sup> | $I_F = 10 \text{ mA}$        | VLMP3100 | $I_V$       | 1.12 | 4        |      | mcd  |
|                                  |                              | VLMP3101 | $I_V$       | 1.8  |          | 4.5  | mcd  |
|                                  |                              | VLMP3102 | $I_V$       | 2.8  |          | 7.1  | mcd  |
|                                  |                              | VLMP3107 | $I_V$       | 2.8  |          | 5.6  | mcd  |
| Dominant wavelength              | $I_F = 10 \text{ mA}$        |          | $\lambda_d$ | 555  |          | 565  | nm   |
| Peak wavelength                  | $I_F = 10 \text{ mA}$        |          | $\lambda_p$ |      | 555      |      | nm   |
| Angle of half intensity          | $I_F = 10 \text{ mA}$        |          | $\phi$      |      | $\pm 60$ |      | deg  |
| Forward voltage                  | $I_F = 20 \text{ mA}$        |          | $V_F$       |      | 2.1      | 2.8  | V    |
| Reverse voltage                  | $I_R = 10 \mu\text{A}$       |          | $V_R$       | 6    | 15       |      | V    |
| Junction capacitance             | $V_R = 0, f = 1 \text{ MHz}$ |          | $C_j$       |      | 15       |      | pF   |

Notes:

<sup>1)</sup>  $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified<sup>2)</sup> In one packing unit  $I_{V\text{max.}}/I_{V\text{min.}} \leq 1.6$ **COLOR CLASSIFICATION**

| GROUP | YELLOW               |      | GREEN |      | SOFT ORANGE          |      | PURE GREEN |      |
|-------|----------------------|------|-------|------|----------------------|------|------------|------|
|       | DOM. WAVELENGTH (nm) |      |       |      | DOM. WAVELENGTH (nm) |      |            |      |
|       | MIN.                 | MAX. | MIN.  | MAX. | MIN.                 | MAX. | MIN.       | MAX. |
| 0     |                      |      |       |      |                      |      | 555        | 559  |
| 1     | 581                  | 584  |       |      | 598                  | 601  | 558        | 561  |
| 2     | 583                  | 586  |       |      | 600                  | 603  | 560        | 563  |
| 3     | 585                  | 588  |       |      | 602                  | 605  | 562        | 565  |
| 4     | 587                  | 590  | 564   | 567  | 604                  | 607  |            |      |
| 5     | 589                  | 592  | 566   | 569  | 606                  | 609  |            |      |
| 6     | 591                  | 594  | 568   | 571  | 608                  | 611  |            |      |
| 7     |                      |      | 570   | 573  |                      |      |            |      |
| 8     |                      |      | 572   | 575  |                      |      |            |      |

Note:

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

**LUMINOUS INTENSITY CLASSIFICATION**

| GROUP | LIGHT INTENSITY (mcd) |       |       |
|-------|-----------------------|-------|-------|
|       | OPTIONAL              | MIN.  | MAX.  |
| F     | -                     | -     | -     |
|       | 2                     | 1.40  | 1.80  |
| G     | 1                     | 1.80  | 2.24  |
|       | 2                     | 2.24  | 2.80  |
| H     | 1                     | 2.80  | 3.55  |
|       | 2                     | 3.55  | 4.50  |
| J     | 1                     | 4.50  | 5.60  |
|       | 2                     | 5.60  | 7.10  |
| K     | 1                     | 7.10  | 9.00  |
|       | 2                     | 9.00  | 11.20 |
| L     | 1                     | 11.20 | 14.00 |
|       | 2                     | 14.00 | 18.00 |
| M     | 1                     | 18.00 | 22.40 |
|       | 2                     | 22.40 | 28.00 |

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.



## CROSSING TABLE

| VISHAY   | OSRAM      | STANLEY   |
|----------|------------|-----------|
| VLMH3100 | -          | -         |
| VLMH3101 | -          | -         |
| VLMH3102 | -          | -         |
| VLMO3100 | LOT670J1L2 | -         |
| VLMO3101 | LOT670J1K2 | -         |
| VLMY3100 | LYT670J1L2 | -         |
| VLMY3101 | LYT670J1K2 | -         |
| VLMY3102 | LYT670K1L2 | -         |
| VLMG3100 | LGT670K1M2 | VYBG1104B |
| VLMG3102 | LGT670L1L2 | -         |
| VLMG3105 | LGT671K1L2 | -         |
| VLMP3100 | LPT670F2J2 | -         |
| VLMP3101 | LPT670G1H2 | VYBG1101W |
| VLMP3102 | LPT670H1J2 | -         |
| VLMP3107 | LPT670H1J1 | -         |

## TYPICAL CHARACTERISTICS

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

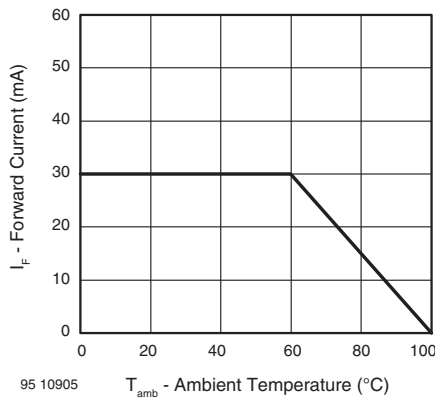


Figure 1. Maximum Permissible Forward Current vs. Ambient Temperature

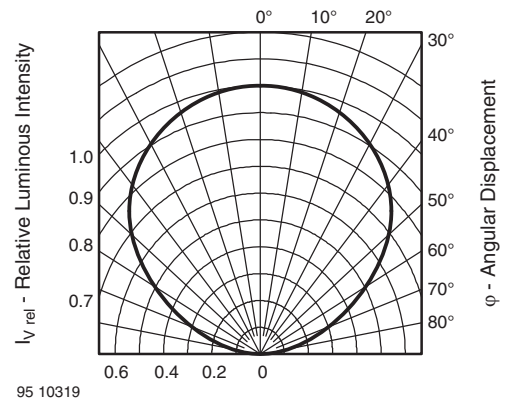


Figure 3. Relative Luminous Intensity vs. Angular Displacement

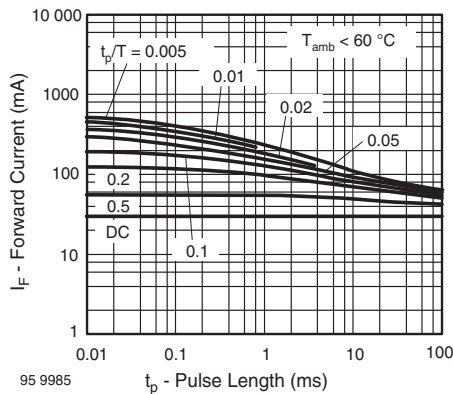


Figure 2. Permissible Pulse Forward Current vs. Pulse Duration

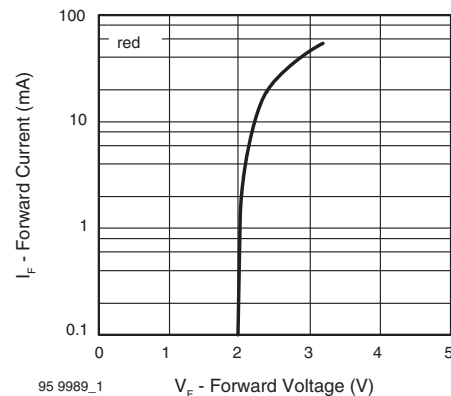


Figure 4. Forward Current vs. Forward Voltage

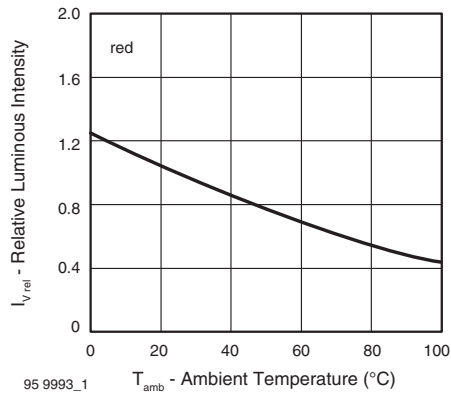


Figure 5. Relative Luminous Intensity vs. Ambient Temperature

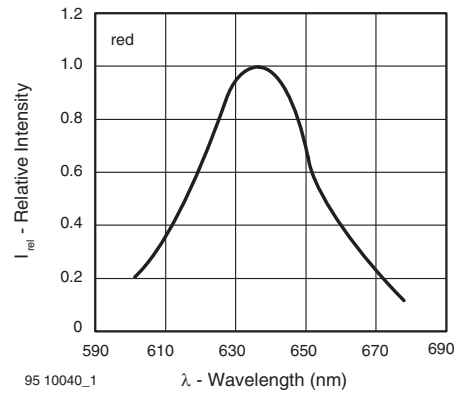


Figure 8. Relative Intensity vs. Wavelength

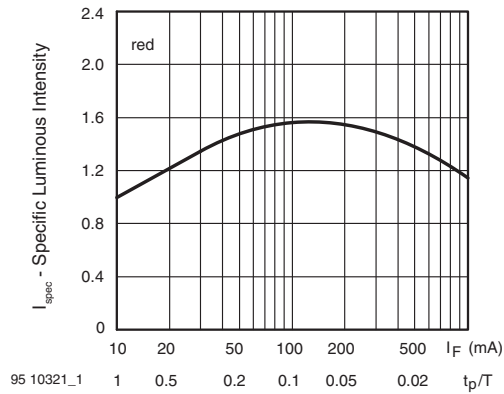


Figure 6. Spec. Luminous Intensity vs. Forw. Current/Duty Cycle

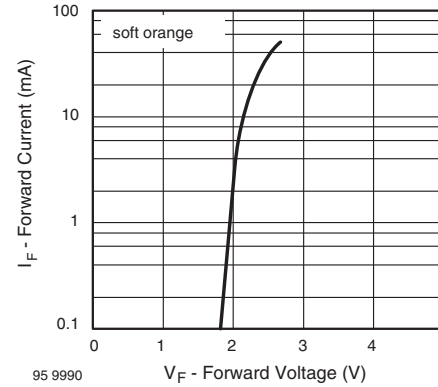


Figure 9. Forward Current vs. Forward Voltage

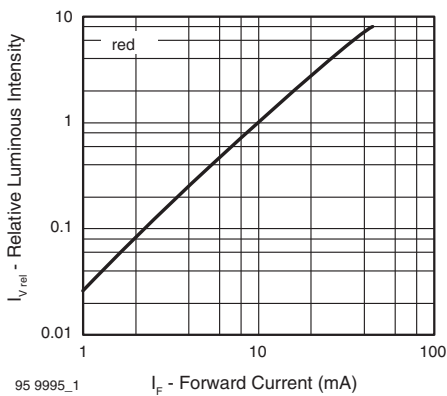


Figure 7. Relative Luminous Intensity vs. Forward Current

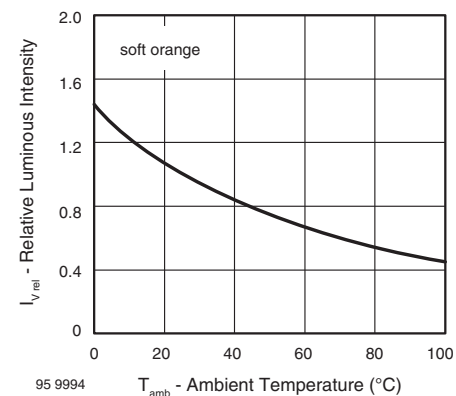


Figure 10. Relative Luminous Intensity vs. Ambient Temperature

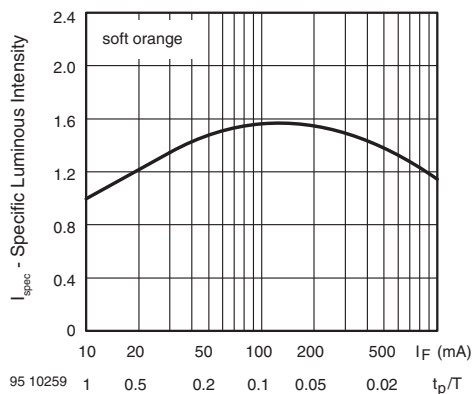


Figure 11. Specific Luminous Intensity vs. Forw. Current/Duty Cycle

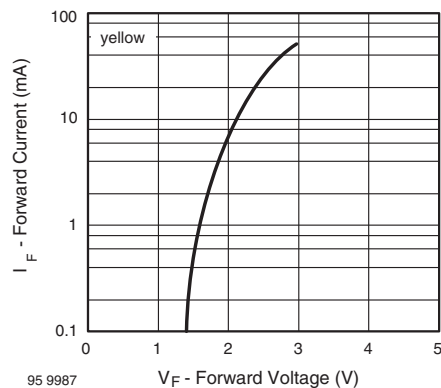


Figure 14. Forward Current vs. Forward Voltage

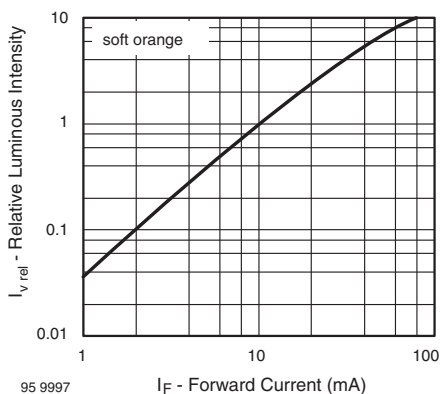


Figure 12. Relative Luminous Intensity vs. Forward Current

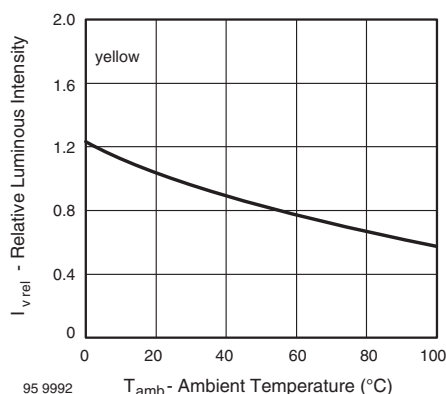


Figure 15. Relative Luminous Intensity vs. Ambient Temperature

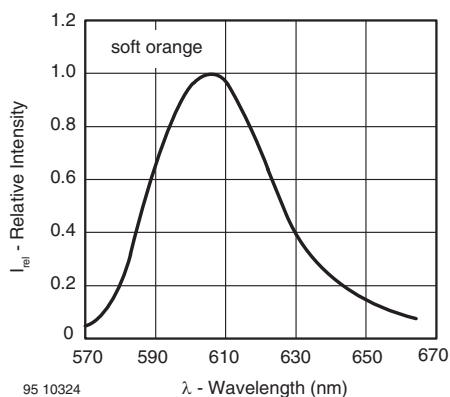


Figure 13. Relative Intensity vs. Wavelength

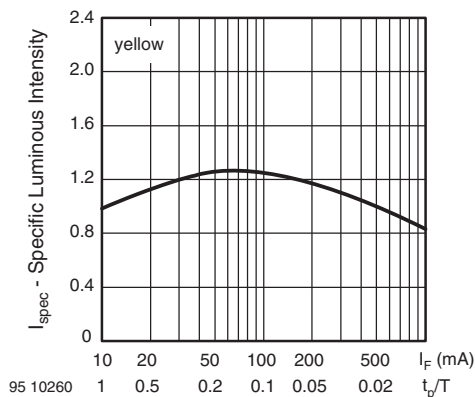


Figure 16. Specific Luminous Intensity vs. Forw. Current/Duty Cycle

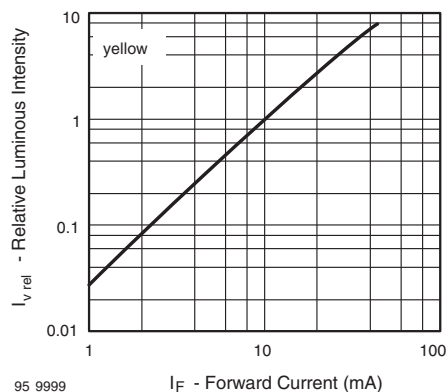


Figure 17. Relative Luminous Intensity vs. Forward Current

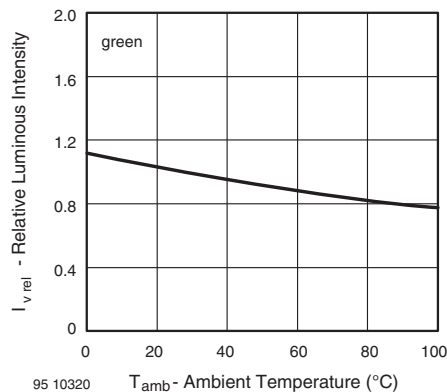


Figure 20. Relative Luminous Intensity vs. Ambient Temperature

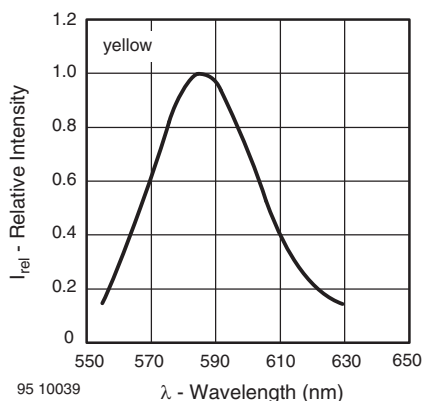


Figure 18. Relative Intensity vs. Wavelength

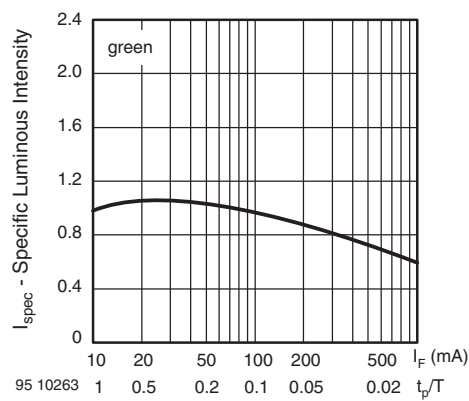


Figure 21. Specific Luminous Intensity vs. Forward Current

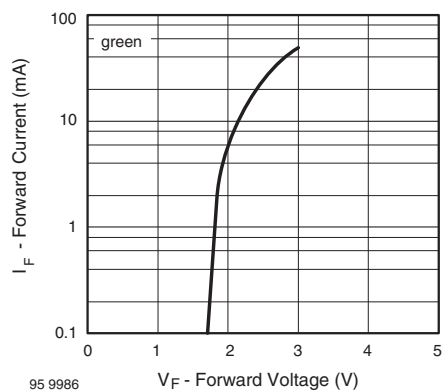


Figure 19. Forward Current vs. Forward Voltage

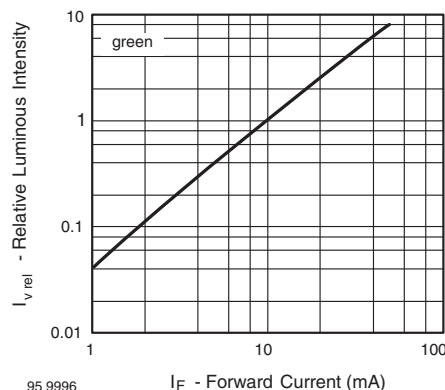


Figure 22. Relative Luminous Intensity vs. Forward Current

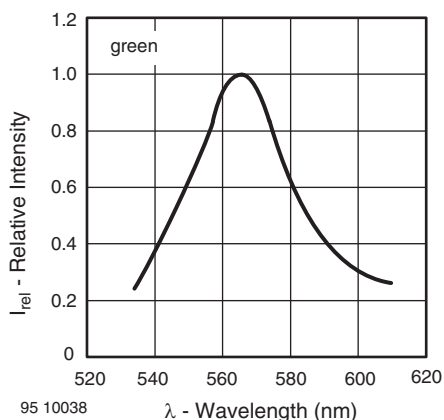


Figure 23. Relative Intensity vs. Wavelength

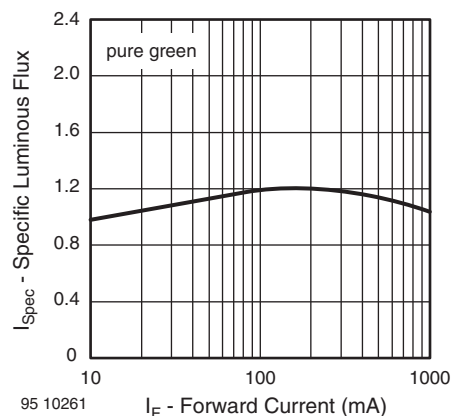


Figure 26. Specific Luminous Intensity vs. Forward Current

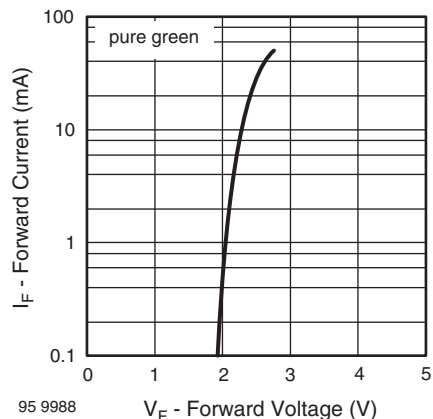


Figure 24. Forward Current vs. Forward Voltage

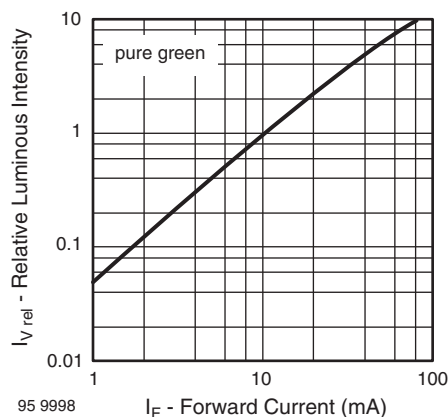


Figure 27. Relative Luminous Intensity vs. Forward Current

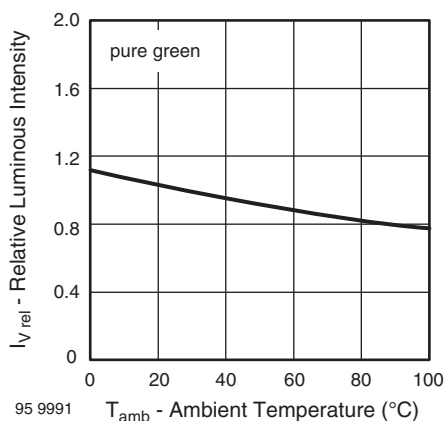


Figure 25. Relative Luminous Intensity vs. Ambient Temperature

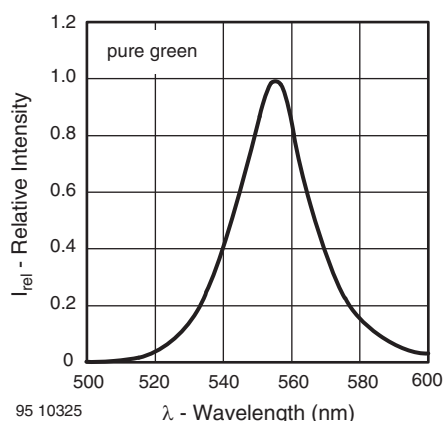
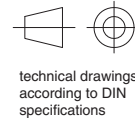
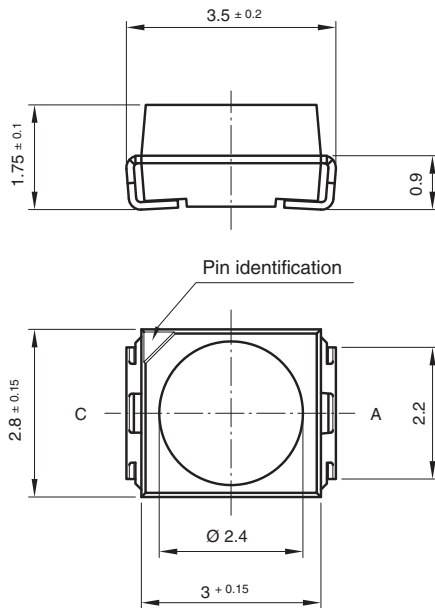
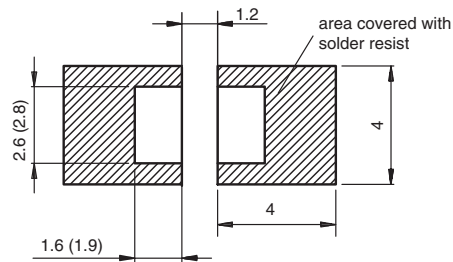


Figure 28. Relative Intensity vs. Wavelength

## PACKAGE DIMENSIONS in millimeters



### Mounting Pad Layout

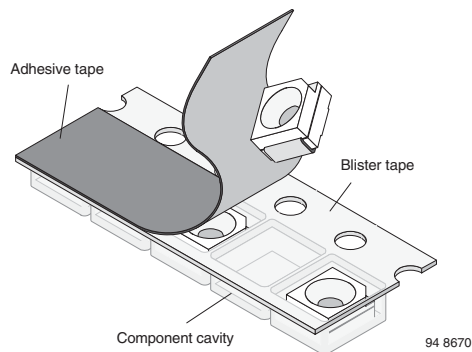


Drawing-No.: 6.541-5067.01-4  
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 20541

## 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.



### TAPING OF VLM.3..

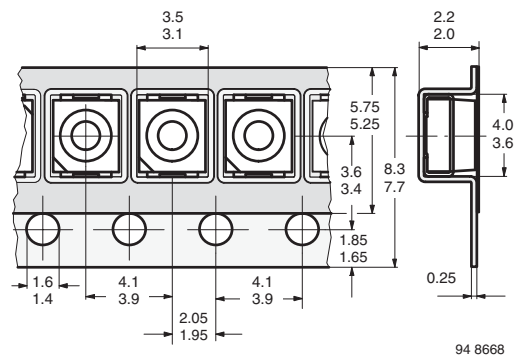


Figure 29. Tape Dimensions in mm for PLCC-2

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

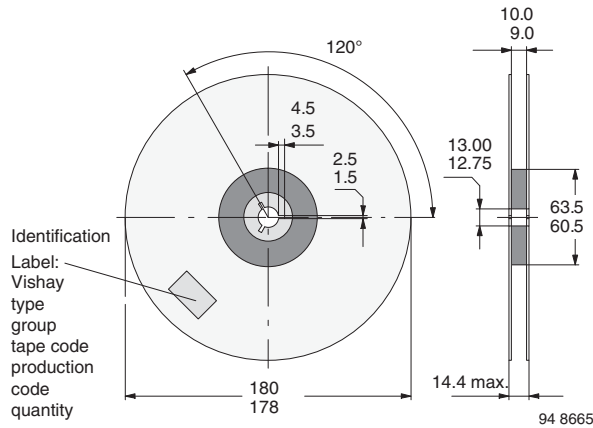


Figure 30. Reel Dimensions - GS08

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

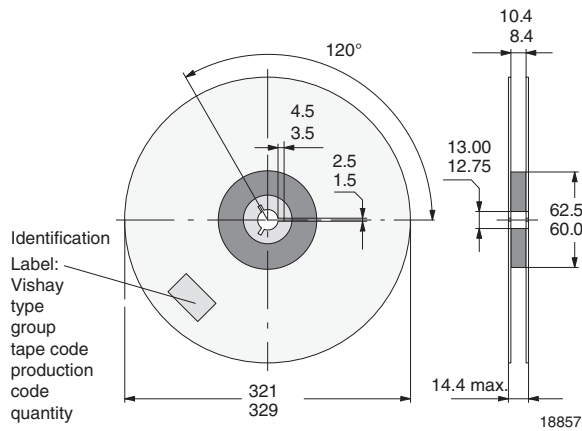


Figure 31. Reel Dimensions - GS18

## SOLDERING PROFILE

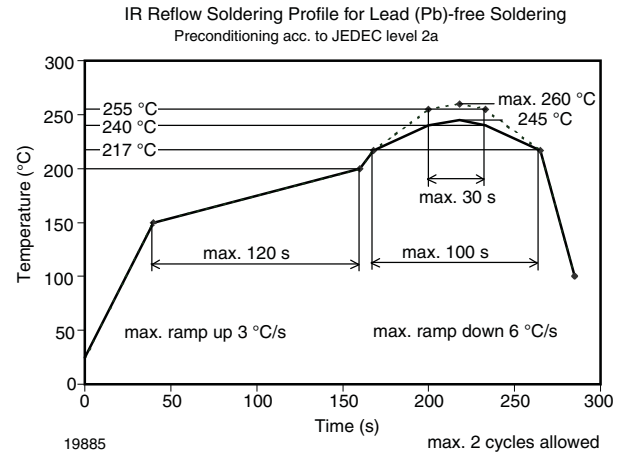


Figure 32. Vishay Lead (Pb)-free Reflow Soldering Profile  
(acc. to J-STD-020)

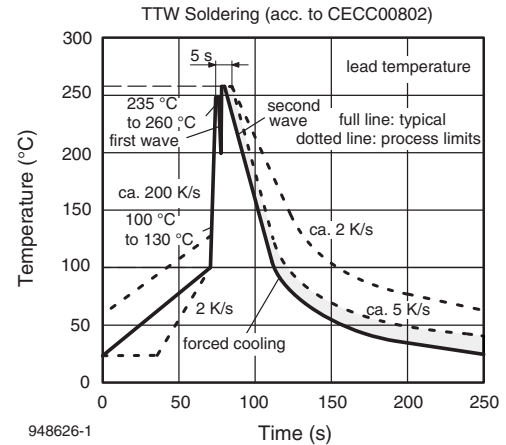
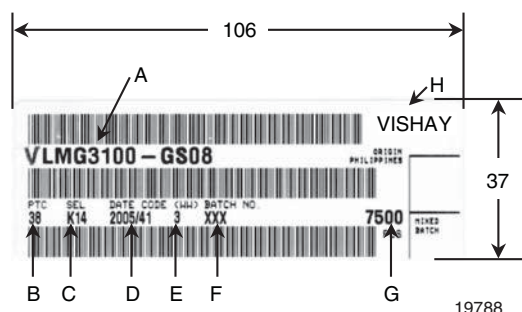


Figure 33. Double Wave Soldering of Opto Devices (all Packages)

## BAR CODE PRODUCT LABEL

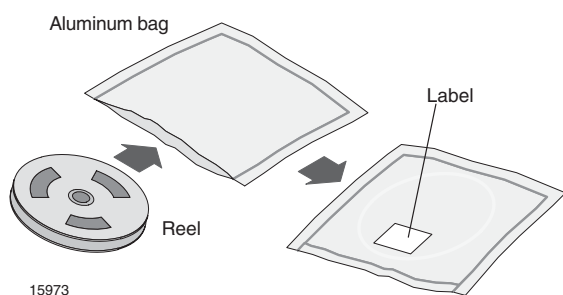
### EXAMPLE:



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):  
e.g.: K1 = code for luminous intensity group  
4 = code for color group
- D) Date code year/week
- E) Day code (e.g. 2: Tuesday)
- 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.

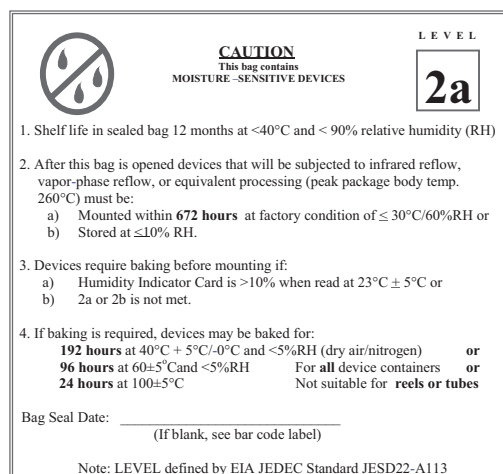
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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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