



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

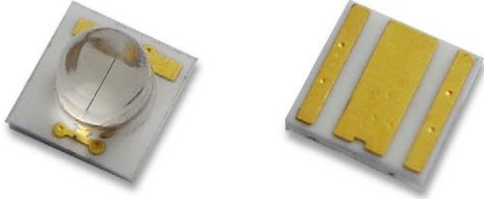
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## UV SMD LED with Silicone Lens



### DESCRIPTION

VLMU3500-...-060 series is a ceramic based high power UV LED with silicone lens for long life time. The package size is 3.5 mm x 3.5 mm and the radiant power up to 1250 mW at 700 mA in a wavelength range of 380 nm to 410 nm.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD ceramic high power
- Product series: high power UV LED
- Angle of half intensity:  $\pm 30^\circ$
- Lead-finishing: Au

### SAFETY ADVICES

Depending on the mode of operation, these devices emit highly concentrated non visible ultraviolet light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 62471 "Photobiological Safety of Lamps and Lamp Systems".

### FEATURES

- Ceramic SMT package with silicone lens
- Dimension (L x W x H) in mm: 3.5 x 3.5 x 2.9
- Forward current: up to 700 mA
- Radiant power (typ.): 780 mW at 500 mA, 1037 mW at 700 mA
- Materials:
  - Die: InGaN
  - Resin: silicone (water clear)
  - Leads / terminations finish: gold plated (Au)
- Grouping parameters:
  - Radiant power
  - Peak wavelength
  - Forward voltage
- Reflow soldering method
- MSL2 according to J-STD-020
- Packaging: MOQ = 100 pieces; 12 mm tape with 100 pieces per reel,  $\varnothing$  180 mm (7")
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Industrial curing
- Photocatalytic purification
- Poster printing curing
- Counterfeit money detector
- Blood detector
- Nail curing
- Teeth curing

### PARTS TABLE

| PART             | COLOR       | RADIANT POWER (mW) |      |      | at I <sub>F</sub> (mA) | WAVELENGTH (nm) |      |      | at I <sub>F</sub> (mA) | FORWARD VOLTAGE (V) |      |      | at I <sub>F</sub> (mA) | TECHNOLOGY |
|------------------|-------------|--------------------|------|------|------------------------|-----------------|------|------|------------------------|---------------------|------|------|------------------------|------------|
|                  |             | MIN.               | TYP. | MAX. |                        | MIN.            | TYP. | MAX. |                        | MIN.                | TYP. | MAX. |                        |            |
| VLMU3500-385-060 | Ultraviolet | 620                | 780  | 940  | 500                    | 380             | 385  | 390  | 500                    | 2.8                 | 3.4  | 4.0  | 500                    | InGaN      |
| VLMU3500-395-060 | Ultraviolet | 620                | 780  | 940  | 500                    | 390             | 395  | 400  | 500                    | 2.8                 | 3.4  | 4.0  | 500                    | InGaN      |
| VLMU3500-405-060 | Ultraviolet | 620                | 780  | 940  | 500                    | 400             | 405  | 410  | 500                    | 2.8                 | 3.4  | 4.0  | 500                    | InGaN      |

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLMU3500-...-060**

| PARAMETER                                     | TEST CONDITION        | SYMBOL     | VALUE       | UNIT                        |
|---|-----------------------|------------|-------------|-----------------------------|
| DC forward current                            |                       | $I_F$      | 700         | mA                          |
| Power dissipation                             |                       | $P_V$      | 2.8         | W                           |
| Electrostatic discharge                       | HBM: MIL-STD-883 C 3B | ESD        | 8000        | V                           |
| Junction temperature                          |                       | $T_j$      | +125        | $^{\circ}\text{C}$          |
| Operating temperature range                   |                       | $T_{amb}$  | -40 to +85  | $^{\circ}\text{C}$          |
| Storage temperature range                     |                       | $T_{stg}$  | -40 to +100 | $^{\circ}\text{C}$          |
| Solder temperature                            |                       | $T_{sol}$  | 260         | $^{\circ}\text{C}$          |
| Thermal resistance - junction to solder point |                       | $R_{thJS}$ | 8           | $^{\circ}\text{C}/\text{W}$ |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLMU3500-...-060, ULTRAVIOLET**

| PARAMETER               | TEST CONDITION        | DEVICE TYPE      | SYMBOL      | MIN. | TYP.     | MAX. | UNIT          |
|-------------------------|-----------------------|------------------|-------------|------|----------|------|---------------|
| Forward voltage         | $I_F = 500\text{ mA}$ |                  | $V_F$       | 2.8  | 3.4      | 4    | V             |
| Radiant power           | $I_F = 350\text{ mA}$ |                  | $\phi_e$    | 445  | 560      | 675  | mW            |
|                         | $I_F = 500\text{ mA}$ |                  |             | 620  | 780      | 940  |               |
|                         | $I_F = 700\text{ mA}$ |                  |             | 824  | 1037     | 1250 |               |
| Radiant intensity       | $I_F = 350\text{ mA}$ |                  | $I_e$       | -    | 395      | -    | mW/sr         |
|                         | $I_F = 500\text{ mA}$ |                  |             | -    | 550      | -    |               |
|                         | $I_F = 700\text{ mA}$ |                  |             | -    | 730      | -    |               |
| Peak wavelength         | $I_F = 500\text{ mA}$ | VLMU3500-385-060 | $\lambda_p$ | 380  | 385      | 390  | nm            |
|                         |                       | VLMU3500-395-060 |             | 390  | 395      | 400  | nm            |
|                         |                       | VLMU3500-405-060 |             | 400  | 405      | 410  | nm            |
| Angle of half intensity | $I_F = 500\text{ mA}$ |                  | $\phi$      | -    | $\pm 30$ | -    | deg           |
| Reverse current         | $V_R = 5\text{ V}$    |                  | $I_R$       | -    | -        | 10   | $\mu\text{A}$ |

**Note**

- Tolerances:  $\pm 11\%$  for  $\phi_e$ ,  $\pm 0.1\text{ V}$  for  $V_F$ ,  $\pm 1\text{ nm}$  for  $\lambda_p$ .

**RADIANT POWER CLASSIFICATION** ( $I_F = 500\text{ mA}$ )

| GROUP | MIN. | MAX. | UNIT |
|-------|------|------|------|
| U062  | 620  | 660  | mW   |
| U066  | 660  | 700  |      |
| U070  | 700  | 740  |      |
| U074  | 740  | 780  |      |
| U078  | 780  | 820  |      |
| U082  | 820  | 860  |      |
| U086  | 860  | 900  |      |
| U090  | 900  | 940  |      |

**PEAK WAVELENGTH CLASSIFICATION** ( $I_F = 500\text{ mA}$ )

| GROUP | MIN. | MAX. | UNIT |
|-------|------|------|------|
| Q380  | 380  | 385  | nm   |
| Q385  | 385  | 390  |      |
| Q390  | 390  | 395  |      |
| Q395  | 395  | 400  |      |
| Q400  | 400  | 405  |      |
| Q405  | 405  | 410  |      |

| <b>FORWARD VOLTAGE CLASSIFICATION</b> ( $I_F = 500 \text{ mA}$ ) |      |      |      |
|--|------|------|------|
| GROUP  | MIN. | MAX. | UNIT |
| V2830  | 2.8  | 3.0  | V    |
| V3032  | 3.0  | 3.2  |      |
| V3234  | 3.2  | 3.4  |      |
| V3436  | 3.4  | 3.6  |      |
| V3638  | 3.6  | 3.8  |      |
| V3840  | 3.8  | 4.0  |      |

**Note**

- In order to ensure availability, single groups for radiant intensity, wavelength, and forward voltage will not be orderable. Only one group for radiant intensity, wavelength, and forward voltage will be shipped in any one reel.

**MARKING EXAMPLE FOR SELECTION CODE ON LABEL**

Selection code: U074Q385V3436

- U074:  $\phi_e$ , range 740 mW to 780 mW
- Q385:  $\lambda_p$ , range 385 nm to 390 nm
- V3436:  $V_F$ , range 3.4 V to 3.6 V

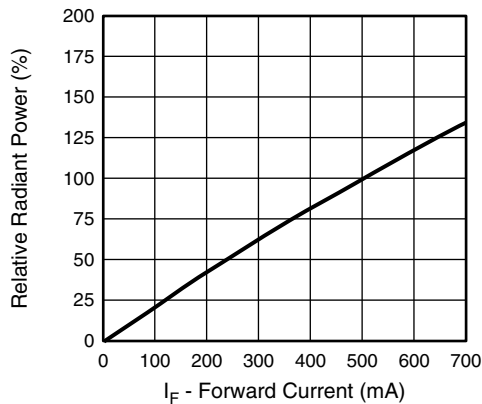
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified)


Fig. 1 - Relative Radiant Power vs. Forward Current

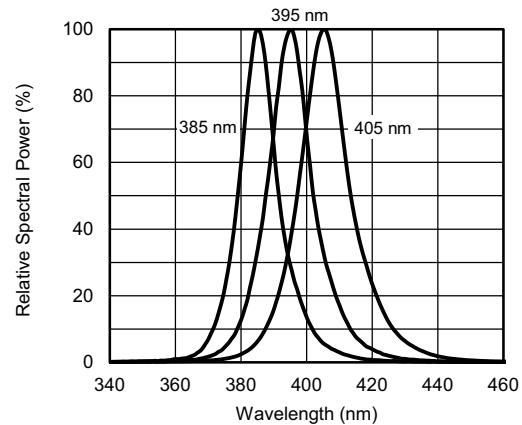


Fig. 3 - Relative Spectral Power vs. Wavelength

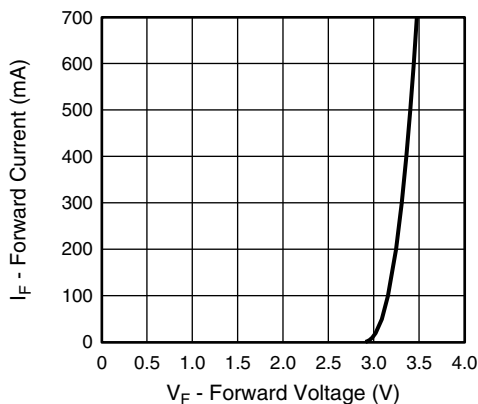


Fig. 2 - Forward Current vs. Forward Voltage

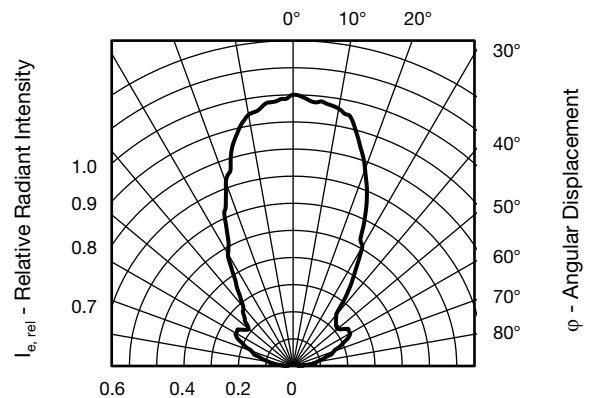


Fig. 4 - Relative Intensity vs. Angular Displacement

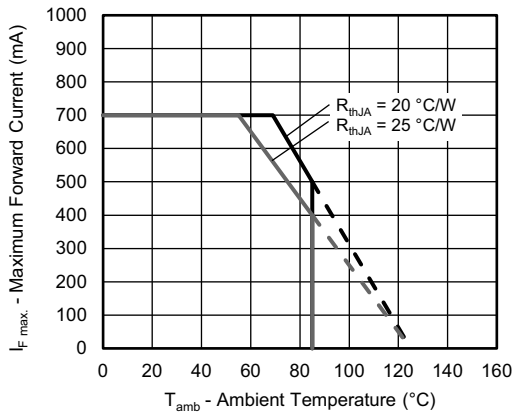


Fig. 5 - Maximum Forward Current vs. Ambient Temperature

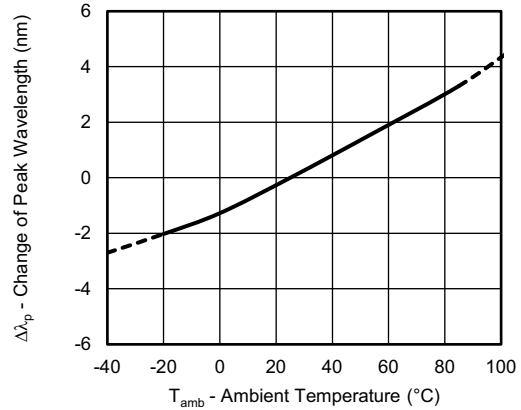


Fig. 7 - Change of Peak Wavelength vs. Ambient Temperature

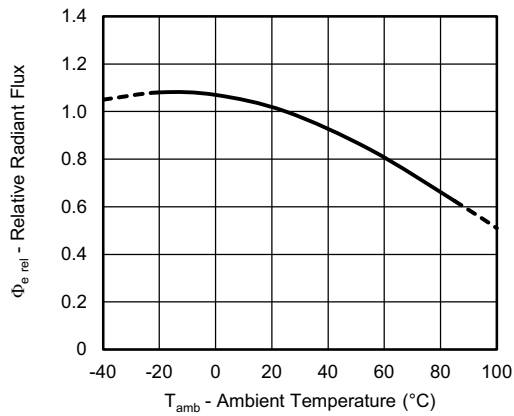


Fig. 6 - Relative Radiant Flux vs. Ambient Temperature

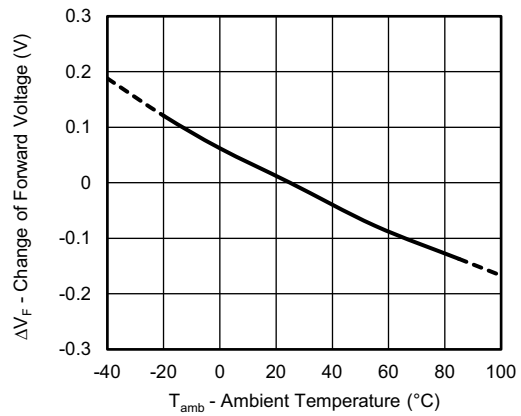
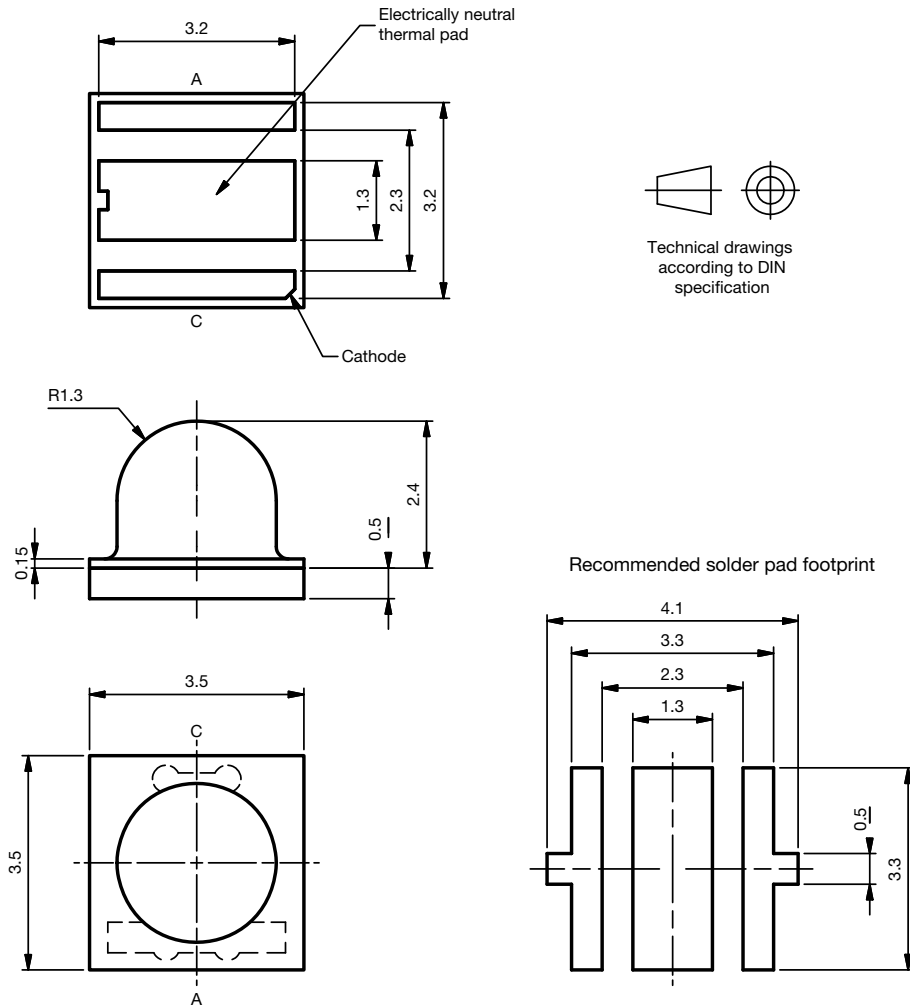


Fig. 8 - Change of Forward Voltage vs. Ambient Temperature

**PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.541-5108.01-4  
Issue: 2; 07.03.16

Not indicated tolerances  $\pm 0.13$

**WIRING**

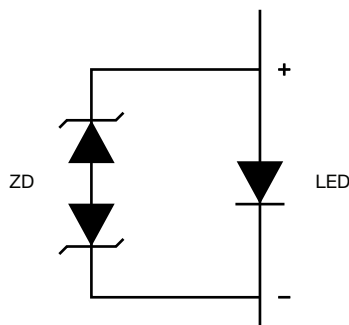
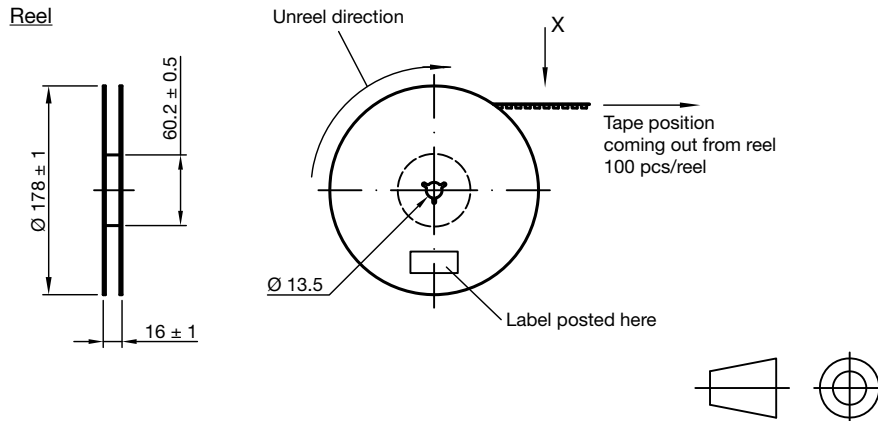
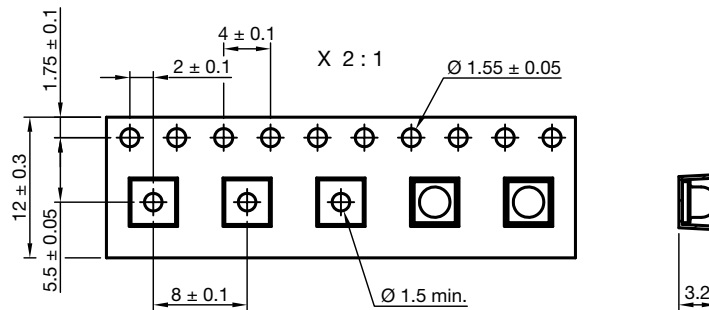
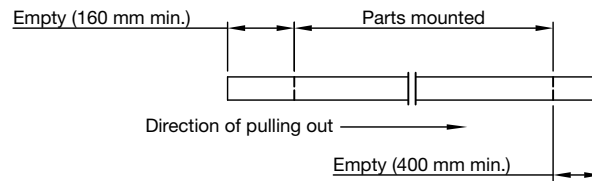


Fig. 9 - Wiring Diagram

**TAPE AND REEL DIMENSIONS** in millimeters



Leader and trailer tape:



Drawing-No.: 9.800-5131.01-4  
Issue: prel; 17.11.15

**SOLDERING PROFILE**

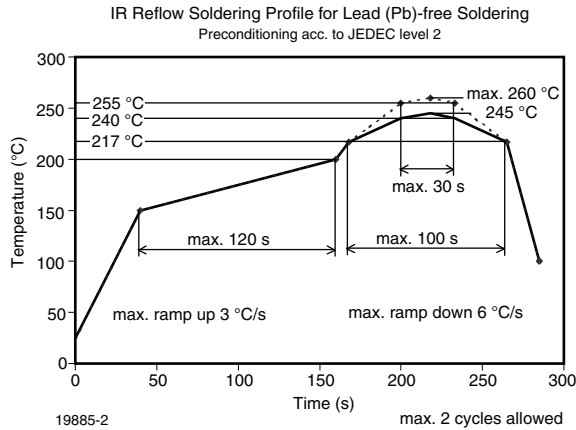


Fig. 10 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

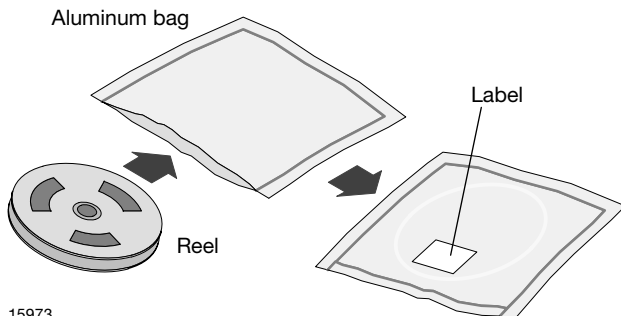
**BAR CODE PRODUCT LABEL (example only)**



- a. 2D barcode
- b. Vishay part number
- c. Quantity
- d. SEL = selection code (binning)
- e. Code of manufacturing plant
- f. Batch = date code: year / week / plant code
- g. Region code
- h. SL = sales location
- i. Terminations finishing
- j. Lead (Pb)-free symbol
- k. Halogen-free symbol
- l. RoHS symbol

**DRY PACKING**

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



15973

**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:

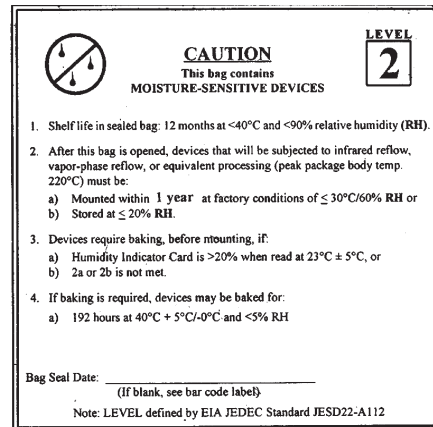
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 1 year 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
- 24 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 2 label is included on all dry bags.



17028

Example of JESD22-A112 level 2 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. Electrostatic 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.





## **Disclaimer**

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

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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