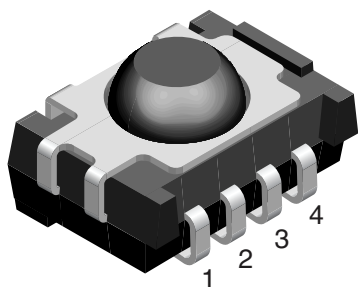


## Silicon PIN Photodiode



16797

### LINKS TO ADDITIONAL RESOURCES



### DESCRIPTION

VEMD8130 is a high speed and high sensitive PIN photodiode. It is a miniature surface-mount device (SMD) including the chip with a 2.2 mm<sup>2</sup> sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength between 870 nm and 950 nm.

### FEATURES

- Package type: surface-mount
- Package form: top view and side view
- Dimensions (L x W x H in mm): 7.5 x 5.3 x 4.0
- Radiant sensitive area (in mm<sup>2</sup>): 2.2
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 45^\circ$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### MECHANICAL DATA

1 = connection for shielding, 2 = cathode, 3 = anode, 4 = n.c.

### ORDERING CODE

#### Taping:

VEMD81...TT - top view taped  
VEMD81...TR - side view taped

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ (μA) | $\phi$ (°) | $\lambda_{0.5}$ (nm) |
|-----------|---------------|------------|----------------------|
| VEMD8130  | 25            | $\pm 45$   | 800 to 1050          |

#### Note

- Test conditions see table “Basic Characteristics”

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING     | REMARKS                      | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VEMD8130      | Tape and reel | MOQ: 1190 pcs, 1190 pcs/reel | Top view     |
|               |               | MOQ: 1120 pcs, 1120 pcs/reel | Side view    |

#### Note

- MOQ: minimum order quantity

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

| PARAMETER                   | TEST CONDITION                            | SYMBOL    | VALUE      | UNIT             |
|-----------------------------|-------------------------------------------|-----------|------------|------------------|
| Reverse voltage             |                                           | $V_R$     | 60         | V                |
| Power dissipation           | $T_{amb} \leq 25^\circ\text{C}$           | $P_V$     | 215        | mW               |
| Junction temperature        |                                           | $T_j$     | 100        | $^\circ\text{C}$ |
| Operating temperature range |                                           | $T_{amb}$ | -25 to +85 | $^\circ\text{C}$ |
| Storage temperature range   |                                           | $T_{stg}$ | -25 to +85 | $^\circ\text{C}$ |
| Soldering temperature       | According to reflow solder profile Fig. 7 | $T_{sd}$  | 260        | $^\circ\text{C}$ |

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                                           |                 |      |             |      |               |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------|------|-------------|------|---------------|
| PARAMETER                                                                                           | TEST CONDITION                                                            | SYMBOL          | MIN. | TYP.        | MAX. | UNIT          |
| Forward voltage                                                                                     | $I_F = 50\text{ mA}$                                                      | $V_F$           | -    | 1           | 1.3  | V             |
| Breakdown voltage                                                                                   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                  | $V_{(BR)}$      | 60   | -           | -    | V             |
| Reverse dark current                                                                                | $V_R = 10\text{ V}$ , $E = 0$                                             | $I_{ro}$        | -    | 2           | 30   | nA            |
| Diode capacitance                                                                                   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                         | $C_D$           | -    | 18          | -    | pF            |
|                                                                                                     | $V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                         | $C_D$           | -    | 7           | 40   | pF            |
| Reverse light current                                                                               | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$ | $I_{ra}$        | 20   | 25          | -    | $\mu\text{A}$ |
| Angle of half sensitivity                                                                           |                                                                           | $\phi$          | -    | $\pm 45$    | -    | $^{\circ}$    |
| Wavelength of peak sensitivity                                                                      |                                                                           | $\lambda_p$     | -    | 940         | -    | nm            |
| Range of spectral bandwidth                                                                         |                                                                           | $\lambda_{0.5}$ | -    | 800 to 1050 | -    | nm            |
| Rise time                                                                                           | $V_R = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 870\text{ nm}$ | $t_r$           | -    | 625         | -    | ns            |
| Fall time                                                                                           | $V_R = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 870\text{ nm}$ | $t_f$           | -    | 670         | -    | ns            |

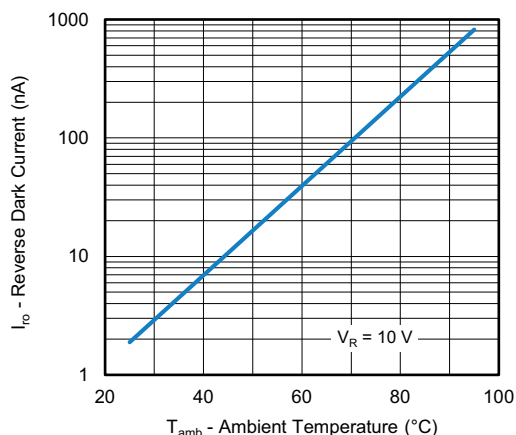
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

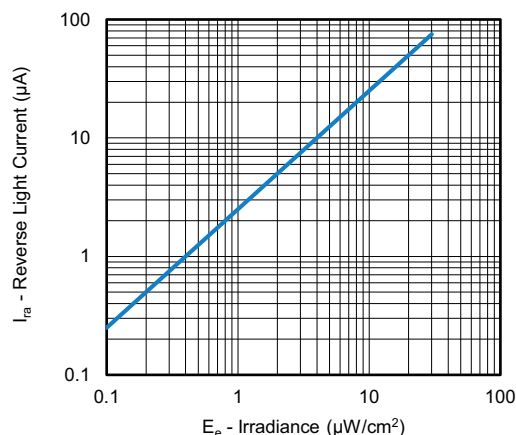


Fig. 3 - Reverse Light Current vs. Irradiance

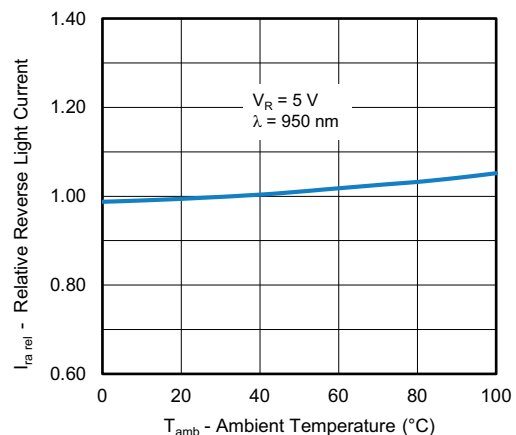


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

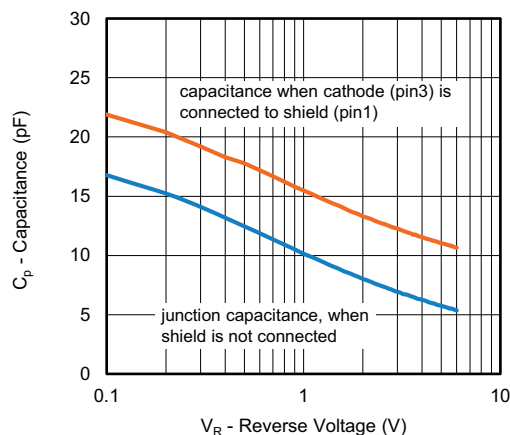


Fig. 4 - Diode Capacitance vs. Reverse Voltage

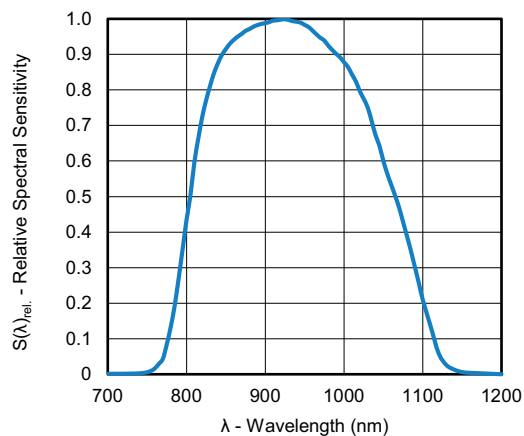


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

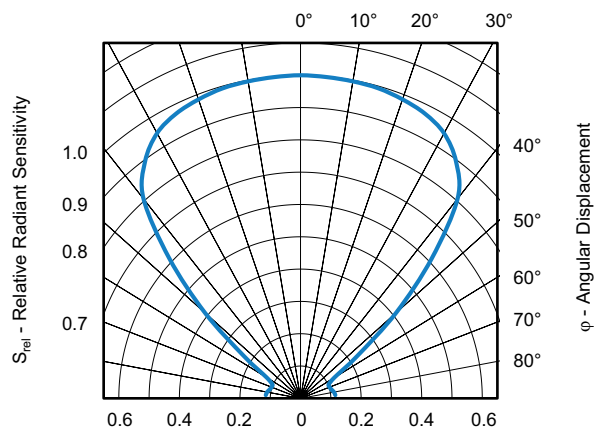
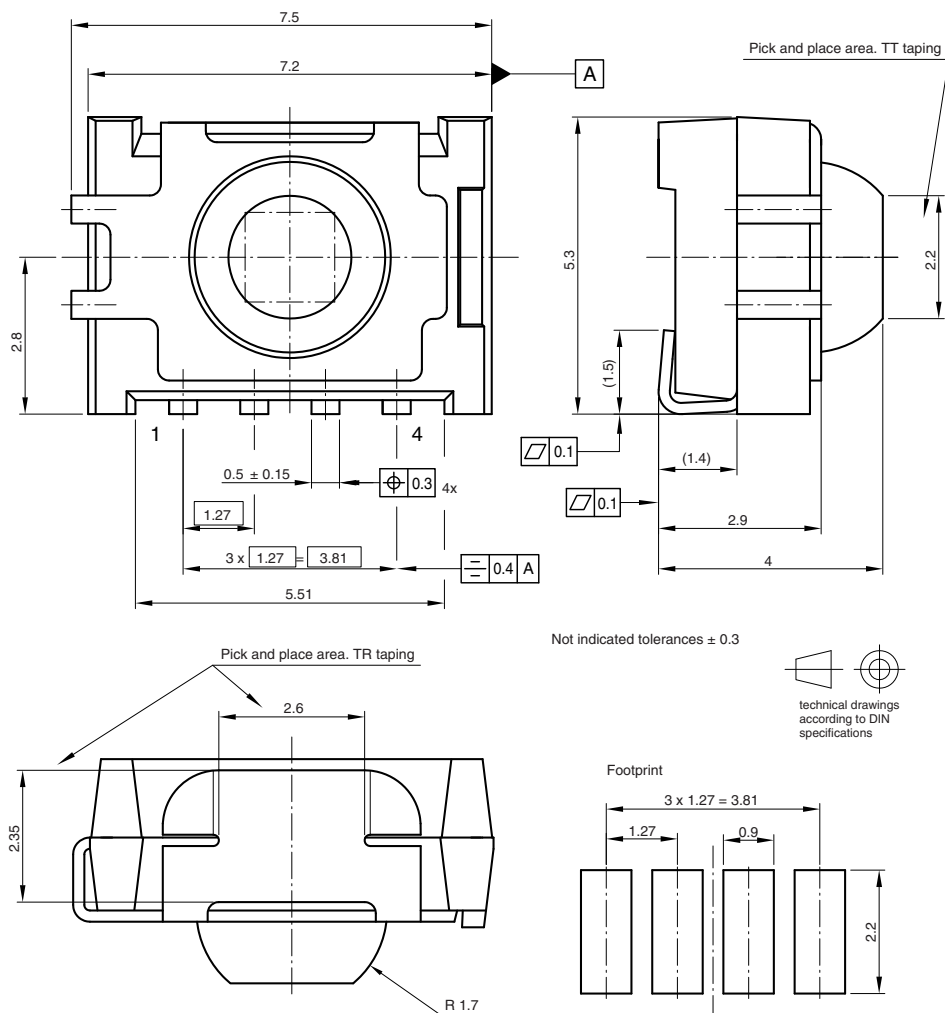


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters


Drawing-No.: 6.544-5341.01-4

Issue: 8; 02.09.09

16776

## ASSEMBLY INSTRUCTIONS

### Reflow Soldering

- Reflow soldering must be done within 72 h while stored under a max. temperature of 30 °C, 60 % RH after opening the dry pack envelope
- Set the furnace temperatures for pre-heating and heating in accordance with the reflow temperature profile as shown in the diagram. Exercise extreme care to keep the maximum temperature below 260 °C. The temperature shown in the profile means the temperature at the device surface. Since there is a temperature difference between the component and the circuit board, it should be verified that the temperature of the device is accurately being measured
- Handling after reflow should be done only after the work surface has been cooled off

### Manual Soldering

- Use a soldering iron of 25 W or less. Adjust the temperature of the soldering iron below 300 °C
- Finish soldering within 3 s
- Handle products only after the temperature has cooled off

## TAPING DIMENSIONS VEMD8130TT in millimeters

## VISHAY LEAD (Pb)-FREE REFLOW SOLDER PROFILE

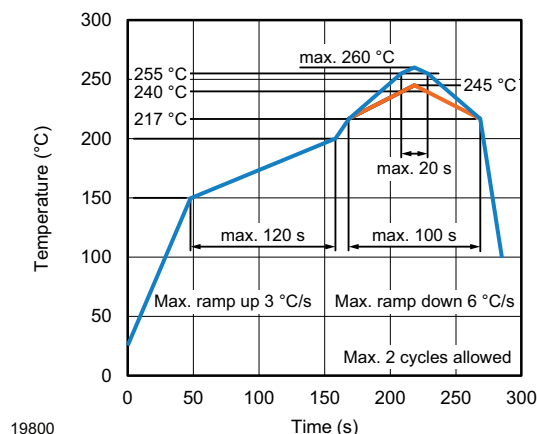
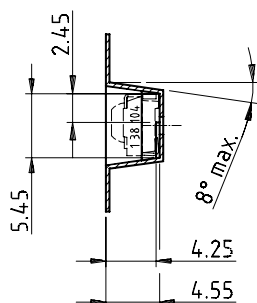
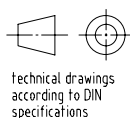
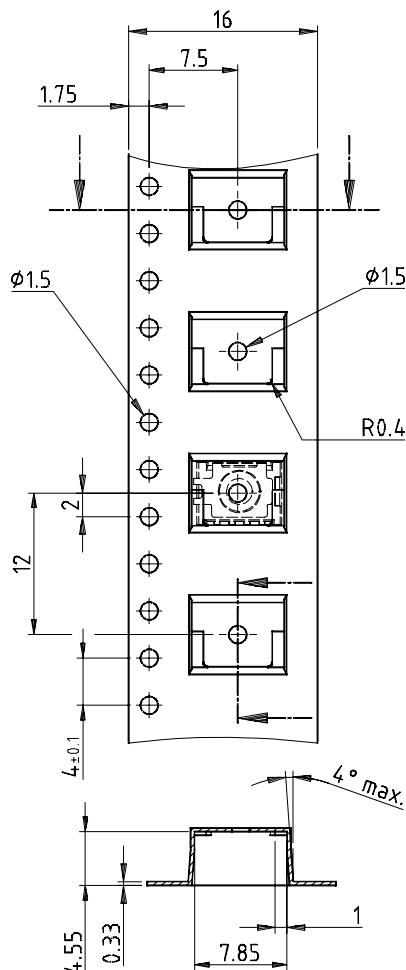


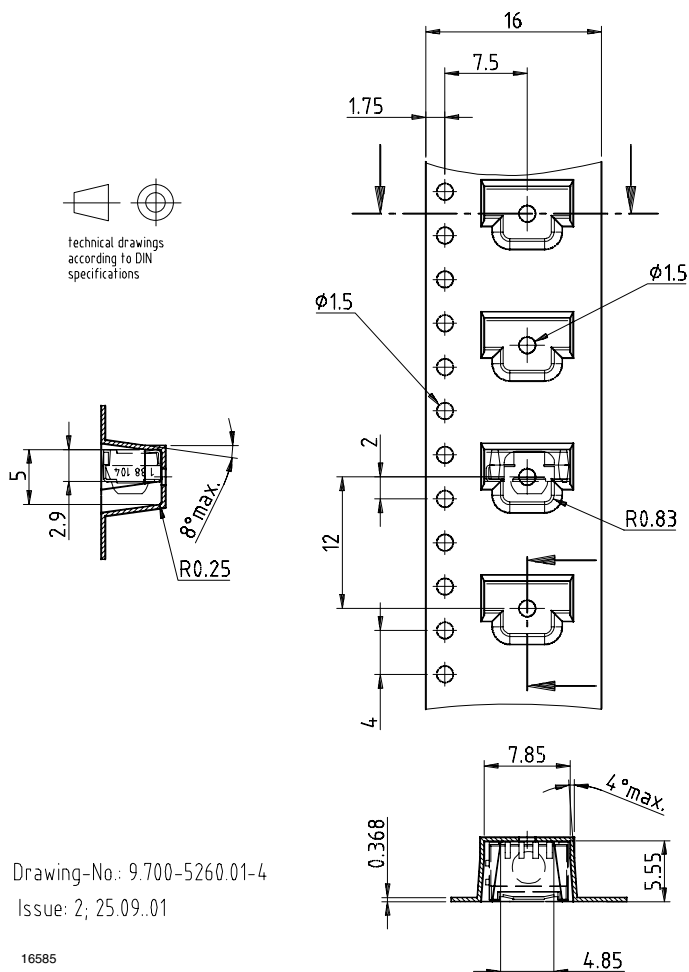
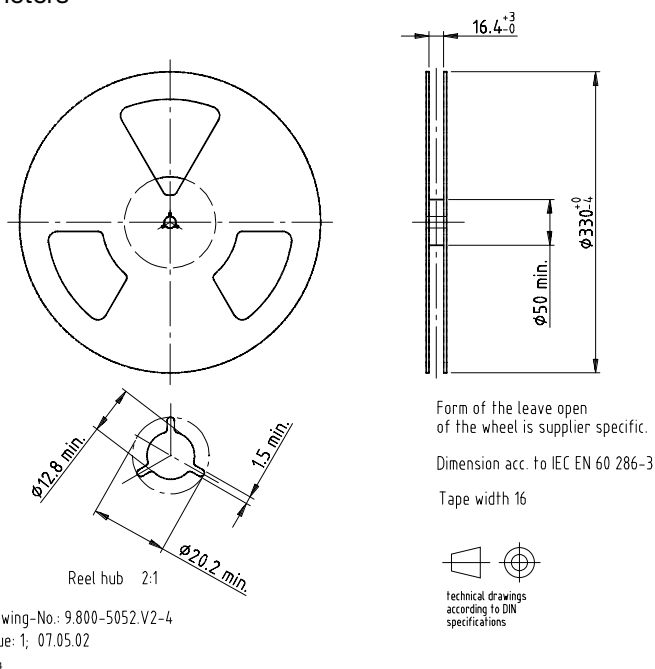
Fig. 7

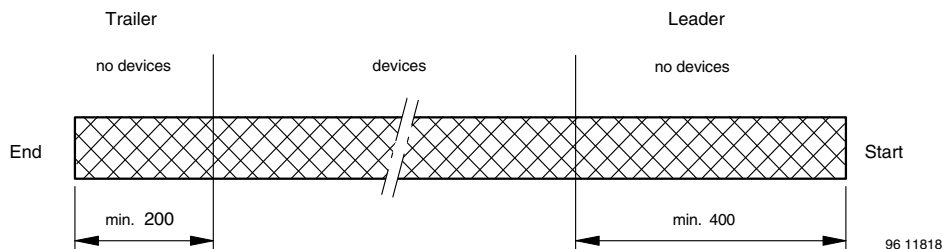


Drawing-No.: 9.700-5259.01-4  
Issue: 1; 05.09.01

16584



**TAPING DIMENSIONS VEMD8130TR** in millimeters

**REEL DIMENSIONS** in millimeters


**LEADER AND TRAILER DIMENSIONS** in millimeters

**COVER TAPE PEEL STRENGTH**

According to DIN EN 60286-3

0.1 N to 1.3 N

300 mm/min.  $\pm$  10 mm/min.

165° to 180° peel angle

**LABEL**
**Standard bar code labels for finished goods**

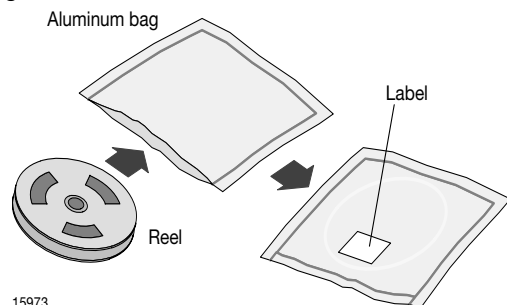
The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

| <b>VISHAY SEMICONDUCTOR GMBH STANDARD BAR CODE PRODUCT LABEL</b> (finished goods) |                     |               |
|-----------------------------------------------------------------------------------|---------------------|---------------|
| <b>PLAIN WRITING</b>                                                              | <b>ABBREVIATION</b> | <b>LENGTH</b> |
| Item-description                                                                  | -                   | 18            |
| Item-number                                                                       | INO                 | 8             |
| Selection-code                                                                    | SEL                 | 3             |
| LOT-/serial-number                                                                | BATCH               | 10            |
| Data-code                                                                         | COD                 | 3 (YWW)       |
| Plant-code                                                                        | PTC                 | 2             |
| Quantity                                                                          | QTY                 | 8             |
| Accepted by                                                                       | ACC                 | -             |
| Packed by                                                                         | PCK                 | -             |
| Mixed code indicator                                                              | MIXED CODE          | -             |
| Origin                                                                            | xxxxxxx+            | Company logo  |
| <b>LONG BAR CODE TOP</b>                                                          | <b>TYPE</b>         | <b>LENGTH</b> |
| Item-number                                                                       | N                   | 8             |
| Plant-code                                                                        | N                   | 2             |
| Sequence-number                                                                   | X                   | 3             |
| Quantity                                                                          | N                   | 8             |
| Total length                                                                      | -                   | 21            |
| <b>SHORT BAR CODE BOTTOM</b>                                                      | <b>TYPE</b>         | <b>LENGTH</b> |
| Selection-code                                                                    | X                   | 3             |
| Data-code                                                                         | N                   | 3             |
| Batch-number                                                                      | X                   | 10            |
| Filter                                                                            | -                   | 1             |
| Total length                                                                      | -                   | 17            |



## 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  $\leq 60\%$  RH max.

After more than 72 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 125 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC® standard JESD22-A112 level 4 label is included on all dry bags.

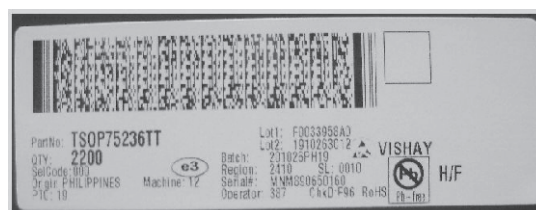
## ESD PRECAUTION

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.

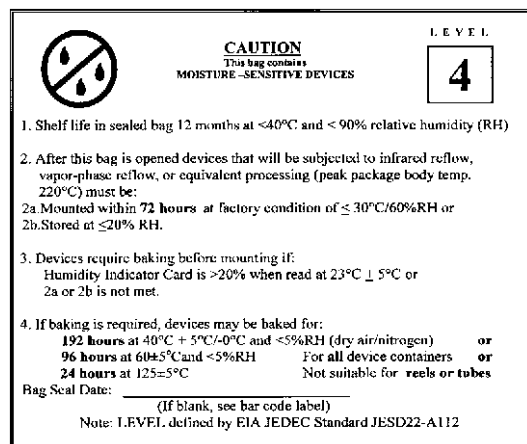
## VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

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.

## BAR CODE PRODUCT LABEL (example)



22178



16943

Example of JESD22-A112 level 4 label



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