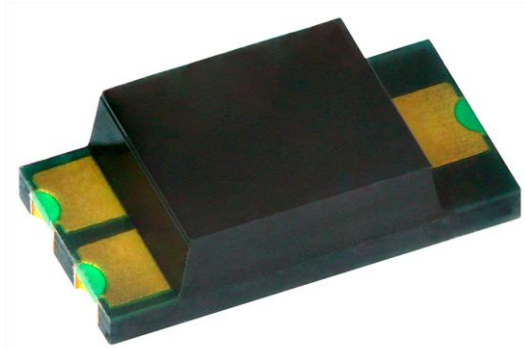


## Silicon PIN Photodiode



### DESCRIPTION

VEMD6110X01 is a high speed and high sensitive PIN photodiode. It is a small surface mount device (SMD) including the chip with a 0.85 mm<sup>2</sup> sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength of 830 nm to 950 nm.

### FEATURES

- Package type: surface mount
- Package form: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- Radiant sensitive area (in mm<sup>2</sup>): 0.85
- High photo sensitivity
- High radiant sensitivity
- Daylight blocking filter matched with 830 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 60^\circ$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE

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

### APPLICATIONS

- High speed photo detector

### PRODUCT SUMMARY

| COMPONENT   | $I_{ra}$ ( $\mu$ A) | $\phi$ (deg) | $\lambda_{0.5}$ (nm) |
|-------------|---------------------|--------------|----------------------|
| VEMD6110X01 | 9.5                 | $\pm 60$     | 750 to 1050          |

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING     | REMARKS                      | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VEMD6110X01   | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 1206         |

#### 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                     |                                   | $V_R$      | 32          | V                |
| Power dissipation                   | $T_{amb} \leq 25^\circ\text{C}$   | $P_V$      | 215         | mW               |
| Junction temperature                |                                   | $T_j$      | 110         | $^\circ\text{C}$ |
| Operating temperature range         |                                   | $T_{amb}$  | -40 to +110 | $^\circ\text{C}$ |
| Storage temperature range           |                                   | $T_{stg}$  | -40 to +110 | $^\circ\text{C}$ |
| Soldering temperature               | Acc. reflow solder profile fig. 8 | $T_{sd}$   | 260         | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Acc. J-STD-051                    | $R_{thJA}$ | 270         | K/W              |

| <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        |      | V             |
| Breakdown voltage   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                   | $V_{(BR)}$      | 32   |          |      | V             |
| Reverse dark current  | $V_R = 10\text{ V}$ , $E = 0$  | $I_{ro}$        |      | 1        | 3    | nA            |
| Diode capacitance   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 12       |      | pF            |
|   | $V_R = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 3.6      |      | pF            |
| Open circuit voltage  | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $V_o$           |      | 356      |      | mV            |
| Temperature coefficient of $V_o$  | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $TK_{V_o}$      |      | -3.1     |      | mV/K          |
| Short circuit current   | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $I_k$           |      | 9        |      | $\mu\text{A}$ |
| Temperature coefficient of $I_k$  | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $TK_{I_k}$      |      | 0.1      |      | %/K           |
| Reverse light current   | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$  | $I_{ra}$        | 6.7  | 9.5      | 12.4 | $\mu\text{A}$ |
| Angle of half sensitivity   |  | $\phi$          |      | $\pm 60$ |      | deg           |
| Wavelength of peak sensitivity  |  | $\lambda_p$     |      | 950      |      | nm            |
| Range of spectral bandwidth   |  | $\lambda_{0.5}$ | 750  |          | 1050 | nm            |
| Rise time   | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 820\text{ nm}$ | $t_r$           |      | 100      |      | ns            |
| Fall time   | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 820\text{ nm}$ | $t_f$           |      | 100      |      | ns            |

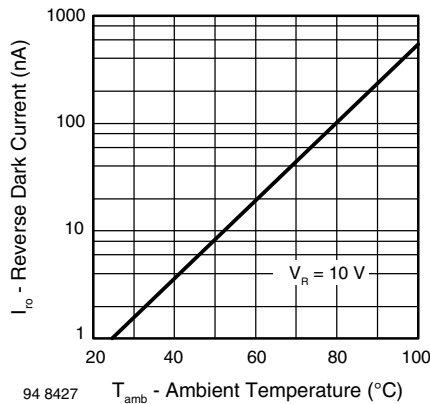
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

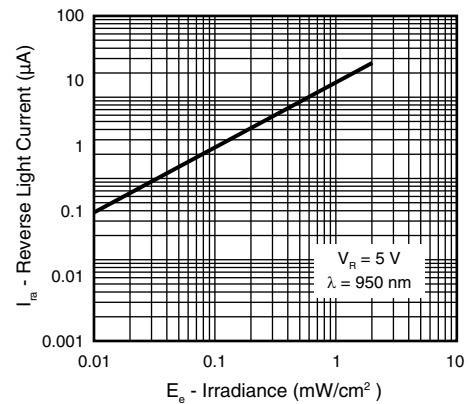


Fig. 3 - Reverse Light Current vs. Irradiance

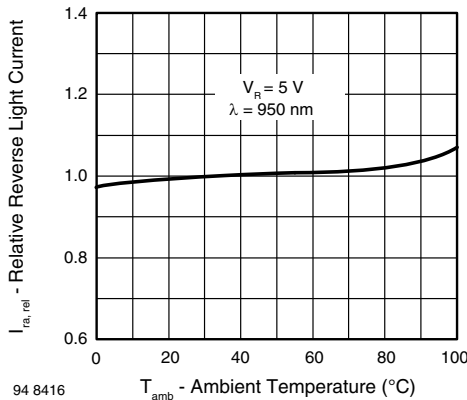


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

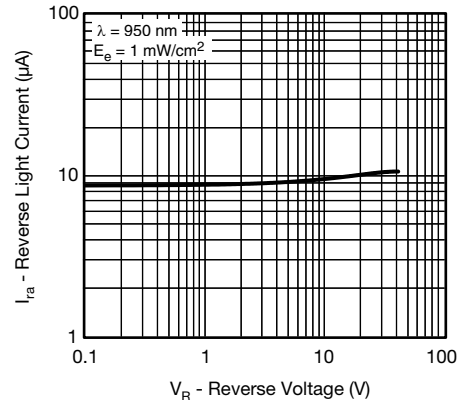


Fig. 4 - Reverse Light Current vs. Reverse Voltage

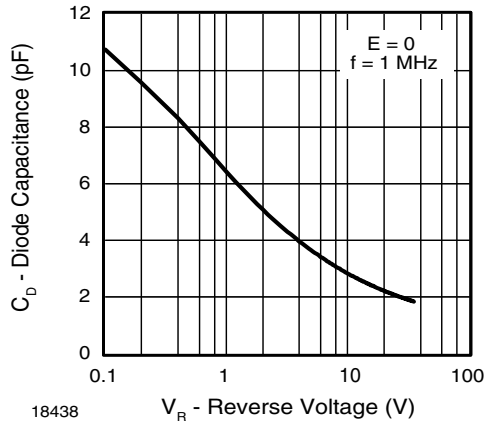


Fig. 5 - Diode Capacitance vs. Reverse Voltage

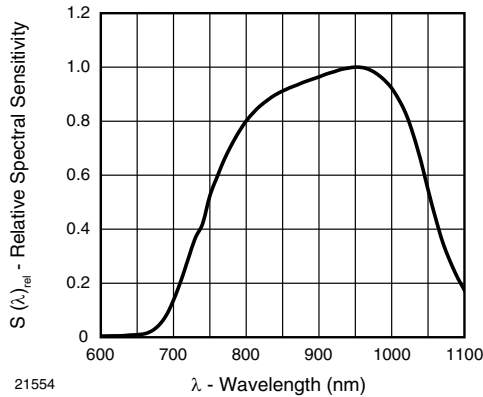


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

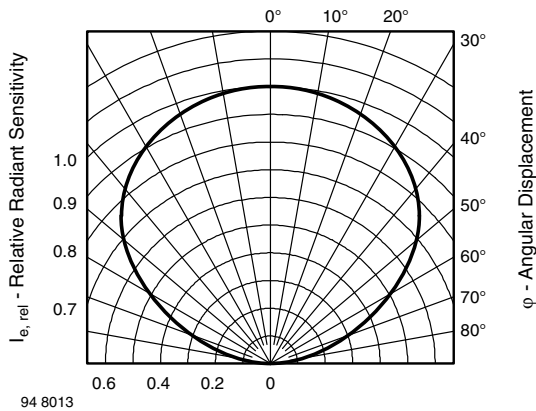


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

**REFLOW SOLDER PROFILE**

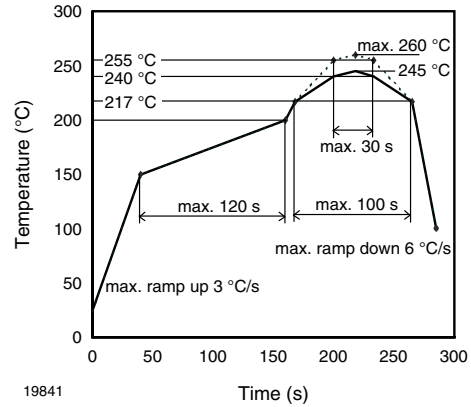


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**DRYPACK**

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

**FLOOR LIFE**

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 72 h

Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ ,  $RH < 60\%$

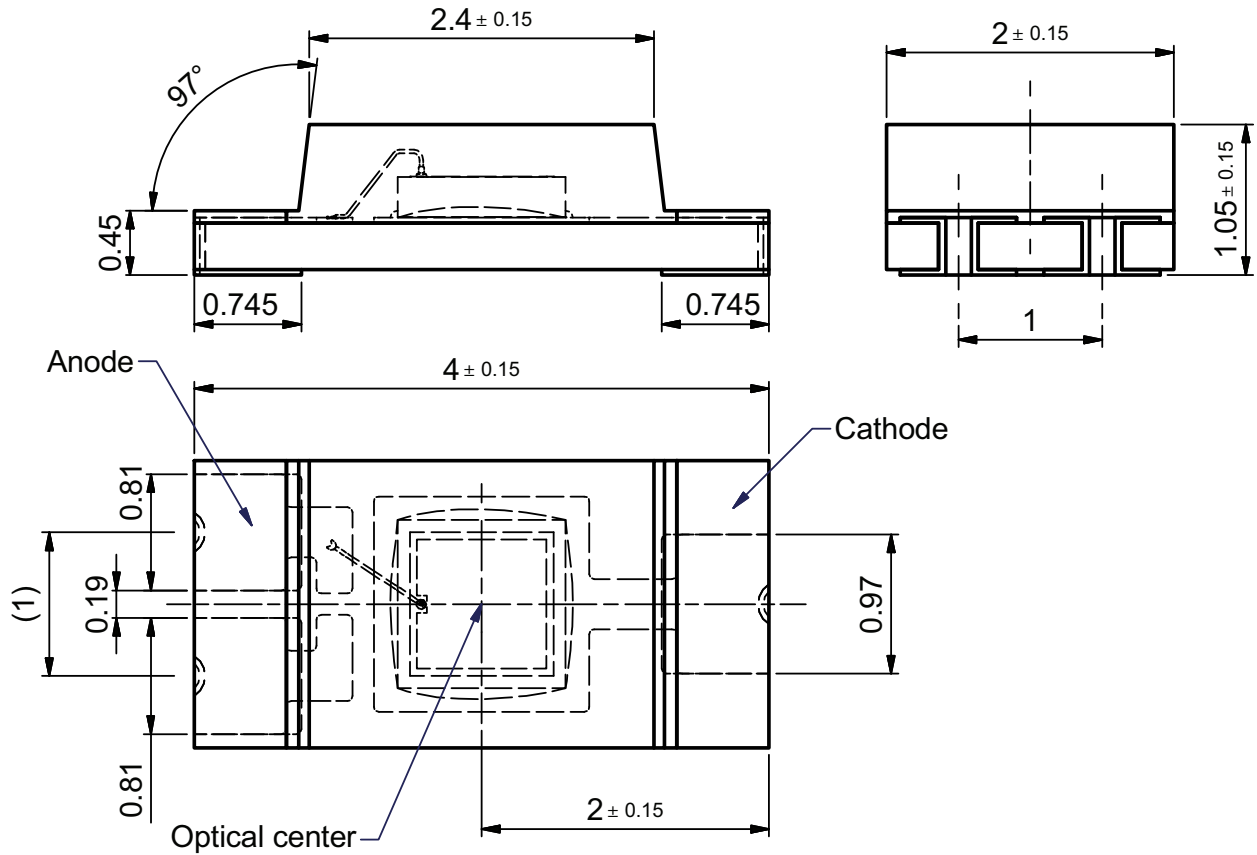
Moisture sensitivity level 4, acc. to J-STD-020.

**DRYING**

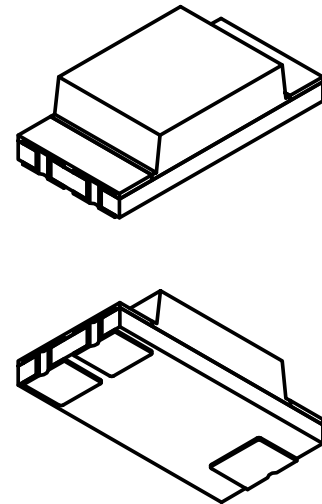
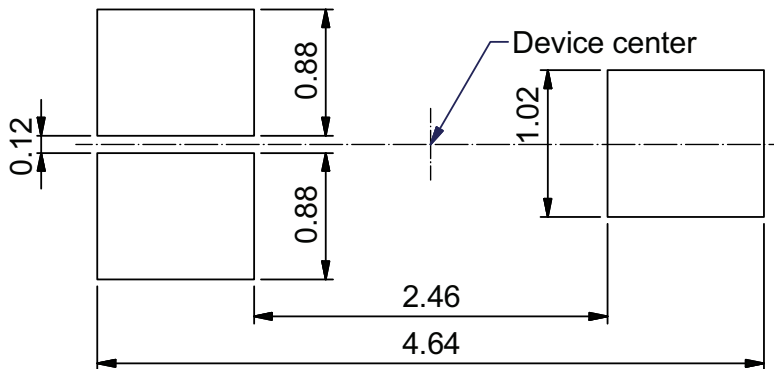
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5 °C),  $RH < 5\%$ .



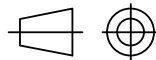
PACKAGE DIMENSIONS in millimeters



Recommended solder pad footprint



Drawing-No. 6.541-5100.01-4  
Preliminary issue 04.07.2013



Technical drawings according to DIN specification.

Not indicated tolerances  $\pm 0.1$ mm

**BLISTER TAPE DIMENSIONS** in millimeters



Not indicated tolerances  $\pm 0.1$

All dimensions in mm

Drawing refers to following Types: TEMD6010FX01

VEMD6x10X01

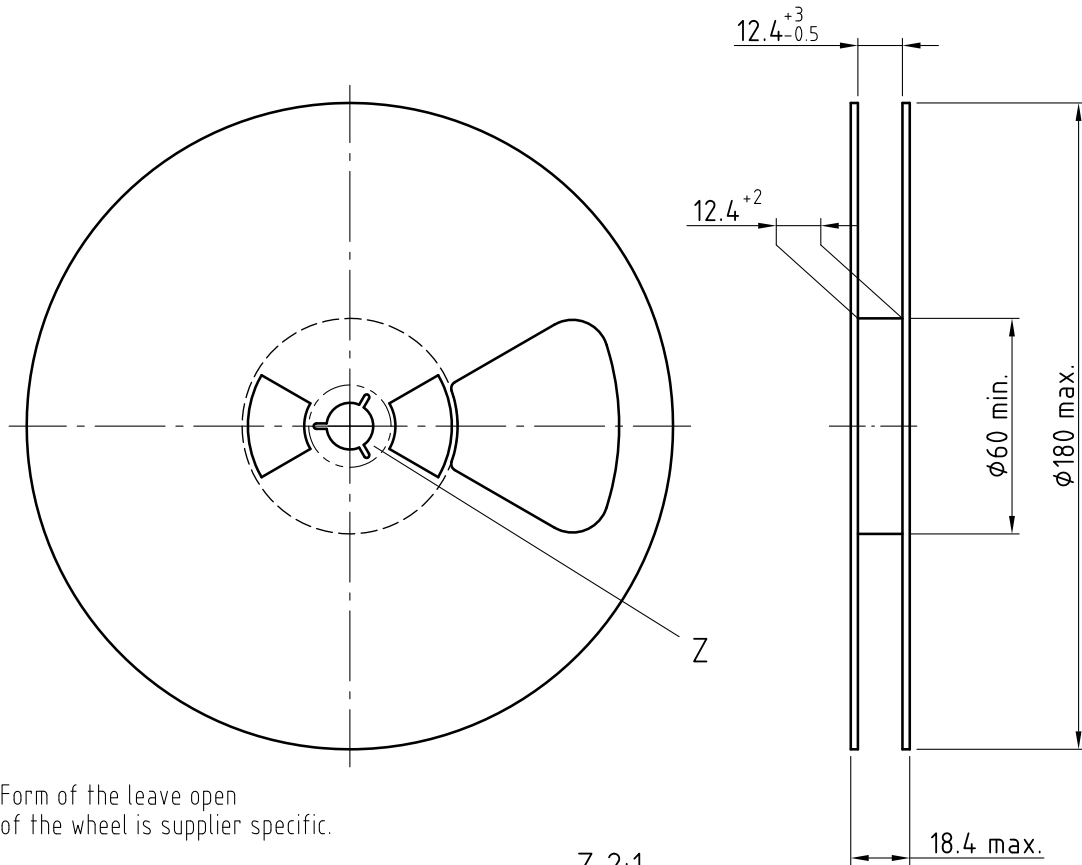
Drawing-No.: 9.700-5329.02-4

VEMD6x15X01

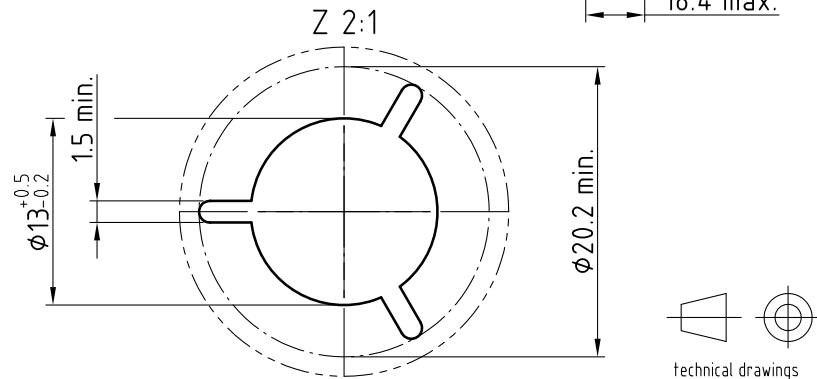
Prel Issue: 16.07.2013



REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



technical drawings according to DIN specifications

Drawing-No.: 9.800-5097.01-4  
Issue: 1; 05.05.08  
20874



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