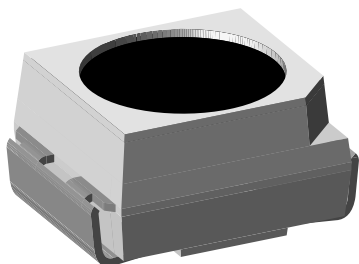


## Silicon PIN Photodiode



### DESCRIPTION

VEMD3160FX01 is a high speed and high sensitive PIN photodiode with a highly linear photoresponse.

### FEATURES

- Package type: surface-mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- Daylight blocking filter
- AEC-Q101 qualified
- Excellent  $I_{ra}$  linearity
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- High speed photo detector
- Small signal detection
- Proximity sensors

### PRODUCT SUMMARY

| COMPONENT    | $I_{ra}$ ( $\mu A$ ) | $\phi$ ( $^\circ$ ) | $\lambda_{0.5}$ (nm) |
|--------------|----------------------|---------------------|----------------------|
| VEMD3160FX01 | 1.6                  | $\pm 60$            | 860 to 1030          |

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE     | PACKAGING     | REMARKS                      | PACKAGE FORM |
|-------------------|---------------|------------------------------|--------------|
| VEMD3160FX01-GS08 | Tape and reel | MOQ: 7500 pcs, 1500 pcs/reel | PLCC-2       |

#### Note

- MOQ: minimum order quantity

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

| PARAMETER                 | TEST CONDITION                     | SYMBOL    | VALUE       | UNIT       |
|---------------------------|------------------------------------|-----------|-------------|------------|
| Reverse voltage           |                                    | $V_R$     | 5           | V          |
| Junction temperature      |                                    | $T_J$     | 110         | $^\circ C$ |
| Ambient temperature range |                                    | $T_{amb}$ | -40 to +110 | $^\circ C$ |
| Storage temperature range |                                    | $T_{stg}$ | -40 to +110 | $^\circ C$ |
| Soldering temperature     | According to reflow solder profile | $T_{sd}$  | 260         | $^\circ C$ |

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

| PARAMETER                           | TEST CONDITION                                                             | SYMBOL          | MIN. | TYP.        | MAX. | UNIT          |
|-------------------------------------|----------------------------------------------------------------------------|-----------------|------|-------------|------|---------------|
| Forward voltage                     | $I_F = 50\text{ mA}$                                                       | $V_F$           | -    | 0.9         | -    | V             |
| Breakdown voltage                   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                   | $V_{(BR)}$      | 20   | -           | -    | V             |
| Reverse dark current                | $V_R = 5\text{ V}$ , $E = 0$                                               | $I_{ro}$        | -    | 1           | 3    | nA            |
| Diode capacitance                   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           | -    | 1.9         | -    | pF            |
|                                     | $V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           | -    | 1           | -    | pF            |
| Temperature coefficient of $I_{ra}$ | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 940\text{ nm}$                       | $TK_{I_{ra}}$   | -    | 0.26        | -    | %/K           |
| Reverse light current               | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 940\text{ nm}$ , $V_R = 5\text{ V}$  | $I_{ra}$        | 1.14 | 1.6         | 2.25 | $\mu\text{A}$ |
|                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 890\text{ nm}$ , $V_R = 5\text{ V}$  | $I_{ra}$        | -    | 1.5         | -    | $\mu\text{A}$ |
| Angle of half sensitivity           |                                                                            | $\phi$          | -    | $\pm 60$    | -    | $^{\circ}$    |
| Wavelength of peak sensitivity      |                                                                            | $\lambda_p$     | -    | 920         | -    | nm            |
| Range of spectral bandwidth         |                                                                            | $\lambda_{0.5}$ | -    | 860 to 1030 | -    | nm            |
| Rise time                           | $V_R = 10\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 950\text{ nm}$ | $t_r$           | -    | 180         | -    | ns            |
| Fall time                           | $V_R = 10\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 950\text{ nm}$ | $t_f$           | -    | 180         | -    | ns            |

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

Basic characteristics graphs to be extended to  $110\text{ }^{\circ}\text{C}$  ambient temperatures where applicable.

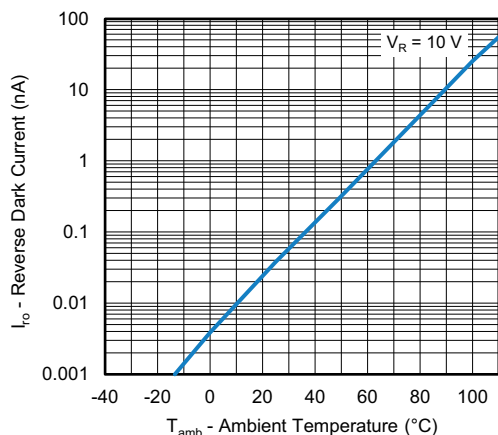


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

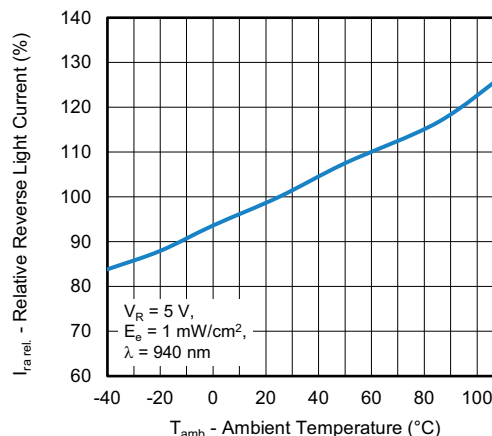


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

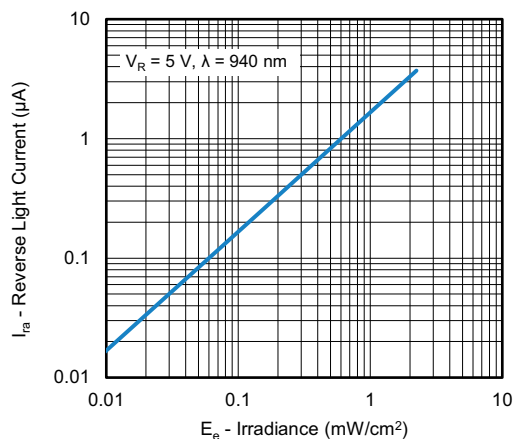


Fig. 3 - Reverse Light Current vs. Irradiance

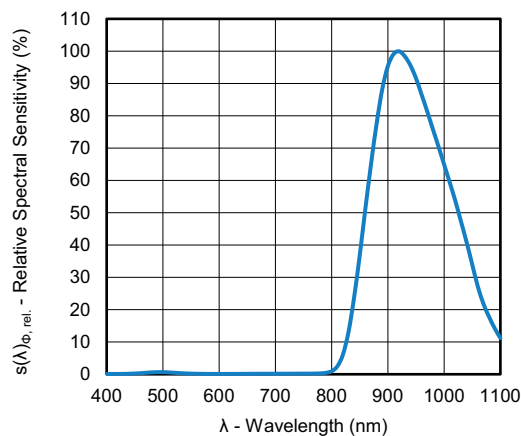


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

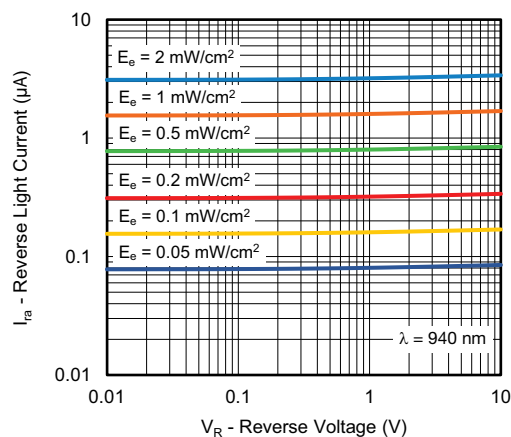


Fig. 4 - Reverse Light Current vs. Reverse Voltage

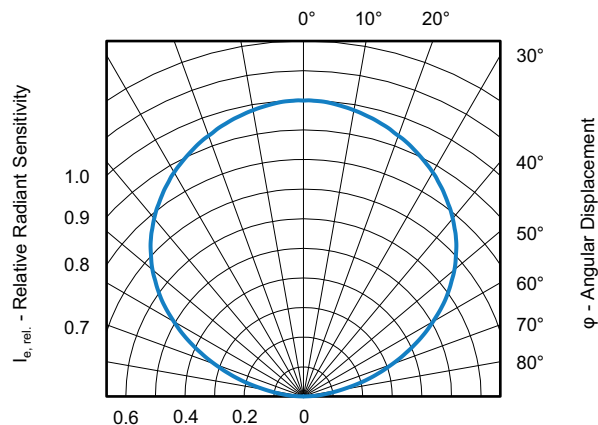


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

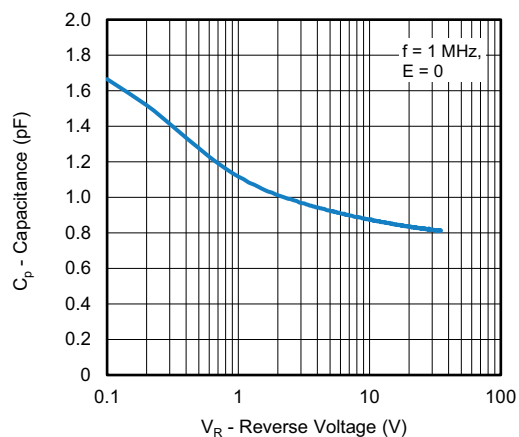


Fig. 5 - Diode Capacitance vs. Reverse Voltage

## 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: 168 h

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

Moisture sensitivity level 3, according to J-STD-033D.

## DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5  $^{\circ}\text{C}$ ), RH < 5 %.

## REFLOW SOLDER PROFILE

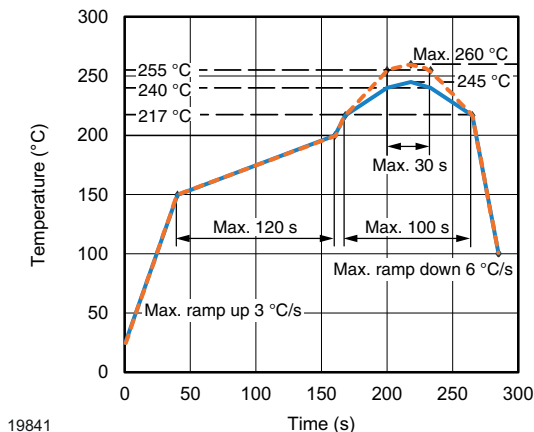
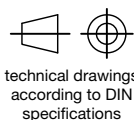
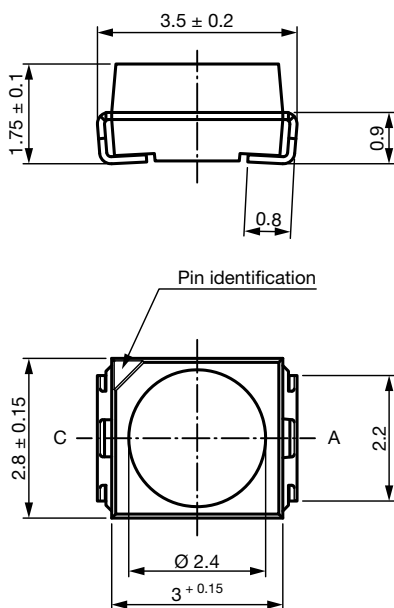
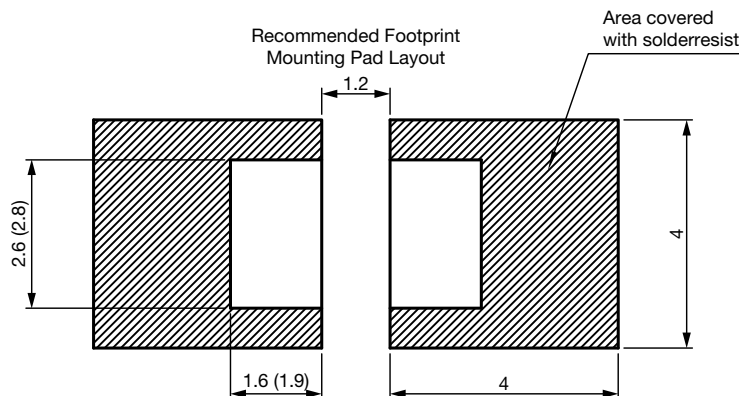


Fig. 8 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5067.01-4  
Issue: 7; 12.03.14







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