

Silicon PIN Photodiode



FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.7
- Radiant sensitive area (in mm²): 0.42
- Operating temperature range: T_{OP} = -40 °C to +110 °C
- Daylight blocking filter matched with 830 nm to 950 nm emitters
- Angle of half sensitivity: φ = ± 55°
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

VEMD4110X01 is a high speed and high sensitive PIN photodiode. It is a miniature surface mount device (SMD) with a 0.42 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength of 830 nm to 950 nm.

APPLICATIONS

- High speed photo detector
- Photo interrupters
- Automotive sensors

| PRODUCT SUMMARY | | | |
|-----------------|---|-------|-----------------------|
| COMPONENT | I _{rs} (μA) at E _e = 1 mW/cm ² , λ = 950 nm, V _R = 5 V | φ (°) | λ _{0.5} (nm) |
| VEMD4110X01 | 2.4 | ± 55 | 740 to 1040 |

Note

- Test conditions see table “Basic Characteristics”

| ORDERING INFORMATION | | | |
|----------------------|---------------|------------------------------|--------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| VEMD4110X01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 0805 |

Note

- MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | |
|---|---|------------------|-------------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage | | V _R | 20 | V |
| Operating temperature range | | T _{amb} | -40 to +110 | °C |
| Storage temperature range | | T _{stg} | -40 to +110 | °C |
| Soldering temperature | According to reflow solder profile Fig. 8 | T _{sd} | 260 | °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 | - | 1.1 | 1.3 | V |
| Reverse dark current | $V_R = 5\text{ V}, E = 0$ | I_{r0} | - | 1 | 3 | nA |
| Diode capacitance | $V_R = 0\text{ V}, f = 1\text{ MHz}, E = 0$ | C_D | - | 7 | - | pF |
| | $V_R = 5\text{ V}, f = 1\text{ MHz}, E = 0$ | C_D | - | 2.5 | - | pF |
| Short circuit current | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$ | I_k | - | 2.2 | - | μA |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$ | V_O | - | 318 | - | mV |
| 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} | 1.9 | 2.4 | 3.1 | μA |
| Angle of half sensitivity | | φ | - | ± 55 | - | $^{\circ}$ |
| Wavelength of peak sensitivity | | λ_p | - | 910 | - | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | - | 740 to 1040 | - | nm |
| Rise time | $V_R = 5\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 820\text{ nm}$ | t_r | - | 100 | - | ns |
| Fall time | $V_R = 5\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 820\text{ nm}$ | t_f | - | 100 | - | ns |

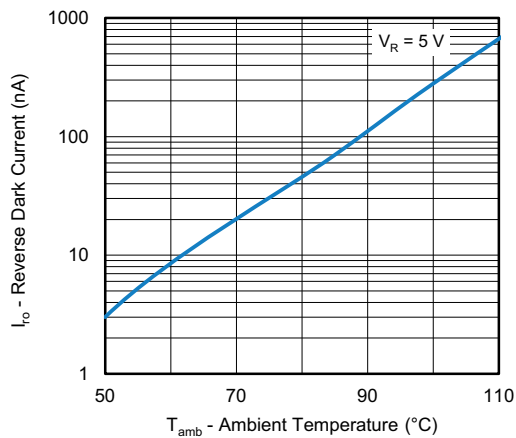
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

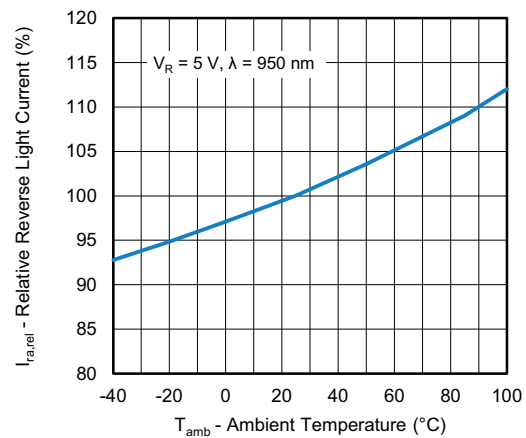


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

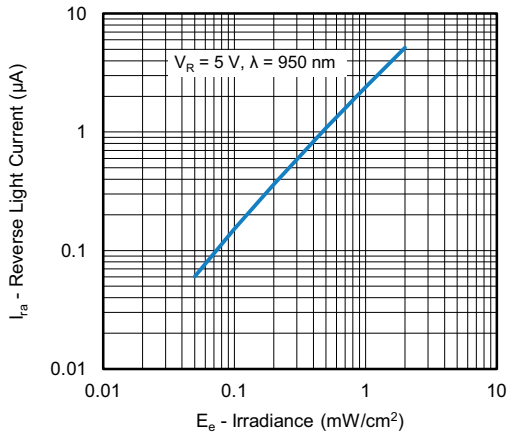


Fig. 3 - Reverse Light Current vs. Irradiance

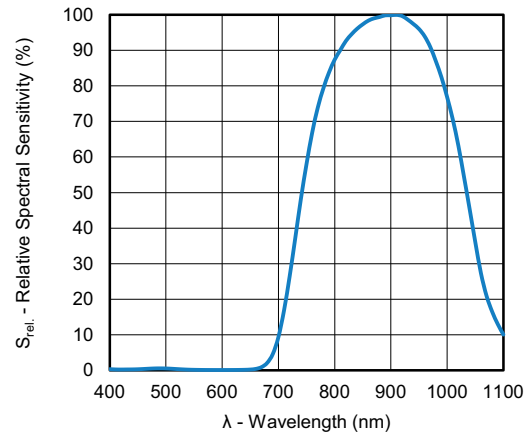


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

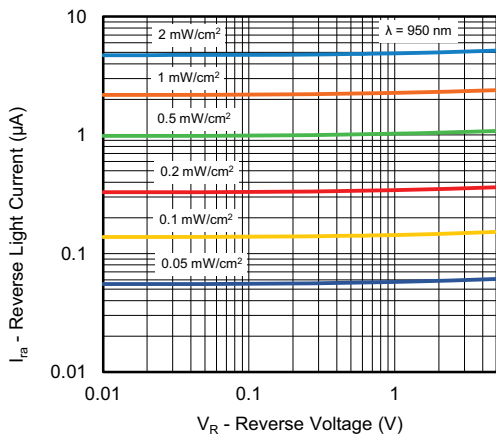


Fig. 4 - Reverse Light Current vs. Reverse Voltage

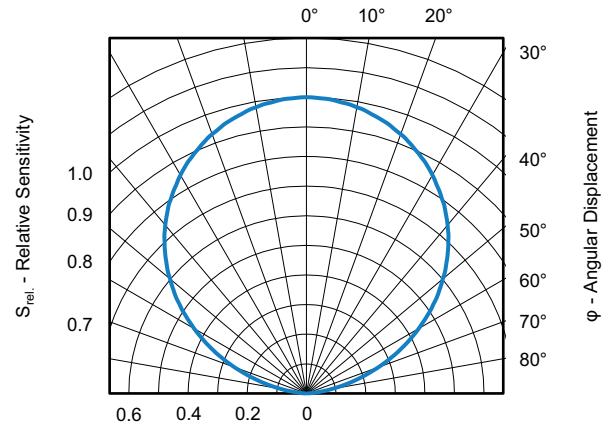
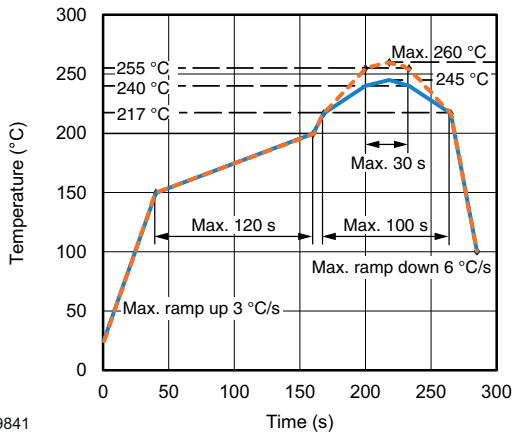


Fig. 6 - Relative Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE



19841

Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to 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: 168 h

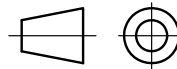
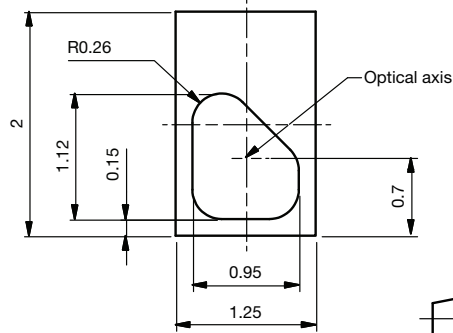
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

Moisture sensitivity level 3, according to J-STD-020.

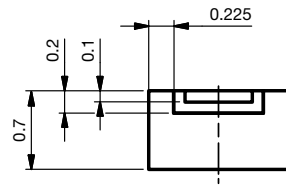
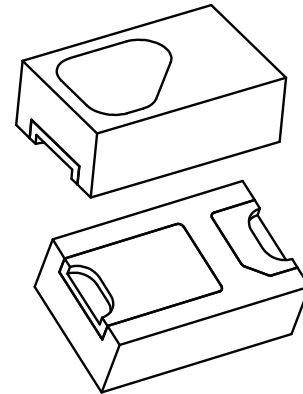
DRYING

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 $40\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$.

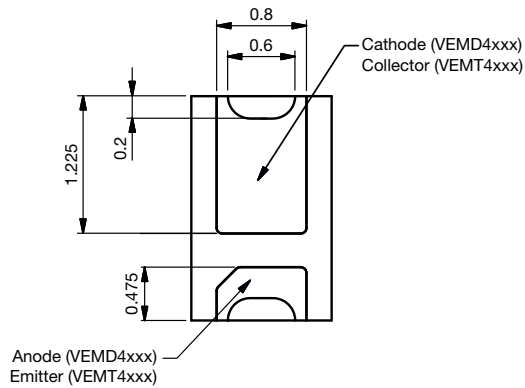
PACKAGE DIMENSIONS in millimeters



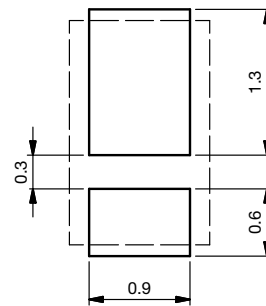
Technical drawings according to DIN specification



Not indicated tolerances ± 0.1



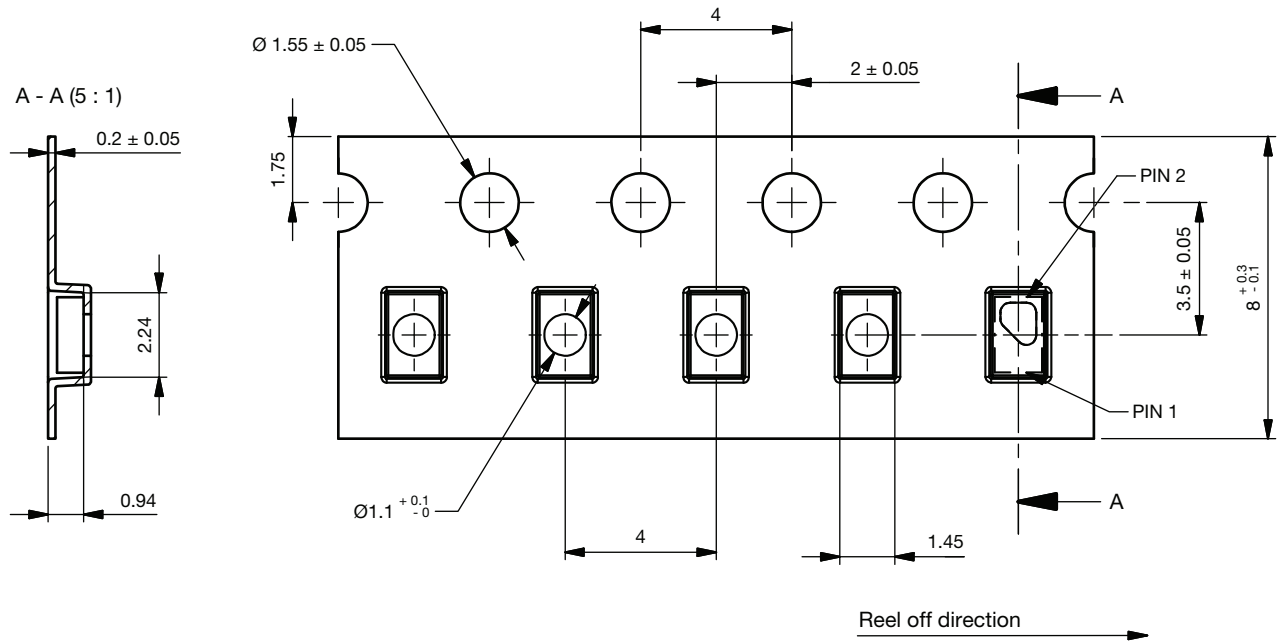
Recommended footprint



Drawing-No.: 6.550-5363.01-4
Issue: 2; 01.07.2020



BLISTER TAPE DIMENSIONS in millimeters

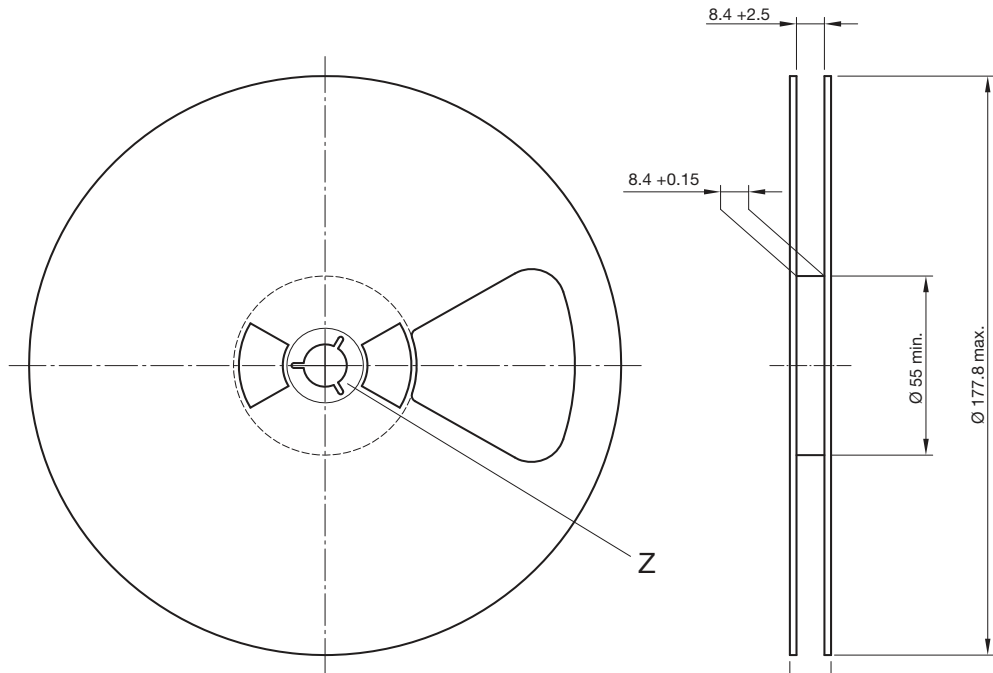


| TYPE | PIN 1 | PIN 2 |
|----------|-------|---------|
| VEMD4xxx | Anode | Cathode |

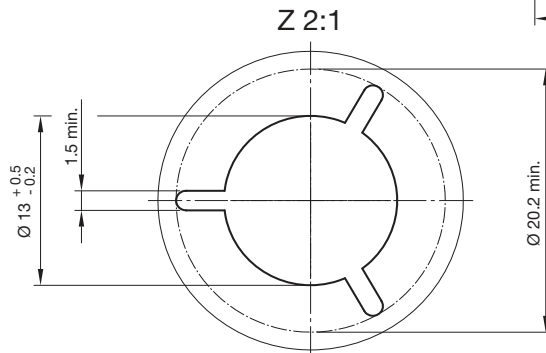
Drawing-No.: 9.700-5411.0-4
Issue: 1_A; 11.10.2022



REEL DIMENSIONS in millimeters



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



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4
Issue: 2; 26.04.10
20875



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