

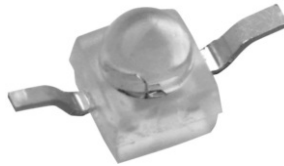
Silicon PIN Photodiode

VEMD2520X01



16758-11

VEMD2500X01



DESCRIPTION

VEMD2500X01 and VEMD2520X01 are high speed and high sensitive PIN photodiodes in a clear epoxy, miniature surface mount package (SMD) with dome lens. The photo sensitive area of the chip is 0.23 mm².

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- AEC-Q101 qualified
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 15^\circ$
- Package matched with IR emitter series VSMB2000X01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications



APPLICATIONS

- High speed photo detector

PRODUCT SUMMARY

| COMPONENT | I _{ra} (μA) | φ (deg) | λ _{0.1} (nm) |
|-------------|----------------------|---------|-----------------------|
| VEMD2500X01 | 12 | ± 15 | 350 to 1120 |
| VEMD2520X01 | 12 | ± 15 | 350 to 1120 |

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|------------------|
| VEMD2500X01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Reverse gullwing |
| VEMD2520X01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Gullwing |

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|-----------------------------------|-------------------|---------------|------|
| Reverse voltage | | V _R | 60 | V |
| Power dissipation | T _{amb} ≤ 25 °C | P _V | 215 | mW |
| Junction temperature | | T _j | 100 | °C |
| Operating temperature range | | T _{amb} | - 40 to + 100 | °C |
| Storage temperature range | | T _{stg} | - 40 to + 100 | °C |
| Soldering temperature | Acc. reflow solder profile fig. 7 | T _{sd} | 260 | °C |
| Thermal resistance junction/ambient | Acc. J-STD-051 | R _{thJA} | 250 | K/W |

Note

T_{amb} = 25 °C, unless otherwise specified

| BASIC CHARACTERISTICS | | | | | | |
|----------------------------------|---|-----------------|------|-------------|------|---------------|
| 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 | 10 | nA |
| Diode capacitance | $V_R = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$ | C_D | | 4 | | pF |
| | $V_R = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$ | C_D | | 1.3 | | pF |
| Open circuit voltage | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$ | V_o | | 350 | | mV |
| Temperature coefficient of V_o | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$ | TK_{V_o} | | -2.6 | | mV/K |
| Short circuit current | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$ | I_k | | 11 | | μA |
| 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} | 5 | 12 | | μA |
| Angle of half sensitivity | | ϕ | | ± 15 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 900 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.1}$ | | 350 to 1120 | | 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 |

Note

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

BASIC CHARACTERISTICS

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

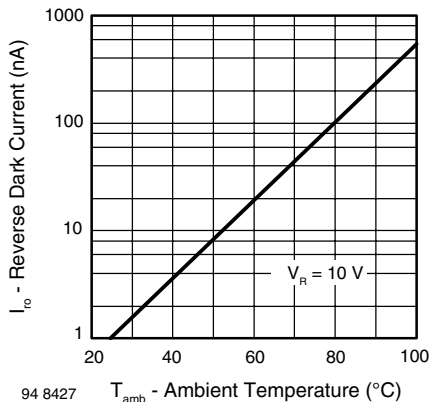


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

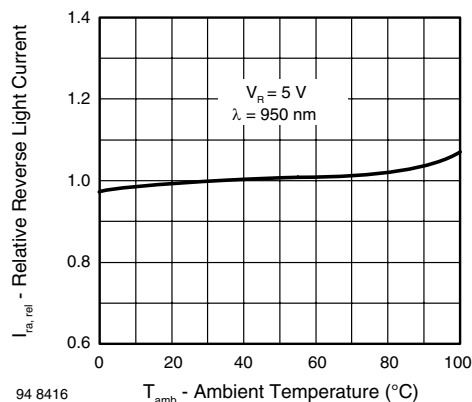


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

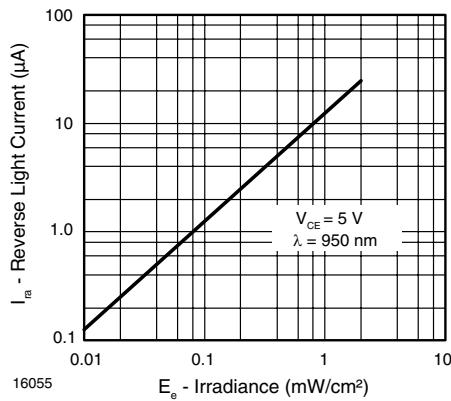


Fig. 3 - Reverse Light Current vs. Irradiance

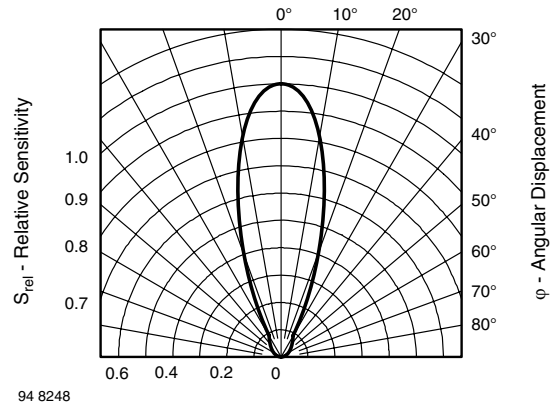


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

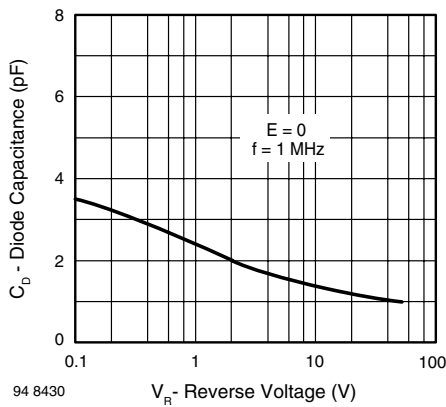


Fig. 4 - Diode Capacitance vs. Reverse Voltage

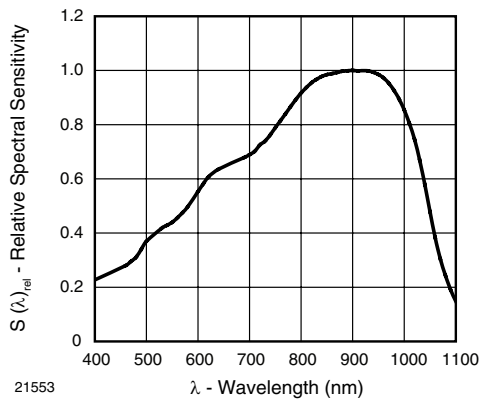


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

REFLOW SOLDER PROFILE

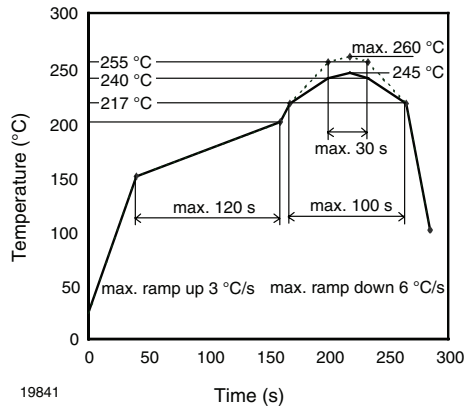


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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: 4 weeks

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

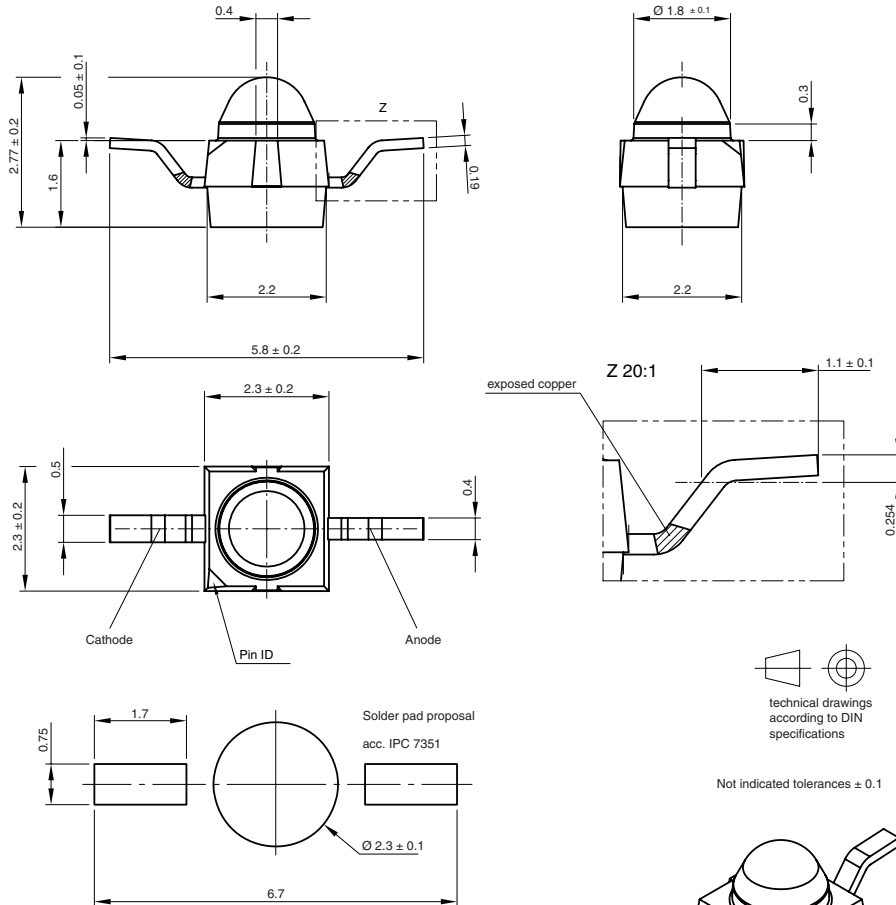
Moisture sensitivity level 2a, acc. to J-STD-020.

DRYING

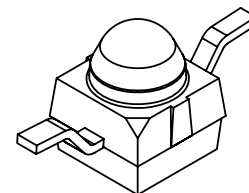
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label.

Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

PACKAGE DIMENSIONS in millimeters: VEMD2500X01



Drawing-No.: 6.544-5391.02-4
Issue: 1; 26.09.08
21517



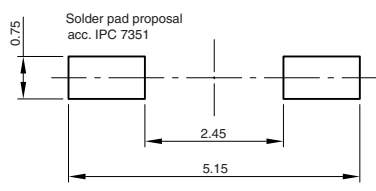
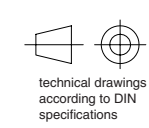
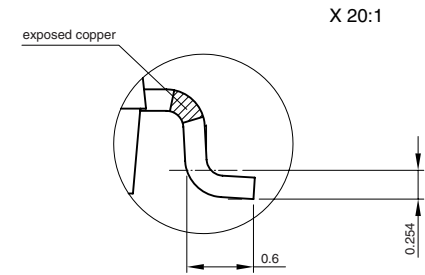
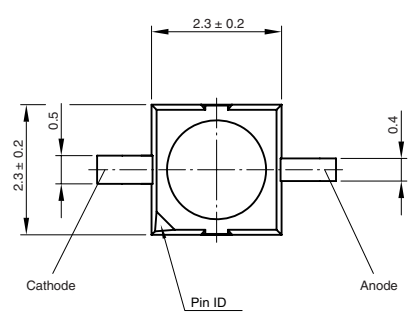
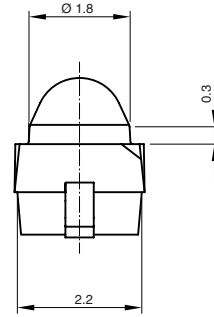
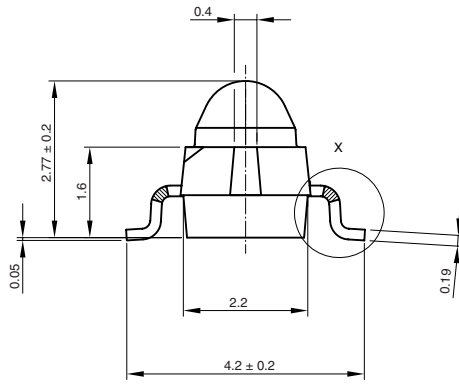


VEMD2500X01, VEMD2520X01

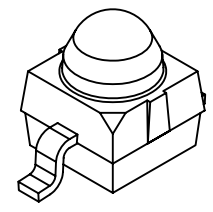
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PACKAGE DIMENSIONS in millimeters: **VEMD2520X01**



Not indicated tolerances ± 0.1



Drawing-No.: 6.544-5383.02-4
Issue: 3; 26.09.08
21488

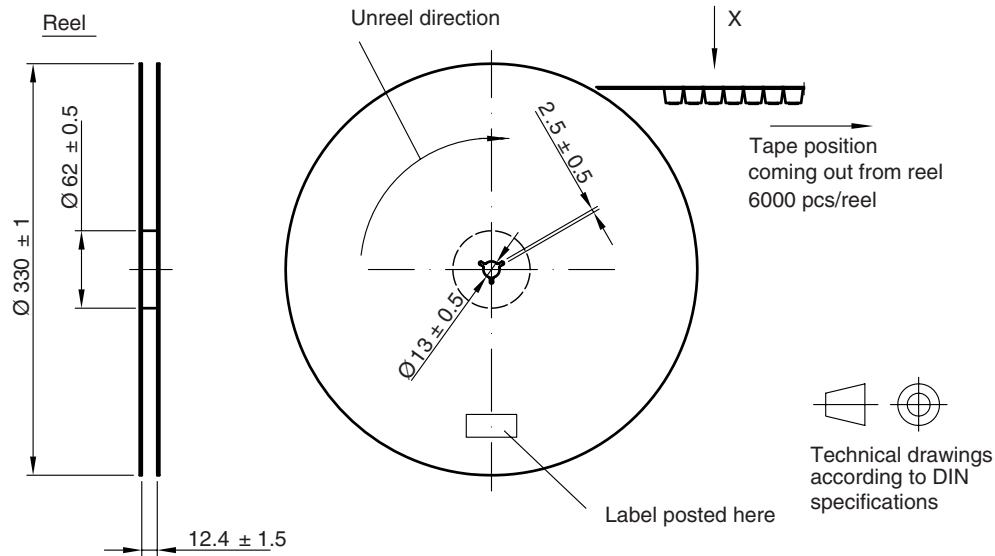
VEMD2500X01, VEMD2520X01

Vishay Semiconductors

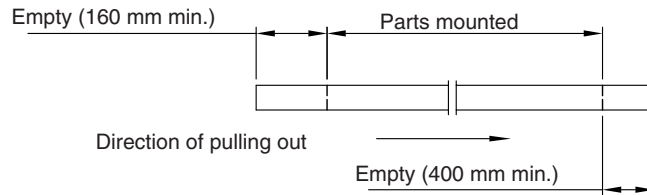
Silicon PIN Photodiode



TAPING AND REEL DIMENSIONS in millimeters: VEMD2500X01

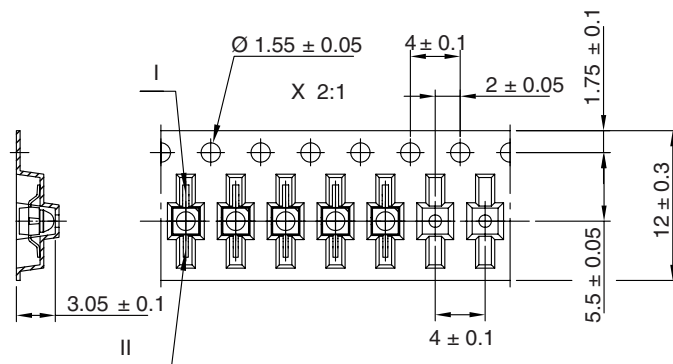


Leader and trailer tape:



Terminal position in tape

| Device | Lead I | Lead II |
|----------|-----------|---------|
| VEMT2000 | Collector | Emitter |
| VEMT2500 | | |
| VEMD2000 | Cathode | Anode |
| VSMB2000 | | |



Drawing-No.: 9.800-5100.01-4
 Issue: X; 29.04.09
 21572

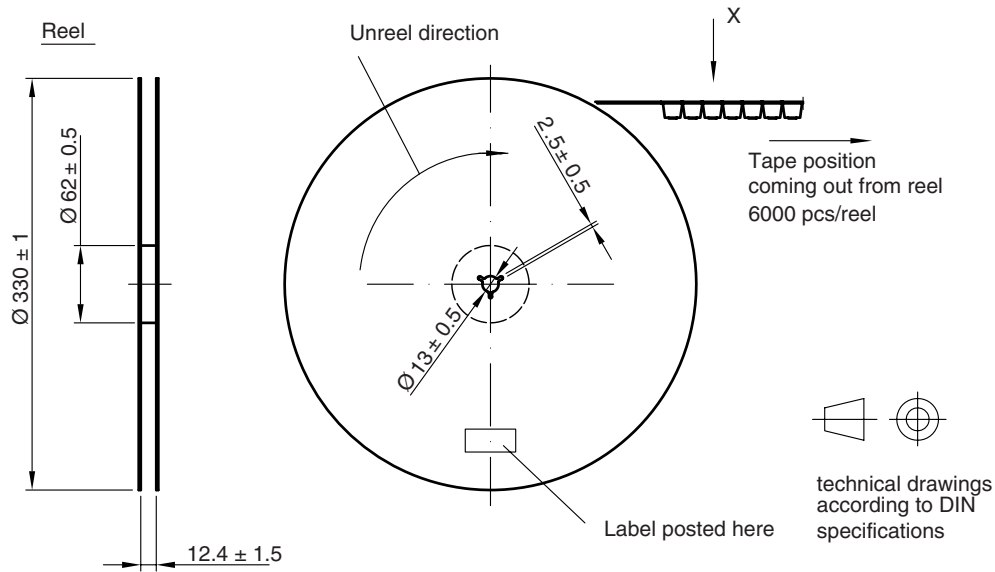


VEMD2500X01, VEMD2520X01

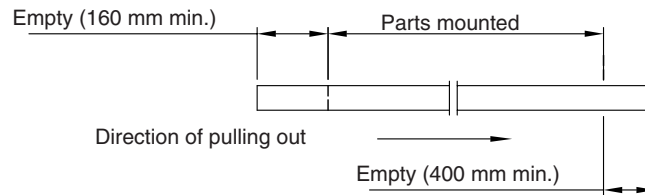
Silicon PIN Photodiode

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TAPING AND REEL DIMENSIONS in millimeters: VEMD2520X01

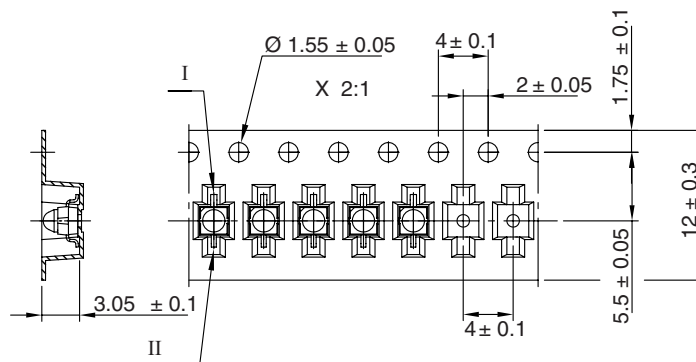


Leader and trailer tape:



Terminal position in tape

| Device | Lead I | Lead II |
|----------|-----------|---------|
| VEMT2020 | Collector | Emitter |
| VEMT2520 | Collector | Emitter |
| VSMB2020 | Cathode | Anode |
| VEMD2020 | Cathode | Anode |



Drawing-No.: 9.800-5091.01-4

Issue: X; 29.04.09

21571



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