Silicon PIN Photodiode

FEATURES

- Package type: surface-mount
- Package form: top view
- Dimensions (L x W x H in mm): 4.8 x 2.5 x 0.5
- Radiant sensitive area (in mm^2): 6.0
- Enhanced sensitivity
- Suitable for visible and near infrared radiation
- Compatible with infrared reflow solder process
- Angle of half sensitivity: $\varphi = \pm 65°$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

VEMD8082 is a high speed and high sensitive PIN photodiode with enhanced sensitivity for visible light. It is a low profile surface-mount device (SMD) including the chip with a 6.0 mm^2 sensitive area detecting visible and near infrared radiation.

APPLICATIONS

- Wearables
- Health monitoring
- High speed photo detector

PRODUCT SUMMARY			
COMPONENT	I_{ra} (µA) at E_e = 1.0 mW/cm², λ = 850 nm, V_R = 5.0 V	φ (°)	$\lambda_{0.1}$ (nm)
VEMD8082	40	± 65	350 to 1100

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD8082	Tape and reel	MOQ: 3000 pcs, 1500 pcs/reel	Top view

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 +85	°C
Storage temperature range		T_{stg}	-55 to +100	°C
Soldering temperature	According to reflow solder profile Fig. 7	T_{sd}	260	°C
ESD safety HBM	± 2000 V, 1.5 kΩ, 100 pF, 3 pulses	ESD_{HBM}	≥ 2	kV

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 20 mA	V_F	-	0.9	-	V
Reverse break down voltage	I_R = 100 µA, E_e = 0 mW/cm²	$V_{(BR)R}$	20	-	-	V
Reverse dark current	V_R = 10 V, E_e = 0 mW/cm²	I_{ro}	-	0.2	10	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D	-	46	-	pF
	V_R = 3 V, f = 1 MHz, E = 0	C_D	-	18	-	pF
Reverse light current	E_e = 1 mW/cm², λ = 525 nm, V_R = 5 V	I_{ra}	17	25	-	µA
	E_e = 1 mW/cm², λ = 850 nm, V_R = 5 V	I_{ra}	-	40	-	µA
	E_e = 1 mW/cm², λ = 940 nm, V_R = 5 V	I_{ra}	24	38	-	µA
Angle of half sensitivity		φ	-	± 65	-	°
Wavelength of peak sensitivity		λ_p	-	890	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	350 to 1100	-	nm
Rise time	V_R = 10 V, R_L = 50 Ω, λ = 830 nm	t_r	-	40	-	ns
Fall time	V_R = 10 V, R_L = 50 Ω, λ = 830 nm	t_f	-	40	-	ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

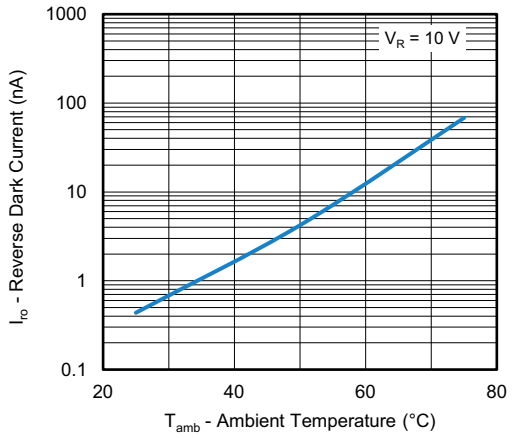


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

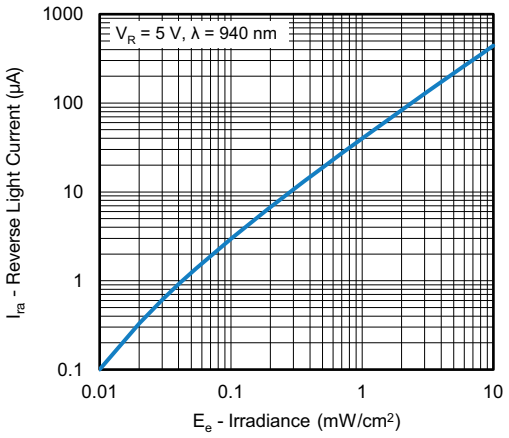


Fig. 3 - Reverse Light Current vs. Irradiance

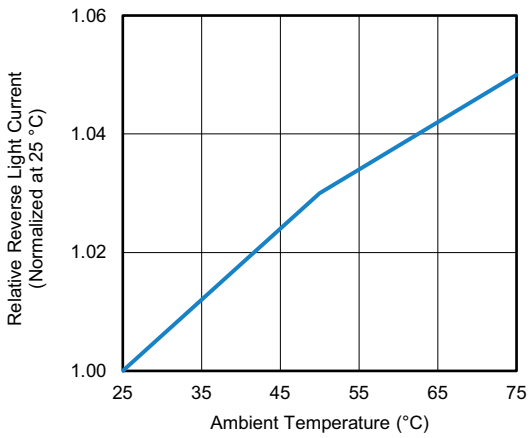


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

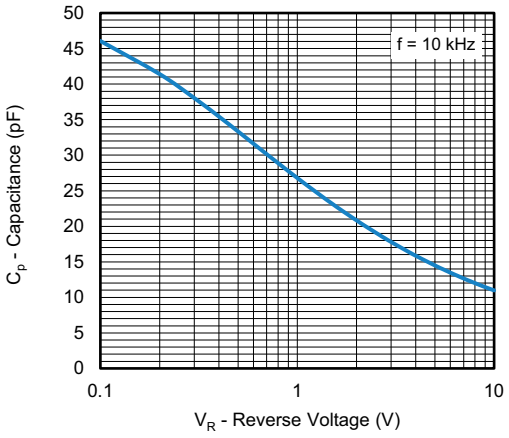


Fig. 4 - Diode Capacitance vs. Reverse Voltage

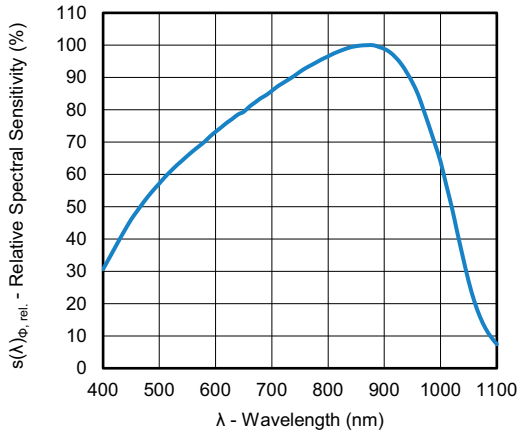


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

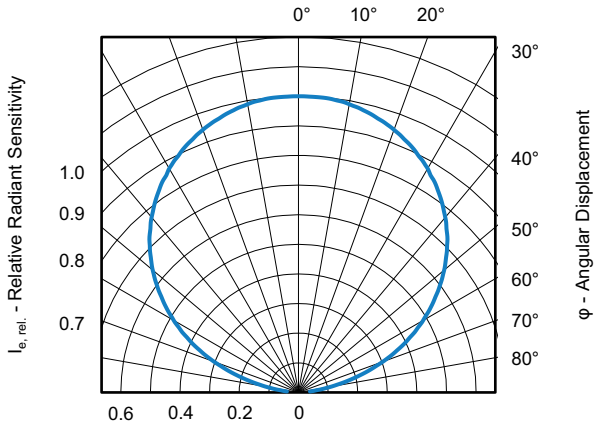
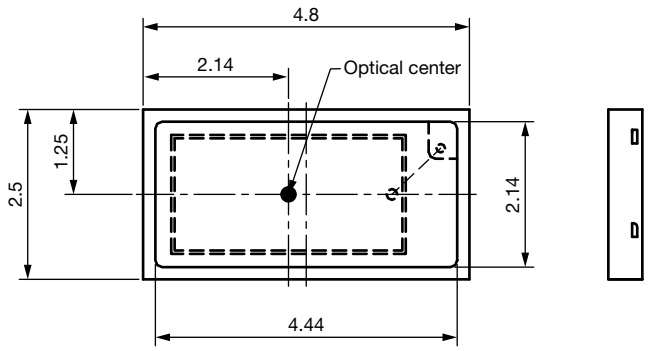
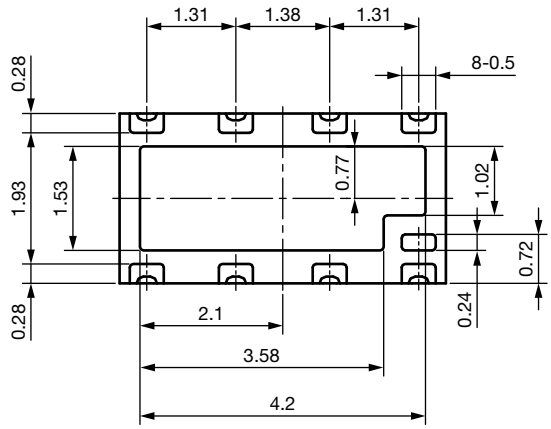


Fig. 6 - Relative Sensitivity vs. Angular Displacement

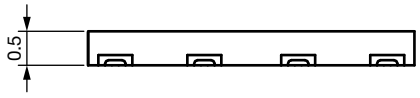
PACKAGE DIMENSIONS in millimeters

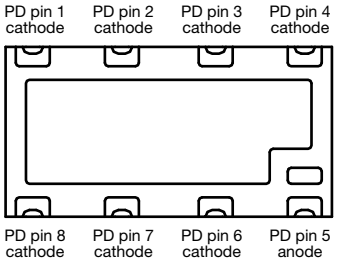


Top view



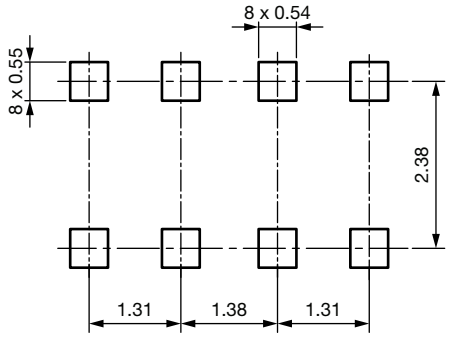
Bottom view



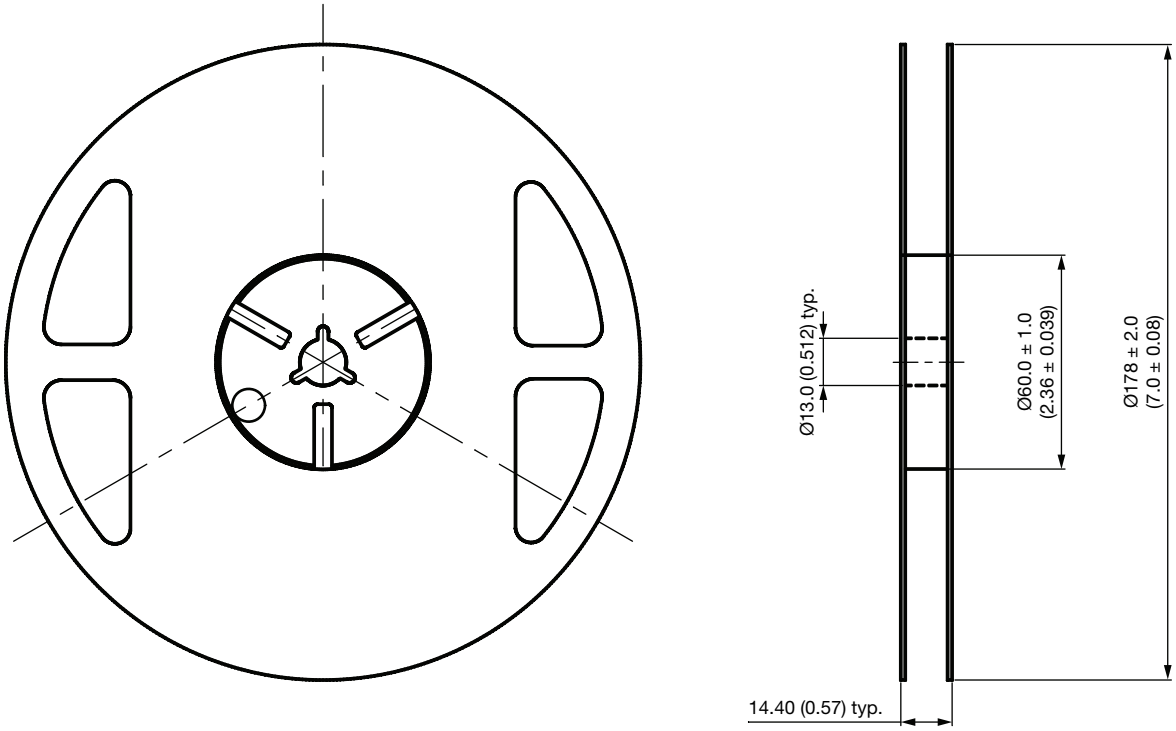


Tolerance is ± 0.1 mm (0.004") unless otherwise noted.

RECOMMENDED SOLDERING PAD DIMENSIONS



REEL DIMENSIONS in millimeters (inches)



Notes

- Empty component pockets sealed with top cover tape
- 7 inch reel - 1500 pieces per reel
- The maximum number of consecutive missing lamps is two
- In accordance with ANSI/EIA 481-1-A-1994 specifications

SOLDER PROFILE

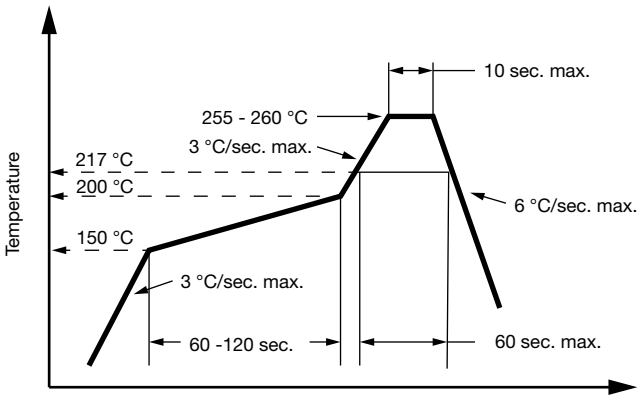


Fig. 7 - Lead (Pb)-free Reflow Solder Profile

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

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

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

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or recommended conditions:

192 h at 40 °C (+ 5 °C), RH < 5 %
or
96 h at 60 °C (+ 5 °C), RH < 5 %

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.