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: 1500 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)

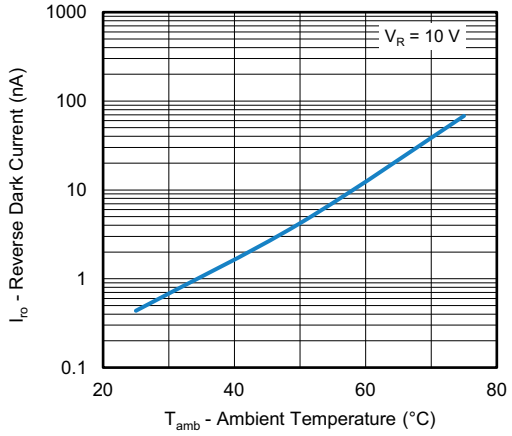


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

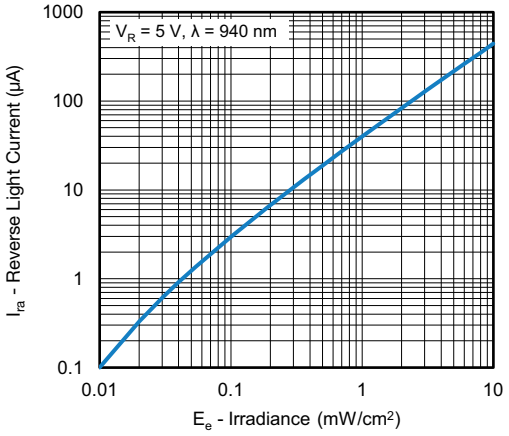


Fig. 3 - Reverse Light Current vs. Irradiance

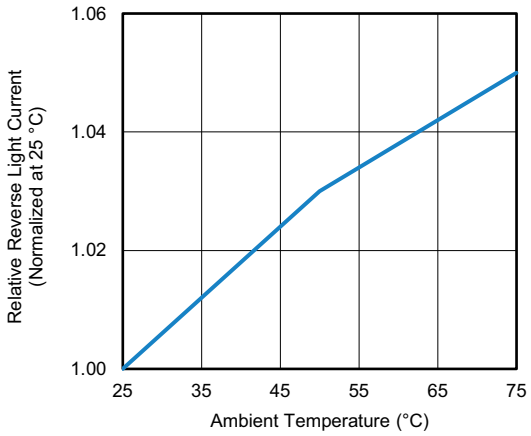


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

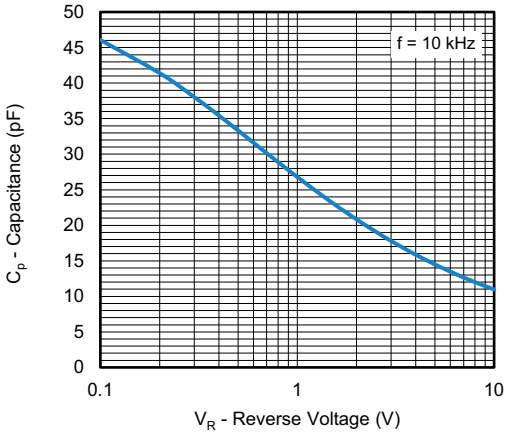


Fig. 4 - Diode Capacitance vs. Reverse Voltage

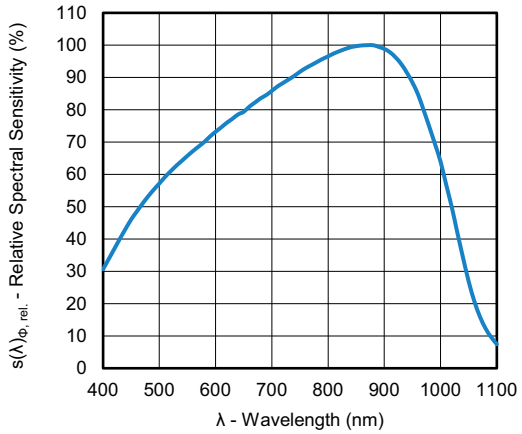


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

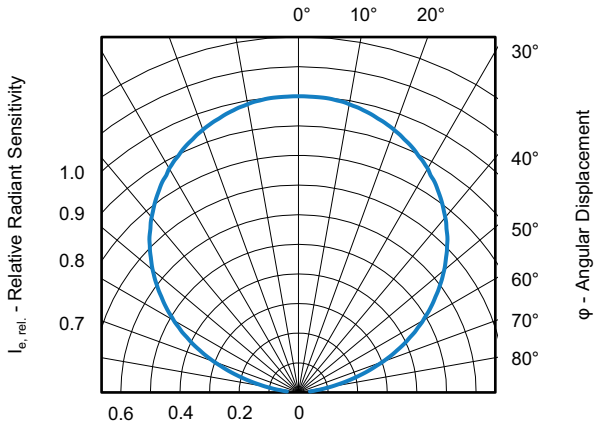
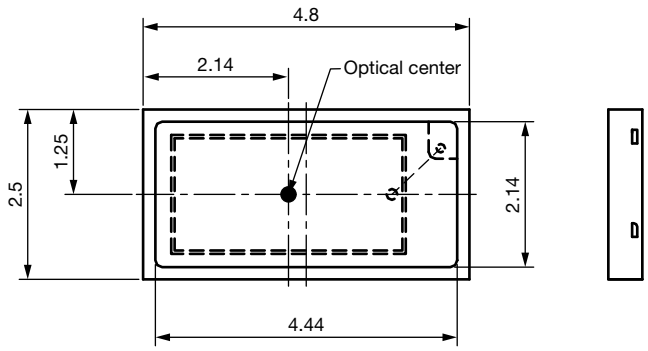
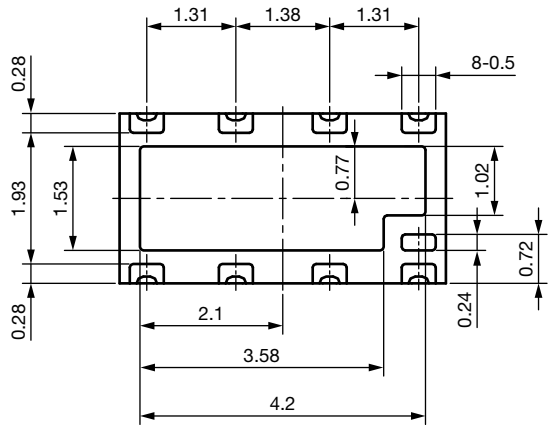


Fig. 6 - Relative Sensitivity vs. Angular Displacement

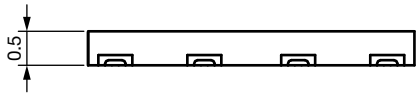
PACKAGE DIMENSIONS in millimeters

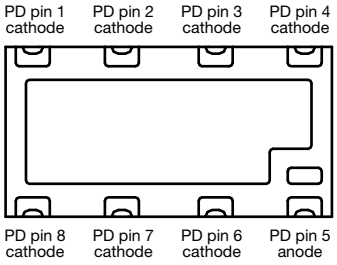


Top view

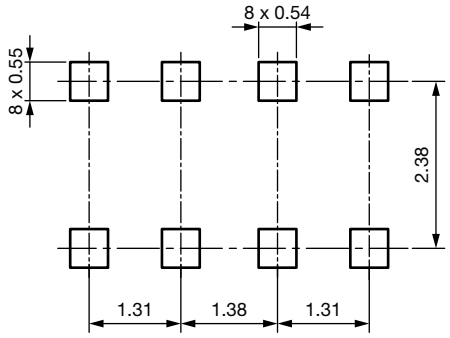


Bottom view

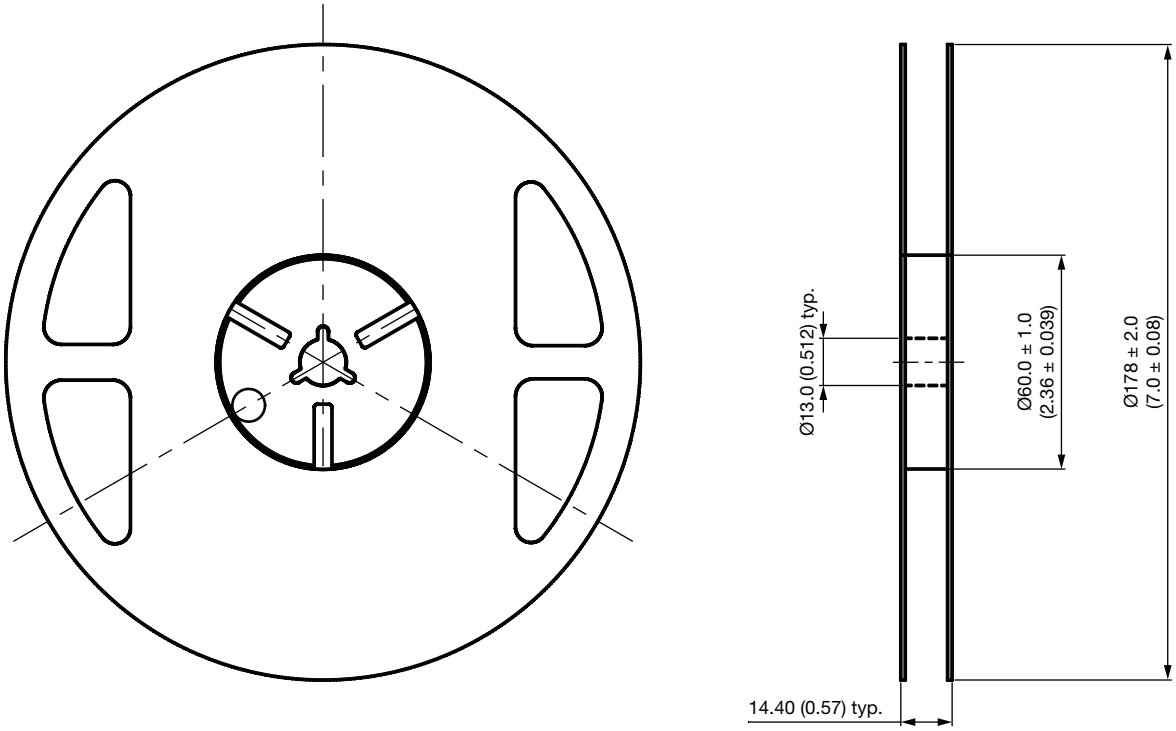




RECOMMENDED SOLDERING PAD DIMENSIONS



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

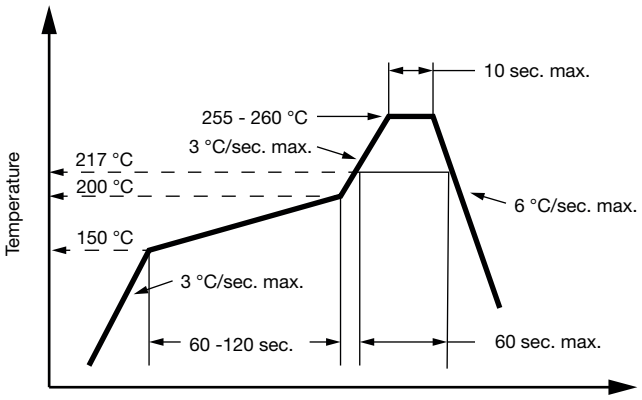


Fig. 7 - Lead (Pb)-free Reflow Solder Profile

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 %

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