RoHS

HALOGEN FREE

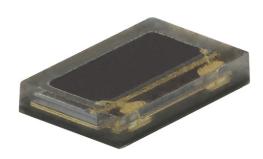
GREEN

(5-2008)



Vishay Semiconductors

Silicon PIN Photodiode



LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

VEMD8083 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 2.8 mm² sensitive area detecting visible and near infrared radiation.

FEATURES

- Package type: surface-mount
- · Package form: top view
- Dimensions (L x W x H in mm): 3.2 x 2.0 x 0.6
- Radiant sensitive area (in mm²): 2.8
- · Enhanced sensitivity
- Suitable for visible and near infrared radiation
- · Compatible with infrared reflow solder process
- Angle of half sensitivity: $\varphi = \pm 60^{\circ}$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>



- Wearables
- · Health monitoring
- · High speed photo detector

PRODUCT SUMMARY				
COMPONENT	I_{ra} (μA) at E_e = 1.0 mW/cm ² , λ = 940 nm, V_R = 0 V	φ (°)	λ _{0.1} (nm)	
VEMD8083	16	± 60	350 to 1100	

Note

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
VEMD8083	Tape and reel	MOQ: 3000 pcs, 3000 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

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BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 1 mA	V _F	-	0.9	1.3	V
Reverse break down voltage	$I_R = 100 \mu A, E_e = 0 \text{ mW/cm}^2$	V _{(BR)R}	20	-	-	V
Reverse dark current	$V_R = 10 \text{ V}, E_e = 0 \text{ mW/cm}^2$	I _{ro}	-	-	10	nA
Diode capacitance	$V_R = 0 \text{ V, } f = 1 \text{ kHz, } E = 0$	C _D	-	50	-	pF
	$V_R = 3 V, f = 1 kHz, E = 0$	C _D	-	35	-	pF
Reverse light current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 525 \text{ nm}$, $V_R = 0 \text{ V}$	I _{ra}	-	11	-	μΑ
	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 660 \text{ nm}$, $V_R = 0 \text{ V}$	I _{ra}	-	14	-	μA
	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 940 \text{ nm}$, $V_R = 0 \text{ V}$	I _{ra}	-	16	-	μΑ
Angle of half sensitivity		φ	-	± 60	-	0
Wavelength of peak sensitivity		λ_{p}	-	940	-	nm
Range of spectral bandwidth		λ _{0.1}		350 to 1100	ı	nm
Rise time	V_R = 10 V, R_L = 1 k Ω , λ = 940 nm	t _r	-	30	-	ns
Fall time	$V_R = 10 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 940 \text{ nm}$	t _f	-	30	-	ns

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

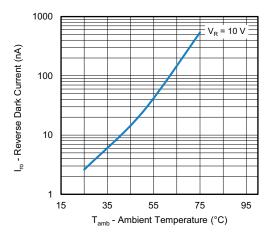


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

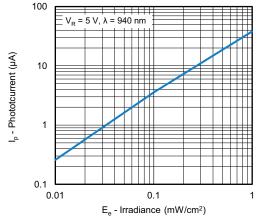


Fig. 3 - Reverse Light Current vs. Irradiance

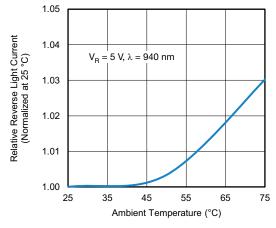


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

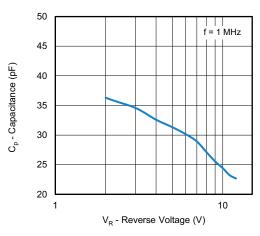


Fig. 4 - Diode Capacitance vs. Reverse Voltage

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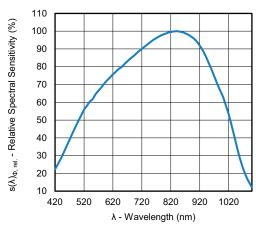


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

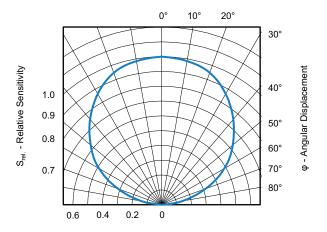
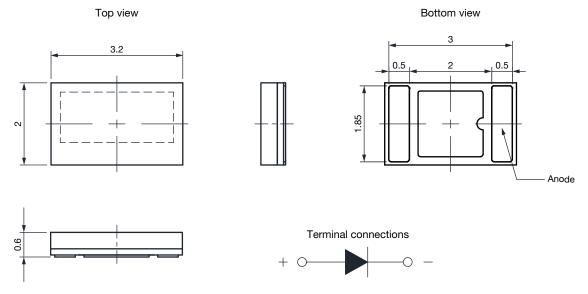


Fig. 6 - Relative Sensitivity vs. Angular Displacement

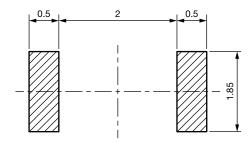
PACKAGE DIMENSIONS in millimeters



Note

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

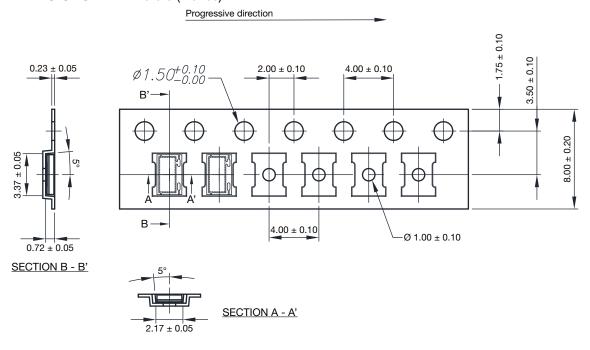
RECOMMENDED SOLDERING PAD DIMENSIONS



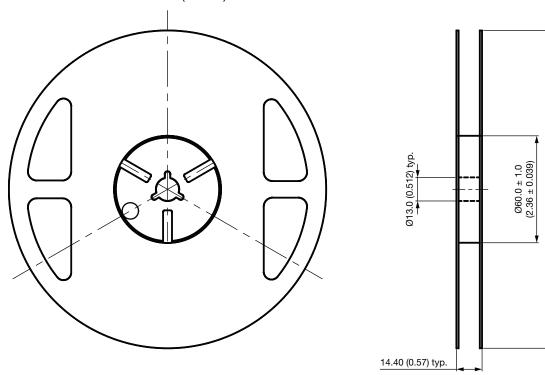
 $\emptyset 178 \pm 2.0$ (7.0 ± 0.08)

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TAPE DIMENSIONS in millimeters (inches)



REEL DIMENSIONS in millimeters (inches)



Notes

- Empty component pockets sealed with top cover tape
- 7 inch reel 3000 pieces per reel
- The maximum number of consecutive missing parts is two
- In accordance with ANSI/EIA 481-1-A-1994 specifications



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SOLDER PROFILE

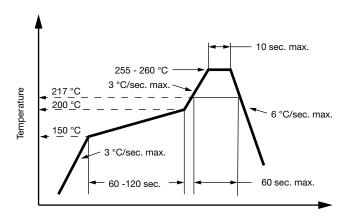


Fig. 7 - Lead (Pb)-free Reflow Solder Profile

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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