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 0.48
- Radiant sensitive area (in mm^2): 5.4
- 0.48 mm low profile package
- Enhanced sensitivity for visible light
- Suitable for visible and near infrared radiation
- Angle of half sensitivity: φ = ± 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)

LINKS TO ADDITIONAL RESOURCES

3D Models

DESCRIPTION

VEMD8081 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 5.4 mm^2 sensitive area detecting visible and near infrared radiation.

APPLICATIONS

- High speed photo detector
- Wearables

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)**
VEMD8081	33	± 65	350 to 1100

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	**PACKAGING**	**REMARKS**	**PACKAGE FORM**
VEMD8081	Tape and reel	MOQ: 5000 pcs, 5000 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}	-40 to +85	°C
Soldering temperature	According to reflow solder profile Fig. 8	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 = 50 mA	V_F	-	2.3	3.3	V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}	-	0.5	10	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D	-	50	-	pF
	V_R = 3 V, f = 1 MHz, E = 0	C_D	-	20	40	pF
Reverse light current	E_e = 1 mW/cm², λ = 525 nm, V_R = 5 V	I_{ra}	15	20	24	µA
	E_e = 1 mW/cm², λ = 850 nm, V_R = 5 V	I_{ra}	29	33	38	µA
Angle of half sensitivity		φ	-	± 65	-	°
Wavelength of peak sensitivity		λ_p	-	840	-	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	-	110	-	ns
Fall time	V_R = 10 V, R_L = 50 Ω, λ = 830 nm	t_f	-	110	-	ns

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

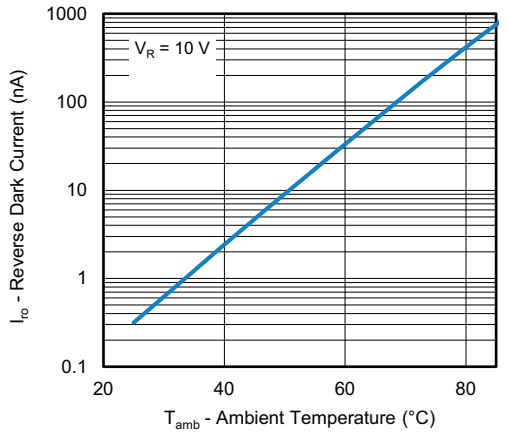


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

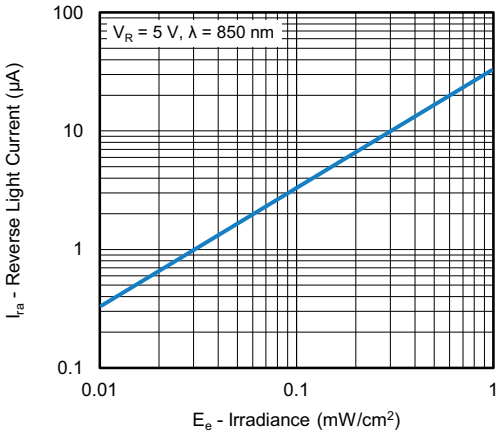


Fig. 3 - Reverse Light Current vs. Irradiance

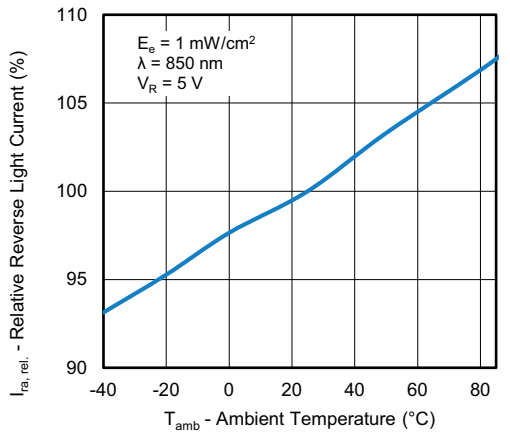


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

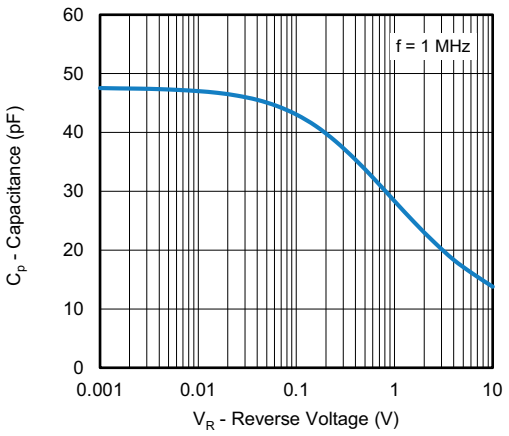


Fig. 4 - Diode Capacitance vs. Reverse Voltage

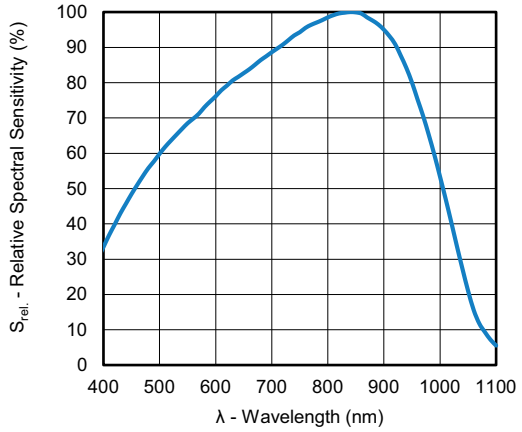


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

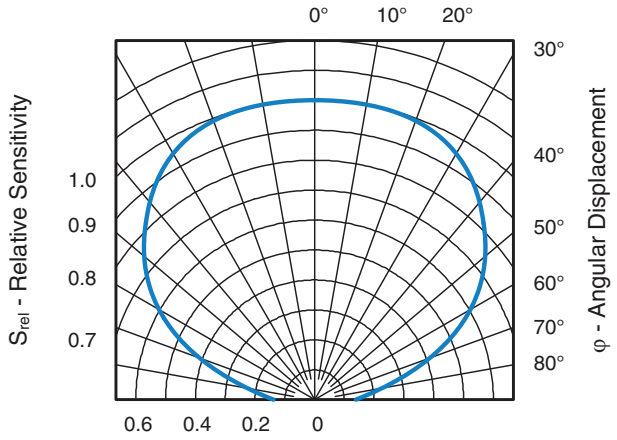
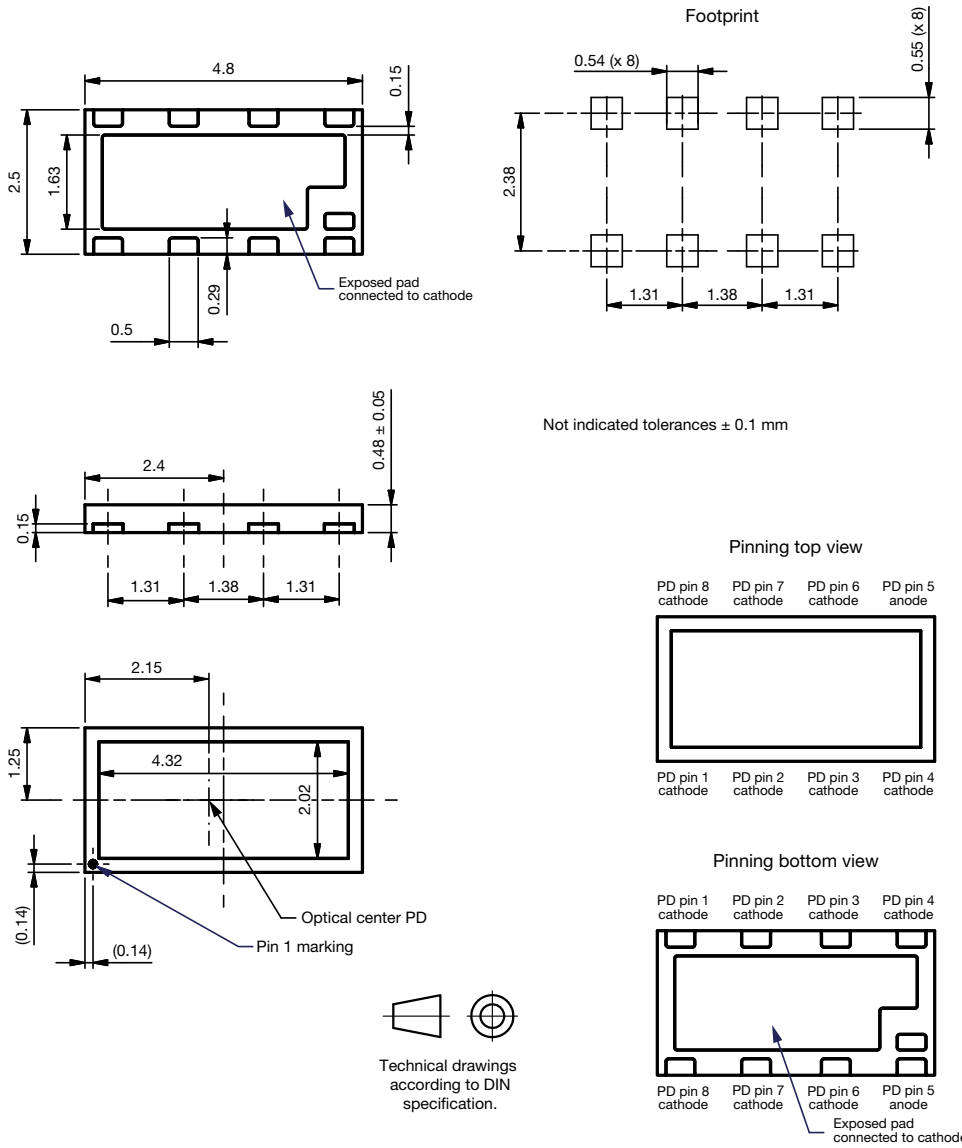


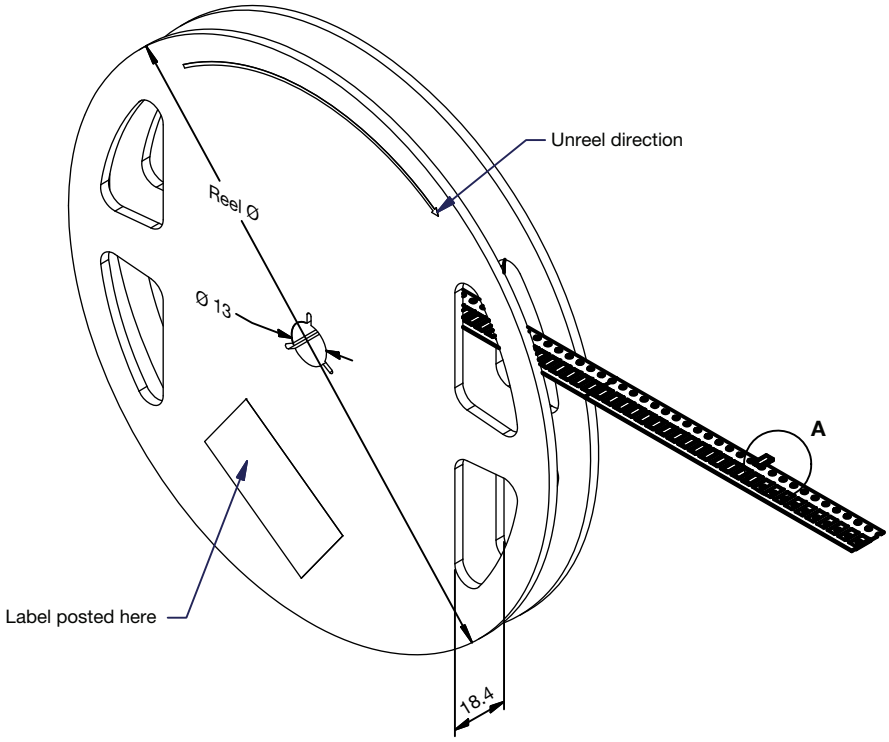
Fig. 6 - Relative Sensitivity vs. Angular Displacement

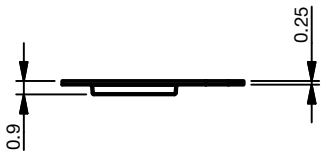
PACKAGE DIMENSIONS in millimeters

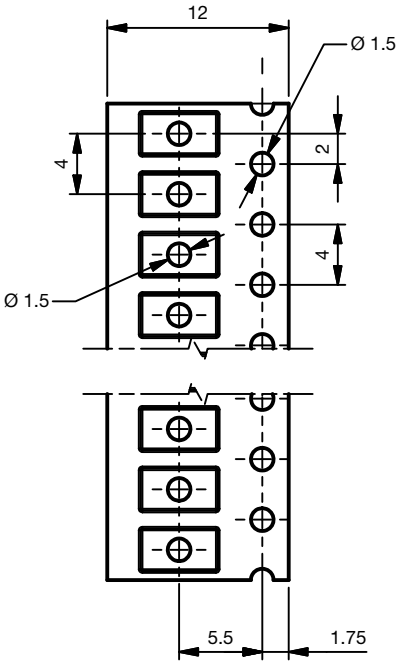


TAPE AND REEL DIMENSIONS in millimeters

Non tolerated dimensions ± 0.1 mm
Reel design is representative for different types







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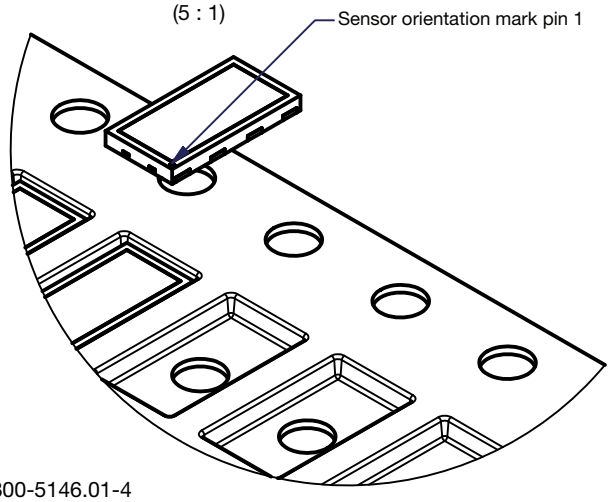

Drawing-No.: 9.800-5146.01-4
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SOLDER PROFILE

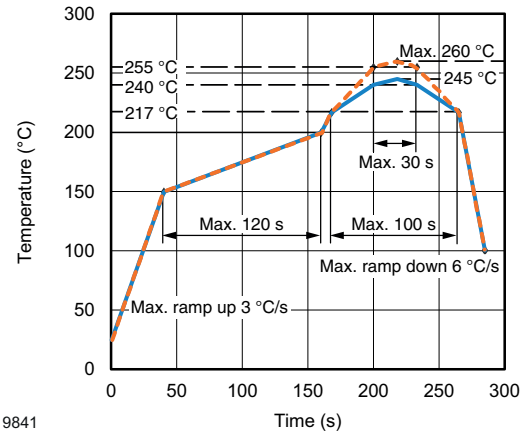

Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

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

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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