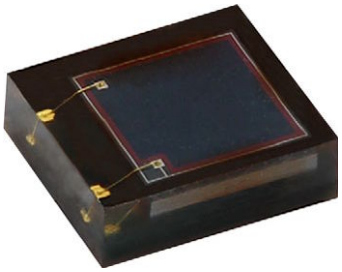
Silicon PIN Photodiode



FEATURES

- Package type: surface-mount
- Package form: top view
- Dimensions (L x W x H in mm): 2.0 x 1.8 x 0.6
- Radiant sensitive area (in mm^2): 1.51
- Clear epoxy for maximum sensitivity
- Suitable for visible and near infrared radiation
- Angle of half sensitivity: $\varphi = \pm 67°$
- 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

VEMD2704 is a high speed and high sensitive PIN photodiode with enhanced sensitivity for visible light. It is optimized for heart rate monitoring and pulse oximetry applications.

APPLICATIONS

- Heart rate monitoring and pulse oximetry
- Wearables

PRODUCT SUMMARY			
COMPONENT	I_{ra} (µA) at E_e = 0.1 mW/cm², λ = 530 nm, V_R = 5.0 V	φ (°)	$\lambda_{0.1}$ (nm)
VEMD2704	0.48	± 67	350 to 1100

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD2704	Tape and reel	MOQ: 4000	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	6	V
Ambient 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. 7	T_{sd}	260	°C
ESD safety HBM	± 2000 V, 1.5 kΩ, 100 pF, 3 pulses	ESD_{HBM}	≥ 2	kV

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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 = 50 mA	V_F	1.0	1.2	1.3	V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}	-	0.03	40	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D	-	17.6	-	pF
Reverse light current (1)	E_e = 0.1 mW/cm², λ = 530 nm, V_R = 5 V	I_{ra}	0.35	0.48	0.65	µA
	E_e = 0.1 mW/cm², λ = 660 nm, V_R = 5 V	I_{ra}	-	0.77	-	µA
	E_e = 0.1 mW/cm², λ = 850 nm, V_R = 5 V	I_{ra}	0.75	1.13	1.40	µA
	E_e = 0.1 mW/cm², λ = 940 nm, V_R = 5 V	I_{ra}	0.85	1.17	1.50	µA
Angle of half sensitivity		φ	-	± 67	-	°
Wavelength of peak sensitivity		λ_p	-	940	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	350 to 1100	-	nm
Rise time	V_R = 5 V, R_L = 50 Ω, λ = 530 nm	t_r	-	70	-	ns
Fall time	V_R = 5 V, R_L = 50 Ω, λ = 530 nm	t_f	-	70	-	ns

Note

(1) The reverse light current for other irradiances can be estimated by linear extrapolation

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

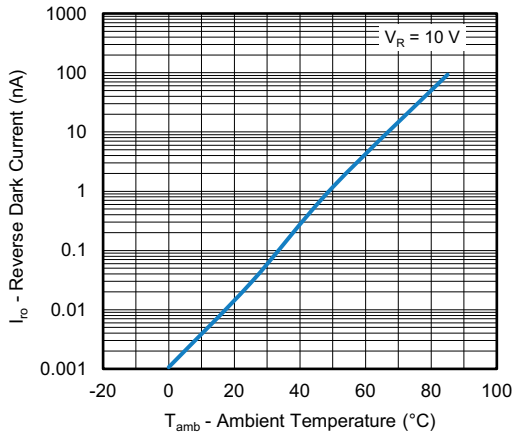


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

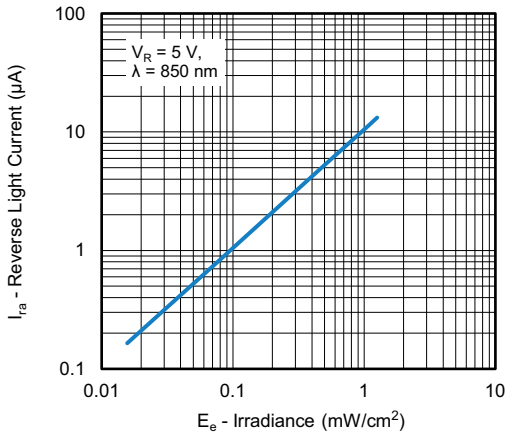


Fig. 3 - Reverse Light Current vs. Irradiance

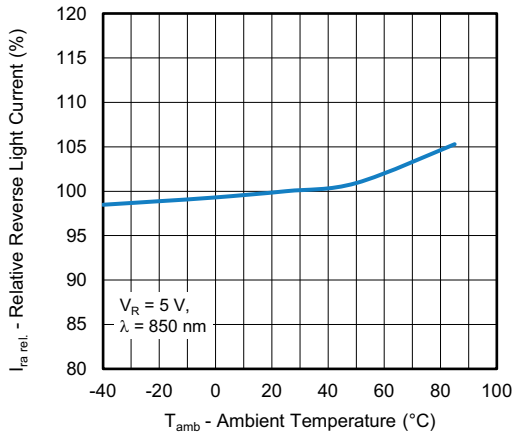


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

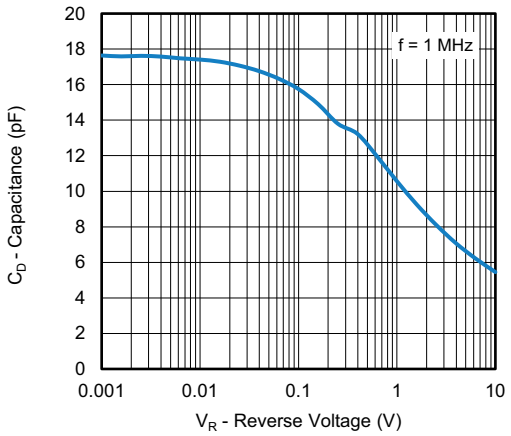


Fig. 4 - Diode Capacitance vs. Reverse Voltage

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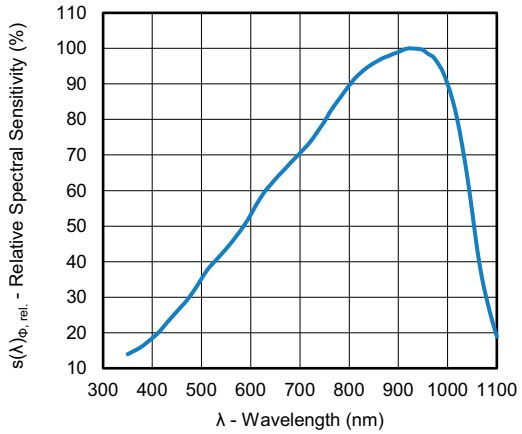


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

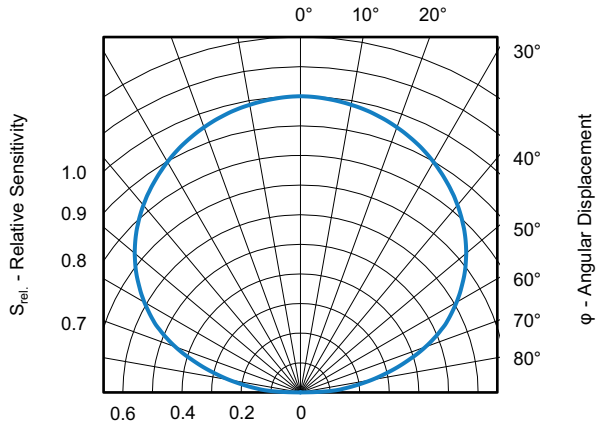
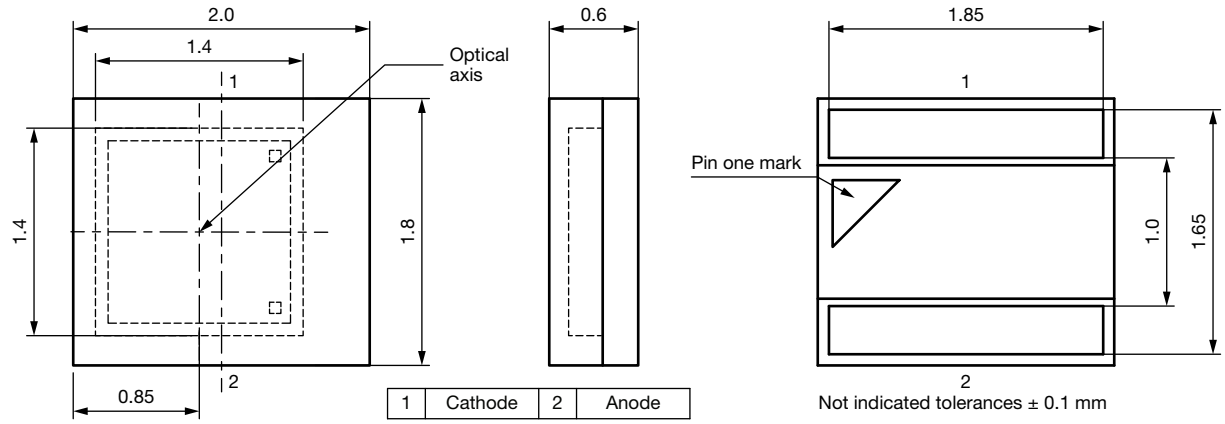
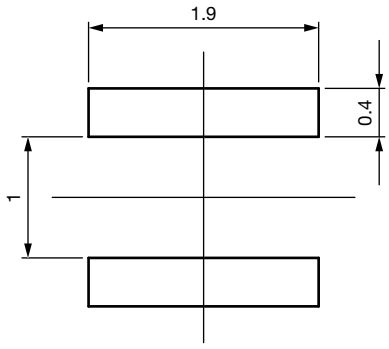


Fig. 6 - Relative Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters

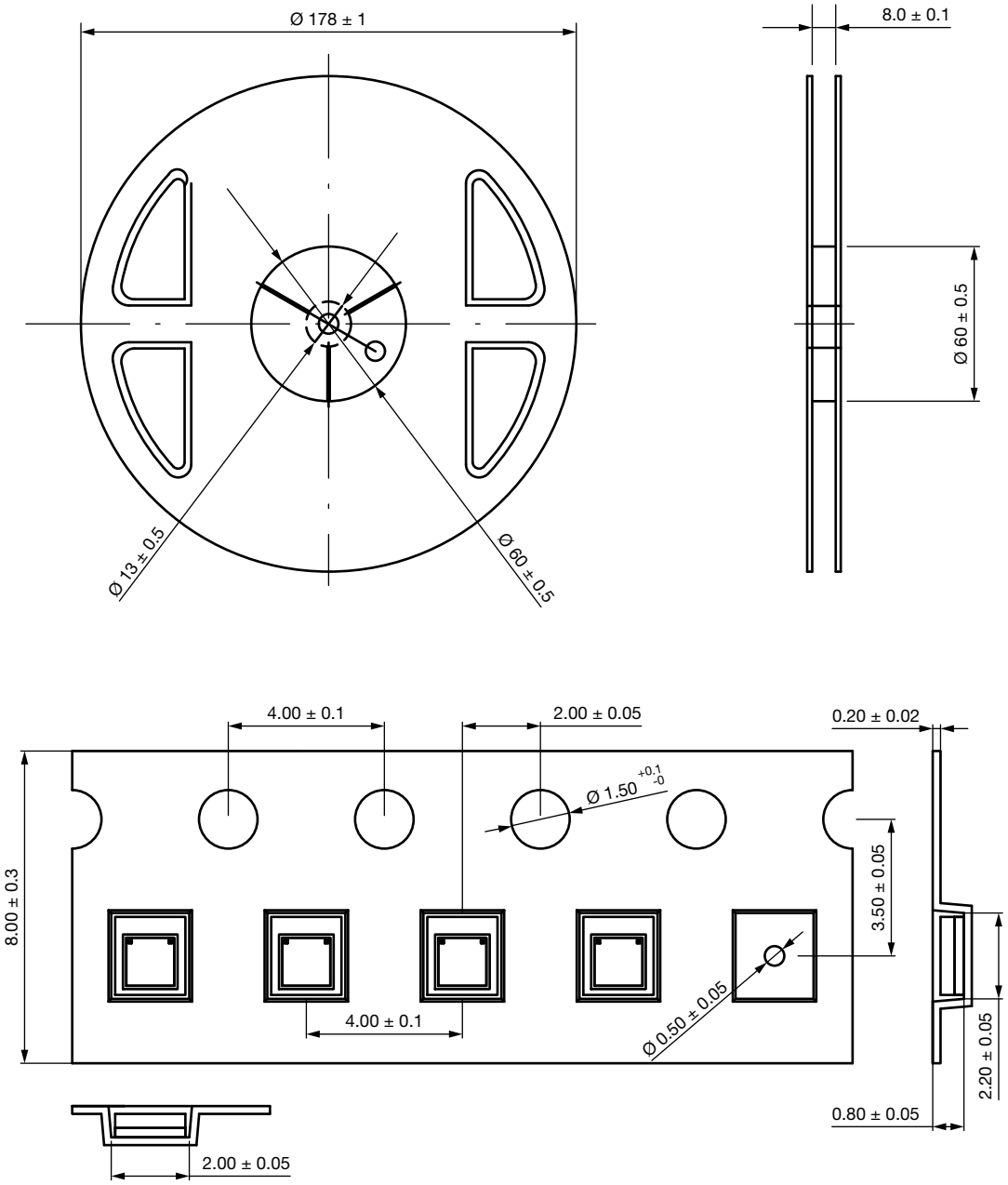


RECOMMENDED FOOTPRINT in millimeters



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TAPE AND REEL DIMENSIONS in millimeters



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SOLDER PROFILE

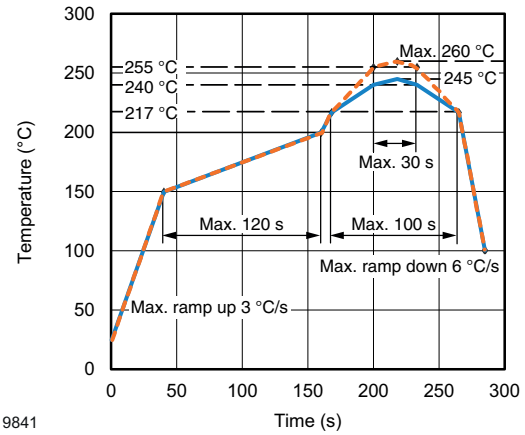


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

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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