

Silicon PIN Photodiode



FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.7
- Radiant sensitive area (in mm²): 0.42
- Operating temperature range: T_{OP} = -40 °C to +110 °C
- Daylight blocking filter matched with 830 nm to 950 nm emitters
- Angle of half sensitivity: $\phi = \pm 55^\circ$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

VEMD4110X01 is a high speed and high sensitive PIN photodiode. It is a miniature surface mount device (SMD) with a 0.42 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength of 830 nm to 950 nm.

APPLICATIONS

- High speed photo detector
- Photo interrupters
- Automotive sensors
- [Hygienic applications](#)

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA) at $E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 5 \text{ V}$	ϕ (°)	$\lambda_{0.5}$ (nm)
VEMD4110X01	2.4	± 55	740 to 1040

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD4110X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

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 +110	°C
Storage temperature range		T _{stg}	-40 to +110	°C
Soldering temperature	According to reflow solder profile Fig. 8	T _{sd}	260	°C

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50\text{ mA}$	V_F	-	1.1	1.3	V
Reverse dark current	$V_R = 5\text{ V}, E = 0$	I_{r0}	-	1	3	nA
Diode capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}, E = 0$	C_D	-	7	-	pF
	$V_R = 5\text{ V}, f = 1\text{ MHz}, E = 0$	C_D	-	2.5	-	pF
Short circuit current	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	I_k	-	2.2	-	μA
Open circuit voltage	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	V_O	-	318	-	mV
Temperature coefficient of I_k	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	TK_{I_k}	-	0.1	-	%/K
Reverse light current	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_R = 5\text{ V}$	I_{ra}	1.9	2.4	3.1	μA
Angle of half sensitivity		ϕ	-	± 55	-	$^{\circ}$
Wavelength of peak sensitivity		λ_p	-	910	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	740 to 1040	-	nm
Rise time	$V_R = 5\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 820\text{ nm}$	t_r	-	100	-	ns
Fall time	$V_R = 5\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 820\text{ nm}$	t_f	-	100	-	ns

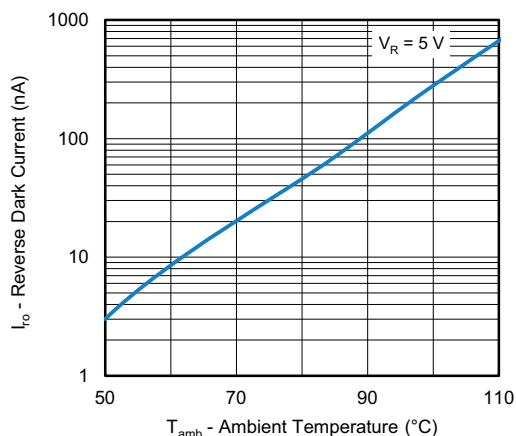
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

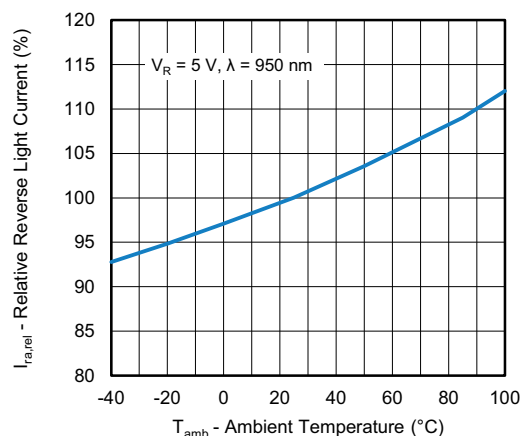


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

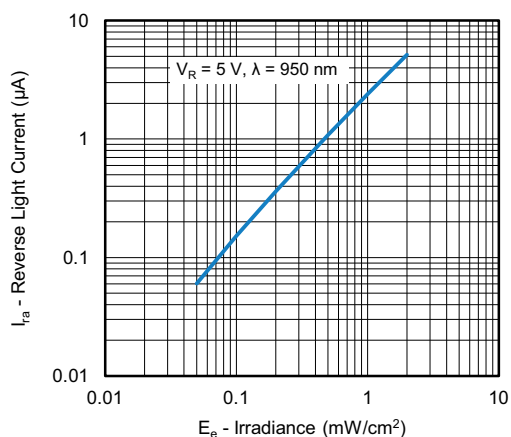


Fig. 3 - Reverse Light Current vs. Irradiance

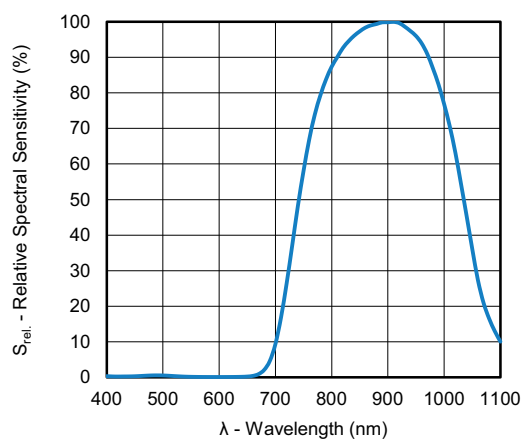


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

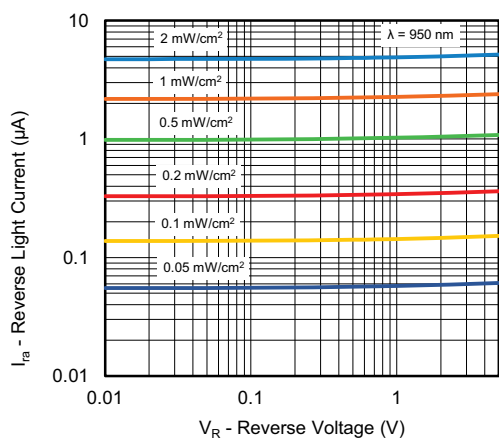


Fig. 4 - Reverse Light Current vs. Reverse Voltage

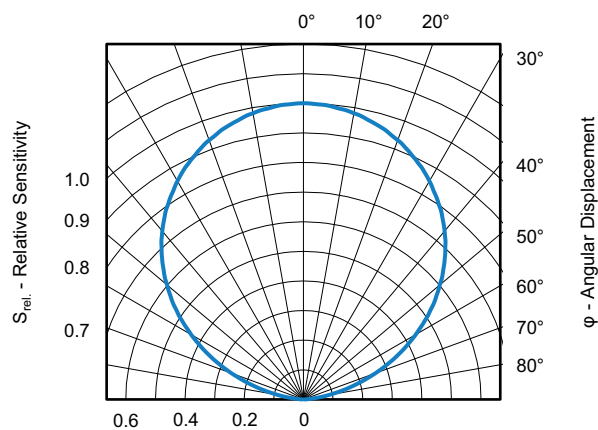


Fig. 6 - Relative Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

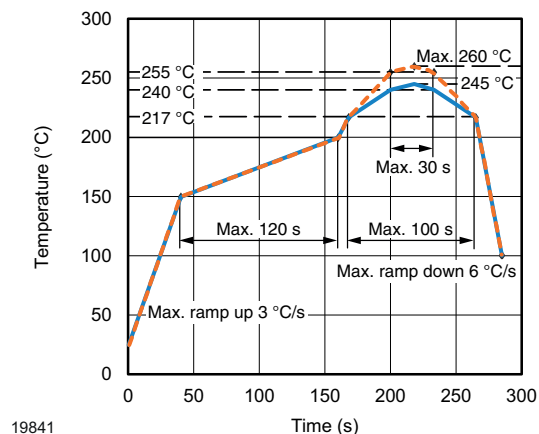


Fig. 7 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 168 h

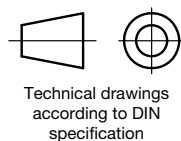
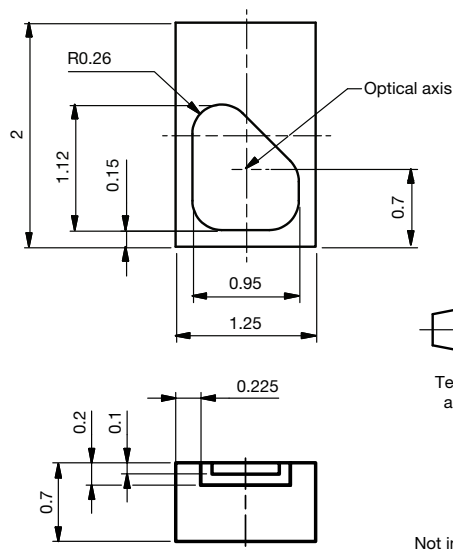
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

Moisture sensitivity level 3, according to J-STD-020.

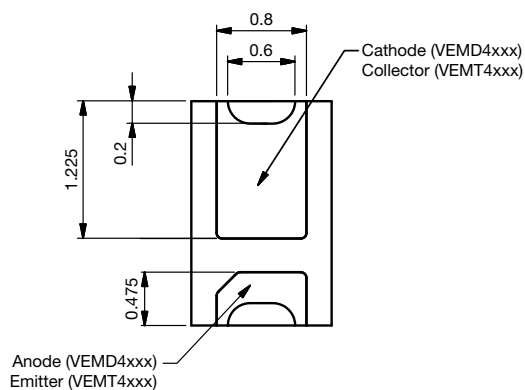
DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C ($+ 5\text{ °C}$), $RH < 5\%$.

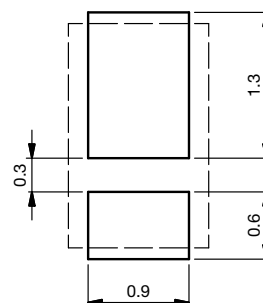
PACKAGE DIMENSIONS in millimeters



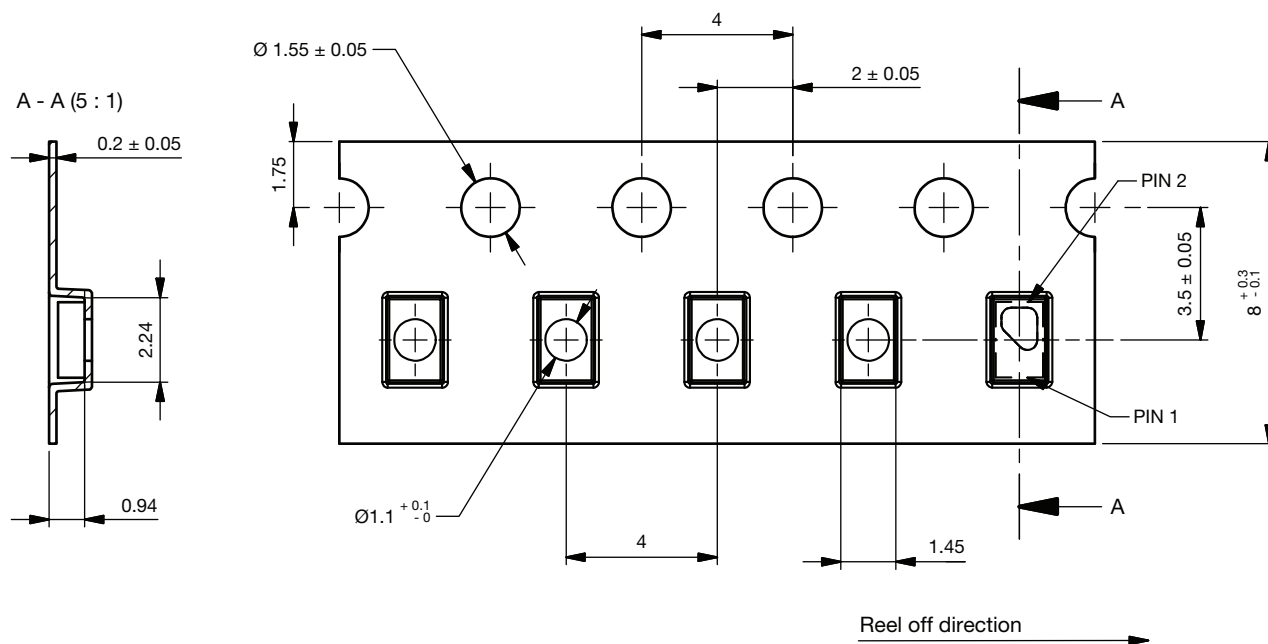
Not indicated tolerances ± 0.1



Recommended footprint



Drawing-No.: 6.550-5363.01-4
Issue: 2; 01.07.2020

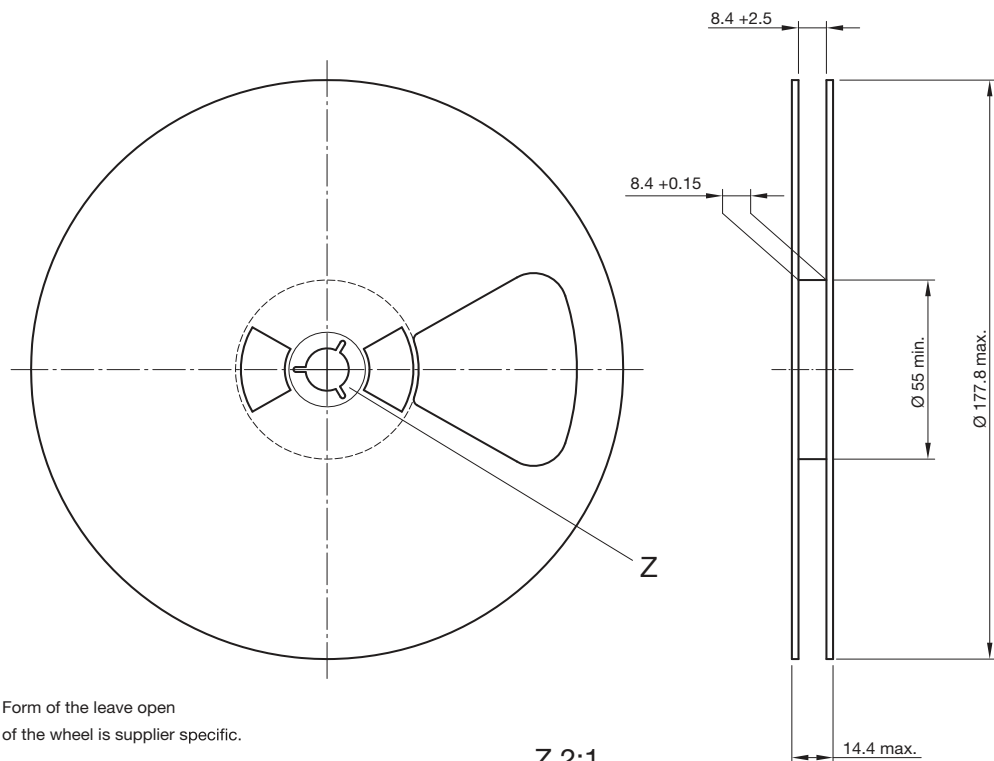
BLISTER TAPE DIMENSIONS in millimeters

TYPE	PIN 1	PIN 2
VEMD4xxx	Anode	Cathode

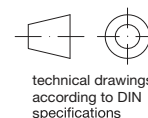
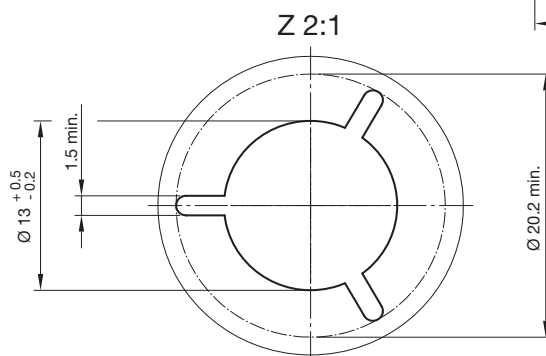
Drawing-No.: 9.700-5411.0-4
Issue: 1_A; 11.10.2022



REEL DIMENSIONS in millimeters



Form of the leave open
of the wheel is supplier specific.



Drawing-No.: 9.800-5096.01-4
Issue: 2; 26.04.10
20875



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