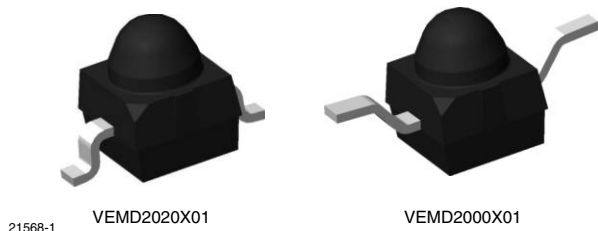


Silicon PIN Photodiode



FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- AEC-Q101 qualified
- High radiant sensitivity
- Daylight blocking filter matched with 830 nm to 950 nm IR emitters
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 15^\circ$
- Package matched with IR emitter series VSMB2000X01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications



RoHS
COMPLIANT
HALOGEN
FREE



DESCRIPTION

VEMD2000X01 and VEMD2020X01 are high speed and high sensitive PIN photodiodes in a miniature surface mount package (SMD) with dome lens and daylight blocking filter. Filter is matched with IR emitters operating at wavelength of 830 nm to 950 nm. The photo sensitive area of the chip is 0.23 mm².

APPLICATIONS

- High speed photo detector
- Infrared remote control
- Infrared data transmission
- Photo interrupters
- Shaft encoders

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	φ (deg)	$\lambda_{0.5}$ (nm)
VEMD2000X01	12	± 15	750 to 1050
VEMD2020X01	12	± 15	750 to 1050

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD2000X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VEMD2020X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_V	215	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	Acc. reflow solder profile fig. 7	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	250	K/W

Note

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

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50 \text{ mA}$	V_F		1		V
Breakdown voltage	$I_R = 100 \text{ }\mu\text{A}$, $E = 0$	$V_{(BR)}$	32			V
Reverse dark current	$V_R = 10 \text{ V}$, $E = 0$	I_{ro}		1	10	nA
Diode capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_D		4		pF
	$V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_D		1.3		pF
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	V_o		350		mV
Temperature coefficient of V_o	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	TK_{V_o}		- 2.6		mV/K
Short circuit current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	I_k		11		μA
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}	5	12		μA
Angle of half sensitivity		ϕ		± 15		deg
Wavelength of peak sensitivity		λ_p		940		nm
Range of spectral bandwidth		$\lambda_{0.5}$		750 to 1050		nm
Rise time	$V_R = 10 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_r		100		ns
Fall time	$V_R = 10 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_f		100		ns

Note

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

BASIC CHARACTERISTICS

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

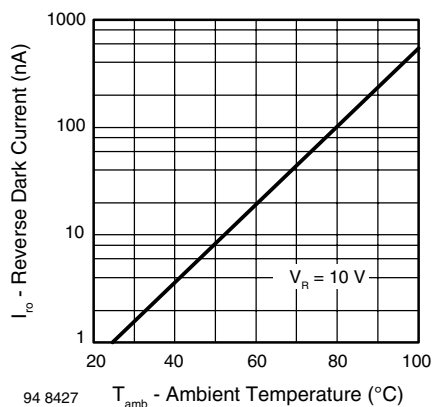


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

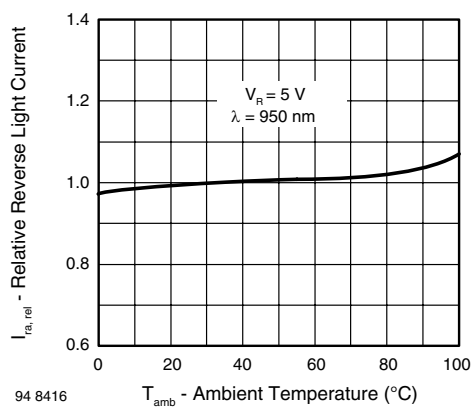


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

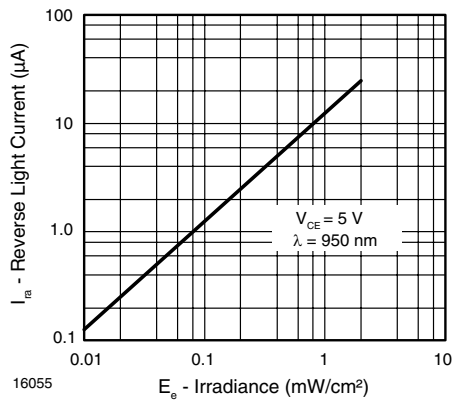


Fig. 3 - Reverse Light Current vs. Irradiance

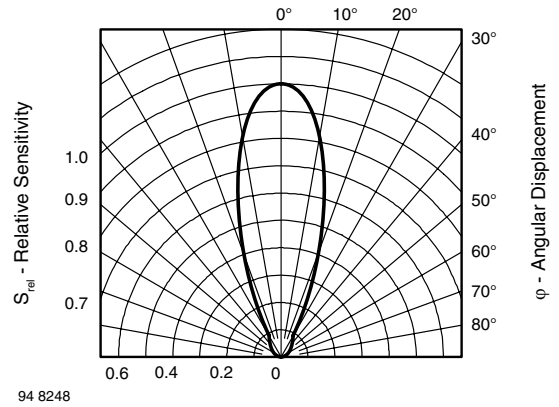


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

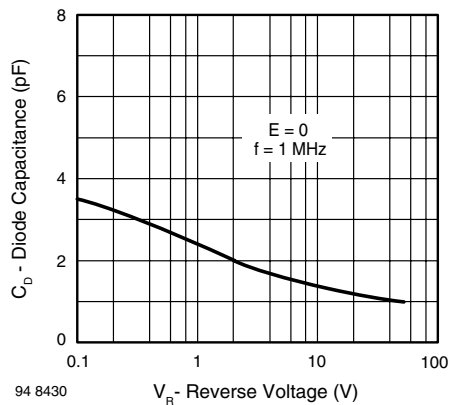


Fig. 4 - Diode Capacitance vs. Reverse Voltage

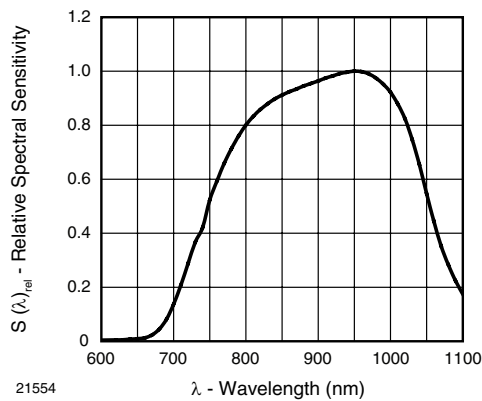


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

REFLOW SOLDER PROFILE

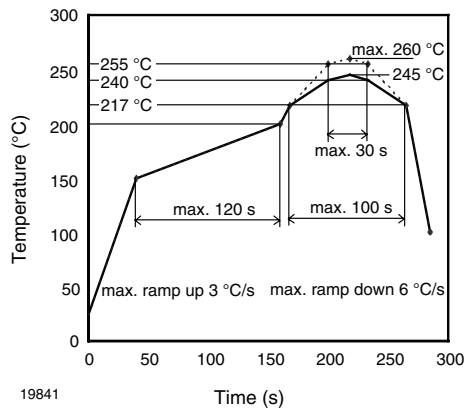


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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

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

Floor life: 4 weeks

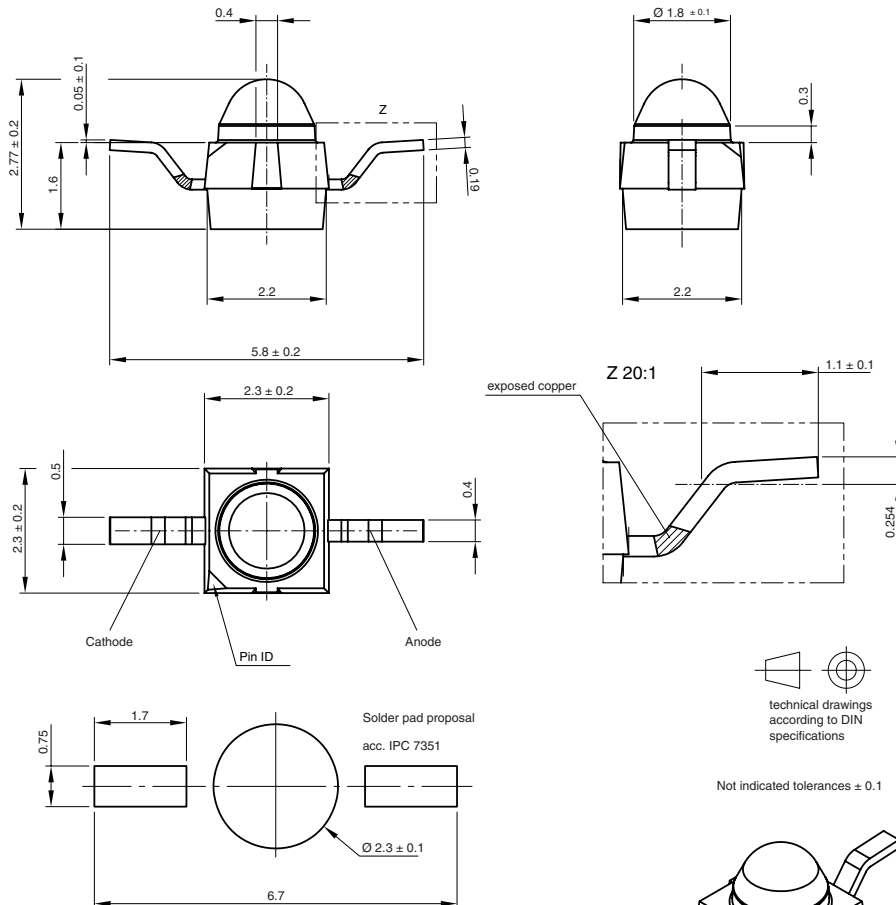
Conditions: $T_{amb} < 30^{\circ}\text{C}$, $RH < 60\%$

Moisture sensitivity level 2a, acc. to J-STD-020.

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40°C (+ 5°C), $RH < 5\%$.

PACKAGE DIMENSIONS in millimeters: VEMD2000



Drawing-No.: 6.544-5391.02-4
Issue: 1; 26.09.08
21517

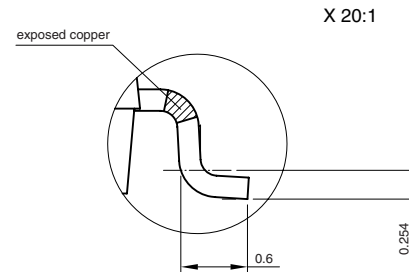
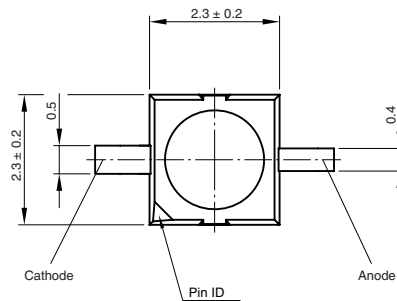
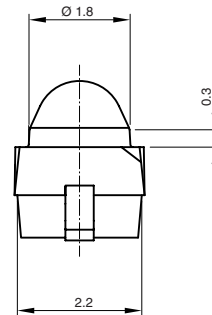
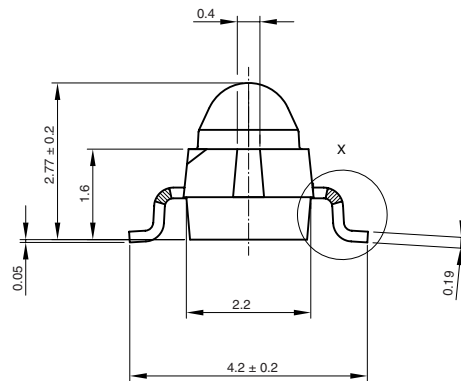


VEMD2000X01, VEMD2020X01

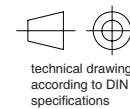
Silicon PIN Photodiode

Vishay Semiconductors

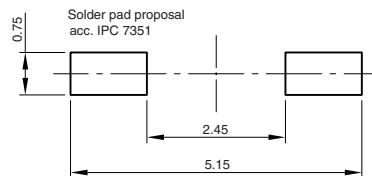
PACKAGE DIMENSIONS in millimeters: VEMD2020



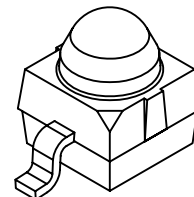
X 20:1



technical drawings
according to DIN
specifications

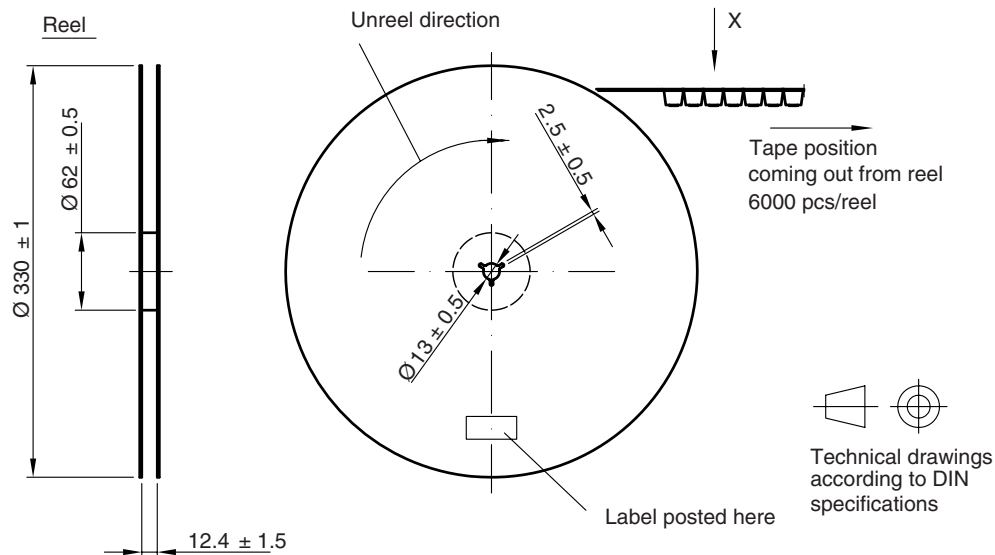


Not indicated tolerances ± 0.1

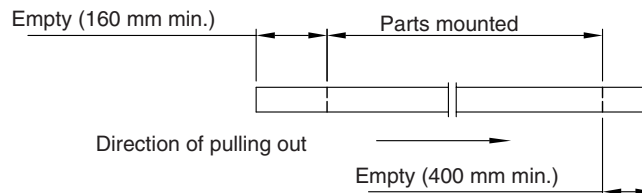


Drawing-No.: 6.544-5383.02-4
Issue: 3; 26.09.08
21488

TAPING AND REEL DIMENSIONS in millimeters: VEMD2000

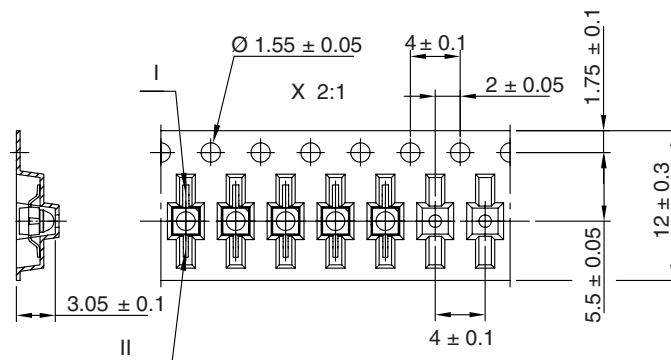


Leader and trailer tape:



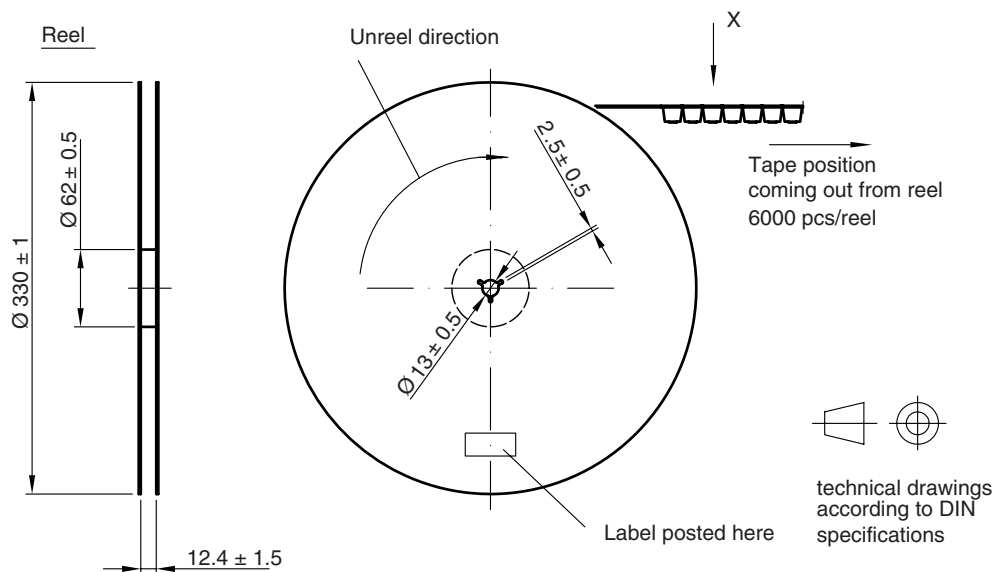
Terminal position in tape

Device	Lead I	Lead II
VEMT2000	Collector	Emitter
VEMT2500		
VEMD2000	Cathode	Anode
VSMB2000		

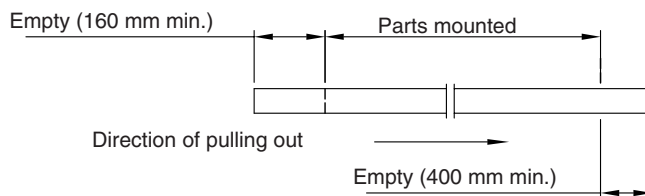


Drawing-No.: 9.800-5100.01-4
Issue: X; 29.04.09
21572

TAPING AND REEL DIMENSIONS in millimeters: VEMD2020

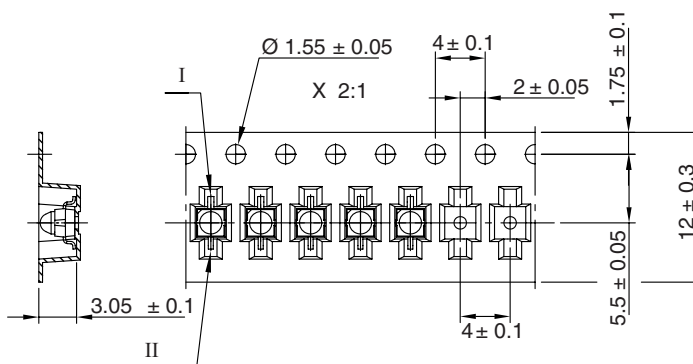


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VEMT2020	Collector	Emitter
VEMT2520		
VSMB2020	Cathode	Anode
VEMD2020		



Drawing-No.: 9.800-5091.01-4

Issue: X; 29.04.09

21571



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