VEMD5010X01

Vishay Semiconductors



FEATURES

- Package type: surface-mount
- · Package form: top view
- Dimensions (L x W x H in mm): 5 x 4 x 0.9
- Radiant sensitive area (in mm²): 7.5
- AEC-Q101 qualified
- · High photo sensitivity
- · High radiant sensitivity
- · Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 65^{\circ}$
- Floor life: 72 h, MSL 4, according to J-STD-020
- please see www.vishay.com/doc?99912

- High speed photo detector
- Hygienic applications

PRODUCT SUMMARY					
COMPONENT	I _{ra} (μΑ)	φ (deg)	λ _{0.1} (nm)		
VEMD5010X01	48	± 65	430 to 1100		

Note

DESCRIPTION

visible and near infrared radiation.

Test conditions see table "Basic Characteristics"

LINKS TO ADDITIONAL RESOURCES

VEMD5010X01 is a high speed and high sensitive PIN

photodiode. It is a low profile surface mount device (SMD) including the chip with a 7.5 mm² sensitive area detecting

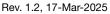
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ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
VEMD5010X01	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Top view	
VEMD5010X01-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs/reel	Top view	

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
Power dissipation	T _{amb} ≤ 25 °C	Pv	215	mW
Junction temperature		Тj	110	°C
Operating temperature range		T _{amb}	-40 to +110	°C
Storage temperature range		T _{stg}	-40 to +110	°C
Soldering temperature	Acc. reflow solder profile fig. 8	T _{sd}	260	°C
Thermal resistance junction/ambient		R _{thJA}	350	K/W
ESD safety HBM	\pm 2000 V, 1.5 kΩ, 100 pF, 3 pulses	ESD _{HBM}	≥2	kV

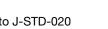


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HALOGEN FREE **GREEN**



• Material categorization: for definitions of compliance

APPLICATIONS

VEMD5010X01



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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	1.3	V
Breakdown voltage	I _R = 100 μA, E = 0	V _(BR)	20			V
Reverse dark current	V _R = 10 V, E = 0	I _{ro}		2	30	nA
Diode capacitance	$V_{R} = 0 V, f = 1 MHz, E = 0$	CD		70		pF
	V _R = 3 V, f = 1 MHz, E = 0	CD		25	40	pF
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	Vo		350		mV
Temperature coefficient of Vo	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	TK _{Vo}		-2.6		mV/K
Short circuit current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	I _k		45		μA
Temperature coefficient of ${\rm I}_{\rm k}$	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	TK _{lk}		0.1		%/K
Reverse light current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 5 \text{ V}$	I _{ra}	40	48		μA
Angle of half sensitivity		φ		± 65		deg
Wavelength of peak sensitivity		λρ		940		nm
Range of spectral bandwidth		λ _{0.1}		430 to 1100		nm
Noise equivalent power	V_R = 10 V, λ = 950 nm	NEP		4 x 10 ⁻¹⁴		W/√Hz
Rise time	V_R = 10 V, R_L = 1 k Ω , λ = 820 nm	t _r		100		ns
Fall time	V_R = 10 V, R_L = 1 k Ω , λ = 820 nm	t _f		100		ns

BASIC CHARACTERISTICS (Tamb = 25 °C, unless otherwise specified)

Basic characteristics graphs to be extended to 110 °C ambient temperatures where applicable.

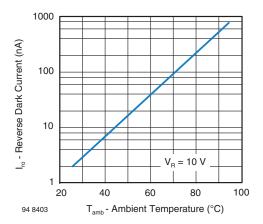


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

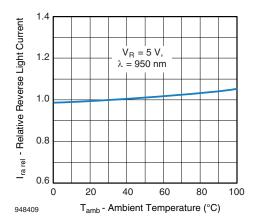
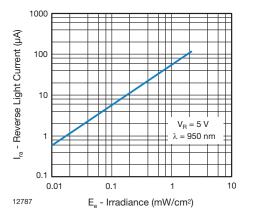


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



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Fig. 3 - Reverse Light Current vs. Irradiance

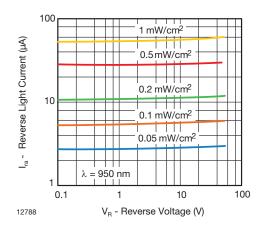


Fig. 4 - Reverse Light Current vs. Reverse Voltage

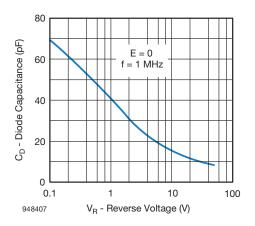


Fig. 5 - Diode Capacitance vs. Reverse Voltage

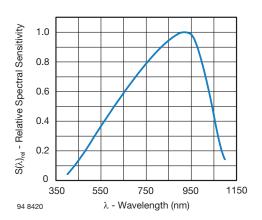


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

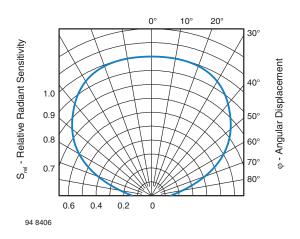


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

3

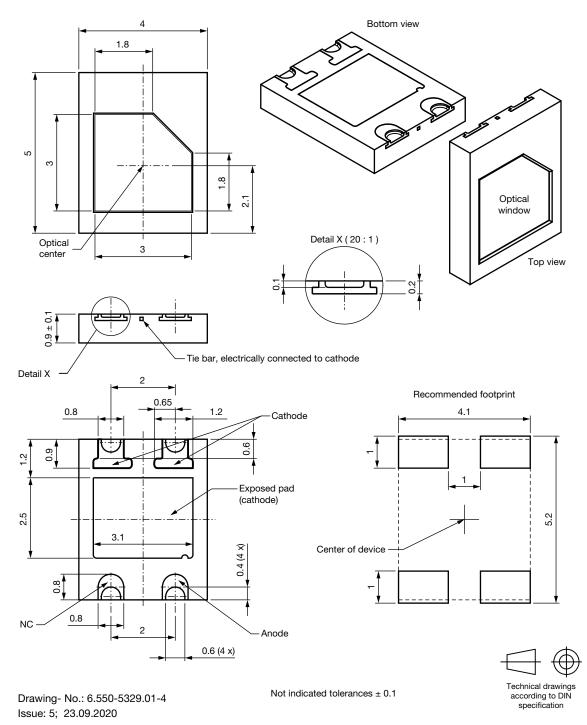
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PACKAGE DIMENSIONS in millimeters

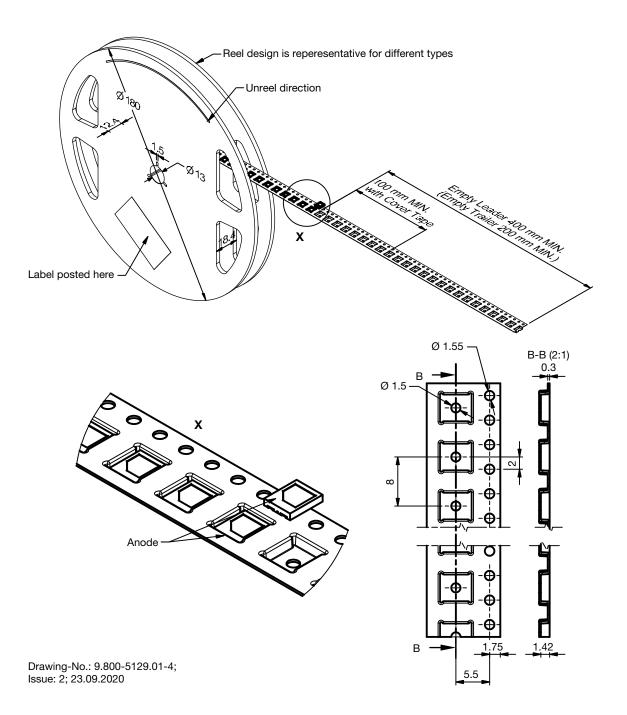


4



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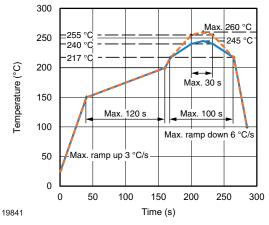
TAPE AND REEL DIMENSIONS in millimeters



5

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SOLDER PROFILE



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Fig. 8 - 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

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: Level 4

Floor life: 72 h

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

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 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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1