



Silicon PIN Photodiode

VEMD2503X01



VEMD2523X01



DESCRIPTION

VEMD2503X01 and VEMD2523X01 are high speed and high sensitive PIN photodiodes in a miniature surface mount package (SMD) with dome lens. The clear epoxy allows light detection of a wide wavelength range from 350 nm to 1120 nm. The photo sensitive area of the chip is 0.23 mm².

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.55
- AEC-Q101 qualified
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\phi = \pm 35^\circ$
- Package matched with IR emitter series VSMB2943X01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE



RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

APPLICATIONS

- High speed photo detector
- Light curtain
- Detector for optical switch

PRODUCT SUMMARY			
COMPONENT	I _{ra} (μA)	φ (deg)	λ _{0.1} (nm)
VEMD2503X01	10	± 35	350 to 1120
VEMD2523X01	10	± 35	350 to 1120

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD2503X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VEMD2523X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

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	60	V
Power dissipation	T _{amb} ≤ 25 °C	P _V	215	mW
Junction temperature		T _j	100	°C
Operating temperature range		T _{amb}	- 40 to + 100	°C
Storage temperature range		T _{stg}	- 40 to + 100	°C
Soldering temperature	Acc. reflow solder profile fig. 7	T _{sd}	260	°C
Thermal resistance junction/ambient	Acc. J-STD-051	R _{thJA}	250	K/W



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		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		10		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}	7	10	14	μA
Angle of half sensitivity		φ		± 35		deg
Wavelength of peak sensitivity		λ_p		900		nm
Range of spectral bandwidth		$\lambda_{0.1}$		350 to 1120		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

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

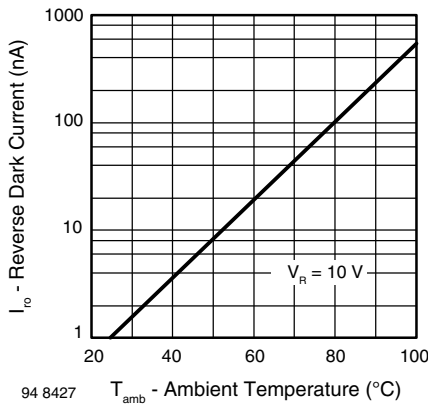


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

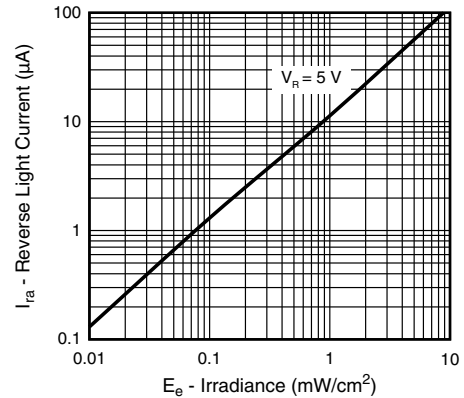


Fig. 3 - Reverse Light Current vs. Irradiance

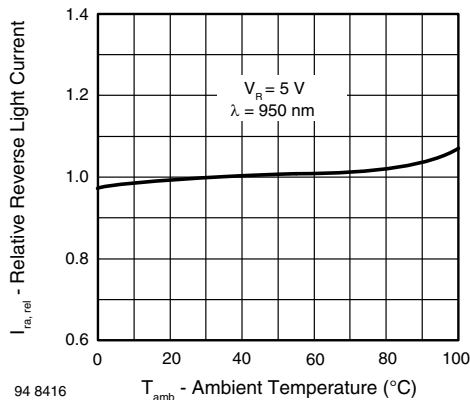


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

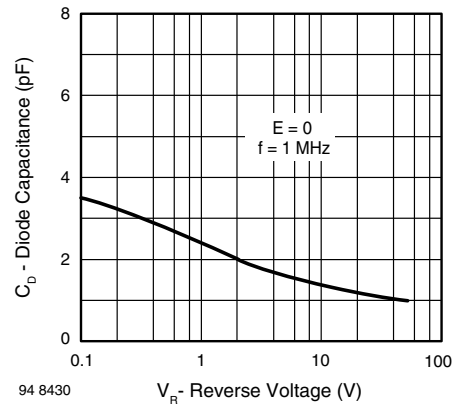


Fig. 4 - Diode Capacitance vs. Reverse Voltage



Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

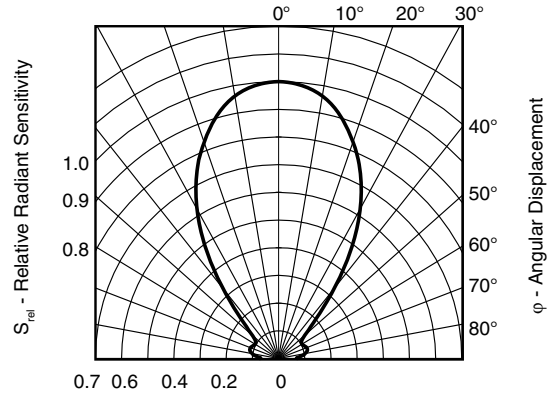


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

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

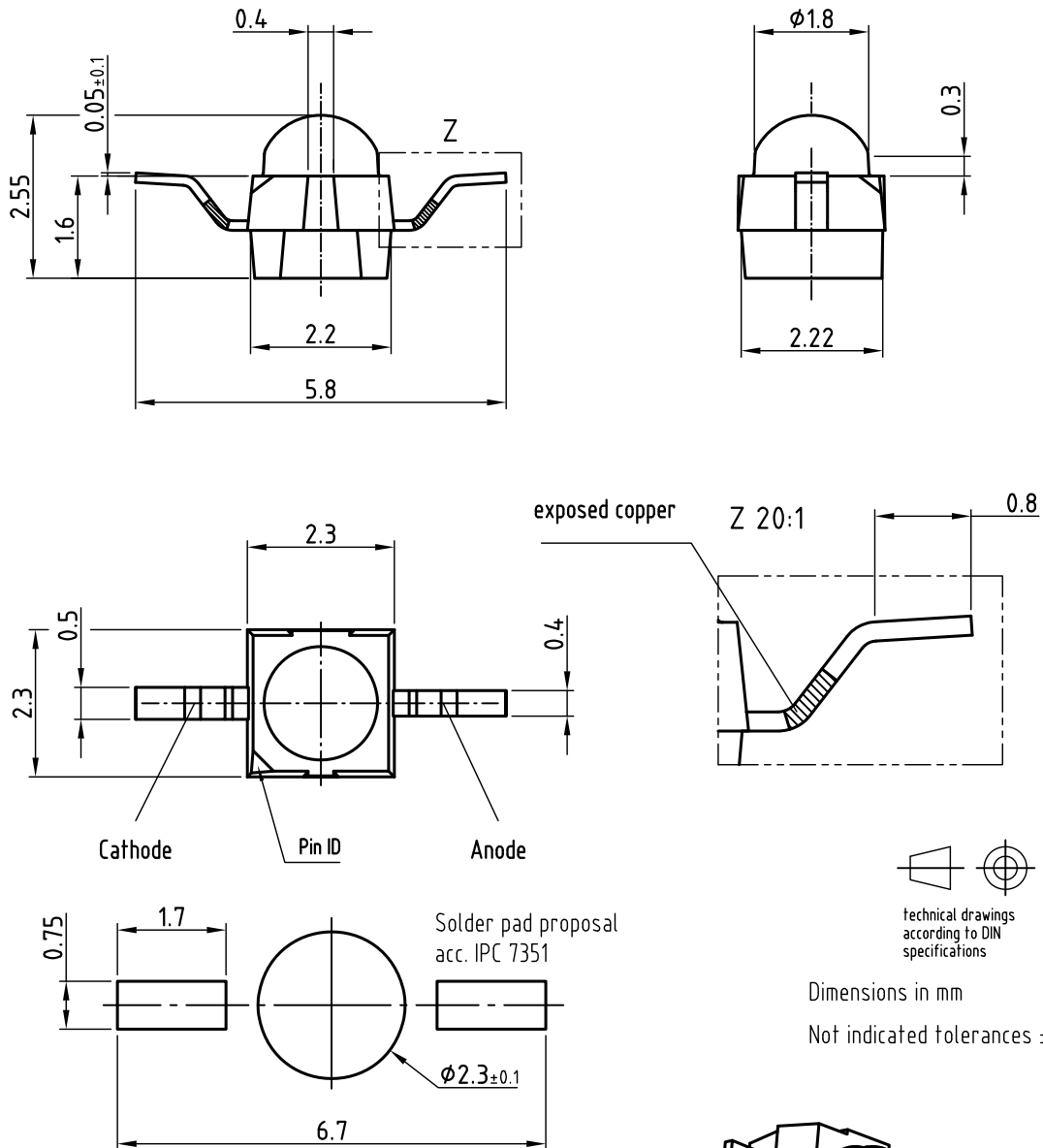
Moisture sensitivity level 2a, acc. to J-STD-020.

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 $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $RH < 5\%$.

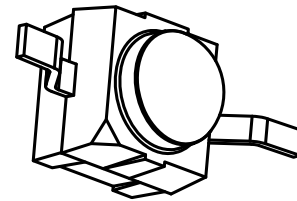


PACKAGE DIMENSIONS in millimeters: VEMD2503



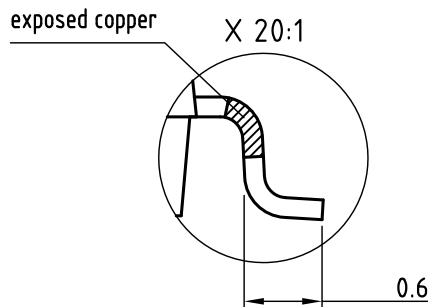
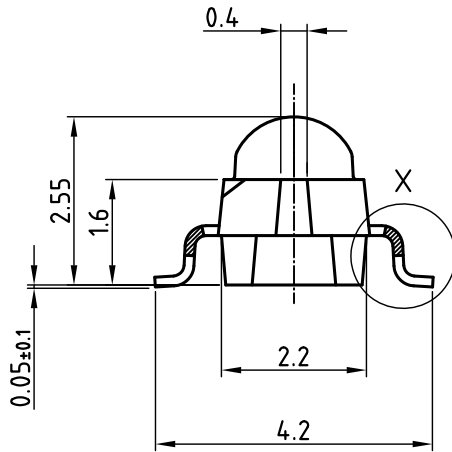
Drawing refers to following types: VSMB2943RGX01
 VSMF2893RGX01
 VEMD2x23X01

Drawing-No.: 6.544-5409.01-4
 Issue: prel. 03.08.12

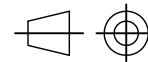




PACKAGE DIMENSIONS in millimeters: VEMD2523



Solder pad proposal
acc. IPC 7351



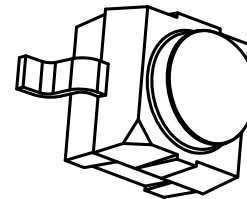
technical drawings
according to DIN
specifications

Dimensions in mm

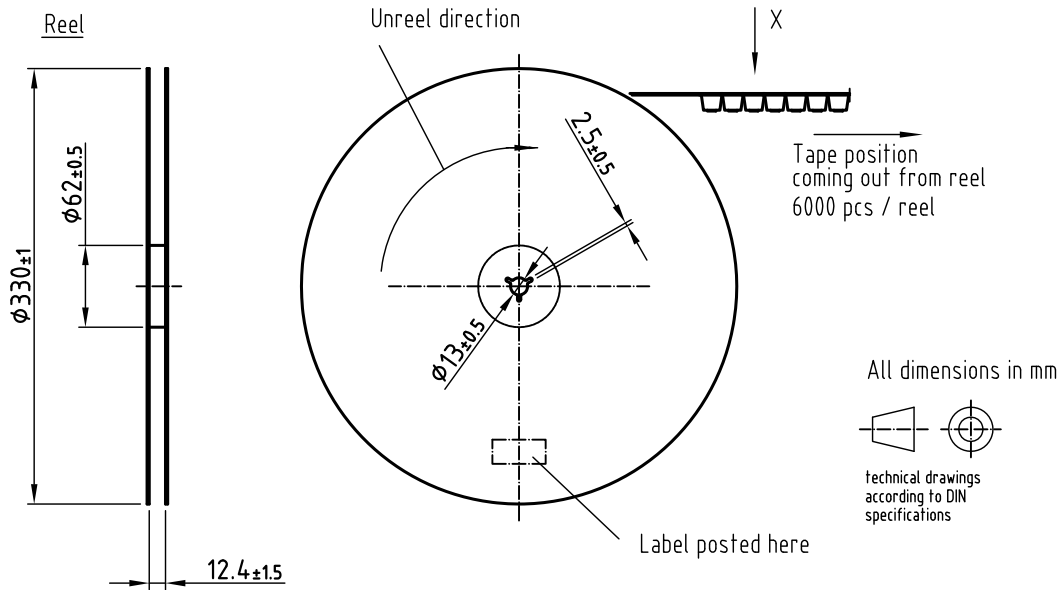
Not indicated tolerances ±0.2

Drawing refers to following types: VSMB2943GX01
 VSMF2893GX01
 VEMD2x23X01

Drawing-No.: 6.544-5408.01-4
 Issue: prel; 03.08.12



TAPING AND REEL DIMENSIONS in millimeters: VEMD2503



Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
V SMB294.3RGX01	Cathode	Anode
V SMF2893RGX01		
V EMD2x03X01		
V EMT2x03X01	Collector	Emitter
V SMY2853RG	Anode	Cathode



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5100.02-4
Issue: prel; 03.08.12

TAPING AND REEL DIMENSIONS in millimeters: VEMD2523



Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01	Cathode	Anode
VSMF2893GX01		
VEMD2x23X01		
VEMT2x23X01	Collector	Emitter
VSMY2853G	Anode	Cathode



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5091.21-4
Issue: prel; 03.08.12



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