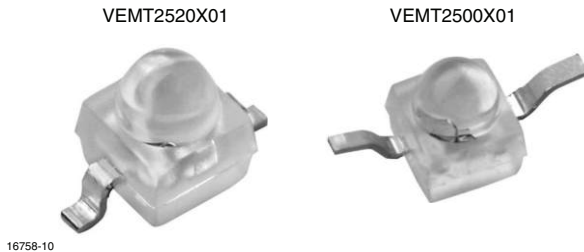


## Silicon NPN Phototransistor



### DESCRIPTION

VENT2500X01 series are silicon NPN epitaxial planar phototransistors in a miniature dome lens, clear epoxy package for surface mounting. The device is sensitive to visible and near infrared radiation.

### 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
- Suitable for visible and near infrared radiation
- 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](http://www.vishay.com/applications)



### APPLICATIONS

- Detector in automotive applications
- Photo interrupters
- Miniature switches
- Counters
- Encoders
- Position sensors

PRODUCT SUMMARY			
COMPONENT	$I_{ca}$ (mA)	$\varphi$ (deg)	$\lambda_{0.1}$ (nm)
VENT2500X01	6	$\pm 15$	470 to 1090
VENT2520X01	6	$\pm 15$	470 to 1090

#### Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VENT2500X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VENT2520X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

#### Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		$V_{CEO}$	20	V
Emitter collector voltage		$V_{ECO}$	7	V
Collector current		$I_C$	50	mA
Power power dissipation	$T_{amb} \leq 75^\circ C$	$P_V$	100	mW



ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{\text{amb}}$	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		$T_{\text{stg}}$	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	Acc. reflow profile fig. 7	$T_{\text{sd}}$	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	Acc. J-STD-051	$R_{\text{thJA}}$	250	K/W

**Note**

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

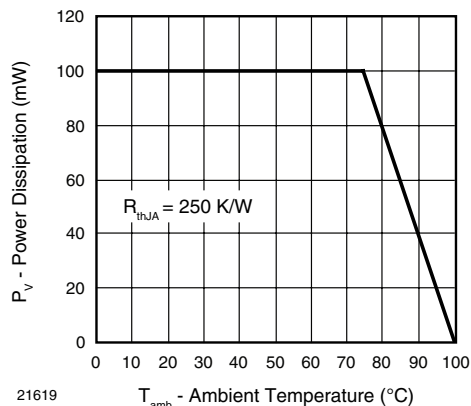


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 0.1 \text{ mA}$	$V_{\text{CEO}}$	20			V
Collector dark current	$V_{\text{CE}} = 5 \text{ V}, E = 0$	$I_{\text{CEO}}$		1	100	nA
Collector emitter capacitance	$V_{\text{CE}} = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$	$C_{\text{CEO}}$		25		pF
Collector light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{\text{CE}} = 5 \text{ V}$	$I_{\text{CA}}$	3	6	9	mA
Angle of half sensitivity		$\phi$		$\pm 15$		deg
Wavelength of peak sensitivity		$\lambda_p$		850		nm
Range of spectral bandwidth		$\lambda_{0.1}$		470 to 1090		nm
Collector emitter saturation voltage	$I_C = 0.05 \text{ mA}$	$V_{\text{CEsat}}$			0.4	V

**Note**

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

## BASIC CHARACTERISTICS

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

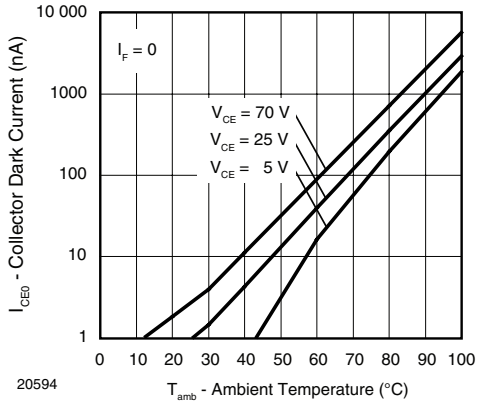


Fig. 2 - Collector Dark Current vs. Ambient Temperature

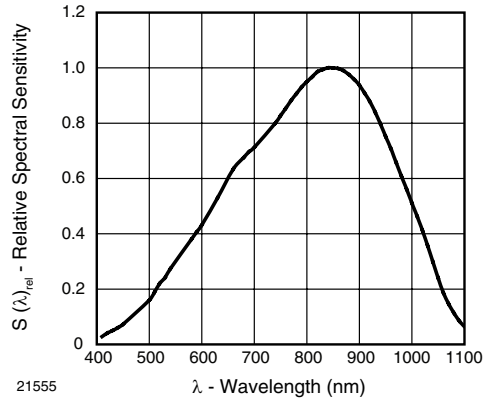


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

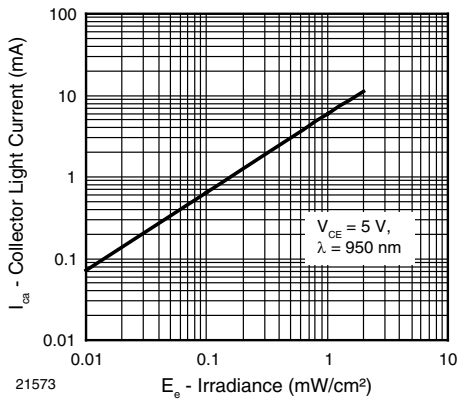


Fig. 3 - Collector Light Current vs. Irradiance

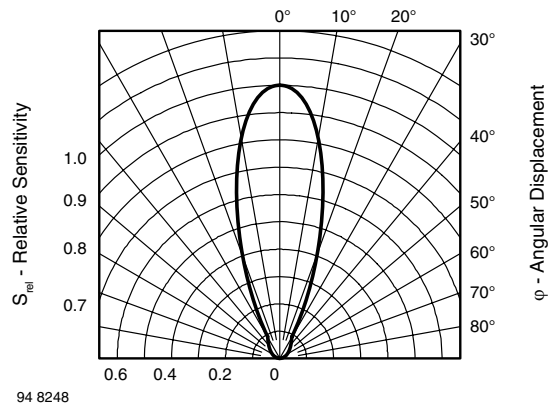


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

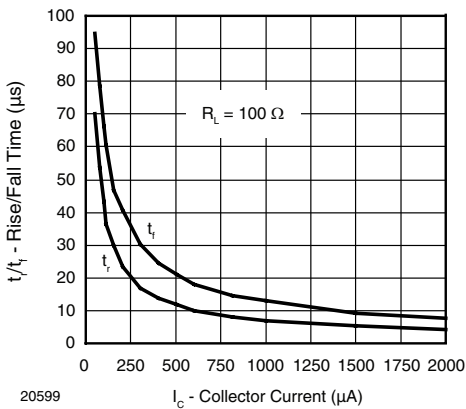
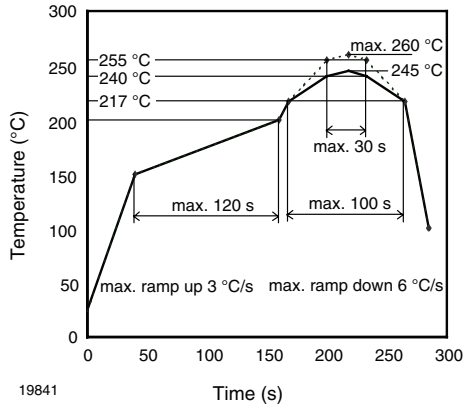


Fig. 4 - Rise/Fall Time vs. Collector Current

## REFLOW SOLDER PROFILE



19841  
Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. 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: 4 weeks

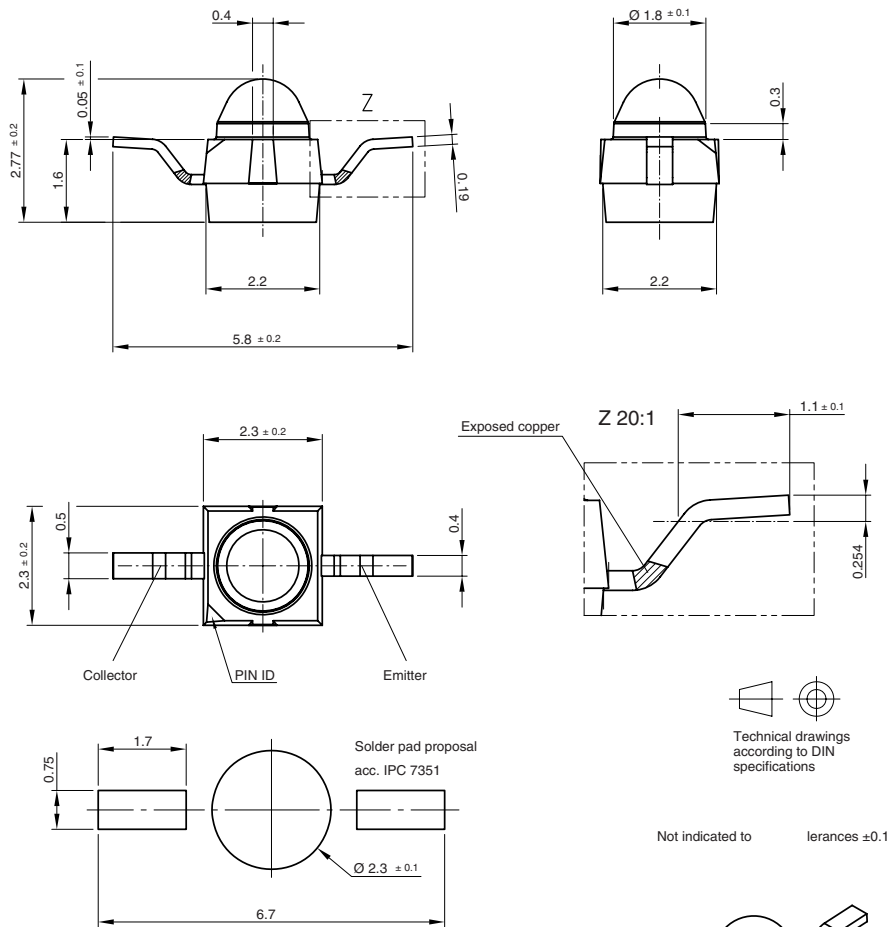
Conditions:  $T_{amb} < 30\text{ °C}$ ,  $RH < 60\%$

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

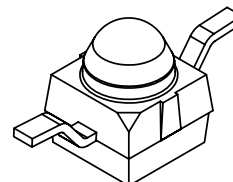
## DRYING

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 VENT2500X01 in millimeters



Drawing-No.: 6.544-5391.01-4  
Issue: 1; 26.09.08  
21570



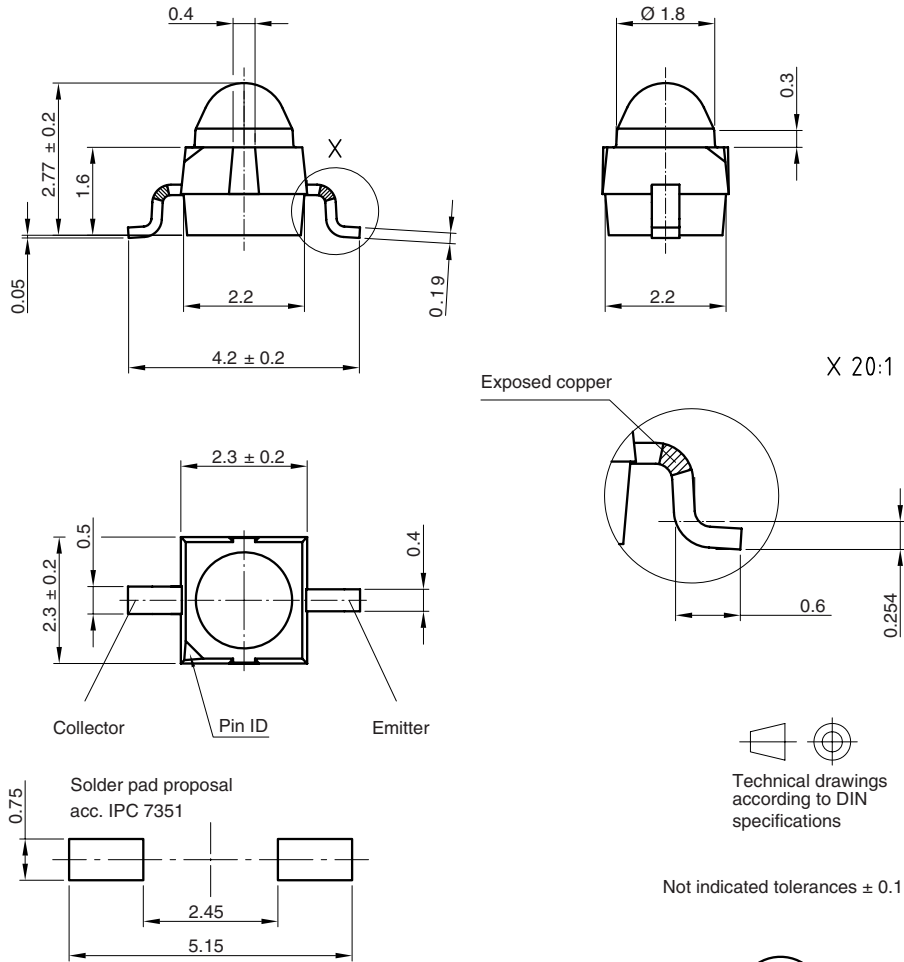


# VENT2500X01, VEMT2520X01

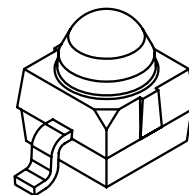
Silicon NPN Phototransistor

Vishay Semiconductors

## PACKAGE DIMENSIONS VEMT2520X01 in millimeters



Drawing-No.: 6.544-5383.01-4  
Issue: 4; 28.01.09  
21569



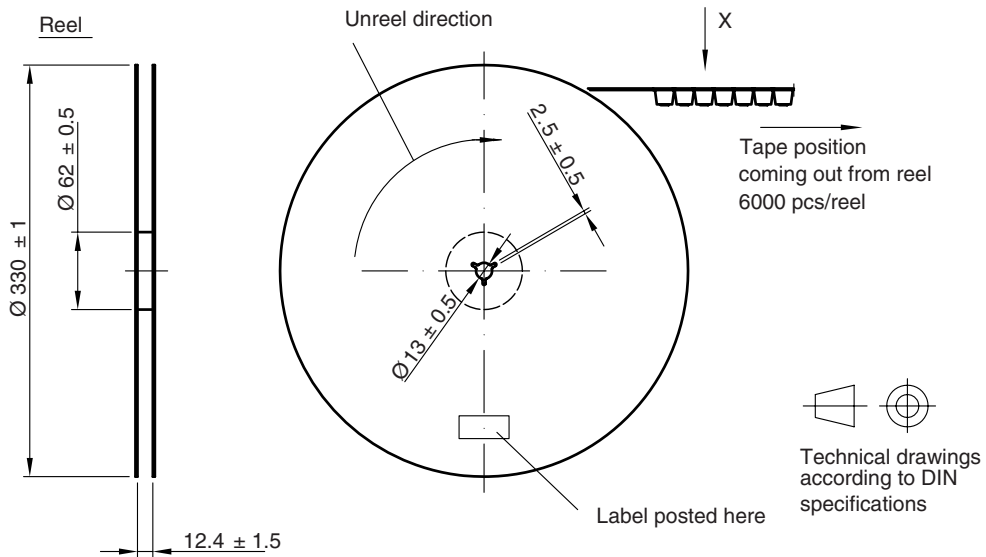
# VEMT2500X01, VEMT2520X01

Vishay Semiconductors

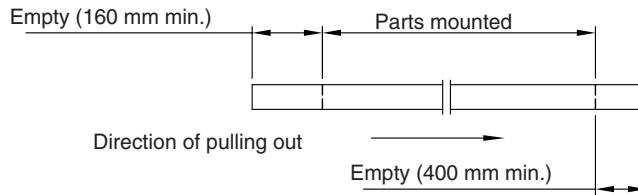
Silicon NPN Phototransistor



## TAPE AND REEL DIMENSIONS VEMT2500X01 in millimeters

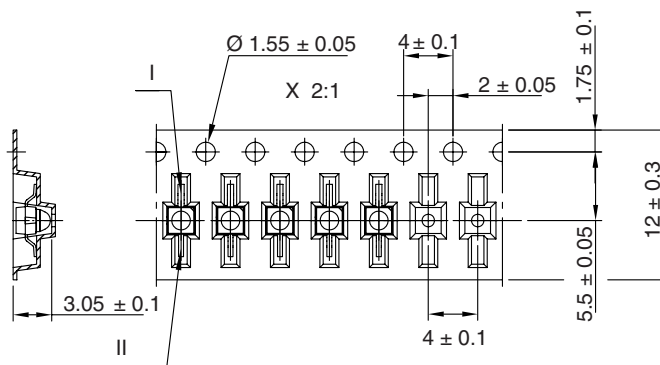


### Leader and trailer tape:



### Terminal position in tape

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



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

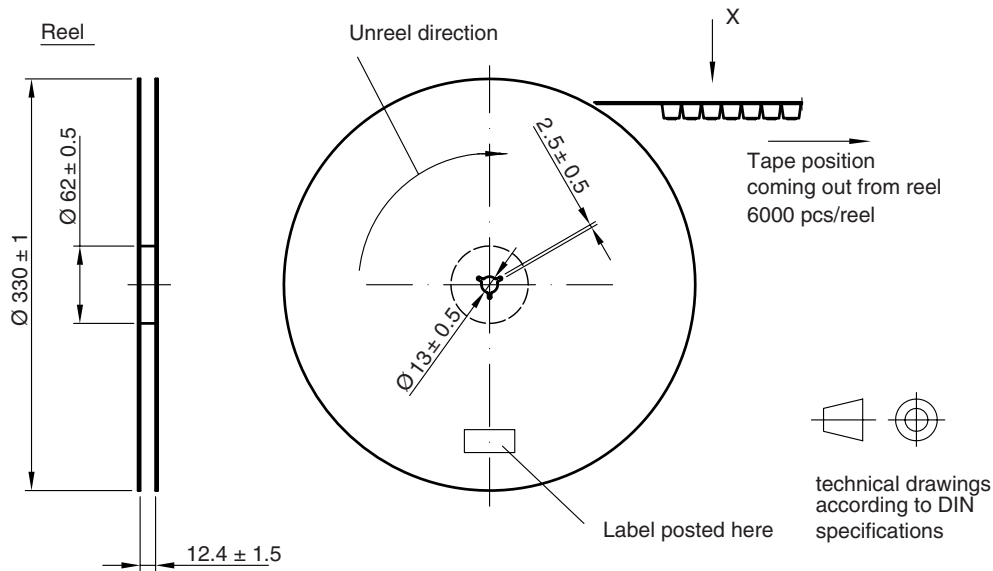


# VENT2500X01, VEMT2520X01

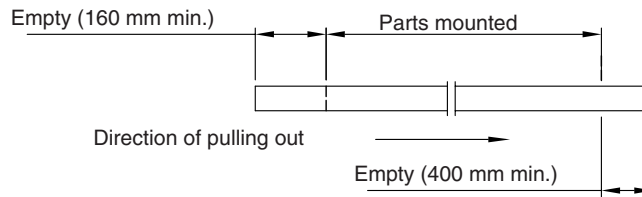
Silicon NPN Phototransistor

Vishay Semiconductors

## TAPE AND REEL DIMENSIONS VEMT2520X01 in millimeters

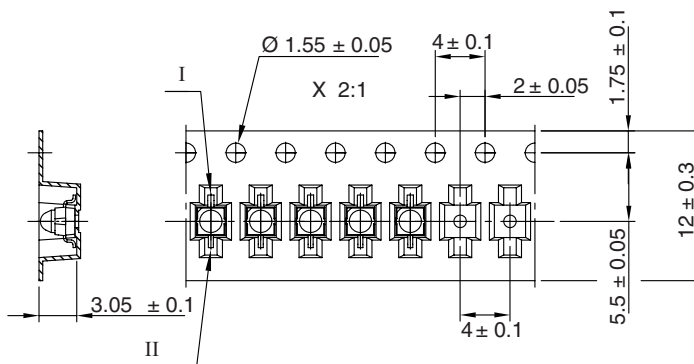


### Leader and trailer tape:



### Terminal position in tape

Device	Lead I	Lead II
VENT2020	Collector	Emitter
VEMT2520		
VSMB2020	Cathode	Anode
VEMD2020		



Drawing-No.: 9.800-5091.01-4

Issue: X; 29.04.09

21571



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