

Silicon NPN Phototransistor

VEMT2520X01



16758-10

VEMT2500X01



DESCRIPTION

VEMT2500X01 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: $\phi = \pm 15^\circ$
- 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

AUTOMOTIVE GRADE


RoHS
COMPLIANT
GREEN
(5-2009)**

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

APPLICATIONS

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

PRODUCT SUMMARY			
COMPONENT	I_{ca} (mA)	ϕ (deg)	$\lambda_{0.1}$ (nm)
VEMT2500X01	6	± 15	470 to 1090
VEMT2520X01	6	± 15	470 to 1090

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMT2500X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VEMT2520X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)				
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	$T_{amb} \leq 75^\circ\text{C}$	P_V	100	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Storage temperature range		T_{stg}	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	Acc. reflow profile fig. 8	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	250	K/W

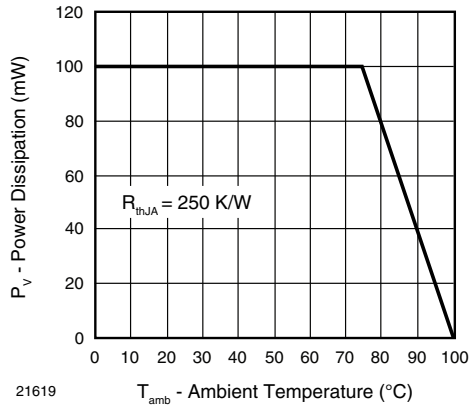


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 0.1\text{ mA}$	V_{CEO}	20			V
Collector dark current	$V_{CE} = 5\text{ V}$, $E = 0$	I_{CEO}		1	100	nA
Collector emitter capacitance	$V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_{CEO}		25		pF
Collector light current	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_{CE} = 5\text{ V}$	I_{CA}	3	6	9	mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_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_{CEsat}			0.4	V
Temperature coefficient of I_{ca}	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_{CE} = 5\text{ V}$	TK_{Ica}		1.1		%/K

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)



Fig. 2 - Collector Dark Current vs. Ambient Temperature

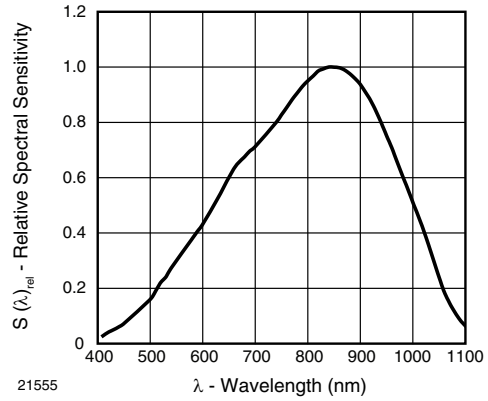


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength



Fig. 3 - Collector Light Current vs. Irradiance

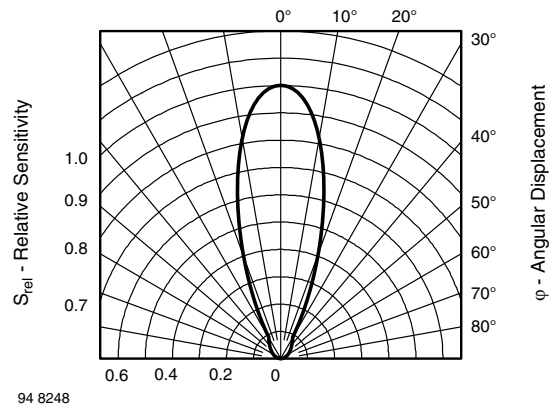


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

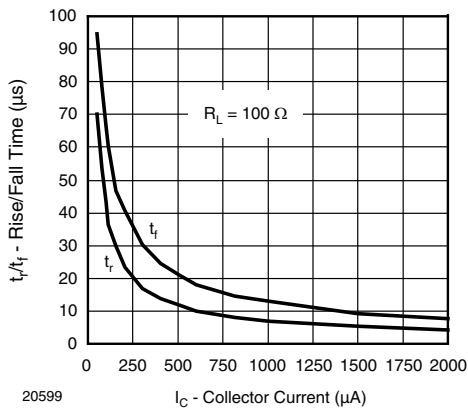


Fig. 4 - Rise/Fall Time vs. Collector Current

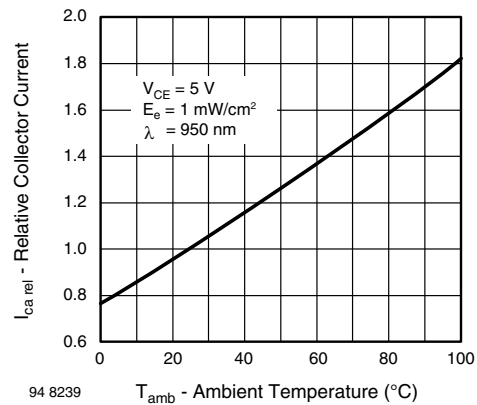
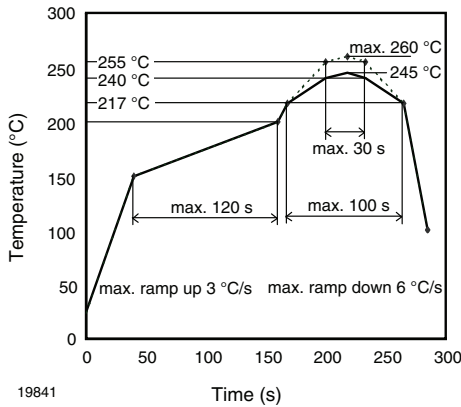


Fig. 7 - Relative Collector Current vs. Ambient Temperature



REFLOW SOLDER PROFILE



19841

Fig. 8 - 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: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

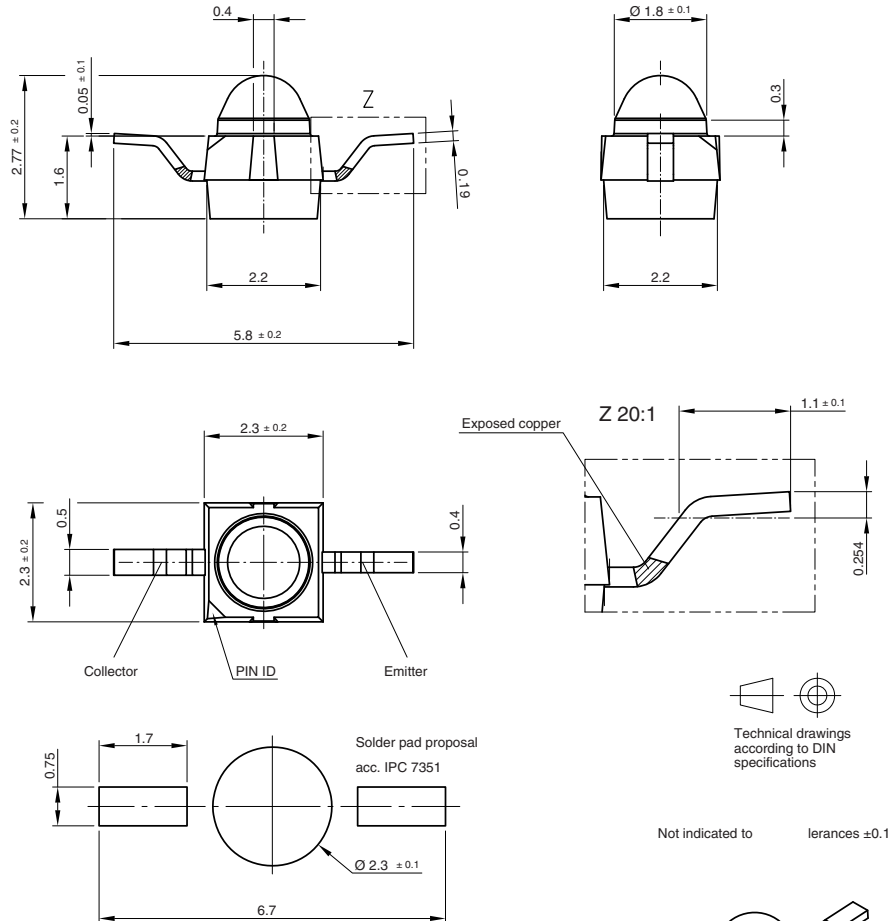
Moisture sensitivity level 2a, acc. to J-STD-020.

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), $RH < 5\%$.

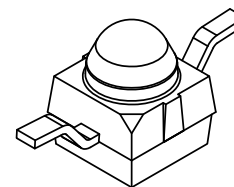
PACKAGE DIMENSIONS VEMT2500X01 in millimeters



Drawing-No.: 6.544-5391.01-4

Issue: 1; 26.09.08

21570

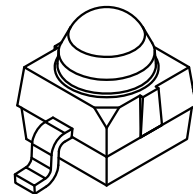




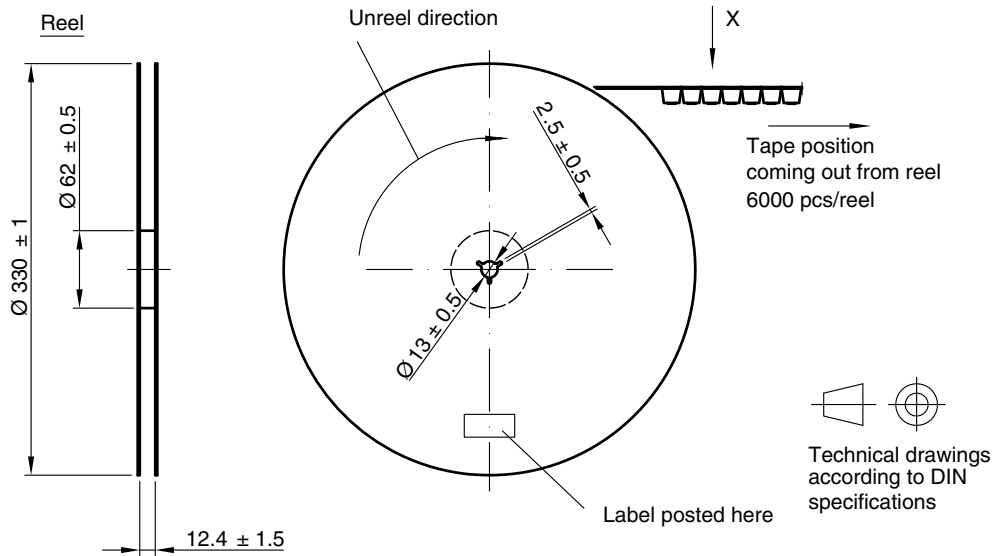
PACKAGE DIMENSIONS VEMT2520X01 in millimeters



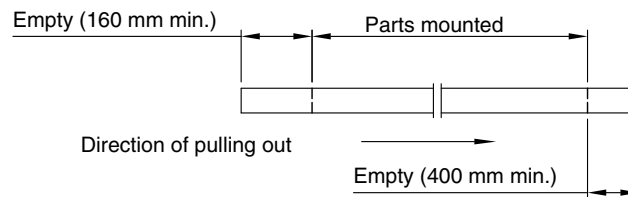
Drawing-No.: 6.544-5383.01-4
Issue: 4; 28.01.09
21569



TAPE AND REEL DIMENSIONS VEMT2500X01 in millimeters

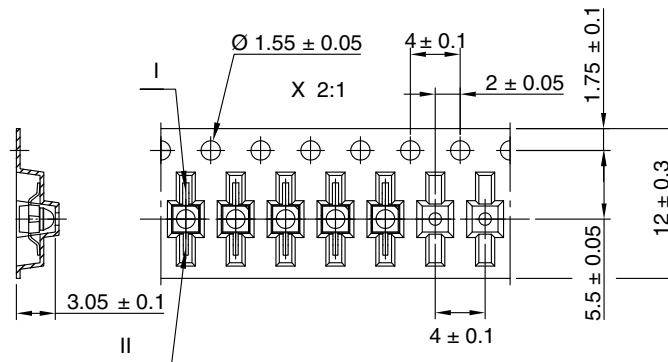


Leader and trailer tape:



Terminal position in tape

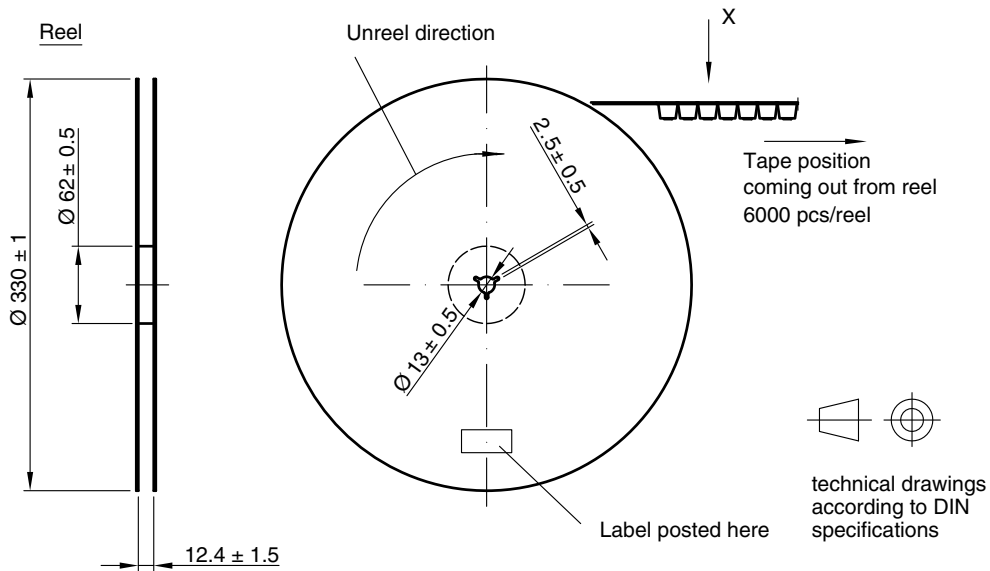
Devicce	Lead I	Lead II
VEMT2000	Collector	Emitter
VEMT2500		
VEMD2000	Cathode	Anode
VEMD2500		
VSMB2000		
VSMG2000	Anode	Cathode
VSMY2850RG		



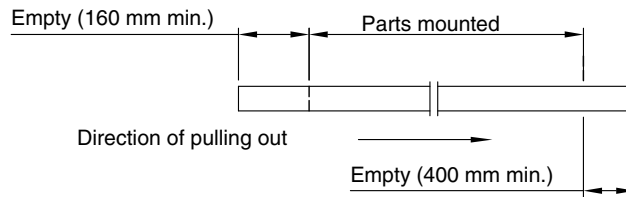
Drawing-No.: 9.800-5100.01-4
 Issue: 2; 18.03.10
 21572



TAPE AND REEL DIMENSIONS VENT2520X01 in millimeters

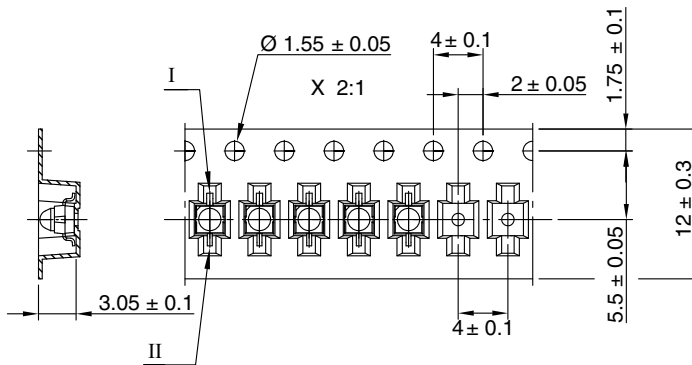


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VENT2020		
VENT2520	Collector	Emitter
VSMB2020		
VSMG2020	Cathode	Anode
VEMD2020		
VEMD2520		
VSMY2850G	Anode	Cathode



Drawing-No.: 9.800-5091.01-4

Issue: 3; 18.03.10

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