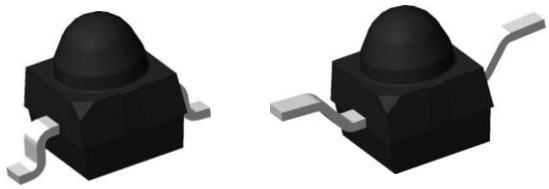
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VEMT2000X01, VEMT2020X01

Vishay Semiconductors

Silicon NPN Phototransistor



21568 VEMT2020X01 VEMT2000X01

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: φ = ± 15°
- 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

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

AUTOMOTIVE GRADE

DESCRIPTION

VEMT2000X01 series are silicon NPN epitaxial planar phototransistors with daylight blocking filter in a miniature, black dome lens package for surface mounting. Filter bandwidth is matched with 830 nm to 950 nm IR emitters.

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_{ca} (mA)	φ (deg)	$\lambda_{0.5}$ (nm)
VEMT2000X01	6	± 15	790 to 970
VEMT2020X01	6	± 15	790 to 970

Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMT2000X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VEMT2020X01	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	$T_{amb} \leq 75$ °C	P_V	100	mW

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
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 profile fig. 7	T_{sd}	260	°C
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	250	K/W

Note
T_{amb} = 25 °C, unless otherwise specified

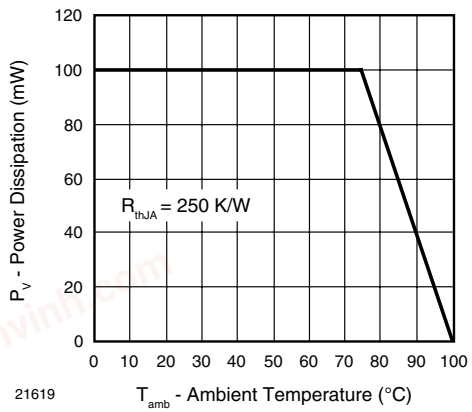


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I_C = 0.1 mA	V_{CEO}	20			V
Collector dark current	V_{CE} = 5 V, E = 0	I_{CEO}		1	100	nA
Collector emitter capacitance	V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CEO}		25		pF
Collector light current	E_e = 1 mW/cm², λ = 950 nm, V_{CE} = 5 V	I_{ca}	3	6	9	mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_p		860		nm
Range of spectral bandwidth		$\lambda_{0.5}$		790 to 970		nm
Collector emitter saturation voltage	I_C = 0.05 mA	V_{CEsat}			0.4	V

Note
T_{amb} = 25 °C, unless otherwise specified

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BASIC CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified

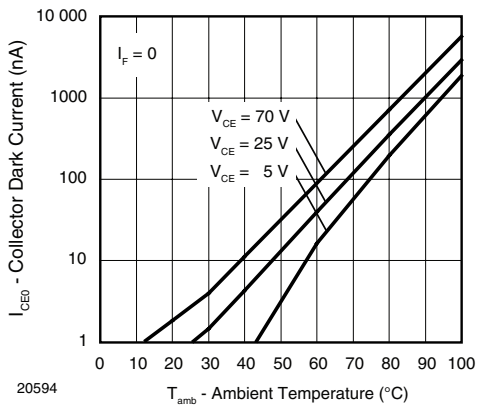


Fig. 2 - Collector Dark Current vs. Ambient Temperature

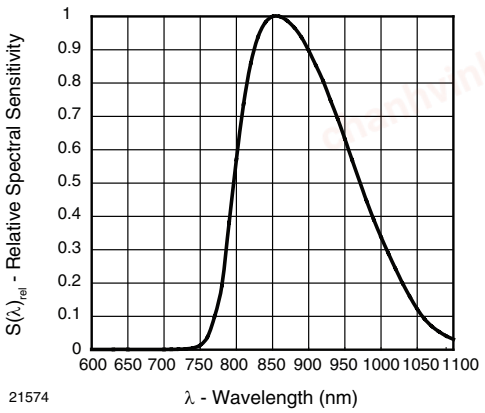


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

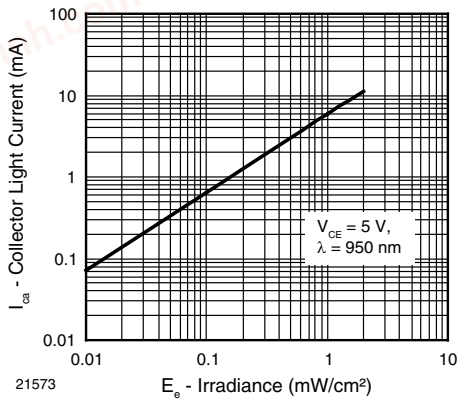


Fig. 3 - Collector Light Current vs. Irradiance

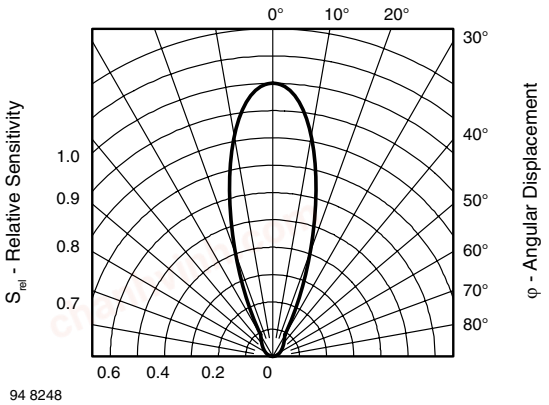


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

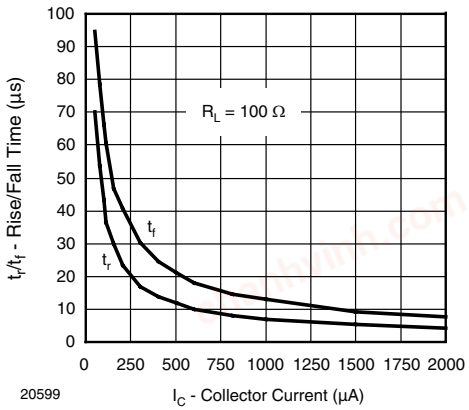


Fig. 4 - Rise/Fall Time vs. Collector Current

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REFLOW SOLDER PROFILE

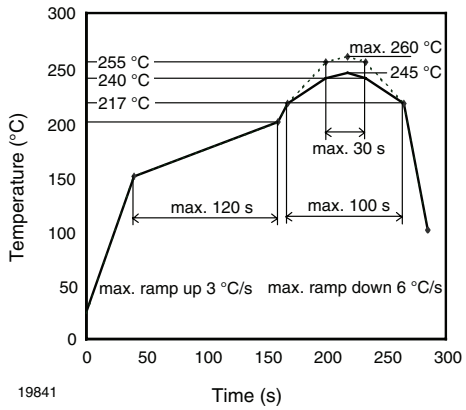


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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.

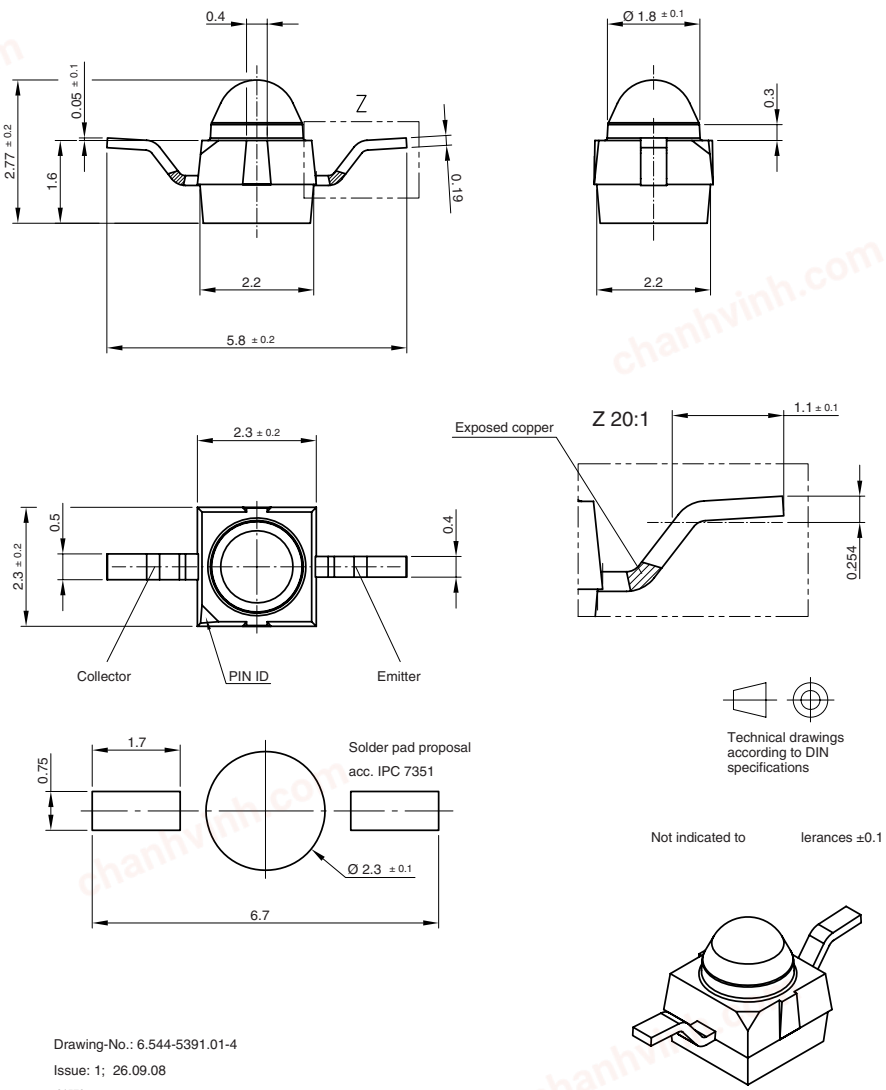
FLOOR LIFE

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 °C, RH < 60 %
Moisture sensitivity level 2a, acc. to J-STD-020.

DRYING

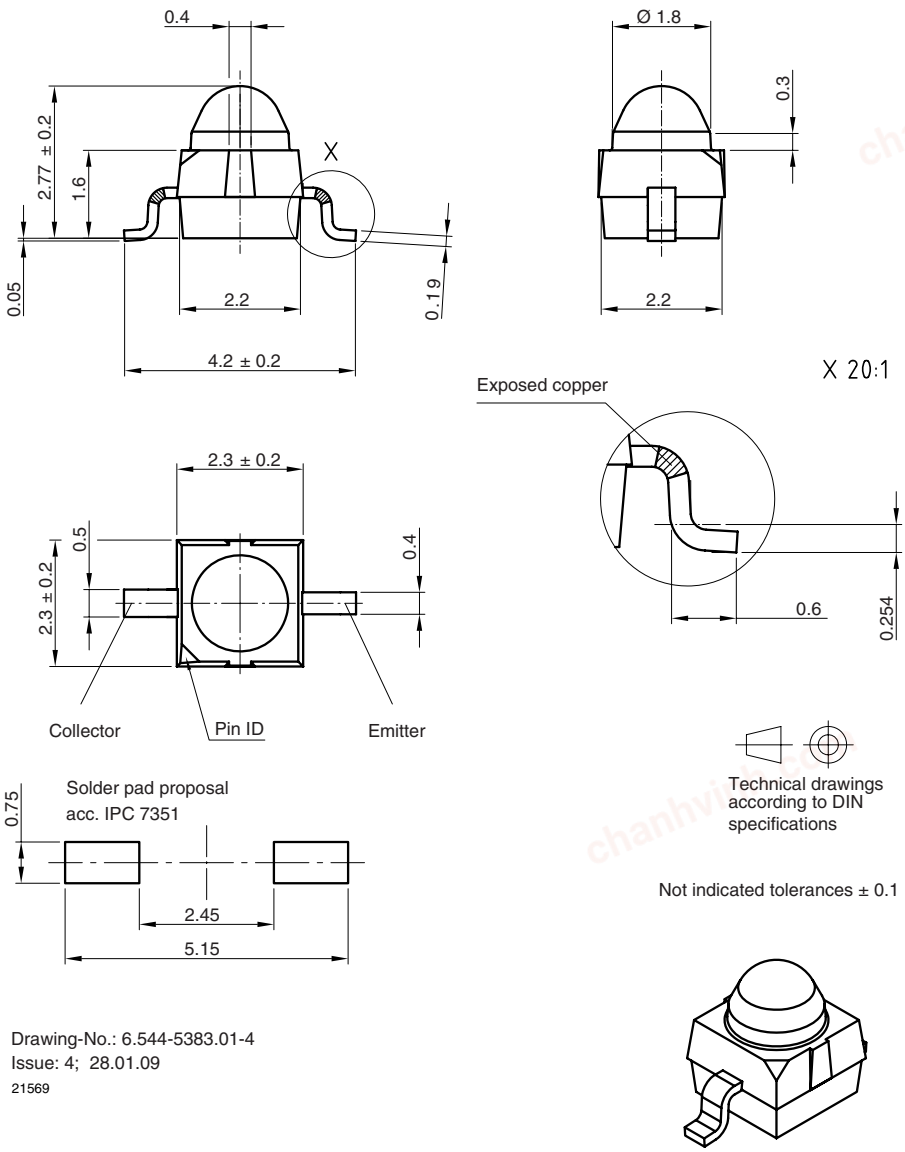
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

PACKAGE DIMENSIONS VEMT2000X01 in millimeters



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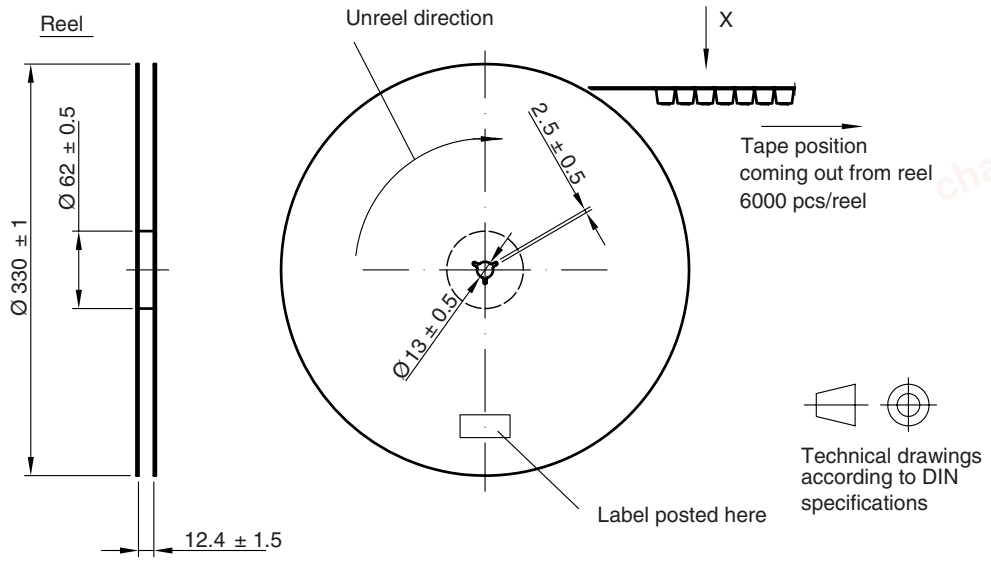
PACKAGE DIMENSIONS VEMT2020X01 in millimeters



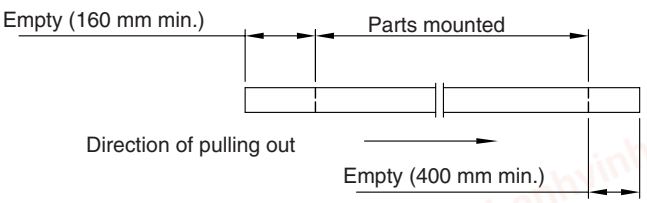
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Issue: 4; 28.01.09
21569

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TAPE AND REEL DIMENSIONS VEMT2000X01 in millimeters

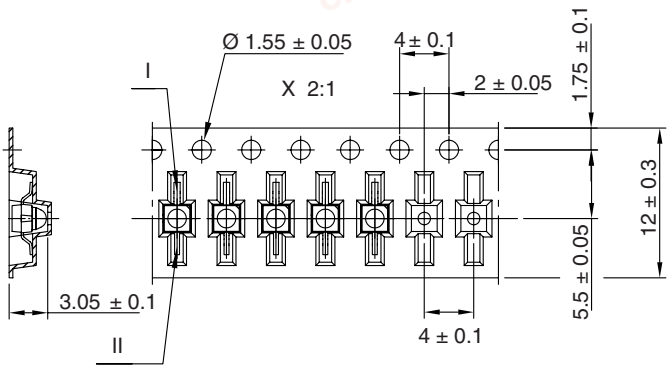


Leader and trailer tape:



Terminal position in tape

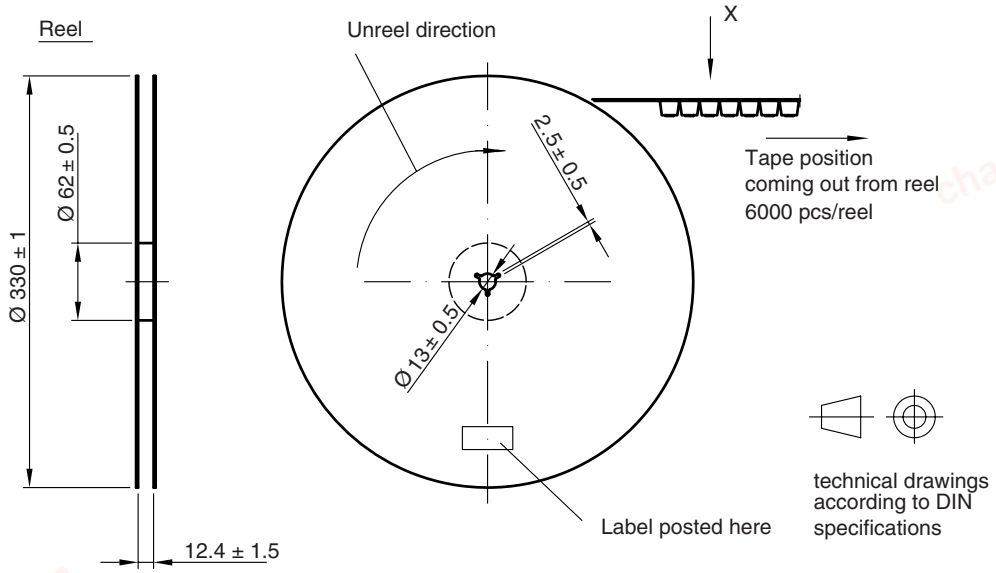
Device	Lead I	Lead II
VEMT2000	Collector	Emitter
VEMT2500		
VEMD2000	Cathode	Anode
VSMB2000		



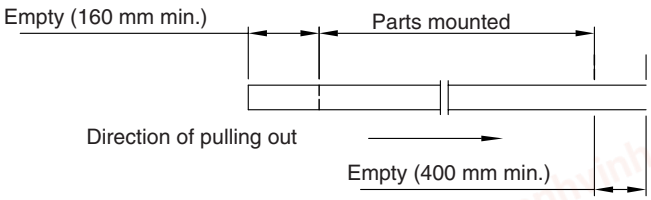
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Issue: X; 29.04.09
21572

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TAPE AND REEL DIMENSIONS VEMT2020X01 in millimeters

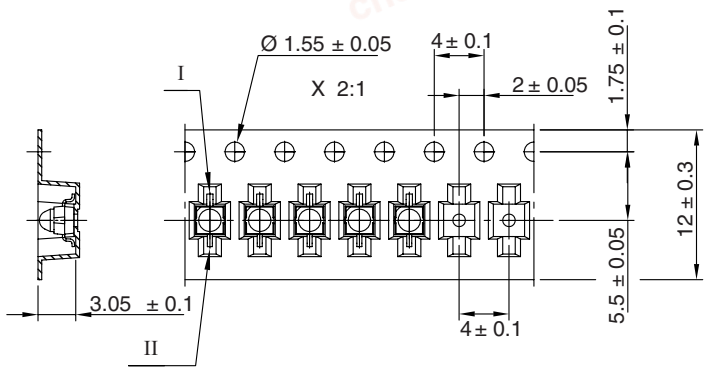


Leader and trailer tape:



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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