



Silicon NPN Phototransistor



VEMT2503X01



VEMT2523X01

DESCRIPTION

VEMT2503X01 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 2.55
- 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 VSMB2943RGX01 and VSMB2943GX01
- 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



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)
VEMT2503X01	2.7	± 35	470 to 1090
VEMT2523X01	2.7	± 35	470 to 1090

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMT2503X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VEMT2523X01	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
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} ≤ 75 °C	P _V	100	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 profile fig. 8	T _{sd}	260	°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 °C, unless otherwise specified)						
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/cm ² , λ = 950 nm, V _{CE} = 5 V	I _{ca}	1.3	2.7	4.1	mA
Angle of half sensitivity		φ		± 35		deg
Wavelength of peak sensitivity		λ _p		850		nm
Range of spectral bandwidth		λ _{0.1}		470 to 1090		nm
Collector emitter saturation voltage	I _C = 0.05 mA	V _{CEsat}			0.4	V
Temperature coefficient of Ica	E _e = 1 mW/cm ² , λ = 950 nm, V _{CE} = 5 V	Tk _{Ica}		1.1		%/K

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

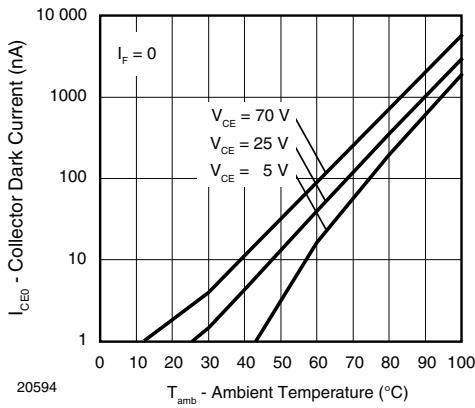


Fig. 2 - Collector Dark Current vs. Ambient Temperature

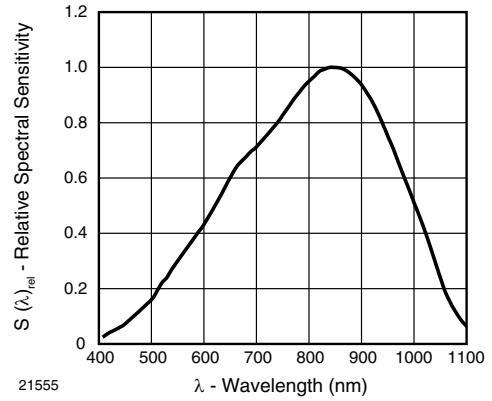


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

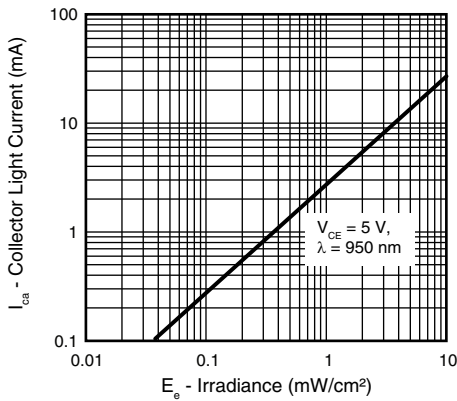


Fig. 3 - Collector Light Current vs. Irradiance

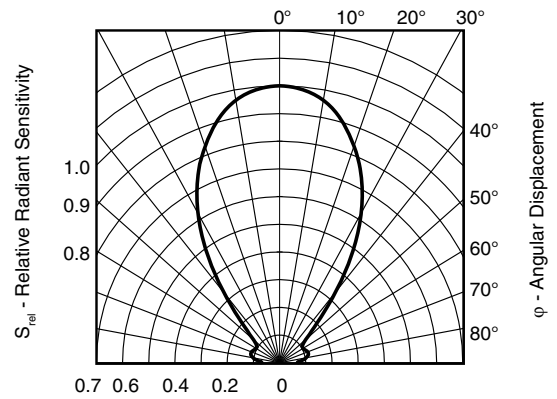


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement



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

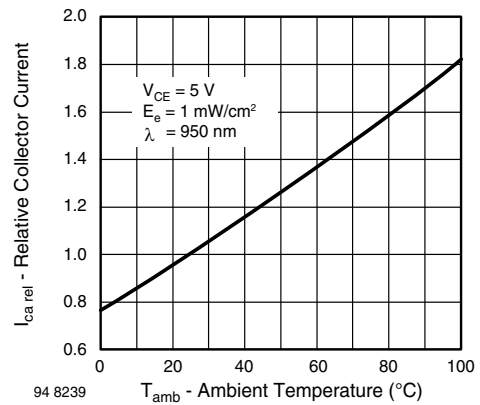


Fig. 7 - Relative Collector Current vs. Ambient Temperature

REFLOW SOLDER PROFILE

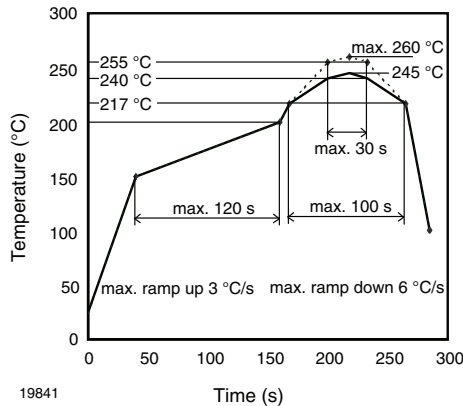


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

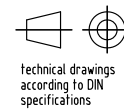
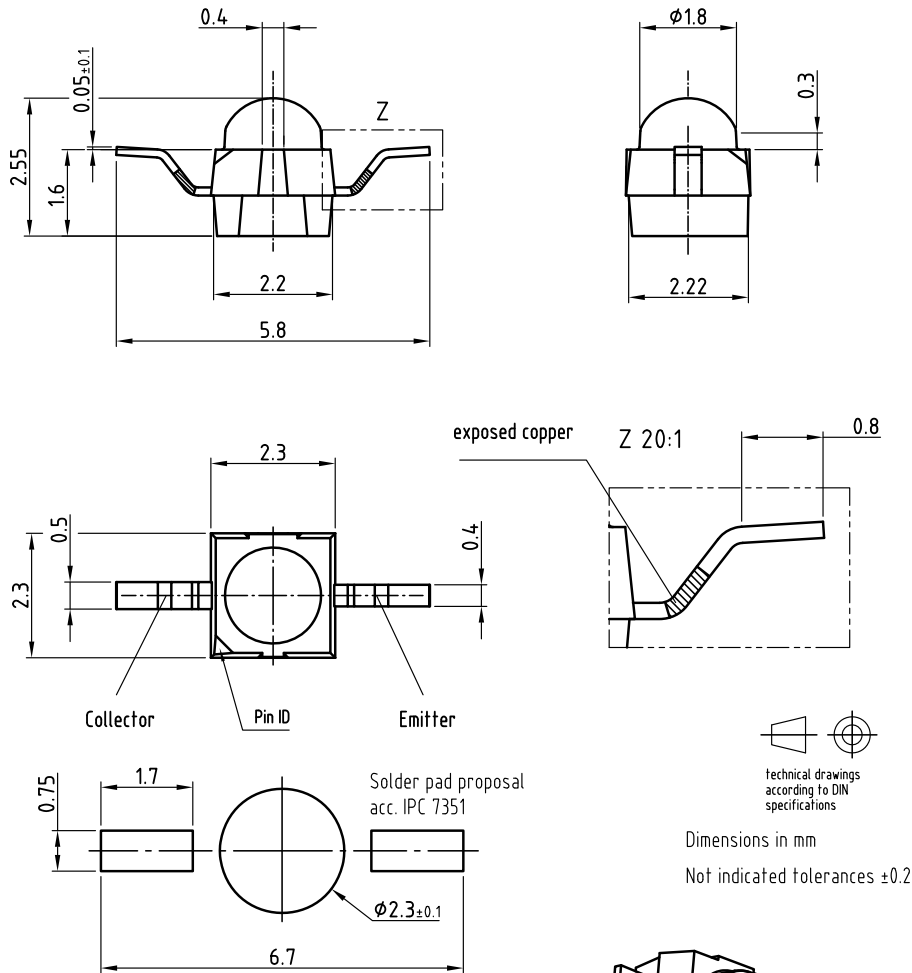
Conditions: $T_{amb} < 30\text{ °C}$, RH < 60 %

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

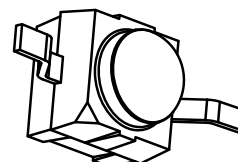
DRYING

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 VEMT2503X01 in millimeters



Dimensions in mm
Not indicated tolerances ± 0.2

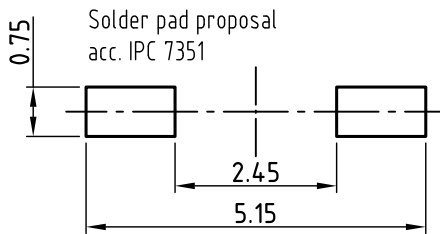


Drawing refers to following types: VEMT2x03X01

Drawing-No.: 6.544-54.09.02-4
Issue: prel. 03.08.12



PACKAGE DIMENSIONS VEMT2523X01 in millimeters



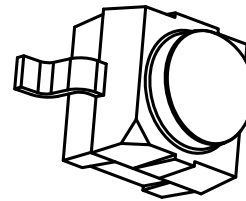
technical drawings according to DIN specifications

Dimensions in mm

Not indicated tolerances ±0.2

Drawing refers to following types: VEMT2x23X01

Drawing-No.: 6.544-5408.02-4
Issue: prel; 03.08.12



TAPE AND REEL DIMENSIONS VEMT2503X01 in millimeters

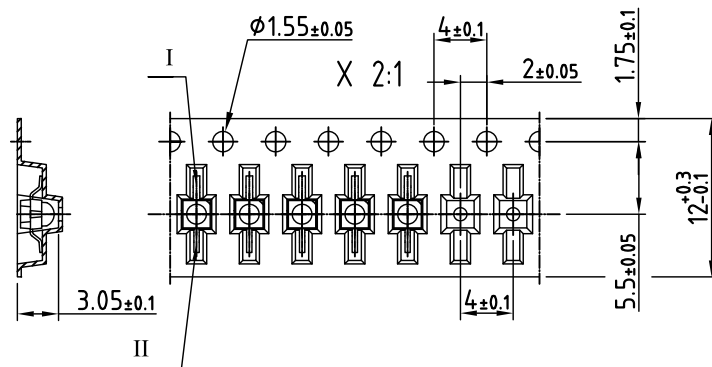


Leader and trailer tape:



Terminal position in tape

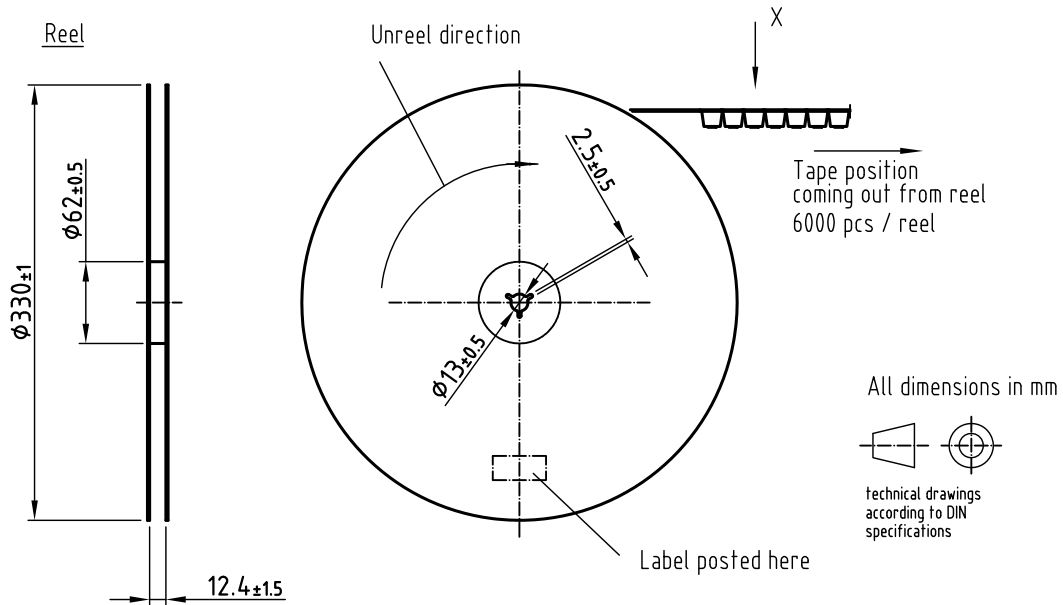
Device	Lead I	Lead II
V SMB2943RGX01	Cathode	Anode
V SMF2893RGX01		
V EMD2x03X01		
V EMT2x03X01	Collector	Emitter
V SMY2853RG	Anode	Cathode



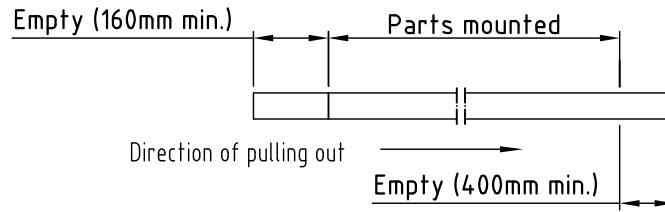
Drawing refers to following types: see table
Reel dimensions and tape

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

TAPE AND REEL DIMENSIONS VEMT2523X01 in millimeters

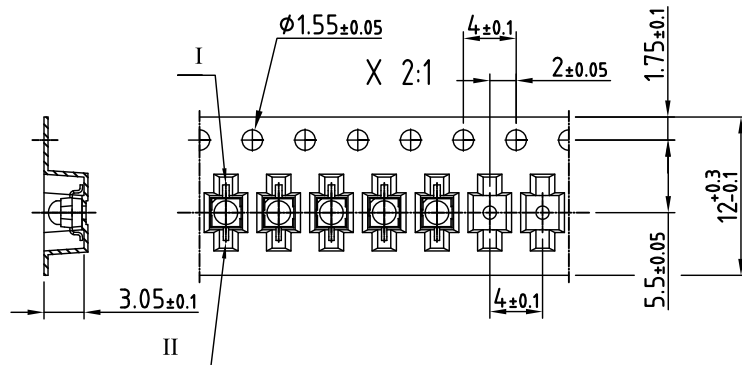


Leader and trailer tape:



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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