



### Silicon NPN Phototransistor



#### DESCRIPTION

VENT2523SLX01 is a silicon NPN epitaxial planar phototransistor in a miniature side looking, surface mount package (SMD) with clear epoxy dome lens. The device is sensitive to visible and near infrared radiation.

#### FEATURES

- Package type: surface mount
- Package form: side view
- Dimensions (L x W x H in mm): 2.3 x 2.55 x 2.3
- 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 VSMB2943SLX01
- 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](http://www.vishay.com/doc?99912)



#### APPLICATIONS

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

| PRODUCT SUMMARY |                      |              |                      |
|-----------------|----------------------|--------------|----------------------|
| COMPONENT       | I <sub>ca</sub> (mA) | $\phi$ (deg) | $\lambda_{0.1}$ (nm) |
| VENT2523SLX01   | 2.7                  | $\pm 35$     | 470 to 1090          |

#### Note

- Test condition see table "Basic Characteristics"

| ORDERING INFORMATION |               |                              |              |
|----------------------|---------------|------------------------------|--------------|
| ORDERING CODE        | PACKAGING     | REMARKS                      | PACKAGE FORM |
| VENT2523SLX01        | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | Side view    |

#### Note

- MOQ: minimum order quantity



| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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  | $T_{amb} \leq 75\text{ }^{\circ}\text{C}$ | $P_V$      | 100           | mW                 |
| Junction temperature   |   | $T_j$      | 100           | $^{\circ}\text{C}$ |
| Operating temperature range  |   | $T_{amb}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| 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                |

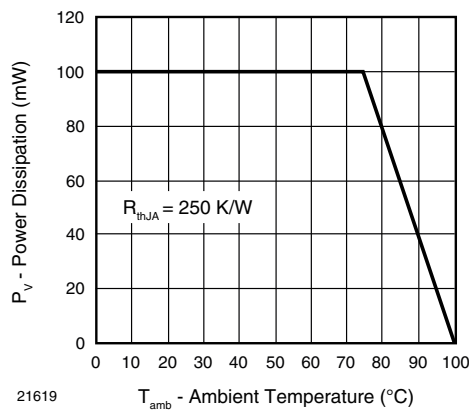


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | $I_{ca}$        | 1.3  | 2.7         | 4.1  | mA   |
| Angle of half sensitivity   |  | $\phi$          |      | $\pm 35$    |      | deg  |
| Wavelength of peak sensitivity  |  | $\lambda_p$     |      | 850         |      | nm   |
| Range of spectral bandwidth   |  | $\lambda_{0.1}$ |      | 470 to 1090 |      | nm   |
| Collector emitter saturation voltage  | $I_C = 0.05\text{ mA}$   | $V_{CEsat}$     |      |             | 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** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

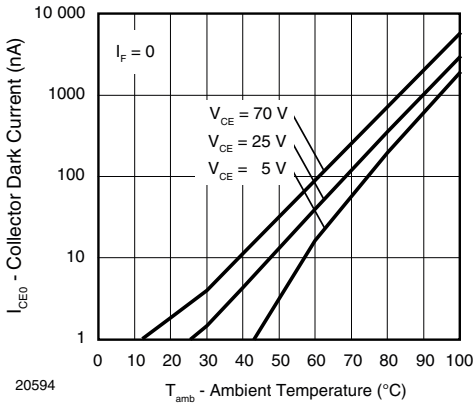


Fig. 2 - Collector Dark Current vs. Ambient Temperature

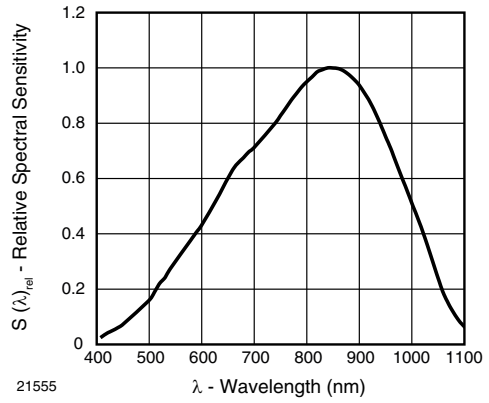


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

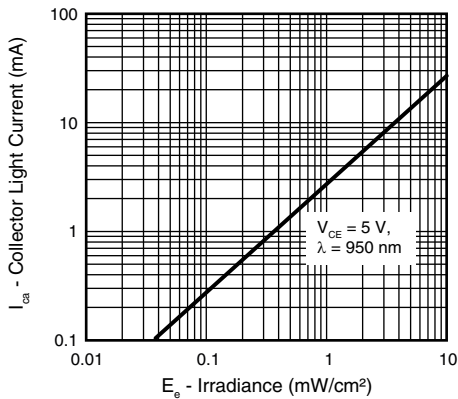


Fig. 3 - Collector Light Current vs. Irradiance

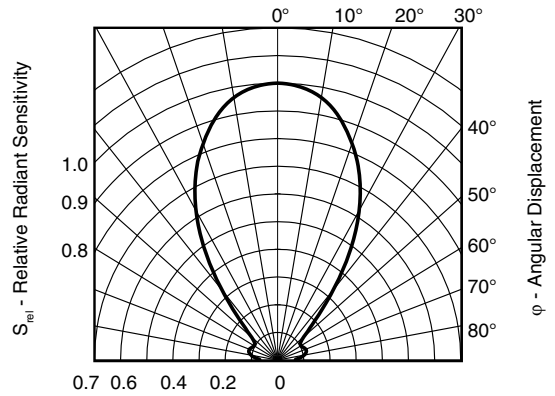


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

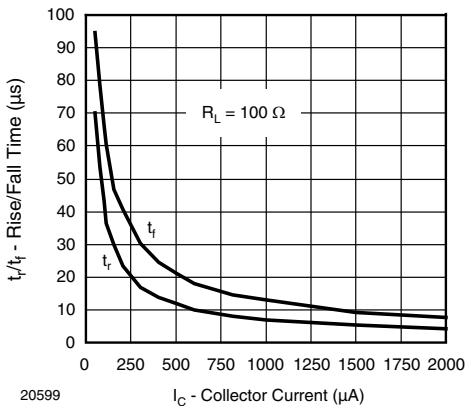


Fig. 4 - Rise/Fall Time vs. Collector Current

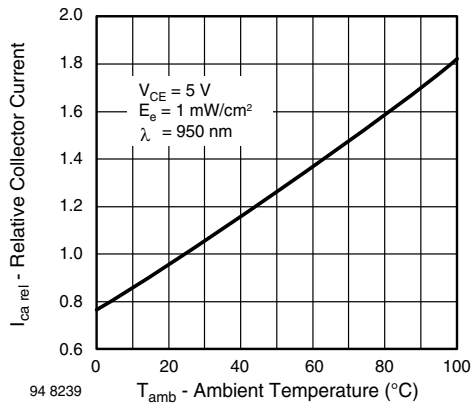


Fig. 7 - Relative Collector Current vs. Ambient Temperature

**REFLOW SOLDER PROFILE**

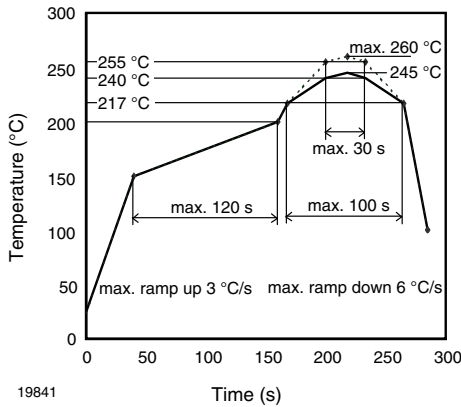


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**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.

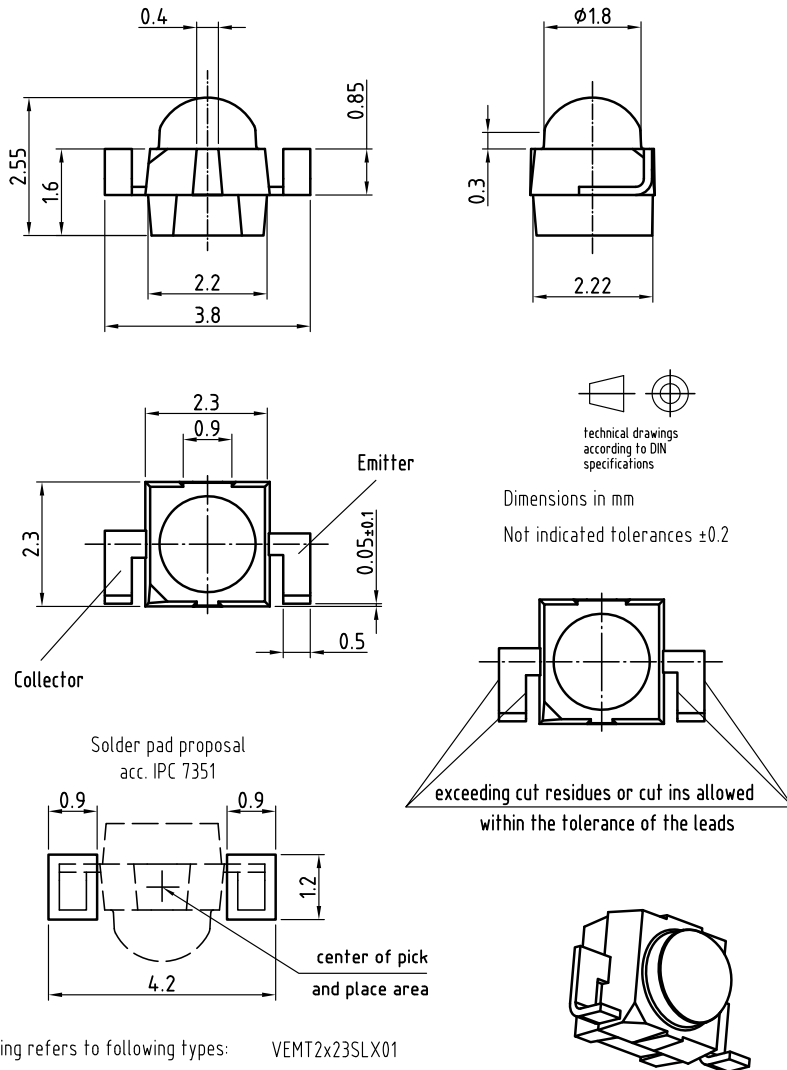
**FLOOR LIFE**

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:  
 Floor life: 4 weeks  
 Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ ,  $RH < 60\%$   
 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  $40\text{ }^{\circ}\text{C}$  (+  $5\text{ }^{\circ}\text{C}$ ),  $RH < 5\%$ .

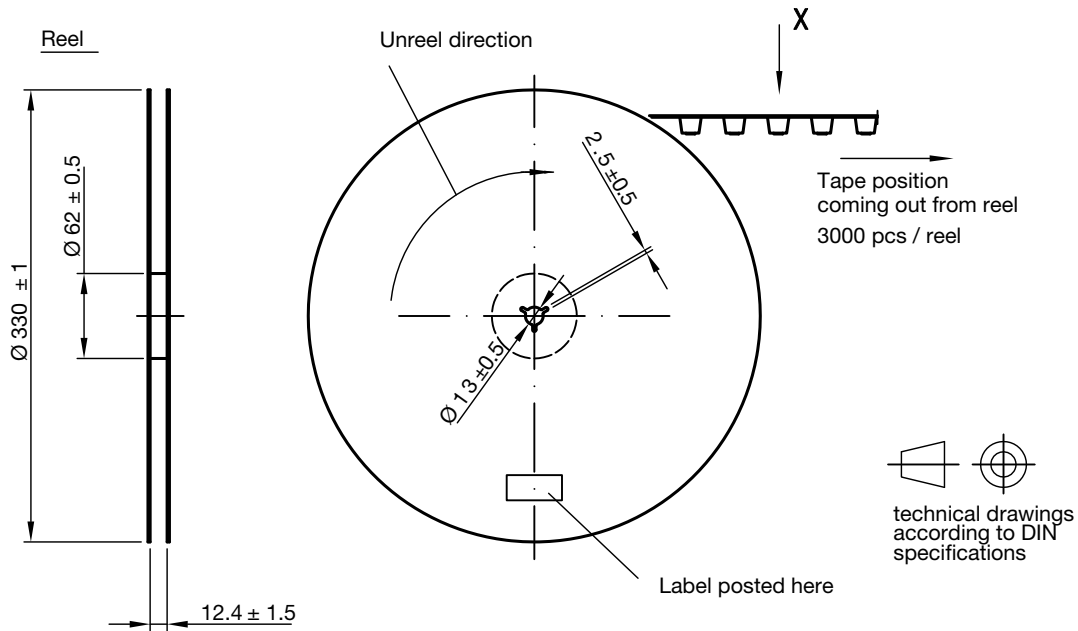
**PACKAGE DIMENSIONS VEMT2523SLX01** in millimeters



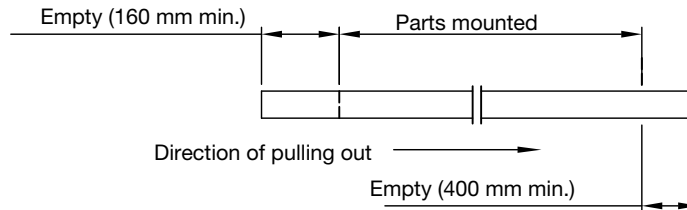
Drawing refers to following types: VEMT2x23SLX01

Drawing-No.: 6.544-5410.01-4  
 Issue: prel. 03.08.12

**TAPE AND REEL DIMENSIONS VENT2523SLX01** in millimeters

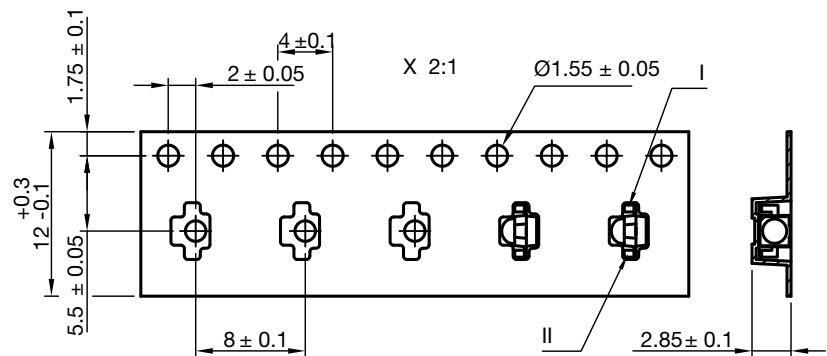


Leader and tailer tape:



Terminal position in tape

| Device        | Lead I    | Lead II |
|---------------|-----------|---------|
| VSMB2943SLX01 | Cathode   | Anode   |
| VSMF2893SLX01 |           |         |
| VSMB2948SL    |           |         |
| VEMD2023SLX01 |           |         |
| VEMD2523SLX01 | Collector | Emitter |
| VENT2023SLX01 |           |         |
| VENT2523SLX01 | Anode     | Cathode |



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

Drawing-No.: 9.800-5123.01-4  
Issue: 2; 19.02.13



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