

## Silicon NPN Phototransistor



### FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.7
- AEC-Q102 qualified
- Suitable for visible and near infrared radiation
- Angle of half sensitivity:  $\phi = \pm 55^\circ$
- Floor life: 72 h, MSL 4, according to 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)

### DESCRIPTION

VENT4110X02 is a high speed silicon NPN phototransistor in a miniature 0805 package. The device is sensitive to visible and near infrared radiation.

### APPLICATIONS

- Photo interrupters, optical barriers
- Miniature switches
- Counters, object detection
- Encoders, rotary, and position sensors
- Detector in automotive sensing

### PRODUCT SUMMARY

COMPONENT	$I_{ca}$ (mA)	$\phi$ (°)	$\lambda_{0.1}$ (nm)
VENT4110X02	1.34	$\pm 55$	700 to 1080

#### Note

- Test conditions see table “Basic Characteristics”

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VENT4110X02	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

#### 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
Junction temperature		$T_j$	125	$^\circ\text{C}$
Temperature range		$T_{amb}$	-40 to +125	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-40 to +125	$^\circ\text{C}$
Soldering temperature	According to reflow solder profile Fig. 10	$T_{sd}$	260	$^\circ\text{C}$



BASIC CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I <sub>C</sub> = 1 mA	V <sub>(BR)CEO</sub>	20	-	-	V
Collector emitter dark current	V <sub>CE</sub> = 20 V, E = 0	I <sub>CEO</sub>	-	0.2	50	nA
Collector emitter capacitance	V <sub>CE</sub> = 5 V, f = 1 MHz, E = 0	C <sub>CEO</sub>	-	12	-	pF
Collector light current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 850 nm, V <sub>CE</sub> = 5 V	I <sub>ca</sub>	0.76	1.5	2.31	mA
	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 940 nm, V <sub>CE</sub> = 5 V		0.67	1.34	2.04	
Angle of half sensitivity		φ	-	± 55	-	°
Wavelength of peak sensitivity		λ <sub>p</sub>	-	890	-	nm
Range of spectral bandwidth		λ <sub>0.1</sub>	-	700 to 1080	-	nm
Collector emitter saturation voltage	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 940 nm, I <sub>C</sub> = 0.1 mA	V <sub>CEsat</sub>	-	0.11	0.16	V
Rise time	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.1 mA, λ = 940 nm, R <sub>L</sub> = 100 Ω	t <sub>r</sub>	-	57	-	μs
Fall time	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.1 mA, λ = 940 nm, R <sub>L</sub> = 100 Ω	t <sub>f</sub>	-	99	-	μs

**BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

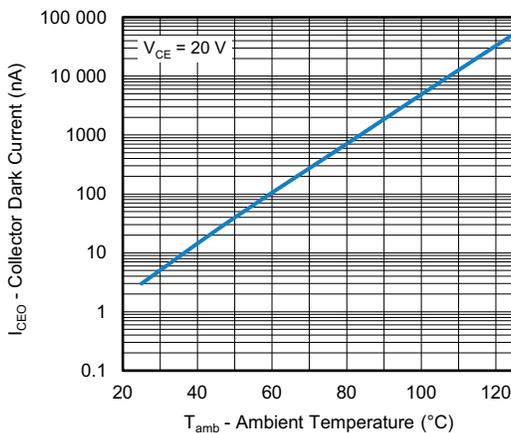


Fig. 1 - Collector Dark Current vs. Ambient Temperature

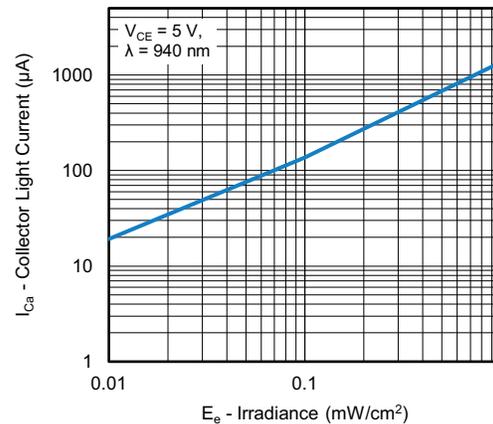


Fig. 3 - Collector Light Current vs. Irradiance

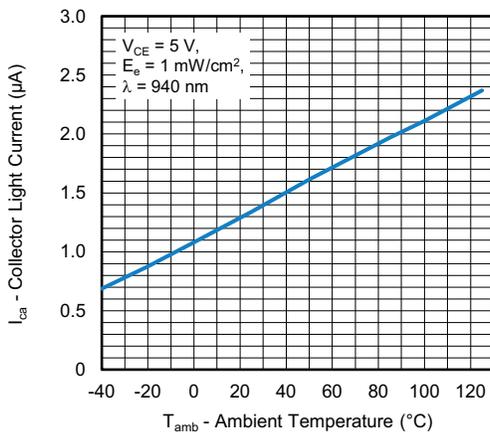


Fig. 2 - Collector Current vs. Ambient Temperature

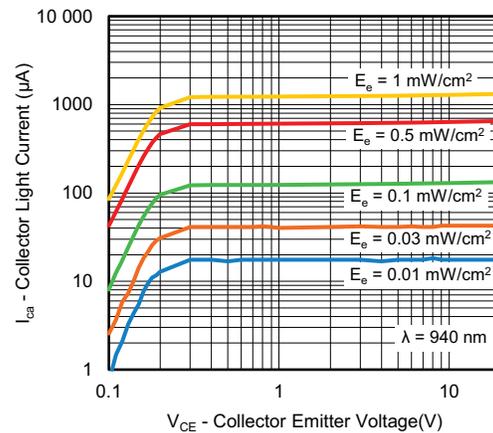


Fig. 4 - Collector Light Current vs. Collector Emitter Voltage

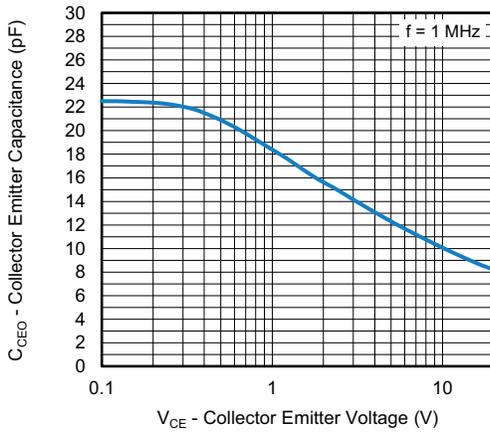


Fig. 5 - Collector-Emitter Capacitance vs. Collector-Emitter Voltage

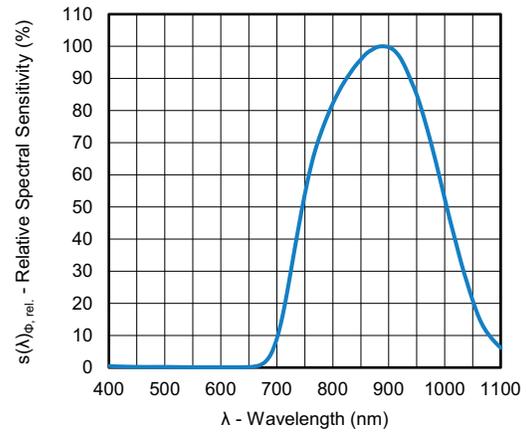


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

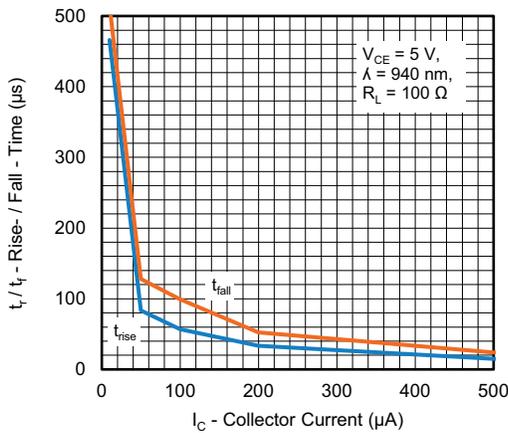


Fig. 6 - Turn-on / Turn-off Time vs. Collector Current

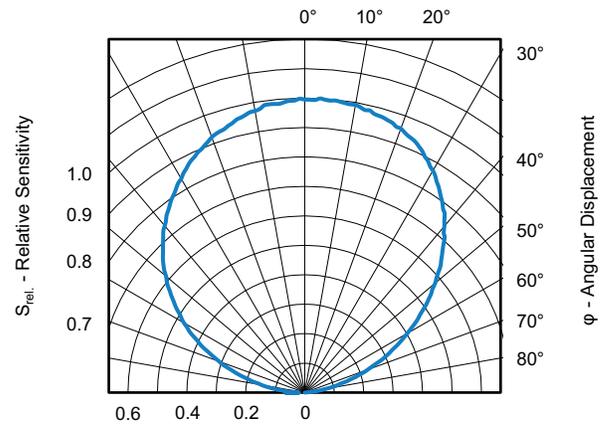
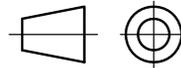
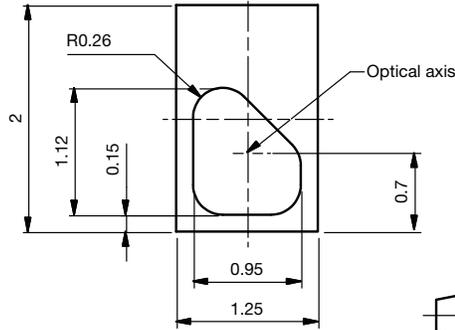
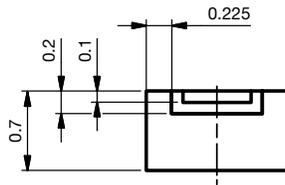
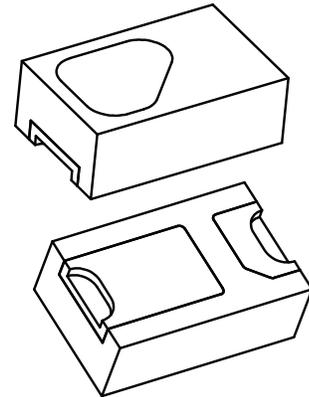


Fig. 8 - Relative Sensitivity vs. Angular Displacement

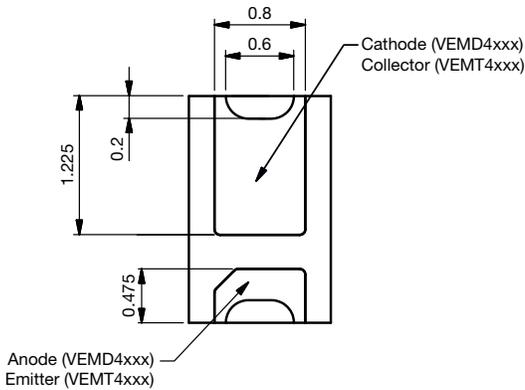
**PACKAGE DIMENSIONS** in millimeters



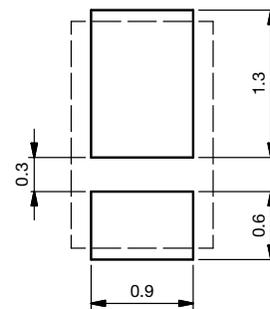
Technical drawings according to DIN specification



Not indicated tolerances  $\pm 0.1$



Recommended footprint



Drawing-No.: 6.550-5363.01-4  
Issue: 2; 01.07.2020

**SOLDER PROFILE**

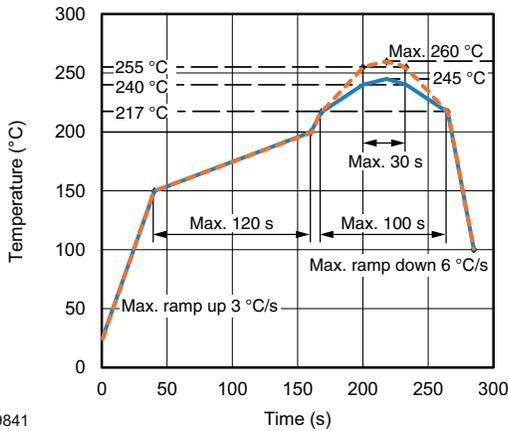


Fig. 9 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

**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: 72 h

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

Moisture sensitivity level 4, according 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  $40\text{ °C} (+ 5\text{ °C})$ ,  $RH < 5\%$ .

**TAPE AND REEL**

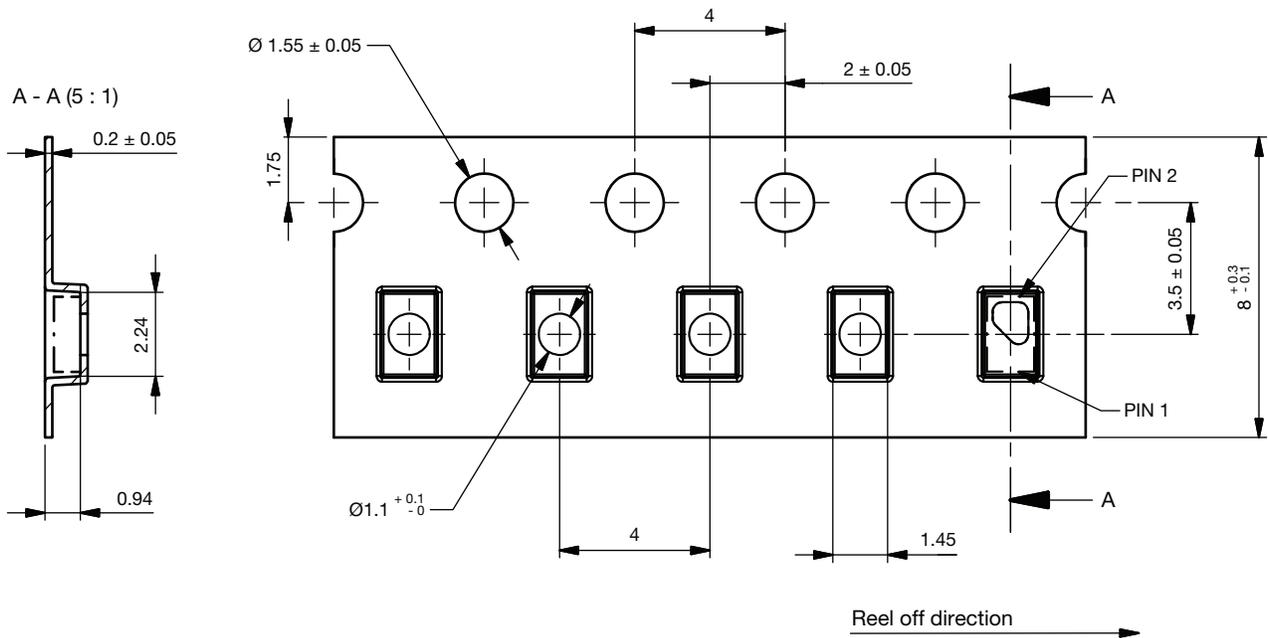


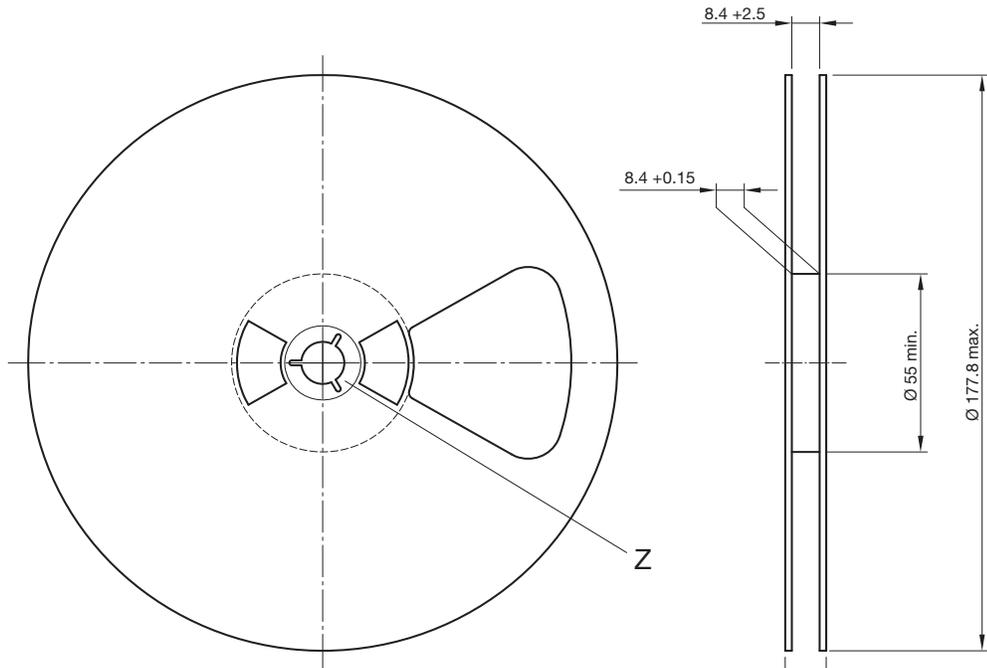
Tabelle		
TYPE	PIN 1	PIN 2
VEMD4xxx	Anode	Cathode
VENT4xxx	Emitter	Collector

Fig. 10 - Blister Tape

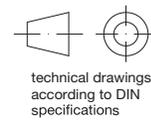
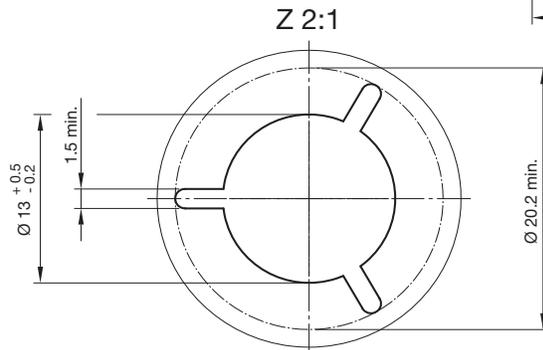
Drawing-No.: 9.700-5411.0-4  
Issue: 2; 18.10.2022



REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



Drawing-No.: 9.800-5096.01-4  
 Issue: 2; 26.04.10  
 20875



<b>REVISION HISTORY</b>		
<b>DATASHEET VERSION</b>	<b>REVISION DATE</b>	<b>CHANGE</b>
1.0	21-Jan-2026	Initial datasheet release



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