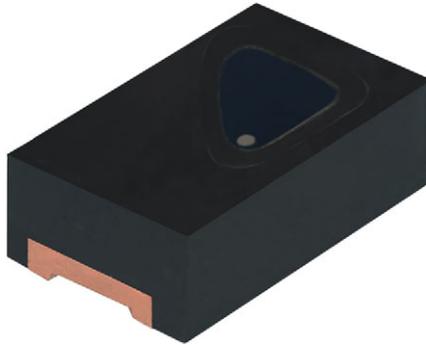


Silicon NPN Phototransistor



DESCRIPTION

VENT4010X02 is a high speed silicon NPN phototransistor in a miniature 0805 package. The device is sensitive to visible and near infrared radiation.

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

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- IR sensing
- Optical switches, barriers
- Optical encoders, slotted detectors
- General light detection

PRODUCT SUMMARY

COMPONENT	I_{ca} (mA)	ϕ (°)	$\lambda_{0.1}$ (nm)
VENT4010X02	1.41	± 55	480 to 1070

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VENT4010X02	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 _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{(BR)CEO}	20	-	-	V
Collector emitter dark current	V _{CE} = 20 V, E = 0	I _{CEO}	-	0.3	50	nA
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz, E = 0	C _{CEO}	-	12	-	pF
Collector light current	E _e = 1 mW/cm ² , λ = 460 nm, V _{CE} = 5 V	I _{ca}	0.06	0.12	0.19	mA
	E _e = 1 mW/cm ² , λ = 530 nm, V _{CE} = 5 V		0.21	0.43	0.66	
	E _e = 1 mW/cm ² , λ = 850 nm, V _{CE} = 5 V		0.79	1.62	2.39	
	E _e = 1 mW/cm ² , λ = 940 nm, V _{CE} = 5 V		0.68	1.41	2.05	
	E _v = 100 lx, white LED, V _{CE} = 5 V		-	0.022	-	
	E _v = 100 lx, CIE illuminant A, V _{CE} = 5 V		-	0.169	-	
Angle of half sensitivity		φ	-	± 55	-	°
Wavelength of peak sensitivity		λ _p	-	880	-	nm
Range of spectral bandwidth		λ _{0.1}	-	480 to 1070	-	nm
Collector emitter saturation voltage	E _e = 1 mW/cm ² , λ = 940 nm, I _C = 0.1 mA	V _{CEsat}	-	0.11	0.16	V
Rise time	V _{CE} = 5 V, I _C = 0.1 mA, λ = 940 nm, R _L = 100 Ω	t _r	-	57	-	μs
Fall time	V _{CE} = 5 V, I _C = 0.1 mA, λ = 940 nm, R _L = 100 Ω	t _f	-	99	-	μs

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

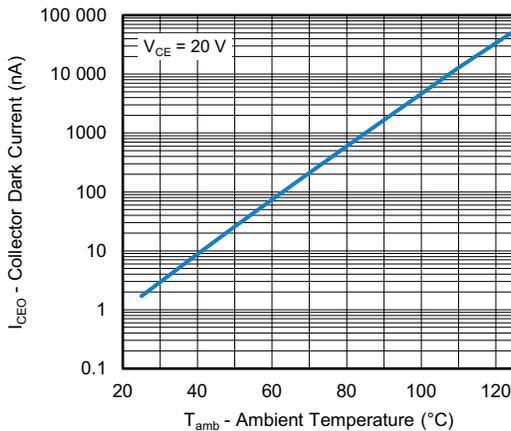


Fig. 1 - Collector Dark Current vs. Ambient Temperature

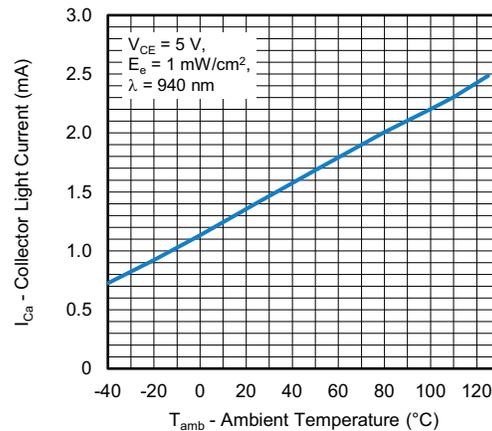


Fig. 2 - Collector Current vs. Ambient Temperature

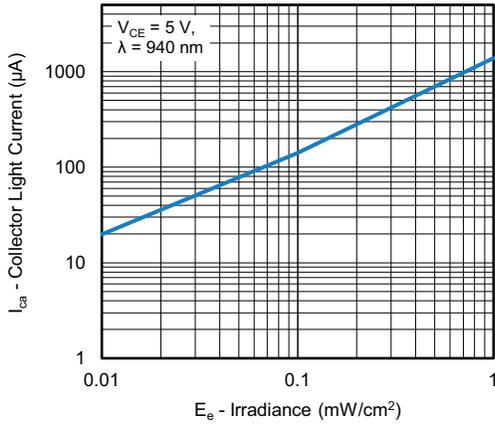


Fig. 3 - Collector Light Current vs. Irradiance

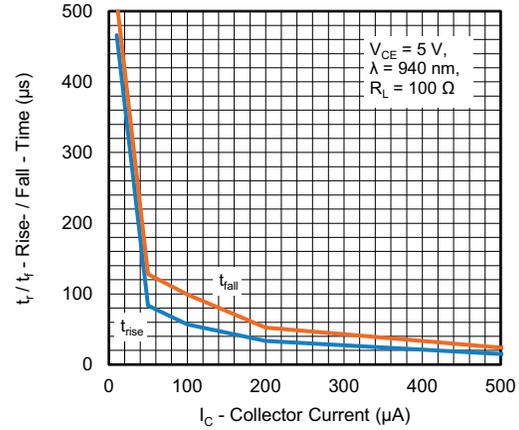


Fig. 6 - Turn-on / Turn-off Time vs. Collector Current

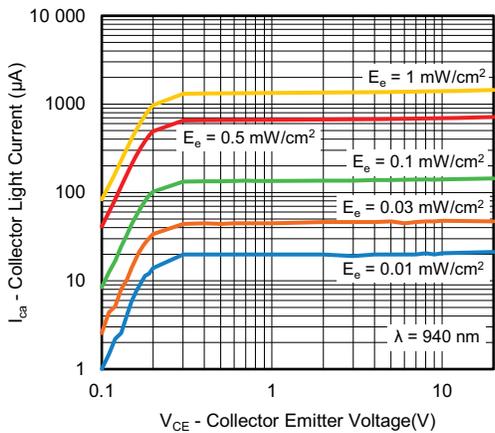


Fig. 4 - Collector Light Current vs. Collector Emitter Voltage

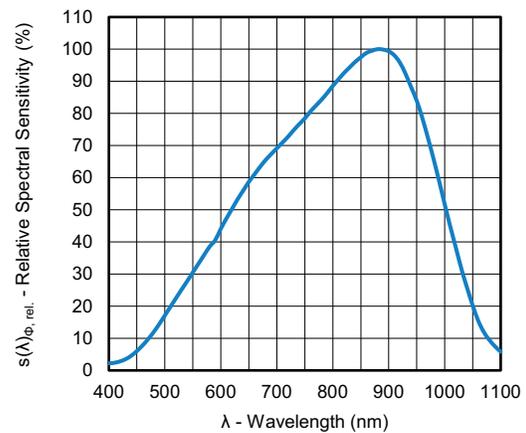


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

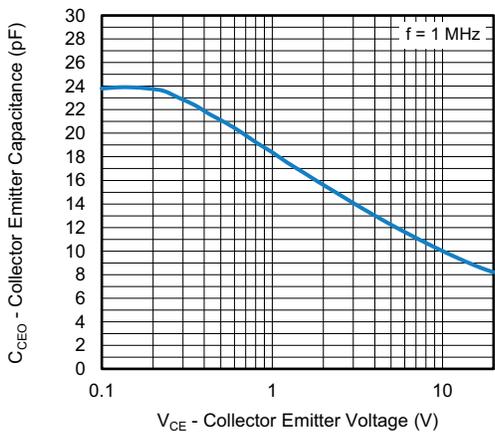


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

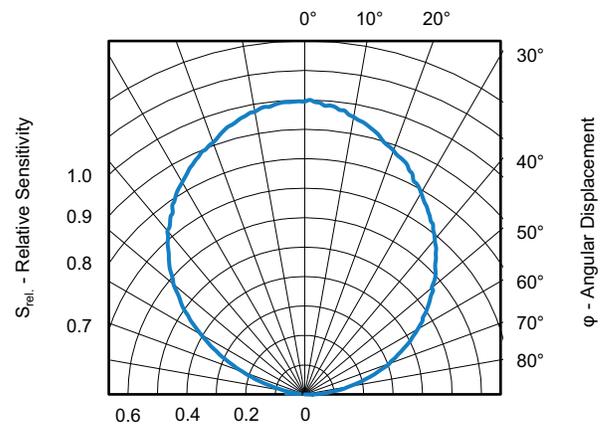
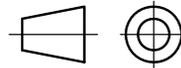
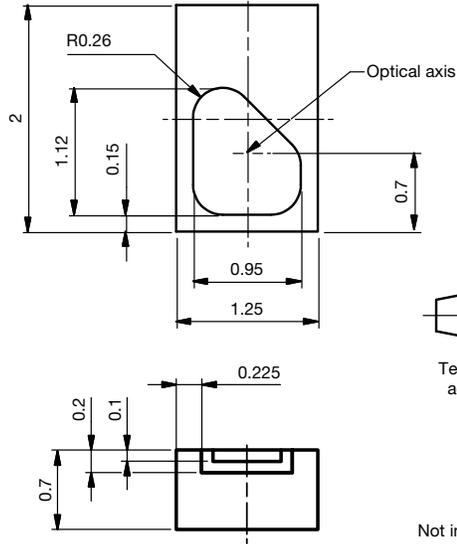


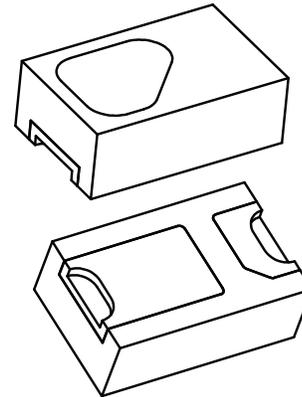
Fig. 8 - Relative Sensitivity vs. Angular Displacement



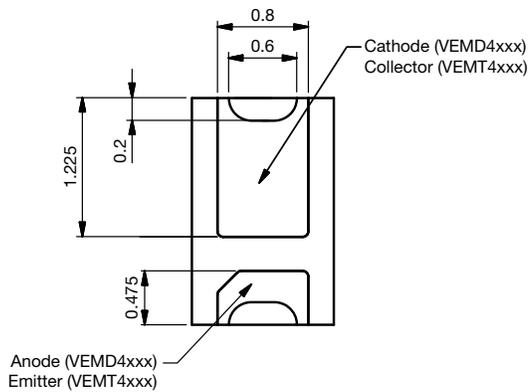
PACKAGE DIMENSIONS in millimeters



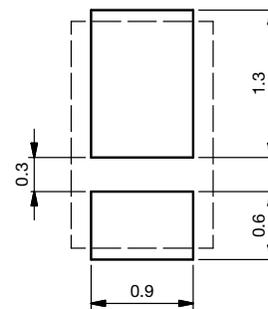
Technical drawings according to DIN specification



Not indicated tolerances ± 0.1



Recommended footprint



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

SOLDER PROFILE

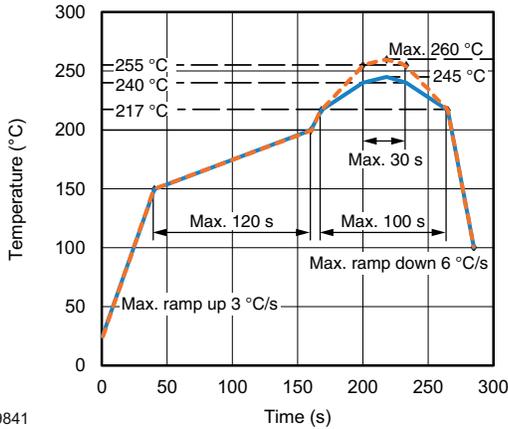


Fig. 9 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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 °C (+ 5 °C), $RH < 5\%$.

TAPE AND REEL

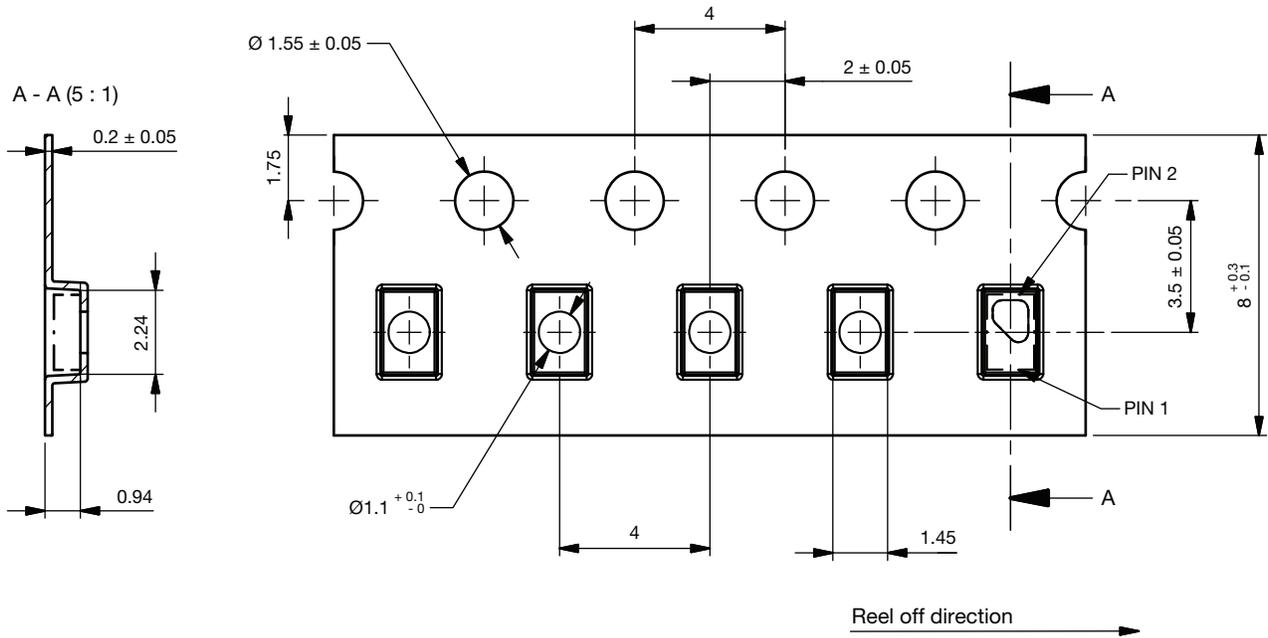


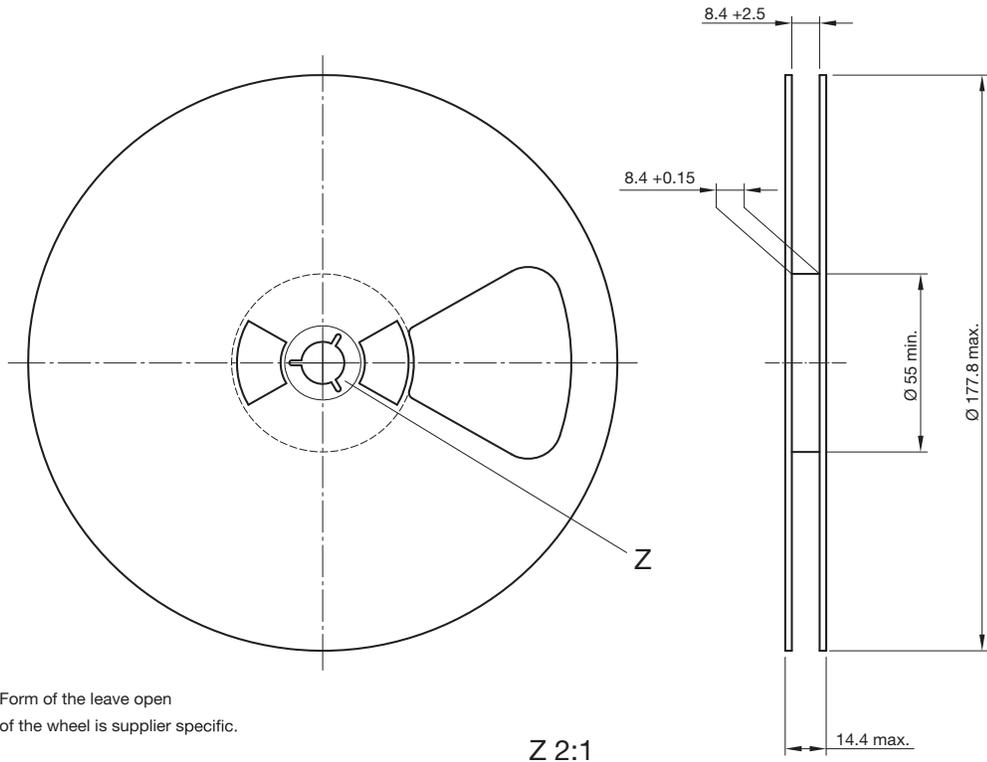
Tabelle		
TYPE	PIN 1	PIN 2
VEMD4xxx	Anode	Cathode
VENT4xxx	Emitter	Collector

Fig. 10 - Blister Tape

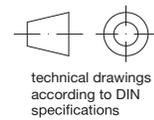
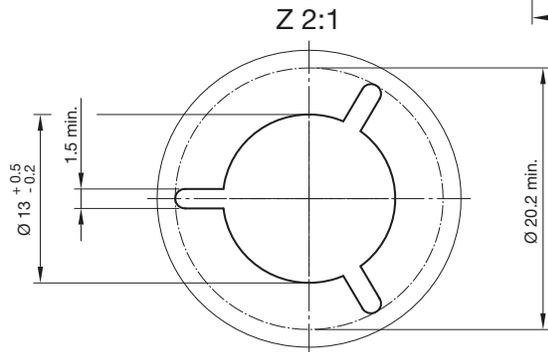
Drawing-No.: 9.700-5411.0-4
Issue: 2; 18.10.2022



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



REVISION HISTORY		
DATASHEET VERSION	REVISION DATE	CHANGE
1.0	21-Jan-2026	Initial datasheet release



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