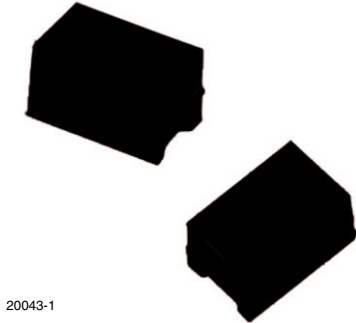




# Silicon Phototransistor in 0805 Package



### FEATURES

- Package type: surface mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- AEC-Q101 qualified
- High photo sensitivity
- Daylight blocking filter matches with 830 nm to 950 nm IR emitters
- Angle of half sensitivity:  $\phi = \pm 60^\circ$
- Package matched with IR emitter series VSMB1940X01
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



### DESCRIPTION

TEMT7100X01 is a silicon NPN epitaxial planar phototransistor with daylight blocking filter in a miniature, black 0805 package for surface mounting. Filter bandwidth is matched with 830 nm to 950 nm IR emitters.

### Note

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### APPLICATIONS

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

### PRODUCT SUMMARY

COMPONENT	I <sub>caE</sub> (μA)	φ (deg)	λ <sub>0.5</sub> (nm)
TEMT7100X01	225 to 675	± 60	750 to 1010

### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT7100X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V <sub>CEO</sub>	20	V
Emitter collector voltage		V <sub>ECO</sub>	7	V
Collector current		I <sub>C</sub>	20	mA
Power power dissipation	T <sub>amb</sub> ≤ 55 °C	P <sub>V</sub>	100	mW
Junction temperature		T <sub>j</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	- 40 to + 100	°C
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C
Soldering temperature	Acc. reflow profile fig. 8	T <sub>sd</sub>	260	°C
Thermal resistance junction/ambient	Acc. J-STD-051	R <sub>thJA</sub>	270	K/W

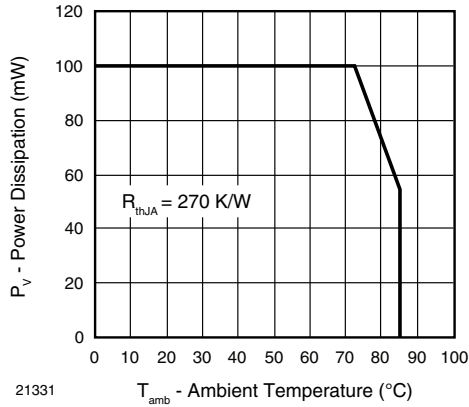


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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> = 0.1 mA	V <sub>CEO</sub>	20			V
Collector dark current	V <sub>CE</sub> = 5 V, E = 0	I <sub>CEO</sub>		1	100	nA
Collector emitter capacitance	V <sub>CE</sub> = 0 V, f = 1 MHz, E = 0	C <sub>CEO</sub>		25		pF
Collector light current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, V <sub>CE</sub> = 5 V	I <sub>CA</sub>	225	450	675	μA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ <sub>p</sub>		870		nm
Range of spectral bandwidth		λ <sub>0.5</sub>		750 to 1010		nm
Collector emitter saturation voltage	I <sub>C</sub> = 0.05 mA	V <sub>CEsat</sub>			0.4	V
Temperature coefficient of I <sub>ca</sub>	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, V <sub>CE</sub> = 5 V	Tk <sub>Ica</sub>		1.1		%/K

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

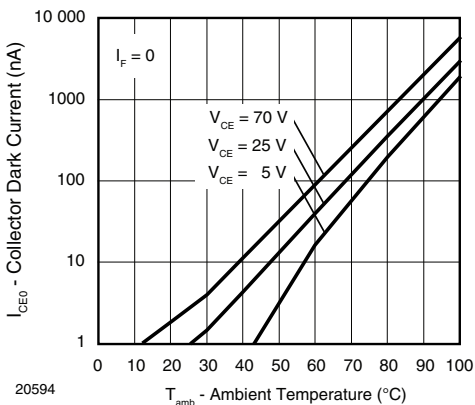


Fig. 2 - Collector Dark Current vs. Ambient Temperature

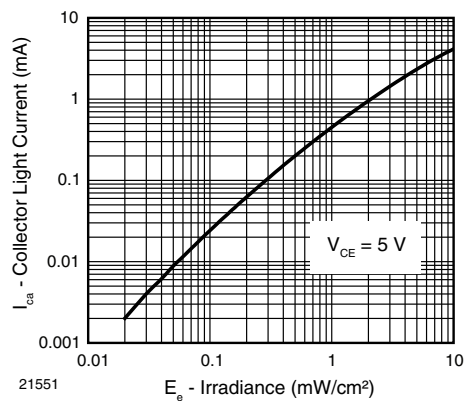


Fig. 3 - Collector Light Current vs. Irradiance

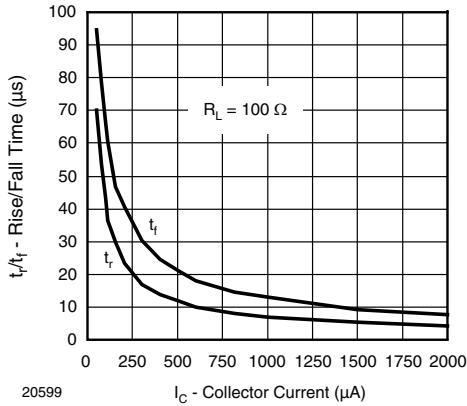


Fig. 4 - Rise/Fall Time vs. Collector Current

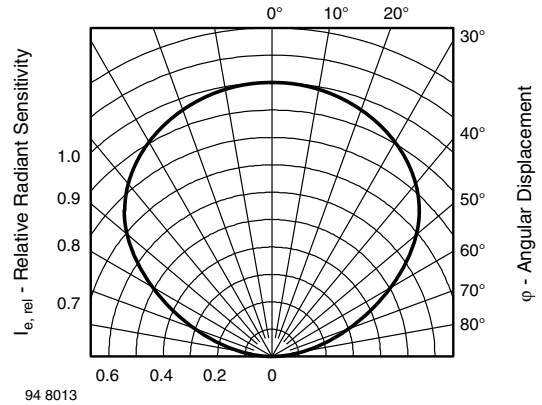


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

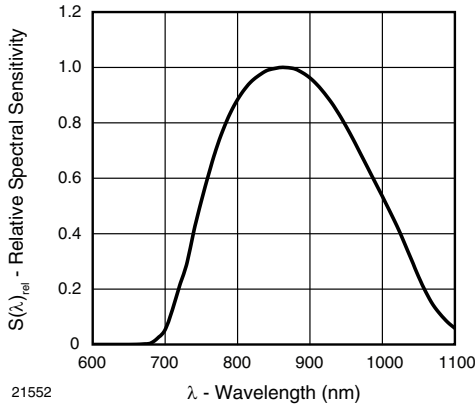


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

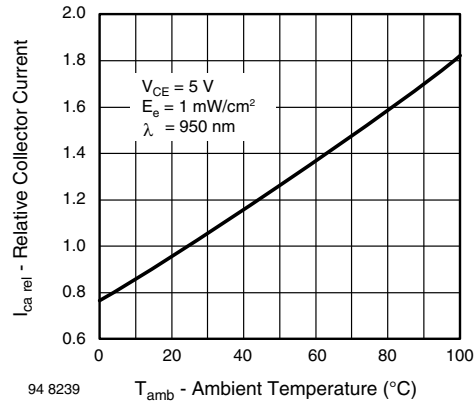


Fig. 7 - Relative Collector Current vs. Ambient Temperature

**REFLOW SOLDER PROFILE**

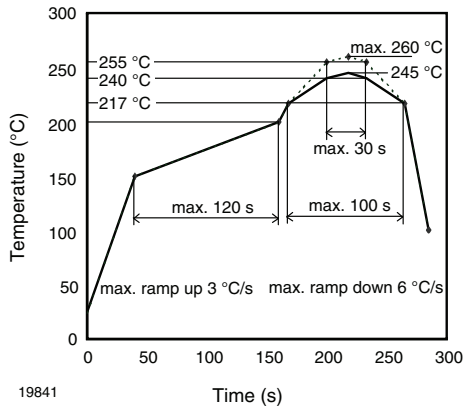


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**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: 168 h

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

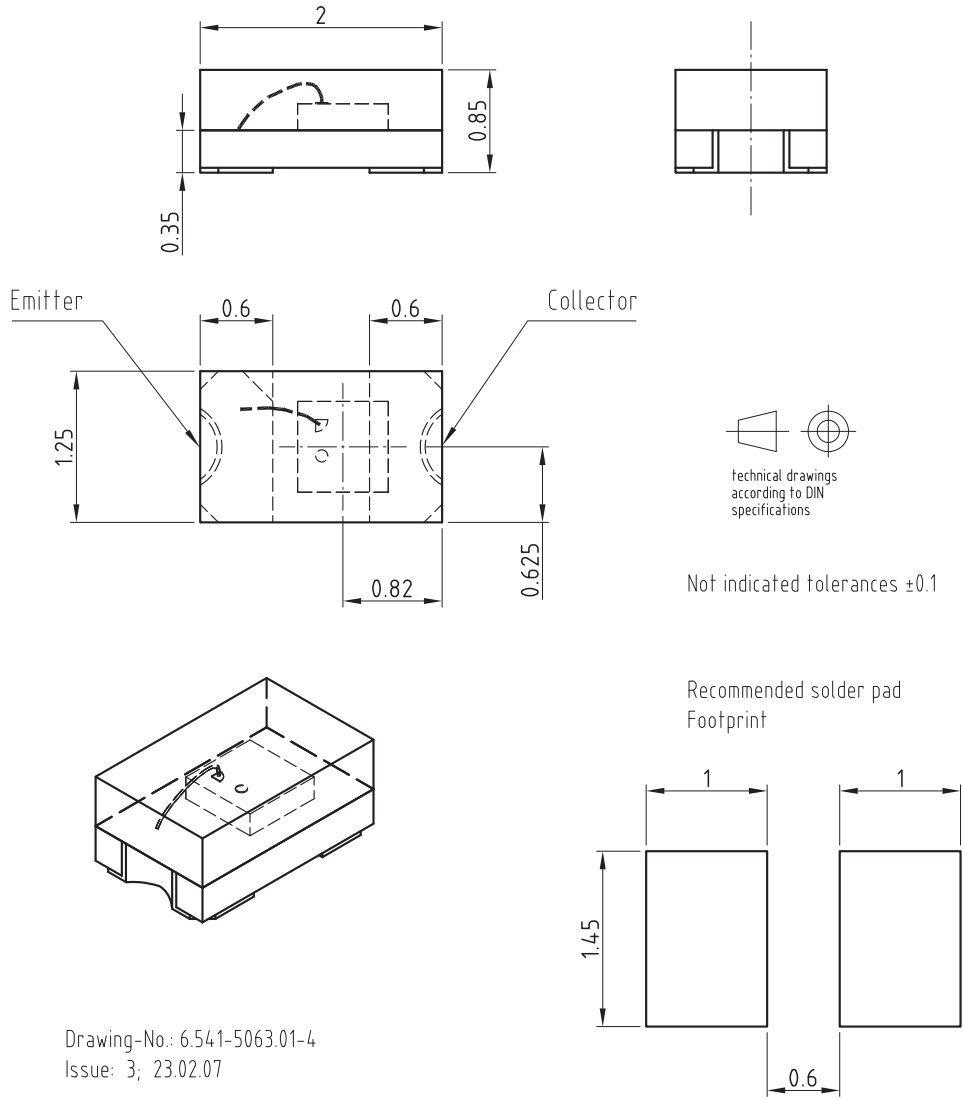
Moisture sensitivity level 3, acc. to J-STD-020.

**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  $40\text{ °C} (+ 5\text{ °C})$ ,  $RH < 5\%$ .



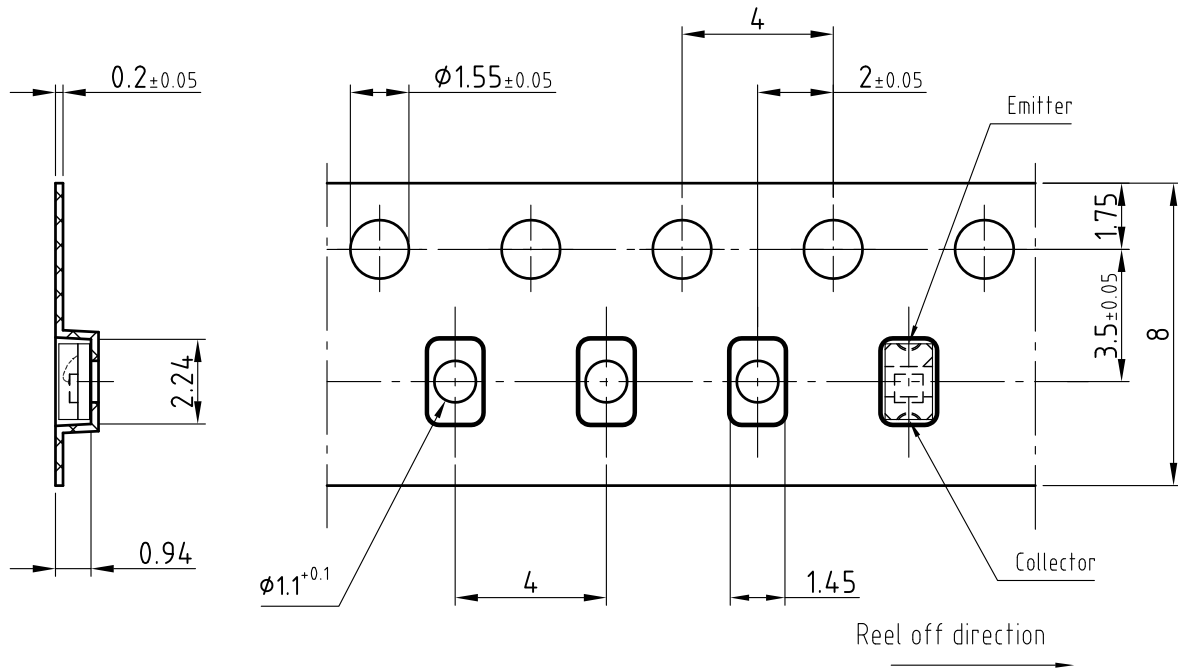
PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5063.01-4  
Issue: 3; 23.02.07  
19757



**BLISTER TAPE DIMENSIONS** in millimeters



Drawing-No.: 9.700-5310.01-4  
 Issue: 2; 14.08.07  
 20690

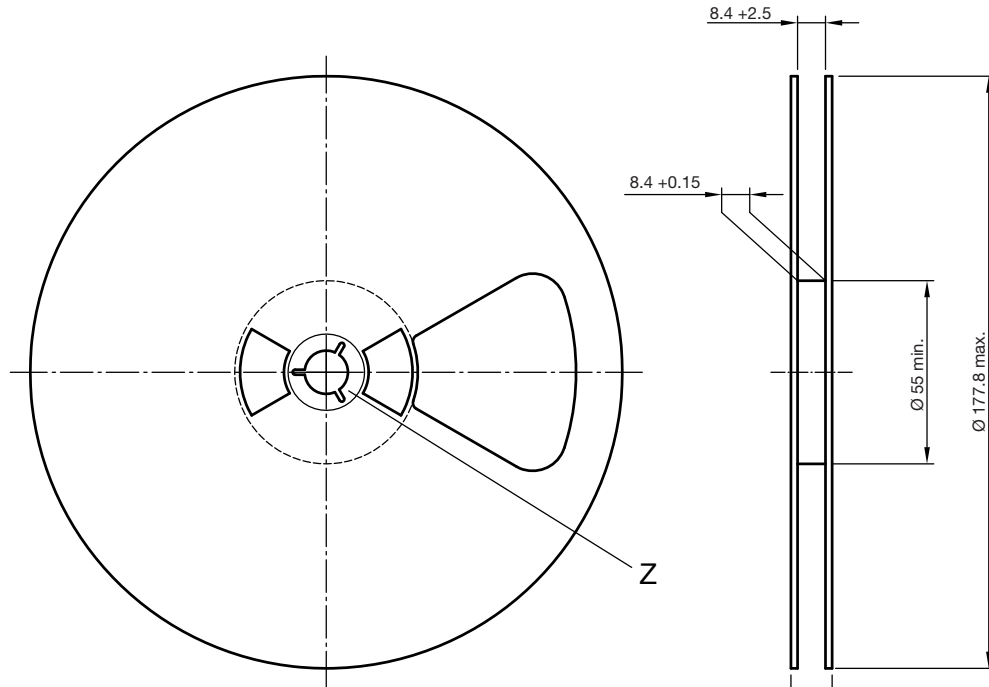
Not indicated tolerances ±0.1

Quantity per reel: 3000 pcs

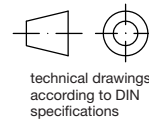
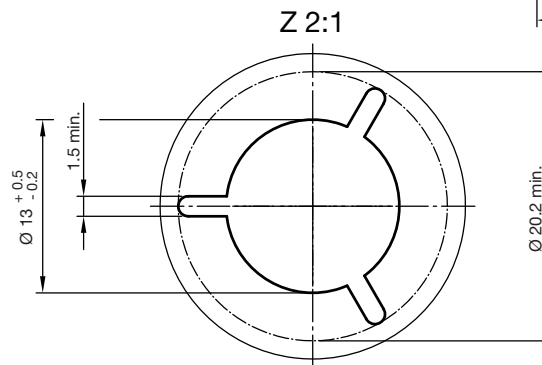
technical drawings according to DIN specifications



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



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