



# 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
- Enhanced operating temperature range: top = -40 °C to +110 °C
- High photo sensitivity
- Daylight blocking filter matches with 830 nm to 950 nm IR emitters
- Angle of half sensitivity:  $\varphi = \pm 60^\circ$
- Package matched with IR emitter series VSMB1940X01
- Floor life: 72 h, MSL 4, 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)



## DESCRIPTION

TEMT7100ITX01 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.

## 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)
TEMT7100ITX01	225 to 675	± 60	750 to 1010

### Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT7100ITX01	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>	110	°C
Operating temperature range		T <sub>amb</sub>	-40 to +110	°C
Storage temperature range		T <sub>stg</sub>	-40 to +110	°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

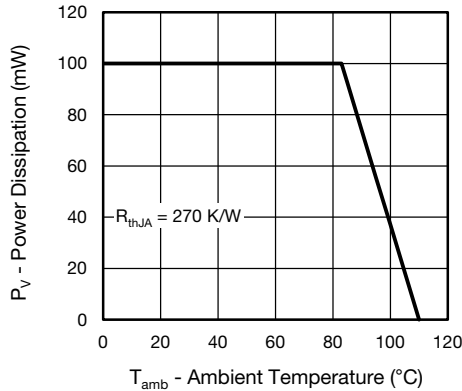


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<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	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$	$I_{CA}$	225	450	675	$\mu\text{A}$
Angle of half sensitivity		$\phi$		$\pm 60$		deg
Wavelength of peak sensitivity		$\lambda_p$		870		nm
Range of spectral bandwidth		$\lambda_{0.5}$		750 to 1010		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)

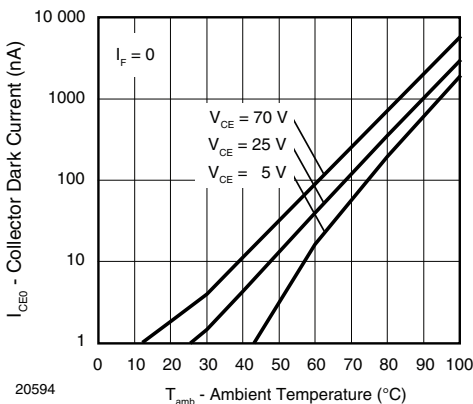


Fig. 2 - Collector Dark Current vs. Ambient Temperature

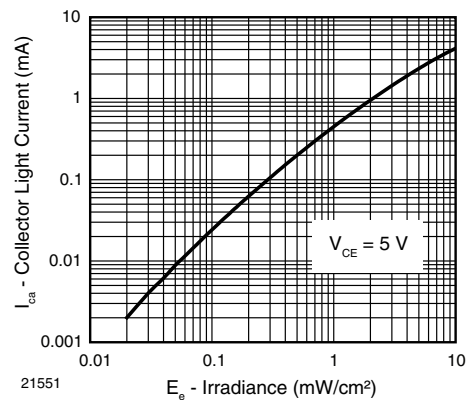


Fig. 3 - Collector Light Current vs. Irradiance

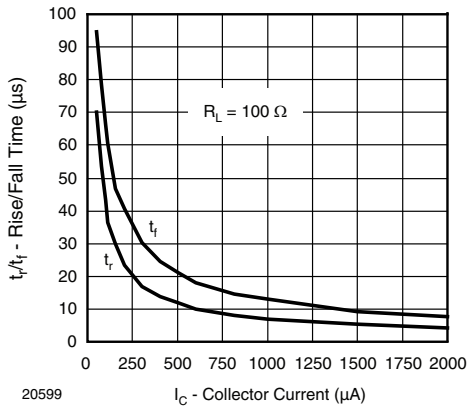


Fig. 4 - Rise/Fall Time vs. Collector Current

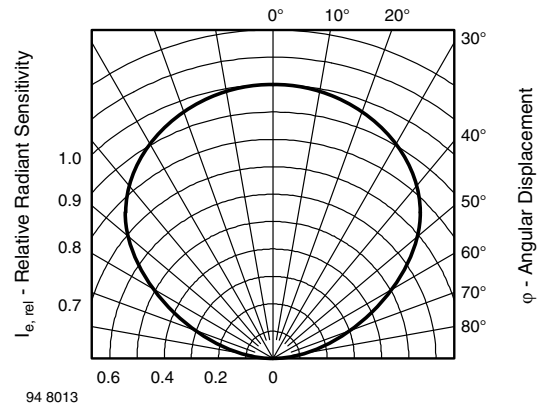


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

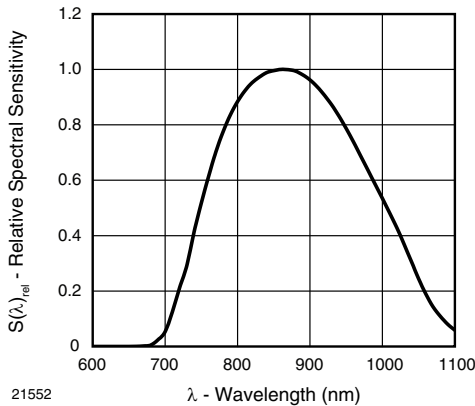


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

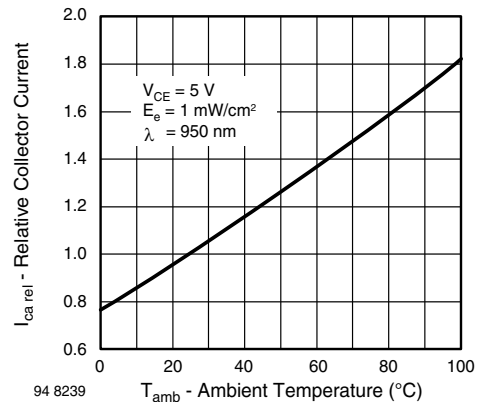


Fig. 7 - Relative Collector Current vs. Ambient Temperature

**REFLOW SOLDER PROFILE**

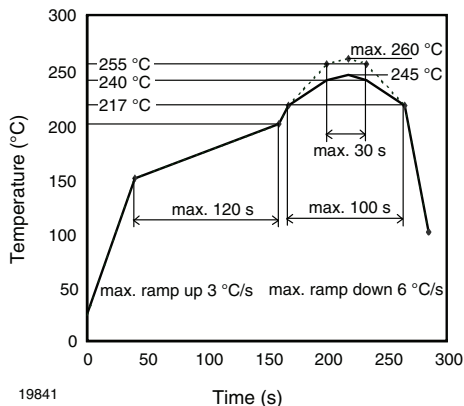


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**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: 72 h

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

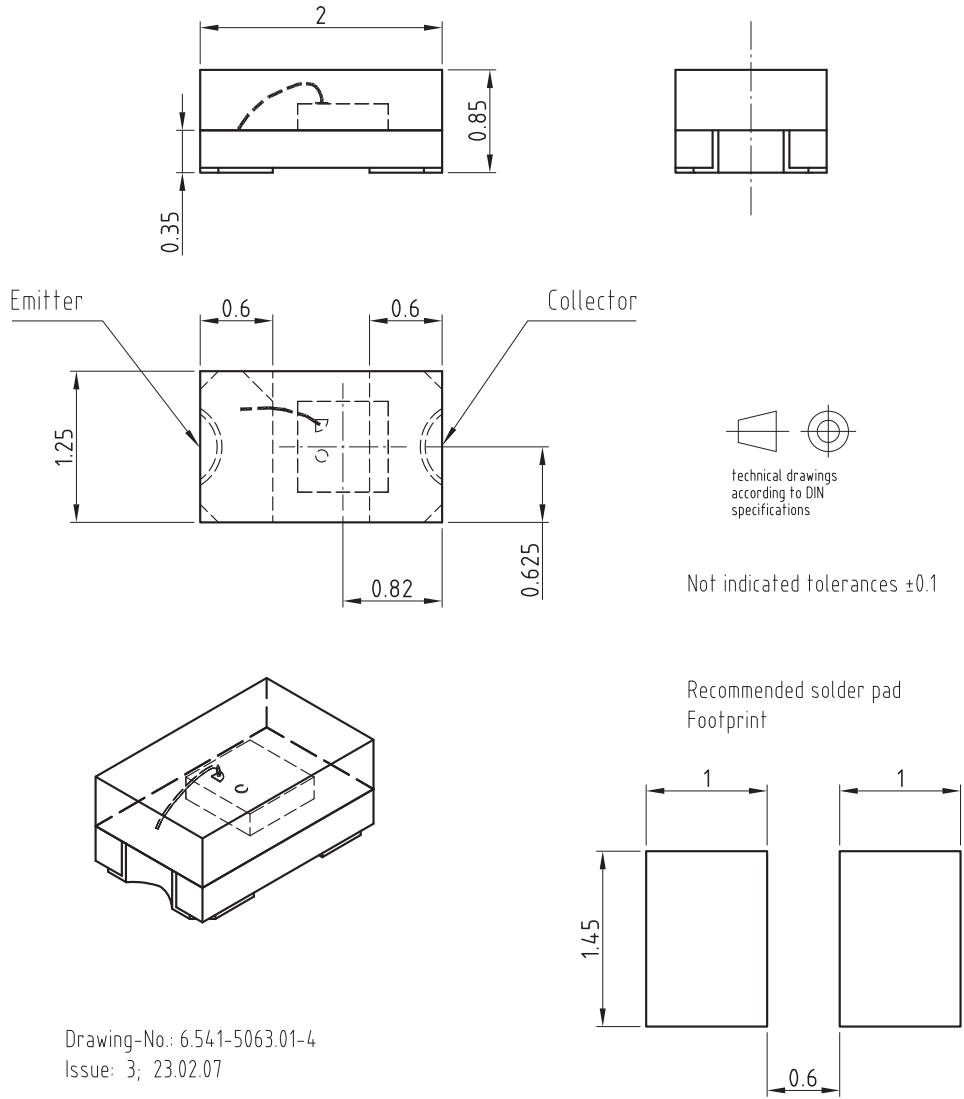
Moisture sensitivity level 4, acc. to J-STD-020.

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



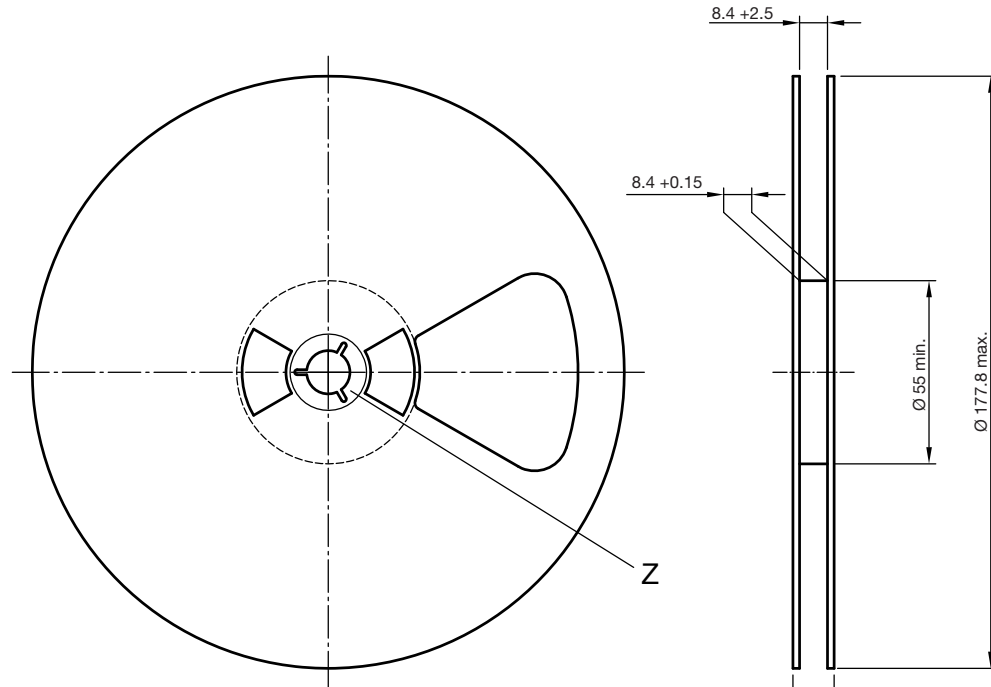
### PACKAGE DIMENSIONS in millimeters



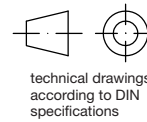
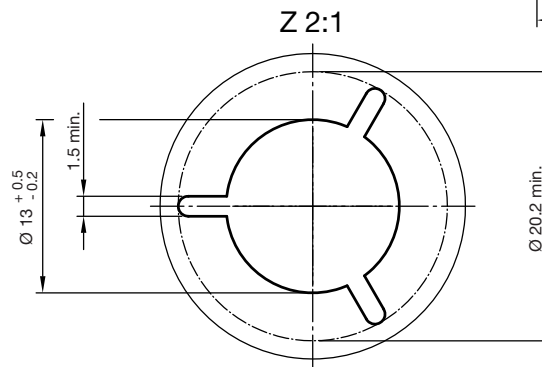




REEL DIMENSIONS in millimeters



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



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