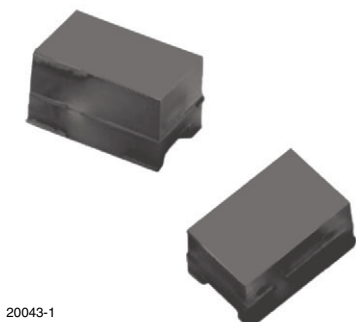


## Silicon Phototransistor in 0805 Package



20043-1

### 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.

### 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, 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)

AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

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

### PRODUCT SUMMARY

COMPONENT	$I_{ca}$ ( $\mu A$ ) at $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$ , $V_{CE} = 5 \text{ V}$	$\phi$ ( $^\circ$ )	$\lambda_{0.5}$ (nm)
TEMT7100X01	225 to 675	$\pm 60$	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 ( $T_{amb} = 25^\circ C$ , 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		$I_C$	20	mA
Power power dissipation	$T_{amb} \leq 55^\circ C$	$P_V$	100	mW
Junction temperature		$T_j$	100	$^\circ C$
Operating temperature range		$T_{amb}$	-40 to +100	$^\circ C$
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ C$
Soldering temperature	According to reflow profile Fig. 8	$T_{sd}$	260	$^\circ C$
Thermal resistance junction-to-ambient	According to J-STD-051	$R_{thJA}$	270	K/W

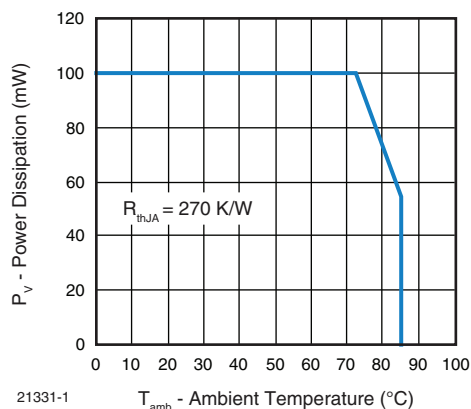


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<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		$\phi$	-	$\pm 60$	-	$^{\circ}$
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)

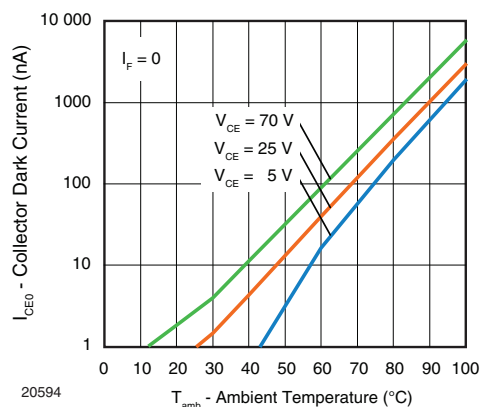


Fig. 2 - Collector Dark Current vs. Ambient Temperature

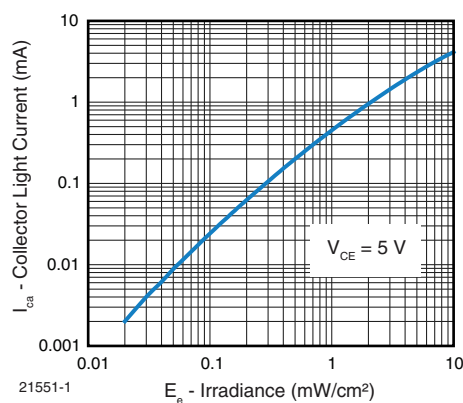


Fig. 3 - Collector Light Current vs. Irradiance

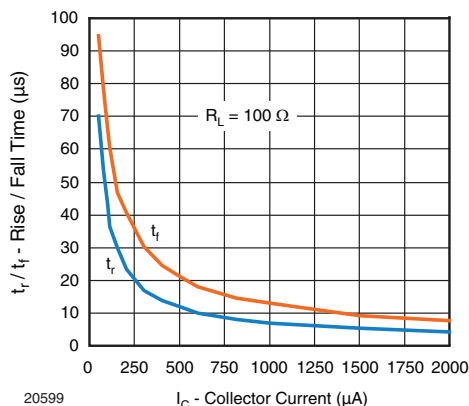


Fig. 4 - Rise/Fall Time vs. Collector Current

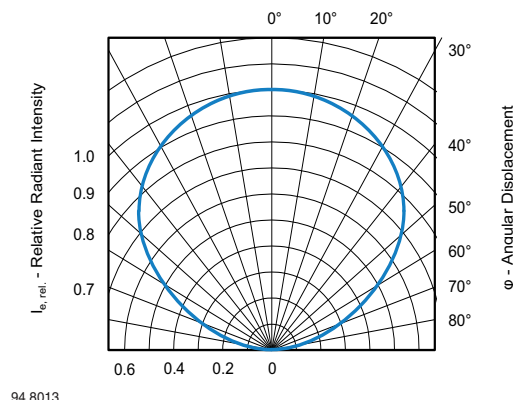


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

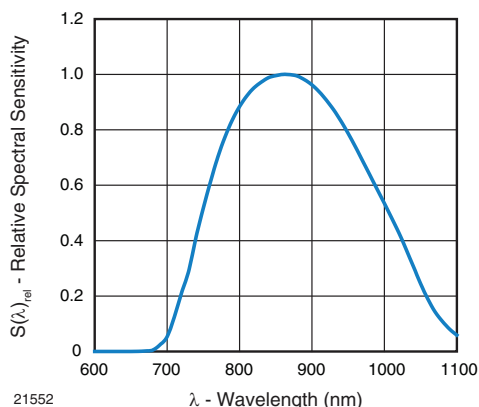


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

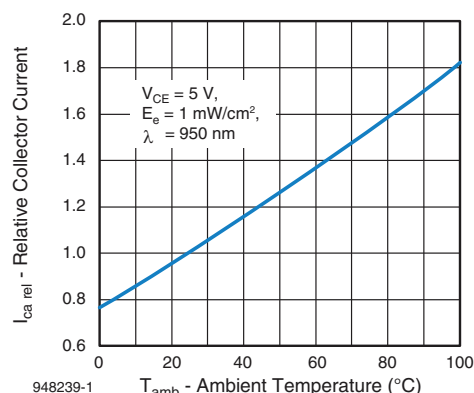


Fig. 7 - Relative Collector Current vs. Ambient Temperature

## REFLOW SOLDER PROFILE

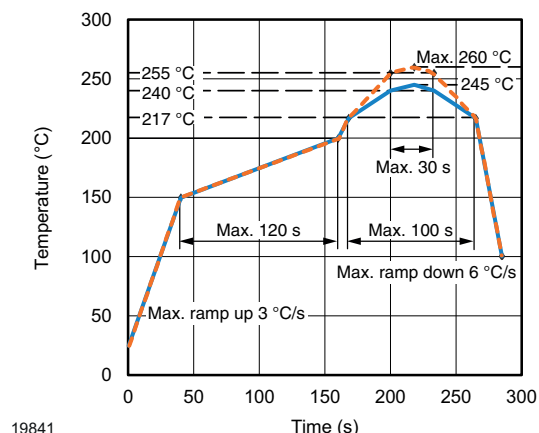


Fig. 8 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

## 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: 168 h

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

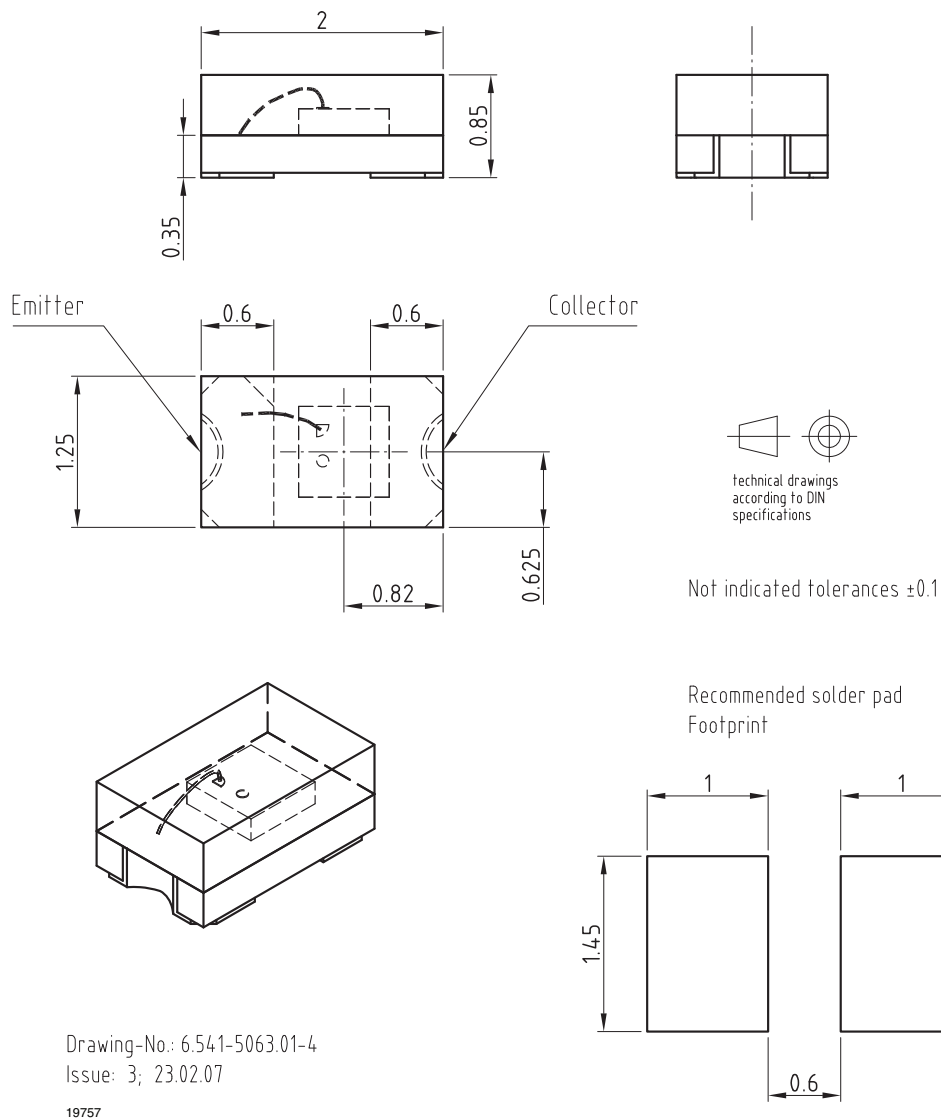
Moisture sensitivity level 3, acc. to J-STD-020.

## DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at  $40^{\circ}\text{C}$  (+  $5^{\circ}\text{C}$ ),  $RH < 5\%$ .



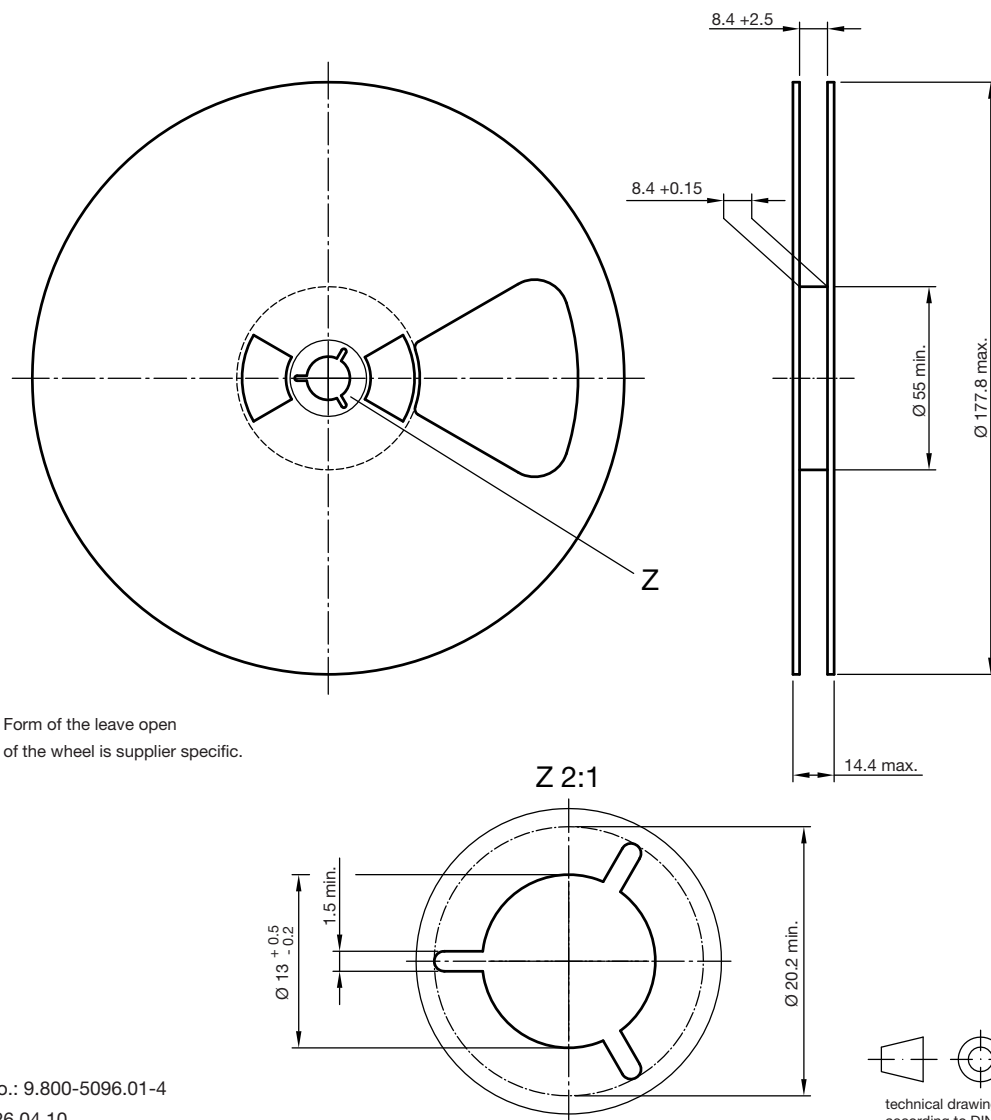
**PACKAGE DIMENSIONS** in millimeters







**REEL DIMENSIONS** in millimeters



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



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