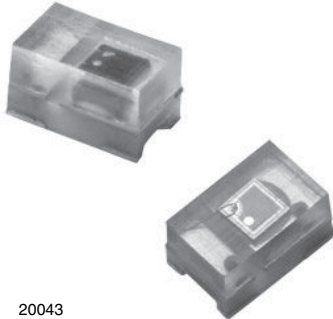




**THE DATASHEET OF
TEMT7000X01**



Silicon Phototransistor in 0805 Package



20043

DESCRIPTION

TEMT7000X01 is a high speed silicon NPN epitaxial planar phototransistor in a miniature 0805 package for surface mounting on printed boards. 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 0.85
- AEC-Q101 qualified
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- 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

AUTOMOTIVE GRADE


RoHS
 COMPLIANT
 HALOGEN
FREE
GREEN
 (5-2008)

APPLICATIONS

- Detector in automotive applications
- Light sensors
- Radiation sensors

PRODUCT SUMMARY

COMPONENT	I_{ca} (μA) at $E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$	φ ($^\circ$)	$\lambda_{0.1}$ (nm)
TEMT7000X01	225 to 675	± 60	470 to 1090

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT7000X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25 \text{ }^\circ\text{C}$, 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	20	mA
Power power dissipation	$T_{amb} \leq 55 \text{ }^\circ\text{C}$	P_V	100	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	-40 to +100	$^\circ\text{C}$
Storage temperature range		T_{stg}	-40 to +100	$^\circ\text{C}$
Soldering temperature	According to reflow profile Fig. 8	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction-to-ambient	According to J-STD-051	R_{thJA}	270	K/W

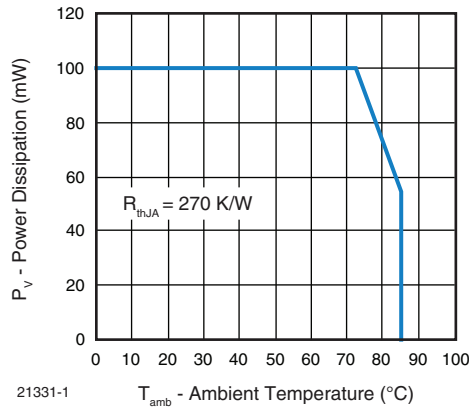


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	μA
Angle of half sensitivity		ϕ	-	± 60	-	$^{\circ}$
Wavelength of peak sensitivity		λ_p	-	850	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	470 to 1090	-	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)

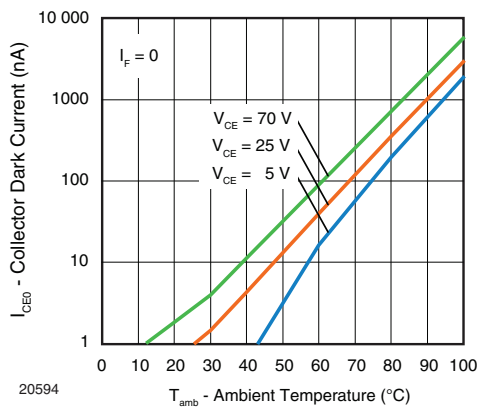


Fig. 2 - Collector Dark Current vs. Ambient Temperature

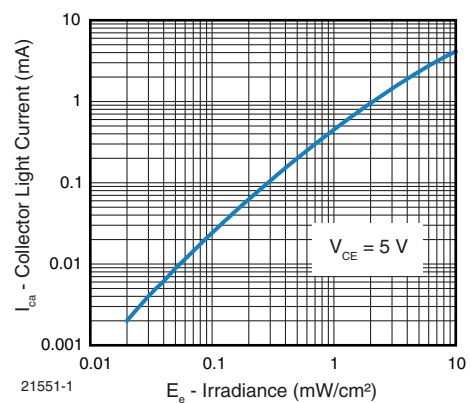


Fig. 3 - Collector Light Current vs. Irradiance

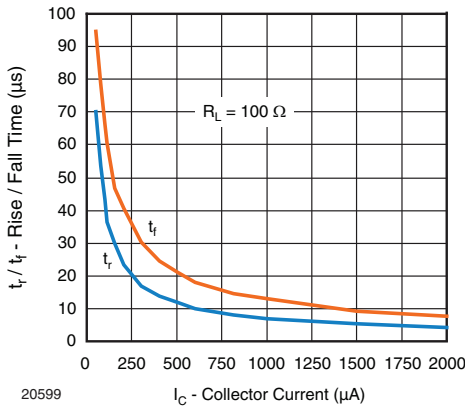


Fig. 4 - Rise/Fall Time vs. Collector Current

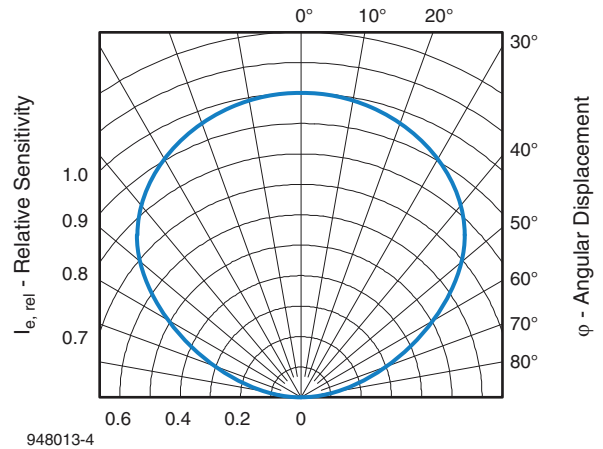


Fig. 6 - Relative Sensitivity vs. Angular Displacement

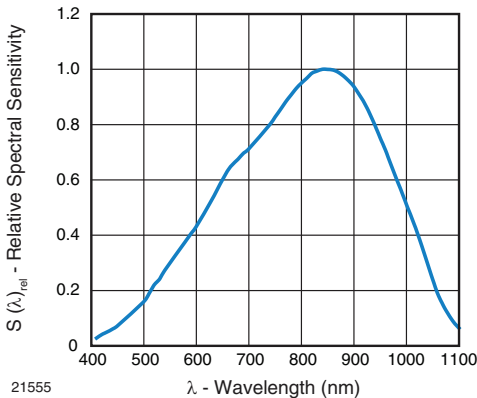


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

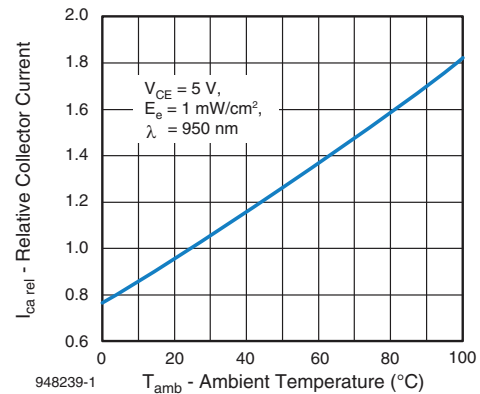


Fig. 7 - Relative Collector Current vs. Ambient Temperature

REFLOW SOLDER PROFILE

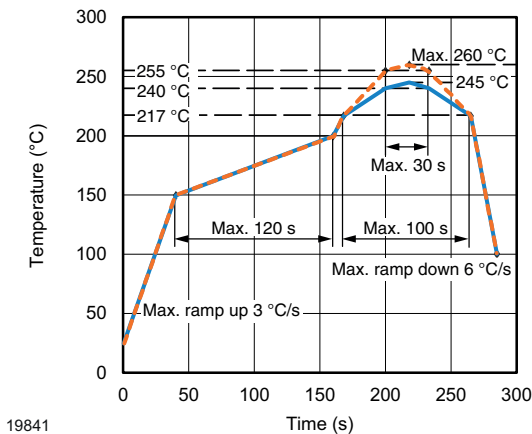


Fig. 8 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

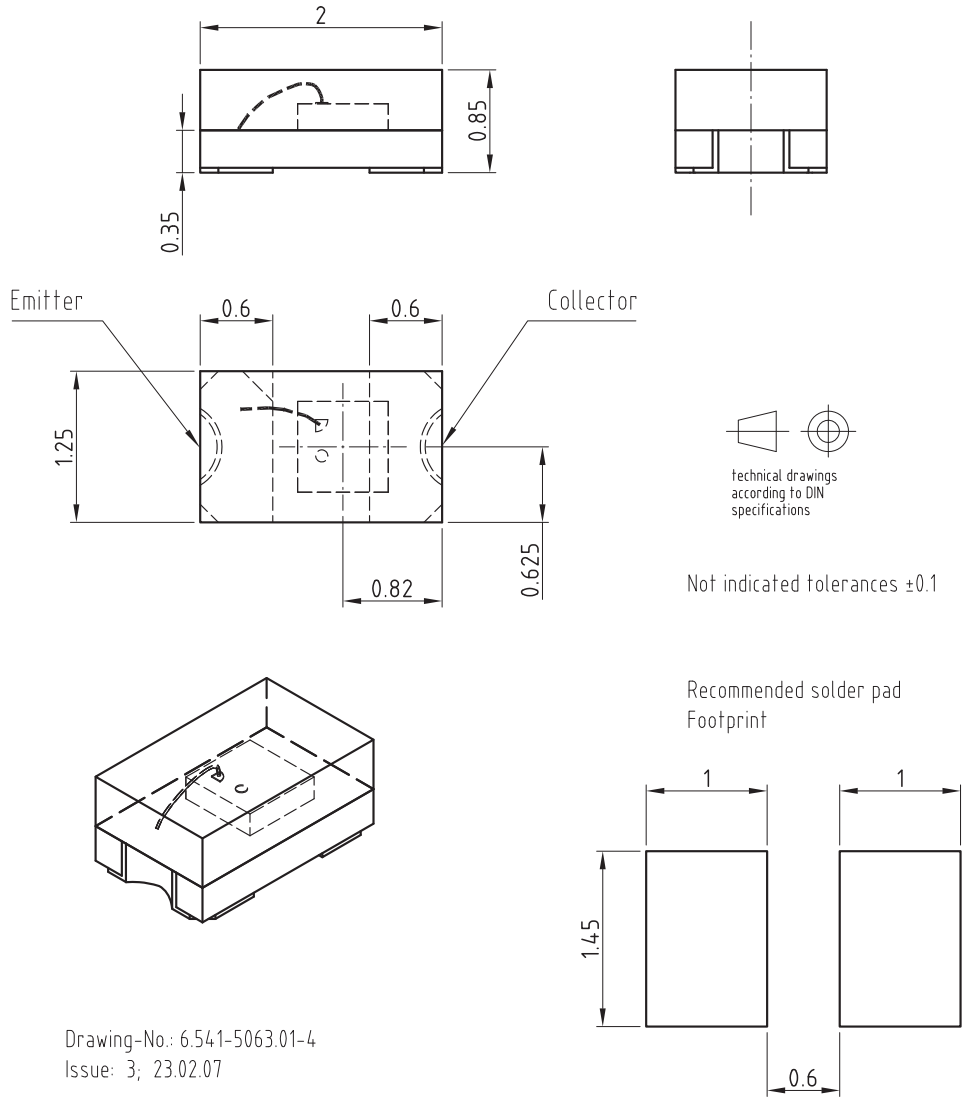
Moisture sensitivity level 3, acc. to J-STD-033D.

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), $RH < 5\%$.



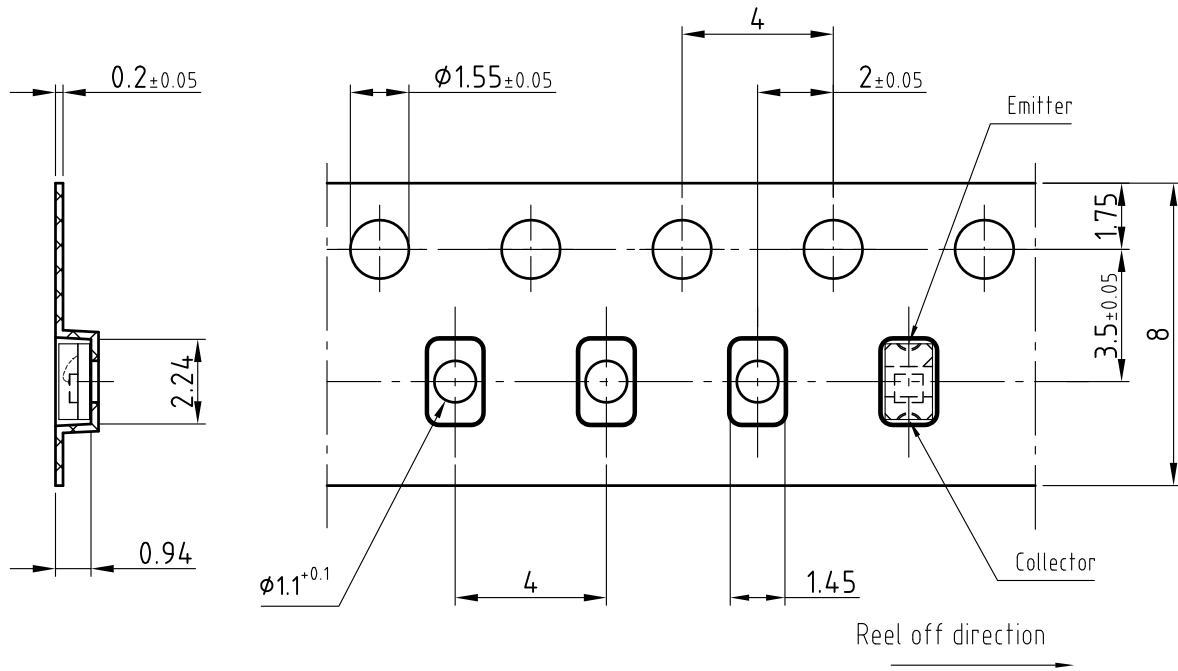
PACKAGE DIMENSIONS in millimeters



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

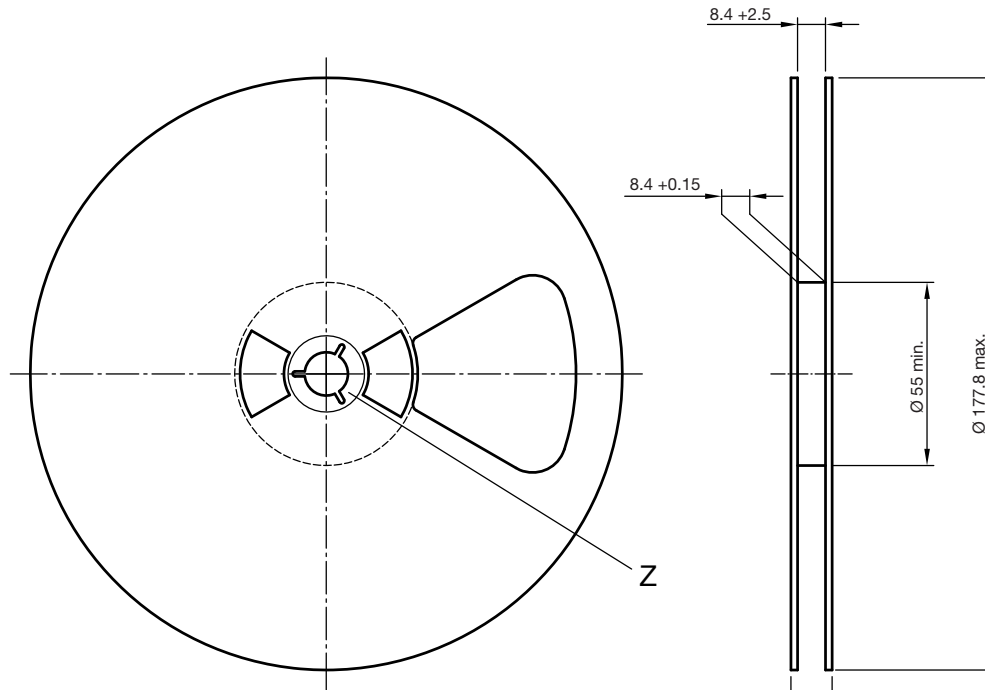
Not indicated tolerances ± 0.1

Quantity per reel: 3000 pcs

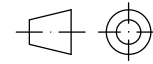
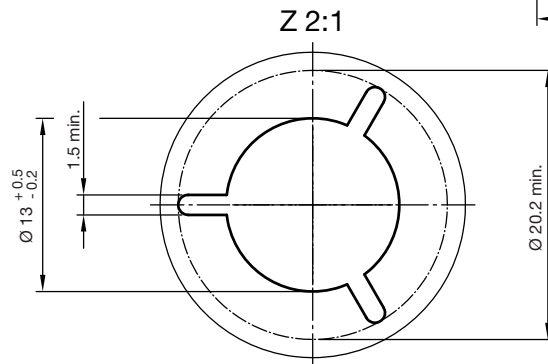
technical drawings according to DIN specifications



REEL DIMENSIONS in millimeters



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



technical drawings according to DIN specifications

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



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