Silicon Phototransistor in 0805 Package



20043

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: φ = ± 60°
- 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

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

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.

APPLICATIONS

- Detector in automotive applications
- Light sensors
- Radiation sensors

PRODUCT SUMMARY			
COMPONENT	I_{ca} (μA) at E_e = 1 mW/cm², λ = 950 nm, V_{CE} = 5 V	φ (°)	$\lambda_{0.1}$ (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 °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	$T_{amb} \leq 55$ °C	P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	According to reflow profile Fig. 8	T_{sd}	260	°C
Thermal resistance junction-to-ambient	According to J-STD-051	R_{thJA}	270	K/W

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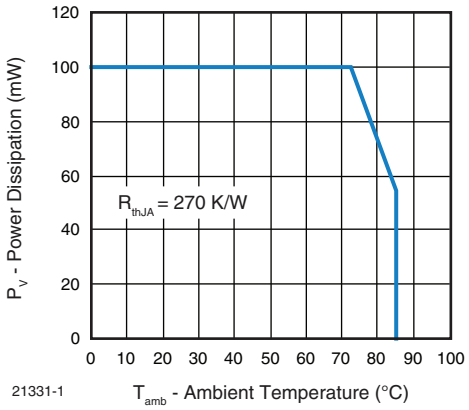


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Collector emitter breakdown voltage	I_C = 0.1 mA	V_{CEO}	20	-	-	V
Collector dark current	V_{CE} = 5 V, E = 0	I_{CEO}	-	1	100	nA
Collector emitter capacitance	V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CEO}	-	25	-	pF
Collector light current	E_e = 1 mW/cm², λ = 950 nm, V_{CE} = 5 V	I_{CA}	225	450	675	µA
Angle of half sensitivity		φ	-	± 60	-	°
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 mA	V_{CEsat}	-	-	0.4	V
Temperature coefficient of I_{ca}	E_e = 1 mW/cm², λ = 950 nm, V_{CE} = 5 V	Tk_{Ica}	-	1.1	-	%/K

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

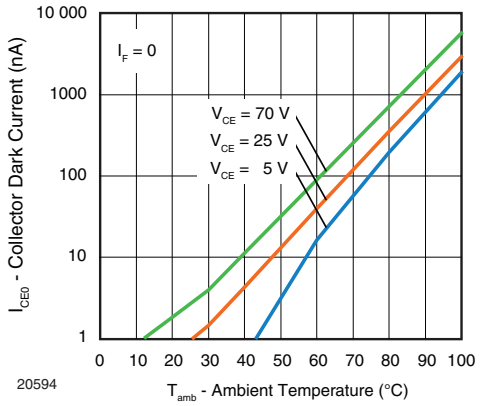


Fig. 2 - Collector Dark Current vs. Ambient Temperature

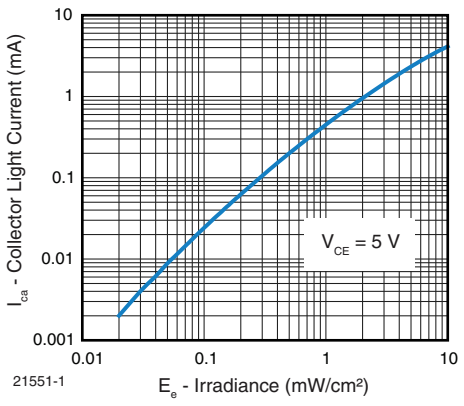


Fig. 3 - Collector Light Current vs. Irradiance

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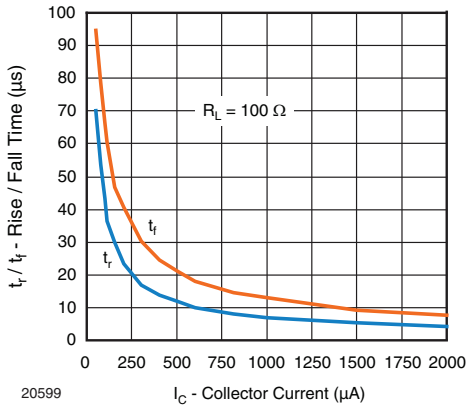


Fig. 4 - Rise/Fall Time vs. Collector Current

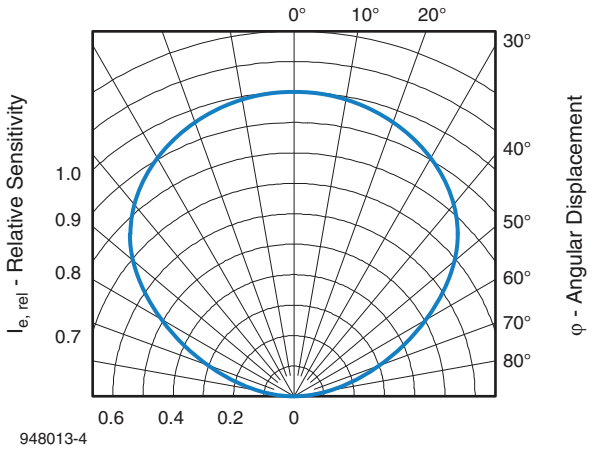


Fig. 6 - Relative Sensitivity vs. Angular Displacement

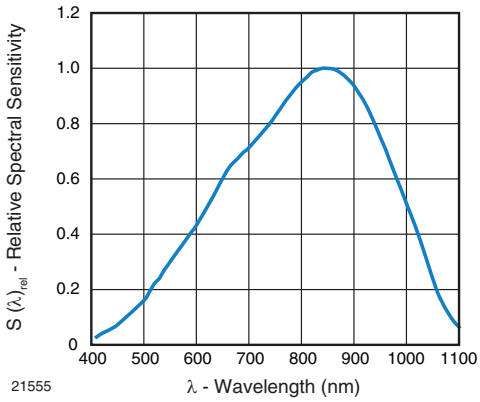


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

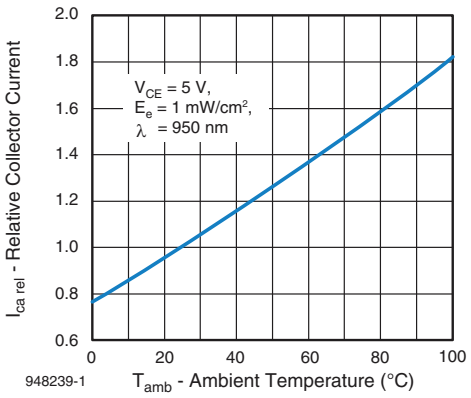


Fig. 7 - Relative Collector Current vs. Ambient Temperature

REFLOW SOLDER PROFILE

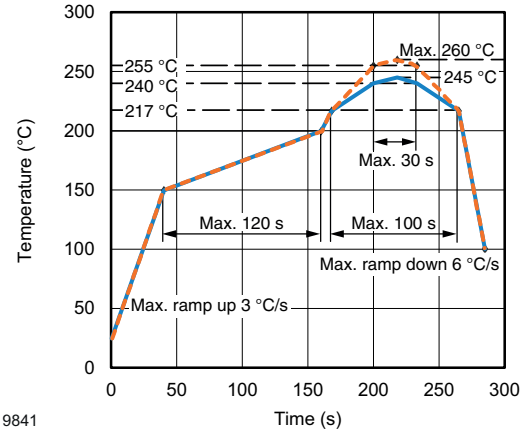


Fig. 8 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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

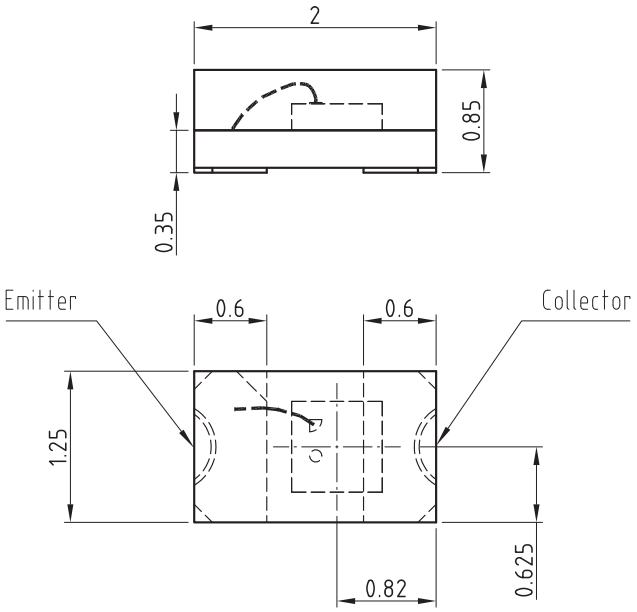
Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:
Floor life: 168 h
Conditions: T_{amb} < 30 °C, RH < 60 %
Moisture sensitivity level 3, acc. to J-STD-033D.

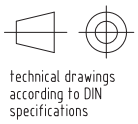
DRYING

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 %.

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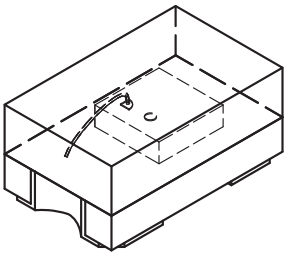
PACKAGE DIMENSIONS in millimeters





technical drawings
according to DIN
specifications

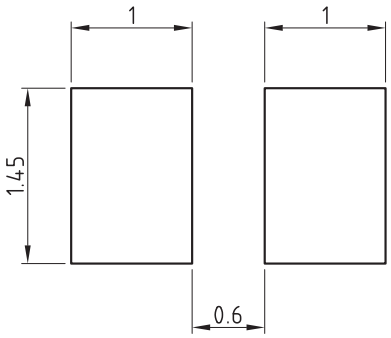
Not indicated tolerances ±0.1



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Issue: 3; 23.02.07

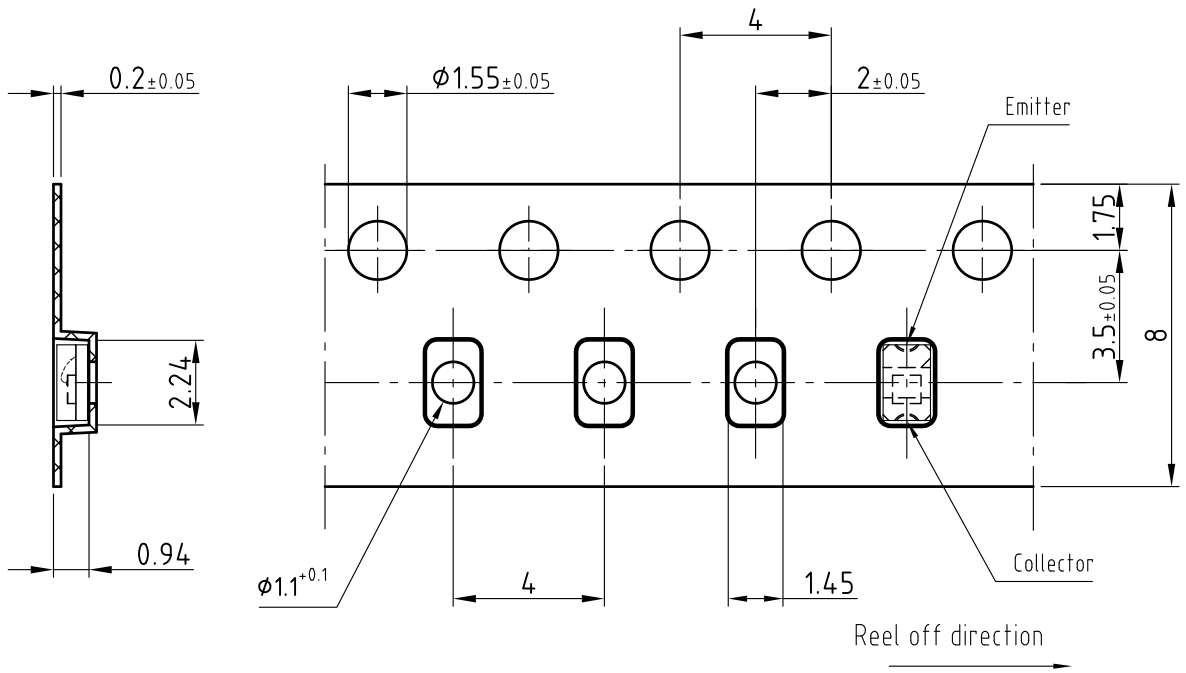
19757

Recommended solder pad
Footprint



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BLISTER TAPE DIMENSIONS in millimeters



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

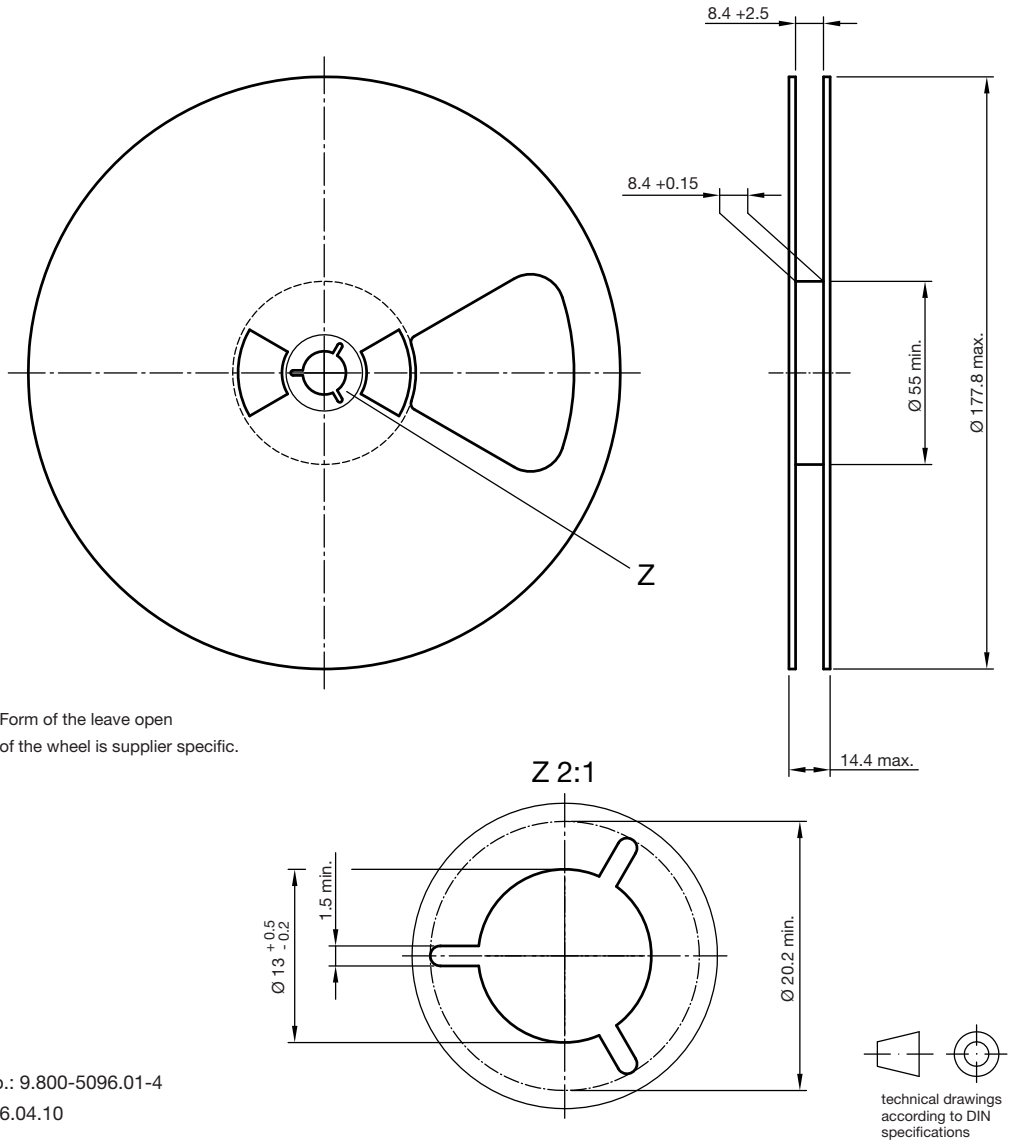
Not indicated tolerances ±0.1

Quantity per reel: 3000 pcs

technical drawings according to DIN specifications

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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

technical drawings
according to DIN
specifications

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