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: φ = ± 60°
- 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

AUTOMOTIVE GRADE

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

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_{caE} (µA)**	**φ (deg)**	**$\lambda_{0.5}$ (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_{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	110	°C
Operating temperature range		T_{amb}	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Soldering temperature	Acc. reflow profile fig. 8	T_{sd}	260	°C
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	270	K/W

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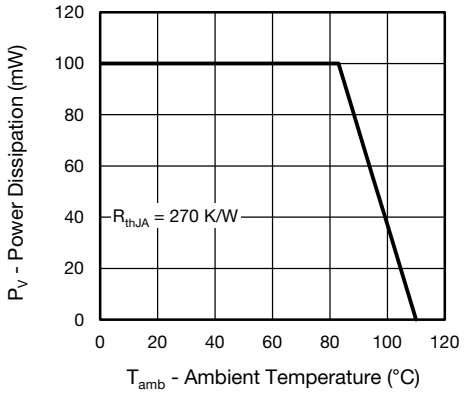

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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		deg
Wavelength of peak sensitivity		λ_p		870		nm
Range of spectral bandwidth		$\lambda_{0.5}$		750 to 1010		nm
Collector emitter saturation voltage	I_C = 0.05 mA	V_{CEsat}			0.4	V
Temperature coefficient of Ica	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)

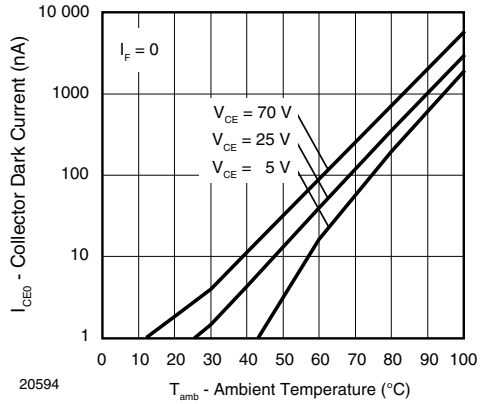

Fig. 2 - Collector Dark Current vs. Ambient Temperature

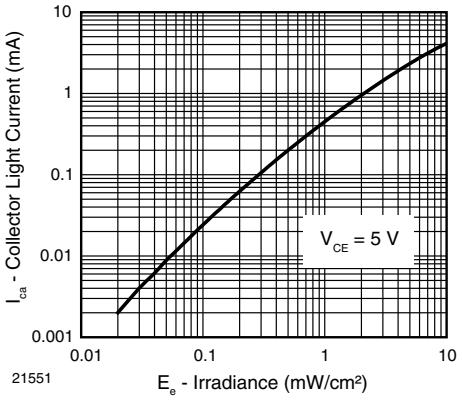

Fig. 3 - Collector Light Current vs. Irradiance

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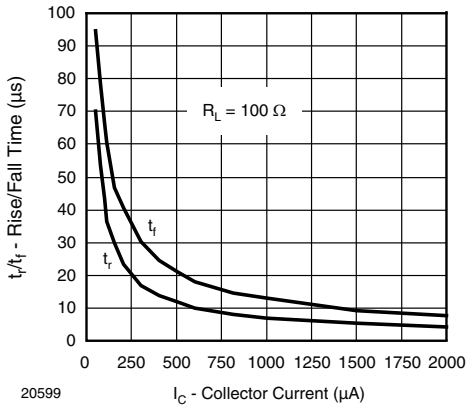

Fig. 4 - Rise/Fall Time vs. Collector Current

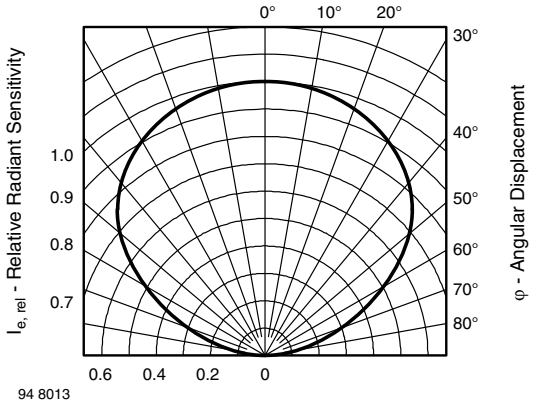

Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

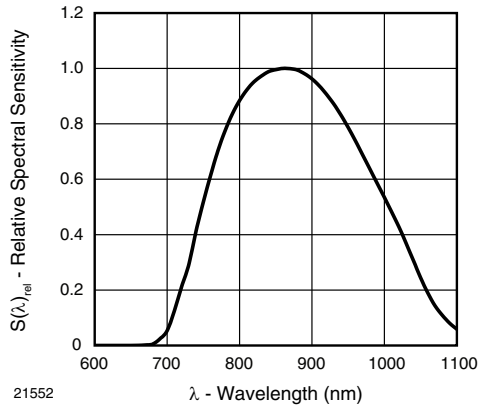

Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

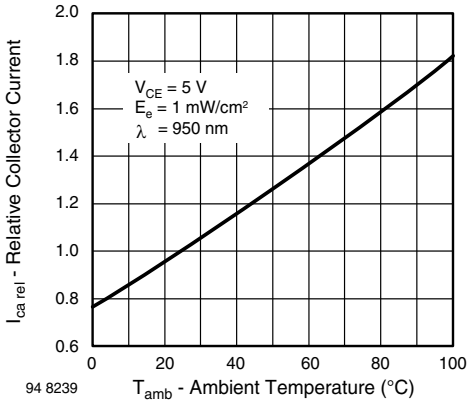

Fig. 7 - Relative Collector Current vs. Ambient Temperature

REFLOW SOLDER PROFILE

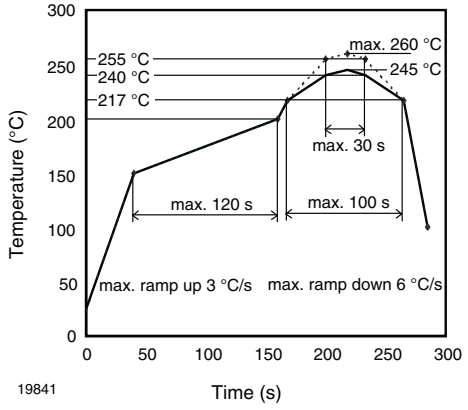

Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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 °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 °C (+ 5 °C), RH < 5 %.

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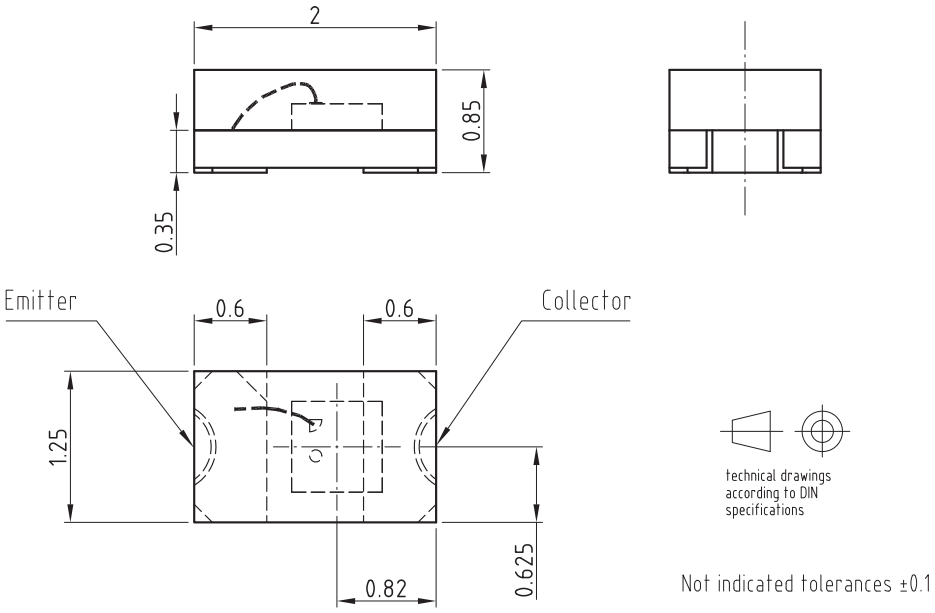
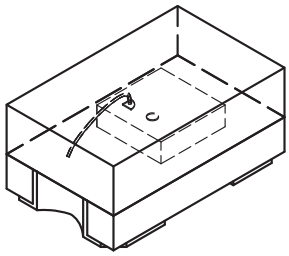
PACKAGE DIMENSIONS in millimeters

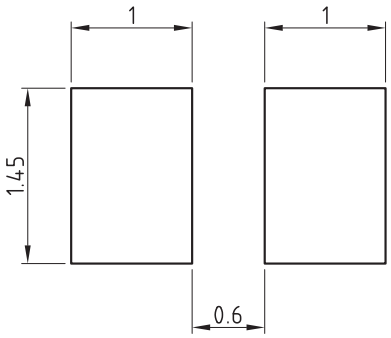




Drawing-No.: 6.541-5063.01-4
Issue: 3; 23.02.07

19757

Recommended solder pad
Footprint



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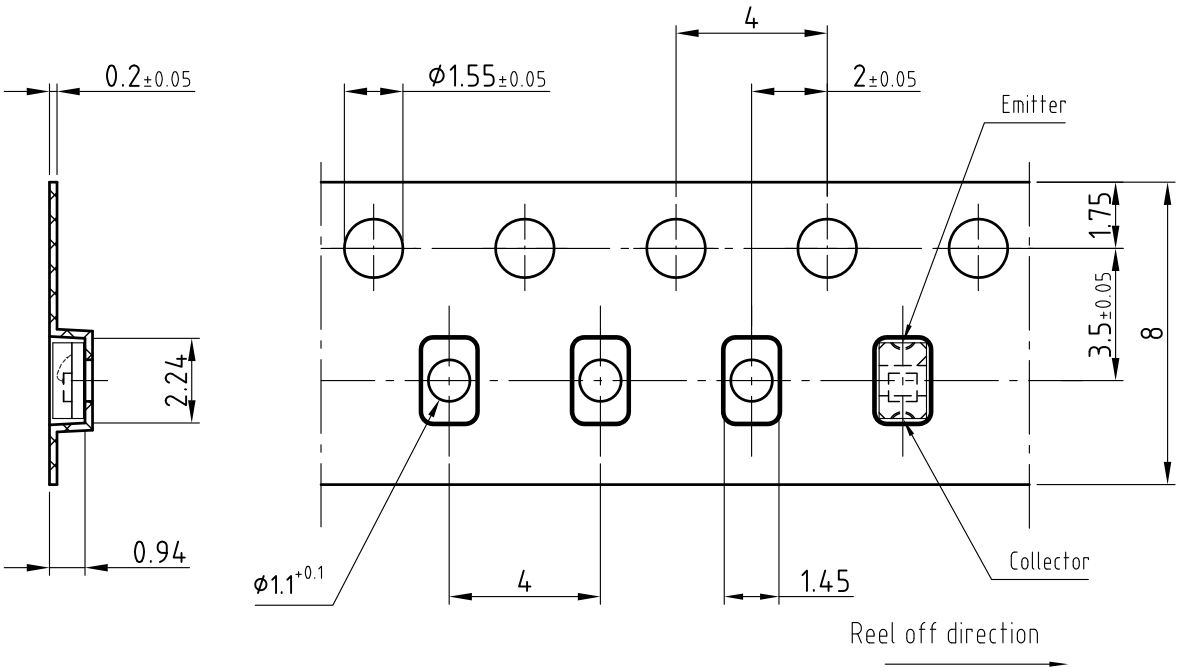
BLISTER TAPE DIMENSIONS in millimeters



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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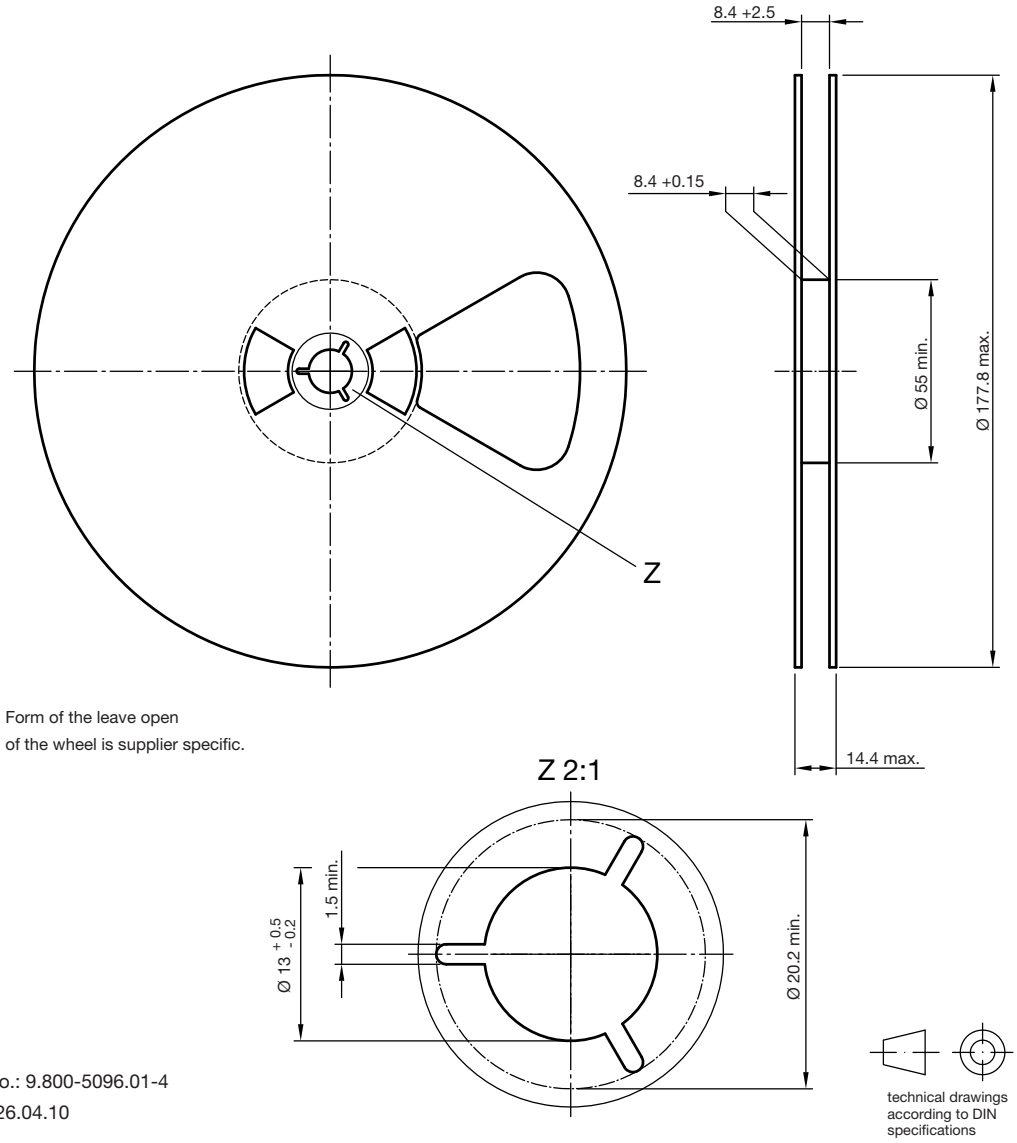
REEL DIMENSIONS in millimeters



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

technical drawings
according to DIN
specifications

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

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