

Silicon Phototransistor in 0805 Package



20043-1

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.

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: $\phi = \pm 60^\circ$
- 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

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_{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 ($T_{amb} = 25^\circ\text{C}$, 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	$T_{amb} \leq 55^\circ\text{C}$	P_V	100	mW
Junction temperature		T_j	110	$^\circ\text{C}$
Operating temperature range		T_{amb}	-40 to +110	$^\circ\text{C}$
Storage temperature range		T_{stg}	-40 to +110	$^\circ\text{C}$
Soldering temperature	Acc. reflow profile fig. 8	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	270	K/W

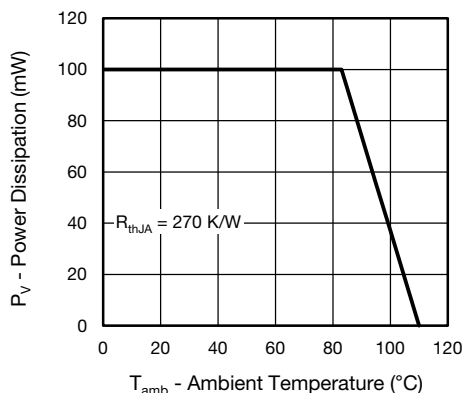


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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		deg
Wavelength of peak sensitivity		λ_p		870		nm
Range of spectral bandwidth		$\lambda_{0.5}$		750 to 1010		nm
Collector emitter saturation voltage	$I_C = 0.05\text{ mA}$	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)

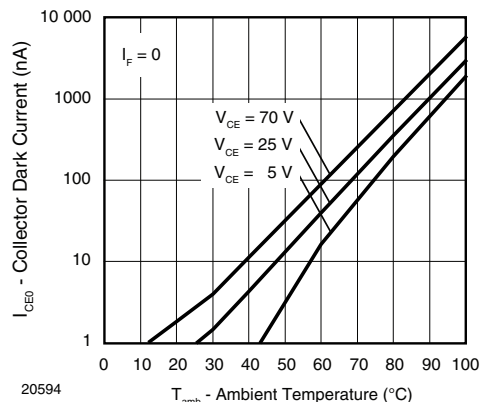


Fig. 2 - Collector Dark Current vs. Ambient Temperature

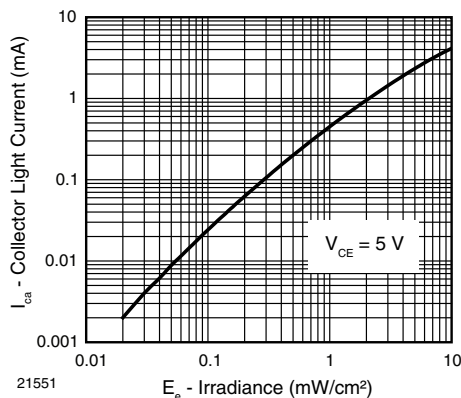


Fig. 3 - Collector Light Current vs. Irradiance

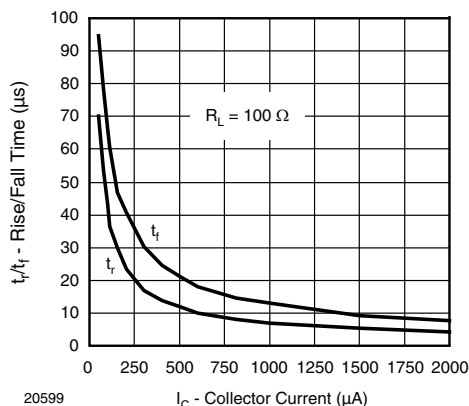


Fig. 4 - Rise/Fall Time vs. Collector Current

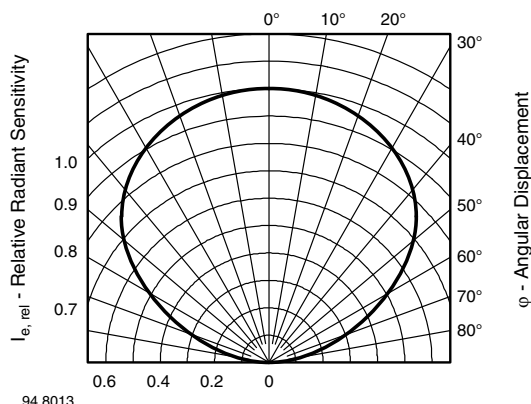


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

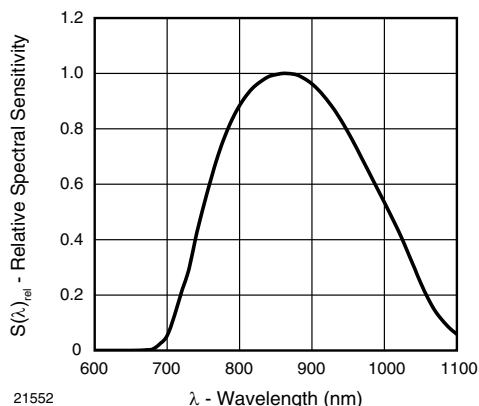


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

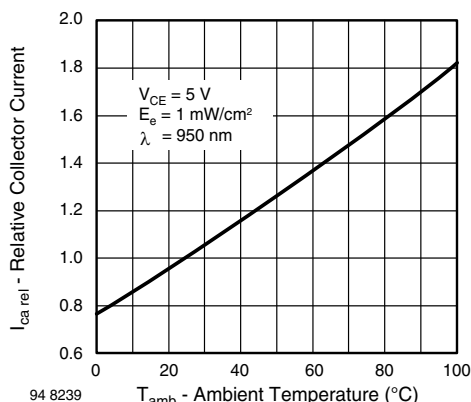


Fig. 7 - Relative Collector Current vs. Ambient Temperature

REFLOW SOLDER PROFILE

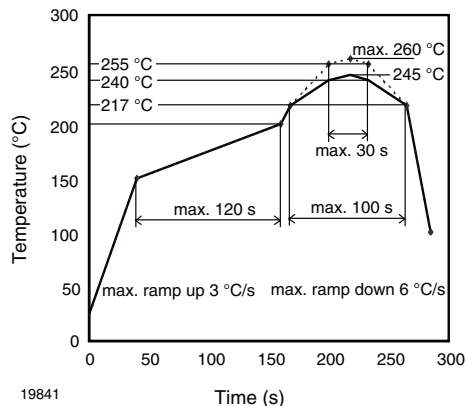


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

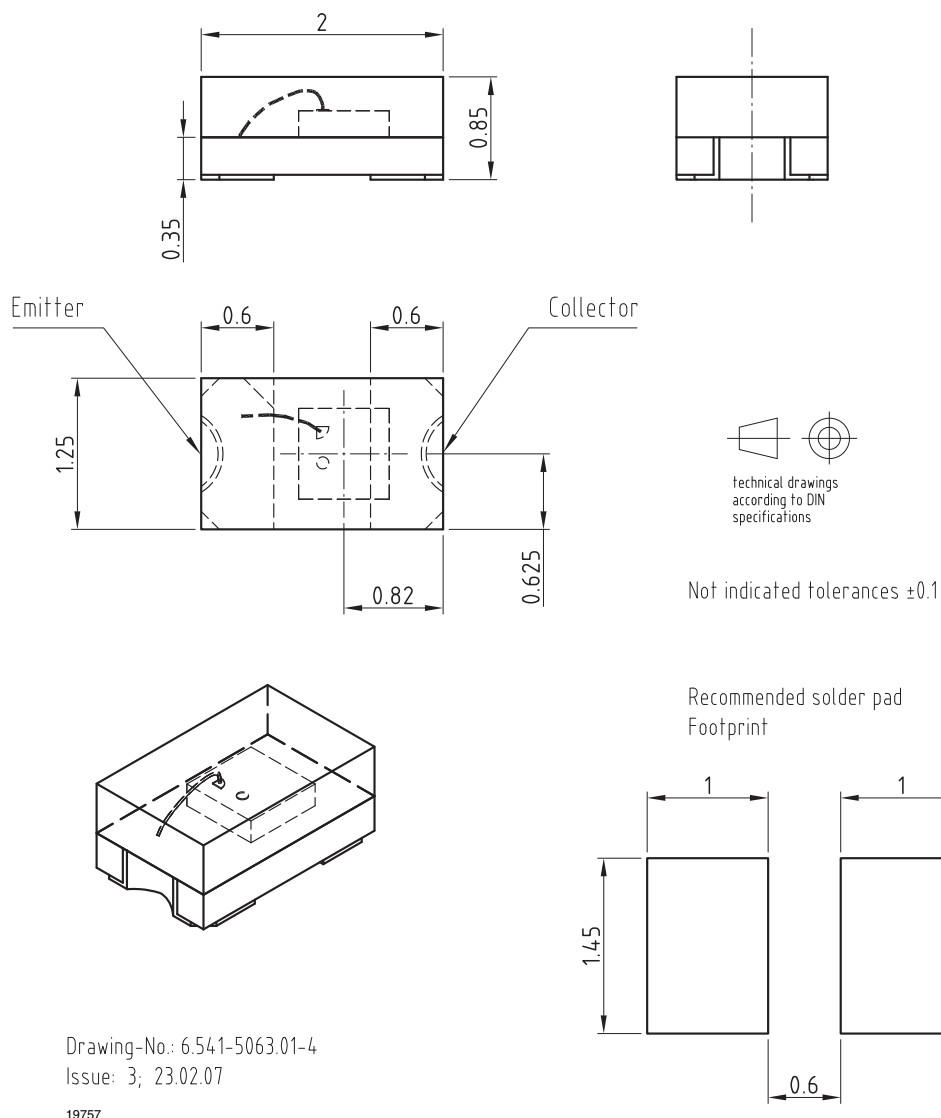
Moisture sensitivity level 4, acc. to J-STD-020.

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

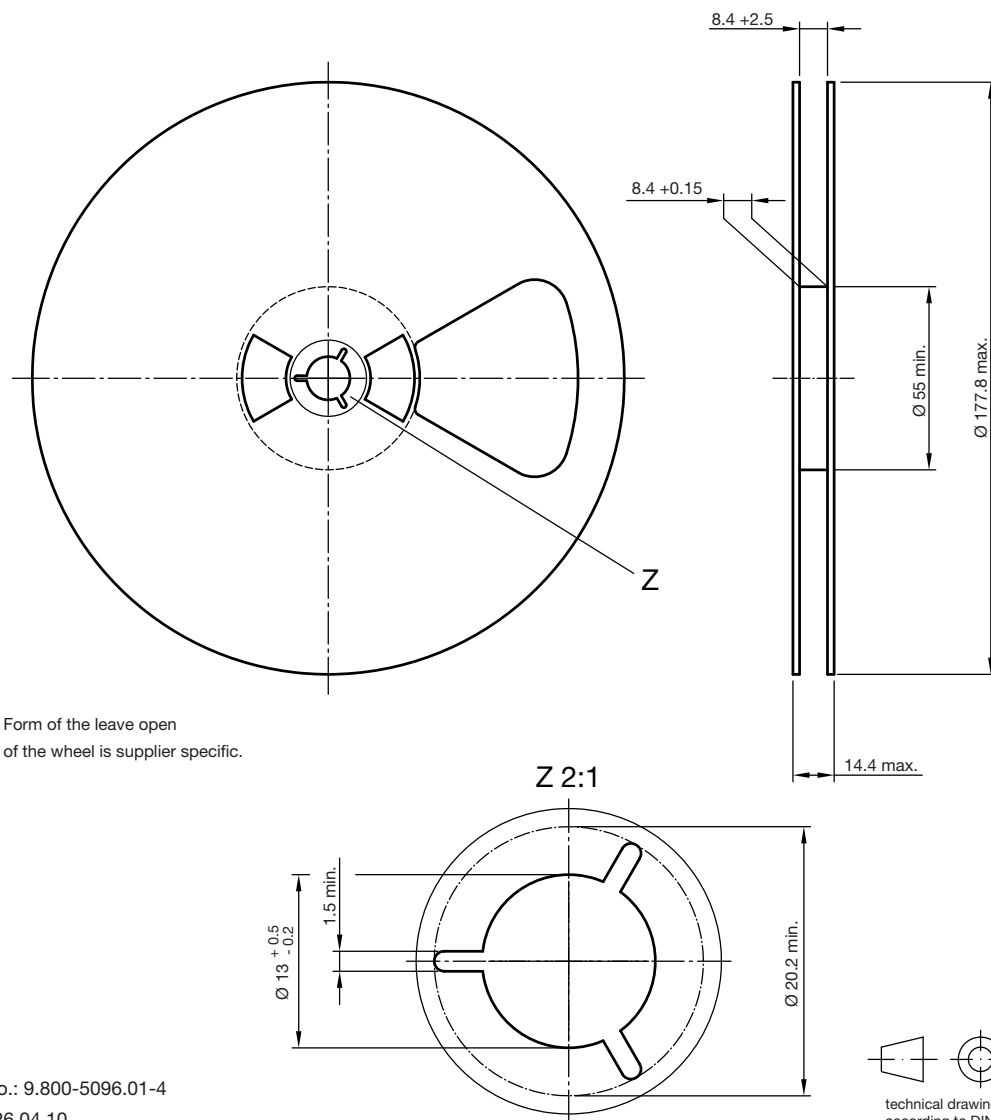


PACKAGE DIMENSIONS in millimeters





REEL DIMENSIONS in millimeters



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



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