

TEMT1520

Vishay Semiconductors



Silicon NPN Phototransistor, RoHS Compliant



19449

FEATURES

- Package type: surface mount
- Package form: gullwing
- Dimensions (L x W x H in mm): 2.5 x 2 x 2.7
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\phi = \pm 15^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS
COMPLIANT

DESCRIPTION

TEMT1520 is a silicon NPN phototransistor with high radiant sensitivity in a clear, surface mount plastic package with lens. It is sensitive to visible and near infrared radiation.

APPLICATIONS

- Detector in electronic control and drive circuits
- Detector for light measurement

PRODUCT SUMMARY

COMPONENT	I_{ca} (mA)	ϕ (deg)	$\lambda_{0.1}$ (nm)
TEMT1520	4.5	± 15	450 to 1080

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT1520	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Emitter collector voltage		V_{ECO}	5	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10$ ms	I_{CM}	100	mA
Power dissipation	$T_{amb} \leq 55^\circ\text{C}$	P_V	100	mW
Junction temperature		T_J	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	Acc. reflow solder profile fig. 8	T_{sd}	< 260	$^\circ\text{C}$
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R_{thJA}	400	K/W

Note

$T_{amb} = 25^\circ\text{C}$, unless otherwise specified





TEMT1520

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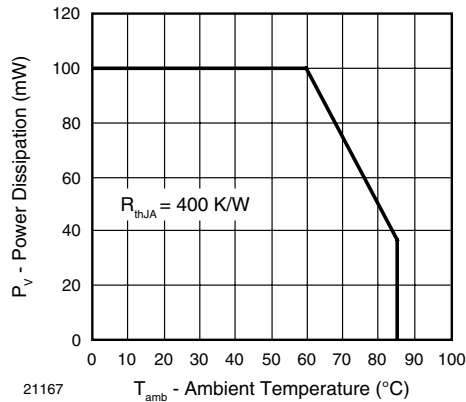


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter voltage	$I_C = 1 \text{ mA}$	V_{CE0}	70			V
Collector emitter dark current	$V_{CE} = 20 \text{ V}, E = 0$	I_{CEO}		1	200	nA
Collector emitter capacitance	$V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$	C_{CEO}		3		pF
Collector light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	I_{ca}	2	4.5	8	mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_p		850		nm
Range of spectral bandwidth		$\lambda_{0.1}$		450 to 1080		nm
Collector emitter saturation voltage	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, I_C = 0.1 \text{ mA}$	V_{CEsat}			0.3	V
Turn-on time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	t_{on}		2.0		μs
Turn-off time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	t_{off}		2.3		μs
Cut-off frequency	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	f_c		180		kHz

Note

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BASIC CHARACTERISTICS

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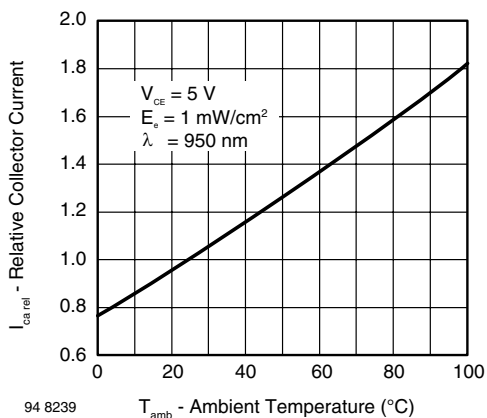


Fig. 2 - Relative Collector Current vs. Ambient Temperature

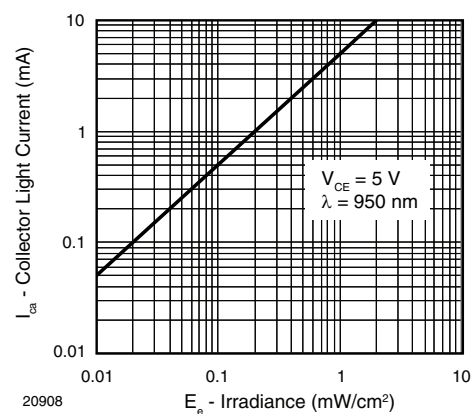


Fig. 3 - Collector Light Current vs. Irradiance

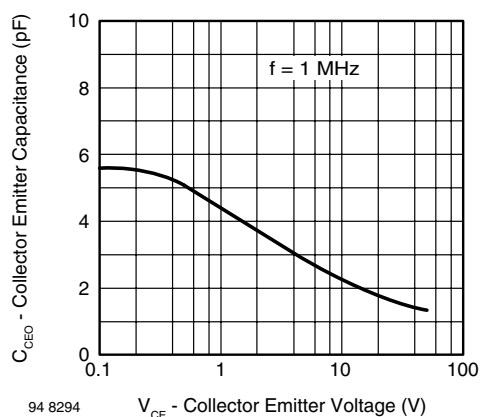


Fig. 4 - Collector Emitter Capacitance vs. Collector Emitter Voltage

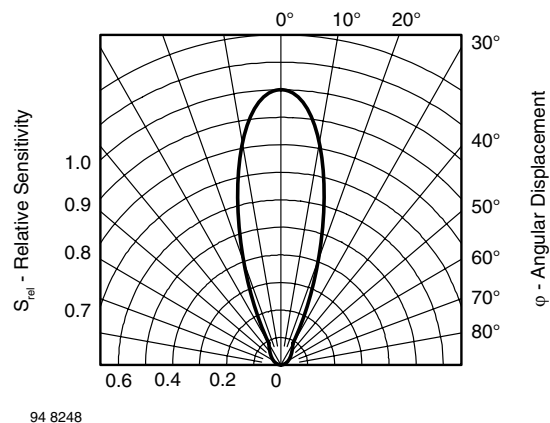


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

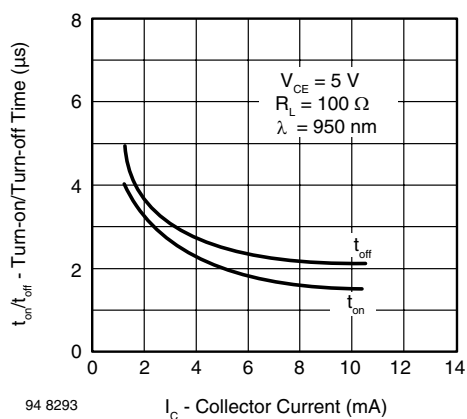


Fig. 5 - Turn-on/Turn-off Time vs. Collector Current

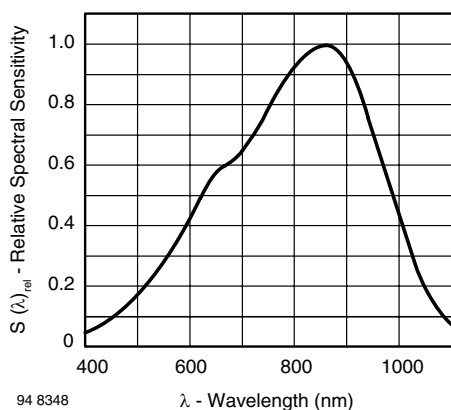


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength



PRECAUTIONS FOR USE

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (burn out will happen).

2. Storage

2.1 Storage temperature and rel. humidity conditions are: 5 °C to 35 °C, R.H. 60 %.

2.2 Floor life must not exceed 168 h, acc. to JEDEC level 3, J-STD-020.

Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccant.

Considering tape life, we suggest to use products within one year from production date.

2.3 If opened more than one week in an atmosphere 5 °C to 35 °C, R.H. 60 %, devices should be treated at 60 °C $\pm$ 5 °C for 15 h.

2.4 If humidity indicator in the package shows pink color (normal blue), then devices should be treated with the same conditions as 2.3.

REFLOW SOLDER PROFILE

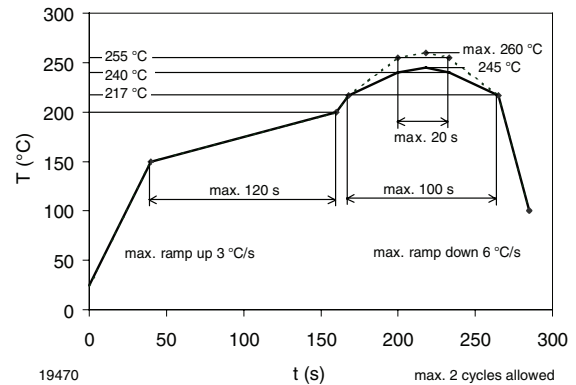
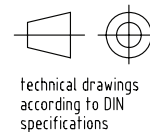
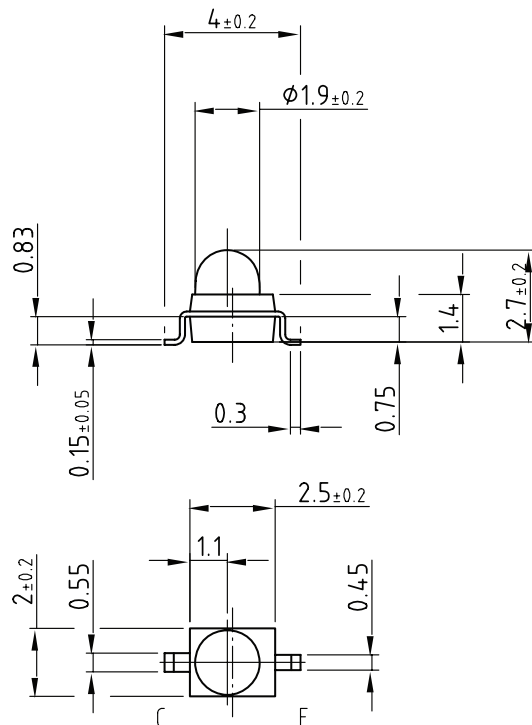


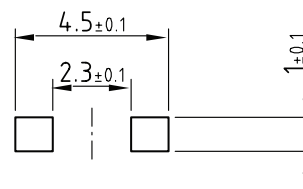
Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

PACKAGE DIMENSIONS in millimeters



technical drawings
according to DIN
specifications

Solder pad proposal

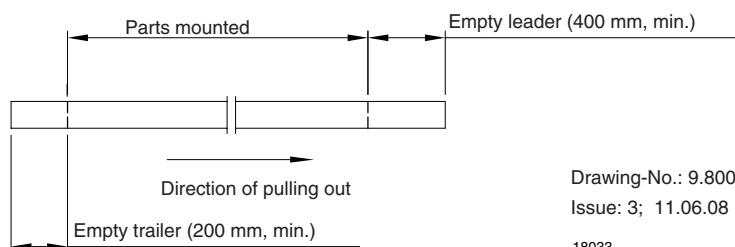
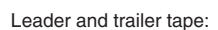


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Issue: 5; 19.01.06

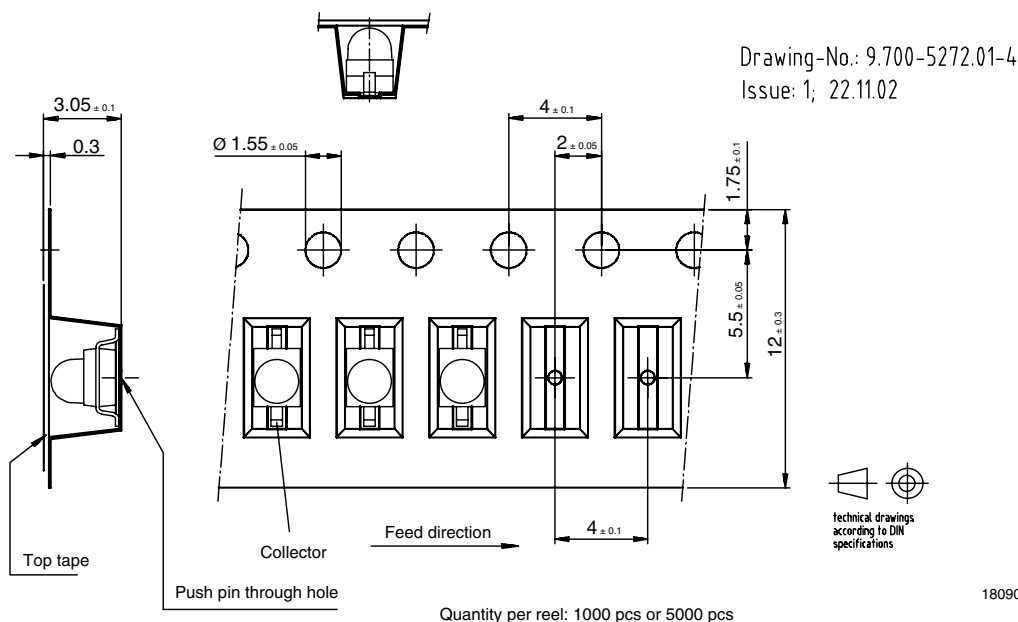
16105

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18033

TAPING DIMENSIONS in millimeters





Disclaimer

All product specifications and data are subject to change without notice.

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