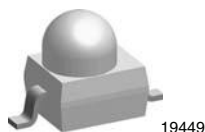


## Silicon NPN Phototransistor, RoHS Compliant



### 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)	$\phi$ (deg)	$\lambda_{0.1}$ (nm)
TEMT1520	4.5	$\pm 15$	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	$T_{amb} \leq 55$ °C	$P_V$	100	mW
Junction temperature		$T_j$	100	°C
Operating temperature range		$T_{amb}$	- 40 to + 85	°C
Storage temperature range		$T_{stg}$	- 40 to + 100	°C
Soldering temperature	Acc. reflow solder profile fig. 8	$T_{sd}$	< 260	°C
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	$R_{thJA}$	400	K/W

**Note**

$T_{amb} = 25$  °C, unless otherwise specified

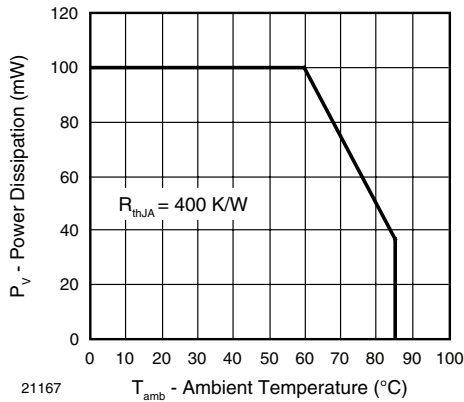


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter voltage	I <sub>C</sub> = 1 mA	V <sub>CEO</sub>	70			V
Collector emitter dark current	V <sub>CE</sub> = 20 V, E = 0	I <sub>CEO</sub>		1	200	nA
Collector emitter capacitance	V <sub>CE</sub> = 5 V, f = 1 MHz, E = 0	C <sub>CEO</sub>		3		pF
Collector light current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, V <sub>CE</sub> = 5 V	I <sub>ca</sub>	2	4.5	8	mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ <sub>p</sub>		850		nm
Range of spectral bandwidth		λ <sub>0.1</sub>		450 to 1080		nm
Collector emitter saturation voltage	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, I <sub>C</sub> = 0.1 mA	V <sub>CEsat</sub>			0.3	V
Turn-on time	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	t <sub>on</sub>		2.0		μs
Turn-off time	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	t <sub>off</sub>		2.3		μs
Cut-off frequency	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	f <sub>c</sub>		180		kHz

**Note**

 T<sub>amb</sub> = 25 °C, unless otherwise specified

**BASIC CHARACTERISTICS**

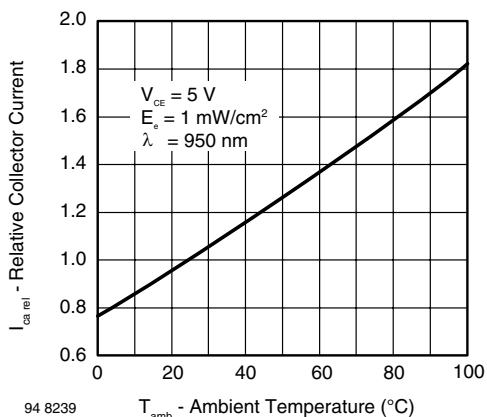
 T<sub>amb</sub> = 25 °C, unless otherwise specified


Fig. 2 - Relative Collector Current vs. Ambient Temperature

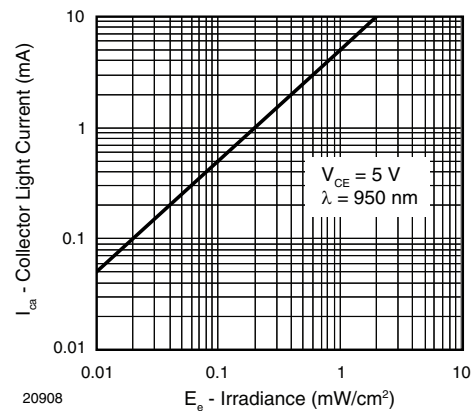


Fig. 3 - Collector Light Current vs. Irradiance

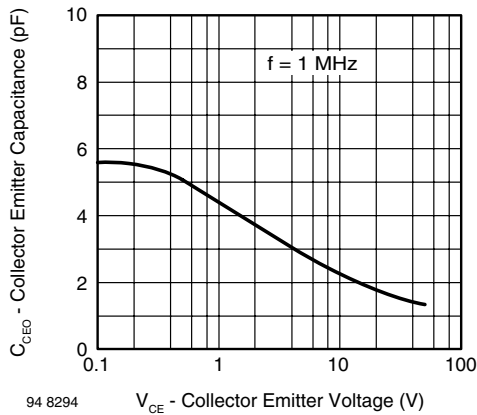


Fig. 4 - Collector Emitter Capacitance vs. Collector Emitter Voltage

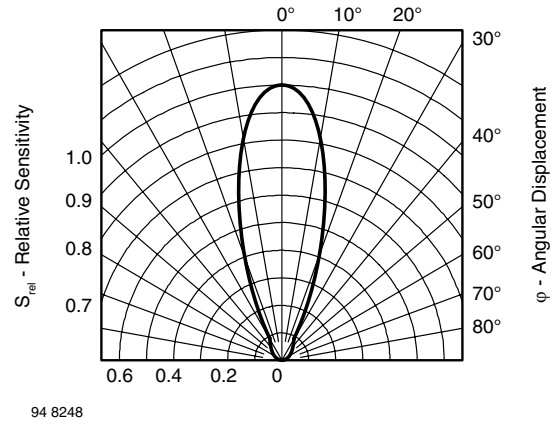


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

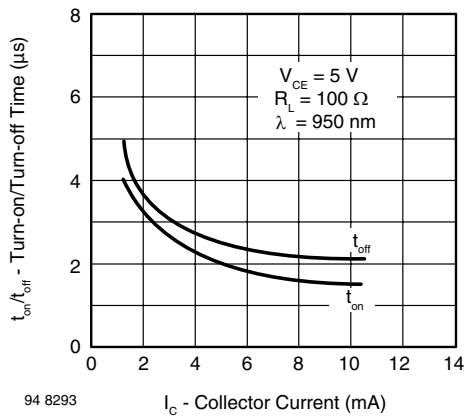


Fig. 5 - Turn-on/Turn-off Time vs. Collector Current

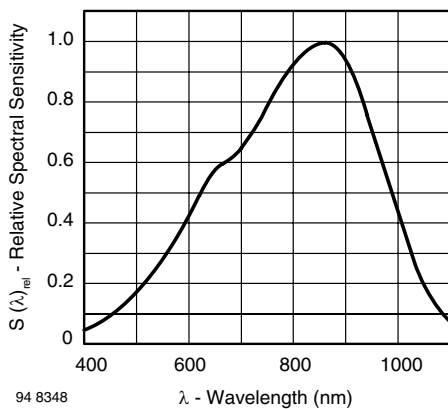


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

### 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

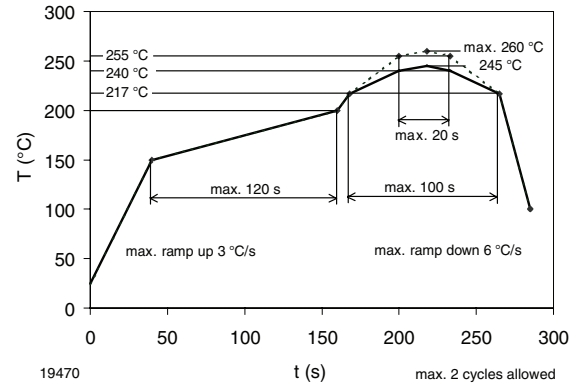
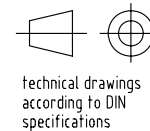
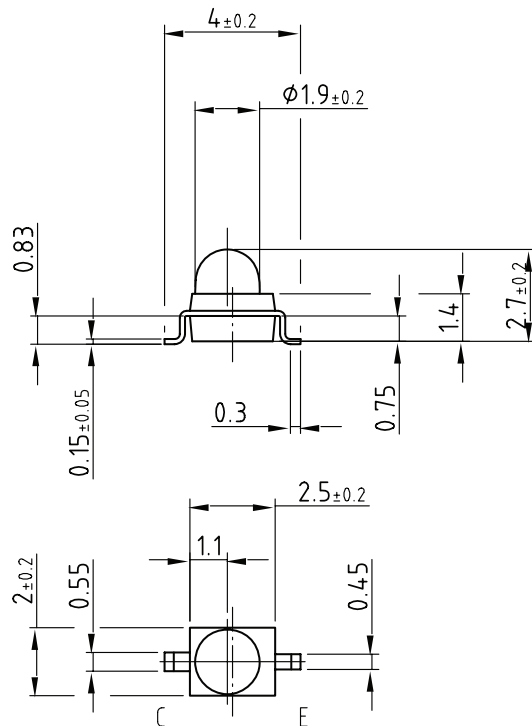
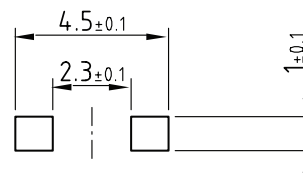


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

### PACKAGE DIMENSIONS in millimeters



#### Solder pad proposal

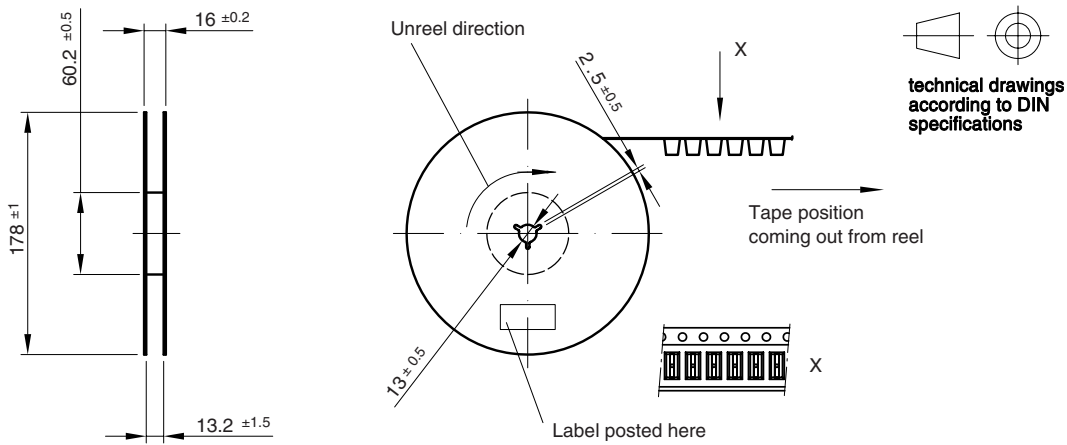


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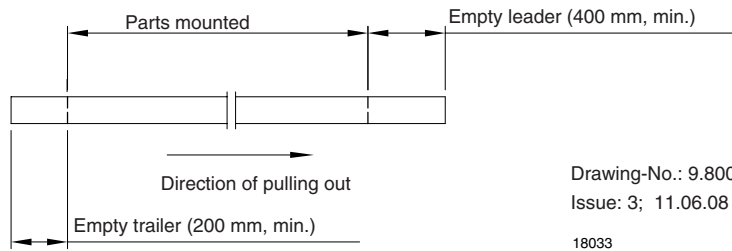
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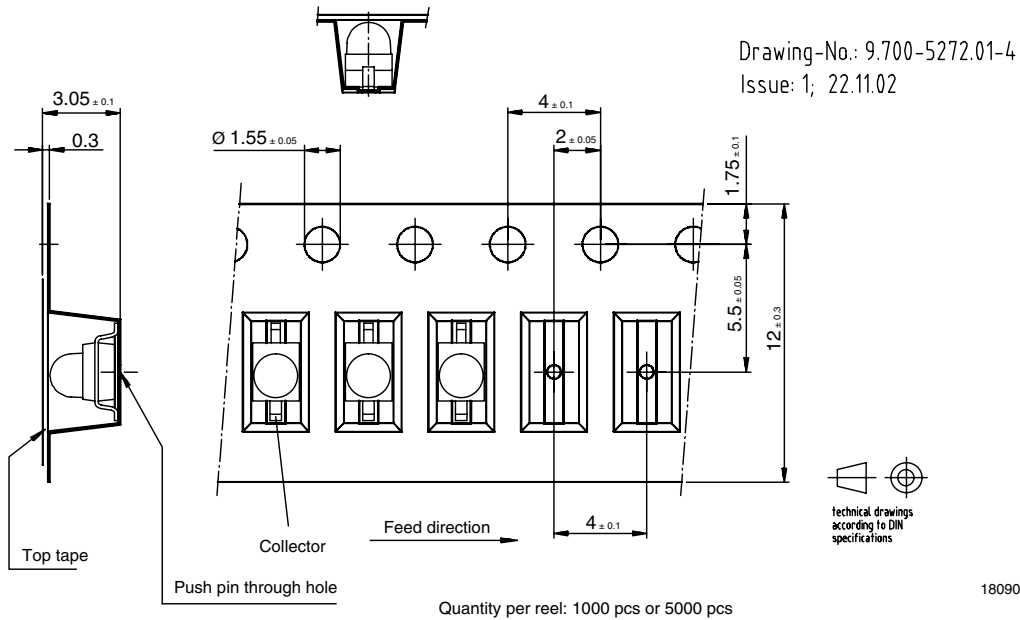
## REEL DIMENSIONS in millimeters



### Leader and trailer tape:



## TAPING DIMENSIONS in millimeters





## Disclaimer

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

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