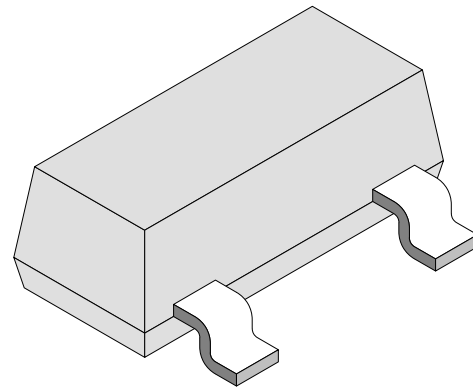

Silicon NPN Phototransistor

Description

TEMT2200 is a high speed silicon NPN epitaxial planar phototransistor in miniature SOT-23 package for surface mounting on printed boards. Due to its waterclear epoxy the device is sensitive to visible and near infrared radiation.

A base terminal is available to enable biasing and sensitivity control.



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Features

- Standard SOT-23 clear plastic package
- Extra wide viewing angle $\varphi = \pm 70^\circ$
- Especially for surface mounting on printed board
- Small mechanical tolerances
- Base terminal available
- Fast response times
- Suitable for visible and near infrared radiation

Applications

Detector in electronic control and drive circuits in SMD technique

Absolute Maximum Ratings

 $T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Value	Unit
Collector Emitter Voltage		V_{CEO}	70	V
Emitter Collector Voltage		V_{ECO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	$t_p/T = 0.5, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leq 25^{\circ}\text{C}$	P_{tot}	75	mW
Junction Temperature		T_j	100	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 5 \text{ s}$	T_{sd}	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	1000	K/W

Basic Characteristics

 $T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	$I_C = 1 \text{ mA}$	$V_{(BR)CEO}$	70			V
Collector 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 Current	$V_{CE}=5\text{V}, I_B=0.5 \mu\text{A}$	I_C	0.2		0.4	mA
Collector Light Current	$E_e=1\text{mW/cm}^2, \lambda=950\text{nm}, V_{CE}=5\text{V}$	I_{ca}		0.45		mA
Angle of Half Sensitivity		ϕ		± 70		deg
Wavelength of Peak Sensitivity		λ_p		850		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620...980		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

Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

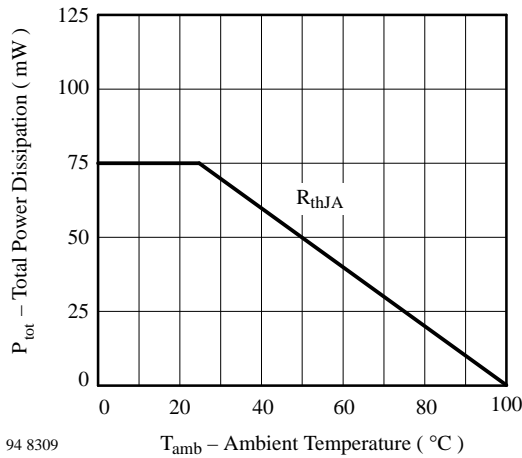


Figure 1 : Total Power Dissipation vs. Ambient Temperature

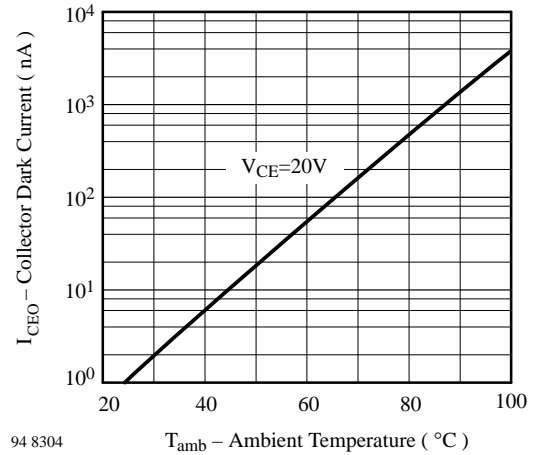


Figure 2 : Collector Dark Current vs. Ambient Temperature

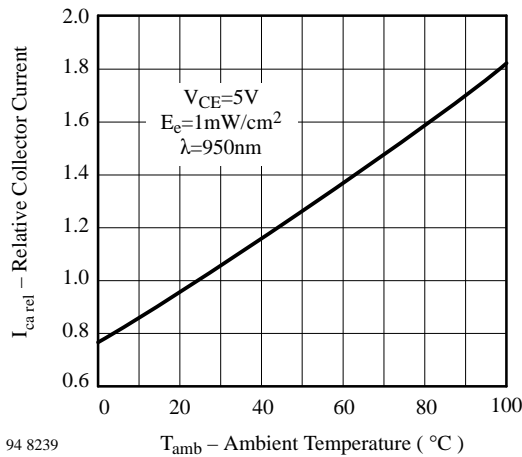


Figure 3 : Relative Collector Current vs. Ambient Temperature

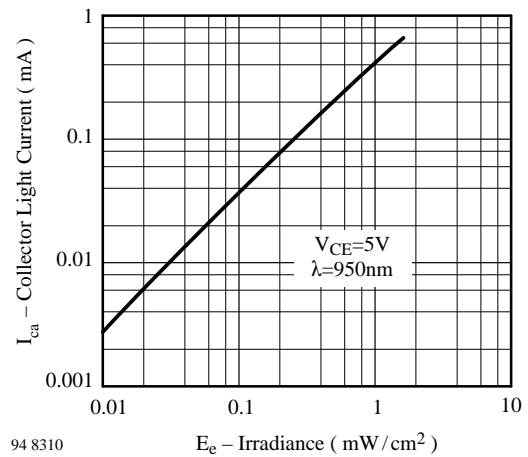


Figure 4 : Collector Light Current vs. Irradiance

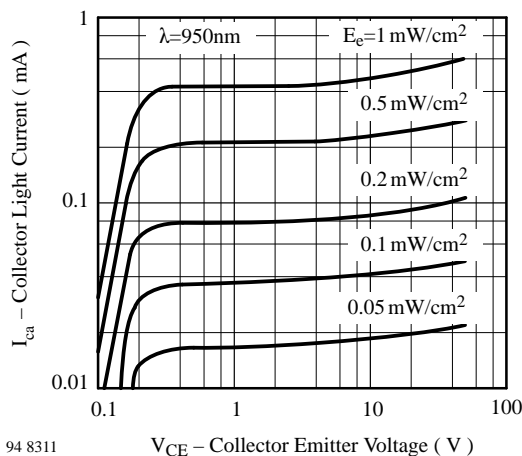


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

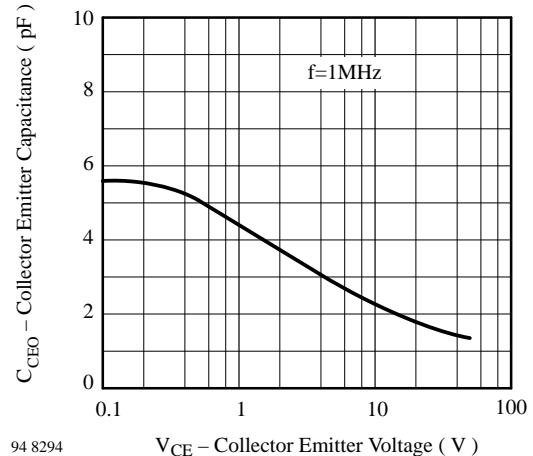
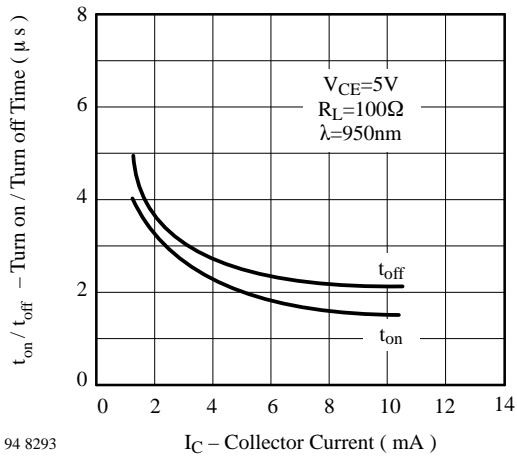


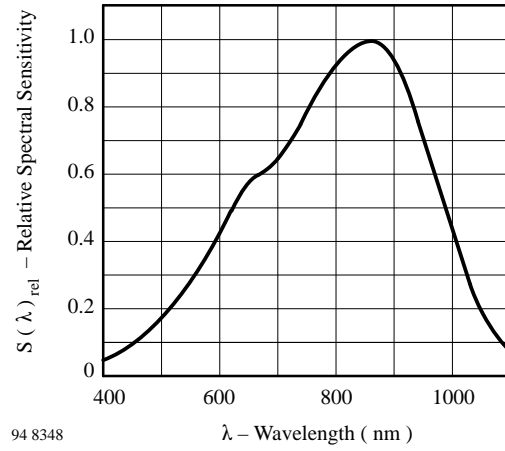
Figure 6 : Collector Emitter Capacitance vs. Collector Emitter Voltage



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I_C – Collector Current (mA)

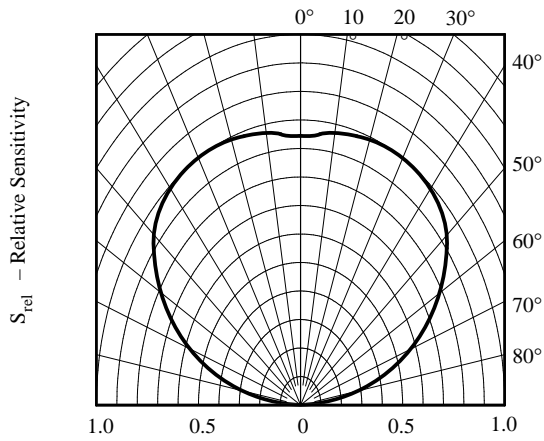
Figure 7 : Turn On/Turn Off Time vs. Collector Current



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λ – Wavelength (nm)

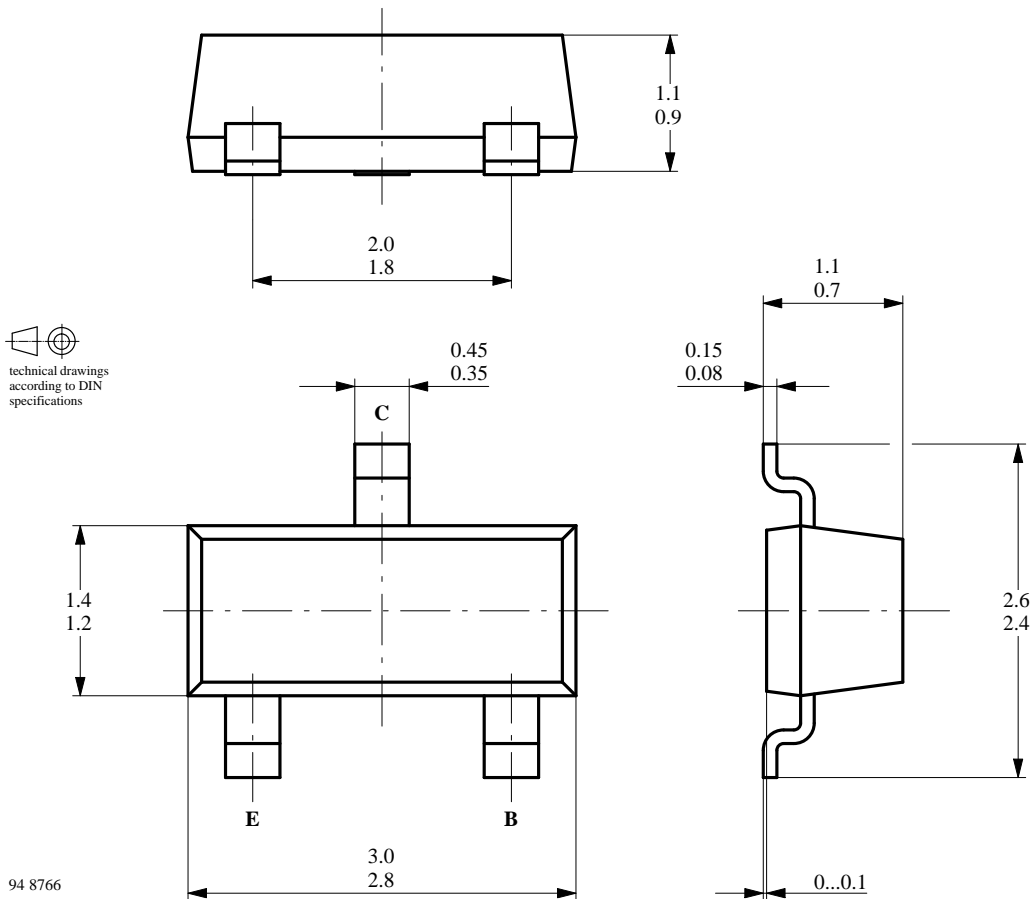
Figure 8 : Relative Spectral Sensitivity vs. Wavelength



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Figure 9 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



We reserve the right to make changes to improve technical design without further notice.

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