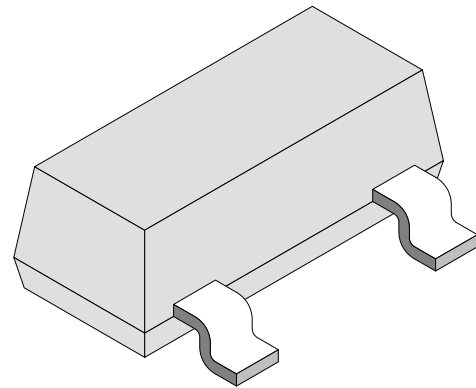

Silicon NPN Phototransistor

Description

TEMT2100 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.

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
- Fast response times
- Suitable for visible and near infrared radiation



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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 Light Current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	I_{ca}	0.30	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)

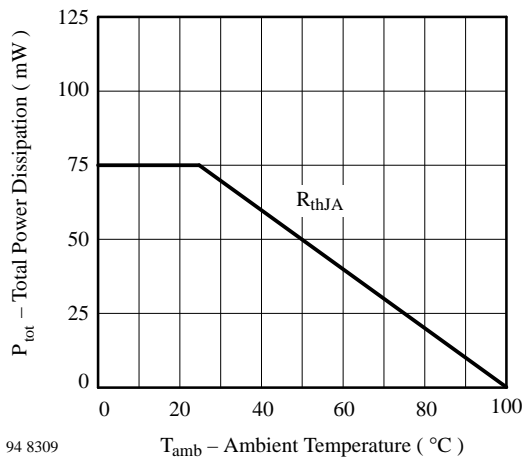


Figure 1 : Total Power Dissipation vs. Ambient Temperature

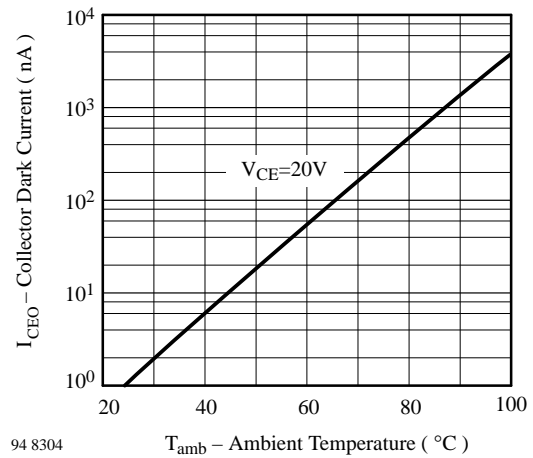


Figure 2 : Collector Dark Current vs. Ambient Temperature

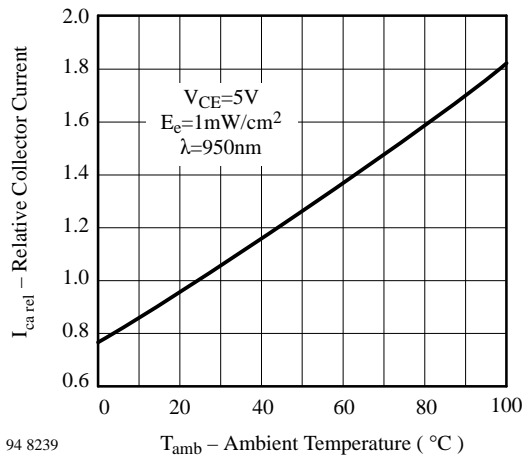


Figure 3 : Relative Collector Current vs. Ambient Temperature

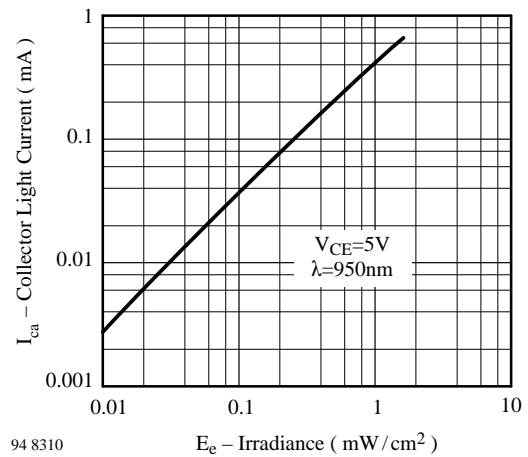


Figure 4 : Collector Light Current vs. Irradiance

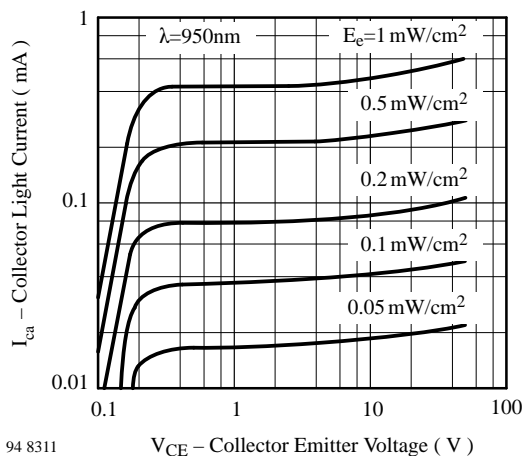


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

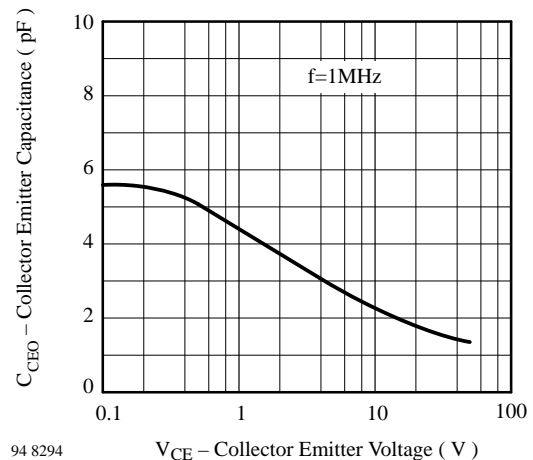
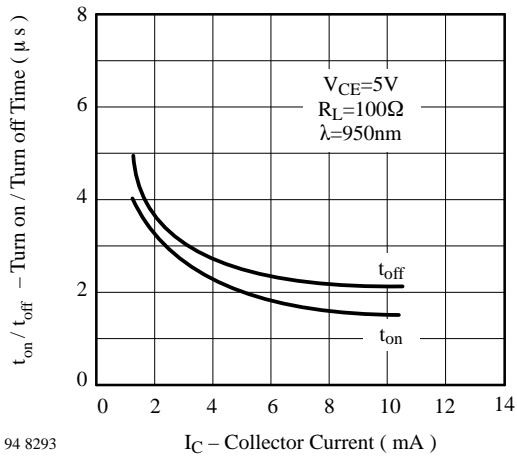
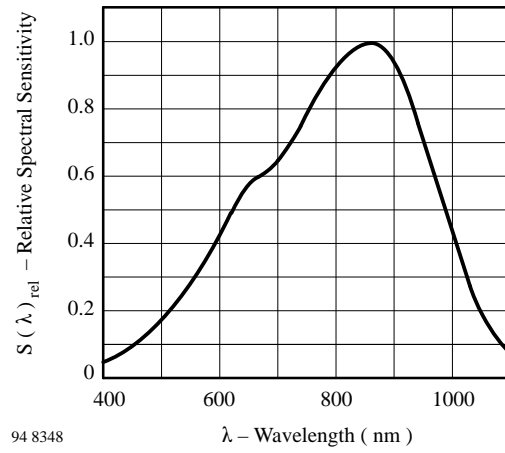


Figure 6 : Collector Emitter Capacitance vs. Collector Emitter Voltage



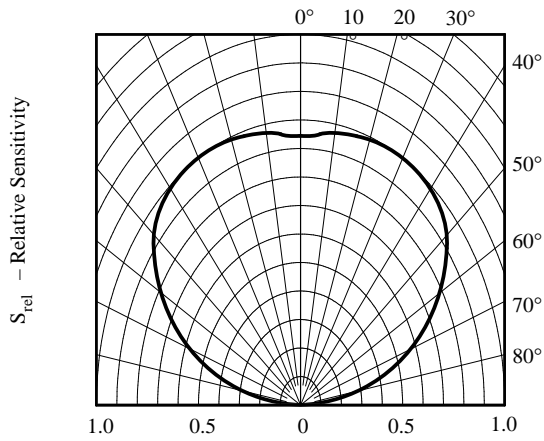
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Figure 7 : Turn On/Turn Off Time vs. Collector Current



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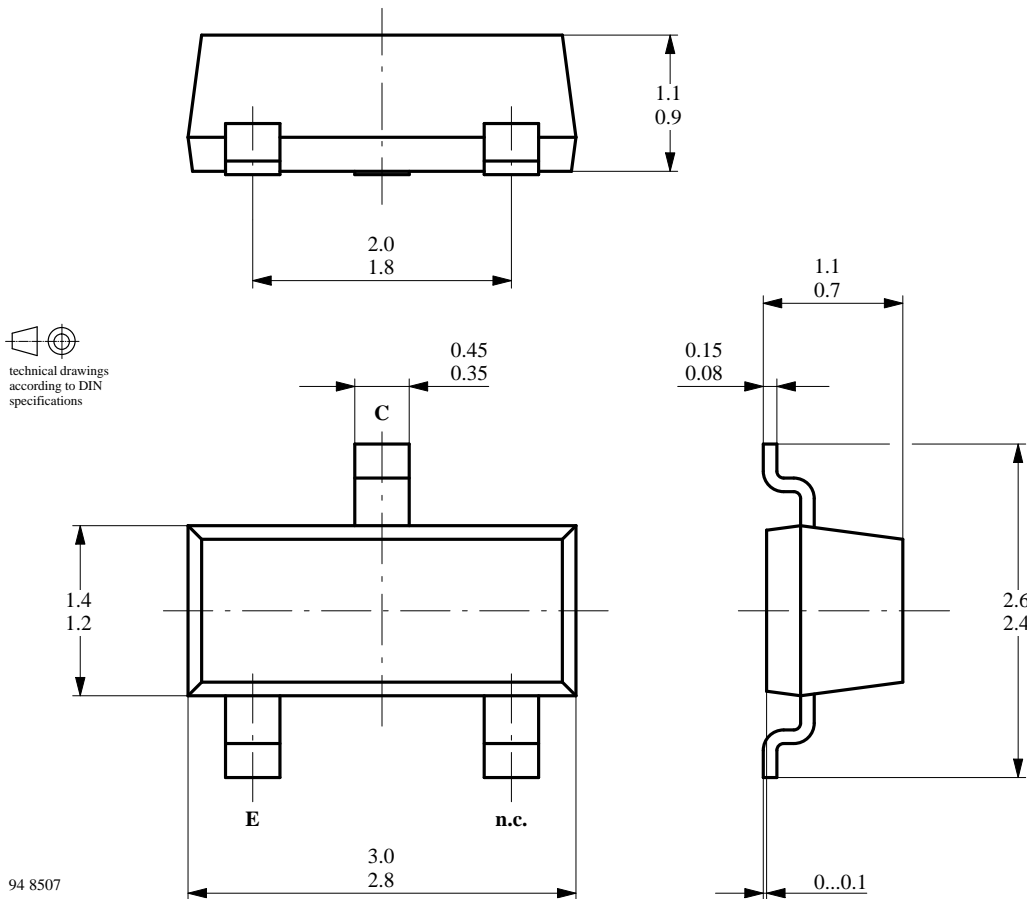
Figure 8 : Relative Spectral Sensitivity vs. Wavelength



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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.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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