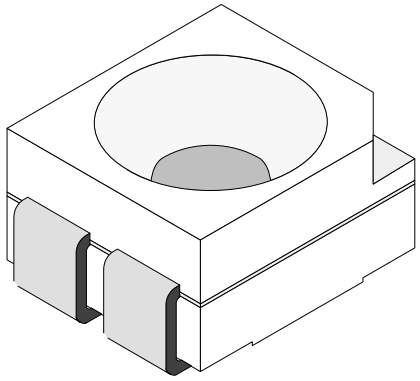
TEMT 4700

Silicon NPN Phototransistor

Description

TEMT4700 is a high speed silicon NPN epitaxial planar phototransistor in a miniature PL–CC–2 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

- PL–CC–2 SMD package
- Extra wide viewing angle $\varphi = \pm 60^\circ$
- Package notch = collector
- Base terminal connected
- Fast response times
- Suitable for visible and near infrared radiation
- Matches with TSMS 3700 IR emitter

Applications

Miniature switches
Counters and sorters
Interrupters
Tape and card readers
Encoders
Position sensors

Absolute Maximum Ratings

T_{amb} = 25°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	$t_p/T \leqq 0.1$, $t_p \leqq 10\mu s$	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leqq 55$ ˚C	P_{tot}	100	mW
Junction Temperature		T_j	100	˚C
Storage Temperature Range		T_{stg}	–55...+100	˚C
Soldering Temperature	t ≦ 3 s	T_{sd}	260	˚C
Thermal Resistance Junction/Ambient		R_{thJA}	450	K/W

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	I_C = 1 mA	$V_{(BR)CEO}$	70			V
Collector Dark Current	V_{CE} = 20 V, E = 0	I_{CEO}		1	200	nA
Collector Emitter Capacitance	V_{CE} = 5 V, f = 1 MHz, E=0	C_{CEO}		3		pF
Collector Light Current	E_e=1mW/cm^2, λ=950nm, V_{CE}=5V	I_{ca}	0.25	0.5		mA
Angle of Half Sensitivity		φ		±60		deg
Wavelength of Peak Sensitivity		λ_p		830		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620...980		nm
Collector Emitter Saturation Voltage	E_e=1mW/cm^2, λ=950nm, I_C=0.1mA	V_{CEsat}		0.15	0.3	V
Rise Time / Fall Time	V_S=5V, I_C=1mA, λ=950nm, R_L=1kΩ	t_r / t_f		6		µs
Rise Time / Fall Time	V_S=5V, I_C=1mA, λ=950nm, R_L=100Ω	t_r / t_f		2		µs
Cut–Off Frequency	V_S=5V, I_C=2mA, R_L=100Ω	f_c		180		kHz

Typical Characteristics (T_{amb} = 25°C unless otherwise specified)

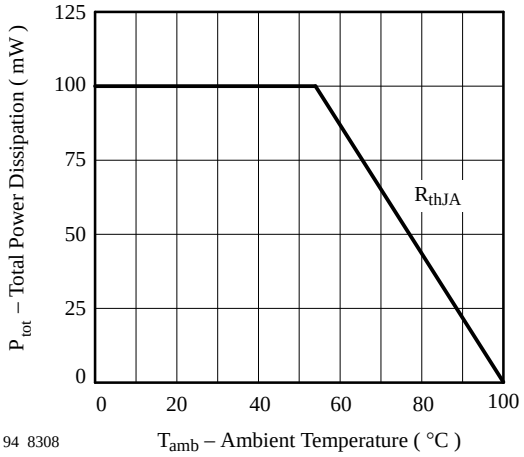


Figure 1 : Total Power Dissipation vs. Ambient Temperature

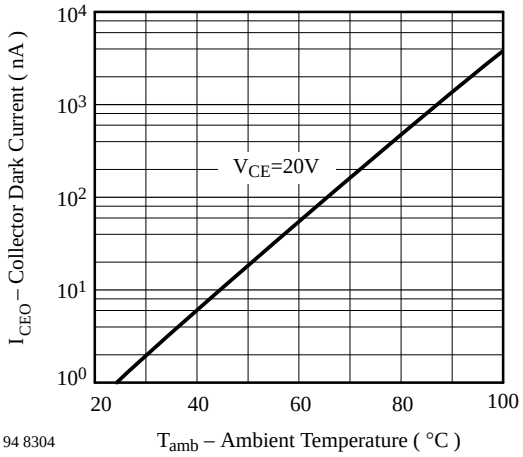


Figure 2 : Collector Dark Current vs. Ambient Temperature

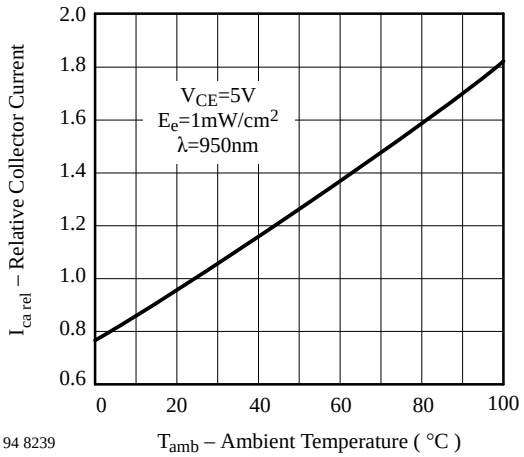


Figure 3 : Relative Collector Current vs. Ambient Temperature

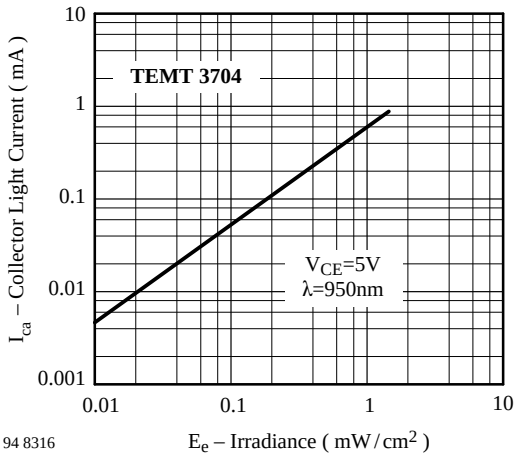


Figure 4 : Collector Light Current vs. Irradiance

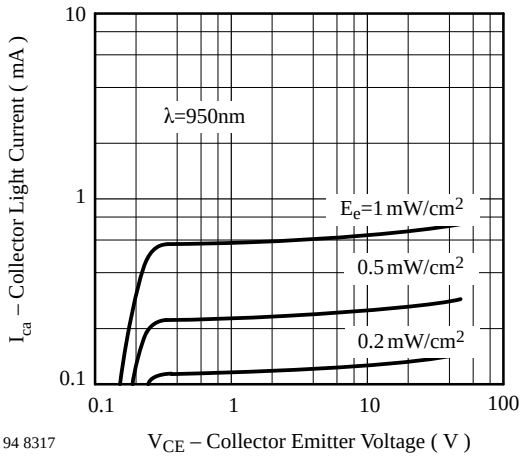


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

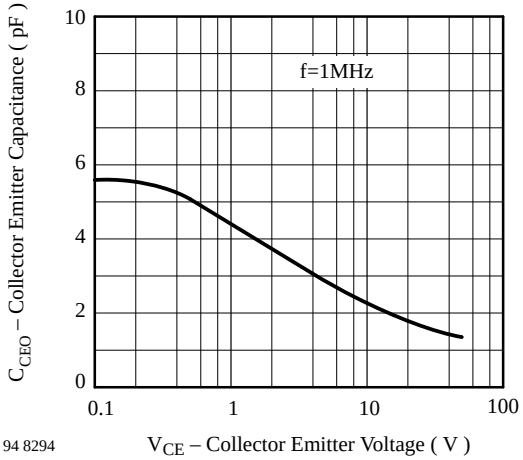


Figure 6 : Collector Emitter Capacitance vs. Collector Emitter Voltage

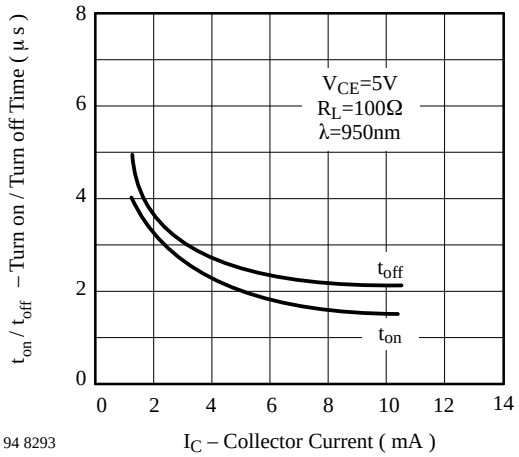


Figure 7 : Turn On/Turn Off Time vs. Collector Current

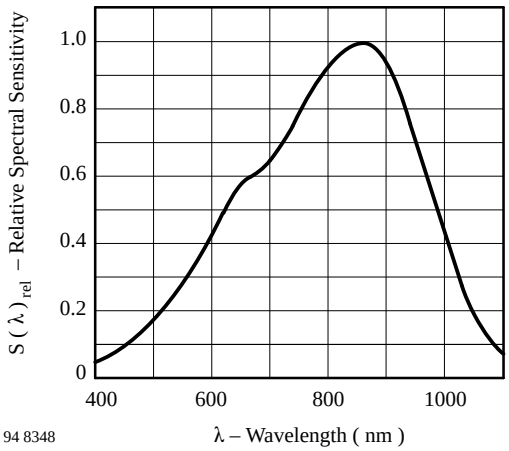


Figure 8 : Relative Spectral Sensitivity vs. Wavelength

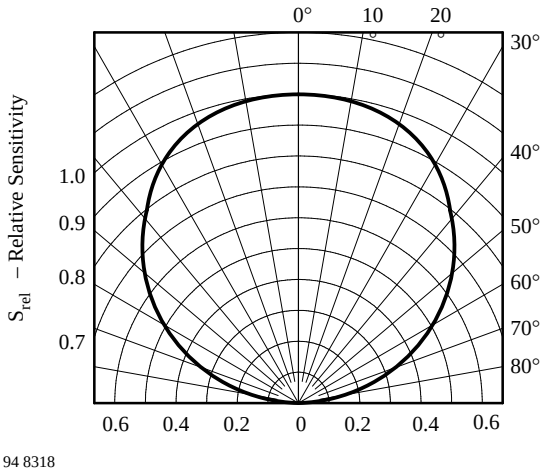
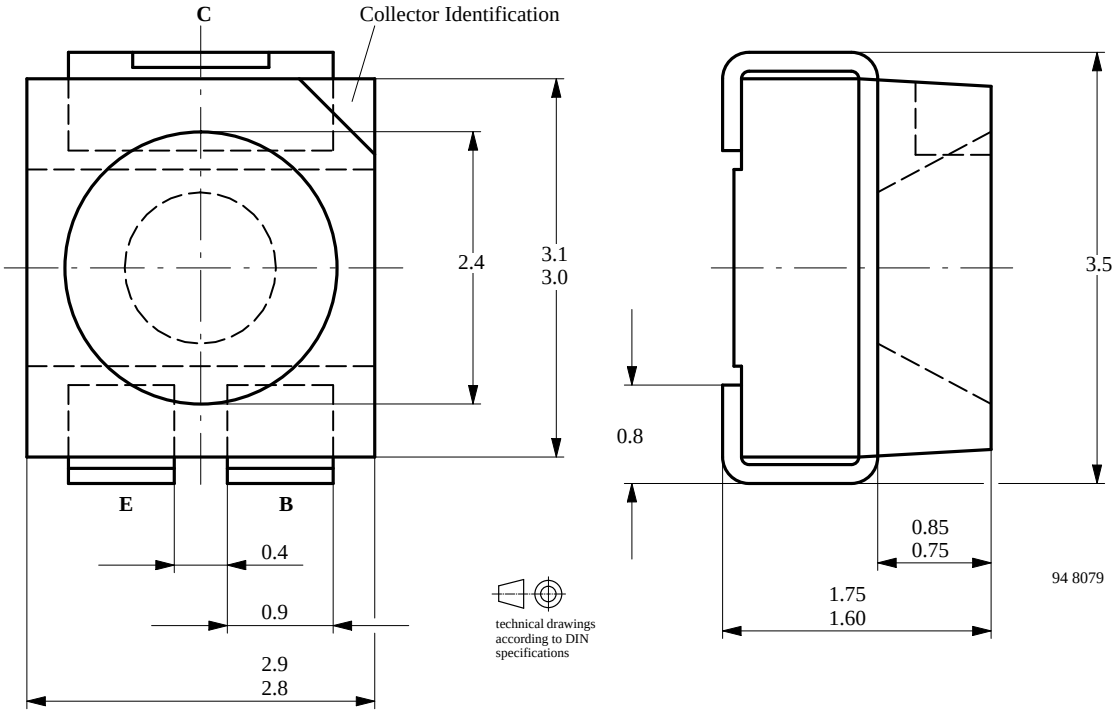


Figure 9 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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