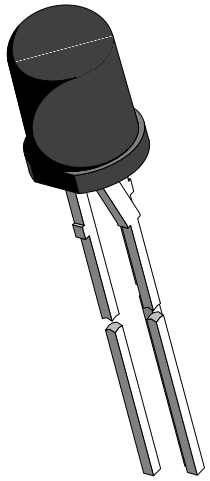
Silicon NPN Phototransistor

Description

BPV 11 F is a very high sensitive silicon NPN epitaxial planar phototransistor in a standard T–1¾ plastic package.
The epoxy package itself is an IR filter, spectrally matched to GaAs IR emitters ($\lambda_p \geqq 900$nm). The viewing angle of ± 15° makes it insensible to ambient straylight.
A base terminal is available to enable biasing and sensitivity control.



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Features

- Very high radiant sensitivity
- Standard T–1¾ (ø 5 mm) package
- IR filter for GaAs emitters (950 nm)
- Angle of half sensitivity $\varphi = \pm 15°$
- Base terminal available

Applications

Detector for industrial electronic circuitry, measurement and control

Absolute Maximum Ratings

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Collector Base Voltage		V_{CBO}	80	V
Collector Emitter Voltage		V_{CEO}	70	V
Emitter Base Voltage		V_{EBO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	t_p/T = 0.5, $t_p \leqq$ 10 ms	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leqq$ 47 ˚C	P_{tot}	150	mW
Junction Temperature		T_j	100	˚C
Storage Temperature Range		T_{stg}	–55...+100	˚C
Soldering Temperature	t ≦ 5 s, 2 mm from body	T_{sd}	260	˚C
Thermal Resistance Junction/Ambient		R_{thJA}	350	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} = 10 V, E = 0	I_{CEO}		1	50	nA
DC Current Gain	V_{CE} = 5 V, I_C = 5 mA, E = 0	h_{FE}		700		
Collector Emitter Capacitance	V_{CE} = 0 V, f = 1 MHz, E=0	C_{CEO}		15		pF
Collector Base Capacitance	V_{CB} = 0 V, f = 1 MHz, E=0	C_{CBO}		19		pF
Collector Light Current	E_e=1mW/cm^2, λ=950nm, V_{CE}=5V	I_{ca}	3	9		mA
Angle of Half Sensitivity		φ		±15		deg
Wavelength of Peak Sensitivity		λ_p		930		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		900...980		nm
Collector Emitter Saturation Voltage	E_e=1mW/cm^2, λ=950nm, I_C=1mA	V_{CEsat}		130	300	mV
Turn–On Time	V_S=5V, I_C=5mA, R_L=100Ω	t_{on}		6		µs
Turn–Off Time	V_S=5V, I_C=5mA, R_L=100Ω	t_{off}		5		µs
Cut–Off Frequency	V_S=5V, I_C=5mA, R_L=100Ω	f_c		110		kHz

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

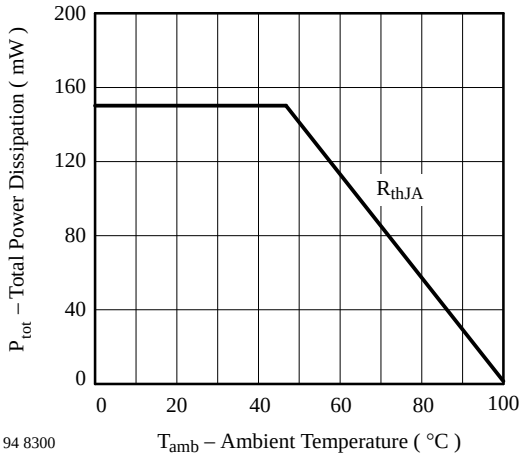


Figure 1 : Total Power Dissipation vs. Ambient Temperature

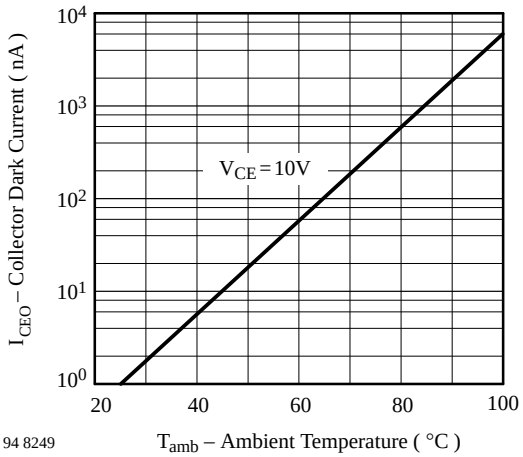


Figure 2 : Collector Dark Current vs. Ambient Temperature

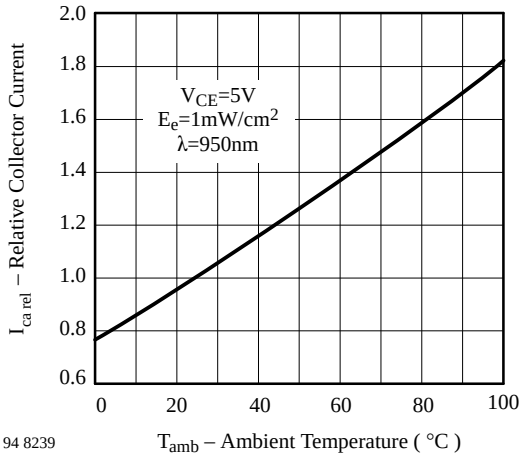


Figure 3 : Relative Collector Current vs. Ambient Temperature

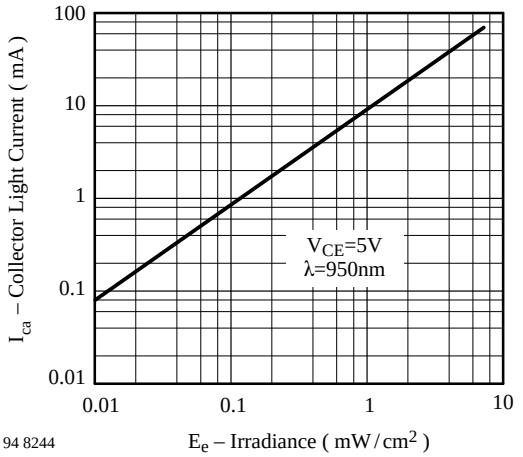


Figure 4 : Collector Light Current vs. Irradiance

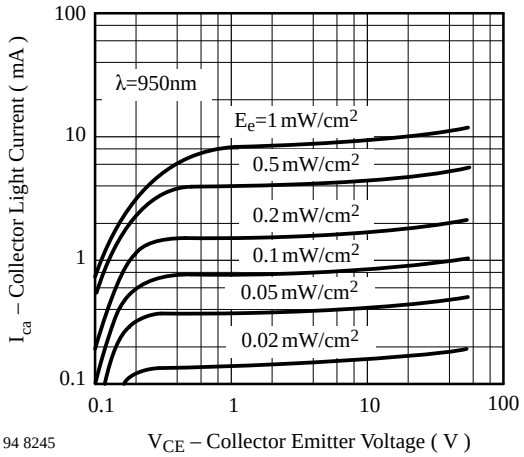


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

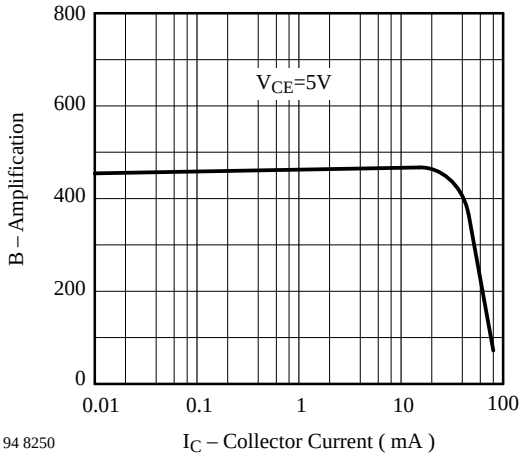


Figure 6 : Amplification vs. Collector Current

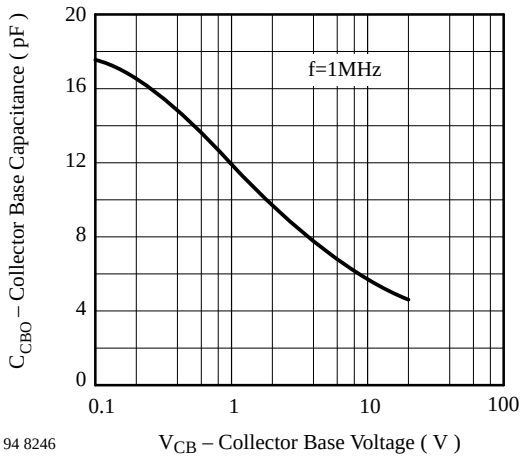


Figure 7 : Collector Base Capacitance vs. Collector Base Voltage

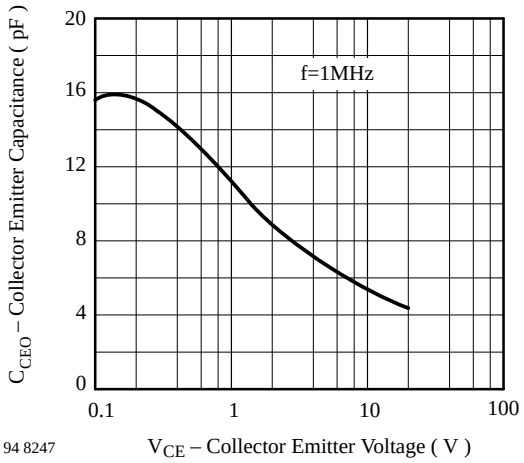


Figure 8 : Collector Emitter Capacitance vs. Collector Emitter Voltage

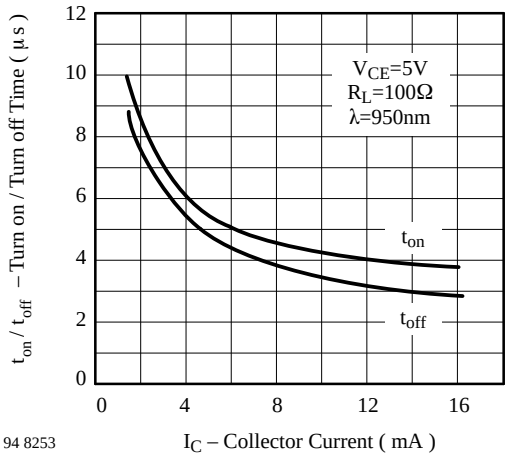


Figure 9 : Turn On/Turn Off Time vs. Collector Current

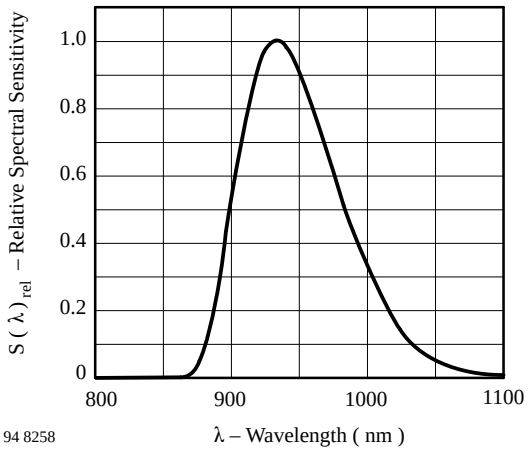


Figure 10 : Relative Spectral Sensitivity vs. Wavelength

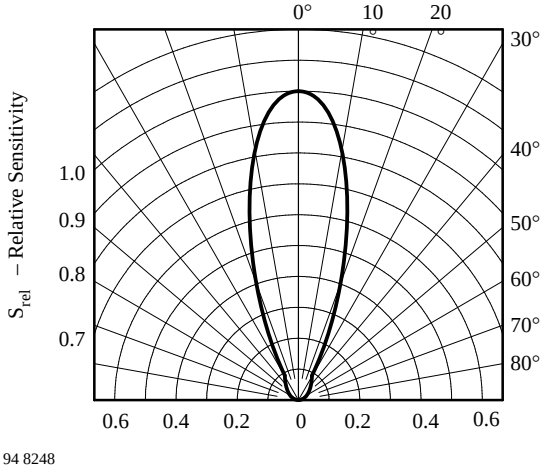
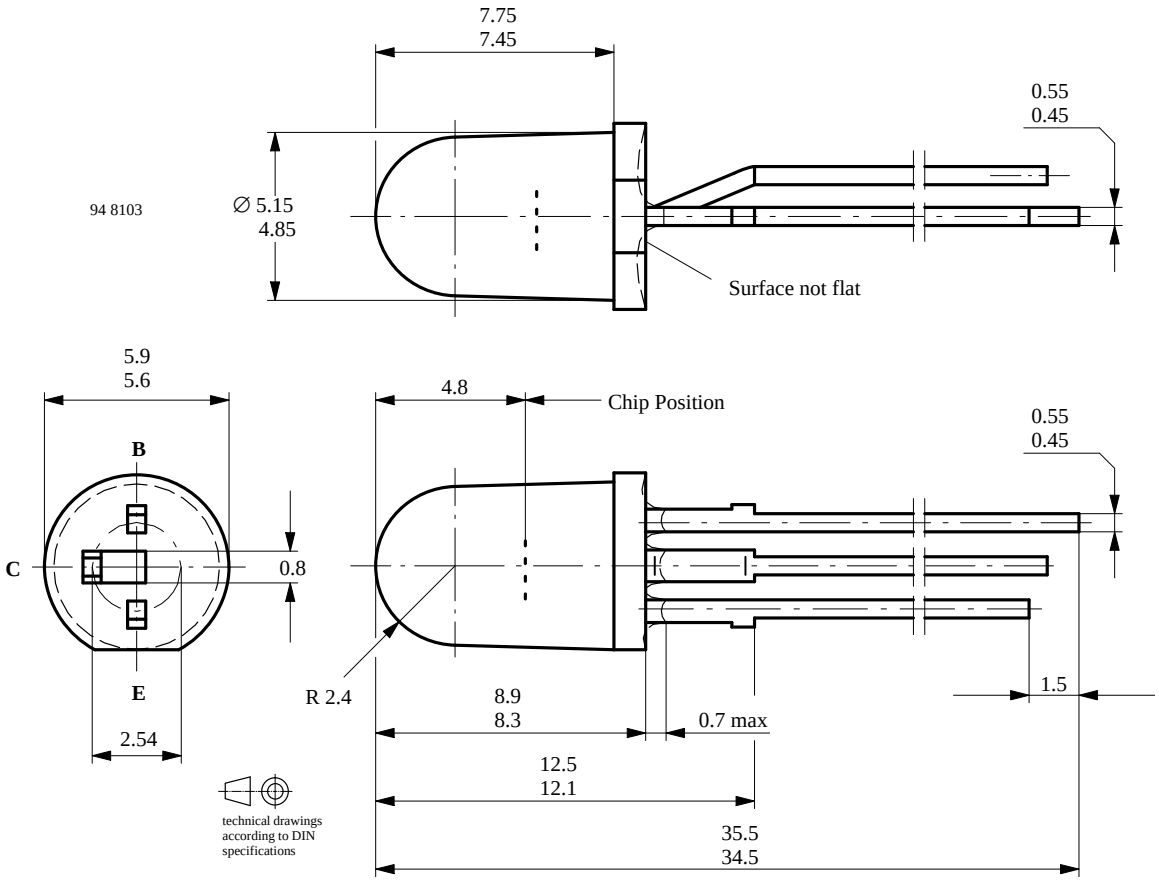


Figure 11 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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