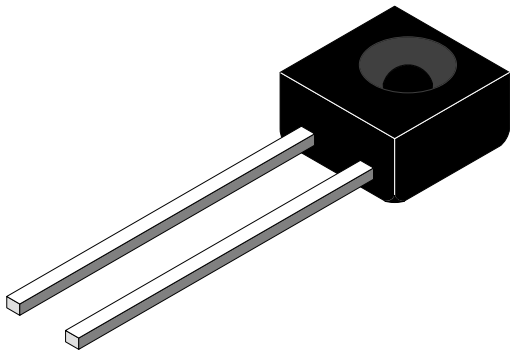
Silicon NPN Phototransistor

Description

BPW78 is a high sensitive silicon NPN epitaxial planar phototransistor in a flat side view plastic package.
A small recessed lens provides a high sensitivity in a low profile case.
The epoxy package itself is an IR filter, spectrally matched to GaAs or GaAs on GaAlAs IR emitters (λ_p > 850nm).



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Features

- Plastic case with IR filter
- Suitable for near infrared radiation
- High radiant sensitivity
- Super flat sideview case with spherical lens
- Lens integrated
- Irradiation direction vertical to mounting direction
- Angle of half sensitivity $\varphi = \pm 25^\circ$
- Selected into sensitivity groups
- Compatibel with CQX 48

Applications

Detector in electronic control and drive circuits

Absolute Maximum Ratings

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Collector Emitter Voltage		V_{CEO}	32	V
Emitter Collector Voltage		V_{ECO}	5	V
Collector Current		I_C	100	mA
Peak Collector Current	t_p/T = 0.5, t_p ≦ 10 ms	I_{CM}	200	mA
Total Power Dissipation	T_{amb} ≦ 40 ˚C	P_{tot}	150	mW
Junction Temperature		T_j	100	˚C
Storage Temperature Range		T_{stg}	–55...+100	˚C
Soldering Temperature	t ≦ 5 s	T_{sd}	260	˚C
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	I_C = 1 mA	$V_{(BR)CEO}$	32			V
Emitter Collector Breakdown Voltage	I_E = 100 µA	$V_{(BR)ECO}$	5			V
Collector Dark Current	V_{CE} = 20 V, E = 0	I_{CEO}		1	100	nA
Collector Emitter Capacitance	V_{CE} = 5 V, f = 1 MHz, E=0	C_{CEO}		6		pF
Angle of Half Sensitivity		φ		±25		deg
Wavelength of Peak Sensitivity		λ_p		920		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		850...980		nm
Collector Emitter Saturation Voltage	E_e=1mW/cm^2, λ=950nm, I_C=0.1mA	V_{CEsat}			0.3	V
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

Type Dedicated Characteristics

T_{amb} = 25°C

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Light Current	BPW78A	V_{CE}=5 V, E_e=1 mW/cm^2, λ_p=950 nm	I_{ca}	1	2	3	mA
	BPW78B	V_{CE}=5 V, E_e=1 mW/cm^2, λ_p=950 nm	I_{ca}	2	4		mA

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

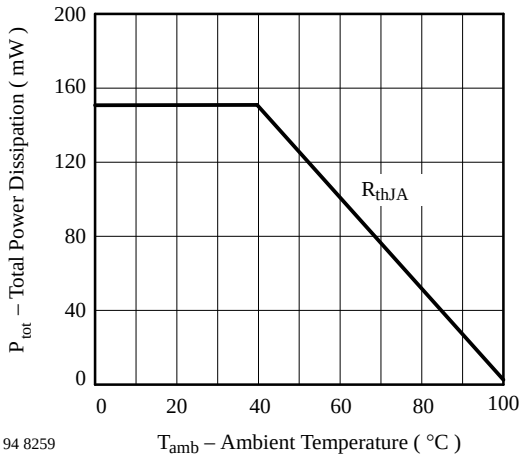


Figure 1 : Total Power Dissipation vs. Ambient Temperature

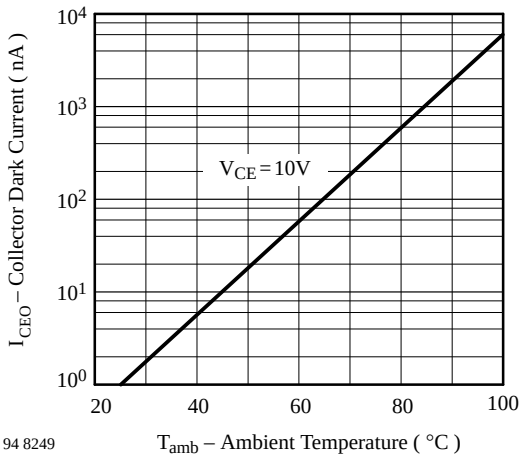


Figure 2 : Collector Dark Current vs. Ambient Temperature

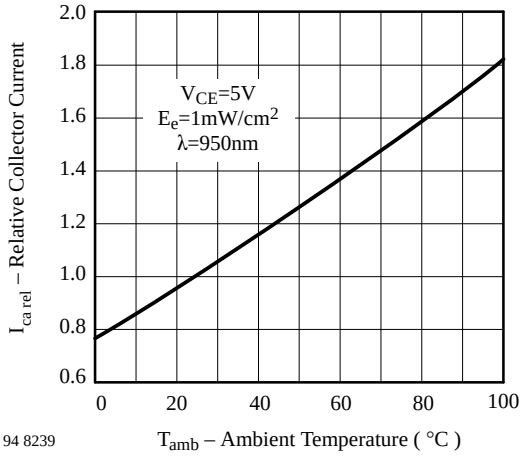


Figure 3 : Relative Collector Current vs. Ambient Temperature

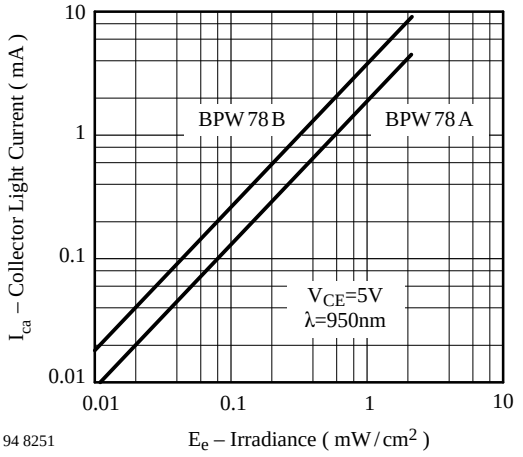


Figure 4 : Relative Radiant Sensitivity vs. Angular Displacement

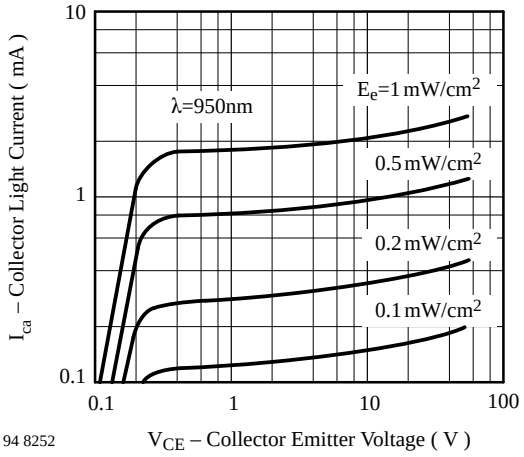


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

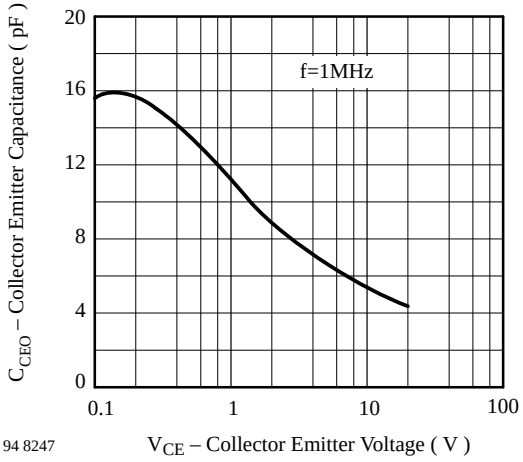


Figure 6 : Collector Emitter Capacitance vs. Collector Emitter Voltage

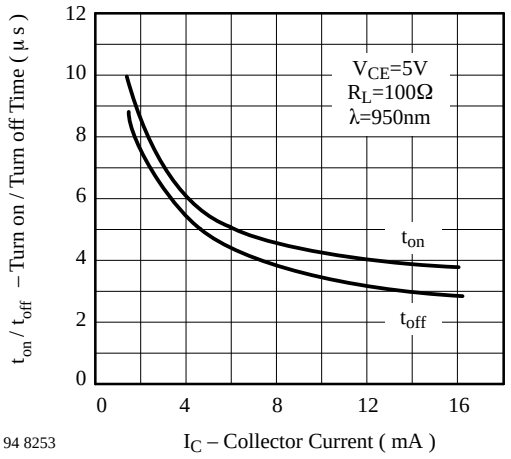


Figure 7 : Turn On/Turn Off Time vs. Collector Current

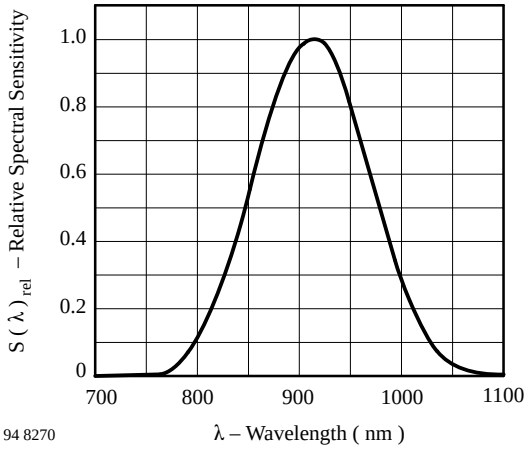


Figure 8 : Relative Spectral Sensitivity vs. Wavelength

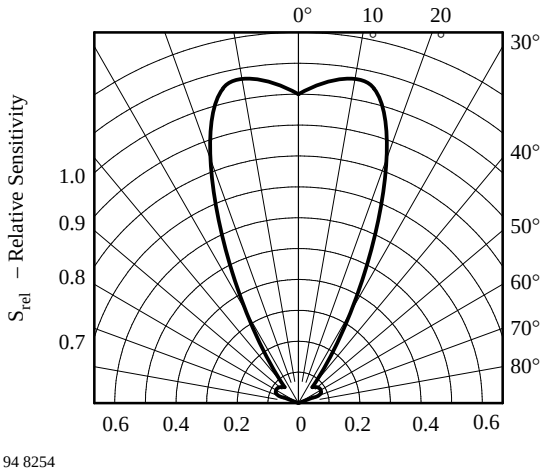
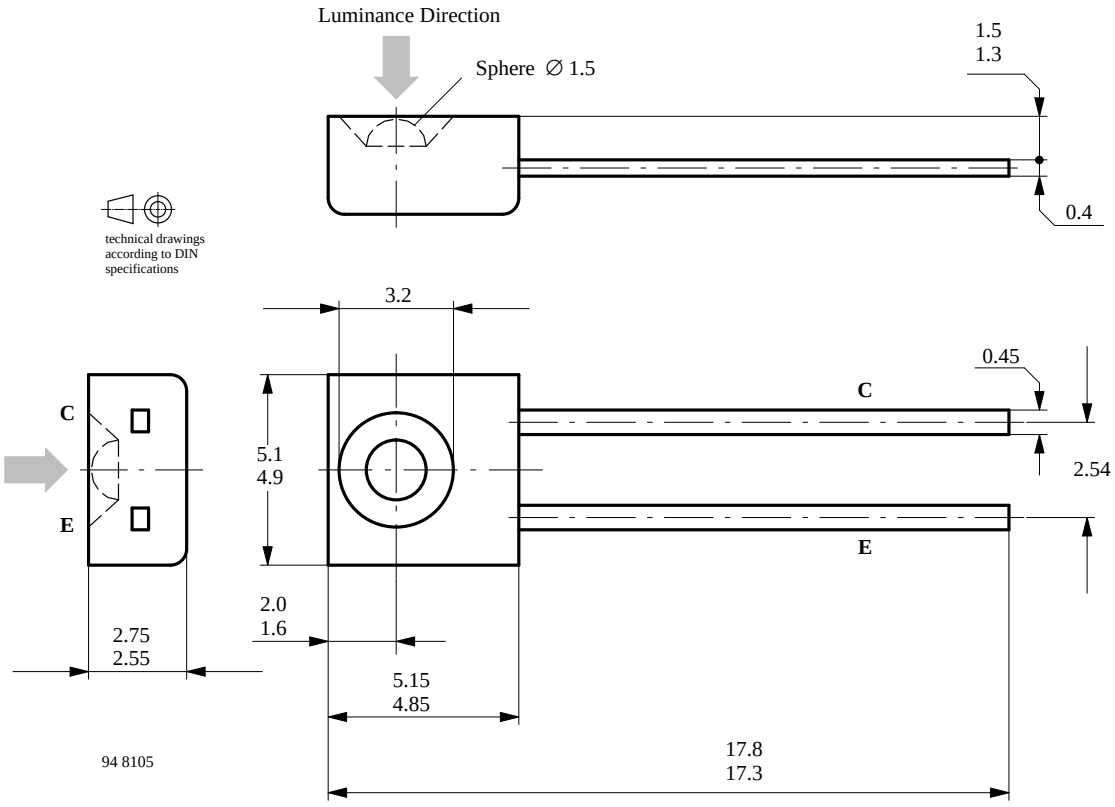


Figure 9 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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