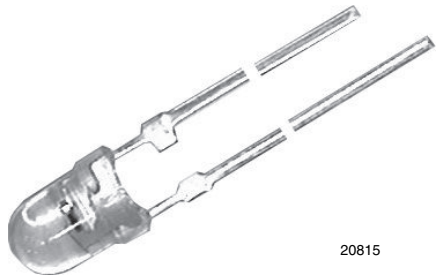
Silicon NPN Phototransistor



FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): Ø 3
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: φ = ± 25°
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e4
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

DESCRIPTION

BPW85 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 plastic package. It is sensitive to visible and near infrared radiation.

APPLICATIONS

- Detector in electronic control and drive circuits

PRODUCT SUMMARY

COMPONENT	I_{ca} (mA)	φ (deg)	$\lambda_{0.1}$ (nm)
BPW85	0.8 to 8	± 25	450 to 1080
BPW85A	0.8 to 2.5	± 25	450 to 1080
BPW85B	1.5 to 4	± 25	450 to 1080
BPW85C	3 to 8	± 25	450 to 1080

Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
BPW85	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1
BPW85A	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1
BPW85B	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1
BPW85C	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	5	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5$, $t_p \leq 10$ ms	I_{CM}	100	mA
Power dissipation	$T_{amb} \leq 55$ °C	P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	t ≤ 3 s, 2 mm from case	T_{sd}	260	°C
Thermal resistance junction/ambient	Connected with Cu wire Ø 0.14 mm^2	R_{thJA}	450	K/W

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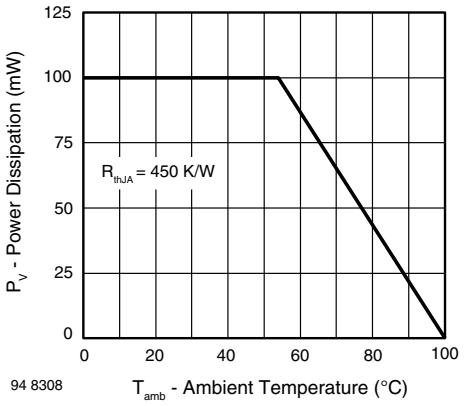

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Collector emitter breakdown voltage	I_C = 1 mA	$V_{(BR)CEO}$	70			V
Collector emitter 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
Angle of half sensitivity		φ		± 25		deg
Wavelength of peak sensitivity		λ_p		850		nm
Range of spectral bandwidth		$\lambda_{0.1}$		450 to 1080		nm
Collector emitter saturation voltage	E_e = 1 mW/cm^2, λ = 950 nm, I_C = 0.1 mA	V_{CEsat}			0.3	V
Turn-on time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{on}		2.0		µs
Turn-off time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{off}		2.3		µs
Cut-off frequency	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	f_c		180		kHz

TYPE DEDICATED CHARACTERISTICS							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Collector light current	E_e = 1 mW/cm^2, λ = 950 nm, V_{CE} = 5 V	BPW85	I_{ca}	0.8		8.0	mA
		BPW85A	I_{ca}	0.8		2.5	mA
		BPW85B	I_{ca}	1.5		4.0	mA
		BPW85C	I_{ca}	3.0		8.0	mA

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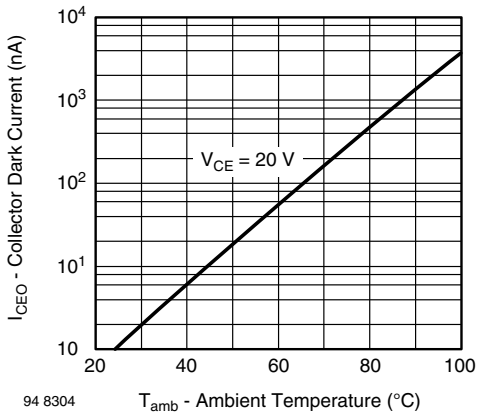

Fig. 2 - Collector Dark Current vs. Ambient Temperature

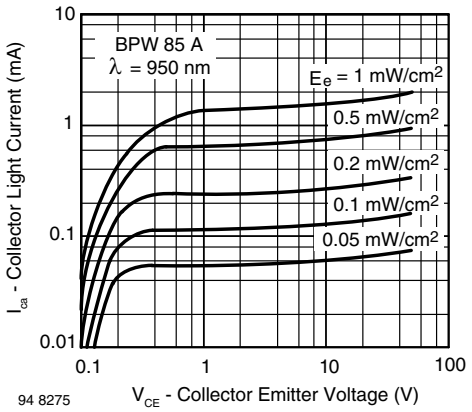

Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

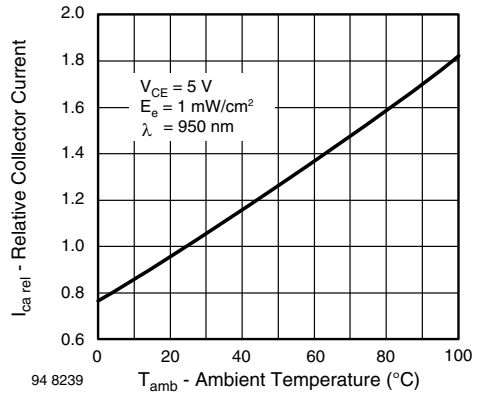

Fig. 3 - Relative Collector Current vs. Ambient Temperature

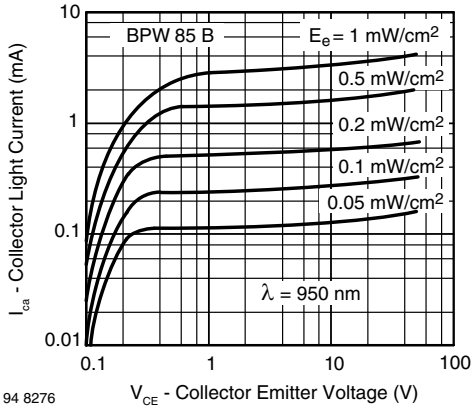

Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

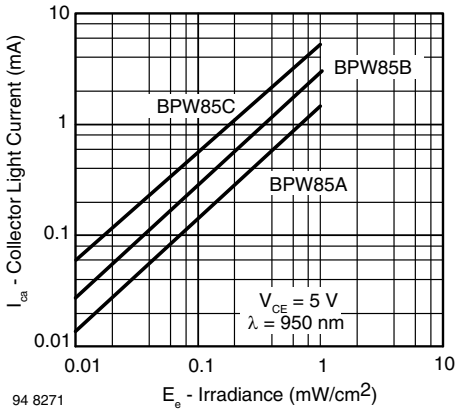

Fig. 4 - Collector Light Current vs. Irradiance

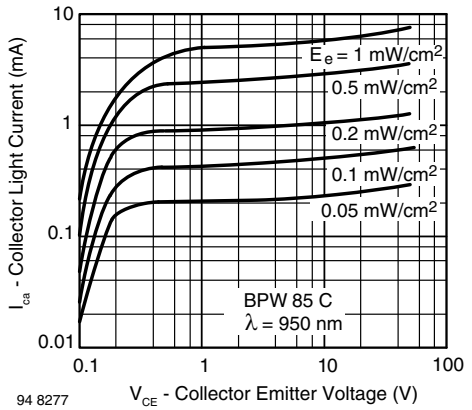

Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

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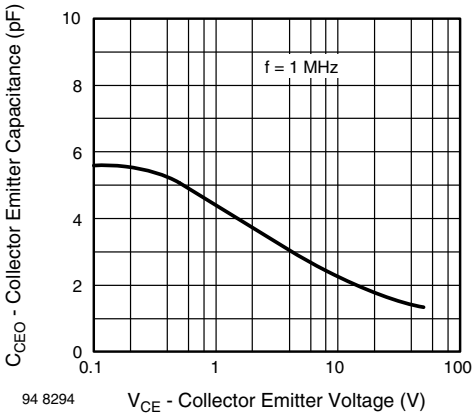

Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

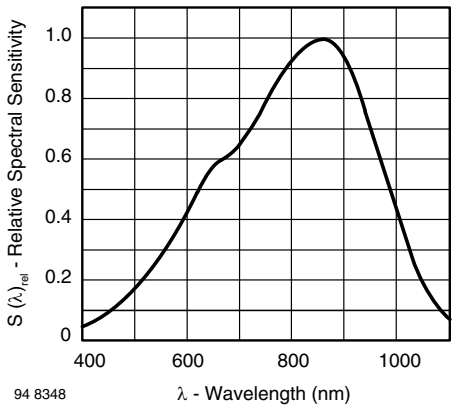

Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

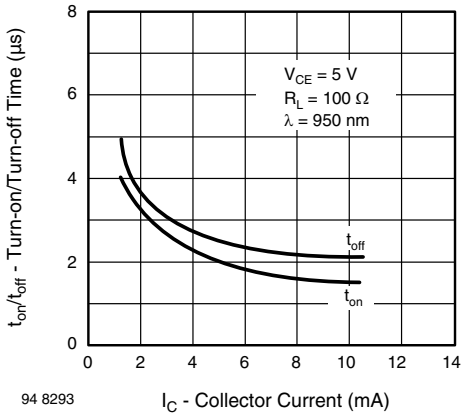

Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

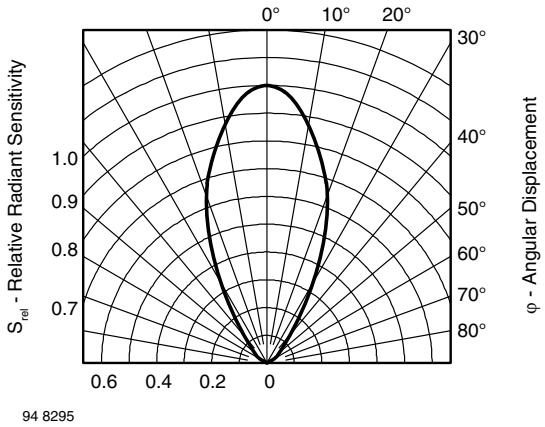

Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

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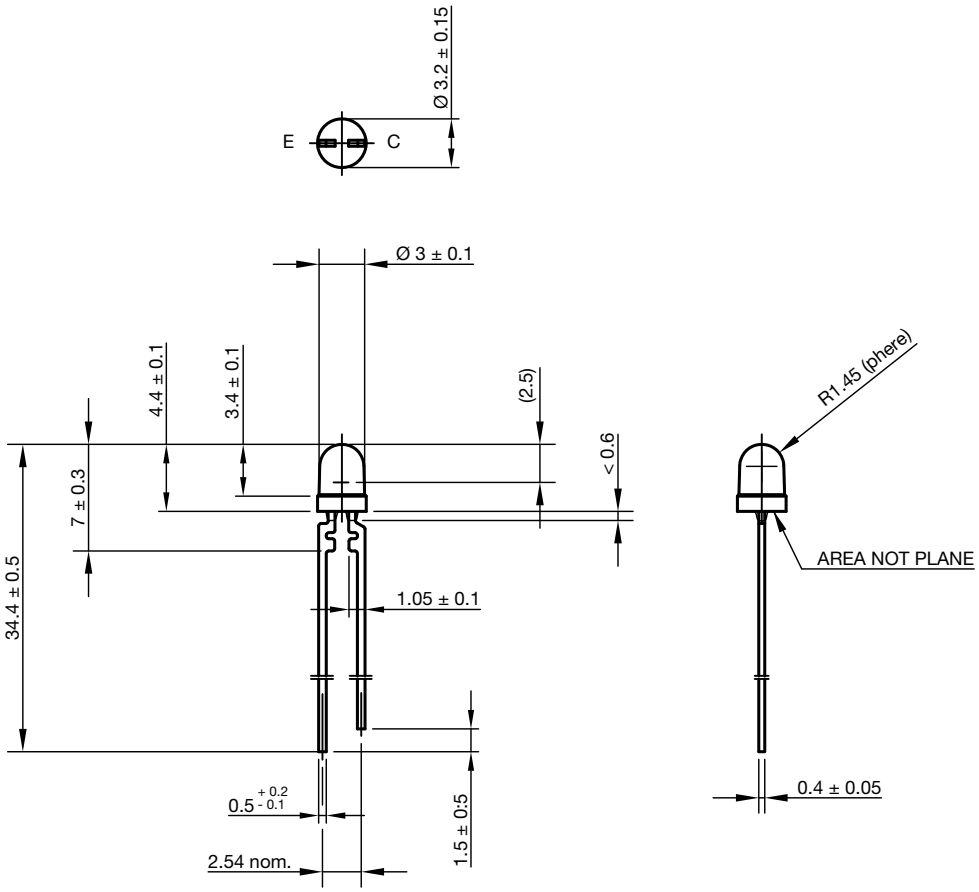
PACKAGE DIMENSIONS in millimeters



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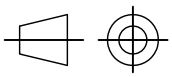

technical drawings
according to DIN
specifications

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