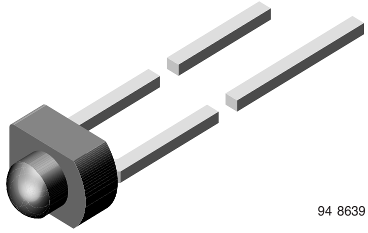
Silicon NPN Phototransistor

Description

BPW17N is a silicon NPN epitaxial planar phototransistor in a miniature plastic case with a ± 12 ° lens.

With a lead center to center spacing of 2.54 mm and a package width of 2.4 mm the devices are easily stackable on PC boards and assembled to arrays of unlimited size.

Due to its waterclear epoxy the device is sensitive to visible and near infrared radiation.



Features

- Miniature T-¾ clear plastic package with lens
- Narrow viewing angle $\varphi = \pm 12$ °
- Insensitive against background light due to narrow aperture
- Suitable for 0.1" (2.54 mm) center to center spacing
- Suitable for visible and near infrared radiation
- Compatible with IR diode CQY37N
- Lead-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

Detector in electronic control and drive circuits

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Collector Emitter Voltage		V_{CEO}	32	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
Total Power Dissipation	$T_{amb} \leq 55$ °C	P_{tot}	100	mW
Junction Temperature		T_j	100	°C
Storage Temperature Range		T_{stg}	- 55 to + 100	°C
Soldering Temperature	$t \leq 3$ s	T_{sd}	260	°C
Thermal Resistance Junction/ Ambient		R_{thJA}	450	K/W

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector Emitter Breakdown Voltage	I_C = 1 mA	$V_{(BR)CEO}$	32			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}		8		pF

Optical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector Light Current	E_e = 1 mW/cm^2, λ = 950 nm, V_{CE} = 5 V	I_{ca}	0.5	1.0		mA
Angle of Half Sensitivity		φ		± 12		deg
Wavelength of Peak Sensitivity		λ_p		825		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620 to 960		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}		4.8		µs
Turn-Off Time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{off}		5.0		µs
Cut-Off Frequency	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	f_c		120		kHz

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

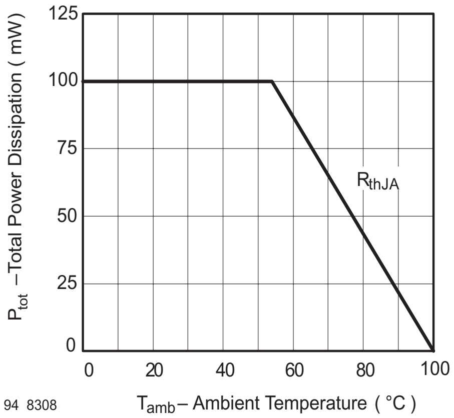


Figure 1. Total Power Dissipation vs. Ambient Temperature

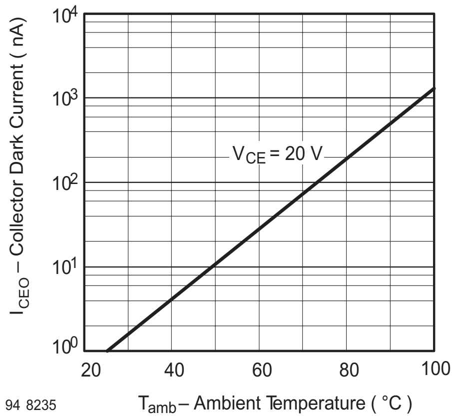


Figure 2. Collector Dark Current vs. Ambient Temperature

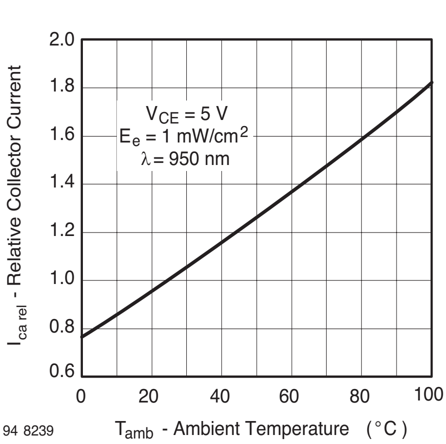


Figure 3. Relative Collector Current vs. Ambient Temperature

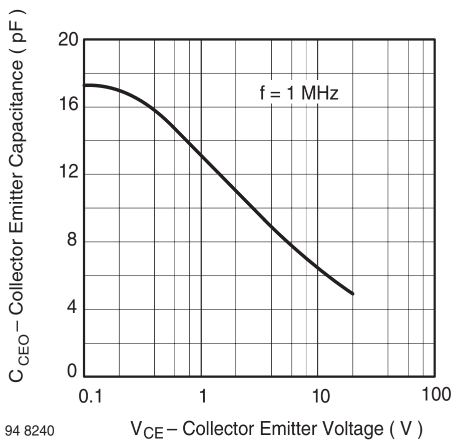


Figure 6. Collector Emitter Capacitance vs. Collector Emitter Voltage

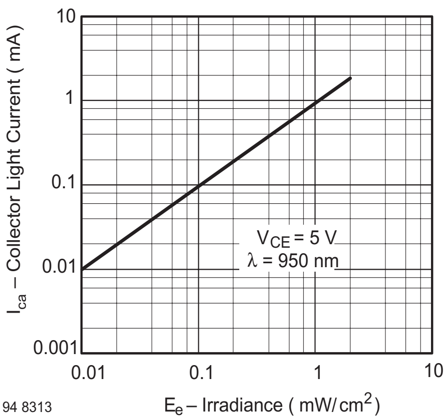


Figure 4. Collector Light Current vs. Irradiance

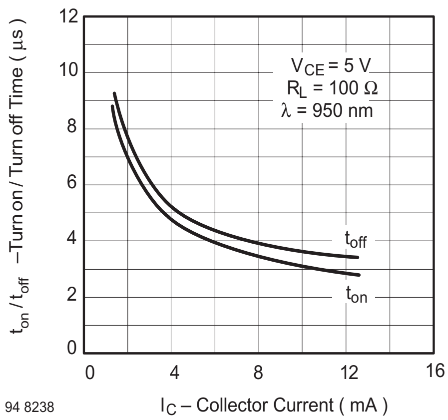


Figure 7. Turn On/Turn Off Time vs. Collector Current

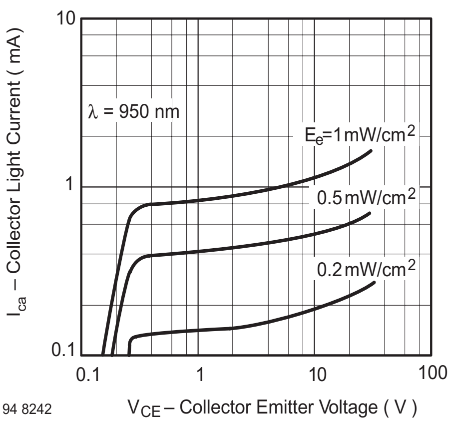


Figure 5. Collector Light Current vs. Collector Emitter Voltage

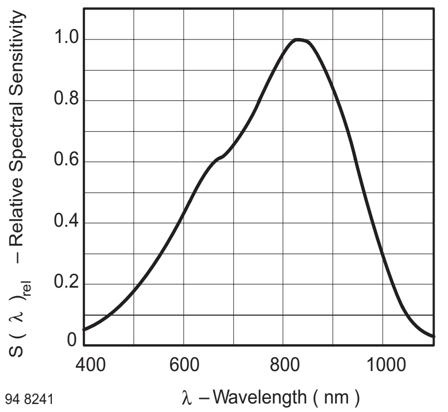


Figure 8. Relative Spectral Sensitivity vs. Wavelength

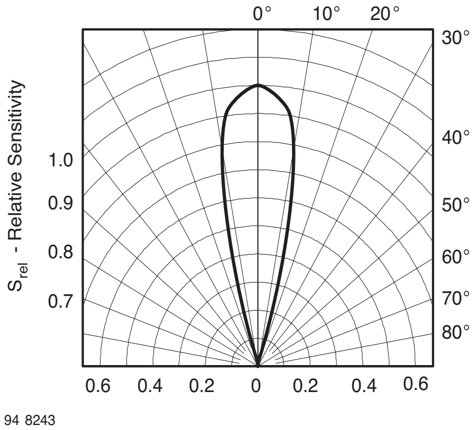
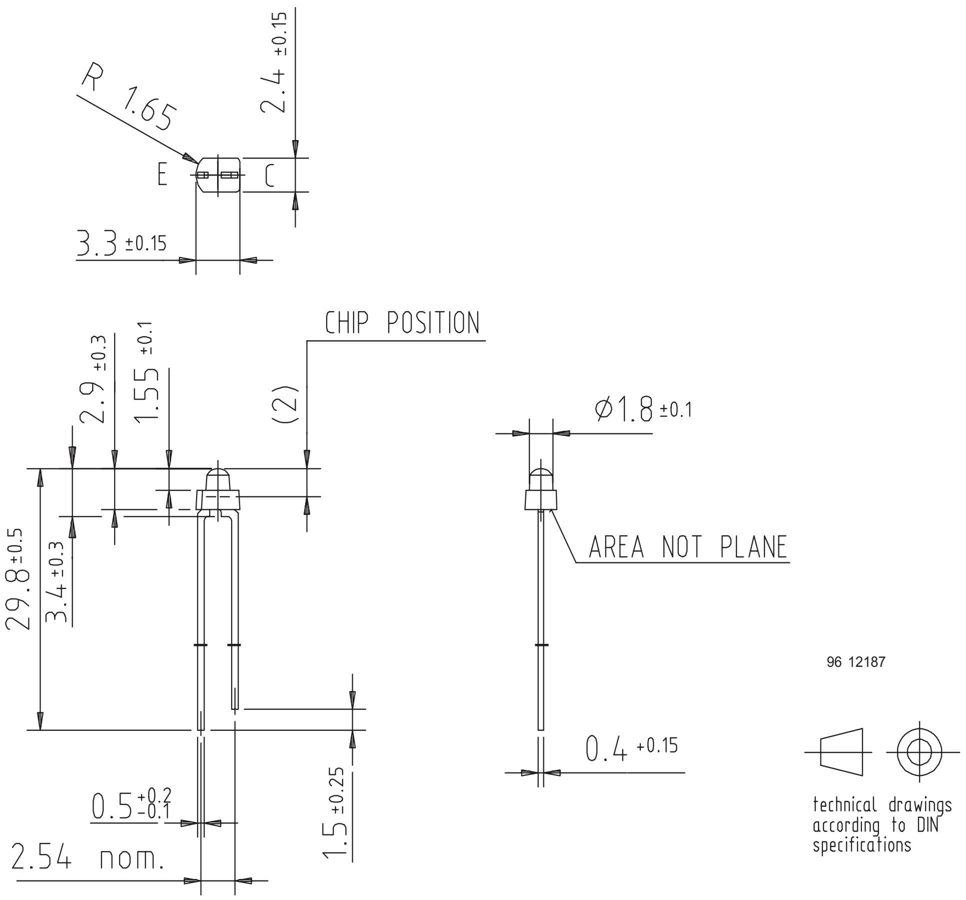


Figure 9. Relative Radiant Sensitivity vs. Angular Displacement

Package Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.