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### Silicon PIN Photodiode

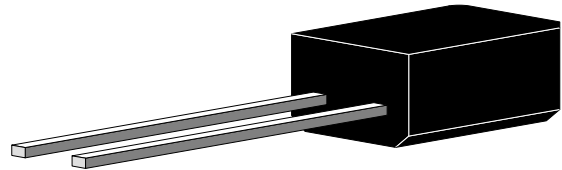
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#### Description

BPW41N is a high speed and high sensitive PIN photodiode in a flat side view plastic package.

The epoxy package itself is an IR filter, spectrally matched to GaAs or GaAs on GaAlAs IR emitters ( $\lambda_p = 950 \text{ nm}$ ).

The large active area combined with a flat case gives a high sensitivity at a wide viewing angle.



#### Features

- Large radiant sensitive area ( $A=7.5 \text{ mm}^2$ )
- Wide angle of half sensitivity  $\varphi = \pm 65^\circ$
- High radiant sensitivity
- Fast response times
- Small junction capacitance
- Plastic case with IR filter ( $\lambda=950 \text{ nm}$ )
- Suitable for near infrared radiation

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#### Applications

High speed photo detector

### Absolute Maximum Ratings

 $T_{amb} = 25^{\circ}\text{C}$ 

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		$V_R$	60	V
Power Dissipation	$T_{amb} \leq 25^{\circ}\text{C}$	$P_V$	215	mW
Junction Temperature		$T_j$	100	$^{\circ}\text{C}$
Storage Temperature Range		$T_{stg}$	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 5\text{ s}$	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient		$R_{thJA}$	350	K/W

### Basic Characteristics

 $T_{amb} = 25^{\circ}\text{C}$ 

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Breakdown Voltage	$I_R = 100\ \mu\text{A}, E = 0$	$V_{(BR)}$	60			V
Reverse Dark Current	$V_R = 10\ \text{V}, E = 0$	$I_{ro}$		2	30	nA
Diode Capacitance	$V_R = 0\ \text{V}, f = 1\ \text{MHz}, E = 0$	$C_D$		70		pF
Diode Capacitance	$V_R = 3\ \text{V}, f = 1\ \text{MHz}, E = 0$	$C_D$		25	40	pF
Open Circuit Voltage	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}$	$V_o$		350		mV
Temp. Coefficient of $V_o$	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}$	$TK_{V_o}$		-2.6		mV/K
Short Circuit Current	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}$	$I_k$		38		$\mu\text{A}$
Temp. Coefficient of $I_k$	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}$	$TK_{I_k}$		0.1		%/K
Reverse Light Current	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}, V_R = 5\ \text{V}$	$I_{ra}$	43	45		$\mu\text{A}$
Angle of Half Sensitivity		$\varphi$		$\pm 65$		deg
Wavelength of Peak Sensitivity		$\lambda_p$		950		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		870...1050		nm
Noise Equivalent Power	$V_R = 10\ \text{V}, \lambda = 950\ \text{nm}$	NEP		$4 \times 10^{-14}$		$\text{W}/\sqrt{\text{Hz}}$
Rise Time	$V_R = 10\ \text{V}, R_L = 1\ \text{k}\Omega, \lambda = 820\ \text{nm}$	$t_r$		100		ns
Fall Time	$V_R = 10\ \text{V}, R_L = 1\ \text{k}\Omega, \lambda = 820\ \text{nm}$	$t_f$		100		ns

## Typical Characteristics ( $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

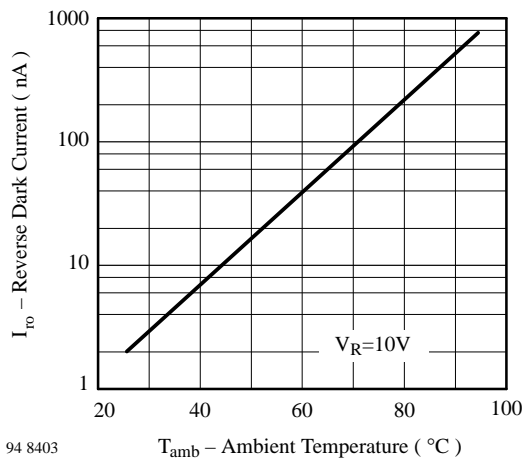


Figure 1 : Reverse Dark Current vs. Ambient Temperature

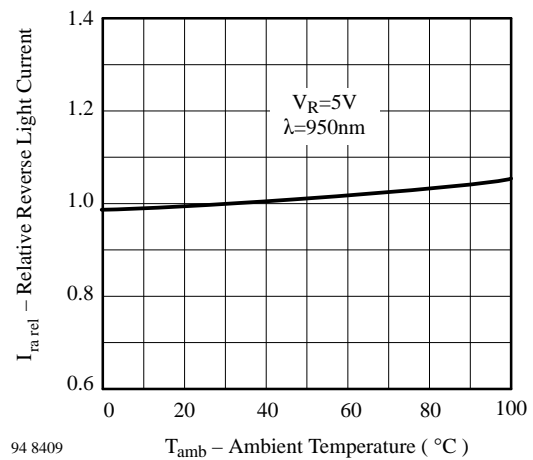


Figure 2 : Relative Reverse Light Current vs. Ambient Temperature

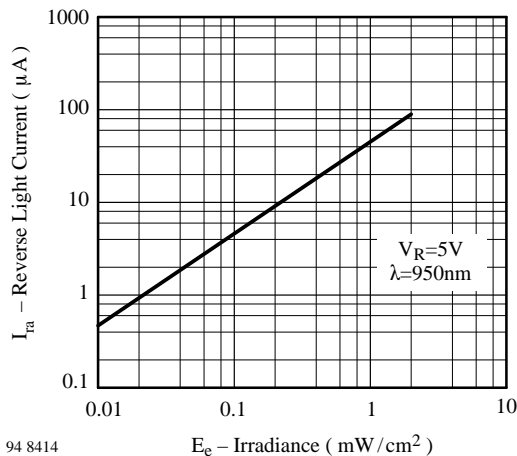


Figure 3 : Reverse Light Current vs. Irradiance

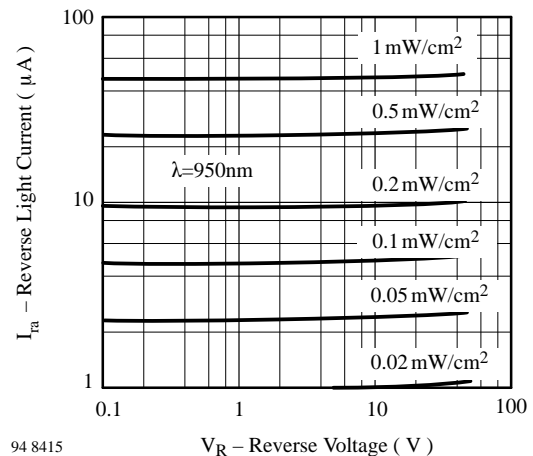


Figure 4 : Reverse Light Current vs. Reverse Voltage

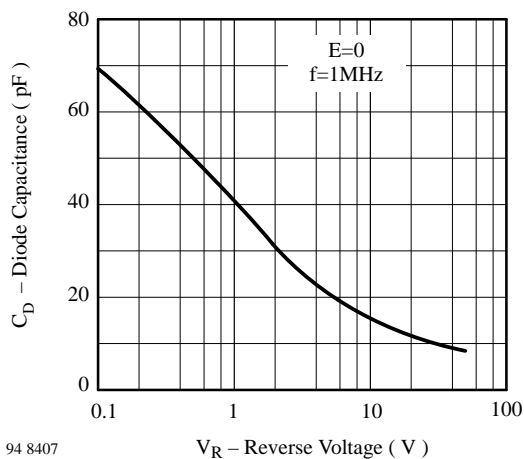


Figure 5 : Diode Capacitance vs. Reverse Voltage

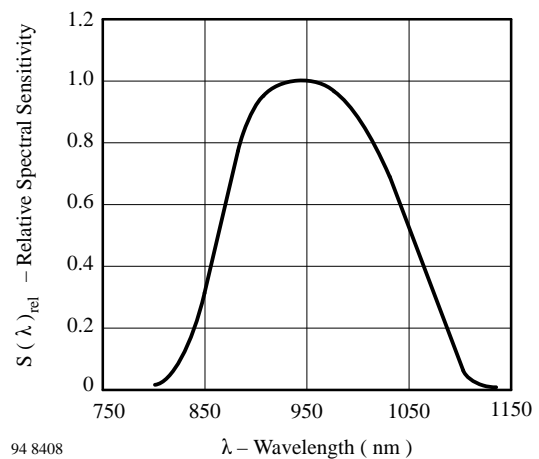
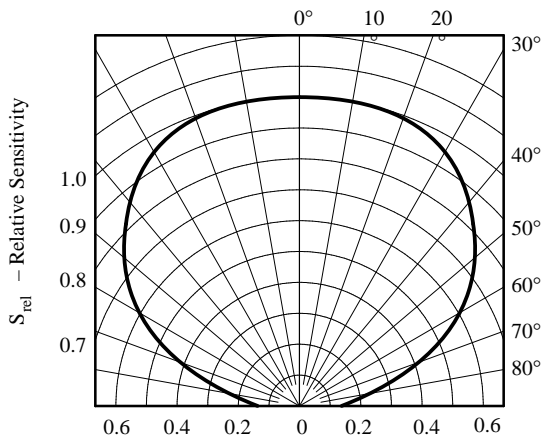


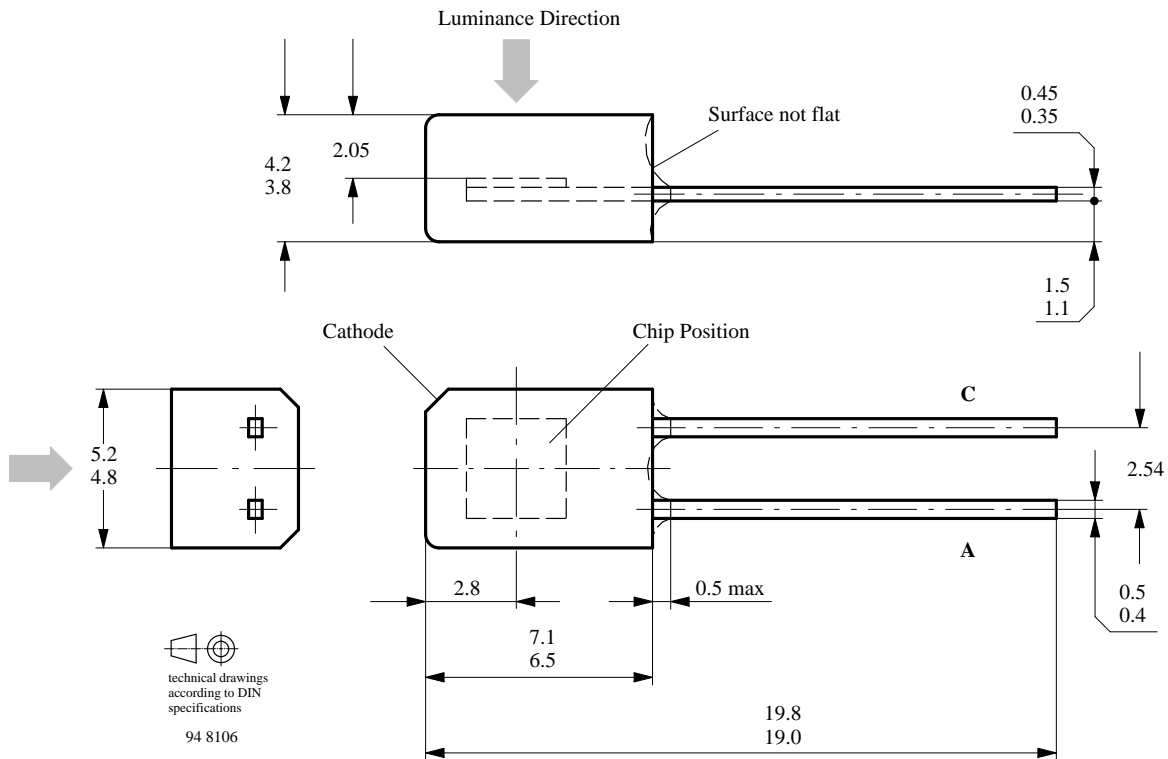
Figure 6 : Relative Spectral Sensitivity vs. Wavelength



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Figure 7 : Relative Radiant Sensitivity vs. Angular Displacement

## Dimensions in mm



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