

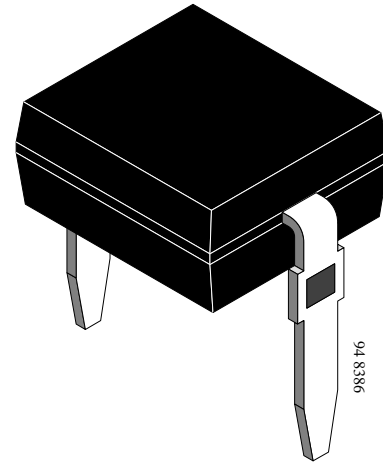
### Silicon PIN Photodiode

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#### Description

BP104 is a high speed and high sensitive PIN photodiode in a miniature flat plastic package. Its top view construction makes it ideal as a low cost replacement of TO-5 devices in many applications.

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 photo sensitivity
- Fast response times
- Small junction capacitance
- Plastic case with IR filter ( $\lambda=950 \text{ nm}$ )

#### 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	$t \leq 3\text{ s}$	$T_{sd}$	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
Short Circuit Current	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}$	$I_k$		38		$\mu\text{A}$
Reverse Light Current	$E_e = 1\ \text{mW}/\text{cm}^2, \lambda = 950\ \text{nm}, V_R = 5\ \text{V}$	$I_{ra}$	40	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)

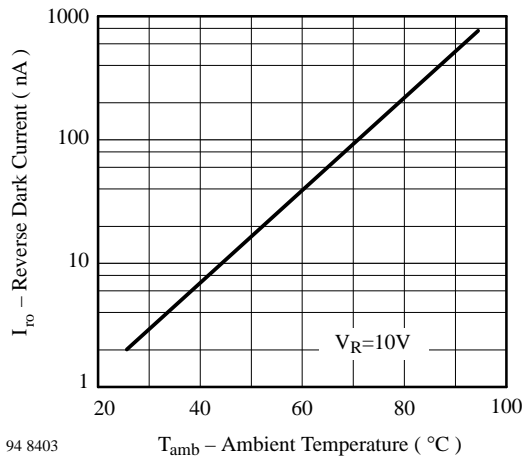


Figure 1 : Reverse Dark Current vs. Ambient Temperature

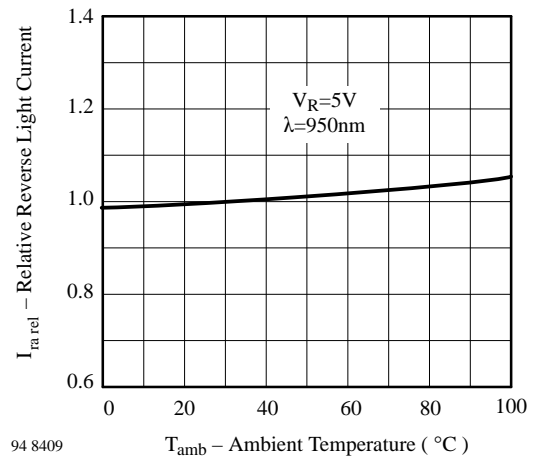


Figure 2 : Relative Reverse Light Current vs. Ambient Temperature

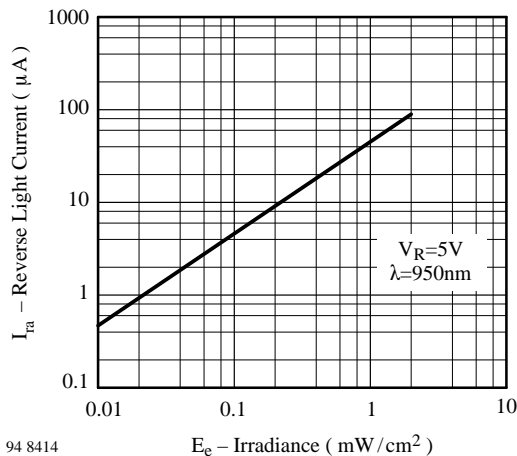


Figure 3 : Reverse Light Current vs. Irradiance

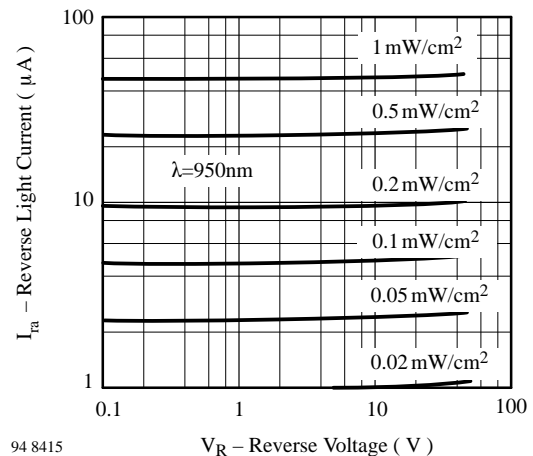


Figure 4 : Reverse Light Current vs. Reverse Voltage

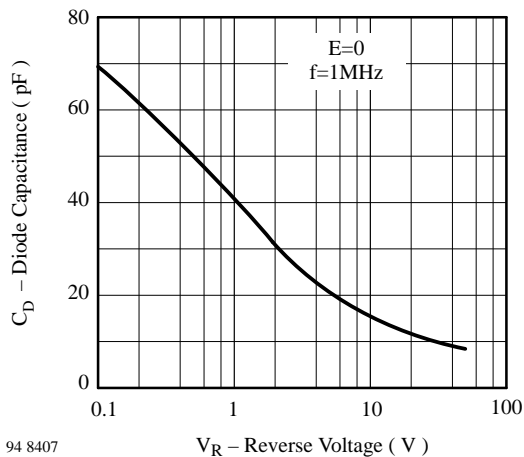


Figure 5 : Diode Capacitance vs. Reverse Voltage

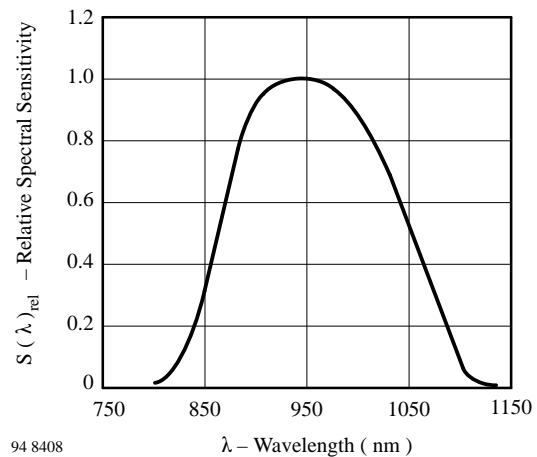
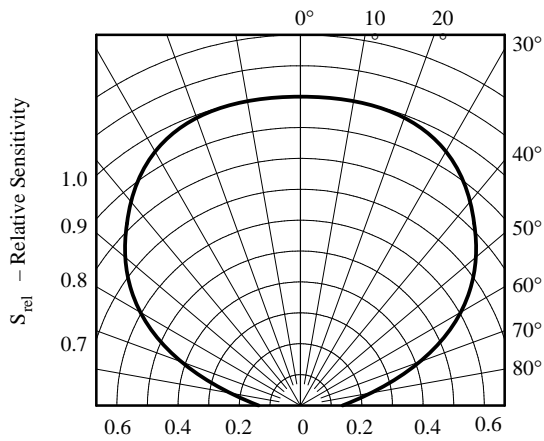


Figure 6 : Relative Spectral Sensitivity vs. Wavelength

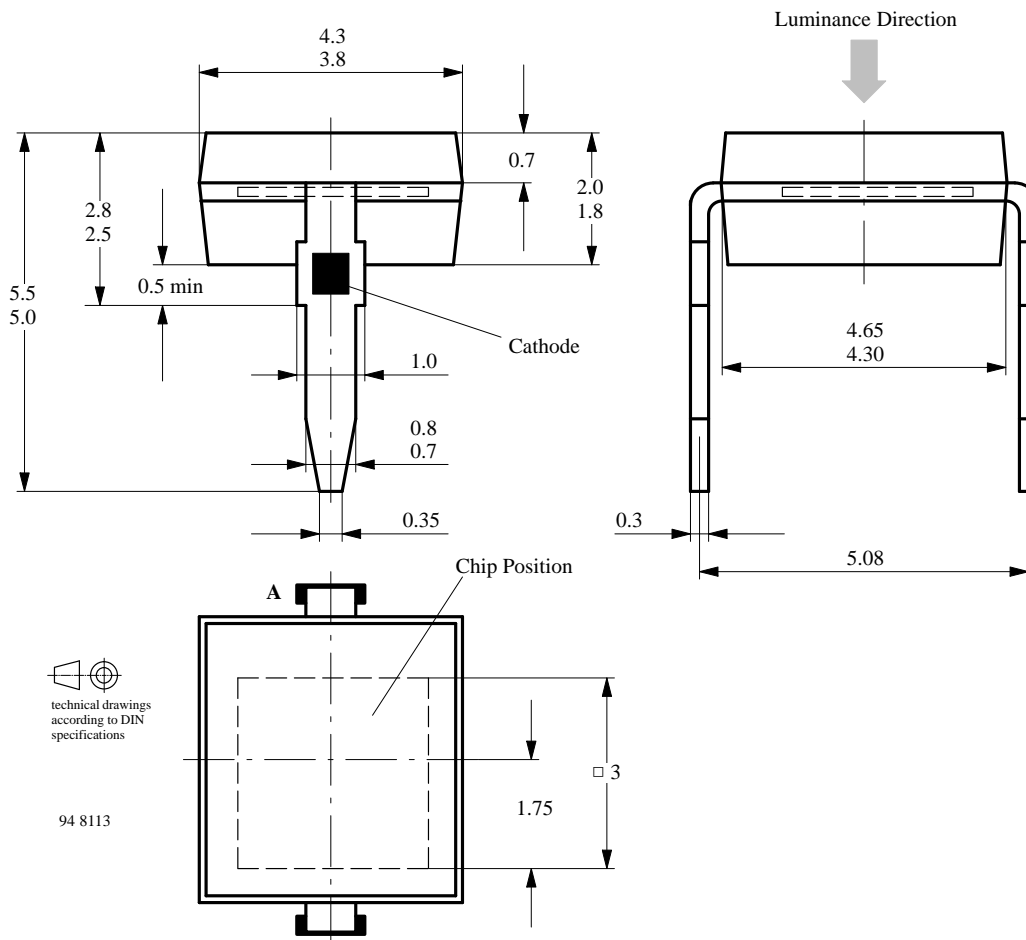
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Figure 7 : Relative Radiant Sensitivity vs. Angular Displacement

### Dimensions in mm



**We reserve the right to make changes to improve technical design without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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