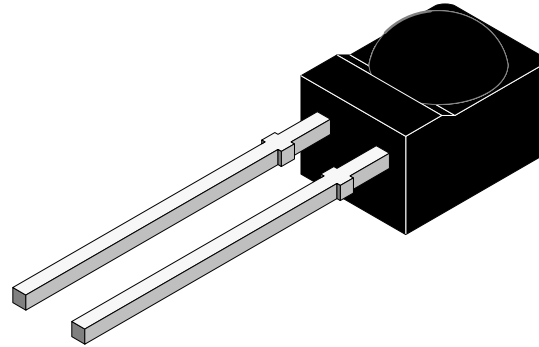

Silicon PIN Photodiode

Description

BPV22F is a high speed and high sensitive PIN photodiode in a plastic package with a spherical side view lens.

The epoxy package itself is an IR filter, spectrally matched to GaAs or GaAs/GaAlAs IR emitters ($\lambda_p = 950 \text{ nm}$). Lens radius and chip position are perfectly matched to the chip size, giving high sensitivity without compromising the viewing angle.

In comparison with flat packages the spherical lens package achieves a sensitivity improvement of 80%.



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Features

- Large radiant sensitive area ($A=7.5 \text{ mm}^2$)
- Wide viewing angle $\varphi = \pm 60^\circ$
- Improved sensitivity
- Fast response times
- Plastic package with IR filter
- Filter designed for 950 nm transmission

Applications

Infrared remote control and free air transmission systems in combination with IR emitter diodes (TSU...- or TSI...-Series).

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	$^{\circ}\text{C}$
Operating Temperature Range		T_{amb}	-55...+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
Forward Voltage	$I_F = 50\text{ mA}$	V_F		1	1.3	V
Breakdown Voltage	$I_R = 100\text{ }\mu\text{A}, E = 0$	$V_{(BR)}$	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
Serial Resistance	$V_R = 12\text{ V}, f = 1\text{ MHz}$	R_S		400		Ω
Open Circuit Voltage	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	V_o		370		mV
Temp. Coefficient of V_o	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	TK_{V_o}		-2.6		mV/K
Short Circuit Current	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}$	I_k		75		μA
Reverse Light Current	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_R = 5\text{ V}$	I_{ra}	55	80		μA
Temp. Coefficient of I_{ra}	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_R = 10\text{ V}$	$TK_{I_{ra}}$		0.1		%/K
Absolute Spectral Sensitivity	$V_R = 5\text{ V}, \lambda = 870\text{ nm}$	$s(\lambda)$		0.35		A/W
Absolute Spectral Sensitivity	$V_R = 5\text{ V}, \lambda = 950\text{ nm}$	$s(\lambda)$		0.6		A/W
Angle of Half Sensitivity		φ		± 60		deg
Wavelength of Peak Sensitivity		λ_p		950		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		870...1050		nm
Quantum Efficiency	$\lambda = 950\text{ nm}$	η		90		%
Noise Equivalent Power	$V_R = 10\text{ V}, \lambda = 950\text{ nm}$	NEP		4×10^{-14}		$\text{W}/\sqrt{\text{Hz}}$
Detectivity	$V_R = 10\text{ V}, \lambda = 950\text{ nm}$	D^*		6×10^{12}		$\text{cm}\sqrt{\text{Hz}}/\text{W}$
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
Cut-Off Frequency	$V_R = 12\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 870\text{ nm}$	f_c		4		MHz
Cut-Off Frequency	$V_R = 12\text{ V}, R_L = 1\text{ k}\Omega, \lambda = 950\text{ nm}$	f_c		1		MHz

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

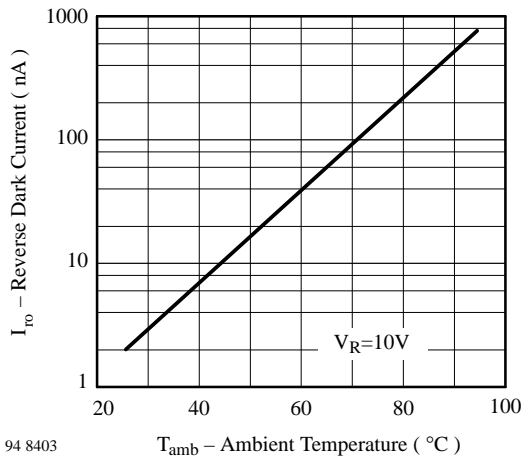


Figure 1 : Reverse Dark Current vs. Ambient Temperature

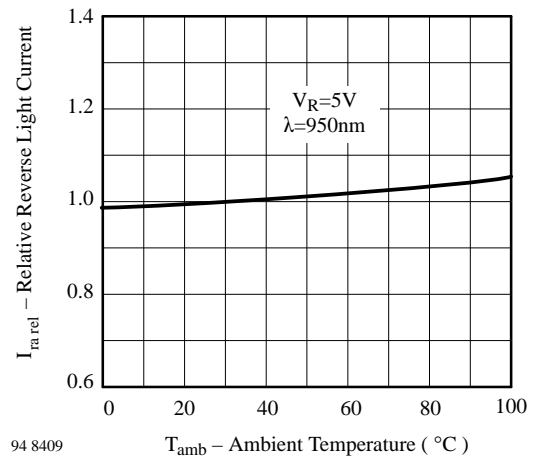


Figure 2 : Relative Reverse Light Current vs. Ambient Temperature

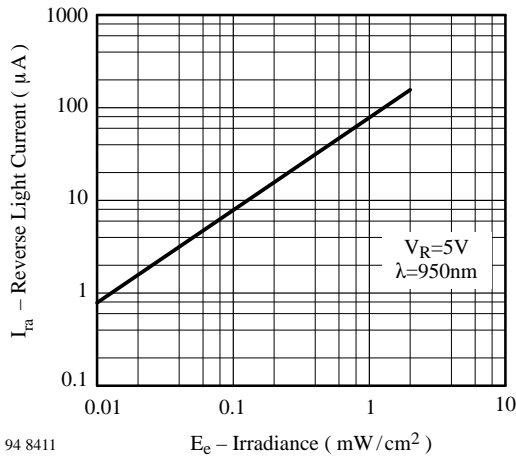


Figure 3 : Reverse Light Current vs. Irradiance

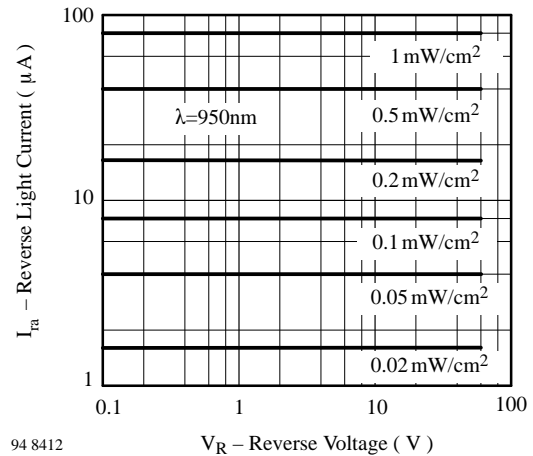


Figure 4 : Reverse Light Current vs. Reverse Voltage

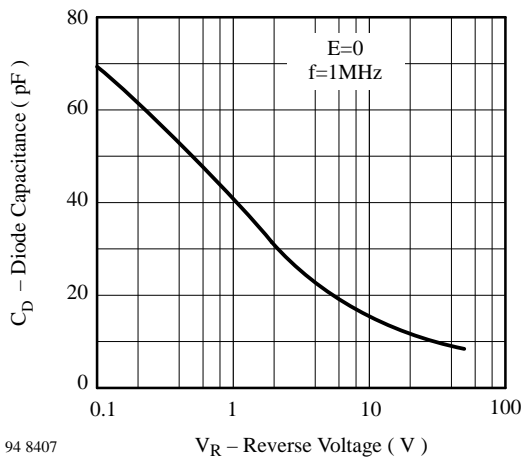


Figure 5 : Diode Capacitance vs. Reverse Voltage

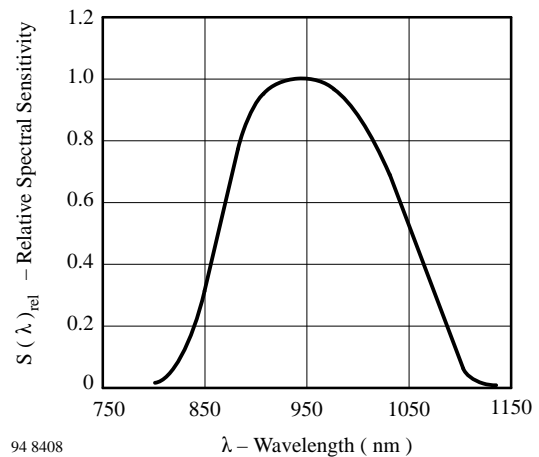
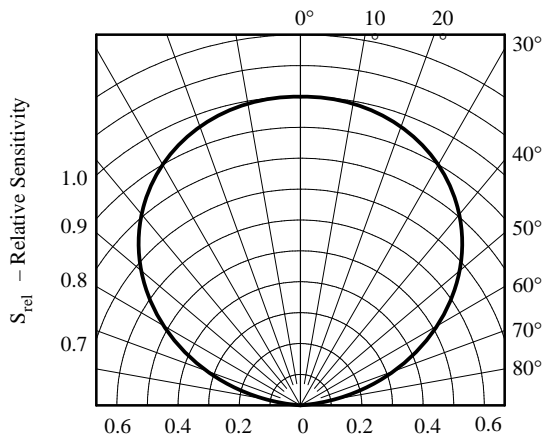


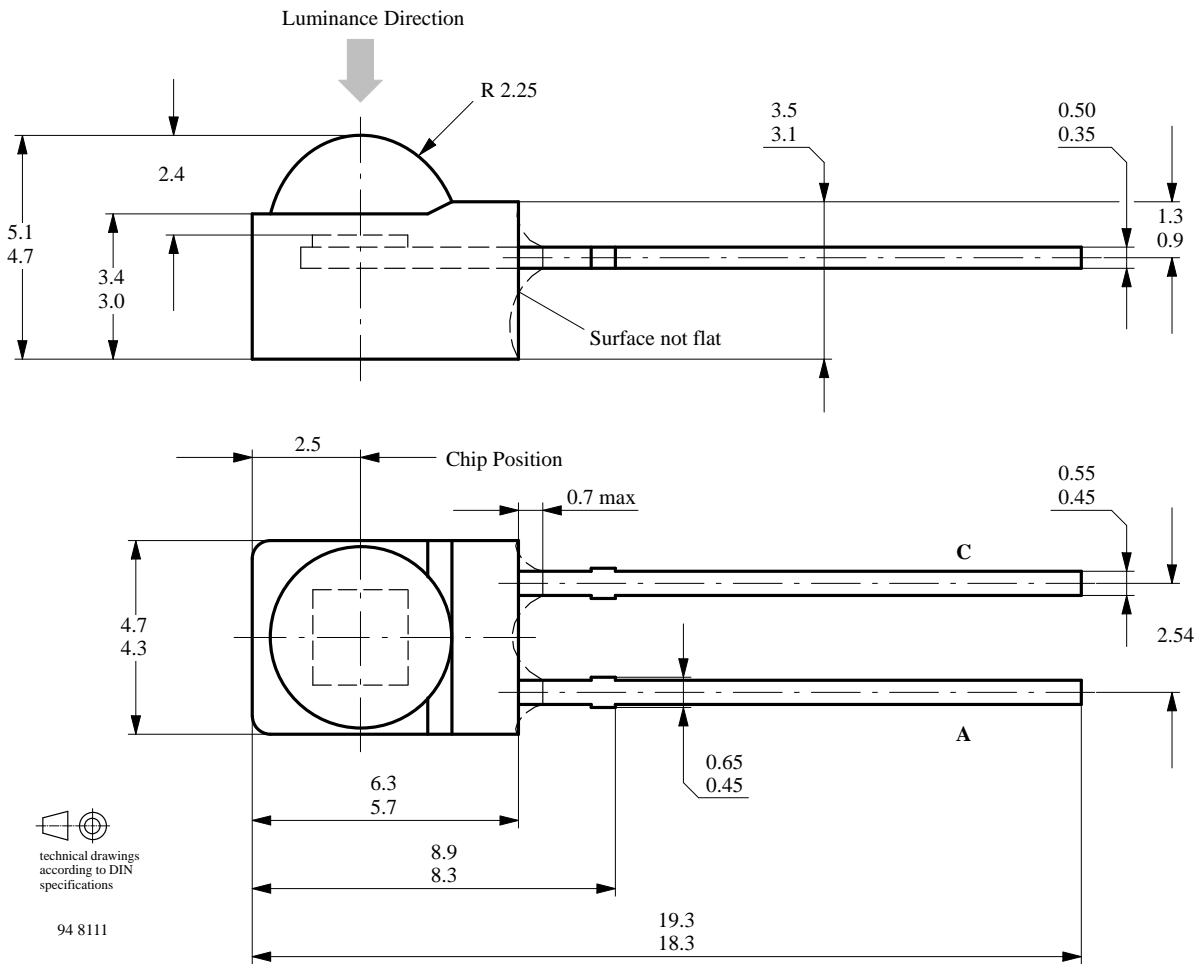
Figure 6 : Relative Spectral Sensitivity vs. Wavelength



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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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