TEMIC

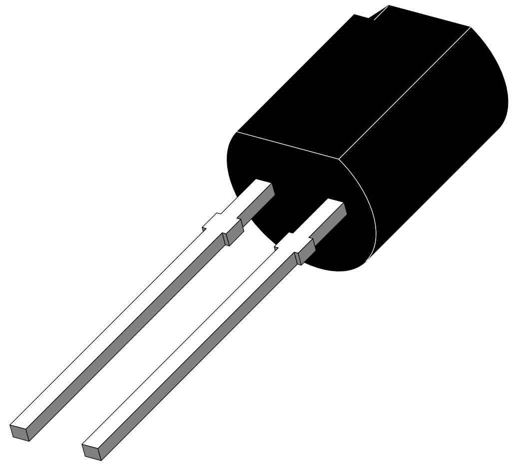
TELEFUNKEN Semiconductors

BPV 20 F

Silicon PIN Photodiode

Description

BPV20F is a high speed and high sensitive PIN photodiode in a plastic package with a cylindrical side view lens.
The epoxy package itself is an IR filter, spectrally matched to GaAs or GaAs/GaAlAs IR emitters (λ_p=950nm). 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 cylindrical lens package achieves a sensitivity improvement of 20 %.



Features

- Large radiant sensitive area (A=7.5 mm^2)
- Wide viewing angle $\varphi = \pm 65^\circ$
- Improved sensitivity
- Fast response times
- TO–92 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°C

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

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	I_F = 50 mA	V_F		1	1.3	V
Breakdown Voltage	I_R = 100 μA, E = 0	$V_{(BR)}$	60			V
Reverse Dark Current	V_R = 10 V, E = 0	I_{ro}		2	30	nA
Diode Capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D		70		pF
Serial Resistance	V_R = 12 V, f = 1 MHz	R_S		400		Ω
Open Circuit Voltage	E_e = 1 mW/cm^2, λ = 950 nm	V_o		360		mV
Temp. Coefficient of V_o	E_e = 1 mW/cm^2, λ = 950 nm	TK_{Vo}		–2.6		mV/K
Short Circuit Current	E_e = 1 mW/cm^2, λ = 950 nm	I_k		55		μA
Reverse Light Current	E_e = 1 mW/cm^2, λ = 950 nm, V_R = 5 V	I_{ra}	40	60		μA
Temp. Coefficient of I_{ra}	E_e = 1 mW/cm^2, λ = 950 nm, V_R = 10 V	TK_{Ira}		0.1		%/K
Absolute Spectral Sensitivity	V_R = 5 V, λ = 870 nm	s(λ)		0.35		A/W
Absolute Spectral Sensitivity	V_R = 5 V, λ = 950 nm	s(λ)		0.6		A/W
Angle of Half Sensitivity		φ		±65		deg
Wavelength of Peak Sensitivity		λ_p		950		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		870...1050		nm
Quantum Efficiency	λ = 950 nm	η		90		%
Noise Equivalent Power	V_R=10V, λ=950nm	NEP		$4x10^{-14}$		W/√ Hz
Detectivity	V_R=10V, λ=950nm	D^*		$6x10^{12}$		cm√Hz/ W
Rise Time	V_R=10V, R_L=1kΩ, λ=820nm	t_r		100		ns
Fall Time	V_R=10V, R_L=1kΩ, λ=820nm	t_f		100		ns
Cut–Off Frequency	V_R=12V, R_L=1kΩ, λ=870nm	f_c		4		MHz
Cut–Off Frequency	V_R=12V, R_L=1kΩ, λ=950nm	f_c		1		MHz

Typical Characteristics (T_{amb} = 25°C unless otherwise specified)

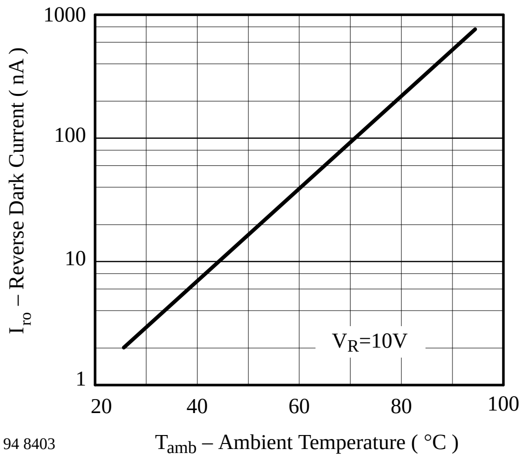


Figure 1 : Reverse Dark Current vs. Ambient Temperature

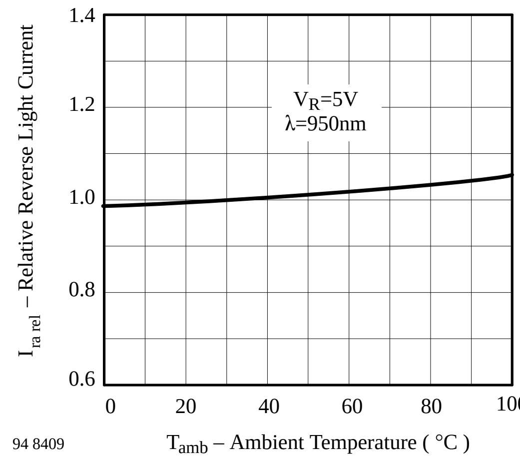


Figure 2 : Relative Reverse Light Current vs. Ambient Temperature

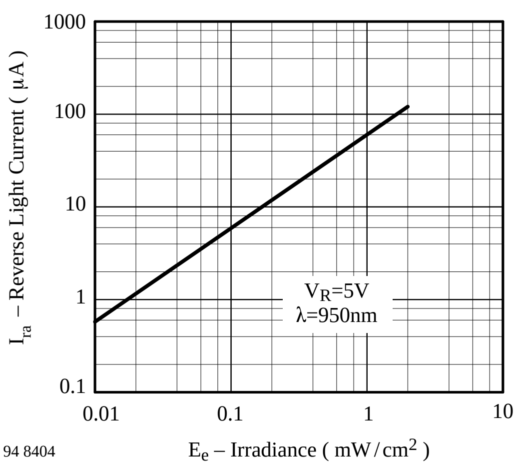


Figure 3 : Reverse Light Current vs. Irradiance

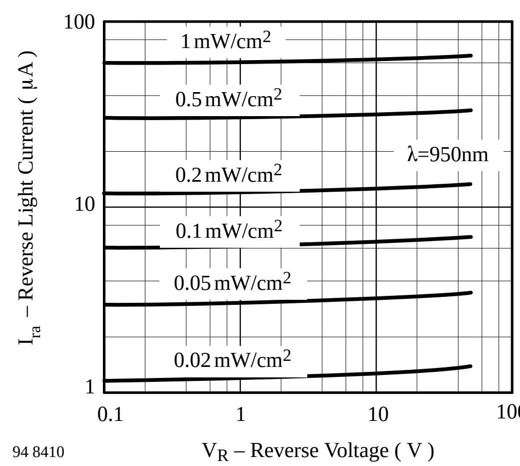


Figure 4 : Reverse Light Current vs. Reverse Voltage

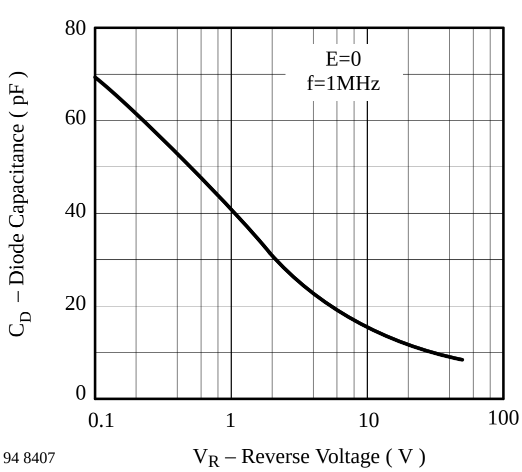


Figure 5 : Diode Capacitance vs. Reverse Voltage

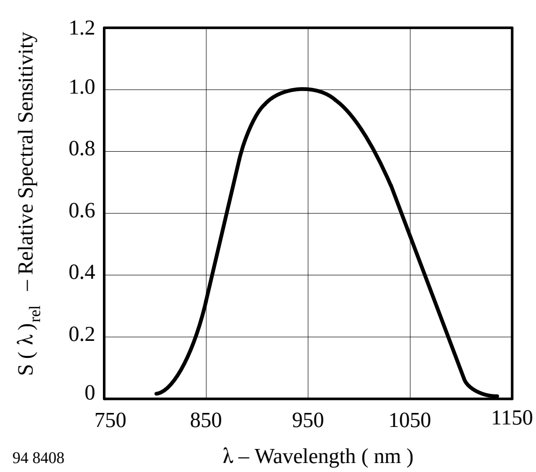


Figure 6 : Relative Spectral Sensitivity vs. Wavelength

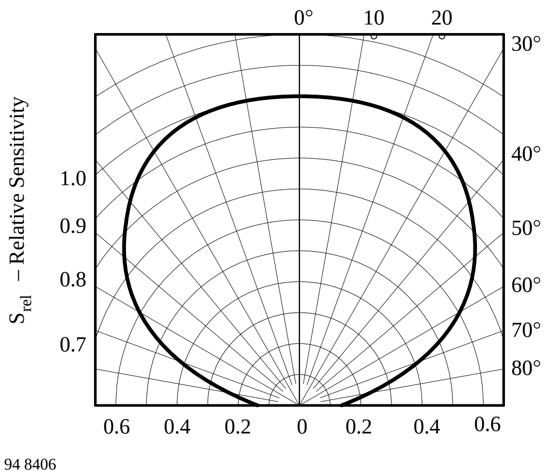
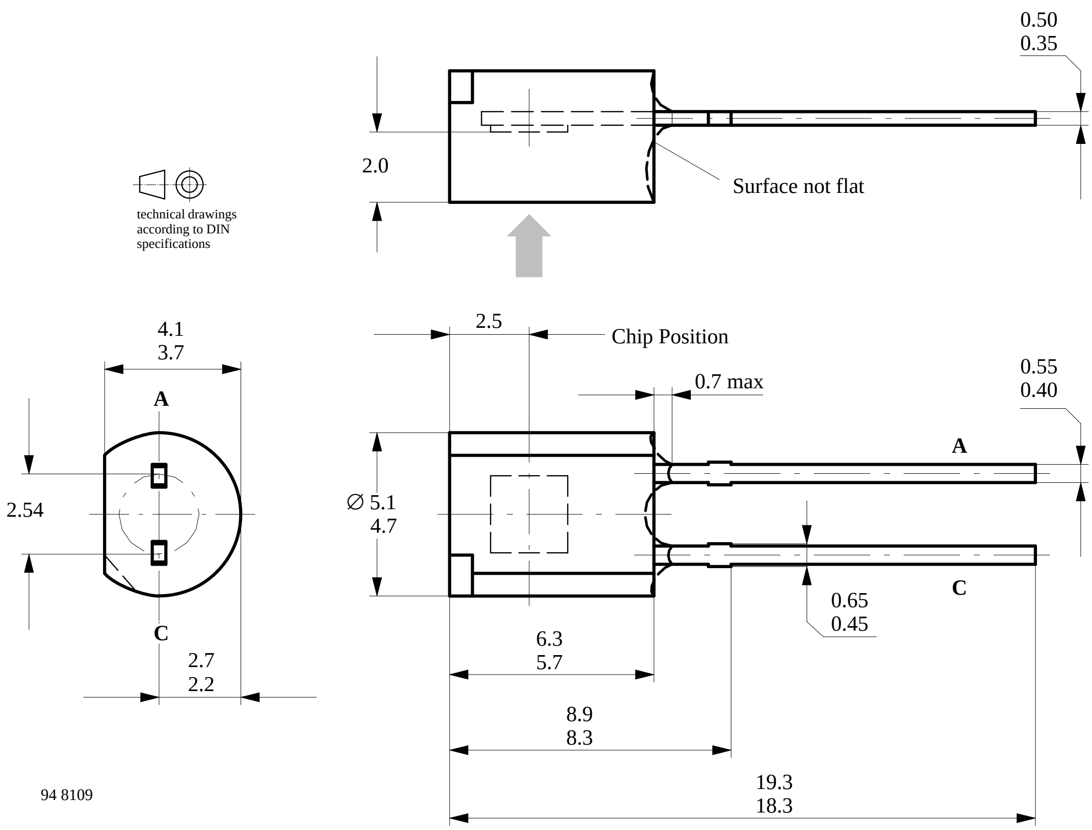


Figure 7 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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