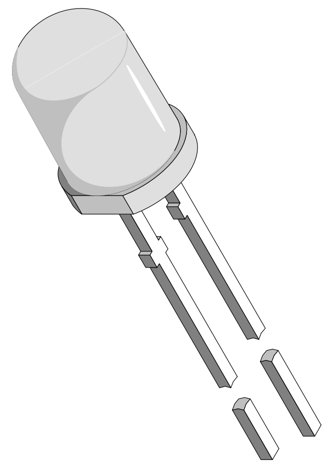
High Speed Silicon PIN Photodiode

Description

BPV10NF is a high sensitive and wide bandwidth PIN photodiode in a standard T–1¾ plastic package. The black epoxy is an universal IR filter, spectrally matched to GaAs (λ=950nm) and GaAlAs (λ=870nm) IR emitters.
BPV10NF is optimized for serial infrared links according to the IrDA standard.



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Features

- Extra fast response times
- High modulation bandwidth (>100 MHz)
- High radiant sensitivity
- Radiant sensitive area A=0.78mm^2
- Low junction capacitance
- Standard T–1¾ (ø 5 mm) package with universal IR filter
- Angle of half sensitivity φ = ± 20°

Applications

Infrared high speed remote control and free air transmission systems with high modulation frequencies or high data transmission rate requirements , especially for direct point to point links.
BPV10NF is ideal for the design of transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK / FSK– coded, 450 kHz or 1.3 MHz). Recommended emitter diodes are TSHF 5...–series or TSSF 4500.

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	2 mm from body, t ≦ 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 = 20 V, E = 0	I_{ro}		1	5	nA
Diode Capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D		11		pF
Open Circuit Voltage	E_e = 1 mW/cm^2, λ = 870 nm	V_o		450		mV
Short Circuit Current	E_e = 1 mW/cm^2, λ = 870 nm	I_k		50		μA
Reverse Light Current	E_e = 1 mW/cm^2, λ = 870 nm, V_R = 5 V	I_{ra}		55		μA
Reverse Light Current	E_e = 1 mW/cm^2, λ = 950 nm, V_R = 5 V	I_{ra}	30	60		μA
Temp. Coefficient of I_{ra}	E_e = 1 mW/cm^2, λ = 870 nm, V_R = 5 V	TK_{Ira}		–0.1		%/K
Absolute Spectral Sensitivity	V_R = 5 V, λ = 870 nm	s(λ)		0.55		A/W
Angle of Half Sensitivity		φ		±20		deg
Wavelength of Peak Sensitivity		λ_p		940		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		790...1050		nm
Quantum efficiency	λ = 950 nm	η		70		%
Noise Equivalent Power	V_R=20V, λ=950nm	NEP		$3x10^{-14}$		W/√ Hz
Detectivity	V_R=20V, λ=950nm	D^*		$3x10^{12}$		cm√Hz/ W
Rise Time	V_R=50V, R_L=50Ω, λ=820nm	t_r		2.5		ns
Fall Time	V_R=50V, R_L=50Ω, λ=820nm	t_f		2.5		ns

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

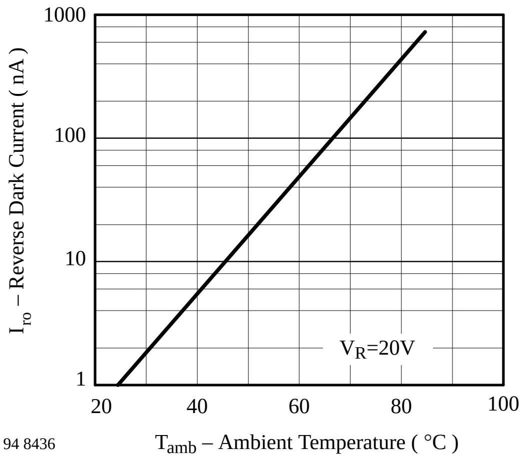


Figure 1 : Reverse Dark Current vs. Ambient Temperature

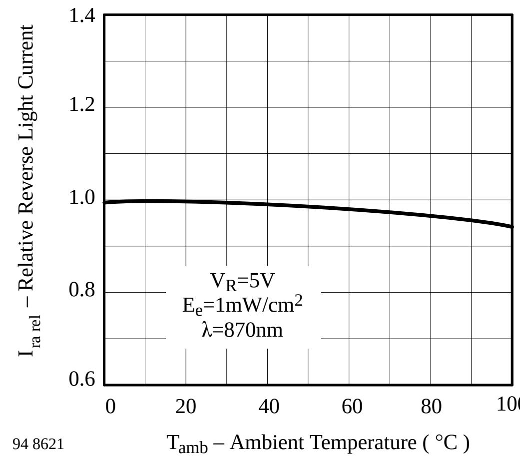


Figure 2 : Relative Reverse Light Current vs. Ambient Temperature

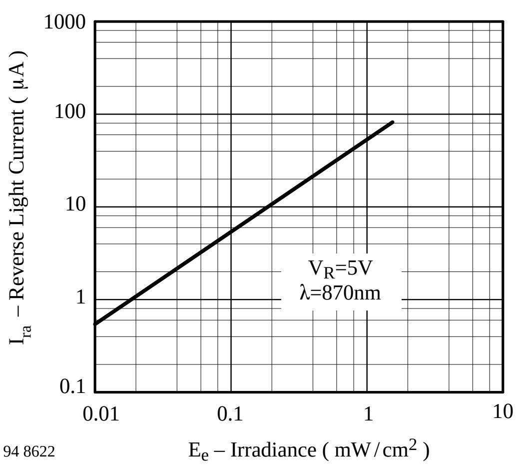


Figure 3 : Reverse Light Current vs. Irradiance

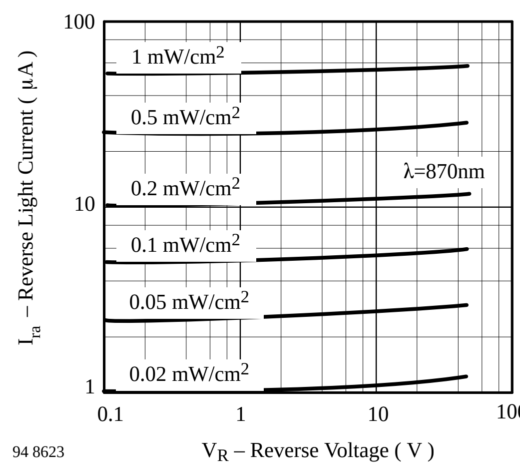


Figure 4 : Reverse Light Current vs. Reverse Voltage

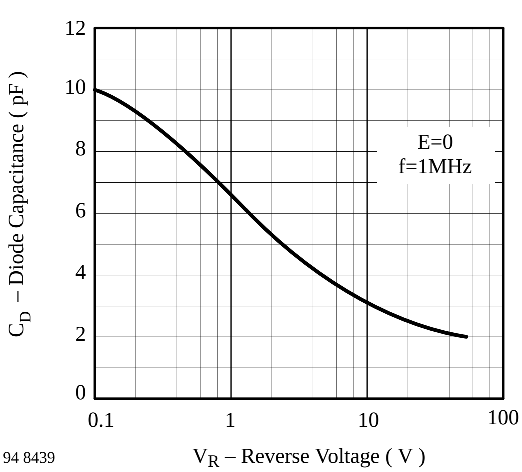


Figure 5 : Diode Capacitance vs. Reverse Voltage

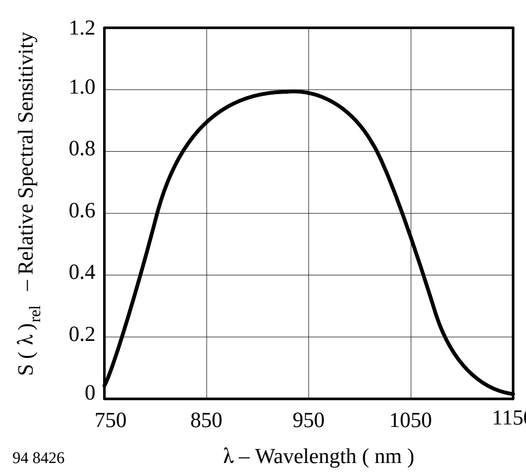


Figure 6 : Relative Spectral Sensitivity vs. Wavelength

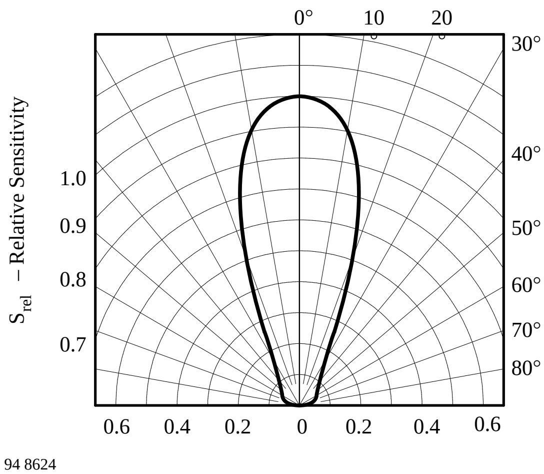
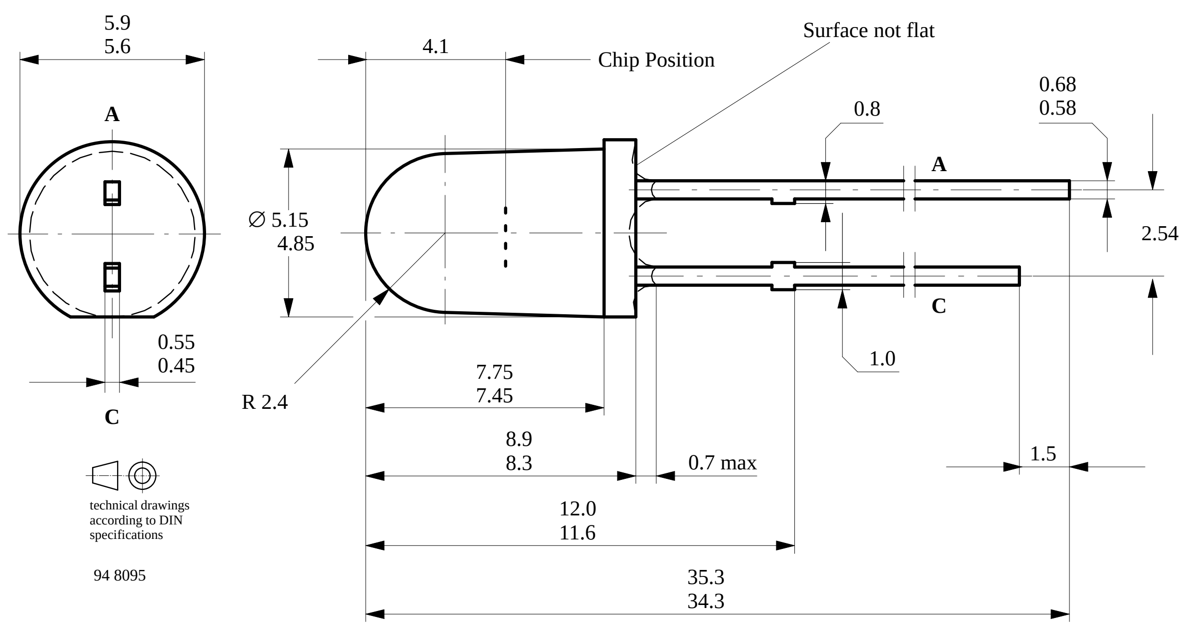


Figure 7 : Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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