Hermetic Coaxial Silicon Photodiode

FPT102

Optoelectronic Products

General Description

The FPT102 is a miniature light-sensing diode in a hermetic, welded case. In the reverse-bias mode of operation, excellent photocurrent linearity is obtained. In the photovoltaic mode, the open-circuit voltage varies in a logarithmic manner and is most sensitive to low-level light variations.

Sensitive At Low Light Level Applications
Excellent Photocurrent Linearity
Fast Response To Light Pulses
Precision Optical Alignment
Miniature—80 Mils In Diameter

Absolute Maximum Ratings

Maximum Temperatures and Humidity

Storage Temperature	−55°C to +150°C
Junction Temperature	−55°C to +100°C
Pin Temperature (Soldering, 10 s)	260°C
Relative Humidity at 65°C	85%

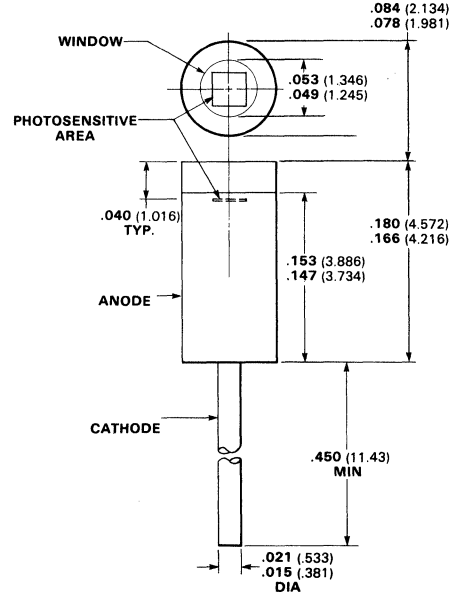
Maximum Power Dissipation

Total Dissipation at T_C = 25°C	75 mW
Derate Linearly from 25°C	0.6 mW/°C

Maximum Voltages

V_R	Reverse Voltage	50 V

Package Outline



Notes
All dimension in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±**0.15** (0.381)

Typical Electrical Characteristics

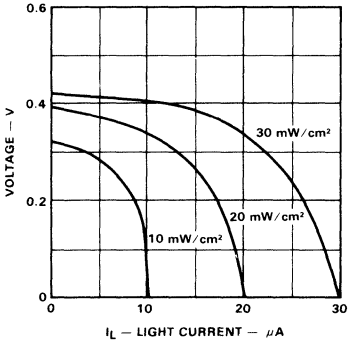
FPT102

Electrical Characteristics $T_A = 25°C$

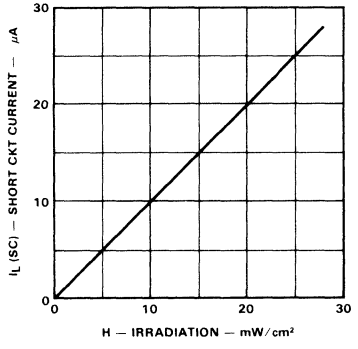
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV	Breakdown Voltage	50	120		V	$I_R = 5.0\ \mu A$, $H \leq 0.1\ \mu W/cm^2$
V_{OC}	Open Circuit Voltage (Note 1)	380	400		mV	No bias, $H = 20\ mW/cm^2$
I_R	Dark Current		0.1	25	nA	$V_R = -10.0$ V, $H \leq 0.1\ \mu W/cm^2$
I_L	Photo Current (Note 1)	12	16		μA	$V_R = -10.0$ V, $H = 20\ mW/cm^2$
$I_{L(sc)}$	Short Circuit Current (Note 1)	12	16		μA	No bias, $H = 20\ mW/cm^2$
R (Tungsten)	Responsitivity (Notes 1 & 2)	0.6	1.0		$\mu A/mW/cm^2$	No bias, $T_C = 2854°$ K
R @ 0.9 μ	Responsitivity 0.9 μ (Note 2)		3.0		$\mu A/mW/cm^2$	No bias, GaAs
C_o	Open Circuit Capacitance		70		pF	$V_R = 0$, $H \leq 0.1\ mW/cm^2$
C_R	Reversed Bias Capacitance		20		pF	$V_R = -10$ V, $H \leq 0.1\ \mu W/cm^2$
R_{max}	Responsitivity (absolute) at Spectral Peak (Note 2)		0.6		A/W	$V_R = 0$, $\lambda = 0.80\ \mu$
NEP	Noise Equivalent Power (Note 2)		1.0×10^{-14}		W	$V_R = -10$ V, $\lambda = 0.80\ \mu$, $\Delta f = 1.0$ Hz
D	Detectivity (Note 2)		8.8×10^{12}		$\frac{cm\sqrt{Hz}}{W}$	$V_R = 10$ V, $\lambda = 0.80\ \mu$, $f = 1.0$ kHz, $\Delta f = 1.0$ Hz

Notes
1. Irradiation source is an unfiltered tungsten lamp operated at 2854°K color temperature.
2. Sensitive Area = 7.75×10^{-3} cm². (Response at metalization is negligible.)

Typical Voltage vs Current Characteristics



Typical Short Circuit Current vs Irradiation



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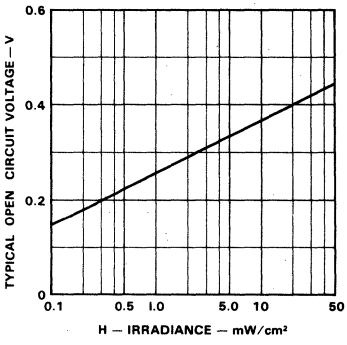
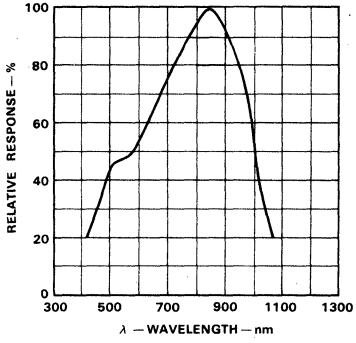
Typical Electrical Characteristic Curves

FPT102

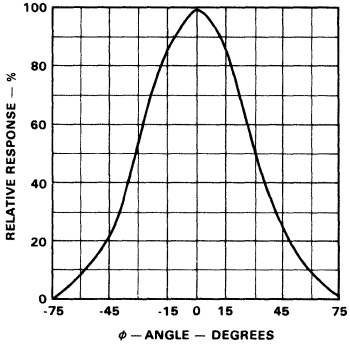
Typical Open Circuit Voltage vs Irradiation



Relative Spectral Response



Typical Photo Current vs Angle of Incidence



Typical Light Current vs Time