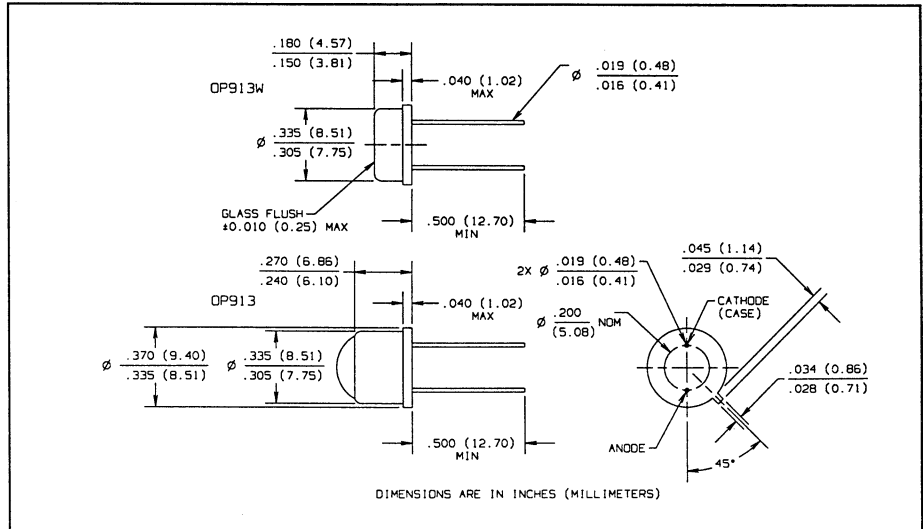
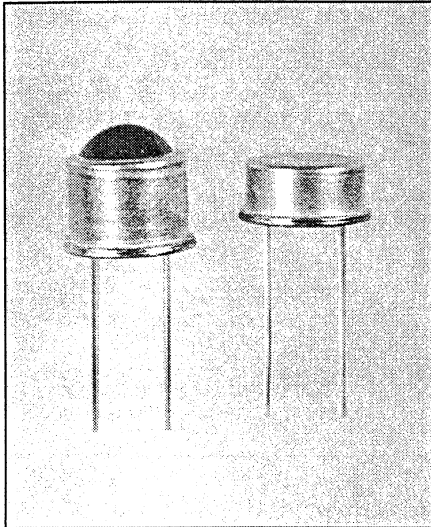


PIN Silicon Photodiodes

Types OP913SL, OP913WSL



Features

- Wide or Narrow receiving angle available
- Large active area (.115" x .115")
- Fast switching time
- Linear response vs irradiance
- Enhanced temperature range

Description

The OP913SL and OP913WSL each consist of a PIN silicon photodiode mounted in a two-leaded, TO-5 hermetically sealed package. The lensing effect of the OP913SL allows an acceptance angle of 10° measured from the optical axis to the half power point. The flat lens of the OP913WSL has an acceptance half angle of 30°. The large active area allows very low light level detection.

Replaces

OP913 and OP913W

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Reverse Voltage	32 V
Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-65° C to +125° C
Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260° C ⁽¹⁾
Power Dissipation	150 mW ⁽²⁾

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (2) Derate linearly 1.5 mW/° C above 25° C.
- (3) Junction temperature maintained at 25° C.
- (4) Light source is an unfiltered tungsten bulb operating at CT = 2870 K or equivalent infrared source.
- (5) At any particular wavelength the flux responsivity, R_θ, is the ratio of the diode photocurrent to the radiant flux producing it. R_θ is related to quantum efficiency by:

$$R_{\theta} = \eta q \left(\frac{\lambda}{1240} \right)$$

Where ηq is the quantum efficiency in electrons per photon and λ is the wavelength in nanometers. Thus at 900 nm, 0.60 A/W corresponds to a quantum efficiency of 83%.
 (6) NEP is the radiant flux at a specified wavelength, required for unity signal-to-noise ratio normalized for bandwidth.

$$NEP = \frac{IN\sqrt{\Delta f}}{R_{\theta}} \quad \text{where } IN\sqrt{\Delta f} \text{ is the bandwidth normalized shot noise.}$$

NEP calculation is made using responsivity at peak sensitivity wavelength, with spot noise measurement at 1000 Hz in a noise bandwidth of 6 Hz. ($\lambda, f, \Delta f$) = ($\lambda_p, 1000 \text{ Hz}, 6 \text{ Hz}$).

Types OP913SL, OP913WSL

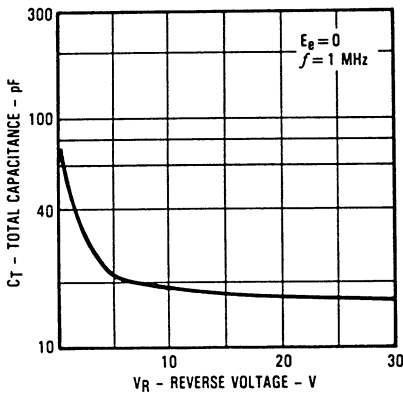
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
I_L	Reverse Light Current	OP913SL 40			μA μA	$V_R = 5\text{ V}$, $E_e = 5\text{ mW/cm}^2$ ⁽³⁾⁽⁴⁾
I_D	Reverse Dark Current			25	nA	$V_R = 10\text{ V}$, $E_e = 0$ ⁽³⁾
V_{CC}	Open Circuit Voltage	OP913SL 300	400		mV mV	$E_e = 5\text{ mW/cm}^2$ ⁽⁴⁾
I_{SC}	Short Circuit Current	OP913SL 40			μA μA	$E_e = 5\text{ mW/cm}^2$ ⁽⁴⁾
$V_{(BR)R}$	Reverse Breakdown Voltage	32			V	$I_R = 100\ \mu\text{A}$
C_T	Total Capacitance	OP913SL 150		150	pF pF	$V_R = 0$, $E_e = 0$, $f = 1\text{ MHz}$
t_{on}, t_{off}	Turn-On Time, Turn-Off Time	OP913SL 50	50		ns ns	$V_R = 10\text{ V}$, $R_L = 1\text{ k}\Omega$

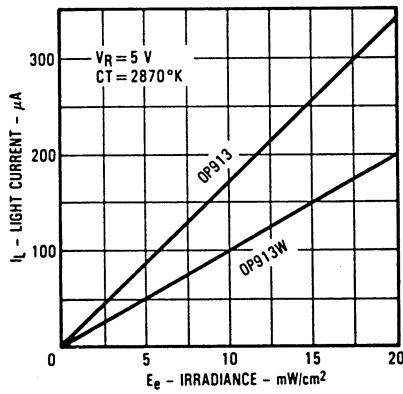
PHOTOSENSORS

Typical Performance Curves

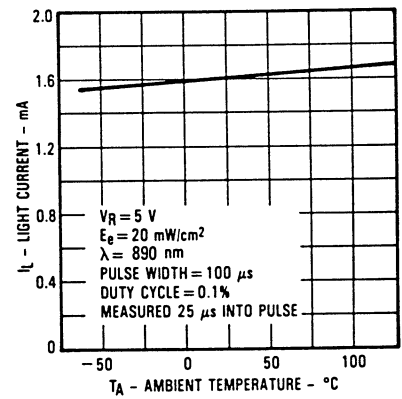
Total Capacitance vs Reverse Bias Voltage



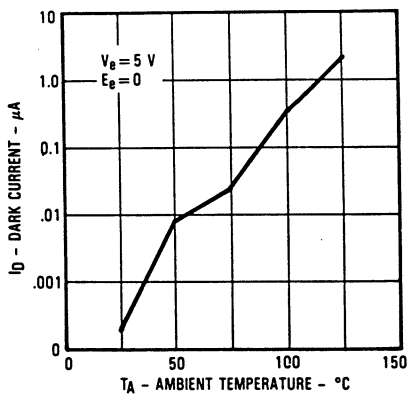
Light Current vs Irradiance



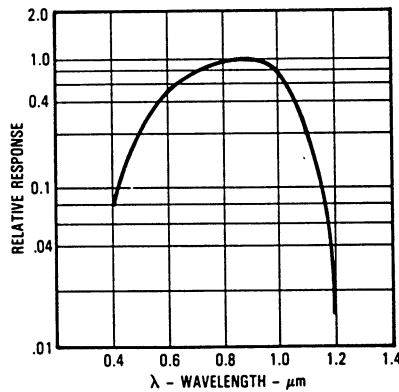
Light Current vs Ambient Temperature



Dark Current vs Ambient Temperature



Relative Response vs Wavelength



Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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