PIN Silicon Photodiode

OP913 Series

Features:
- TO-05 hermetically sealed package
- Linear response vs. irradiance
- Fast switching time
- Narrow receiving angle
- Enhanced temperature range

OP913SL   OP913WSL

Description:

OP913SL and **OP913WSL** consist of a PIN silicon photodiode mounted in a two-leaded TO-05 hermetically sealed package.

OP913SL has a dome lens with an acceptance angle of 10° when measured from the optical axis to the half power point.
OP913WSL has a flat lens with an acceptance half angle of 30°. This large active area allows very low light level detection.

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

Applications:
- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
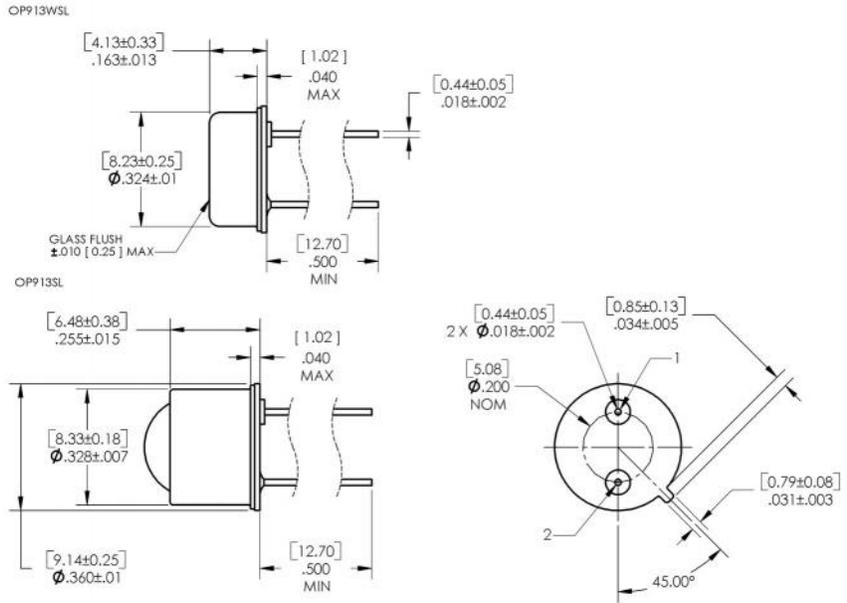- End of travel sensor
- Door sensor

Ordering Information

Part Number	Sensor	Viewing Angle	Lead Length
OP913SL	Photodiode	20°	0.50"
OP913WSL		80°	

OP913SL, OP913WSL

OP913SL, OP913WSL

Pin#	Sensor
1	Cathode
2	Anode

RoHS

PIN Silicon Photodiode

OP913 Series

Electrical Specifications

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

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

Electrical Characteristics (T_A = 25° C unless otherwise noted)

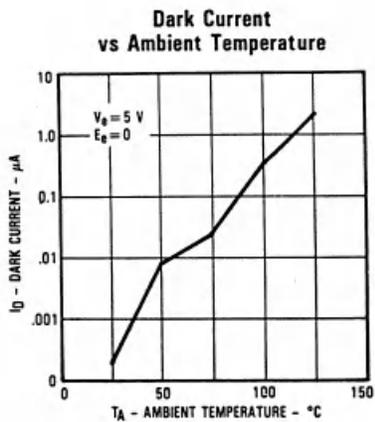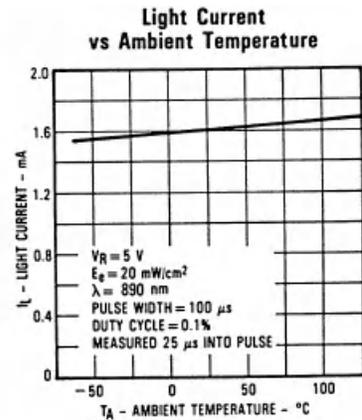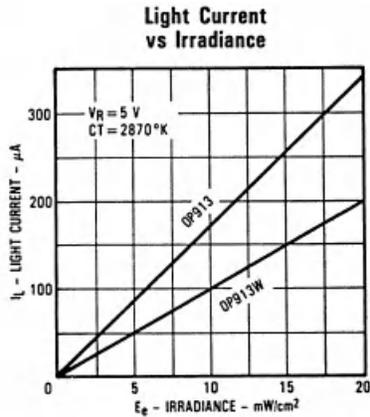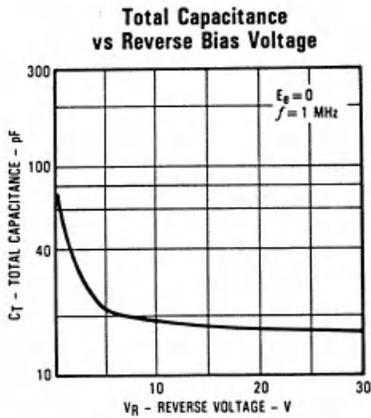| SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
I_L	Reverse Light Current: OP913SL OP913WSL	120 40	- -	- -	µA	V_R = 5 V, E_E = 5 mW/cm^2 [3][4]
I_D	Reverse Dark Current	-	-	25	nA	V_R = 10 V, E_E = 0[3]
V_{CC}	Open Circuit Voltage: OP913SL OP913WSL	- -	400 300	- -	mW	E_E = 5 mW/cm$^{2(4)}$
I_{SC}	Short Circuit Current: OP913SL OP913WSL	120 40	- -	- -	V	E_E = 5 mW/cm$^{2(4)}$
V_{BR}	Reverse Breakdown Voltage	32	-	-	V	E_E = 100 µA
C_T	Total Capacitance	-	-	150	pF	V_R = 0, E_E = 0, f = 1 MHz
t_{ON}, t_{OFF}	Turn On / Turn Off Time	-	50	-	ns	V_R = 10 V, R_L = 1 kΩ

Notes:

(1) RMA flux is recommended. Duration can be extended to a maximum of 10 seconds when flow soldering.
(2) Derate linearly 1.5 mW/° C above 25° C.
(3) Junction temperature for all devices in this data sheet is 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 responsively, Rθ is related to quantum efficiency by: Rθ = ηq (λ/1240), 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 calculation is made using responsivity at peak sensitivity wavelength, with spot noise measurement at 1000 Hz in a noise bandwidth of 6 Hz. (λ, *f, Δ f*) = (λp, 1000 Hz, 6 Hz).

Performance

OP913SL, OP913WSL

Total Capacitance vs Reverse Bias Voltage

Light Current vs Irradiance

Light Current vs Ambient Temperature

Dark Current vs Ambient Temperature

Relative Response vs Wavelength