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## How photodiodes work and some examples

### Photodiodes

1. Receive an electromagnetic signal and convert this signal into an electrical signal (photoelectric effect?)
2. Emits a separate signal with no light present (dark current)

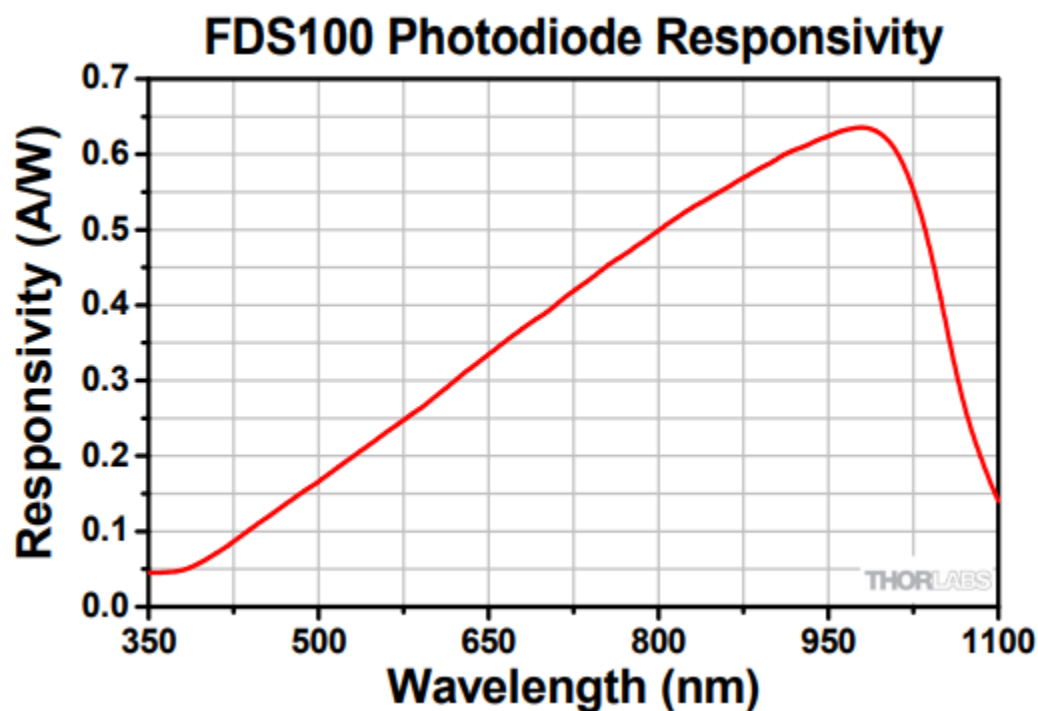
### Examples:

1. [FDS100 Photodiode \(Thorlabs\)](#)

- a. The output signal of the photodiode is described by the equation (where P = power,  $R_L$  = resistor load, and  $R(\lambda)$  = responsivity):

$$V_o = P \times \mathfrak{R} \times R_L$$

- b. The responsivity is described by the following graph:



- c. Thus, the maximum output voltage is **when the wavelength is approximately 980nm** (according to the specifications). In general, the maximum wavelength range is between 350nm and 1100 nm.
- d. Dark Current is noted at a maximum of 20nA and 1.0 nA on the average.
- e. The maximum Reverse Bias Voltage is **25V** and the maximum reverse Current is **5mA**

The next step is to simulate this component and measure the feedback on the load resistance.