

The Ins and Outs of Phototransistors

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In brief

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When it comes to electrical engineering components, phototransistors are often at the top of the list - but what are they? How do they work? And how can engineers ensure that they select the right type for their project? Read on for answers to these questions and more.

What are phototransistors?

A phototransistor is a type of optical sensor, otherwise known as a photo sensor. This means its input is that of light, while its output is an amplified electrical signal. Phototransistors have a base region that is extremely sensitive to light. Arguably, the most common type of phototransistor is a bipolar transistor. This phototransistor is enveloped in a see-through case which allows light to flood into the base-collector junction with ease.

In the majority of instances, phototransistors are available as either two-leaded or three-leaded devices. The two-leaded variety is the simpler version of the two where the device is 100% dependent on light to operate due to the base being electrically unavailable. A three-leaded phototransistor, on the other hand, boasts a slightly different configuration where the base lead is brought out. In this case, the device can be employed as a conventional BJT with or without the additional light-sensitivity feature.

You will see phototransistors being used in the creation and design of a wide selection of applications. This is because they are readily available and usually affordable to the source. Most commonly, they will be incorporated into an appliance or application where a light beam is interrupted. However, they can also be embraced for accurate light level detection. They can be found in the base design of security systems, lighting control solutions, card readers, and infra-red detectors, to name just a few examples.

Selecting the right phototransistor

With so many different types and manufacturers to choose from, it can prove challenging to select the right phototransistor for your project. Generally, the three most important considerations include the phototransistor's wavelength, linearity, and sensitivity. Some phototransistors can sense a broader range of wavelengths than others.

Furthermore, the linearity of the output based on the intensity of the light will also vary significantly from model to model. Finally, the overall sensitivity of the phototransistor is important to think about. This is because the phototransistor's sensitivity determines the ratio of the output signal to the input intensity of the light.

Remember to also consider other factors, such as cost, response time, and size. The best course of action is to seek out a search engine dedicated specifically to helping engineers find the various electrical components that they need at the best possible price. Octopart is an example of this type of search engine, allowing you to compare thousands of electrical engineering components, from phototransistors to magnetic sensors and digital potentiometers, in minutes.

Now that you know the basics of how phototransistors work and what to look out for when choosing one for your project, you can make a responsible and cost-effective purchase decision. Best of luck!

Also read

- [How to Improve your Web Browser Security and Privacy](#)
- [How CloudReady Can Speed up Your Old PC?](#)
- [Convert Your Picture to Text using OCR Technology](#)

References

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