

Article Overview

Optocouplers are electronic components that provide electrical isolation between circuits using light, essential for protecting sensitive electronics and ensuring safe signal transmission.

What is an Optocoupler?

An optocoupler, also called an optoisolator or photocoupler, is a device that transmits electrical signals between two isolated circuits using light. It typically consists of a light-emitting diode (LED) on the input side and a photodetector (such as a phototransistor, photodiode, or photoSCR) on the output side, all enclosed in a light-tight package. When the LED is activated, it emits light that triggers the photodetector, generating a corresponding electrical signal without any direct electrical connection, providing galvanic isolation and protecting low-voltage circuits from high-voltage spikes, ground loops, or electrical noise .

Types of Optocouplers

- o Phototransistor Optocouplers: Commonly used for general signal isolation and switching applications .
- o Photodarlington Optocouplers: Provide higher current gain for low-input signals .
- o TRIAC/SCR Optocouplers: Used for AC load switching, often in motor control or dimmer circuits .
- o Photodiode Optocouplers: Offer faster response times for high-speed digital applications .

Key Specifications

When selecting an optocoupler, consider:

- o Current Transfer Ratio (CTR): Efficiency of signal transfer from input to output.
- o Switching Speed: Measured in microseconds or Mbps, important for high-speed circuits.
- o Isolation Voltage: Maximum voltage the device can safely isolate between input and output.
- o Output Configuration: Logic, transistor, or TRIAC/SCR depending on the application .

Applications

Optocouplers are widely used in:

- o Switch-mode power supplies for feedback isolation.
- o PLC inputs and industrial control systems to protect microcontrollers from high voltages.
- o Motor drives and AC load control using TRIAC optocouplers.
- o Signal isolation in sensitive electronics to prevent noise interference .

Sourcing Genuine Optocouplers

To ensure authenticity and reliability, purchase from authorized distributors or manufacturers:

- o Würth Elektronik: Offers a wide range of optocouplers with datasheets, CAD models, and long production lifetimes .
- o Mouser Electronics: Authorized distributor with online ordering and no minimum quantities .
- o DigiKey: Large in-stock selection with same-day shipping .
- o Vishay: Manufacturer providing high-isolation, wide-temperature-range optocouplers .
- o RS Components: Offers leading brands like Avago, Fairchild, and Vishay for industrial and domestic applications . Choosing components from these sources ensures genuine, high-quality optocouplers suitable for both industrial and hobbyist projects.

If you're a PCB designer or electrical engineer looking to understand optocouplers, you're

Optocouplers play a crucial role in providing electrical isolation between circuits, preventing interference, and protecting sensitive

What is Optocoupler and How It Works As we have already learnt about transistors, an ideal transistor will not allow

What is Optocoupler? An Optocoupler or an Opto-isolator (also known as photocoupler and optical isolator) is an electronic

Optocouplers are electronic components which use light waves to provide electrical isolation while

An optocoupler uses light to transfer signals between circuits, keeping them electrically isolated. This protects

An optocoupler, also known as an opto-isolator, is an electronic component that transfers

An optocoupler (or opto-isolator) is a component that transfer signals between circuits using

Photocoupler / optocoupler terminology The terms photocoupler, optocoupler and opto-isolator are often used interchangeably within

what is opto coupler Opto-coupler is an electronic component that is used to conduct the electrical signals from one circuit to another

Optocouplers are in stock with same-day shipping at Mouser from industry leading manufacturers. Mouser is

an authorized

After studying this section, you should be able to: Describe basic applications of optocouplers: Understand the design of optocoupler

Optocouplers/Isolators manufactured by Vishay, a global leader for semiconductors and passive electronic components.

To conclude, optocouplers continue to be essential components in electronic design, offering a reliable signal isolation

In some applications like motor control, relays and communication interfaces, the optocoupler is used as an isolated electronic

Optoisolators What Is an Optocoupler (Optoisolator), and How Does It Work? An optocoupler--also known

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