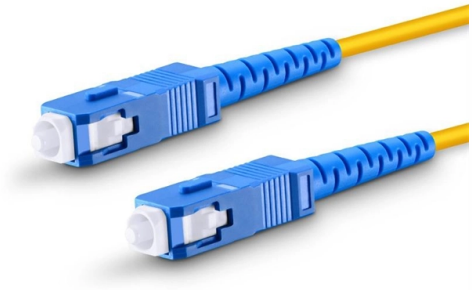
Working principle of PC817 optocoupler



Overview

In this guide, we will explore the various aspects of the PC817''s features, working principle, technical specifications, applications, and frequently asked questions.

Key Takeaways

The PC817 optocoupler transmits electrical signals between two isolated circuits using an infrared LED and a phototransistor, providing optical isolation without direct electrical connection.

Internal Structure

The PC817 consists of two main components housed in a single 4-pin package: Infrared LED (Input Side): Emits infrared light when a current flows through it. Phototransistor (Output Side): Detects the infrared light and conducts current accordingly. These components are optically coupled but electrically isolated, allowing signal transfer without direct electrical contact.

Step-by-

Step Working PrincipleLED Emission (Input Side): When a voltage is applied to the input pins, current flows through the infrared LED.

The LE

D emits infrared light proportional to the input current. This light is invisible to the human eye but can be detected by the phototransistor. Optical Transmission: The emitted infrared light passes through a transparent barrier inside the IC.

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This barrier ensures electrical isolation between the input and output circuits, protecting sensitive components from high voltages or noise. The PC817 can typically withstand up to 5,000 Vrms between input and output. Phototransistor Activation (Output Side): The phototransistor receives the infrared light and becomes conductive.

The amount of current it allows to flow from collector to emitter depends on the intensity of the received light, effectively reproducing the input signal on the output side. Signal Isolation and Transfer: Since the input and output are not electrically connected, the PC817 provides galvanic isolation, preventing voltage spikes or noise from affecting the output circuit. The output can then drive other components, such as microcontrollers, relays, or logic circuits, safely.

Key Features

Low Input Current: Operates with small currents, suitable for microcontroller interfacing. Fast Switching: Can handle digital signals efficiently. Compact Size: 4-pin DIP package for easy integration.

Wide Applications: Used in high-voltage isolation, noise-sensitive circuits, and relay driving.

Practical Example

For instance, a microcontroller outputting 5V can control a 12V relay through a PC817. When the microcontroller sends a HIGH signal, the LED inside the PC817 glows, activating the phototransistor. This triggers a transistor to switch the 12V relay, while the microcontroller remains electrically isolated from the high-voltage circuit.

This principle ensures safe signal transmission and protects low-voltage electronics from high-voltage disturbances.

Article Content

Guide to the PC817 Optocoupler

In this guide, we will explore the various aspects of the PC817''s features, working principle, technical specifications, applications, and frequently asked questions.

PC817 Optocoupler pinout, working and Example with Arduino

To fully understand the optocoupler''s working principle, we will explore it from four different perspectives, each highlighting a unique method of circuit isolation.

All About PC817 Optocoupler

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To fully understand the optocoupler''s working principle, we will explore it from four different perspectives, each highlighting a unique method of circuit isolation. The main aim is to enable one circuit to

What is PC817 Optocoupler : Working & Its Applications

PC817 IC includes an LED & a phototransistor which are connected jointly optically. The signal can be transmitted optically in between an i/p and an o/p side without any physical connection. To any

PC817 Optocoupler: How It Works and Where It''s Used

The PC817 is a compact, low-cost, 4-pin photocoupler that contains an infrared LED and a phototransistor. Its job is to transfer a signal across an

PC817 Optocoupler: Pinout, Features, and Applications

Explore the PC817 optocoupler''s pinout, working principle, and applications. Learn how it provides electrical isolation and signal transfer.

All About PC817 Optocoupler : 9 Steps

To fully understand the optocoupler''s working principle, we will explore it from four different perspectives, each highlighting a unique method of circuit isolation.

PC817: Optocoupler (Optoisolator) Explained – Tricky Circuit

1. What is the PC817? The PC817 consists of an infrared LED and a phototransistor in a 4-pin package. It isolates low-voltage control circuits (e.g., Arduino, ESP32, STM32) from high-voltage power

PC817 Optocoupler: Working, Pinout, Circuit, Applications, and ...

PC817 is a widely used optocoupler that provides electrical isolation between input and output using an internal LED and phototransistor. This guide explains its working principle, pinout

Guide to the PC817 Optocoupler

Working Principle of PC817 Circuit The Optocoupler operates based on the principle of optical isolation, which allows to transmit electrical signals between two isolated circuits.

Working of an Opto-Coupler PC817

This video explains working of a 4 pin Opto-Coupler IC, PC 817. Basically an optocoupler is a small component in the form of IC which couples electrical sig...

Working Principle and Package of PC817 Optocoupler

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Working Principle and Package of PC817 Optocoupler 2024-07-19 18062 An optocoupler, also known as an opto-isolator, is a combination of an infrared LED and a phototransistor. It is

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Exploring the PC817 Optocoupler: Working Principle, Package ...

I. What is PC817 optocoupler? The PC817 serves as an optical isolator, incorporating both an infrared diode and a phototransistor to facilitate electrical isolation of signals between two

PC817 Optocoupler: How It Works and Where It''s Used

Final Verdict The PC817 optocoupler is a key component in transmitting and isolating electrical signals in electronic circuits. Not only is it

PC817 Optocoupler: Pinout, Features, Equivalent, and

Complete guide on the PC817 optocoupler including 180-word introduction, pinout, features, working, equivalents, and detailed applications for

PC817 High-Speed Optocoupler Working and Characteristics

Optocoupler working In the following part, Easybom will elaborate on the high-speed optocoupler working principle. An electrical signal is applied to the input end of the optocoupler to

PC817 Optocoupler: Pinout, Specifications, Circuits and Datasheet

Working Principle of PC817 (How to Use) The operation of the PC817 optocoupler is straightforward, yet its integration with diverse devices necessitates adherence to specific

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