

# Typical Application Circuits of Optical Couplers



## Summary of Content

Optocouplers are widely used to isolate signals between circuits, protect sensitive electronics, and interface low-voltage logic with high-voltage systems.

### Basic Phototransistor Optocoupler Circuit

A common application involves a phototransistor optocoupler connected to an emitter resistor. The input LED is driven by a digital or analog signal, and the phototransistor output is connected to a load resistor ( $R_L$ ) to interface with TTL logic or microcontrollers. The current transfer ratio (CTR), which is the ratio of the phototransistor collector current to the LED input current, must be considered for reliable operation. For example, a typical CTR of 100% at  $I_F = 10 \text{ mA}$  may degrade over time and temperature, so design allowances are made to ensure a safe minimum output current for logic high and low states ( $V_{IL} \leq 0.8 \text{ V}$ ,  $I_{IL} \leq 1.6 \text{ mA}$ ) (Vishay application note) .

### AC and DC Signal Isolation

Optocouplers can transfer both AC and DC signals across galvanically isolated circuits. In AC applications, a phototransistor or photo-triac optocoupler can interface with mains voltage while protecting low-voltage control circuits. For DC applications, the LED is forward-biased by a DC voltage, and the phototransistor output switches the connected load, effectively isolating the input and output stages .

### Interfacing with Logic Circuits

## Article Content

Optocoupler Circuits, Working, Characteristics, Interfacing

Optocouplers can be ideally used for creating a perfectly isolated coupling across a low DC control circuit and a high

Optocoupler Circuit Operation | Specification | Applications

An Optocoupler Circuit Operation (optoelectronic coupler) is essentially a photo-transistor and an LED combined in one package.

Using Opto Couplers

Typical optocouplers can handle input and output currents from a few microamps to tens of milliamps. There are many optocouplers

ANO007 | Understanding Phototransistor Optocouplers

In order to design a functionally robust and reliable application with optocouplers, it is essential to understand not only the device's

Application Examples

Optocouplers are used to isolate signals for protection and safety between a safe and a potentially hazardous or electrically noisy

Optocoupler Applications

This manual describes the characteristics of typical optocouplers. Also included are notes on designing application circuits for typical

Optocoupler: Its Types and Various Application in DC/AC Circuits

Often in circuits, especially low voltage or highly noise sensitive circuits, Optocoupler is used to isolate circuitry to

Optocoupler devices and application

An optocoupler (or an optoelectronic coupler) is basically an interface between two circuits which operate at (usually)

Optocoupler Tutorial and Optocoupler Application

Common applications for opto-couplers include microprocessor input/output switching, DC and AC power control, PC

OPTOCOUPLER DEVICES AND APPLICATION

The ideal isolation scheme should only allow signal flow in one direction, should respond to dc levels, and should offer an extremely

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