

Common Voltage Levels of Optocouplers



AI Overview

An optocoupler's voltage is defined by the forward voltage of its input LED, the reverse voltage limit of the LED, and the maximum isolation voltage between input and output circuits.

Input Side Voltage The input of an optocoupler consists of a light-emitting diode (LED). The forward voltage of this LED typically ranges from 1.2V to 1.4V for standard infrared LEDs, depending on the specific device and current applied. The reverse voltage of the LED is usually low, often around 5V, and exceeding this can cause a reverse current that may damage the LED or reduce its light-emitting efficiency. The LED's voltage drop is proportional to the current flowing through it, and datasheets specify the maximum forward current to prevent overheating or destruction.

Output Side Voltage The output side of an optocoupler is usually a phototransistor, photodarlington, or photo-SCR/triac. The voltage across the output device depends on the collector-emitter voltage (V_{CE}) for phototransistors or the blocking voltage for photo-SCRs and triacs. Typical phototransistor optocouplers can handle collector-emitter voltages from 20V up to 80V, while specialized devices may support higher voltages. The output voltage is controlled by the external circuit and the current transfer ratio (CTR) of the optocoupler.

Isolation Voltage A key voltage specification is the isolation voltage, which defines the maximum voltage that can be applied between the input and output without breakdown. Standard optocouplers provide isolation up to 5kV RMS, ensuring that high voltages on the input side do not affect the output side. This voltage is tested for a short duration (e.g., 1 minute) and guarantees insulation under normal operating conditions.

Summary

Parameter	Typical Value
Forward voltage (LED input)	~1.2–1.4V
Reverse voltage (LED input)	~5V maximum
Output voltage (phototransistor V_{CE})	20–80V typical
Isolation voltage	up to 5kV RMS

Understanding these voltage limits is essential for designing circuits that safely use optocouplers to transfer signals between high-voltage and low-voltage sections while maintaining el...

Article Content

Optocoupler Circuits, Working, Characteristics, Interfacing

Isolation voltage (Viso): It is defined as the absolute maximum AC voltage that can exist across the input and output circuit stages of the

Opto-isolator

Opto-isolators prevent high voltages from affecting the system receiving the signal. Commercially available opto-isolators withstand input-to-output voltages up to

Optoelectronics: Optocouplers

Optocouplers provide both electrical insulation and signal isolation. The ability of an optocoupler to protect surrounding circuitry against damage

Optocoupler Circuits, Working, Characteristics, Interfacing

Optocoupling devices work as logic level changeovers between two circuits, It has the ability to block noise transfer across the integrated circuits, for

Using Opto Couplers

Each logic family (e.g. LSTTL or CMOS types) may have different logic voltage levels and different input and output current requirements, and optocouplers can

Optocoupler

Optocoupler Optocouplers are an important application of LEDs. An LED and a phototransistor are sealed in a light-proof plastic package, so that light from the LED is received by the phototransistor.

What is Photocoupler | Optocoupler | Optoisolator

What is an Optocoupler (Optoisolator / Photocoupler)? An Optocoupler (Optoisolator / Photocoupler) is an electronic component that

Explanation of Photocoupler / Optocoupler Specifications

Generally, this voltage depends on the reverse withstand voltage between the emitter and base of the phototransistor and is low. If a reverse voltage that

ANO007 | Understanding Phototransistor Optocouplers

Common-emitter (CE) and common-collector (CC) are the typical configurations to DC-bias the optocoupler, as shown in Figure 36 left and right,

Guidelines for reading an optocoupler datasheet

Optocouplers, also known as opto-isolators, are components that transfer electrical signals between two isolated circuits by using infrared light. As an isolator, an optocoupler can prevent high voltages from

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 main parameters and parasitic elements, but also their tolerances

What Is Optocoupler and Its Application with Examples

Safety: Protects low-voltage microcontrollers (3.3V/5V) from high-voltage spikes (110V/220V). Level Shifting: Allows a 3.3V signal to switch a 24V

Transistor Output Optocouplers Frequently Asked Questions (FAQs)

There are values defined in Isolation rating (VISO), maximum transient isolation voltage (VIOTM) and maximum working voltage (VIORM). These are the most common definitions together with the DTI

Optocoupler Tutorial and Optocoupler Application

Optocoupler Tutorial Summary Optocouplers and Opto-isolators are great electronic devices that allow devices such as the power transistors or a

Optocoupler

This handbook begins with a selection guide followed by sections discussing critical optocoupler design parameters such as Insulation and Withstand Voltage, Regulatory Agency Safety Standards,

Opto Coupled Devices

& Opto Sensors Optocouplers or opto isolators consisting of a combination of an infrared LED (also IRED or ILED) and an infra red sensitive device such as a photodiode or a phototransistor are widely

What is Optocoupler and How it works?

Such a device already exists, and as you guessed, it is the optocoupler! Optocoupler Inputs and Outputs Optocouplers come in many

Opto Coupled Devices

Each logic family (e.g. LSTTL or CMOS types) may have different logic voltage levels and different input and output current requirements, and optocouplers can provide a convenient way of interfacing two

Optocouplers in Electrical Isolation and Signal

This article explores optocouplers, which are important for electrically isolating circuits and enabling signal transmission. It details their working

The Ultimate Optocouplers Guide: Isolation, Types, and

Our complete optocouplers guide covers what they are, how they work, the different types, and key applications. Learn to select the right opto

Optocouplers for TTL-CMOS Logic Level Shifting

Here I'll illustrate using optocouplers to voltage logic shifting between TTL and CMOS devices. Optocouplers also isolate output transistor voltages from digital

Optocouplers, Part 2: Parameters and applications FAQ

Q: What are some representative application connections for optocouplers and the isolation they provide? A: Among the many applications —

Optocouplers Desig

e tolerated. Common-mode interference that exceeds the maximum specification might result in abnormal voltage transitions or excessive noise on the output signal. (CMTR is slightly different than

Optocoupler Tutorial for Beginners

Optocouplers are very useful when you need to isolate different sections of a circuit, for example in power supply circuits to transfer signals

What is Photocoupler | Optocoupler | Optoisolator

Optocouplers generally offer isolation voltages ranging from 1,500V to 10,000V RMS. Working Voltage: Maximum continuous voltage allowed

Understanding Optocouplers: Principles, Types and

Optocouplers are very important in modern electronics because they reliably and efficiently isolate circuits, improving safety and performance. They

Basic Characteristics and Application Circuit Design of Transistor

Because of this, it is possible to specify the threshold output voltage level with sufficient margin to allow for ease and flexibility in design. This circuit is recommended for that purpose. Figure 2.7 shows a

Optocoupler Tutorial and Optocoupler Application

Since there is no direct electrical connection between the input and output of an optocoupler, electrical isolation up to 5kV is achieved. Optocouplers

Types of Optocouplers – PCB HERO

Optocouplers (also known as optoisolators) are electronic components that transfer electrical signals between two isolated circuits using

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.sabineamsee.co.za>

Email: info@sabineamsee.co.za

Phone: +27 82 415 6793

Address: Unit 7, Innovation Park, 34 Electron Road, Kempton Park, 1620,
South Africa

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