

Optical coupler saturated and conducting



Article Overview

An optocoupler is saturated and conducting when the phototransistor receives enough light from the LED to allow maximum collector current, resulting in a low collector-emitter voltage ($V_{CE,sat}$) and minimal resistance.

Understanding Saturation in Optocouplers

An optocoupler consists of an infrared LED and a phototransistor. When the LED emits light, the phototransistor conducts, transferring current across the isolation barrier. Saturation occurs when the LED current is sufficient to drive the phototransistor into its maximum conduction state, where the collector-emitter voltage drops to a minimum, typically around 0.25 V to 0.4 V for standard transistor-output optocouplers. In this state, the transistor behaves almost like a closed switch, allowing the collector current (I_C) to flow with minimal voltage drop.

Current Transfer Ratio (CTR) and Saturation

The Current Transfer Ratio (CTR) is the ratio of the phototransistor's output current to the LED forward current, expressed as a percentage. For example, if the LED current (I_F) is 5 mA and the CTR is 300%, the phototransistor can theoretically conduct 15 mA. However, if external resistances limit the current, the transistor may still be saturated but only conduct the allowed current. To ensure full saturation, designers often provide more LED current than the minimum required, e.g., 7.5 mA in the previous example, to guarantee the transistor reaches its low $V_{CE,sat}$.

Linear vs Saturated Operation...

Article Content

Basic Characteristics and Application Circuit Design of Transistor Couplers

This document outlines the basic characteristics and application design of general-purpose transistor output photocouplers (optical

Opto Coupled Devices

Saturation Mode In saturation mode, the optocoupler output transistor is either turned fully "on" (saturation conditions), or fully "off"

Fiber Coupler Tutorials

The coupling ratio is calculated from the measured insertion loss. Coupling ratio (in %) is the ratio of the optical power from each

Optocoupler Circuit Operation | Specification | Applications

Optocoupler Circuit Operation: An Optocoupler Circuit Operation (optoelectronic coupler) is essentially a photo-transistor and an LED

Transistor Output Optocouplers Frequently Asked Questions (FAQs)

Transistors operate as solid state switches which turn on and off with regard to the applied signal. In the saturation mode of the

Optocoupler Operation

Saturation Mode In saturation mode, the optocoupler output transistor is either turned fully "on" (saturation conditions), or fully "off"

What is an Optocoupler A.K.A Opto-isolator or Photocoupler?

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

Transistor Output Optocouplers Frequently Asked Questions (FAQs)

In the saturation mode of the optocoupler, the emitted light from the diode is high enough to make the phototransistor conducting

4N25, 4N26, 4N27, 4N28

DESCRIPTION The 4N25 family is an industry standard single channel phototransistor coupler. This family includes the 4N25, 4N26,

Optocoupler Circuits | Nuts & Volts Magazine

Simply described, an optocoupler device is a sealed, self-contained unit that houses independently-powered optical (light) Tx and Rx

Optical couplers (Chapter 5)

Optical couplers are passive devices that couple light through waveguides or fibers. They play a very important role in the

Guidelines for reading an optocoupler datasheet

Saturated and non-saturated CTR A datasheet provides detailed graphs for non-saturated as well as saturated curves for logic

Optical Coupler

Optical coupler is a semiconductor device, which is designed to transfer electrical signals by using light waves in order to provide

What Is Optocoupler | Opto-coupler Working And Application

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

BSc Chemistry

Distribution of optical signals to more than one station is not so simple and hence we cannot simply connect a few fibers. To

A Review of Optical Coupler Theory, Techniques, and Applications

The theory of coupling between different media is well-established, however the field of coupler design is perpetually adapting and

Optocoupler Basics: Definition, Types, and Features

/ Fiber Optic / Optocoupler Basics: Definition, Types, and Features Optocoupler Basics: Definition, Types, and Features An

Optical Coupler

6.1.2.3 The optical coupler Due to the circuit cannot support the large load voltage, an optical coupler is used to protect the controller

Microsoft Word

The output saturation power is the output optical power at which the amplifier gain decreases by a factor of two (or by 3 dB). The

ANO007 | Understanding Phototransistor Optocouplers

An optocoupler, also known as photocoupler or opto-isolator, is a device which can transfer an electrical signal across two

Contact Us

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

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

Email: sales@gmarkconstruction.co.za

Phone: +31-6-15-38-72-94

Address: Herengracht 456, 1017 BS Amsterdam, Netherlands

This document is for informational purposes only. Specifications subject to change without notice.

