

Can optocouplers explode



AI Overview

Optocouplers can fail catastrophically under extreme electrical or thermal stress, potentially causing the package to crack or rupture, but actual explosions are rare. How Optocouplers Work An optocoupler consists of a light-emitting diode (LED) and a photodetector (such as a phototransistor) enclosed in a solid-state package. The LED converts an electrical signal into light, which is detected by the phototransistor to transfer the signal across electrically isolated circuits. The package is typically made of epoxy or plastic, sometimes with a metal frame for mechanical support and heat dissipation. Why Optocouplers Might "Explode" While optocouplers are designed for high-voltage isolation (up to 10 kV in some commercial devices), they can fail violently under certain conditions: Overvoltage or Overcurrent: Applying a voltage or current beyond the LED or phototransistor ratings can cause thermal runaway, overheating the semiconductor junctions. This can lead to the epoxy package cracking or popping. Thermal Stress: Excessive ambient temperature or poor heat dissipation can cause the internal LED or phototransistor to overheat, potentially releasing gases from the epoxy and causing the package to rupture. Electrical Transients: High-voltage spikes or fast transients can exceed the isolation barrier, damaging the internal components and sometimes causing arcing inside the package, which may produce smoke or a small popping sound. Mechanical Stress: Physical damage or improper soldering can compromise the package integrity, making it more susceptible to cracking under electrical or thermal stress. Realistic Outcomes In most cases, failure manifests as: Loss of signal transfer Smoke or burning smell Cracked or deformed package A true explosion is extremely rare because the energy stored in the small LED and phototransistor is minimal. However, in high-power circuits where the optocoupler is exposed to extreme overvoltage or short circuits, the package could rupture violently enough t...

Article Content

Can I use two optocouplers to increase the galvanic isolation?

We need a galvanic isolation of 10 kV in our flyback powersupply. We faced some problems in choosing the optocoupler in terms of the price. We thought maybe it could be possible if

What Is Optocoupler | Opto-coupler Working And Application

A: Yes, optocouplers can experience degradation or failure over time due to factors such as LED aging, temperature stress, high voltage or current surges, and mechanical stress.

Optocoupler Tutorial for Beginners

It's important to note that while optocouplers are excellent for isolating and transmitting signals, they differ from solid-state relays, which are designed to switch larger loads. This means the

Opto-coupler Input Circuits for PLCs

These can also be surface mount as well. All contain an LED emitter and many a photo transistor output. Fig. 2 Fig. 2 show just a few of the many types of optocouplers. The bottom two are often used as

Everything You Need to Know About Optocouplers in Electronics

Dive deep into the world of optocouplers with our comprehensive guide. Learn about their basics, types, working principles, applications, and testing methods. Discover how optocouplers

Optocoupler Interfacing with AVR Pic and 8051 Microcontroller

By following the instructions outlined in this article, readers can successfully incorporate optocouplers into their microcontroller-based projects, enabling them to achieve effective isolation and control in

Detecting and measuring AC line voltage with an optocoupler

I simulated the circuit shown below using MultiSim and obtained some interesting results. The simulation suggests that you can accurately reproduce the AC line voltage from the input to the

Terms of use

Thank you for accessing the website of IC-Components We respects your privacy and takes your online safety seriously. To better protect your privacy, we provide the notice below explaining our

Why did this zener diode explode? | Page 3 | All About Circuits

As you can see from the schematics, that diode drives nine N-Channel MOSFETS when they are activated through the corresponding optocouplers driven by an external controller connected

Lifetime of Optocoupler/Photocoupler

It is possible to estimate the lifetime of an optocoupler by determining the percentage of the decrease in CTR that can be tolerated under the same conditions.

Opto-isolator

Some optocouplers have a reflective pair configuration. This configuration refers to optocouplers that contain a source that emits light and a sensor that only detects light when it has reflected off an object.

Watch Catch Me If You Can (2002)

A seasoned FBI agent is always one step behind a teenage serial forger who stole millions while posing as a pilot, a doctor, and a lawyer.

As an Electronic Technician, attention to detail is critical ...

That's why safety is always my top priority, especially when dealing with sensitive components like IGBT transistors, which can be dangerous if mishandled because It can explode.

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 provide a convenient way of interfacing two

Loudspeaker Protector, my version

I was criticised that I should have put optocouplers in transistors collectors in order to physically separate PIC from analog section of the amplifier. According to the critic, PIC can cause

Current Transfer Ratio Calculator

The current transfer ratio (CTR) is a critical parameter for evaluating the efficiency of optocouplers and similar devices. This guide provides a comprehensive understanding of CTR, its

Isolate a linear signal with a regular optocoupler

Because of the different ground domain, it's desirable to isolate this using an optocoupler. Will a non high linearity isolator (like the TCMD1000) with a CTR of around 100% provide a linear

Optocoupler + 12v automotive relay control circuit parts help and ...

Hi, I am having trouble finding an example to reference and understand how they choose the values of resistors to make the circuit function. As I am creating this post, I've looked to the right

Optocoupler Tutorial and Optocoupler Application

Optocouplers are available in four general types, each one having an infra-red LED source but with different photo-sensitive devices. The four optocouplers are called the: Photo

MOSFET power module and optocoupler

I want to drive a 12V DC motor single direction 10A from Arduino PWM pin. I found several power MOSFET modules. Some have optocoupler, some don't. Both are advertised as

When should I use an optocoupler as opposed to a transistor ...

You only ever see optocouplers used properly when safety isolation is needed between devices or when they can't share a common ground. I see optocouplers used sometimes on relay drive circuits where

High-Performance Optocouplers For Power Efficiency

High-performance optocouplers take this to the next level by offering superior power efficiency, allowing for optimized energy consumption in various applications. By utilizing advanced

What is Optocoupler and How it works?

Optocouplers come in many different shapes, sizes and speeds (something which will be discussed later), but most of them have the same basic features – a diode input and a switching

Optocouplers in Electrical Isolation and Signal Transmission

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

Contact Us

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

Website: <https://adikor.eu>

Email: info@adikor.eu

Phone: +33 6 48 37 92 15

Address: 12 Rue de la Paix, 75002 Paris, France

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

