

Current transfer ratio of optocouplers

Article Overview

The current transfer ratio (CTR) of an optocoupler is a critical parameter that indicates the efficiency of the device in transferring input current to output current, typically expressed as a percentage.

Definition of CTR

The current transfer ratio (CTR) is defined as the ratio of the output current (I_C) from the phototransistor to the input current (I_F) flowing through the LED in the optocoupler. It is expressed mathematically as:

$$CTR = (I_C / I_F) \times 100\%$$

This ratio is similar to the DC current amplification ratio of a transistor and is crucial for understanding the performance of optocouplers in various applications .

Importance of CTR

- **Performance Indicator:** CTR is a key performance indicator for optocouplers, affecting their ability to isolate and transfer signals between circuits while maintaining signal integrity.
- **Design Considerations:** When designing circuits with optocouplers, it is essential to account for CTR variations due to factors such as temperature, LED current, and the collector-emitter voltage of the phototransistor .

Factors Affecting CTR

- **Input Current (I_F):** The CTR is dependent on the input current supplied to the LED. As the input current increases, the CTR typically reaches a maximum point before it...

Article Content

Feb 05, 2026

Transistor Optocoupler CTR (Current Transfer Ratio) Calculator

Calculate the Current Transfer Ratio (CTR) of a transistor optocoupler using this calculator and understand the CTR formula.

Feb 25, 2026

What is Current Transfer Ratio (CTR) and why does it matter?

What is Current Transfer Ratio (CTR) ? Answer: The current transfer ratio (CTR) is an important parameter in

Dec 01, 2025

Guidelines for reading an optocoupler datasheet

Current transfer ratio Figure 6: Current transfer ratio CTR is very much like a gain value for transistors. The CTR describes the ratio

Mar 28, 2026

opto isolator

As I understand the optocoupler current transfer ratio, CTR is like the hfe of a transistor. I can't understand if the CTR

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Basic Characteristics and Application Circuit Design of Transistor

Transistor couplers which have high photosensitivity and high current-transfer ratios are effective as interfaces for signal

Jul 23, 2026

What is Current Transfer Ratio (CTR) and why does it matter?

The gain of an optocoupler is expressed as the Current Transfer Ratio (CTR). It is defined as the ratio of the

Apr 17, 2026

5-10. Characteristics of Photocouplers (Current Transfer

Current transfer ratio of transistor coupler: It is expressed by the amplification ratio of the output current

Nov 17, 2025

Opto Coupler CTR Explanation

Device current transfer ratio is dependent to the luminous intensity of the light source, operating temperature and continuous

Jun 09, 2026

{1145} Optocoupler Current transfer ratio CTR

In this video number {1145} Optocoupler Current transfer ratio CTR . I explained current

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Current Transfer Ratio (CTR) and Response Time of

Learn about the current transfer ratio (CTR) characteristics and response time of photocouplers/optocouplers.

Feb 14, 2026

Reading Optocouplers datasheet: current transfer ratio (CTR)

Looking at the datasheet, it looks like the current transfer ratio is also dependent on the forward current as well as the

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{1403} Optocoupler Function & CTR Explained | Current Transfer Ratio ...

Understand how the CTR (Current Transfer Ratio) defines its performance, and how to

Feb 26, 2026

ANO007 | Understanding Phototransistor Optocouplers

The ratio between the phototransistor collector current (IC) and the IR-LED current (IF) represents the main optocoupler parameter:

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Optocouplers, Part 2: Parameters and applications FAQ

Part 1 of this FAQ explored the basics of the optocoupler. This part looks at key parameters and some application

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What is the current transfer ratio?

The current transfer ratio (CTR) refers to the ratio of the collector current at the output side IC to the input current passed to the LED

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What is Current Transfer Ratio (CTR)?

What is Current Transfer Ratio (CTR)? Current Transfer Ratio (CTR) is a ratio of the output collector current to the input forward

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Impact of the Current Transfer Ratio on Switching Times

A higher CTR means that for a given forward current (I_F), more photocurrent is generated, enabling the output transistor to reach

Nov 15, 2025

Make sure your optocoupler is properly biased

In isolated power supplies, optocouplers pass the feedback signal across the isolation boundary. Optocouplers contain both a light

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Understanding the CTR of an optocoupler | All About Circuits

I'm having a particularly hard time understanding the CTR (Current Transfer Ratio), and how that will impact my

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Current Transfer Ratio Calculator

The Current Transfer Ratio (CTR) Calculator is a tool used to determine the efficiency of current transfer between the

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Using Opto Couplers

The current in each half of the circuit is linked by the Current Transfer Ratio or CTR, which is simply the

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5-10. Characteristics of Photocouplers (Current Transfer Ratio: CTR)

The current transfer ratio (CTR) of a transistor-output photocoupler is the ratio of input current and output current expressed as a %.

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Current Transfer Ratio (CTR) and opto couplers

In the 1980's optocouplers became the rage for providing negative feedback to the primary side of switching power

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Current Transfer Ratio (CTR) and Response Time of Photocouplers ...

Current Transfer Ratio (CTR) and Response Time of Photocouplers / Optocouplers
Current Transfer Ratio (CTR) The current

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Current Transfer Ratio (CTR) can be critical in certain applications, such as providing the feedback value of a variable

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Explanation of Photocoupler / Optocoupler Specifications

Current Transfer Ratio: CTR (%) The value that expresses the collector current (I_C) ratio in relation to a prescribed forward current (I_F)

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What is Current Transfer Ratio In a Linear Optocoupler?

In optocouplers generally it represents how much of the diode current is reflected in the transistor current. It is a

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Optocoupler Device CTR and Circuit CTR Explained

CTR stands for current transfer ratio. In bipolar junction transistor this is the so called current gain or simply beta. It is the ratio of the

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Using Opto Couplers

After studying this section, you should be able to: Describe basic applications of optocouplers: Understand the design of optocoupler

Oct 30, 2025

Transistor Output Optocouplers Frequently Asked Questions (FAQs)

CTR is the abbreviation for Current Transfer Ratio. It describes the two main parameters of optocouplers and is obtained by dividing

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