

3.4 Operation in the Reverse Breakdown Region – Zener Diodes

Reading Assignment: pp. 167-171

A Zener Diode →

The 3 **technical** differences between a junction diode and a Zener diode:

- 1.
- 2.
- 3.

The **practical** difference between a Zener diode and "normal" junction diodes:

→ Manufacturer **assumes** diode will be operated in **breakdown region**. Therefore:

1.

2.

3.

HO: Zener Diode Notation

A. Zener Diode Models

Q: How do we **analyze** zener diodes circuits?

A: **Same** as junction diode circuits—

Big problem ->

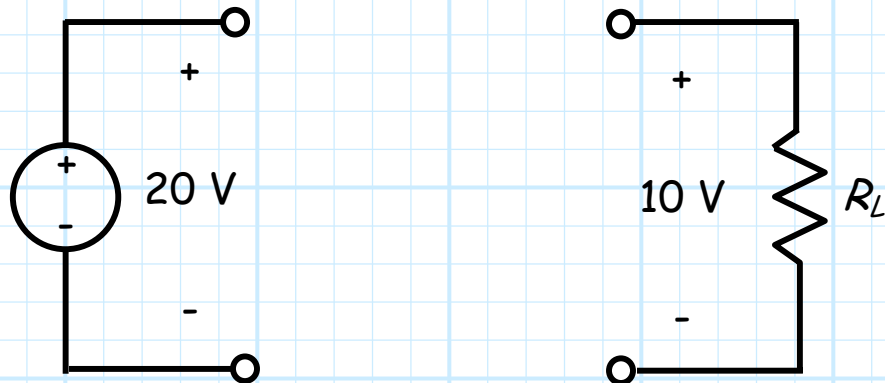
Big solution ->

HO: Zener Diode Models

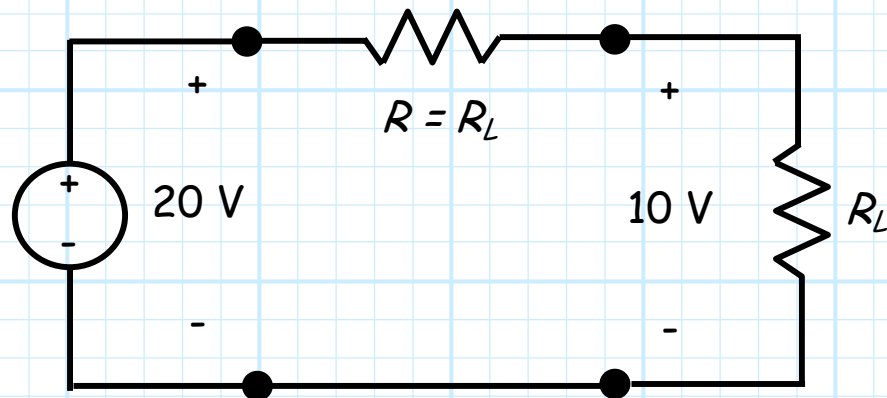
Example: Zener Circuit Analysis

B. Voltage Regulation

Say that we have a 20 V supply but need to place 10 V across some load:



The solution **seems** easy! →



This, in fact is a **very bad** solution—

HO: The Shunt Regulator

Two primary **measures** of voltage regulator effectiveness are **line regulation** and **load regulation**.

HO: Line Regulation

HO: Load Regulation

Example: The Shunt Regulator

Voltage regulation can (as is) achieved by **other** means.

Voltage Regulators