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Module 917: Zener Voltage Regulator

Procedure

Build the following circuit. Use the rechargeable NiMH battery to power the Schmitt trigger inverter chip. The Zener diode is the lone diode in your kit with the thicker leads. There are portions of relevant datasheets on the back side of this paper.

Turn on the oscilloscope and press the Default Setup button. Use ***only*** the horizontal and vertical scale adjustments and the trigger and meas menus to complete today's task to improve your skills.

Use the oscilloscope to view both voltages V_1 and V_2 as the $2\ k\Omega$ potentiometer is adjusted.

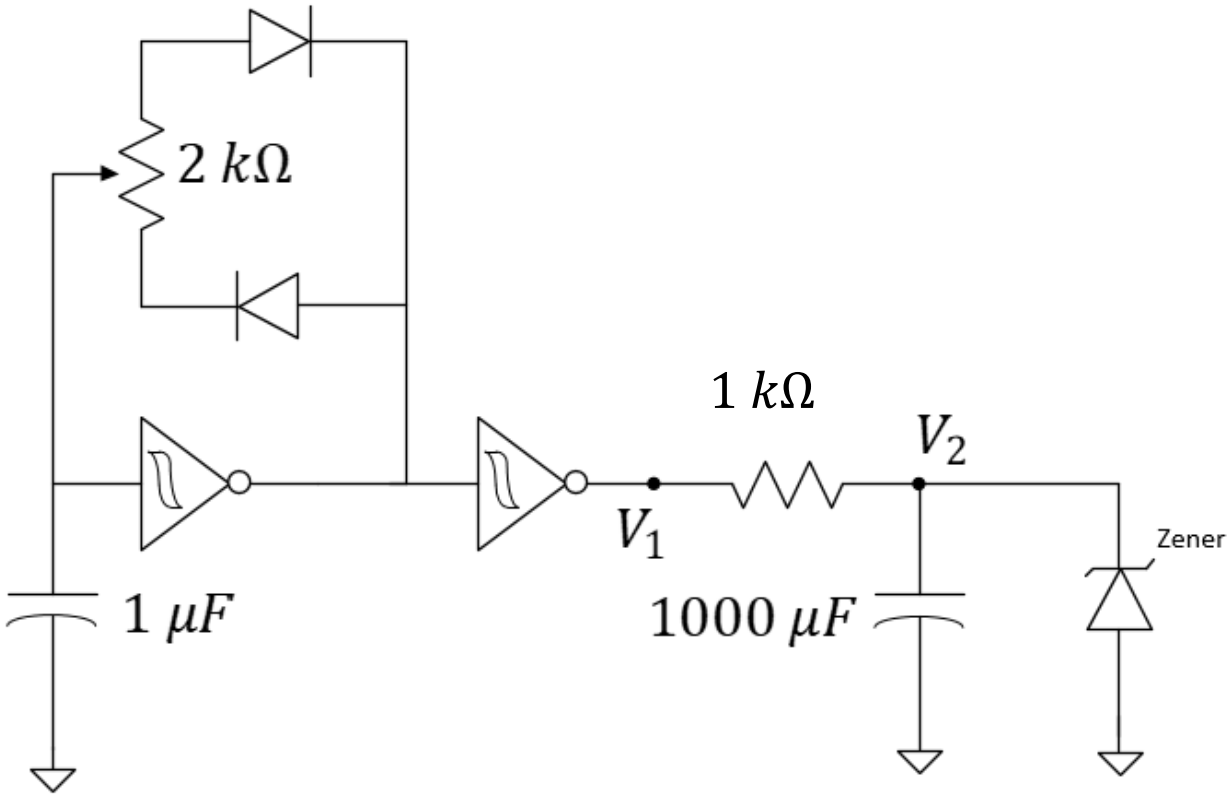


Figure 1: *A PWM-to-5VDC Zener-regulated circuit.*

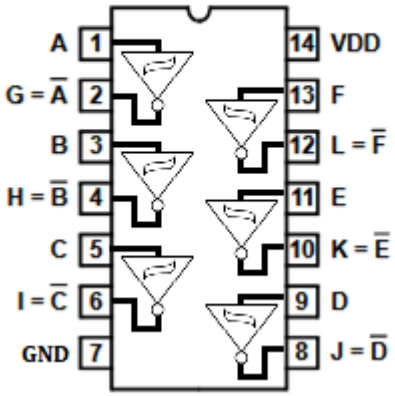
Verify that adjustment of the $2\ k\Omega$ potentiometer will cause the voltage V_2 to increase and then stop at some value. Use the oscilloscope to measure and record the voltage V_2 (to two digits) at which V_2 significantly slows in its growth. Let your TA know you are ready for evaluation to receive your module grade.

Evaluation

- Ability to map a circuit design onto the breadboard in a functional and clean manner.
- Ability to use the oscilloscope.
- Ability to troubleshoot problems that occur during a build.

CD40106 CMOS Hex Schmitt Triggers

CD40106BMS
TOP VIEW



Description

CD40106BMS consists of six Schmitt trigger circuits. Each circuit functions as an inverter with Schmitt trigger action on the input. The trigger switches at different points for positive and negative going signals. The difference between the positive going voltage (VP) and the negative going voltage (VN) is defined as hysteresis voltage (VH) (see Figure 17).

Features

- **High Voltage Type (20V Rating)**
- **Schmitt Trigger Action with No External Components**
- **Hysteresis Voltage (Typ.)**
  - **0.9V at VDD = 5V**
  - **2.3V at VDD = 10V**
  - **3.5V at VDD = 15V**

Silicon Power Zener Diodes