# Potentiometer Basics

Last updated 7/15/21

Potentiometer Basics

- Variable resistance
  - 1K Ohm example

Pin 1

Pin 2 "wiper"

1K Ω total resistance

Pin 3

Pin 1

100 Ω

Pin 2 "wiper"

900 Ω

Pin 3

Pin 1

750 Ω

Pin 2 "wiper"

250 Ω
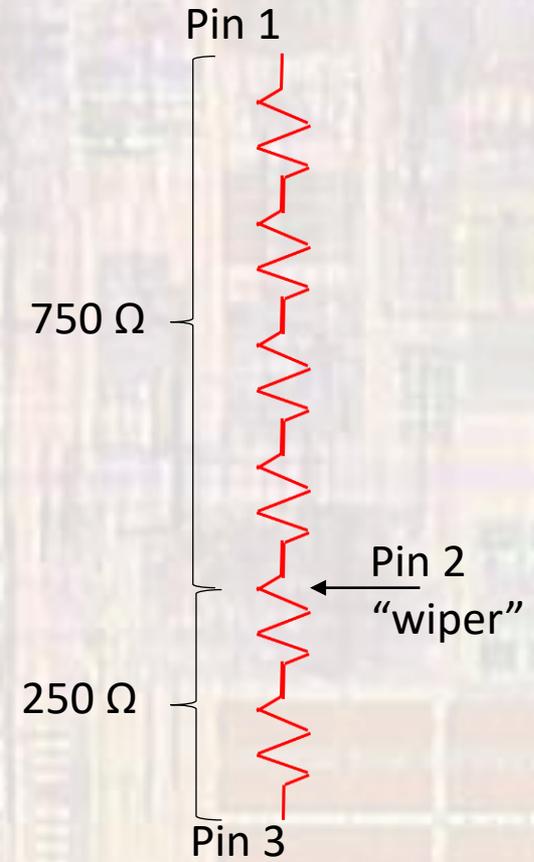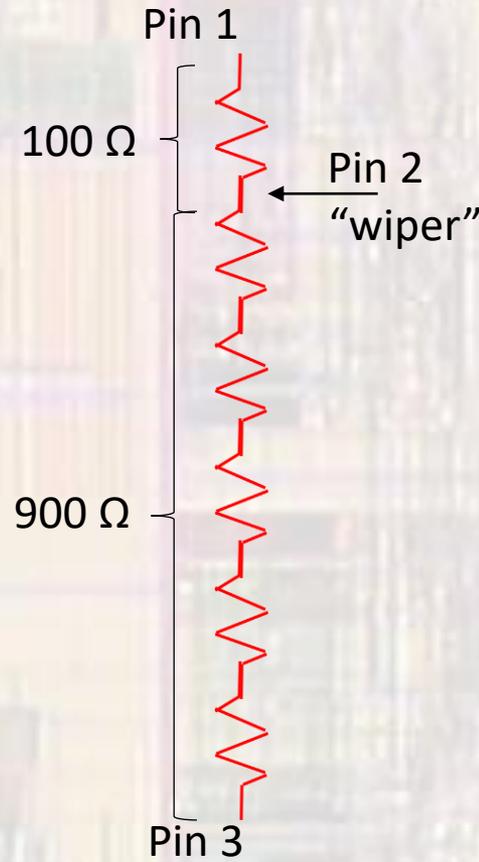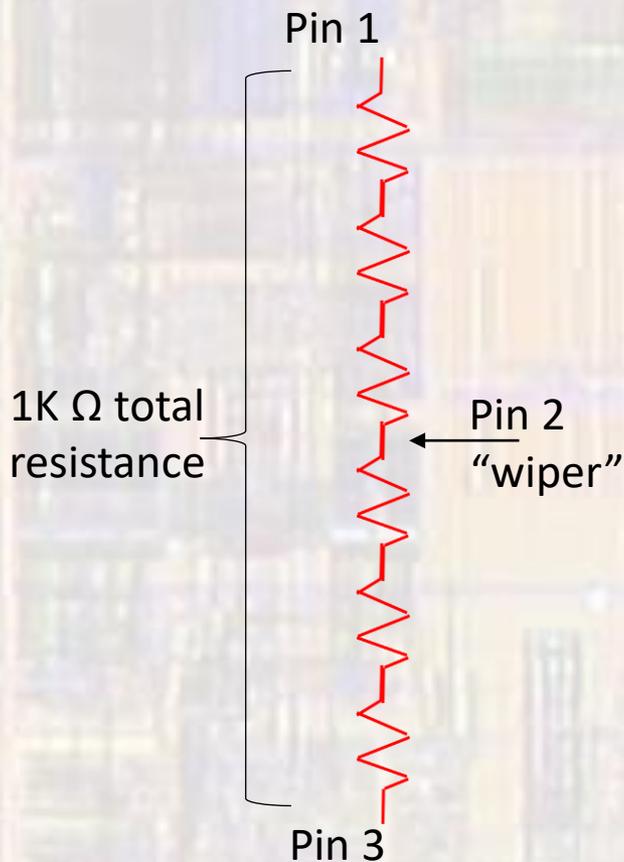
Pin 3

Potentiometer Basics

- Variable resistance
  - Voltage Divider

3.3V

Pin 1

750 Ω
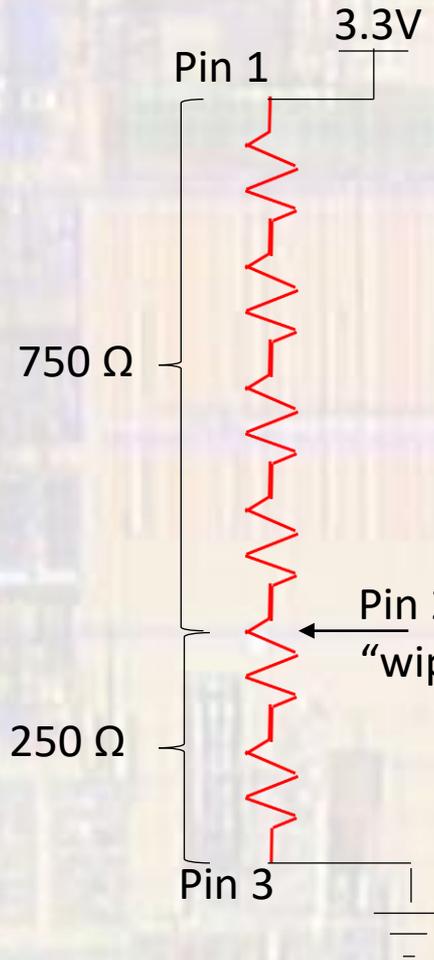
$$V_{out} = \frac{(V_{top} - V_{bottom}) * R_{bottom}}{R_{total}}$$

Pin 2
"wiper"

$$\frac{(3.3V - 0V) * 250\ \Omega}{250\ \Omega + 750\ \Omega} = 0.825\ V$$

250 Ω

Pin 3

Potentiometer Basics

- ## Variable resistance
  - ### Rheostat – one pin open
    - Using only pin1 and Pin 2 (wiper)*

Pin 1

750 Ω

750 Ω

Pin 2 "wiper"

250 Ω

Pin 3   OPEN

Pin 1

100 Ω

100 Ω

Pin 2 "wiper"

900 Ω

Pin 3   OPEN
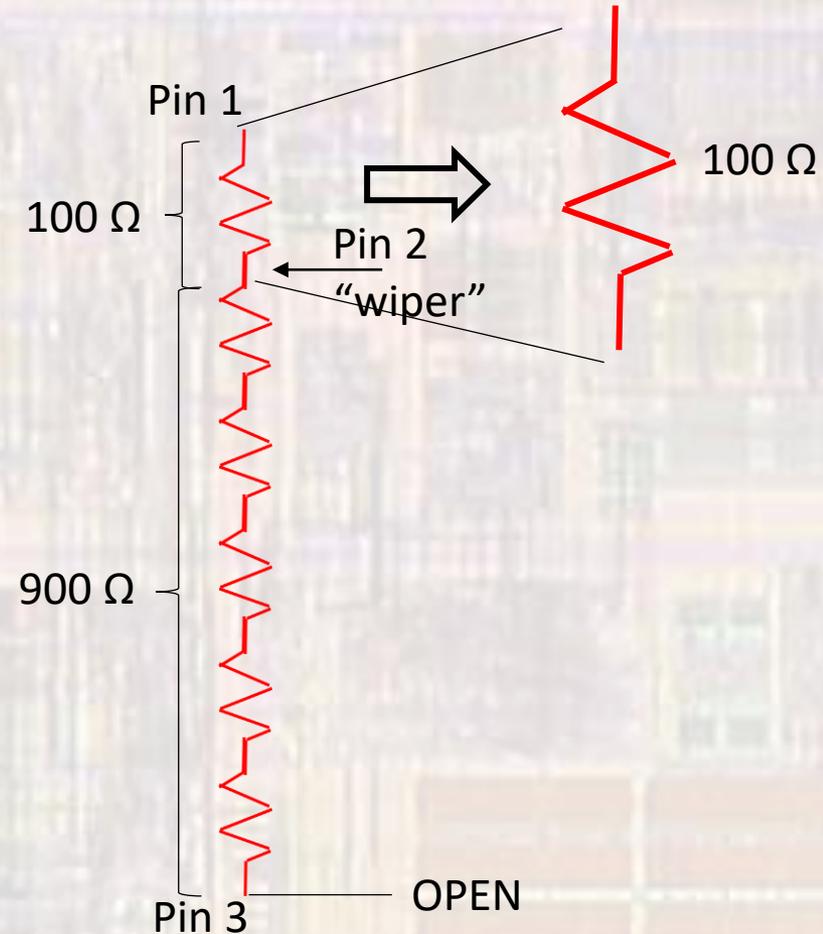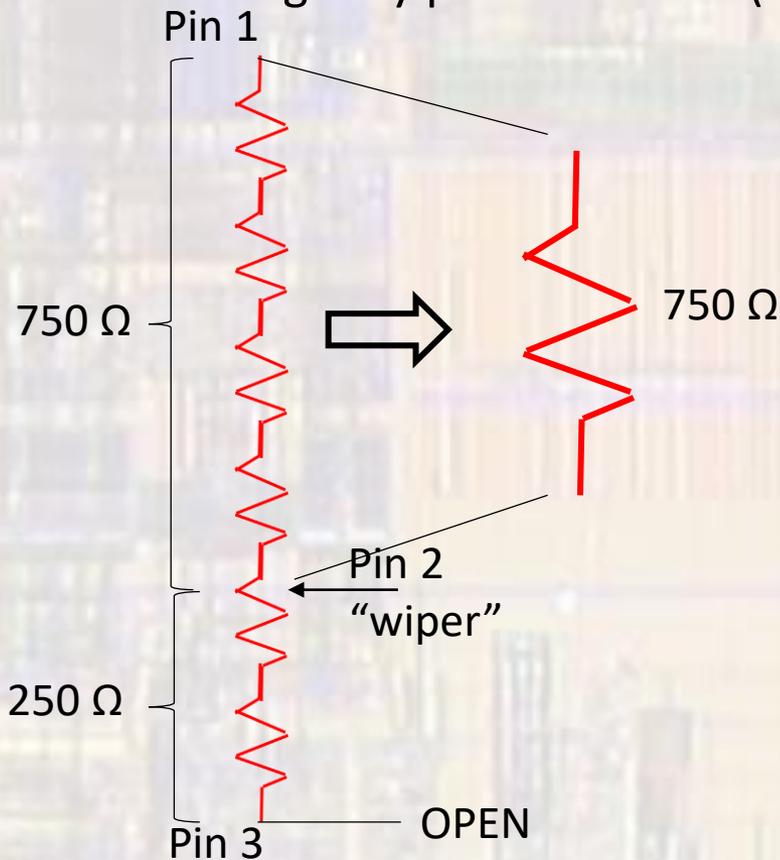
* Pin2 and Pin3 would also work

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Potentiometer Basics

- Variable resistance
  - Rheostat – one pin open
  - 1KΩ example

VDD

R_{load}

$Vout = VDD * R_{var} / (R_{var} + R_{load})$

R_{var}
$0 - 1K\ \Omega$

gnd

Potentiometer Basics

- Variable resistance

3352

ADJUSTMENT SLOT

$\frac{4.06}{(.160)}$ LONG

X $\frac{.86}{(.034)}$ WIDE

X $\frac{.84}{(.033)}$ DEEP TYP.

$\frac{3.81 \pm .51}{(.150 \pm .020)}$ TYP.

$\frac{8.89}{(.350)}$

$\frac{5.08}{(.200)}$ TYP. $\frac{.64}{(.025)}$ TYP.

$\frac{4.75}{(.187)}$ TYP.

$\frac{1.27}{(.050)}$ TYP.

③ ②

$\frac{9.53 \pm .38}{(.375 \pm .015)}$

①

$\frac{.51 \pm .05}{(.020 \pm .002)}$

$\frac{7.62}{(.300)}$ TYP.

DIA. PINS TYP.

② WIPER

CCW ① ③ CW

CLOCKWISE