

IEEE's Hands on Practical Electronics (HOPE)

Week 3: Ohm's Law, Equivalent Resistance

Definitions:

Ohmic: has a behavior that obeys ohm's law

Series: Connected one right after another; cascaded

Parallel: Both terminals are connected to the same two points on the circuit

Equations:

Ohm's Law: $R = V/I$

Other forms of Ohm's law: $V = IR$ or $I = V/R$

For resistors in series: $R_{total} = R_1 + R_2 + \dots + R_n$

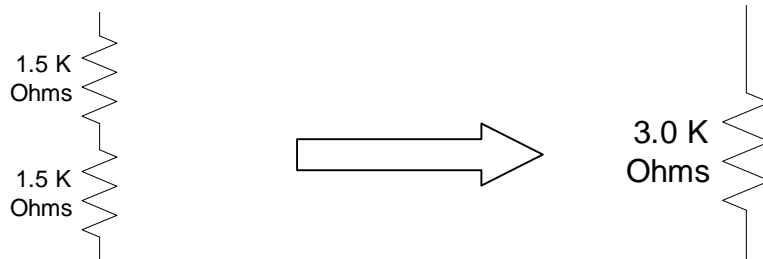
For resistors in parallel: $1/R_{total} = 1/R_1 + 1/R_2 + \dots + 1/R_n$

Notation:

Resistors in parallel are often written as $R_1//R_2$ instead of expanding it with the equation above.

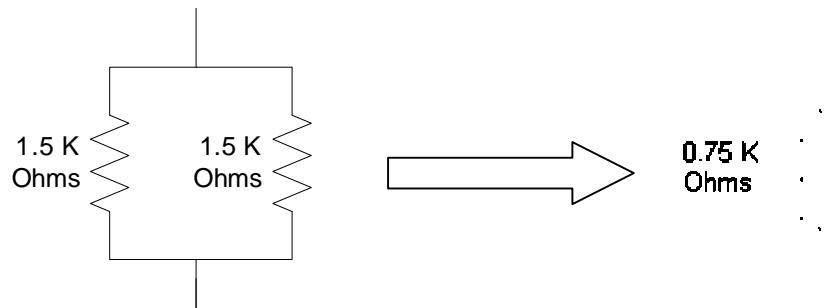
Example:

R_{total} for resistors in series:



R_{total} is equal to the sum of $R_1 + R_2$

R_{total} for resistors in parallel:



$$1/R_{total} = 1/R_1 + 1/R_2$$

To find R_{total} , take the inverse of $1/R_{total}$