

E.9 Alternative Expressions for Power

From section E.4 $P = VI$

but Ohm's law says $V = IR$

So we can get two alternate expressions for power

$$P = I^2 R$$

and $P = \frac{V^2}{R}$

Example:

A light globe is rated as 75 W, it has a current of 500 mA flowing through it. What is the resistance of the light globe?

$$P = I^2 R \quad 75 = (500 \times 10^{-3})^2 \times R \quad R = \frac{75}{(500 \times 10^{-3})^2} = 300 \Omega$$