## Answer on Question #37945, Physics, Other

One might find the surface area of the light bulb from Stefan-Boltzmann law:

$$P = S \epsilon \sigma T^4 \quad ,$$

where $P$ is the power radiated, $\epsilon$ is the emissivity, $\sigma$ is Stefan's constant ( $\sigma = 5.67 \cdot 10^{-8}\, J \cdot s^{-1} \cdot m^{-2} \cdot K^{-4}$ ) and $T$ is temperature.

Surface are is hence

$$S = \frac{P}{\epsilon \sigma T^4} = \frac{60\, W}{0.437 \cdot 5.67 \cdot 10^{-8}\, J \cdot s^{-1} \cdot m^{-2} \cdot K^{-4} \cdot (3.38 \cdot 10^3 + 273.15)^4\, K^4} = 13.6 \cdot 10^{-6}\, m^2 \quad .$$