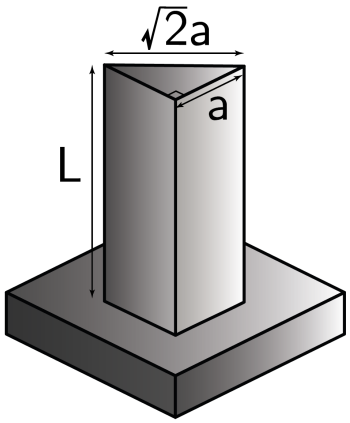
Fins - Parameter 4

Determine the fin parameter m^2 for the shown fin geometry.



Given the standard definition of the fin parameter:

$$m^2 = \frac{\alpha \cdot U}{\lambda \cdot A_\mathrm{c}}$$

Where the circumference can be stated as follows:

$$U = 2a + \sqrt{2}a$$

And the cross-sectional area:

$$A_\mathrm{c} = \frac{1}{2}\left(\sqrt{2}a \cdot a\right)$$

Which gives:

$$m^2 = \frac{2\alpha\left(2+\sqrt{2}\right)}{\lambda a} = \frac{\alpha\left(4+2\sqrt{2}\right)}{\lambda a}$$