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When a sinusoidal alternating current of peak value I_0 passes through a resistor of resistance R, the mean power dissipated in the resistor is P.

When another sinusoidal alternating current passes through the same resistor of resistance R, the mean power dissipated in the resistor is $4P$.

What is the root-mean-square value of this current?

A

$\dfrac{I_0}{\sqrt{2}}$

B

I_0

C

$\sqrt{2}I_0$

D

$2I_0$