Root Mean Square (RMS) Value

The RMS value of an AC current is the equivalent DC current that would produce the same amount of heat in a circuit over the same time.

$$I_{RMS} = I_{DC} = \sqrt{\frac{(i_1^2 + i_2^2 + i_3^2 \cdots + i_n^2)}{n}}$$

$$V_{RMS} = V_{DC} = \sqrt{\frac{(v_1^2 + v_2^2 + v_3^2 \cdots + v_n^2)}{n}}$$

$$I_{RMS} = \frac{1}{\sqrt{2}} I_m$$

When $i = I_m sin(\omega t)$