voltage   power rating

Power

→ Power is defined as the rate of transfer of energy.
· Power is measured in watts (w), where 1 watt is equivalent to 1 joule per second.

$$P = \frac{E}{t} \xleftarrow{\text{energy (J)}} \\ \xleftarrow{\text{time (s)}}$$

TEAC   MODEL NO. CT-M6811
COLOUR TELEVISION RECEIVER
V 03359   N533
240V ∼, 50Hz, 130W   PAL(B/G)
TEAC CORPORATION   MADE IN CHINA
In case of operational difficulty or service requirements, contact the TEAC Service Centre in your State
www.teac.com.au
S/N   SERIAL NO.
5901239-04

Combining Current and Voltage

∵ $V = \dfrac{W}{Q}$ ... ① $I = \dfrac{\Delta Q}{\Delta t}$ ... ②

① × ②: $IV = \dfrac{W}{\cancel{Q}} \times \dfrac{\cancel{Q}}{t}$

$\qquad = \dfrac{W}{t}$

$\qquad = P$

∴ $P = IV$

power/w   voltage/V
$$P = \underset{\text{current/A}}{I} V$$

More ways to calculate power

$P = IV$
$\downarrow \quad \llcorner V = IR$
$\boxed{P = I^2 R}$

$P = IV$
$\downarrow \quad \llcorner I = \dfrac{V}{R}$
$\boxed{P = \dfrac{V^2}{R}}$

Energy

· Electrical energy can be given in kWh and J. (1 kWh = 3.6 MJ)

$P = \dfrac{E}{t}$
$E = Pt$
$\downarrow \quad \llcorner P = IV$
$\boxed{E = IVt}$

current/A   voltage/v   time/s

$P = \dfrac{E}{t}$
$E = Pt$
$\downarrow \quad \llcorner P = I^2R$
$\boxed{E = I^2Rt}$

$P = \dfrac{E}{t}$
$E = Pt$
$\downarrow \quad \llcorner P = \dfrac{V^2}{R}$
$\boxed{E = \dfrac{V^2}{R}t}$