

# Re: Power Measurement: Watts Vs. Volts

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Kaimbridge wrote:

> For instance, "Danger, Keep out: 50,000 volts!" (or just "High  
> Voltage"). Static electricity can zap you with 50,000 volts, and  
> you'll just feel a snap—Why?: Because there is very little amperage,

No, the current is determined from the voltage and resistance (body resistance and ground resistance in series) by Ohms law  $R = U/I$ . But in the case of static electricity the current will stop immediately, because the capacity of the "power source" is extremely low.

> Similarly, product "letter" batteries (A, AA, AAA, C, D) are all  
> measured as "1.5 volts" (I believe 2 equal 3 volts, 4 equal 6,  
> etc.—?). Don't the batteries have a defined amperage (maybe that's  
> the difference between A and AA and C, etc.?), thus why aren't they  
> defined as "\_\_\_watt" batteries (if the amperage—and therefore the  
> wattage—decreases as the battery weakens, its defined value would be  
> its full, maximum strength)?

Again current is determined by Ohms law. There are two main differences between a C battery and an AAA: Capacity and internal resistance. A battery converts chemical into electrical energy, a C battery has more of the chemicals and hence can sustain a given current for a longer time. In addition, its electrodes are bigger, hence internal resistance is lower. The voltage across a battery is determined by the kind of chemicals used inside, for example  $Zn/C = 1.5\text{ V}$ .

> Finally, radio signal strength: Why is it measured as "microvolts" and  
> not "microwatts", especially since a station's transmitter output power  
> \*is\* measured in wattage?

The field strength is  $V/m$ , this will result in a certain voltage across the poles of an antenna. Given the antenna's resistance (usually 220 or 75 Ohm) this will result in a certain power, since  $R = U/I$  and  $P = U \cdot I$  the power is  $P = U^2/R$ .

A good high school physics textbook will cover these fundamentals in more detail.

- **References:**

- ◆ **[Power Measurement: Watts Vs. Volts](#)**

- ◇ *From:* Kaimbridge

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