**33.6 Power in an AC Circuit**

In chapter 28, we found that the power delivered by a battery to an dc circuit equals to:

P=I2R=ΔV.I

Similarly, the power delivered by an ac generator to RLC circuit can be calculated as:

Also, we can express **the average power Pav.** as following:

)

Where: ) is called the **power factor**.

**Special case:**

When ,

Then:

Moreover, we can write the average power as:

We can conclude that:

* No power losses are associated with **pure capacitors and pure inductors** in an AC circuit. Why?
* The average power delivered by the source is converted to internal energy in the **resistor**.

**33.7 Resonance in a series RLC circuit**

In the RLC circuit, the resonance frequency occurs when the driving frequency is such that the rms current has its maximum value.

 33.14

**The angular frequency ω0 at which is called the resonance frequency of the circuit.**

 33.15

The average power as a function of frequency for a series RLC circuit as:

* When ω=ω0, the average power is **maximum.**

The power factor Q can also be computed as following: