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WIRELESS POWER CONSORTIUM

SETTING THE INTERNATIONAL STANDARD FOR INTEROPERABLE WIRELESS CHARGING

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How it works

**Total energy consumption**

Basic principle

Efficiency

Figure of merit

Quality factor

Coupling factor

Reflected impedance

Resonant coupling

EMF limits - basic restrictions

Maximum power transfer into space

Shielding effectiveness

Further Reading

Comparison of power savings

Making wireless truly wireless

Blog

08/11/2011 [Waterproof Qi phone](#)

## Wireless Power Efficiency

The energy consumption of battery chargers has two main contributors: charging efficiency and standby power consumption.

### STANDBY POWER CONSUMPTION

Unfortunately, many people leave the chargers and cradles connected to mains power when the charger is not used. The standby power consumption (also called "no-load power consumption") is significant. A simple calculation shows that power consumed in standby mode is about the same as the energy consumed when loading the battery.

We assume that many people will also keep their wireless battery chargers continuously plugged into the mains. One of our main design goals was, therefore, minimize standby power. Go low!

We did go low. In the mean time we have demonstrated a system with only 0.0001 Watt (100  $\mu$ W) standby power consumption. And that is probably not the bottom.

### CHARGING EFFICIENCY

The other contributor is charging efficiency. Our wireless chargers have the same ingredients as a wired charger (an AC-DC adaptor plus charging electronics) and one additional ingredient: the copper wire between adaptor and the mobile phone is replaced with a wireless link. That link is not efficient as a copper wire (what can beat a copper wire?), but careful design made it possible to achieve at least 70% transfer efficiency. And that percentage can go up a bit if a manufacturer is willing to spend more on high-quality components.

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