Device to enhance Wireless Power transmission

THE INVENTION

Device that is placed near the emitting and/or the receiving coil. It rearranges the magnetic energy in space, leading to an increase of the WPT neither modifying the distance between the emitting an receiving coils nor introducing any material between them (i.e. without modifying the effective distance of free space between emitter and receiver). It has been demonstrated effective at frequencies near the two standards that are being implemented for WPT.

Innovative aspects and advantatges

> Simple construction with feasible and cheap commercial materials.

> Does not invade the free space between the emitter and the receiver.

> Suitable for high (>3MHz) and low (≃200KHz) frequencies.

> Improvement increases as the coils are placed further away

> Experimental tests with commercial coils approved for current standards (e.g : Qi) show improvements up to 220%.

IP Rights (2 patents)

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PCT 26/06/2013 (Priority Date: 27/07/2012)

Scientific Team

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Summary

Wireless power transfer (WPT) is in general achieved using different strategies. One of the most relevant approaches is based on resonant/non-resonant magnetic induction between distant coils. In this case one coil (emitter) is connected to an AC power generator, creating an AC magnetic field. This field induces a current to a second coil (receiver), which then can be used to power a device or can be stored.

Generally, the distance at which can be transferred a useful amount of power is very small (it is known that almost no power is received at a distance of just three times the diameter of the emitting coil).

We develop a device to enhance the WPT with a simple construction made with feasible materials, suitable for high and low frequencies, which can improve wireless power transmission to current technology.

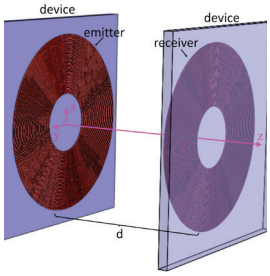

Fig. 1 Devices are placed without affecting the distance of free space between the coils.

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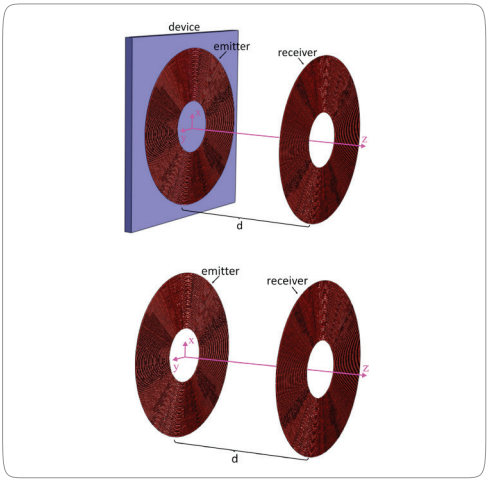

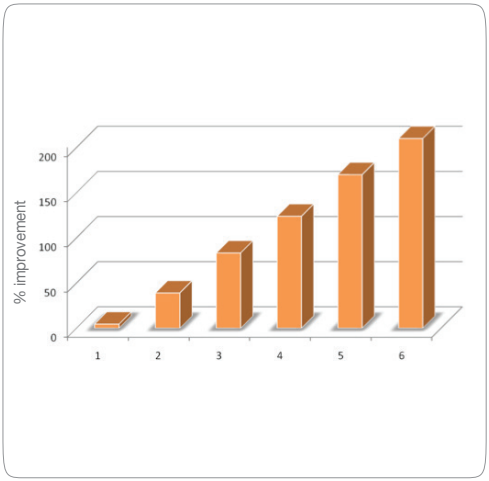

Fig. 2 Experimental results showing the improvement on the power transferred between two coils by using one of our devices (left upper sketch) respect to the case of the bare coils (left lower sketch) as a function of the distance (d) between the coils (being R the external radius of the coils). Measurements were obtained working at a frequency around 4MHz in both cases. These results can be further improved by optimizing our device.

Papers IP related background

http://arxiv.org/abs/1308.5878
http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.109.263903

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