

WIRELESS PWR CHARGING

1. Inductive power transfer between nearby coils of wire is an old technology, existing since the transformer was developed in the 1800s. Induction heating has been used for 100 years. With the advent of cordless appliances, inductive charging stands were developed for appliances used in wet environments like electric toothbrushes and electric razors to reduce the hazard of electric shock.

2. Inductive **charging** (also known as **wireless charging**) uses an electromagnetic field to transfer energy between two objects. This is usually done with a **charging** station. Energy is sent through an inductive coupling to an electrical device, which can then use that energy to charge batteries or run the device. Induction chargers use an induction coil to create an alternating electromagnetic field from within a charging base, and a second induction coil in the portable device takes power from the electromagnetic field and converts it back into electric current to charge the battery. The two induction coils in proximity combine to form an electrical transformer. Greater distances between sender and receiver coils can be achieved when the inductive charging system uses resonant inductive coupling. Recent improvements to this resonant system include using a movable transmission coil (i.e. mounted on an elevating platform or arm) and the use of other materials for the receiver coil made of silver plated copper or sometimes aluminium to minimize weight and decrease resistance due to the skin effect.



Fig.1 : Wireless Charging

3. Advantages

(a) Protected connections – No corrosion when the electronics are all enclosed, away from water or oxygen in the atmosphere

(b) Safer for medical implants – For embedded medical devices, allows recharging/powering through the skin rather than having wires penetrate the skin, which would increase the risk of infection.

(c) Durability – Without the need to constantly plug and unplug the device, there is significantly less wear and tear on the socket of the device and the attaching cable.

(d) Increased convenience – No need for cables

4. Disadvantages.

(a) Slower charging – Due to the lower efficiency, devices can take longer to charge when supplied power is the same amount.

(b) More expensive – Inductive charging also requires drive electronics and coils in both device and charger, increasing the complexity and cost of manufacturing.

5. Newer approaches reduce transfer losses through the use of ultra thin coils, higher frequencies, and optimized drive electronics. This results in more efficient and compact chargers and receivers, facilitating their integration into mobile devices or batteries with minimal changes required. These technologies provide charging times comparable to wired approaches, and they are rapidly finding their way into mobile devices.

6. Wireless technology is always welcomed as they are advantageous than unwieldy, wiry networks. You have a lot of options as the facility of wireless charging for mobile phones is implemented. If your mobile phone is running out of battery and you are in emergency to call someone, you can recharge your phone by packet energy without a need to search for plugging with this **wireless charger**. Qi is regarded as the wireless technology which can be used to recharge all kinds of devices without having to use messy wires and to buy any individual charging station. This is accomplished by the vision and hard work of Wireless Power Consortium. So, there is no doubt that 2015 is the year of new wireless charging technology.

Qi Charging

7. The new charging technology makes use of power of induction for charging your device instead of direct electrical flow. As a matter of the fact, this technology has been developed over time for those exhausting pacesetters. The device within the chest is powered and handled wirelessly by the equivalent part outside the chest. Qi charging is quick and much easier to do. All somebody need is a Qi-enabled device and a charging mat to make the power start flowing instantly. You will enjoy the same result as you plug the device into the wall. The device will be automatically recognizing the power source and begins accepting the instant flow of energy that charges the batteries. This will happen at the speed of 5W which is used to charge the domestic portable devices such as music players, tablets, laptops, Bluetooth earpieces and mobile phones. However, the chargers in the medium power category can even deliver energy up to 120 watts. There are two main elements of Qi wireless charging system:-

(a) Base Station: Qi base station is the device which provides inductive power for wireless transmission. It includes a power transmitter in which the transmitting coil is the major element. Overall, Qi charger has a flat surface and normally represented as interface surface. You can place mobile or any other device on this surface to start charging.

(b) Mobile Device: Qi mobile devices have the ability to consume wirelessly transmitted power which is typically used to charge the battery present within the mobile device.

Benefit From This Technology

8. People who have Qi enabled devices can take advantage of this technology which has been developed for them. All one need is to make sure that his work place or home has a Qi charging mat to charge his/her device. If somebody make use of Qi charging, he/she will be ahead of others by knowing the working of this technology.

9. WPC(Wireless Portable Charger) and Qi standards keep on developing things until we are able to make use of this technology for running every device that we use daily. Many people have got excited about this technology and if you are one among them, you need not wait for a longer time to take pleasure in out of Qi wireless charging advancement. While many companies have been working on the development of this charging, it is sure that Qi charging becomes standard in everyone's life. The limitless resources make it possible for these organizations to integrate this technology in various fields very quickly.

10. References:

- (a) Shinohara, Naoki (2014). Wireless Power Transfer via Radiowaves. John Wiley & Sons. pp. ix–xiii. ISBN 1118862961.
- (b) US 6972543 "Series resonant inductive charging circuit"
- (c) Pogue, David (2009-06-03). "Another Pre Innovation: The Touchstone Charging Stand". The New York Times (The New York Times Company). Retrieved 2009-10-15.