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QI Wireless Charging a Scope of Magnetic Inductive Coupling

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Abstract : QI or 'Chee' which is an interface standard for inductive electrical power transfer over distances of up to 4 cm (1.6 inches). The Qi system comprises a power transmission pad and a compatible receiver in a portable device which is placed on top of the power transmission pad, which charges using the principle of electromagnetic induction. An alternating current is passed through the transmitter coil, generating a magnetic field. This, in turn, induces a voltage in the receiver coil; this can be used to power a mobile device or charge a battery. The efficiency of the power transfer depends on the coupling (k) between the inductors and their quality (Q) The coupling is determined by the distance between the inductors (z) and the relative size (D2 /D). The coupling is further determined by the shape of the coils and the angle between them. If the receiver coil is at a certain distance to the transmitter coil, only a fraction of the magnetic flux, which is generated by the transmitter coil, penetrates the receiver coil and contributes to the power transmission. The more flux reaches the receiver, the better the coils are coupled.

Keywords : inductive electric power, electromagnetic induction, magnetic flux, coupling
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