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(57) Abstract :

The Resonance-Optimized Tesla Coil is an advanced wireless energy transmission system designed to maximize power transfer efficiency by utilizing resonance principles. It comprises a primary coil connected to a high-voltage power source and a secondary coil tuned to resonate at the same frequency as the primary coil. The system features precise resonance tuning mechanisms, high-conductivity materials to minimize energy losses, and dynamic feedback control to maintain optimal performance under varying load conditions. Safety mechanisms are incorporated to prevent overvoltage, overcurrent, and overheating. This technology is versatile, offering improved efficiency and safety for applications in electric vehicle charging, consumer electronics, and industrial automation.

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