

A novel wireless power transfer (WPT) system with double intermediate resonators is proposed. In addition to the power and load coils, this WPT system has four self-resonators: 1) a sending resonator; 2) a receiving resonator; and 3) two intermediate resonators. For optimal design, this WPT system is analyzed using an equivalent circuit model. In particular, a tuning scheme for coupling coefficients is proposed to determine optimal positions of the power and load self-resonators for maximizing the power transfer efficiency. The experiments show that the electric power can be wirelessly transferred to the receiving coil located at a distance of more than four times the resonator diameter away from the sending coil. The measured transfer efficiency of this WPT system is above 70%.