1. Record Nr. UNINA9910138962903321 Autore Shinohara Naoki Wireless power transmission via radiowaves / / Naoki Shinohara Titolo Pubbl/distr/stampa London, England;; Hoboken, New Jersey:,: ISTE Ltd:,: John Wiley & Sons, , 2014 ©2014 **ISBN** 1-118-86300-3 1-118-86295-3 Descrizione fisica 1 online resource (254 p.) Collana Waves series Disciplina 621.319 Soggetti Electric power transmission Radio waves Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Cover; Title Page; Contents; Introduction; Chapter 1. History, Present and Future of WPT; 1.1. Theoretical predictions and the first trial in the 19th Century; 1.2. Rejuvenated WPT by microwaves in the 1960's; 1.3. Inductive coupling WPT projects in the 20th Century; 1.4. WPT as a game-changing technology in the 21st Century; Chapter 2. Theory of WPT; 2.1. Theoretical background; 2.2. Beam efficiency and coupling efficiency; 2.2.1. Beam efficiency of radiowaves; 2.2.2. Theoretical increase of beam efficiency; 2.2.3. Coupling efficiency at very close coupling distance; 2.3. Beam forming 2.3.1. Beam-forming theory for the phased array and its error 2.3.2. Target detecting via radiowaves; 2.4. Beam receiving; Chapter 3. Technologies of WPT; 3.1. Introduction; 3.2. Radio frequency (RF) generation - HPA using semiconductors; 3.3. RF generation microwave tubes; 3.3.1. Magnetrons; 3.3.2. Traveling wave tube/traveling wave tube amplifier; 3.3.3. Klystron; 3.4 Beam-forming and target-detecting technologies with phased array; 3.4.1. Introduction; 3.4.2. Phased array in the 1990's; 3.4.3. Phased array in the 2000's; 3.4.4. Phased array using magnetrons; 3.4.5. Retrodirective 3.5. RF rectifier - rectenna and tube type 3.5.1. General rectifying

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Sommario/riassunto

Recent advances in Wireless Power Transmission (WPT) technologies have enabled various engineering applications with potential product implementation. WPT can be utilized to charge batteries in various pieces of equipment without the need for a wired connection. Energy can be harvested from ambient RF and microwave radiation and 1 million kW microwaves can be transmitted from space to the ground. This book covers all the theory and technologies of WPT, such as microwave generators with semi-conductors and microwave tubes, antennas, phased arrays, beam efficiency, and rectifiers...