

Design and Characterization of Thermoelectric and Photovoltaic Energy Harvesting Systems for Wireless Sensor Nodes

Zoran Prijić

Abstract: As a process of obtaining electrical energy by conversion from the surrounding sources, energy harvesting is convenient for powering wireless sensor nodes. Operation of the nodes requires reliable systems for conversion, storage and management of the harvested energy. This paper reviews some of the most common design principles and characterization methods for the energy harvesting systems based on the small thermoelectric generators and photovoltaic cells. Techniques for solving cold boot issues and achieving prolonged autonomy of the nodes are highlighted. Illustrative design examples of the nodes, based on the commercially available (off-the-shelf) devices, are presented.