DESIGN OF RECTIFIER CIRCUIT FOR RF/MICROWAVE ENERGY SCAVENGING APPLICATION

H. Mangalam¹, V. Ganesh²
¹Professor & Head, ²Assistant Professor,
Department of ECE, Sri Ramakrishna Institute of Technology, Coimbatore, India.
mangalam.ece@srit.org, ganesh.ece@srit.org

ABSTRACT

A design of Rectifier circuit for energy scavenging from an ambient field is proposed in this paper. The ability to harvest RF energy, from ambient or dedicated sources, enables wireless charging of low-power devices and has resulting benefits on product design, usability, and reliability. The average of the density of RF waves is in the range of -30dBm to 20dBm. These RF signals can be received by means of multiband antenna which can then be rectified into DC voltage and stored in suitable storage devices. This proposed work focuses on the design of rectifier circuit using the surface mount RF schottky diode (HSMS-2822) by Agilent. The simulation is carried out for various stages of rectifier circuit and the performance is studied by using Agilent Advanced Design System (ADS) software tool. The proposed rectifier can be optimized for various frequencies with high RF-to-DC conversion efficiencies upto 98% for the input RF power in the range of -20dBm to 10 dBm.

Keywords-RF energy, Ambient field, Schottky diode, Rectifier circuit, RF-DC conversion