

# Energizing Low Power Devices by Harvesting Energy from Ubiquitous Electromagnetic Wave Resources

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**Abstract:** *In the recent years most of the devices are designed with low power consumption such as wearable devices, remote monitoring sensors, sensors used in fashionable cities. However, even long lasting batteries have a limited lifespan and must be replaced every few years. Replacements of batteries become costly when there are hundreds of sensors in rural areas. Technologies of Energy harvesting, on the other hand, provide infinite operating life of low-power equipment and avoid the need to replace batteries where it is costly, impractical or hazardous. Energy Harvesting (EH) is a process wherein the sources such as mechanical load, vibrations, temperature gradients and light, etc., serve as the resource from which the energy is harvested and transformed to obtain relatively small levels of power in the range of nW-mW. The transducer converts one form of energy to other form usually electrical signal. The output obtained from the RF antenna is sent for power conditioning to ensure the operating frequency, voltage and current. The received RF signal is given to the matching network to provide proper impedance matching between the antenna and the signal conditioning circuit. The received RF signal is rectified and passed through the voltage multiplier circuit. In order to get sufficient output voltage to drive the device voltage quadrupler is used in the proposed system. As electromagnetic wave is available in surplus in our surrounding, it can be an uninterrupted resource for the energy generation for the device. Energy storage device is associated with the energy scavenging circuitry to enable the energy scavenged to be utilized for future purpose. The proposed system meets the state-of-the-art in the field of energy harvesting for low power devices using the RF energy harvesting.*

**Keywords:** Energy Harvesting, RF Source, Electromagnetic Field, Low Power Device

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