

Title : Improvement of RF-DC conversion efficiency for the microwave wireless power transmission

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Related RISH mission : Mission 2 (Advanced Development of Science and Technology towards a Solar Energy Society)

Abstract :

Currently, the necessity of the Internet of things (IoT) technique is increasing. IoT requires a flexible configuration of sensor networks, which is hindered by wired-charging sensors. The wireless power transfer (WPT) can be the solution to this problem. Using WPT enables the charging without wires in operation. This is useful for realizing the battery-less society. There are some species in WPT, capacitive, inductive, and microwave. Our research focuses on the microwave WPT. Microwave WPT can transmit energy to very far object, for example from satellites to Earth. In addition, microwave WPT enables integrating communications and battery-less motion of the sensor network. However, there are some problems. Microwave WPT interferes with communications and its charging efficiency is lower than the wired charging. This study focused on the improvement of transmission efficiency

For improving the efficiency, high-efficiency rectifiers are required. In this paper, we studied on the rectifiers with pulse modulated signal. Pulse modulation can increase the peak-to-average power ratio of input signal. Therefore, there is possibility to improve the RF-DC conversion efficiency. Then we experimented the rectifier with pulse modulated waves. As a result, we could improve the RF-DC conversion efficiency of rectifiers using pulse modulation.

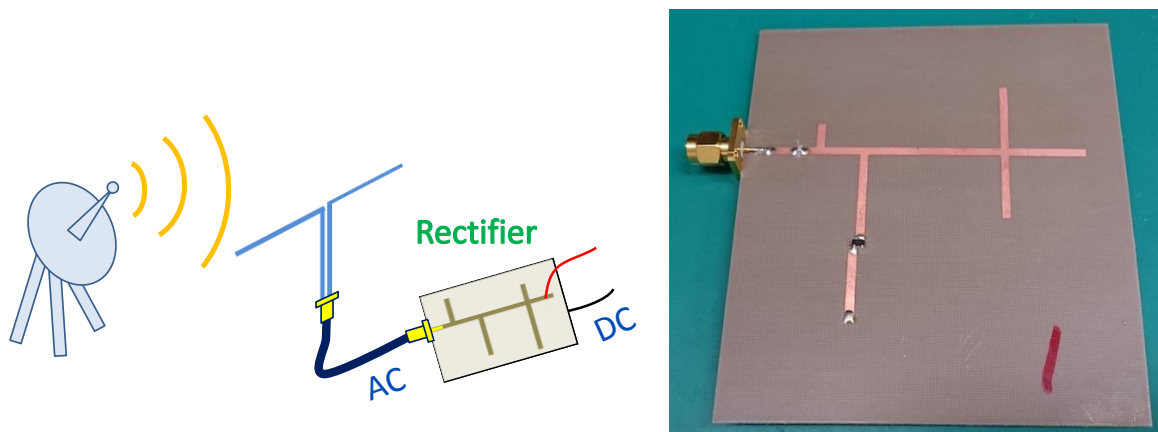


Fig. 1 Left) Schematic of microwave WPT
Right) Picture of fabricated and experimented rectifier