

# **An Overview on a Technique to Measure and Control of the Electromagnetic Radiation Inside a Microwave Oven**

*Farah A.Thamer , Haitham B. Al-Wakeel , Taghreed  
Mohammadridha , Zeyid T. Ibraheem*

## **Abstract:**

*The Microwave oven is a system used to convert the electromagnetic energy to thermal energy when the microwave cavity is loaded with a dielectric material. The ordinary microwave ovens are not supported with complex features for detecting parameters such as temperature, weight, and loaded material availability. Due to the lack of material availability, several laboratory and industrial applications require these features to switch off the oven. The reflections of electromagnetic radiation inside an empty microwave oven lead to oven damage. An overview of the microwave oven characteristics and emergence of electromagnetic radiation inside a microwave oven is presented in this study. The parameters measured inside the microwave oven, methods for power attenuation in a microwave oven, microwave power detector, and microwave oven leakage are discussed as well. Moreover in the methodology of this work, proposed a new technique based on the measurement of leaked microwave power to control the microwave oven. The preliminary results showed that the leakage measurement of electromagnetic power changes with the state/phase of the material inside the microwave oven, which ensured the possibility of the proposed promising technique. This work will be continued to connect the microwave oven with a spectrum analyzer and computer via hardware and software interfaces depending on the methodology of this article. A computer code will be developed to read the measured power and automatically switch off the microwave oven depending on materials state.*