UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

FABRIC ABSORBER FOR MICROWAVE

MOHAMMAD AFIQ BIN KAMAL

BACHELOR OF ENGINEERING (HONS) ELECTRICAL AND ELECTRONIC ENGINEERING

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Microwave absorber is developed to attenuate and reduce the frequency radiation and commonly used in an anechoic chamber. The anechoic chamber can provide near-field measurement conditions for testing antennas radiation performance. This chamber can effectively eliminate outside electromagnetic interference and other reflection interference. The purpose of the study is to develop a microwave absorber from new material which is fabric, that able to achieve a significant reflectivity performance. Five fabric materials proposed are cotton, denim, polyester, leather, and nylon. Each of the material constructed in three different sizes which are small, medium, and large. Due to the current pandemic faced which is COVID-19, simulation method is approached, and the full functionality of CST Microwave Studio is implemented to estimate the reflectivity of the absorber. The shape of the absorber chosen is hollow pyramidal absorber. So, to construct the absorber model, the properties of the fabric such as dielectric constant and thickness are considered. When comparing the size, larger size absorber exhibits the best reflectivity performance meanwhile for material, denim exhibits the best reflectivity performance in L, S, C, and X-band which ranging from 1 GHz to 12 GHz frequency. Overall, denim material with large size absorber is the most effective to reduce the frequency radiation.

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