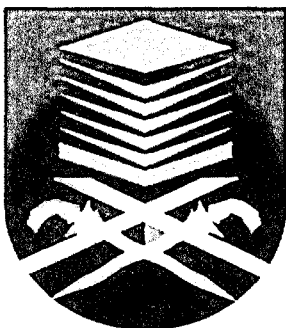


**SIERPINSKI CARPET FRACTAL ANTENNA WITH  
ELECTROMAGNETIC BAND GAP (EBG) STRUCTURE**

**This thesis is presented in partial fulfilment for the award of the Bachelor of  
Engineering Electronic (Communication) with honours.**

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## ABSTRACT

This work presents the design, simulation and fabrication of Sierpinski Carpet Fractal Antenna with Electromagnetic Band Gap (EBG) structure at center frequency of 5.8 GHz. The antenna was designed and simulated using the Computer Simulation Technology (CST) software. Rogers RT/Duroid 5880 was used as a substrate for this antenna design with the thickness of 0.38 mm and dielectric constant of 2.2. After the fabricating process, the antenna was measured using a Vector Network Analyzer (VNA). Analysis was conducted to compare the performance of the fractal antenna between the different number of iteration and the implementation with and without EBG. Performance of the antenna was discussed in term of return loss ( $S_{11}$ ), voltage standing wave ratio (VSWR) and radiation pattern. The third iteration of Sierpinski Carpet Fractal Antenna with EBG structure resulting to a better return loss ( $S_{11}$ ), gain and reduce the size of the antenna. Both the measured and simulated values were acceptable and meet the specification. The antenna has achieved unidirectional radiation pattern and can be used for RFID application.

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