

**UNIVERSITI TEKNOLOGI MARA**

**CIRCUIT MODELING FOR A 280% BANDWIDTH  
ENHANCEMENT OF ELECTROMAGNETIC BAND-  
GAP (EBG) PATCH ANTENNA**

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## ABSTRACT

This paper presents an investigation of equivalent circuit model for a rectangular microstrip patch antenna with Electromagnetic Band-Gap (EBG) at a height of 0.75mm using substrate Rogers RO3003 with nine squares and four rectangular of EBG at the ground plane. The objective of the proposed design is to enhance the bandwidth of low profile microstrip path antennas, to minimize the size of substrate and the patch instead, and also designing the electric circuit modeling. The patch antenna along with the EBG was designed to resonate at frequency of 2.65GHz for LTE applications. Both simulation and measurement works were carried out to verify the performance of EBG in patch antenna using the Computer Simulation Technology Microwave Studio (CST-MWS) and Vector Network Analyzer (VNA) respectively. Then, the parameters of the equivalent circuit model for microstrip patch antenna were estimated using the Advanced Designing System (ADS) software. The results confirm the fact that EBG enhanced the bandwidth and reduced the antenna size by 280% and 13.13%, respectively.

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