

**DESIGN OF A CAVITY-BACKED MICROSTRIP PATCH ANTENNA
BY SUBSTRATE INTEGRATED WAVEGUIDE (SIW) FOR
WIRELESS COMMUNICATION APPLICATIONS**

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA**



AMIRUL ZAHIRI BIN ROGANI

2011847126

Faculty of Electrical Engineering

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR DARUL EHSAN

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ABSTRACT

This paper describes the design of A Cavity Backed Microstrip Patch Antenna by Substrate Integrated Waveguide for Wireless Communication Applications. Wireless communication technology nowadays has experienced an era of very rapid improvement. Many inventions and design of modern wireless communication system such as wireless local area network (WLAN), mobile handsets and local positioning system (LPS) required highly performance antenna. Therefore, new design of antenna are proposed to developed a microstrip patch antenna backed by SIW cavity in order to make antenna with better performance, good radiation and gain. This thesis will concentrate on the design that will combine the advantages of microstrip patch antenna, together with SIW cavity-backed and slot technique. The effect to the antenna performance by the slot length l_s , and slot width w_s , as a tuning element also has been analyzed. 2.4 GHz frequency has been selected for operating frequency suitable for wireless communication application. The whole antenna design including backed cavity, slot and feeding element is completely constructed at a single substrate. The proposed antenna was simulated using Computer Simulation Technology (CST) and fabricated on FR4 substrate with relative permittivity of 4.7, and substrate and copper thickness of 1.6mm and 0.035mm respectively. The results obtained provide a workable antenna design for wireless communication application.

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