

**COMPUTER-AIDED DESIGN AND
FABRICATION OF MICROSTRIP
LOW-PASS FILTER**

**Presented in partial fulfilment for the award of the
Bachelor of Electrical Engineering (Honours)
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ABSTRACT

The purpose of this project is to design, simulate, fabricate and measure the characteristics of a microstrip low-pass filter operating at microwave frequencies using computer-aided design (CAD) package. The filter was designed to have minimum return loss of 15 dB over the frequency range of 0~2 GHz and minimum attenuation of 15dB at 3 GHz. The type of this filter is called maximally flat or Butterworth filter, which has less delay distortion than other type of microwave filters [1].

The microstrip laminates used are '*Duroid/Rogers 5872*' with a 0.5 mm substrate thickness and relative permittivity (ϵ_r) of 2.33. A commercially available CAD suite HP Eesof TouchStone Libra was utilised to eliminate tedious processes associated with conventional filter design methods. The circuit was fabricated using facilities available at the faculty. The filter characteristics were determined using a Wiltron 562 Scalar Network Analyser.

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1.1 OBJECTIVE AND INTRODUCTION TO THE PROJECT

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The filter was synthesised using standard filter tables. It is then simulated on HP Eesof Libra.

1.2 COMPUTER-AIDED DESIGN (CAD) OF MICROWAVE CIRCUITS

Computers are powerful tools for microwave designers in performing arduous and error-prone calculations. Computers as a tool are used to design many circuits or components faster and cheaper than conventional methods. To get high reliability standards, precisely characterised and less error to the designing circuits, computer-aided design becomes a better simulator in microwave technology, and it cannot be separated.