

**OPTICAL LOSS AND BIREFRINGENCE MEASUREMENTS OF OPTICAL
PLANAR WAVEGUIDES USING PRISM COUPLER**

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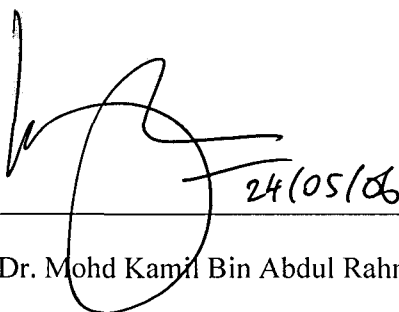
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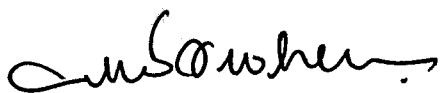
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This Final Year Project Report entitled "Optical loss and birefringence measurements of Optical Planar Waveguides using Prism Coupler" was submitted by Mohamad Nizwan bin Marzuki, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by

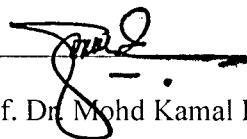


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ABSTRACT

The optical loss, the variation of refractive index, n and thickness with different laser wavelengths and polarizations in polymer waveguide on glass substrate were studied. The optical loss of the polymer was measured in dB/cm using the prism coupler. The refractive index, thickness and birefringence properties of the polymer have been studied with two different wavelengths (632.8nm and 1550nm) and polarizations (TE and TM). In measuring the optical loss, there existed several errors that may cause from the polymer waveguide's methods of fabrication, but the value of the loss can still be observed to be about 0.048dB/cm. The refractive index and thickness were examined as a function of spin coating parameter of the polymer. Change in refractive index and thickness were studied for different planar waveguide parameters. An apparent difference of the refractive index and thickness of the polymer with the polarization used for both wavelengths was observed. This behavior may be attributed by the anisotropic properties of the polymer. The information on the values of polarized refractive index for each parameter was used to obtain the birefringence of the polymer and it was measured to be 0.0071 for 632.8nm wavelength and 0.0137 for 1550nm wavelength.