

## Efficiency enhancement of optical strip waveguide by the effect of heat treatment

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### Abstract

Optical strip waveguide fabricated by spin-coat technique and device pattern transfer using positive photoresist through photo lithography (ultraviolet light) is studied in terms of its efficiency against heat treatment. A direct coupler or fiber-fiber coupling test method was used to investigate different wavelength of laser sources attached with the optical waveguide films. An input power of 5 mW was employed to measure the propagation loss and lattice mismatch. The speed of light and the numerical aperture was correlated with refractive index. The result showed a good efficiency of laser transfer to fabricate the optical waveguide. There was an optimum annealed temperature set at 500 °C for maximum efficiency and low loss. Operating wavelength also was identified at 630 nm for suitable output power in waveguide devices. Besides, cutoff thickness, numerical aperture and normalized frequency were calculated for most favorable heat effects in the waveguide.