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Abstract
In this thesis, we created an unique process combining with soft molding, fabricate directional coupler waveguide component.
Optical coupling devices are important components in a integrated optical circuits. A two-guide directional coupler can be applied as optical power transfer devices, optical filter and isolators. To design the coupler device, it is emphasized on the effects of the waveguide parameters such as width, gap, and the coupling length. Polymer waveguides are of great interest for their low cost and easy fabrication.
In this paper, we propose a novel process, with the photolithography and soft molding techniques, to produce directional coupler devices. First step use a rubber (PDMS) to transfer the pattern. The second step is to apply a mold enough thick to obtain waveguide pattern on the OG146 and OG169 polymer. If these molding process are combined with a LIGA-like process that can produce a mold for the subsequent molding processes, it may have great potential for mass production. The advanced technology of LIGA-like process can achieve sub-micro accuracy. The optical-field distribution and coupling behavior within the coupling system are discussed by near-field measurement.
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