Development of Blue Laser Direct-Write Lithography System

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Abstract

The optical lithography system researched in this study adopted the laser direct-write lithography technology with nano-positioning stage by using retailing blue ray optical pickup head contained 405nm wavelength and 0.85 numerical aperture of focus lens as the system lighting source. The system employed a photodiode received the focusing error signal reflected by the glass substrate to identify specimen position and automatic focused control with voice coil motor. The pattern substrate was loaded on a nano-positioning stage; input pattern path automatically and collocate with inner program at the same time. This research has successfully developed a blue laser lithography process system. The single spot size can be narrowed down to 3.07 μm and the linewidth is 3.3μm, time of laser control can reach to 450 ns and the exposure pattern can be controlled by program as well.

Keywords: lithography, laser direct-write, blue ray, optical pickup head, voice coil motor

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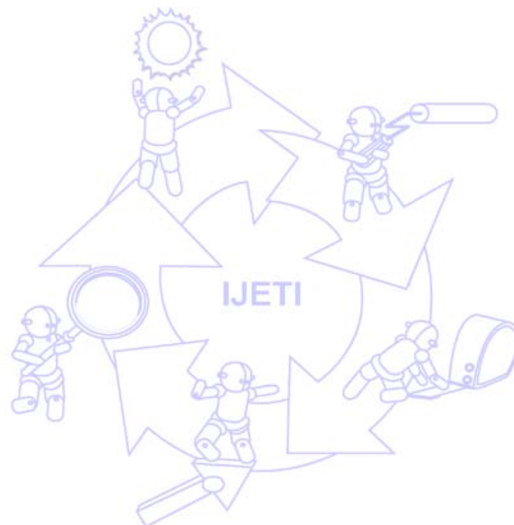

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