

A STUDY ON MASKLESS FABRICATION OF MICRO LENS ARRAY USING UV LASER LOCAL THERMAL-EXPANSION TECHNOLOGY

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ABSTRACT

Micro lens array (MLA) is widely used in information technology (IT) products such as a projection display, an optical power regulator, a micro mass spectrometer, and medical appliances. Various MLA products have been developed by using a reflow method, micro etching, electroplating, micro laser machining, and *etc.* These techniques have needed lots of expensive masks. In this paper, we have proposed a new UV laser local thermal-expansion (UV-LLTE) technology. This method is maskless fabrication process and provides various MLA patterns for short manufacturing time. We have also investigated the optimal fabrication conditions of MLA using negative photoresist material. We have measured the 3D shape of a micro lens and the optical properties of the prototype MLA obtained by UV-LLTE. Finally, we have manufactured chrome micro mold of MLA for mass production.

Key Words: MLA (micro lens array), UV laser, Direct fabrication, UV-LLTE (UV laser local thermal-expansion), Negative photoresist material, Micro mold

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