

Abstract Submitted
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One-Step, Non-Contact Pattern Transfer by Direct-Current Plasma Immersion Ion Implantation DIXON T.K. KWOK, PAUL K. CHU, City University of Hong Kong — A one-step non-contact pattern transferring method is demonstrated. Clear non-identical images with well-defined boundaries are simultaneously transferred to a substrate by -15 kV plasma immersion ion implantation through a patterned metal mask. The metal mask is 6 cm away from the substrate and no lens system is necessary for the pattern transfer. To avoid diversification of compensating ions, the electric field must be smoothed out by the fine mesh overlapping on top of the metal mask. Complex patterns with micrometer size line-widths can be transferred onto a silicon wafer by placing the metal masks 4 mm away from the wafer. Scanning electron microscopy (SEM) discloses that by negatively biasing the metal mask, ions coming from a hole with a diameter of 200 micrometers in the mask can be confined to a smaller region of 100 micrometers. The ion focusing effect is confirmed by two-dimensional multiple grid particle-in-cell (PIC) simulation.

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