

36-46 Spot Beam Formation Method by HL-700 VSB Lithography System

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A variable shaped beam type electron beam lithography system has been modified for fabricating deep sub-micron features. The modification is carried out by the switching off beam shaping components and by making the reduction image of the LaB6 cathode on the target in place of the reduction image of the shaping apertures. 50 nm width's 45 degree isolated patterns have been clearly fabricated by using ZEP-520 positive type resist coated on silicon wafers. The modification procedure from variable shaped beam arrangement to Gaussian spot beam one is very easy in a conventional HL-700 electron beam exposure machine. The exposure speed by Gaussian spot beam becomes higher in the deep sub-micron region compared to the variable shaped beam because of its higher electron beam current density. The new mix and match method is proposed to use both of the Gaussian spot beam and the variable shaped beam in the same machine to achieve the high throughput for fabricating the deep sub-micron features.

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