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ABSTRACT

A new method to improve the thickness uniformity of a silicon-on-insulator layer in a defined area by photoetching with *N*-fluoropyridinium salts using a projector was proposed. The method involved initial calculation of the red–green–blue tone distribution from the top silicon layer thickness distribution to be etched using the relationship between the etching depth and red–green–blue tone in a projector. Photoetching was then conducted by projection of an image with the required tone distribution onto a silicon layer surface coated with *N*-fluoropyridinium salts. The uniformity of silicon layers with a thickness of less than 10 nm was improved in an area of approximately 20 × 20 mm by photoetching after prior thinning by thermal oxidation and wet etching. The developed method enables the thickness uniformity in a defined area to be improved while avoiding exfoliation of the silicon layer or the formation of silicon islands in subsequent thermal treatment. In addition, this method has the potential to be cost-effective because it uses a projector.

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