

High aspect ratio structures enabled by backside illumination of SU-8

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Creation of high-aspect ratio (HAR) structures presents a challenge for most micro-fabrication methods. Recently we have been using contact lithography to create HAR SU-8 structures for optical baffles (Fig. 1). The baffles are intended to enforce a narrow field of view so that bright off-axis sources like the sun can be excluded from view of dimmer objects. Contact lithography with high viscosity spin-on resists is complicated by edge beads, and challenges with ensuring good optical contact between the mask and the resist. Here we report on a backside lithography approach (Fig. 2) where the mask is printed on a transparent substrate and the thick photoresist is spun directly on the patterned substrate. Back-side exposure through the transparent substrate results in the best possible contact between the mask and resist. The approach eliminates edge bead concerns and enables higher aspect ratio fabrication. We present fabrication and characterization results using the backside illumination approach.

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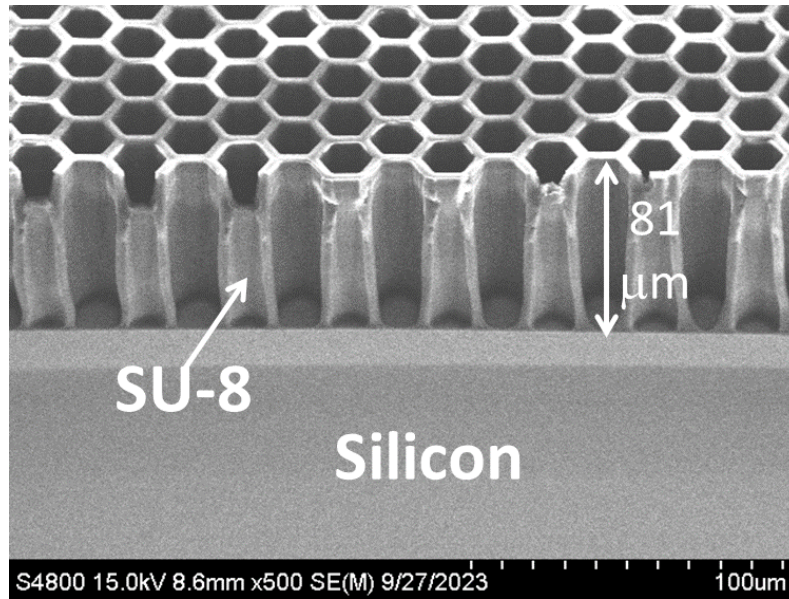


Figure 1: High aspect ratio SU-8 structures used for optical baffles.

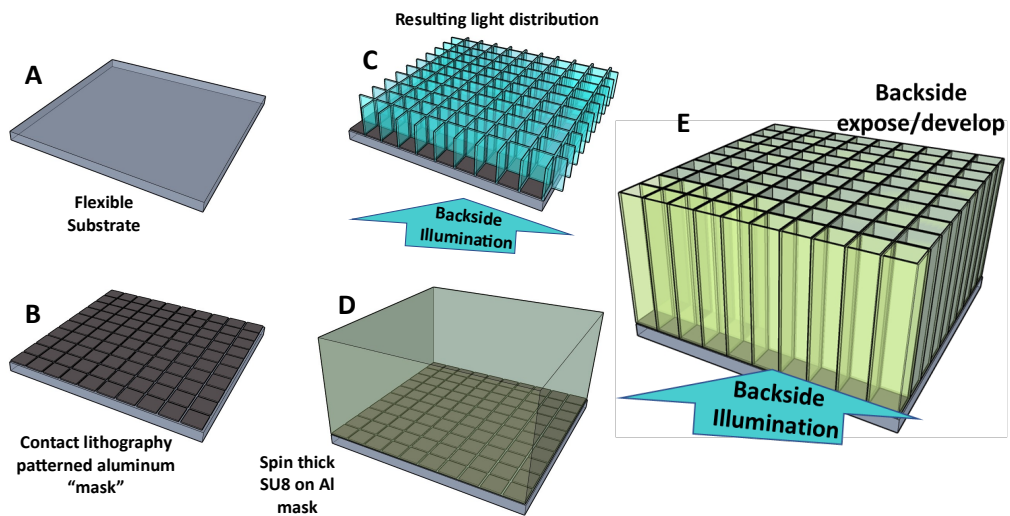


Figure 2: Fabrication sequence for backside illumination approach to create high aspect ratio structures in-situ.