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Method and Experiment of Fabricating and Cutting the Burr for Y Shape Nanochannel

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Abstract : The present paper proposes using atomic force microscopy (AFM) and the concept of specific down force energy (SDFE) to establish a method for fabricating and cutting the burr for Y shape nanochannel on silicon (Si) substrate. For fabricating Y shape nanochannel, it first makes the experimental cutting path planning for fabricating Y shape nanochannel until the fifth cutting layer. Using the constant down force by AFM and SDFE theory and following the experimental cutting path planning, the cutting depth and width of each pass of Y shape nanochannel can be predicted by simulation. The paper plans the path for cutting the burr at the edge of Y shape nanochannel. Then, it carries out cutting the burr along the Y nanochannel edge by using a smaller down force. The height of standing burr at the edge is required to be below the set value of 0.54 nm. The results of simulation and experiment of fabricating and cutting the burr for Y shape nanochannel is further compared.

Keywords : atomic force microscopy (AFM), nanochannel, specific down force energy (SDFE), Y shape, burr, silicon
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