BECOMING FAMILIAR WITH ELABFTW

LITOGRAPHY GROUP

The abstract reported below is taken by **"3D free forms in c-Si via grayscale lithography and RIE"** (https://doi.org/10.1016/j.mee.2018.02.006).

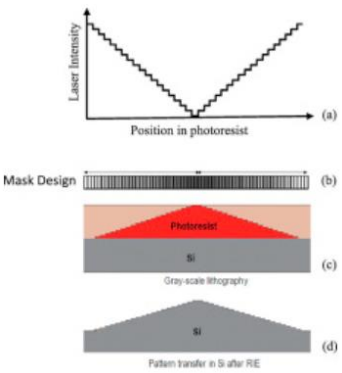
Imagine you participate to this experiment and you are using elabFTW as electronic notebook.

1. Define the main resources categories for this experiment and insert the corresponding entries;
2. Define an experiment category and an experiment template by using the resources you inserted.

Abstract

A grayscale technology process for structuring of true 3D shapes into crystalline silicon (c-Si) has been developed. The process combines maskless grayscale lithography and an optimized RIE process. To achieve a 1:1 transfer of the 3D photoresist patterns into c-Si, the RIE process was optimized for a selectivity of S = 1 and an anisotropy A_f close to one. Suitable process conditions of the RIE process are defined by SF_6 flowrate of 3 sccm, CHF_3 flowrate of 35 sccm, a RF power of 100 W, a temperature of 10 °C and a pressure of 10 mTorr. The 3D pattern transfer is demonstrated at special test structures as well as at real 3D structures such as pyramids. The developed process allows a direct transfer from 3D CAD data via maskless grayscale lithography using Heidelberg Instrument DWL66FS to c-Si 3D structures. The pattern transfer accuracy is about 5% in respect to the 3D CAD data.

Graphical Abstract



Schematic showing the gray scale technology (a) the exposure laser intensity variation profile (b) CAD layout of test patterns with different exposure intensity, (c) cross section: in case of a positive PR the “dose to clear” is obtained at the interface between the dark red and the light red pattern. (d) Cross section of the pattern transferred into Si after RIE.