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| 1. Title:                     | The effect of mask background density on imaging performance in EUV lithography |
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### 3. Abstract body:

It is well known that the effect of stray light or flare in EUV lithography is significantly higher than optical lithography. It is getting more important and difficult to reduce the level of stray light down to less than 10%, which is required in high volume manufacturing. The scattered light mainly comes from rough mirror surface, which is used in illumination optics and projection system. There are several methods to characterize and quantify the properties of the stray light such as traditional Kirk test, resist threshold approximation, and complex calculation by measuring roughness and wavefront error of mirrors. EUV mask as a mirror can be also one of scattering sources that cause scattered light. In addition, the imaging performance of feature can be affected by its surrounding pattern densities. EUV mask used in real applications such as memory and logic devices has various background densities, which is determined by patterned multilayer area. In this paper, the effect of background density in EUV mask is studied in terms of imaging performance with simulation and experiments.