



Abstract of the Disclosure

There are provided a projection exposure method using a modified illumination method used during a lithographic process of a semiconductor device, and a projection exposure apparatus and a mask therefor. Exposure of an object is performed by irradiating oblique incident components of light onto a mask having patterns formed thereon after removing the vertical incident components of zero-order diffracted light and enhancing the oblique incident components of +1st- and -1st-order diffracted light. The vertical incident components of light interferes to be removed by a phase difference of light by means of a grating mask having uniform patterns regularly disposed formed thereon, while first-order diffracted light is enhanced. The grating mask has grating patterns formed to repeatedly disposed triangles as a basic pattern and to have a phase difference alternately on the upper surface of the mask. Thus, contrast is increased, the resolution of a lithographic process is improved, and depth-of-focus is increased. 64Mb DRAM patterns can be formed by using a conventional projection exposure apparatus.