

ABSTRACT**A METHOD, PROGRAM PRODUCT AND APPARATUS FOR PERFORMING
DOUBLE EXPOSURE LITHOGRAPHY**

A method of generating complementary masks based on a target pattern having features to be imaged on a substrate for use in a multiple-exposure lithographic imaging process. The method includes the steps of: defining an initial H-mask corresponding to the target pattern; defining an initial V-mask corresponding to the target pattern; identifying horizontal critical features in the H-mask having a width which is less than a predetermined critical width; identifying vertical critical features in the V-mask having a width which is less than a predetermined critical width; assigning a first phase shift and a first percentage transmission to the horizontal critical features, which are to be formed in the H-mask; and assigning a second phase shift and a second percentage transmission to the vertical critical features, which are to be formed in the V-mask. The method further includes the step of assigning chrome to all non-critical features in the H-mask and the V-mask. The non-critical features are those features having a width which is greater than or equal to the predetermined critical width. The non-critical features are formed in the H-mask and the V-mask utilizing chrome. The target pattern is then imaged on the substrate by imaging both the H-mask and V-mask.