

LITHOGRAPHIC APPARATUS, DEVICE MANUFACTURING METHOD AND VARIABLE ATTENUATOR

ABSTRACT OF THE DISCLOSURE

A lithographic apparatus includes an illumination system for providing a projection beam of radiation, a support structure for supporting patterning structure for imparting a pattern to the projection beam, a substrate table for holding a wafer and a projection system for projecting the patterned beam onto a target portion of the wafer. In order to permit control of the radiation dose at the wafer so that the throughput of wafers can be optimised, a variable attenuator is provided to vary the intensity of the projection beam while not changing the position of the beam. The variable attenuator comprises two parallel mirrors positioned such that an input beam of radiation is incident on a first of the mirrors by which it is reflected towards a second of the mirrors by which the beam is reflected to produce an output beam of radiation of required intensity for input to the illumination system, and a tilting mechanism for tilting the mirrors such that the mirrors remain parallel to one another and the angles of incidence of the beams on the mirrors are changed so as to vary the intensity of the output beam. This allows the intensity of the projection beam to be varied continuously without changing the position of the beam, whether the input beam is converging, diverging or parallel.

Figure 2