

[DOCUMENT] Abstract

Provided is a mask blank having sufficiently fast repair rate of EB defect repair, and sufficiently high repair rate ratio to EB defect repair relative to a transparent substrate, even if the phase shift film is formed as a stacked structure of a high transmitting layer made of a SiN-based material with a large amount of nitrogen content and a low transmitting layer made of a SiN-based material with a small amount of nitrogen content.

The mask blank includes a phase shift film on a transparent substrate, the phase shift film has a structure including three sets or more of a set of a stacked structure including a high transmitting layer and a low transmitting layer, the high transmitting layer and the low transmitting layer are made of a material consisting of silicon and nitrogen, or a material consisting of silicon, nitrogen, oxygen, and one or more elements selected from a metalloid element and a non-metallic element, the high transmitting layer includes 50 atom% or more nitrogen content and has a thickness of 12 nm or less, and the low transmitting layer includes less than 50 atom% nitrogen content and has a thickness less than the high transmitting layer.