

ABSTRACT

5 A photomask blank for an exposure light of ArF excimer laser, including a
transparent substrate and a light-shielding film containing molybdenum, silicon, and
nitrogen. The light-shielding film is formed in a single layer or a multilayer composed of
a single composition layer or a composition gradient layer, a reflectance of the light-
shielding film on a side remote from the substrate is 40% or less, and among the refractive
10 indexes at the surfaces on the substrate side and the side remote from the substrate of all
layers, a difference between the highest and lowest refractive indexes is 0.2 or less, and
among the extinction coefficients at the surfaces, a difference between the highest and
lowest extinction coefficients is 0.5 or less. The light-shielding film assumes a
satisfactory and undeteriorated sectional shape of a mask pattern in an etching process in
15 mask processing or defect correcting.

Figure 1