

SELF-ALIGNED OPAQUE REGIONS FOR ATTENUATING PHASE-SHIFTING MASKS

Abstract

An attenuating phase-shifting optical lithographic mask is fabricated, in a specific embodiment of the invention, by first depositing a uniformly thick molybdenum silicide layer (11) on a top planar surface of quartz (10). The molybdenum silicide layer has a thickness sufficient for acting as an attenuating
5 (partially transparent) layer in a phase-shifting mask. A uniformly thick chromium layer (12) is deposited on the molybdenum silicide layer. The chromium layer has a thickness sufficient for acting as an opaque layer in the phase-shifting mask. Next, the chromium layer is patterned by dry or wet etching, while the chromium is selectively masked with a first patterned resist layer (13). Then the
10 molybdenum silicide layer is patterned by dry or wet etching, using the resulting patterned chromium layer as a protective layer, whereby a composite layer of molybdenum silicide and chromium is formed having mutually separated composite stripes (31, 32). Any remaining resist is removed. Next the top and sidewall surfaces of some, but not others, of these mutually separated stripes
15 are coated with a second patterned resist layer (15). Finally (FIG. 6), the chromium layer, but not the molybdenum silicide layer, is removed from the others of the mutually separated composite stripes.

Drawings for publication in O.G.: FIGS. 2, 5, 6

