

ABSTRACT

Included are a first step including forming a planar silicon layer on a silicon substrate and forming a first pillar-shaped silicon layer and a second pillar-shaped silicon layer on the planar silicon layer; a second step including forming an oxide film hard mask on the first pillar-shaped silicon layer and the second pillar-shaped silicon layer, and forming a second oxide film on the planar silicon layer, the second oxide film being thicker than a gate insulating film; and a third step including forming the gate insulating film around each of the first pillar-shaped silicon layer and the second pillar-shaped silicon layer, forming a metal film and a polysilicon film around the gate insulating film, the polysilicon film having a thickness that is smaller than half of a distance between the first pillar-shaped silicon layer and the second pillar-shaped silicon layer, forming a third resist for forming a gate line, and performing anisotropic etching to form the gate line.