METHOD FOR PRODUCING SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE

ABSTRACT

A method for producing a semiconductor device includes a first step including forming a planar silicon layer 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 a gate insulating film around each of the first pillar-shaped silicon layer and second pillar-shaped silicon layer, forming a metal film and a polysilicon film around the gate insulating film, the thickness of the polysilicon film being 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 forming the gate line; and a third step including depositing a fourth resist so that a portion of the polysilicon film on an upper side wall of each of the first pillar-shaped silicon layer and second pillar-shaped silicon layer is exposed, removing the exposed portion of the polysilicon film by etching, removing the fourth resist, and removing the metal film by etching to form a first gate electrode and a second gate electrode connected to the gate line.

Figure 1