THIN FILM TRANSISTORS AND SEMICONDUCTOR DEVICE

ABSTRACT

The TFT has a channel-forming region formed of a crystalline semiconductor film obtained by heat-treating and crystallizing an amorphous semiconductor film containing silicon as a main component and germanium in an amount of not smaller than 0.1 atomic % but not larger than 10 atomic % while adding a metal element thereto, wherein an orientation ratio of the lattice plane {101} is not smaller than 20%, the lattice plane {101} having an angle of not larger than 10 degrees with respect to the surface of the semiconductor film, an orientation ratio of the lattice plane {001} is not larger than 3%, the lattice plane {001} having an angle of not larger than 10 degrees with respect to the surface of the semiconductor film, and an orientation ratio of the lattice plane {111} is not larger than 5%, the lattice plane {111} having an angle of not larger than 10 degrees with respect to the surface of the semiconductor film as detected by the electron backscatter diffraction pattern method.

(Fig. 5)