METHOD FOR MANUFACTURING SOI SUBSTRATE AND SEMICONDUCTOR DEVICE

ABSTRACT OF THE DISCLOSURE

To provide a method for manufacturing a semiconductor substrate provided with a single crystal semiconductor layer which can be used practically even when a substrate with a low upper temperature limit, such as a glass substrate, is used. An oxide film is formed on a single crystal semiconductor substrate; accelerated ions are introduced into the single crystal semiconductor substrate through the oxide film to form an embrittled region in the single crystal semiconductor substrate; a supporting substrate is bonded such that the supporting substrate and the single crystal semiconductor substrate face each other with the oxide film interposed therebetween; separation is performed at the embrittled region into the supporting substrate to which a single crystal semiconductor layer is bonded and part of the single crystal semiconductor substrate by heating of the single crystal semiconductor substrate; first etching is performed on a surface of the single crystal semiconductor layer bonded to the supporting substrate with a substrate bias applied; the single crystal semiconductor layer is irradiated with a laser beam and at least part of the surface of the single crystal semiconductor layer is melted and solidified; and second etching is performed on the surface of the single crystal semiconductor layer with no substrate bias applied.

Figure 3