ABSTRACT OF THE DISCLOSURE

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE PRODUCED THEREBY

A semiconductor device free from electric failure in transistors at upper trench edges can be produced by a simplified process comprising basic steps of forming a pad oxide film on the circuit-forming side of a semiconductor substrate; forming an oxidation prevention film on the pad oxide film; removing the oxidation presention film and the pad oxide film at a desired position, thereby exposing the surface of the semiconductor substrate; horizontally recessing the pad oxide film, etching the exposed surface of the semiconductor substrate by isotropic etching; forming a trench to a desired depth, using the oxidation prevention film as a mask; horizontally recessing the pad oxide film; oxidizing the trench formed in the semiconductor substrate; embedding an embedding isolation film in the oxidized trench; removing the embedding isolation film formed on the oxidation prevention film; removing the oxidation prevention film formed on the circuit-forming side of the semiconductor substrate; and removing the pad oxide film formed on the circuit-forming side of the semiconductor substrate, where round upper trench edges with a curvature can be obtained, if necessary, by conducting isotropic etching of exposed surface of the semiconductor substrate and horizontally recessing of the pad oxide film before the oxidation of the trench, whereby only one oxidation step in required.
(Figure 1)