A DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICE AND A METHOD FOR ITS MANUFACTURE

ABSTRACT

A semiconductor device (JFET, 4, 5) is supported by a semiconductor body which comprises a substrate (1), an oxide layer (2) and a weakly negatively doped (n) monocrystalline wafer (3). Trenches for a dielectrically isolating layer (5) which surrounds a component region (4) are etched in the wafer (3). A field effect transistor (JFET) in the component region has two positively doped (p) wafer-like gate regions (G1), which have been diffused in the component region with the aid of a first mask. Two heavily negatively (n^+) doped regions (S2, D2) are diffused in the component region with the aid of a second mask, these regions forming the source region and the drain region of the transistor (JFET). The semiconductor body (1, 2, 3) is easy to produce and is available commercially, which simplifies manufacture of the field effect transistor (JFET). Manufacture is also simplified because the configuration of both the component region (4) and the parts (G1, S2, D2) of the transistor (JFET) are determined by the simple choice of masks. The component region (4) is weakly doped (n) and is easy to deplete of charge carriers. The electrical field strength in the component region (4) is weak, according to the RESURF method, and the field effect transistor (JFET) withstands high voltages (V_S, V_D, V_G) without risk of current breakthrough. The component region (4) occupies only a relatively small area on the substrate (1).

Figure 1 for publication together with the Abstract.