ABSTRACT OF THE DISCLOSURE

LARGE ANGLE TILT IMPLANT (LATI) METHOD FOR FORMING A LIGHTLY DOPED DRAIN (LDD)

A method for forming within a Metal Oxide Semiconductor Field Effect Transistor (MOSFET) a Lightly Doped Drain (LDD) low dose ion implant structure which partially overlaps a source/drain electrode high dose ion implant structure. To form the Lightly Doped Drain (LDD) low dose ion implant structure there is formed upon a semiconductor substrate a gate dielectric layer having formed thereupon a gate electrode. Formed then upon the exposed portions of the semiconductor substrate, the gate dielectric layer and the gate electrode is an insulator layer. Finally; there is implanted through a Large Angle Tilt Implant (LATI) method a minimum of one low dose ion implant through the insulator layer and into the semiconductor substrate to form the Lightly Doped Drain (LDD) low dose ion implant structure within the semiconductor substrate. The Lightly Doped Drain (LDD) low dose ion implant structure includes a portion of the semiconductor substrate beneath the gate electrode edges. As an extension of the method, there may additionally be implanted in-situ substantially orthogonally to the semiconductor substrate a minimum of one high dose ion implant through the insulator layer and into the semiconductor substrate. The high dose ion implant is employed in forming a source/drain electrode high dose ion implant structure adjoining but not beneath the gate electrode edges. As a further extension of the method, there may be formed a polysilicon layer upon the insulator layer. The polysilicon layer, if present, and/or the insulator layer may optionally be anisotropically etched to form a polysilicon spacer and/or an insulator spacer. By forming the polysilicon layer prior to the low dose ion implant or the high dose ion implant, there is formed a low dose ion implant structure or a high dose ion implant structure with a shallower junction which assists in reducing short channel effects.

(FIGURE 2 IS SUGGESTED FOR PUBLICATION)