ABSTRACT OF THE DISCLOSURE

METHOD FOR MINIMISING THE HOT CARRIER EFFECT IN N-MOSFET DEVICES

An N-Channel Metal Oxide Semiconductor Field Effect Transistor (N-MOSFET) with minimum susceptibility to the Hot Carrier Effect (HCE) and a method by which the N-MOSFET is fabricated. Formed upon a semiconductor substrate is a N-MOSFET structure comprising a gate oxide upon a semiconductor substrate, a gate electrode upon the gate oxide and a pair of N+ source/drain electrodes adjoining the gate electrode and the gate oxide. Implanted into the gate oxide regions beneath the gate electrode edges is a dose of a hardening ion. The hardening ion may be either nitrogen ion or fluorine ion. The hardening ion is implanted at an angle non-orthogonal to the plane of the semiconductor substrate through means of a large tilt angle ion implant process. Optionally, a Lightly Doped Drain (LDD) source/drain electrode structure or Double Doped Drain (DDD) source/drain electrode structure may be incorporated into the N-MOSFET structure.

(Fig. 1a)