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(54) Title: A SEMICONDUCTOR WAFER AND A METHOD FOR PRODUCING THE SEMICONDUCTOR WAFER

Fig. 3

3nm GaN
10nm Al _{0.25} Ga _{0.75} N
1nm AlN
150nm GaN
1800nm Al _{0.2} Ga _{0.8} N
400nm Al _{0.44} Ga _{0.56} N
400nm Al _{0.75} Ga _{0.25} N
200nm AlN
950µm Si

(57) Abstract: A semiconductor wafer and a method for producing the semiconductor wafer. The semiconductor wafer comprises a silicon single crystal substrate having a top surface and a stack of layers covering the top surface, the stack of layers comprising an AlN nucleation layer which covers the top surface of the silicon single crystal substrate, wherein the top surface of the silicon single crystal substrate has a crystal lattice orientation which is off-oriented with respect to the {111}- plane, the normal to the top surface being inclined with respect to the <111>-direction toward the <11-2>-direction by an angle Θ of not less than 0.3° and not more than 6°, the azimuthal tolerance of the inclination being $\pm 0.1^\circ$; and an AlGaIn buffer layer which covers the AlN nucleation layer and comprises one or more Al_xGa_{1-x}N layers, wherein $0 < x < 1$.

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