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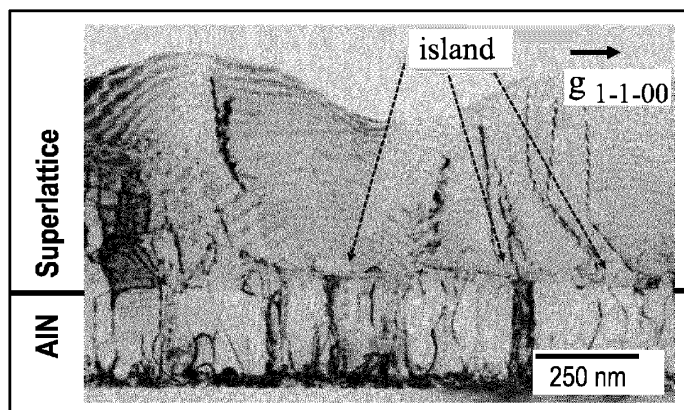
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(54) Title: SEMICONDUCTOR WAFER HAVING A MULTILAYERED STRUCTURE AND METHOD FOR PRODUCING THE
SAME

Fig. 6



(57) Abstract: A semiconductor wafer having a multilayered structure and a diameter of not less than 150 mm and not more than 300 mm, wherein the multilayered structure comprises in this order a monocrystalline silicon substrate having a {111} orientation; at least one AlN nucleation layer; an $\text{Al}_z\text{Ga}_{1-z}\text{N}$ layer; islands of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ and islands of $\text{Al}_y\text{Ga}_{1-y}\text{N}$; a superlattice structure comprising 20 to 120 periods, each period consisting of a layer of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ and a layer of $\text{Al}_y\text{Ga}_{1-y}\text{N}$; and one or more monocrystalline, doped GaN layers having a total thickness of not less than 6 μm , wherein at least one of the one or more monocrystalline, doped GaN layers has a threading dislocation density of not more than $5.0 \times 10^8 \text{ cm}^{-2}$, and wherein $0.3 \leq z \leq 0.7$; $0.7 \leq x \leq 1.0$; and $0 \leq y \leq 0.5$.

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