

ABSTRACTTitle: Multilayer Epitaxial Structure And Method For
Fabricating Same

An all epitaxial process performed entirely in a CVD
5 reactor is employed to grow heavily doped layer (N+) on
lightly doped layer (N-) on heavily doped substrate (P+),
eliminating the need for separate diffusion, even for high
impurity concentrations. The process starts with a heavily
doped silicon substrate (P+) of carrier concentration
10 typically greater than 1×10^{19} per cm^3 . To minimize
outdiffusion, the substrate is "capped" by growing very
thin and heavily doped silicon layers (10) which are
depleted by hydroven purges. A first epitaxial layer (N-)
is grown over the "capped" substrate. This layer is
15 relatively lightly doped, having a resistivity of more than
200 ohm.cm. A second epitaxial layer (N+) is then grown
over the first epitaxial layer (N-). The second epitaxial
layer (N+) has a polarity opposite to that of the substrate
(P+) and is heavily doped to a resistivity of less than
20 .005 ohm.cm.

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