MOSFET Device With Localized Stressor

ABSTRACT OF THE DISCLOSURE

MOSFETs having localized stressors are provided. The MOSFET has a stress-inducing layer formed in the source/drain regions, wherein the stress-inducing layer comprises a first semiconductor material and a second semiconductor material. A treatment is performed on the stress-inducing layer such that a reaction is caused with the first semiconductor material and the second semiconductor material is forced lower into the stress-inducing layer. The stress-inducing layer may be either a recessed region or non-recessed region. A first method involves forming a stress-inducing layer, such as SiGe, in the source/drain regions and performing a nitridation or oxidation process. A nitride or oxide film is formed in the top portion of the stress-inducing layer, forcing the Ge lower into the stress-inducing layer. Another method embodiment involves forming a reaction layer over the stress-inducing layer and performing a treatment process to cause the reaction layer to react with the stress-inducing layer.

Figure 6