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(54) Title: DAMAGE-FREE PLASMA-ENHANCED CVD PASSIVATION OF AlGaN/GaN HIGH ELECTRON MOBILITY TRANSISTORS

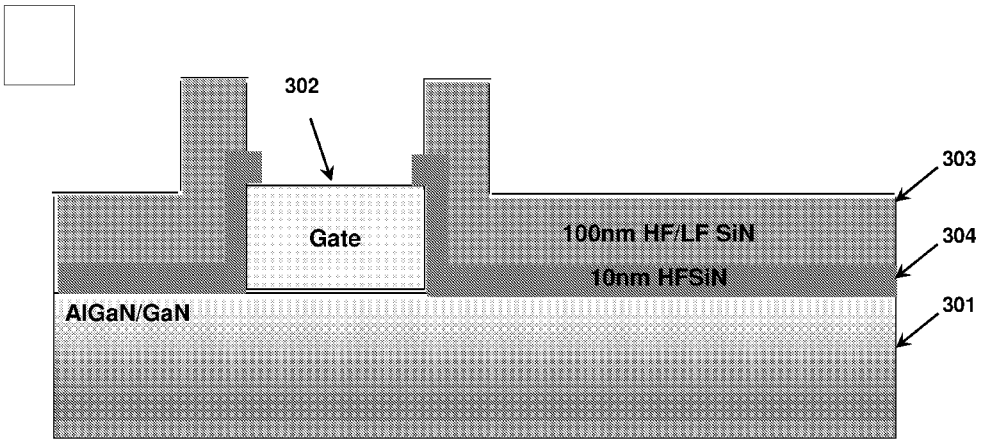

FIG. 3

(57) Abstract: Passivated AlGaN/GaN HEMTs having no plasma damage to the AlGaN surface and methods for making the same. In a first embodiment, a thin HF SiN barrier layer is deposited on the AlGaN surface after formation of the gate. A thick HF/LF SiN layer is then deposited, the thin HF SiN layer and the thick HF/LF Sin layer comprising bi-layer SiN passivation on the HEMT. In a second embodiment, a first thin HF SiN barrier layer is deposited on the AlGaN surface before formation of the gate and is annealed. Following annealing of the first SiN layer, the gate is formed, and a second HF SiN barrier layer is deposited, followed by a thick HF/LF SiN layer, the three SiN layers comprising tri-layer SiN passivation on the HEMT.

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