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(54) Title: NANOTUBE ENABLED, GATE-VOLTAGE CONTROLLED LIGHT EMITTING DIODES

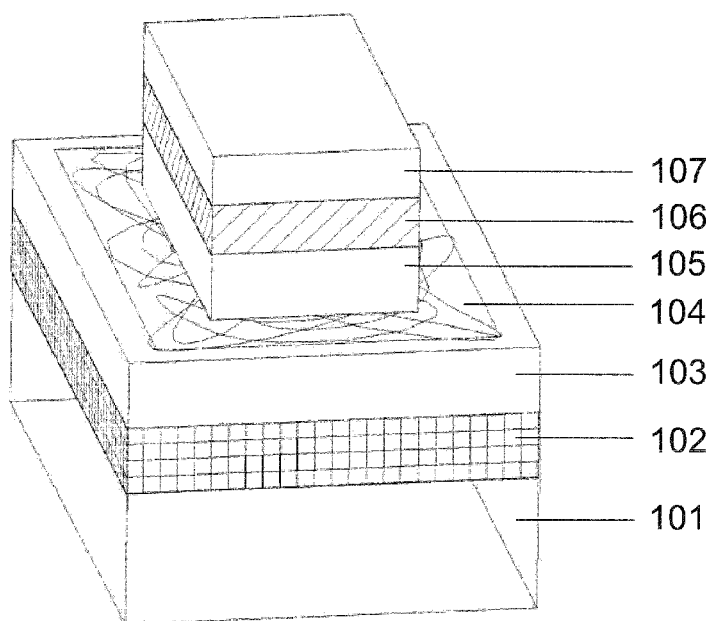


Figure 1

(57) Abstract: Embodiments of the invention relate to vertical field effect transistor that is a light emitting transistor. The light emitting transistor incorporates a gate electrode for providing a gate field, a first electrode comprising a dilute nanotube network for injecting a charge, a second electrode for injecting a complementary charge, and an electroluminescent semiconductor layer disposed intermediate the nanotube network and the electron injecting layer. The charge injection is modulated by the gate field. The holes and electrons, combine to form photons, thereby causing the electroluminescent semiconductor layer to emit visible light. In other embodiments of the invention a vertical field effect transistor that employs an electrode comprising a conductive material with a low density of states such that the transistors contact barrier modulation comprises barrier height lowering of the Schottky contact between the electrode with a low density of states and the adjacent semiconductor by a Fermi level shift.



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