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201303250-3 26 April 2013 (26.04.2013) SG(71) Applicants: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis, Singapore 138632 (SG). **NATIONAL UNIVERSITY OF SINGAPORE** [SG/SG]; 21 Lower Kent Ridge Road, Singapore 119077 (SG).(72) Inventors: **TEO, Ee Jin**; c/o Institute of Materials Research and Engineering, 3 Research Link, Singapore 117602 (SG). **TENG, Jinghua**; c/o Institute of Materials Research and Engineering, 3 Research Link, Singapore 117602 (SG). **YANG, Chengyuan**; c/o National University of Singapore, Blk S12, 2 Science Drive 3, Department of Physics, NUS, Singapore 117542 (SG). **BETTIOL, Andrew**; c/o National University of Singapore, Blk S12, 2

Science Drive 3, Department of Physics, NUS, Singapore 117542 (SG).

(74) Agent: **SPRUSON & FERGUSON (ASIA) PTE LTD**; P.O. Box 1531, Robinson Road Post Office, Singapore 903031 (SG).

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(54) Title: HIGH SPEED SURFACE PLASMON COUPLED LIGHT EMITTING DIODES

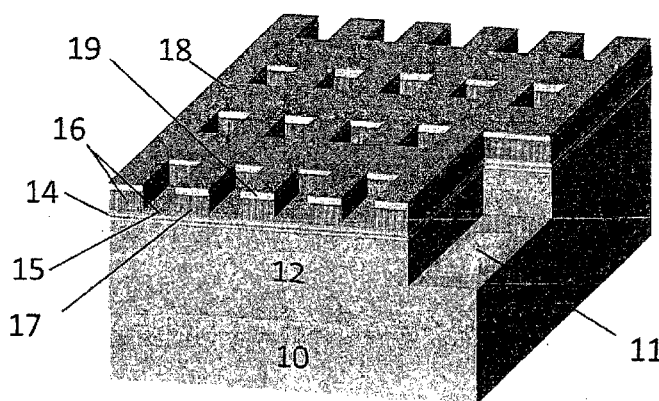
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FIG.1

(57) Abstract: A light emitting diode device (LED) is provided. The LED comprises a first-doped layer on a substrate, an active layer on the first-doped layer, a second-doped layer on the active layer, and a metal layer on the second-doped layer. The second-doped layer is patterned on a surface opposite to the active layer to define a first portion and a second portion. The first portion of the second-doped layer has a first portion thickness constrained for electron-hole pairs in the active layer to couple efficiently to a surface plasmon mode at an interface of the metal layer and the second-doped layer thereby increasing the spontaneous emission rate of the LED. The second portion of the second-doped layer has a second portion thickness sufficient to ensure formation of a p-n junction in the LED.

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