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(54) Title: INCOHERENT TYPE-III MATERIALS FOR CHARGE CARRIERS CONTROL DEVICES

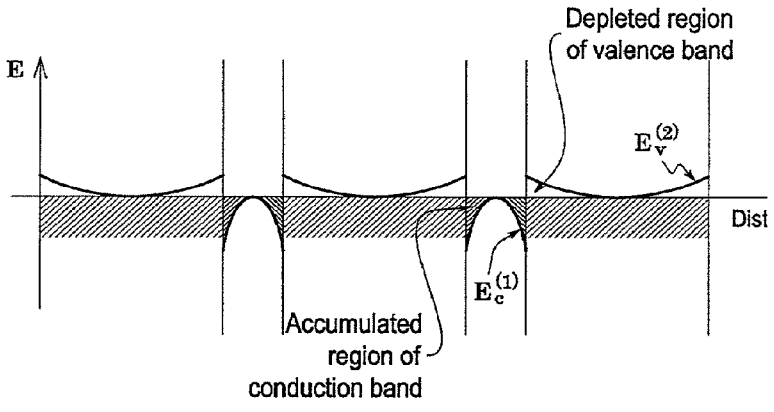


FIG. 3B
E-distance band profile diagram of incoherent type-II structures with periodic inserted 2DILs

(57) Abstract: A semiconductor junction may include a first semiconductor material and a second material. The first and the second semiconductor materials are extrinsically undoped. At least a portion of a valence band of the second material has a higher energy level than at least a portion of the conduction band of the first semiconductor material (type-III band alignment). A flow of a majority of free carriers across the semiconductor junction is diffusive. A region of generation and/or recombination of a plurality of free carriers is confined to a two-dimensional surface of the second material, and at the interface of the first semiconductor material and the second material.

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