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(54) Title: SEMICONDUCTOR SUBSTRATE INCORPORATING A NEUTRON CONVERSION LAYER

(57) Abstract: A semiconductor substrate incorporating a neutron conversion layer that is sensitive enough to permit the counting of single neutron events. The substrate includes an active semiconductor device layer, a base substrate, an insulating layer provided between the active semiconductor device layer and the base substrate, and a neutron conversion layer provided between the active semiconductor device layer and the base substrate. The neutron conversion layer is located within the insulating layer, between the insulating layer and the base substrate or between the active semiconductiv e device layer and the insulating layer. A barrier layer is provided between at least one of the neutron conversion layer and the active semiconductor device layer and the neutron conversion layer and the base substrate to prevent diffusion of the neutron conversion material provided in the neutron conversion layer. Further, a plurality of trenches may be formed in the active semiconductor device layer.

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