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(54) **TWO DIMENSIONAL SEMICONDUCTOR TRANSISTOR, TWO DIMENSIONAL SEMICONDUCTOR WITH THE SAME AND MANUFACTURING METHOD THEREOF**

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(57) **ABSTRACT**

A two dimensional (2D) semiconductor transistor includes a gate electrode, a gate insulating film provided on the gate electrode, a 2D semiconductor layer provided on the gate insulating film and provided in a hetero-junction structure having a staggered band gap, a source electrode and a drain electrode provided on the 2D semiconductor layer and disposed to be spaced apart from each other. The 2D semiconductor layer includes a first semiconductor layer and a second semiconductor layer having mutually different electrical characteristics and at least partially overlapped with each other, and one of the first semiconductor layer and the second semiconductor layer is lightly doped with dopants.

