CLAIMS

1. A memory device comprising:

a first semiconductor layer, a first conductive layer, a second semiconductor layer, and a second conductive layer that are arranged in this order in a first direction, spaced apart from each other;

a first semiconductor film extending in the first direction, being in contact with the first semiconductor layer and the second semiconductor layer, and intersecting the first conductive layer and the second conductive layer;

a first memory film provided between the first conductive layer and the first semiconductor film; and

a second memory film provided between the second conductive layer and the first semiconductor film, wherein

the first semiconductor layer couples to a first bit line, and

the second semiconductor layer couples to a second bit line.

2. The memory device according to claim 1, wherein

the first memory film and the second memory film are a charge storage film.

3. The memory device according to claim 2, wherein

the charge storage film includes silicon nitride.

4. The memory device according to claim 1, wherein

the first memory film and the second memory film are a ferroelectric film.

5. The memory device according to claim 4, wherein

the ferroelectric film includes at least one material selected from lead zirconate titanate, strontium tantalate bismuthate, and polyvinylidene fluoride-trifluoroethylene (P(VDF-TrFE)).

6. The memory device according to claim 1, wherein the first semiconductor layer and the second semiconductor layer contain an N-type impurity.

7. The memory device according to claim 6, wherein the first semiconductor film contains an N-type impurity.

8. The memory device according to claim 7, wherein a concentration of the N-type impurity contained in the first semiconductor layer and the second semiconductor layer is equal to or higher than a concentration of the N-type impurity contained in the first semiconductor film.

9. The memory device according to claim 6, wherein the first semiconductor film contains a P-type impurity.

10. The memory device according to claim 1, wherein each of the first semiconductor layer, the first conductive layer, the second semiconductor layer, and the second conductive layer surrounds the first semiconductor film when viewed in the first direction.

11. The memory device according to claim 1, further comprising:

a second semiconductor film extending in the first direction, being in contact with the first semiconductor

layer and the second semiconductor layer, intersecting the first conductive layer and the second conductive layer, and provided apart from the first semiconductor film.

12. The memory device according to claim 1, further comprising:

a third semiconductor layer, a third conductive layer, a fourth semiconductor layer, and a fourth conductive layer that are arranged in this order in the first direction, spaced apart from each other;

an insulating film extending in the first direction and provided between the first semiconductor layer and the third semiconductor layer, between the first conductive layer and the third conductive layer, between the second semiconductor layer and the fourth semiconductor layer, and between the second conductive layer and the fourth conductive layer;

a third semiconductor film extending in the first direction, being in contact with the third semiconductor layer and the fourth semiconductor layer, and intersecting the third conductive layer and the fourth conductive layer;

a third memory film provided between the third conductive layer and the third semiconductor film; and

a fourth memory film provided between the fourth conductive layer and the third semiconductor film.