Claims

What is claimed is:

1. A semiconductor device, comprising:

a first metal-oxide semiconductor (MOS) transistor on a substrate;

a pickup region adjacent to one side of the first MOS transistor;

a protection diode adjacent to another side of the first MOS transistor, wherein the protection diode comprises a first doped region in the substrate; and

a salicide block (SAB) on the first doped region, wherein

the pickup region and the first doped region comprise a first conductive type, and wherein

the protection diode comprises different conductive type.

2. The semiconductor device of claim 1, wherein the first MOS transistor comprises:

a first gate structure on the substrate; and

a first source/drain region adjacent to two sides of the first gate structure.

3. The semiconductor device of claim 2, wherein the protection diode is electrically connected to the first gate structure.

4. The semiconductor device of claim 1, wherein the protection diode further comprises a second doped region on the first doped region, wherein the second doped region comprises a second conductive type.

5. The semiconductor device of claim 4, wherein a concentration of the pickup region is less than a concentration of the first doped region.

6. The semiconductor device of claim 1, wherein the protection diode comprises:

a well region in the substrate, wherein the well region comprises the first conductive type; and

a doped region on the well region, wherein the doped region comprises a second conductive type.

7. The semiconductor device of claim 6, wherein a concentration of the well region is less than a concentration of the pickup region.

8. The semiconductor device of claim 1, wherein the protection diode further comprises a second doped region adjacent to the first doped region, wherein the second doped region comprises a second conductive type.

9. The semiconductor device of claim 8, wherein the second doped region is electrically connected to the first gate structure.

10. The semiconductor device of claim 8, wherein bottom surfaces of the first doped region and the second doped region are coplanar.

11. The semiconductor device of claim 1, further comprising a second MOS transistor between the first MOS transistor and the protection diode.

12. The semiconductor device of claim 11, wherein the first MOS transistor and the second MOS transistor comprise different conductive type.

13. The semiconductor device of claim 11, wherein the second MOS transistor comprises:

a second gate structure on the substrate; and

a second source/drain region adjacent to two sides of the second gate structure.