CLAIMS

1. A semiconductor device comprising:

a substrate;

a first metal film formed on the substrate;

an insulation film formed on at least the first metal film;

a semiconductor film formed on the insulation film;

a protection film formed on at least the semiconductor film and protecting the semiconductor film;

a second metal film formed on the protection film;

a semiconductor component including at least:

two electrodes formed from the second metal film;

a protection portion formed from the protection film and including two semiconductor component-side holes that are through holes formed at positions overlapping the electrodes, respectively; and

a semiconductor portion formed from the semiconductor film, connected to the electrodes via the semiconductor component-side holes, respectively, and including outer edges that cross outer edges of the electrodes in a plan view;

a static dissipating line formed from the first metal film, arranged adjacent to the semiconductor component in a plan view, extending along a plate surface of the substrate and along a direction that crosses an arrangement direction of the electrodes, and configured to dissipate static;

a semiconductor component connecting line formed from the second metal film, continuing from one of the electrodes, and extending along the plate surface of the substrate and along the arrangement direction of the electrodes so as to cross the static dissipating line; and

a static protection portion including at least a static

dissipating portion formed from the second metal film or the semiconductor film, arranged closer to the semiconductor component than an intersection of the static dissipating line and the semiconductor component connecting line such that at least a portion of the static dissipating portion overlaps the static dissipating line in a plan view, and configured to dissipate static.

2. The semiconductor device according to claim 1, wherein the semiconductor film is made of oxide semiconductor.

3. The semiconductor device according to claim 1 or 2, wherein the static dissipating portion is formed from the semiconductor film.

4. The semiconductor device according to claim 3, wherein the static protection portion includes a second static dissipating portion formed from the second metal film, arranged such that at least a portion thereof overlaps the static dissipating portion in a plan view, and including outer edges that cross outer edges of the static dissipating portion.

5. The semiconductor device according to claim 4, wherein

the static dissipating portion has a rectangular shape in a plan view, and

the second static dissipating portion is arranged such that the outer edges thereof cross the outer edges of the static dissipating portion at least at four points.

6. The semiconductor device according to claim 5, wherein the second static dissipating portion includes at least four outer

edges parallel to four outer edges of the static dissipating portion, respectively, and a distance between the outer edges thereof parallel to each other is different from a distance between the outer edges of the static dissipating portion parallel to each other.

7. The semiconductor device according to any one of claims 1 to 6, further comprising:

a second semiconductor component connecting line formed from the second metal film and continuing from another one of the electrodes of the semiconductor component;

a second semiconductor component connecting line-side insulator formed from the insulation film and the protection film and including a second semiconductor component connecting line-side hole that is a through hole formed at a position overlapping the second semiconductor component connecting line in a plan view; and

a static dissipating line-side connecting portion formed from the first metal film, continuing from the static dissipating line, arranged such that at least a portion thereof overlaps the second semiconductor component connecting line in a plan view, and connected to the second semiconductor component connecting line via the second semiconductor component connecting line-side hole.

8. The semiconductor device according to claim 7, further comprising a second semiconductor component including at least:

two second electrodes formed from the second metal film;

a second protection portion formed from the protection film and including two second semiconductor component-side holes that are through holes formed at positions overlapping the second

electrodes; and

a second semiconductor portion formed from the semiconductor film and connected to the second electrodes via the second semiconductor component-side holes, respectively, wherein

the semiconductor component connecting line shorts out one of the electrodes to one of the second electrodes, and

the second semiconductor component connecting line shorts out the other one of the electrodes to the other one of the second electrodes.

9. The semiconductor device according to claim 8, further comprising:

a gate electrode-side insulator formed from the protection film and the insulation film and including a gate electrode-side hole that is a through hole formed at a position overlapping the semiconductor component connecting line;

a gate electrode included in the semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the electrodes, the semiconductor portion, and the semiconductor component connecting line in a plan view, and connected to the semiconductor component connecting line via the gate electrode-side hole;

a second gate electrode-side insulator formed from the protection film and the insulation film and including a second gate electrode-side hole that is a through hole formed at a position overlapping the semiconductor component connecting line; and

a second gate electrode included in the second semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the second electrodes, the second semiconductor portion, and the second semiconductor component connecting line in a plan view, and connected to the second

semiconductor component connecting line via the second gate electrode-side hole.

10. The semiconductor device according to any one of claims 1 to 9, further comprising:

a signal line formed from the first metal film and arranged on an opposite side from the static dissipating line with respect to the semiconductor component;

a signal line-side connecting portion formed from the first metal film and at an end of the signal line;

a contact portion-side insulator formed from the protection film and the insulation film and including a contact portion-side hole that is a through hole formed at a position overlapping the signal line-side connecting portion; and

a contact portion formed from the second metal film and including at least a semiconductor component-side connecting portion formed at an end of the semiconductor component connecting line so as to overlap the signal line-side connecting portion in a plan view and connected to the signal line-side connecting portion via the contact portion-side hole.

11. The semiconductor device according to claim 10, further comprising static dissipating projections formed at portions of the signal line-side connecting portion in the contact portion and the static dissipating line opposed to each other so as to project toward each other to dissipate static.

12. The semiconductor device according to any one of claims 1 to 11, further comprising:

a gate electrode-side insulator formed from the protection film and the insulation film and including a gate electrode-side

hole that is a through hole formed at a position overlapping the semiconductor component connecting line;

a gate electrode included in the semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the electrodes, the semiconductor portion, and the semiconductor component connecting line in a plan view, and connected to the semiconductor component connecting line via the gate electrode-side hole; and

a gate non-overlapping-type static dissipating portion continuing from the semiconductor portion and including an outer edge that crosses an outer edge of the other one of the electrodes in a plan view at a position that does not overlap the gate electrode in a plan view.

13. A display device comprising:

the semiconductor device according to any one of claims 1 to 12;

a counter substrate arranged opposite the semiconductor device;

a liquid crystal layer arranged between the semiconductor device and the counter substrate; and

a switching component included in the semiconductor device and connected to at least the semiconductor component.

CLAIMS

1. A semiconductor device comprising:

a substrate;

a first metal film formed on the substrate;

an insulation film formed on at least the first metal film;

a semiconductor film formed on the insulation film;

a protection film formed on at least the semiconductor film and protecting the semiconductor film;

a second metal film formed on the protection film;

a semiconductor component including at least:

two electrodes formed from the second metal film;

a protection portion formed from the protection film and including two semiconductor component-side holes that are through holes formed at positions overlapping the electrodes, respectively; and

a semiconductor portion formed from the semiconductor film, connected to the electrodes via the semiconductor component-side holes, respectively, and including outer edges that cross outer edges of the electrodes in a plan view;

a static dissipating line formed from the first metal film, arranged adjacent to the semiconductor component in a plan view, extending along a plate surface of the substrate and along a direction that crosses an arrangement direction of the electrodes, and configured to dissipate static;

a semiconductor component connecting line formed from the second metal film, continuing from one of the electrodes, and extending along the plate surface of the substrate and along the arrangement direction of the electrodes so as to cross the static dissipating line; and

a static protection portion including at least a static

dissipating portion formed from the second metal film or the semiconductor film, arranged closer to the semiconductor component than an intersection of the static dissipating line and the semiconductor component connecting line such that at least a portion of the static dissipating portion overlaps the static dissipating line in a plan view, and configured to dissipate static.

2. The semiconductor device according to claim 1, wherein the semiconductor film is made of oxide semiconductor.

3. The semiconductor device according to claim 1 or 2, wherein the static dissipating portion is formed from the semiconductor film.

4. The semiconductor device according to claim 3, wherein the static protection portion includes a second static dissipating portion formed from the second metal film, arranged such that at least a portion thereof overlaps the static dissipating portion in a plan view, and including outer edges that cross outer edges of the static dissipating portion.

5. The semiconductor device according to claim 4, wherein

the static dissipating portion has a rectangular shape in a plan view, and

the second static dissipating portion is arranged such that the outer edges thereof cross the outer edges of the static dissipating portion at least at four points.

6. The semiconductor device according to claim 5, wherein the second static dissipating portion includes at least four outer edges parallel to four outer edges of the static dissipating

portion, respectively, and a distance between the outer edges thereof parallel to each other is different from a distance between the outer edges of the static dissipating portion parallel to each other.

7. The semiconductor device according to claim 1 or 2, further comprising:

a second semiconductor component connecting line formed from the second metal film and continuing from another one of the electrodes of the semiconductor component;

a second semiconductor component connecting line-side insulator formed from the insulation film and the protection film and including a second semiconductor component connecting line-side hole that is a through hole formed at a position overlapping the second semiconductor component connecting line in a plan view; and

a static dissipating line-side connecting portion formed from the first metal film, continuing from the static dissipating line, arranged such that at least a portion thereof overlaps the second semiconductor component connecting line in a plan view, and connected to the second semiconductor component connecting line via the second semiconductor component connecting line-side hole.

8. The semiconductor device according to claim 7, further comprising a second semiconductor component including at least:

two second electrodes formed from the second metal film;

a second protection portion formed from the protection film and including two second semiconductor component-side holes that are through holes formed at positions overlapping the second electrodes; and

a second semiconductor portion formed from the

semiconductor film and connected to the second electrodes via the second semiconductor component-side holes, respectively, wherein

the semiconductor component connecting line shorts out one of the electrodes to one of the second electrodes, and

the second semiconductor component connecting line shorts out the other one of the electrodes to the other one of the second electrodes.

9. The semiconductor device according to claim 8, further comprising:

a gate electrode-side insulator formed from the protection film and the insulation film and including a gate electrode-side hole that is a through hole formed at a position overlapping the semiconductor component connecting line;

a gate electrode included in the semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the electrodes, the semiconductor portion, and the semiconductor component connecting line in a plan view, and connected to the semiconductor component connecting line via the gate electrode-side hole;

a second gate electrode-side insulator formed from the protection film and the insulation film and including a second gate electrode-side hole that is a through hole formed at a position overlapping the semiconductor component connecting line; and

a second gate electrode included in the second semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the second electrodes, the second semiconductor portion, and the second semiconductor component connecting line in a plan view, and connected to the second semiconductor component connecting line

via the second gate electrode-side hole.

10. The semiconductor device according to claim 1 or 2, further comprising:

a signal line formed from the first metal film and arranged on an opposite side from the static dissipating line with respect to the semiconductor component;

a signal line-side connecting portion formed from the first metal film and at an end of the signal line;

a contact portion-side insulator formed from the protection film and the insulation film and including a contact portion-side hole that is a through hole formed at a position overlapping the signal line-side connecting portion; and

a contact portion formed from the second metal film and including at least a semiconductor component-side connecting portion formed at an end of the semiconductor component connecting line so as to overlap the signal line-side connecting portion in a plan view and connected to the signal line-side connecting portion via the contact portion-side hole.

11. The semiconductor device according to claim 10, further comprising static dissipating projections formed at portions of the signal line-side connecting portion in the contact portion and the static dissipating line opposed to each other so as to project toward each other to dissipate static.

12. The semiconductor device according to claim 1 or 2, further comprising:

a gate electrode-side insulator formed from the protection film and the insulation film and including a gate electrode-side hole that is a through hole formed at a position overlapping the semiconductor component connecting line;

a gate electrode included in the semiconductor component, formed from the first metal film, arranged so as to overlap at least portions of the electrodes, the semiconductor portion, and the semiconductor component connecting line in a plan view, and connected to the semiconductor component connecting line via the gate electrode-side hole; and

a gate non-overlapping-type static dissipating portion continuing from the semiconductor portion and including an outer edge that crosses an outer edge of the other one of the electrodes in a plan view at a position that does not overlap the gate electrode in a plan view.

13. A display device comprising:

the semiconductor device according to claim 1 or 2;

a counter substrate arranged opposite the semiconductor device;

a liquid crystal layer arranged between the semiconductor device and the counter substrate; and

a switching component included in the semiconductor device and connected to at least the semiconductor component.