CLAIMS

Claim 1:

A display panel, comprising:

a circuit substrate;

a first light-emitting element, electrically connected to the circuit substrate, and configured to emit blue light and/or ultraviolet light;

a first color conversion layer, covering the first light-emitting element, and configured to convert blue light and/or ultraviolet light into red light;

a first color filter layer, covering and contacting a top surface of the first color conversion layer, configured to have a transmittance of 0% to 5% for blue light and/or ultraviolet light, and configured to have a transmittance of 60% to 99% for red light;

a second light-emitting element, electrically connected to the circuit substrate, and configured to emit blue light, wherein the first color conversion layer and the first color filter layer are separated from the second light-emitting element; and

an encapsulation layer, surrounding the first light-emitting element, the first color conversion layer, the first color filter layer, and the second light-emitting element; and

a third light-emitting element, electrically connected to the circuit substrate, and configured to emit green light, wherein the encapsulation layer surrounds the third light-emitting element, and the encapsulation layer is configured to have a transmittance of 0% to 5% for blue light, and have a transmittance of 60% to 99% for green light.

Claim 2:

The display panel as claimed in claim 1, wherein the first color filter layer extends from the top surface of the first color conversion layer to the circuit substrate along

a side surface of the first color conversion layer.

Claim 3:

The display panel as claimed in claim 1, further comprising:

a barrier layer, located on the circuit substrate, and having an opening overlapping the first light-emitting element, wherein the first color conversion layer is located in the opening, and the first color filter layer extends from the top surface of the first color conversion layer to a top surface of the barrier layer along a side surface of the first color conversion layer.

Claim 4:

The display panel as claimed in claim 1, further comprising:

a plurality of first light-emitting elements, electrically connected to the circuit substrate, and configured to emit blue light and/or ultraviolet light;

a plurality of first color conversion layers, respectively covering the first light-emitting elements, and configured to convert blue light and/or ultraviolet light into red light;

a plurality of first color filter layers, respectively covering and contacting top surfaces of the first color conversion layers;

a plurality of second light-emitting elements, electrically connected to the circuit substrate, and configured to emit blue light, wherein the first color conversion layers and the first color filter layers are separated from the second light-emitting elements; and

a plurality of third light-emitting elements, electrically connected to the circuit substrate, and configured to emit green light, wherein at least one of the first light-emitting elements is surrounded by four of the third light-emitting elements, and at least one of the

second light-emitting elements is surrounded by the other four of the third light-emitting elements.

Claim 5:

The display panel as claimed in claim 1, wherein the encapsulation layer contacts the second light-emitting element, and the encapsulation layer is separated from the first light-emitting element.

Claim 6:

A display panel, comprising:

a circuit substrate;

a first light-emitting element, electrically connected to the circuit substrate, and configured to emit blue light and/or ultraviolet light;

a first color conversion layer, covering the first light-emitting element, and configured to convert blue light and/or ultraviolet light into red light;

a first color filter layer, completely covering the first color conversion layer, configured to have a transmittance of 0% to 5% for blue light and/or ultraviolet light, and configured to have a transmittance of 60% to 99% for red light;

a second light-emitting element, electrically connected to the circuit substrate, and configured to emit blue light, wherein the first color conversion layer and the first color filter layer are separated from the second light-emitting element;

an encapsulation layer, surrounding the first light-emitting element, the first color conversion layer, the first color filter layer, and the second light-emitting element; and

a third light-emitting element, electrically connected to the circuit substrate, and

configured to emit green light, wherein the encapsulation layer surrounds the third light-emitting element, and the encapsulation layer is configured to have a transmittance of 0% to 5% for blue light, and have a transmittance of 60% to 99% for green light.

Claim 7:

A manufacturing method of a display panel, comprising:

electrically connecting a first light-emitting element, a second light-emitting element, and a third light-emitting element to a circuit substrate, wherein the first light-emitting element is configured to emit blue light and/or ultraviolet light, the second light-emitting element is configured to emit blue light, and the third light-emitting is configured to emit green light;

forming an encapsulation layer surrounding the first light-emitting element, the second light-emitting element, and the third light-emitting element, and the encapsulation layer is configured to have a transmittance of 0% to 5% for blue light, and have a transmittance of 60% to 99% for green light;

forming a first color conversion layer to cover the first light-emitting element, and separating the first color conversion layer from the second light-emitting element, wherein the first color conversion layer is configured to convert blue light and/or ultraviolet light into red light; and

forming a first color filter layer on the first color conversion layer, and separating the first color filter layer from the second light-emitting element, wherein the first color filter layer is configured to have a transmittance of 0% to 5% for blue light and/or ultraviolet light, and the first color filter layer is configured to have a transmittance of 60% to 99% for red light.

Claim 8:

The manufacturing method of the display panel as claimed in claim 7, further comprising:

before forming the first color conversion layer, forming the encapsulation layer surrounding the first light-emitting element, the second light-emitting element, and the third light-emitting element, wherein the encapsulation layer has a first groove overlapping the first light-emitting element and a second groove overlapping the second light-emitting element;

forming the first color conversion layer in the first groove, wherein the first color conversion layer does not fill the first groove; and

forming the first color filter layer in a portion of the first groove that is not filled by the first color conversion layer, wherein the encapsulation layer contacts a sidewall of the first color conversion layer and a sidewall of the first color filter layer.