CLAIMS

Claim 1. A liquid crystal display device which includes a pair of substrates, and a liquid crystal layer sandwiched between the pair of substrates, and is configured such that a pixel is formed by picture elements of a plurality of colors,

wherein one of the pair of substrates includes scanning lines, signal lines, and storage capacitor lines, a thin film transistor connected to each of the scanning line and the signal line, and a pixel electrode connected to the thin film transistor;

the other of the pair of substrates includes an opposed electrode;

the liquid crystal layer comprises a region having a larger thickness and a region having a smaller thickness in one pixel,

the pixel electrode is arranged for each of the picture elements; and

the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer among the plurality of pixel electrodes arranged in one pixel is connected to the thin film transistor with a larger channel width among the plurality of thin film transistors arranged in the one pixel.

Claim 2. The liquid crystal display device according to claim 1,

wherein the overlapping area of the scanning line and the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the scanning line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 3. The liquid crystal display device according to

one of claim 1 and claim 2,

wherein the overlapping area of the signal line and the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the signal line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 4. The liquid crystal display device according to one of claim 1 to claim 3,

wherein the overlapping area of the storage capacitor line and the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the storage capacitor line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 5. The liquid crystal display device according to one of claim 1 to claim 4,

wherein an area of the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from an area of the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 6. The liquid crystal display device according to one of claim 1 to claim 5,

wherein the scanning line and the pixel electrode form gate-drain capacitance;

the signal line and the pixel electrode form source-drain capacitance;

the storage capacitor line and the pixel electrode form storage capacitance;

the pixel electrode and the opposed electrode form liquid crystal capacitance;

a ratio of the gate-drain capacitance to a total of the

gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

a difference between a largest ratio of the gate-drain capacitance and a smallest ratio of the gate-drain capacitance, among the ratios of the gate-drain capacitance respectively obtained for the picture elements of the plurality of colors, is 10% or less of the smallest ratio of the gate-drain capacitance.

Claim 7. The liquid crystal display device according to one of claim 1 to claim 6,

wherein a value of a response coefficient obtained by calculating, in the one picture element, a ratio of the maximum value of the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance, with respect to the minimum value of the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

the difference between the largest response coefficient and the smallest response coefficient, among the response coefficients respectively obtained for the picture elements of the plurality of colors, is 5% or less of the smallest response coefficient.

Claim 8. The liquid crystal display device according to one of claim 1 to claim 7,

wherein the pixel electrode is configured by a plurality of sub-pixel electrodes divided from each other in one picture element;

the thin film transistors are connected to the sub-pixel electrodes respectively;

the storage capacitor lines overlap the sub-pixel electrodes respectively; and

the liquid crystal display device includes a driving circuit which inverts a polarity of a voltage of the storage capacitor line at regular time intervals.

Claim 9. The liquid crystal display device according to claim 8,

wherein a ratio of the storage capacitance with respect to the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

the difference between the largest ratio of the storage capacitance and the smallest ratio of the storage capacitance, among the ratios of the storage capacitance respectively obtained for the picture elements of the plurality of colors, is 1.0% or less of the smallest ratio of the storage capacitance.

CLAIMS

Claim 1. A liquid crystal display device which includes a pair of substrates, and a liquid crystal layer sandwiched between the pair of substrates, and is configured such that a pixel is formed by picture elements of a plurality of colors,

wherein one of the pair of substrates includes scanning lines, signal lines, and storage capacitor lines, a thin film transistor connected to each of the scanning line and the signal line, and a pixel electrode connected to the thin film transistor;

the other of the pair of substrates includes an opposed electrode;

the liquid crystal layer includes a region having a larger thickness and a region having a smaller thickness in one pixel, whereby each of the regions corresponds to any of the picture elements (or the pixel electrodes);

the pixel electrode is arranged for each of the picture elements; and

the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer among the plurality of pixel electrodes arranged in one pixel is connected to the thin film transistor with a larger channel width among the plurality of thin film transistors arranged in the one pixel;

wherein the overlapping area of the signal line and the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the signal line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 2. The liquid crystal display device according to claim 1,

wherein the overlapping area of the scanning line and the

pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the scanning line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 3. The liquid crystal display device according to claims 1 or 2,

wherein the overlapping area of the storage capacitor line and the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from the overlapping area of the storage capacitor line and the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 4. The liquid crystal display device according to any one of claims 1 to 3,

wherein an area of the pixel electrode that overlaps a region having a smaller thickness of the liquid crystal layer is different from an area of the pixel electrode that overlaps a region having a larger thickness of the liquid crystal layer.

Claim 5. The liquid crystal display device according to any one of claims 1 to 4,

wherein the scanning line and the pixel electrode form gate-drain capacitance;

the signal line and the pixel electrode form source-drain capacitance;

the storage capacitor line and the pixel electrode form storage capacitance;

the pixel electrode and the opposed electrode form liquid crystal capacitance;

a ratio of the gate-drain capacitance to a total of the gate-drain capacitance, the source-drain capacitance, the

storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

a difference between a largest ratio of the gate-drain capacitance and a smallest ratio of the gate-drain capacitance, among the ratios of the gate-drain capacitance respectively obtained for the picture elements of the plurality of colors, is 10% or less of the smallest ratio of the gate-drain capacitance.

Claim 6. The liquid crystal display device according to any one of claims 1 to 5,

wherein the scanning line and the pixel electrode form gate-drain capacitance;

the signal line and the pixel electrode form source-drain capacitance;

the storage capacitor line and the pixel electrode form storage capacitance;

the pixel electrode and the opposed electrode form liquid crystal capacitance;

wherein a value of a response coefficient obtained by calculating, in the one picture element, a ratio of the maximum value of the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance, with respect to the minimum value of the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

the difference between the largest response coefficient and the smallest response coefficient, among the response coefficients respectively obtained for the picture elements of the plurality of colors, is 5% or less of the smallest response coefficient.

Claim 7. The liquid crystal display device according to any one of claims 1 to 6,

wherein the pixel electrode is configured by a plurality of sub-pixel electrodes divided from each other in one picture element;

the thin film transistors are connected to the sub-pixel electrodes respectively;

the storage capacitor lines overlap the sub-pixel electrodes respectively; and

the liquid crystal display device includes a driving circuit which inverts a polarity of a voltage of the storage capacitor line at regular time intervals.

Claim 8. The liquid crystal display device according to claim 7,

wherein the scanning line and the pixel electrode form gate-drain capacitance;

the signal line and the pixel electrode form source-drain capacitance;

the storage capacitor line and the pixel electrode form storage capacitance;

the pixel electrode and the opposed electrode form liquid crystal capacitance;

wherein a ratio of the storage capacitance with respect to the total of the gate-drain capacitance, the source-drain capacitance, the storage capacitance, and the liquid crystal capacitance is different for each of the picture elements of the plurality of colors; and

the difference between the largest ratio of the storage capacitance and the smallest ratio of the storage capacitance, among the ratios of the storage capacitance respectively obtained for the picture elements of the plurality of colors, is 1.0% or less of the smallest ratio of the storage capacitance.