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(54) **Pixel of an organic light emitting diode display device and method of driving the same**

Pixel einer Organische lichtemittierende Diodenanzeigevorrichtung und Ansteuerungsverfahren dafür

Pixel d'un dispositif à diode d'affichage électroluminescent organique et son procédé de commande

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Description

BACKGROUND

1. Field of the Invention

[0001] The present invention relates to an electroluminescent display, e.g., an organic light emitting diode (OLED) display device, and a method of driving the same. More particularly, the invention relates to an OLED display device capable of displaying an image having a uniform luminance, and a method of driving the same.

2. Description of the Related Art

[0002] There have been many attempts to develop various flat panel displays capable of reducing the weight and volume characteristics typical of cathode ray tubes. Flat panel displays include, e.g., liquid crystal displays, field emission displays, plasma display panels, OLED display devices, etc.

[0003] OLED display devices produce an image by employing light emitting diode(s), which generate light by recombining electrons and holes. OLED display devices may have advantages such as rapid response time and/or relatively low power consumption. OLED display devices may employ a voltage driving mode employing a voltage as a data signal, or an electric current driving mode employing an electric current as a data signal.

[0004] The voltage driving mode may divide a predetermined voltage into a plurality of grey levels, and may display a predetermined image by supplying one of the divided voltages as a data signal to pixels. However, with the voltage driving mode, it may be difficult to display a uniform image due to variations in threshold voltage and electron mobility of a respective drive transistor included in each of the pixels of the display.

[0005] The electric current driving mode may display an image by supplying a respective predetermined electric current as a data signal to the pixels of the display. Such an electric current driving mode may display a uniform image regardless of the threshold voltage and the electron mobility of the respective drive transistor. However, the electric current driving mode may not charge a desired voltage to the respective pixels within a given time because the electric current driving mode employs a micro-electric current as a data signal. Therefore, it may be impossible to drive a large-area circuit using the electric current driving mode. More particularly, when the micro-electric current is used as the data signal, a large amount of time may be required for charging the pixels because of load capacitance in each data line. The electric current driving mode may be disadvantageous because it may be very difficult to design a data driver that uses the micro-electric current to display a large number of grey levels.

[0006] The above information disclosed in this Background section is only for enhancement of understanding

of the background of the invention, and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

5 US 2005/0007357 discloses a pixel circuit that supplies a current to a light emitting diode of each pixel. In operation, a TFT as a fourth switch is turned on together with a TFT as a second switch at the time of an auto-zero operation, a reference current line is connected to a drive transistor of the pixel through a first node.

10 US 2006/0221009 relates to a drive circuit for electroluminescent devices. IN particular, there is disclosed a drive circuit that attempts to compensate for the dispersion of the characteristics of drive transistors. A switch is turned off and two switches are turned on such that a constant current flows in a drive transistor. The voltage of a capacitor on the side of a further switch is varied according to a signal voltage, and thereby the resultant voltage is added to the gate of the drive transistor.

20 EP 1585100 discloses a light emission display including data lines, scan lines and pixel circuits. A pixel circuit includes a light emission element, a first transistor including a control electrode and first and second electrodes, the first transistor outputting a current corresponding to a voltage between the first electrode and the control electrode, a first switch coupled between the control electrode of the first transistor and the light emission element and for receiving a first control signal. A first capacitor and a second capacitor are also provided. The pixel circuit aims to reduce short-range transistor threshold voltage variations and long-range voltage drops.

SUMMARY OF THE INVENTION

35 **[0007]** The invention is directed to a light emitting diode display device and a method of driving the same, which substantially overcome one or more of the problems due to the limitations and disadvantages of the related art.

40 **[0008]** It is therefore an object of the invention to provide a light emitting diode display device capable of displaying an image having a uniform luminance, and a method of driving the same.

45 **[0009]** Accordingly, the invention provides a pixel of a display according to claim 1. In addition, an organic light emitting diode display device according to claim 5 is provided.

50 **[0010]** Also provided is a method of driving a pixel of an organic light emitting diode display device according to claim 15. Preferred aspects of the invention are defined in claims 2-4, 6-14 and 16-17.

BRIEF DESCRIPTION OF THE DRAWINGS

55 **[0011]** The above and other features and advantages of the present invention will become more apparent to those of ordinary skill in the art from referring to the following detailed description of embodiments thereof taken in conjunction with the attached drawings, in which:

[0012] FIG. 1 is a diagram of an OLED display device according to an embodiment of the present invention;

[0013] FIG. 2 is a diagram of an embodiment of a pixel employable by the display device shown in FIG. 1;

[0014] FIG. 3 illustrates a data driver coupled to the pixel of FIG. 2; and

[0015] FIG. 4 is a waveform diagram of signals employable by a method of driving the pixel of FIG. 2 according to an embodiment of the present invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0016] The invention will now be described more fully hereinafter with reference to the accompanying drawings, in which embodiments of the invention are illustrated. Aspects of the invention may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein.

[0017] In the following description one element is coupled to another element, one element may be not only directly coupled to another element but also indirectly coupled to another element via another element(s). Terms such as "primary" and "secondary" are used to distinguish different elements, and are not meant to express temporal or spatial correspondence. Irrelevant elements are omitted for clarity.

[0018] In some embodiments of the present invention, a predetermined electric current may flow, e.g., be supplied to a current sink, e.g., supplied from a current source to a respective one of electric current sink lines, to substantially and/or completely compensate for a threshold voltage and electron mobility of a drive transistor during a period when a driving scan signal is supplied to a prior scan line, and a data signal (voltage) may be supplied to charge a voltage corresponding to the respective data signal during a period when a current scan signal is supplied to the scan line currently being driven. In embodiments of the invention, the voltage for compensating for the threshold voltage and electron mobility of the drive transistor and the voltage corresponding to the data signal may be converted into one voltage, and the converted voltage may be used to drive the drive transistor. Therefore, it may be possible to display an image having uniform luminance.

[0019] In OLED display device(s) and method(s) of driving the same employing one or more aspects of the present invention, a predetermined electric current may flow, e.g., be supplied, e.g., from a current source to a respective one of the electric current sink lines, to primarily charge a voltage that may substantially and/or completely compensate for the threshold voltage and electron mobility of a drive transistor and to secondarily charge a voltage corresponding to the data signal. The primarily charged voltage and the secondarily charged voltage may be converted into one voltage, and an electric current corresponding to the converted voltage may be supplied to the respective OLED. Accordingly, embodiments

of the present invention may display an image having uniform luminance regardless of the threshold voltage and electron mobility of the respective drive transistor(s). Embodiments of the present invention may stably and substantially and/or completely compensate for the threshold voltage and electron mobility of the respective drive transistor(s) because a predetermined, e.g., fixed, electric current source may be used to sink an electric current. That is, because a voltage corresponding to the threshold voltage and the electron mobility of the drive transistor may be stored in the pixel as a result of the predetermined electric current flowing to a current sink, e.g., flowing from the respective electric current source to the respective electric current sink line, load capacitance of the electric current sink line may be sufficiently charged.

[0020] FIG. 1 illustrates a diagram of an OLED display device according to an embodiment of the present invention.

[0021] Referring to FIG. 1, the OLED display device includes a pixel unit 130. The pixel unit 130 includes multiple pixels 140 coupled to scan lines S1, S2...Sn, light emitting control lines E1, E2...En, data lines D1, D2...Dm, electric current sink lines CS1, CS2...CSm, a scan driver 110, a data driver 120 and a timing controller 150. The scan driver 110 serves to drive the scan lines S1, S2...Sn and the light emitting control lines E1, E2...En. The data driver 120 serves to drive the data lines D1, D2...Dm and the electric current sink lines CS1, CS2...CSm. The timing controller 150 serves to control the scan driver 110 and the data driver 120.

[0022] The pixel unit 130 includes the pixels 140 in regions at least partially defined by the scan lines S1, S2...Sn, the light emitting control lines E1, E2...En, the data lines D1, D2...Dm, and the electric current sink lines CS1, CS2...CSm. The pixels 140 are coupled to a first external power source ELVDD and a second external power source ELVSS. Each of the pixels 140 is primarily charged with a voltage to at least substantially and/or completely compensate for electron mobility and a threshold voltage of a respective drive transistor MD (see FIG. 2) included in each of the pixels 140, when an electric current flows to a current sink, e.g., flows from a current source to the electric current sink lines CS1, CS2...CSm. Each of the pixels 140 is secondarily charged with a voltage corresponding to a data signal when a data signal voltage is supplied to the data lines D1, D2...Dm. The pixels 140 supply a predetermined electric current from the first power source ELVDD to the second power source ELVSS via an OLED (see Fig. 2), where the predetermined electric current corresponds to the primarily and secondarily charged voltages. The pixels 140 will be described in greater detail below.

[0023] In some embodiments of the invention, a zeroth scan line S0 (not shown) is provided. The zeroth scan line S0 may be provided, e.g., adjacent to the first scan line S1, and the zeroth scan line S0 may be coupled with the respective pixels 140 arranged, e.g., on a first hori-

zontal line. The respective pixels 140 arranged on the first horizontal line may also be driven stably.

[0024] The timing controller 150 generates the data drive control signal DCS and the scan drive control signal SCS corresponding to externally supplied synchronizing signals. The timing controller 150 supplies externally provided data DATA to the data driver 120. The data drive control signal DCS generated in the timing controller 150 are supplied to the data driver 120, and the scan drive control signal SCS is supplied to the scan driver 110.

[0025] The scan driver 110 receives the scan drive control signal SCS. The scan driver 110, receiving the scan drive control signal SCS, sequentially supplies scan signals to the scan lines S1, S2...Sn. The scan driver 110 receiving the scan drive control signal SCS sequentially supplies light emitting control signals to the light emitting control lines E1, E2...En. For each of the pixels 140, the respective light emitting control signal is supplied so that it overlaps with at least two scan signals. For example, the light emitting control signal supplied to an ith, where i is an integer from 1 to n, light emitting control line Ei overlaps with a prior scan signal supplied to a prior scan line, e.g., an ith-1 scan line Si-1, and a current scan signal supplied to an ith scan line Si. More particularly, e.g., the prior scan signal drives respective ones of the pixels 140 arranged in an ith-1 row to emit or not emit light and the current scan signal drives respective ones of the pixels 140 arranged in the ith row to emit or not emit light.

[0026] The data driver 120 receives a data drive control signal DCS from the timing controller 150. During a prior scan period, e.g., when the prior scan signal is being supplied to, e.g., the ith-1 row, the data driver 120 receiving the data drive control signal DCS sinks a predetermined electric current via the electric current sink lines CS1, CS2...CSm to respective ones of the pixels 140, e.g., pixels arranged in the ith row, to be driven during a subsequent, e.g., next or current, scan period to display or not display light. More particularly, e.g., the ith-1 scan line Si-1 corresponds to the prior scan line if the pixels currently being driven are coupled with the ith-1 scan line Si-1 and the ith scan line Si.

[0027] The predetermined electric current is set to an electric current value sufficient to charge a load capacitance of each of the electric current sink lines CS1, CS2...CSm during a prior period when the prior scan signal is supplied to the prior scan line, e.g., Si-1. The predetermined electric current is be set to a level substantially identical to or higher than an electric current flowing in the OLEDs when each of the pixels 140 emits the light with maximum luminance. The predetermined electric current may be experimentally determined in consideration of a size of a panel, a width of the electric current sink lines CS1, CS2...CSm, resolution, etc.

During respective scan periods, e.g., the prior scan period, the current scan period, etc., the data driver 120 supplies the respective data signals via the data lines D1, D2...Dm to the respective ones of the pixels 140 to be selected by the respective scan signal. The respective

data signal is set to a voltage corresponding to grey levels. The ith scan line Si is set to the current scan line if the pixels are coupled with the prior scan line, e.g., the ith-1 scan line Si-1, and the ith scan line Si.

[0028] FIG. 2 illustrates an embodiment of the pixel of FIG. 1. For convenience, the exemplary pixel 140 is illustrated to be coupled with a jth data line Dj, where j is an integer of 1 to m, and the ith scan line Si. However, embodiments of the invention are not limited thereto and other configurations may be employed.

[0029] Referring to FIG. 2, the pixel 140 includes an OLED, and a pixel circuit 142 adapted to supply an electric current to the OLED.

[0030] The OLED generates light having a predetermined color corresponding to the electric current supplied from the pixel circuit 142. The OLED generates light having one of red, green and blue colors to correspond to the electric current supplied to the OLED.

[0031] The pixel circuit 142 primarily charges the voltage that may at least substantially and/or completely compensate for a threshold voltage and electron mobility of the drive transistor MD when the prior scan signal is supplied to the prior scan line, e.g., the ith-1 scan line Si-1, and secondarily charges a voltage corresponding to the data signal when the current scan signal is supplied to the current scan line, e.g., the ith scan line Si. The pixel circuit 142 converts the primarily charged voltage and the secondarily charged voltage into one voltage, and the pixel circuit 142 supplies a predetermined driving or controlling electric current to the respective OLED coupled to the respective pixel circuit 142. The pixel circuit 142 includes the drive transistor MD, first to fifth transistors M1 to M5, a first capacitor C1 and a second capacitor C2.

[0032] A first electrode of the first transistor M1 is coupled to the data line Dj, and a second electrode is coupled to a first node N1. A gate electrode of the first transistor M1 is coupled to the ith scan line Si. The first transistor M1 turns on when the respective scan signal is supplied to the ith scan line Si, thereby electrically coupling the first node N1 with the data line Dj.

[0033] A first electrode of the second transistor M2 is coupled to the electric current sink line CSj, and a second electrode of the second transistor M2 is coupled to a second electrode of the drive transistor MD. A gate electrode of the second transistor M2 is coupled to the ith-1 scan line Si-1. The second transistor M2 turns on when the respective scan signal is supplied to the ith-1 scan line Si-1, thereby electrically coupling the second electrode of the drive transistor MD with the electric current sink line CSj.

[0034] A first electrode of the third transistor M3 is coupled to a gate electrode of the drive transistor MD, and a second electrode of the third transistor M3 is coupled to the second electrode of the drive transistor MD. A gate electrode of the third transistor M3 is coupled to the ith-1 scan line Si-1. The third transistor M3 turns on when the scan signal is supplied to the ith-1 scan line Si-1, and

may causes the drive transistor MD to be diode-coupled.

[0035] A first electrode of the fourth transistor M4 is coupled to the first node N1, and a second electrode of the fourth transistor M4 is coupled to a second node N2. A gate electrode of the fourth transistor M4 is coupled to the light emitting control line Ei. The fourth transistor M4 turns on when the light emitting control signal is supplied, and the fourth transistor M4 turns off when a light emitting control signal is not supplied.

[0036] A first electrode of the fifth transistor M5 is coupled to the second electrode of the drive transistor MD, and a second electrode of the fifth transistor M5 is coupled to an anode electrode of the OLED. A gate electrode of the fifth transistor M5 is coupled to the light emitting control line Ei. The fifth transistor M5 turns on when the light emitting control signal is supplied, and turns off when the light emitting control signal is not supplied.

[0037] A first electrode of the drive transistor MD is coupled to the first power source ELVDD, and the second electrode of the drive transistor MD is coupled to the first electrode of the fifth transistor M5. A gate electrode of the drive transistor MD is coupled to the second node N2. The drive transistor MD supplies an electric current, corresponding to a voltage applied to the second node N2, flowing from the first power source ELVDD to the second power source ELVSS via the fifth transistor M5 and the OLED.

[0038] The first capacitor C1 is coupled between the second node N2 and the first power source ELVDD. The first capacitor C1 charges a predetermined voltage when an electric current flows into, e.g., sinks into, the electric current sink line CSj.

[0039] The second capacitor C2 is coupled between the first node N1 and the first power source ELVDD. The second capacitor C2 charges a voltage corresponding to the data signal supplied to the data line Dj.

[0040] FIG. 3 illustrates a data driver coupled to the pixel circuit 142 of the pixel illustrated in FIG. 2. Referring to FIG. 3, the data driver 120 includes an electric current source 121 and a data signal generation unit 122.

[0041] The electric current source 121 is coupled to the electric current sink line CSj in order to sink the predetermined electric current. In some embodiments of the invention, each of the electric current sink lines CS1, CS2...CSm (see FIG. 1) is coupled to respective electric current sources 121 to sink the electric current from the electric current sink lines CS1, CS2...CSm. In other embodiments, electric current sink lines CS1, CS2...CSm is commonly coupled to a single electric current source 121. In embodiments employing a plurality of the electric current sources 121, each of the electric current sources 121 supplies the same or substantially the same amount of current.

[0042] In FIGS. 2 and 4, the transistors M1 to M5 have been exemplified as p-type transistors, e.g., PMOS, but are not limited thereto. Also, at least for the scan signals and the light emitting control signals, "supplying" a signal may correspond to a "low level" state of the signal and

"not supplying" a signal may correspond to a "high level" state of the signal, but is not limited thereto.

[0043] The data signal generation unit 122 generates the data signal to correspond to data DATA supplied by the timing controller 150. The data signal generation unit 122 includes a shift register, latches, a digital/analog converter, a buffer, etc.

[0044] FIG. 4 illustrates a waveform diagram of signals employable by a method of driving the pixel 140 illustrated in FIGS. 3 and 4.

[0045] The light emitting control signal is supplied, e.g., a portion of the light emitting control signal having a low level is supplied, to the ith light emitting control line Ei. The fourth transistor M4 and the fifth transistor M5 is turned on when the light emitting control signal is supplied, e.g., logic low level, to the ith light emitting control line Ei. The fourth transistor M4 and the fifth transistor M5 are turned off when the light emitting control signal is not supplied, e.g., logic high level, to the ith light emitting control line Ei.

[0046] The scan signal is then supplied to the ith-1 scan line Si-1. The second transistor M2 and the third transistor M3 is turned on when the scan signal is supplied to the ith-1 scan line Si-1. The second electrode of the drive transistor MD is electrically coupled with the electric current sink line CSj when the second transistor M2 is turned on. The drive transistor MD is diode-coupled when the third transistor M3 is turned on. The predetermined electric current sinks, e.g., flows from the electric current source 121 via the drive transistor MD and the third transistor M3, when the second and third transistors M2 and M3 are turned on.

[0047] A voltage corresponding to the predetermined electric current flowing in the drive transistor MD is applied to the second node N2, and the first capacitor C1 is charged with a voltage corresponding to a voltage applied to the second node N2. The voltage applied to the second node N2 is determined by an electric current flowing in the drive transistor MD. The voltage applied to the second node N2 corresponds to a voltage sufficient to substantially and/or completely compensate for the threshold voltage and electron mobility of the drive transistor MD. The voltage applied to the second node N2 is set to the voltage that substantially and/or completely compensates for the threshold voltage and electron mobility the respective drive transistor MD in each of the pixels 142, since the electric current flowing in the drive transistor MD is set to the same level in each of the pixels 142.

[0048] The first transistor M1 is maintained in an off state during a period when the scan signal is not supplied, e.g., is at a logic high level, to the ith-1 scan line Si-1. Accordingly, during that time, the data signal supplied to the data line Dj is supplied to pixels coupled to the ith scan line Si.

[0049] Then, the supply of the scan signal to the ith-1 scan line Si-1 is stopped, e.g., changed to logic high, and the current scan signal is supplied to the ith scan line Si.

The second transistor M2 and the third transistor M3 are turned off when the supply of the current scan signal to the i th-1 scan line S_{i-1} is stopped. The first transistor M1 is turned on when the current scan signal is supplied to the i th scan line S_i . When the first transistor M1 is turned on, the data signal DS supplied to the data line D_m is supplied to the first node N1. The second capacitor C2 charges a voltage corresponding to the data signal.

[0050] The first transistor M1 is turned off when supply of the current scan signal to the i th scan line S_i is stopped, i.e., changed to a logic high level, after the voltage corresponding to the data signal is charged in the second capacitor C2. The light emitting control signal is then supplied, e.g., changed to a logic low level, to the i th light emitting control line E_i .

[0051] The fourth transistor M4 and the fifth transistor M5 are turned on when the light emitting control signal is supplied to the i th light emitting control line E_i . The second node N2 is electrically coupled with the first node N1 when the fourth transistor M4 is turned on. When the second node N2 is electrically coupled with the first node N1, the voltage charged in the first capacitor C1 and the voltage charged in the second capacitor C2 are divided and converted into one voltage, and the converted voltage is applied to the second node N2. The voltage applied to the second node N2 is determined by the voltage of the data signal and stored in the first capacitor C1, which substantially and/or completely compensates for the threshold voltage and electron mobility of the drive transistor MD.

[0052] The voltage applied to the second node N2 is varied according to the capacitances of the first capacitor C1 and the second capacitor C2. For this purpose, the capacitances of the first capacitor C1 and the second capacitor C2 are experimentally determined to apply a desired voltage to the second node N2.

[0053] The drive transistor MD supplies a driving or controlling electric current from the first power source ELVDD to the OLED via the fifth transistor M5 corresponding to the voltage applied to the second node N2. Light having a predetermined luminance may then be emitted by the OLED.

[0054] Embodiments of the present invention have been disclosed herein, and although specific terms are employed, they are used and are to be interpreted in a generic and descriptive sense only and not for purpose of limitation. Accordingly, it will be understood by those of ordinary skill in the art that various changes in form and details may be made without departing from the scope of the present invention as set forth in the following claims.

Claims

1. An organic light emitting diode display device, comprising:

data lines (D_1, \dots, D_m),
scan lines (S_1, \dots, S_m),
light emitting control lines (E_1, \dots, E_n),
electric current sink lines (CS_1, CS_m),
pixels comprising each:

an organic light emitting diode (OLED);
a drive transistor (MD) adapted to supply an electric current to the organic light emitting diode (OLED), wherein a first electrode of the drive transistor (MD) is connected to a power source (ELVDD) and a second electrode of the drive transistor (MD) is connected to the organic light emitting diode (OLED);
a second transistor (M2) electrically connected between a respective one of electric current sink lines (CS_j) and the second electrode of the drive transistor (MD), the second transistor (M2) being adapted to turn on when a first scan signal is supplied to a first respective one of the scan lines (S_{i-1}) associated with the pixel;
a third transistor (M3) electrically connected between a gate electrode and the second electrode of the drive transistor (MD), the third transistor (M3) having a gate electrode connected to the first respective one of scan lines (S_{i-1}); and
said each pixel being **characterized in that** it comprises
a first capacitor (C1) and a second capacitor (C2) having each a first electrode electrically connected to a first power source (ELVDD), said first capacitor (C1) having a second electrode electrically connected to a gate electrode of the drive transistor (MD);
a fourth transistor (M4) electrically connected between the gate electrode of the drive transistor (MD) and a second electrode of the second capacitor (C2), the fourth transistor (M4) having a gate electrode connected to a respective one of the light emitting control lines (E_i);
a first transistor (M1) electrically connected between a respective one of data lines (D_j) and the second electrode of the second capacitor (C2), the first transistor (M1) having a gate electrode connected to a second respective one of the scan lines (S_i) associated with the pixel, wherein the first transistor (M1) is adapted to supply a data signal voltage to said second capacitor (C2) when a second scan signal is supplied to the second respective one of the scan lines (S_i) associated with the pixel;
the first scan signal being supplied before the second scan signal is supplied.

2. A display device as claimed in claim 1, wherein the first capacitor (C1) is adapted to be charged by a predetermined electric current supplied to the respective electric current sink line (CS_j) when the first scan signal is supplied to the first scan line (S_{i-1}) associated with the pixel, and the second capacitor (C2) is adapted to be charged by the data signal voltage when the second scan signal is supplied to the second scan line (S_i) associated with the pixel.
3. A display device as claimed in claim 2, wherein the fourth transistor (M4) is adapted to be turned on so as to connect the first capacitor (C1) and the second capacitor (C2) in parallel so that a voltage charged in the first capacitor (C1) and a voltage charged in the second capacitor (C2) are converted into one voltage when the light emitting control signal is supplied to the respective light emitting control line (E_i); the drive transistor (MD) being adapted to supply an electric current corresponding to the converted voltage to the organic light emitting diode (OLED).
4. A display device as claimed in any one of claims 1 to 3, further comprising a fifth transistor (M5) coupled between the drive transistor (MD) and the organic light emitting diode (OLED), and the fifth transistor (M5) is adapted to be turned on when the light emitting control signal is supplied to the respective light emitting control line (E_i).
5. An organic light emitting diode display device according to any one of claims 1 to 4 comprising:
- a scan driver (110) adapted to supply a respective scan signal to each of the scan lines (S₁,..., S_n) and to supply a respective light emitting control signal to each of the light emitting control lines (E₁,...,E_n), the respective scan signals including the first scan, signal and the second scan signal for a respective pixel; and
- a data driver (120) adapted to primarily charge the respective pixel by sinking a predetermined electric current through the electric current sink line (CS_j) for the respective pixel when the first scan signal is supplied to the first scan line (S_{i-1}) of the respective pixel, and to secondarily charge the respective pixel by supplying a data signal voltage to the data line (D_j) of the respective pixel when the second scan signal is supplied to the second scan line (S_i) of the respective pixel.
6. An organic light emitting diode display device as claimed in claim 5, wherein the scan driver (110) is adapted to supply the first scan signal to the first scan line (S_{i-1}) before the second scan signal is supplied to the second scan line (S_i) such that the first of the at least two scan lines primarily charges some of the pixels during a previous time period before a subsequent time period during which the second one of the at least two scan lines secondarily charges other ones of the pixels.
7. An organic light emitting diode display device as claimed in claim 5 or claim 6, wherein the electric current is an electric current that is adapted to charge a load capacitor of each of the electric current sink lines (CS₁,...,CS_m).
8. An organic light emitting diode display device as claimed in claim 7, wherein the electric current is set to a level substantially identical to or higher than an electric current resulting in a maximum luminance from a light emitting diode (OLED) in each of the pixels.
9. An organic light emitting diode display device as claimed in any one of claims 5 to 8, wherein the data driver (120) includes electric current sources coupled to each of the electric current sink lines to sink the electric current.
10. An organic light emitting diode display device as claimed in one of claims 5 to 9, wherein the data driver (120) includes an electric current source commonly coupled to the electric current sink lines to sink the electric current.
11. An organic light emitting diode display device as claimed in any one of claims 5 to 10, wherein each of the pixels is adapted to convert the primarily charged voltage and the secondly charged voltage into one converted voltage, and to supply an electric current corresponding to the converted voltage to a light emitting element.
12. An organic light emitting diode display device as claimed in any one of claims 5 to 11, wherein the display device is adapted to charge the primarily charged voltage, which at least substantially compensates for a threshold voltage and an electron mobility of the drive transistor, in the first capacitor (C1) when the respective first scan signal is supplied to the respective first scan line (S_{i-1}), and to charge the secondarily charged voltage, corresponding to the data signal, in the second capacitor (C2).
13. An organic light emitting diode display device as claimed in claim 12, wherein the display device is adapted to convert the voltages charged in the first capacitor (C1) and the second capacitor (C2) into one voltage when the fourth transistor (M4) is turned on, and the drive transistor (MD) supplies an electric current corresponding to the converted voltage to the light emitting diode (OLED).

14. An organic light emitting diode display device as claimed in claim 12 or 13, wherein the scan driver (110) is adapted to simultaneously output the respective light emitting control signal to a current, i th, one of the light emitting control lines (E_1, \dots, E_n), the respective first scan signal to the respective first, i th-1, scan line (S_{i-1}) and the respective second scan signal to the respective second, i th scan line (S_i), where i is an integer from 1 to n .
15. A method of driving an organic light emitting diode display device according to any one of claims 1 to 4, the method comprising:
- charging a voltage in the first capacitor (C_1) included in the pixel while sinking an electric current, for at least substantially compensating for an electron mobility of the drive transistor (MD), the electric current being sunk in the drive transistor (MD) of the pixel when a first scan signal is supplied to the first scan line (S_{i-1}) associated with the pixel;
 - after charging the voltage in the first capacitor (C_1), charging a voltage in the second capacitor (C_2) included in the pixel by supplying a data signal voltage to the pixel when a second scan signal is supplied to the second scan line (S_i) associated with the pixel;
 - turning on the fourth transistor (M_4) for converting the voltages charged in the first capacitor (C_1) and the second capacitor (C_2) into one voltage; and
 - supplying an electric current corresponding to the converted voltage to the light emitting diode (OLED) of the pixel.
16. A method of driving an organic light emitting diode display device as claimed in claim 15, wherein the electric current is set to an electric current that charges a load capacitor of an electric current sink line (CS_j) associated with the pixel.
17. A method of driving an organic light emitting diode display device as claimed in claim 15 or claim 16, wherein converting the voltages includes electrically coupling in parallel the second capacitor (C_2) with the first capacitor (C_1).

Patentansprüche

1. Anzeigevorrichtung mit organischen Leuchtdioden, umfassend:
- Datenleitungen (D, \dots, D_m),
 - Abtastleitungen (S_1, \dots, S_m),
 - Lichtemissionssteuerleitungen (E_1, \dots, E_n),
 - elektrische Stromsenkenleitungen ($CS_1, \dots,$

CS $_m$),
Bildpunkte, die jeweils umfassen:

eine organische Leuchtdiode (OLED);
einen Ansteuerungstransistor (MD), der dafür eingerichtet ist, der organischen Leuchtdiode (OLED) einen elektrischen Strom zuzuführen, worin eine erste Elektrode des Ansteuerungstransistors (MD) mit einer Leistungsquelle (ELVDD) verbunden ist und eine zweite Elektrode des Ansteuerungstransistors (MD) mit der organischen Leuchtdiode (OLED) verbunden ist;
einen zweiten Transistor (M_2), der zwischen eine entsprechende der elektrischen Stromsenkenleitungen (CS_j) und die zweite Elektrode des Ansteuerungstransistors (MD) elektrisch verbunden ist, wobei der zweite Transistor (M_2) dafür eingerichtet ist, einzuschalten, wenn an eine erste entsprechende der Abtastleitungen (S_{i-1}), die dem Bildpunkt zugeordnet ist, ein erstes Abtastsignal angelegt wird;
einen dritten Transistor (M_3), der zwischen eine Gateelektrode und die zweite Elektrode des Ansteuerungstransistors (MD) elektrisch verbunden ist, wobei der dritte Transistor (M_3) eine Gateelektrode hat, die mit der ersten entsprechenden der Abtastleitungen (S_{i-1}) verbunden ist; und

wobei jeder Bildpunkt **dadurch gekennzeichnet ist, dass** er umfasst:

einen ersten Kondensator (C_1) und einen zweiten Kondensator (C_2), die jeweils eine erste Elektrode haben, die mit einer ersten Leistungsquelle (ELVDD) verbunden ist, wobei der erste Kondensator (C_1) eine zweite Elektrode hat, die mit einer Gateelektrode des Ansteuerungstransistors (MD) elektrisch verbunden ist;
einen vierten Transistor (M_4), der zwischen die Gateelektrode des Ansteuerungstransistors (MD) und eine zweite Elektrode des zweiten Kondensators (C_2) elektrisch verbunden ist, wobei der vierte Transistor (M_4) eine Gateelektrode hat, die mit einer entsprechenden der Lichtemissionssteuerleitungen (E_i) verbunden ist;
einen ersten Transistor (M_1), der zwischen eine entsprechende der Datenleitungen (D_j) und die zweite Elektrode des zweiten Kondensators (C_2) elektrisch verbunden ist, wobei der erste Transistor (M_1) eine Gateelektrode hat, die mit einer zweiten dem Bildpunkt zugeordneten entsprechenden der Abtastleitungen (S_i) verbunden ist, wor-

- in der erste Transistor (M1) dafür eingerichtet ist, eine Datensignalspannung an den zweiten Kondensator (C2) anzulegen, wenn an die zweite dem Bildpunkt zugeordnete entsprechende der Abtastleitungen (Si) ein zweites Abtastsignal angelegt wird; wobei das erste Abtastsignal angelegt wird, bevor das zweite Abtastsignal angelegt wird.
2. Anzeigevorrichtung nach Anspruch 1, worin der erste Kondensator (C1) dafür eingerichtet ist, durch einen vorbestimmten elektrischen Strom aufgeladen zu werden, welcher der entsprechenden elektrischen Stromsenkenleitung (CSj) zugeführt wird, wenn das erste Abtastsignal an die erste dem Bildpunkt zugeordnete Abtastleitung (Si-1) angelegt wird, und der zweite Kondensator (C2) dafür eingerichtet ist, durch die Datensignalspannung aufgeladen zu werden, wenn das zweite Abtastsignal an die zweite dem Bildpunkt zugeordnete Abtastleitung (Si) angelegt wird.
 3. Anzeigevorrichtung nach Anspruch 2, worin der vierte Transistor (M4) dafür eingerichtet ist, eingeschaltet zu werden, um dadurch den ersten Kondensator (C1) und den zweiten Kondensator (C2) parallel zu schalten, so dass eine im ersten Kondensator (C1) geladene Spannung und eine im zweiten Kondensator (C2) geladene Spannung in eine Spannung konvertiert werden, wenn das Lichtemissionssteuersignal an die entsprechende Lichtemissionssteuerleitung (Ei) angelegt wird; wobei der Ansteuerungstransistor (MD) dafür eingerichtet ist, der organischen Leuchtdiode (OLED) einen elektrischen Strom zuzuführen, welcher der konvertierten Spannung entspricht.
 4. Anzeigevorrichtung nach einem der Ansprüche 1 bis 3, ferner einen fünften Transistor (M5) umfassend, der zwischen den Ansteuerungstransistor (MD) und die organische Leuchtdiode (OLED) gekoppelt ist, und der fünfte Transistor (M5) ist dafür eingerichtet, eingeschaltet zu werden, wenn das Lichtemissionssteuersignal an die entsprechende Lichtemissionssteuerleitung (Ei) angelegt wird.
 5. Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 1 bis 4, umfassend:
 - einen Abtasttreiber (110), der dafür eingerichtet ist, ein jeweiliges Abtastsignal an jede der Abtastleitungen (S1, ..., Sm) anzulegen und ein jeweiliges Lichtemissionssteuersignal an jede der Lichtemissionssteuerleitungen (E1, ..., En) anzulegen, wobei die jeweiligen Abtastsignale das erste Abtastsignal und das zweite Abtastsignal für einen entsprechenden Bildpunkt einschließen;
 - einen Datentreiber (120), der dafür eingerichtet ist, den jeweiligen Bildpunkt durch Ziehen eines vorbestimmten elektrischen Stroms über die elektrische Stromsenkenleitung (CSj) für den jeweiligen Bildpunkt primär zu laden, wenn das erste Abtastsignal an die erste Abtastleitung (Si-1) des jeweiligen Bildpunkts angelegt wird, und den jeweiligen Bildpunkt durch Anlegen einer Datensignalspannung an die Datenleitung (Dj) des jeweiligen Bildpunkts sekundär zu laden, wenn das zweite Abtastsignal an die zweite Abtastleitung (Si) des jeweiligen Bildpunkts angelegt wird.
 6. Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 5, worin der Datentreiber (110) dafür eingerichtet ist, das erste Abtastsignal an die erste Abtastleitung (Si-1) anzulegen, bevor das zweite Abtastsignal an die zweite Abtastleitung (Si) angelegt wird, so dass die erste der mindestens zwei Abtastleitungen einige der Bildpunkte während eines vorangehenden Zeitabschnitts primär lädt, und zwar vor einem anschließenden Zeitabschnitt, während dessen die zweite der mindestens zwei Abtastleitungen andere der Bildpunkte sekundär lädt.
 7. Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 5 oder 6, worin der elektrische Strom ein elektrischer Strom ist, der dafür angepasst ist, einen Lastkondensator jeder der elektrischen Stromsenkenleitungen (CS1, ..., CSm) zu laden.
 8. Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 7, worin der elektrische Strom auf einen Pegel gesetzt wird, der im wesentlichen identisch oder höher als ein elektrischer Strom ist, der zu einer maximalen Leuchtdichte von einer Leuchtdiode (OLED) in jedem der Bildpunkte führt.
 9. Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 5 bis 8, worin der Datentreiber (120) elektrische Stromquellen aufweist, die mit jeder der elektrischen Stromsenkenleitungen gekoppelt sind, um den elektrischen Strom zu ziehen.
 10. Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 5 bis 9, worin der Datentreiber (120) eine elektrische Stromquelle aufweist, die mit den elektrischen Stromsenkenleitungen gemeinsam gekoppelt ist, um den elektrischen Strom zu ziehen.
 11. Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 5 bis 10, worin jeder der Bildpunkte dafür eingerichtet ist, die primär geladene Spannung und die sekundär geladene Spannung in eine konvertierte Spannung zu konvertieren und ei-

nem Licht emittierenden Element einen elektrischen Strom zuzuführen, welcher der konvertierten Spannung entspricht.

12. Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 5 bis 12, worin die Anzeigevorrichtung dafür eingerichtet ist, die primär geladene Spannung, die eine Schwellenspannung und eine Elektronenbeweglichkeit des Ansteuerungstransistors zumindest im Wesentlichen kompensiert, in den ersten Kondensator (C1) zu laden, wenn das jeweilige erste Abtastsignal an die jeweilige erste Abtastleitung (Si-1) angelegt wird, und die sekundär geladene Spannung, die dem Datensignal entspricht, in den zweiten Kondensator (C2) zu laden. 5
13. Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 12, worin die Anzeigevorrichtung dafür eingerichtet ist, die im ersten Kondensator (C1) und im zweiten Kondensator (C2) geladenen Spannungen in eine Spannung zu konvertieren, wenn der vierte Transistor (M4) eingeschaltet wird, und der Ansteuerungstransistor (MD) der Leuchtdiode (OLED) einen elektrischen Strom zuführt, welcher der konvertierten Spannung entspricht. 10
14. Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 12 oder 13, worin der Abtasttreiber (110) dafür eingerichtet ist, das jeweilige Lichtemissionssteuersignal an eine aktuelle, i-te, der Lichtemissionssteuerleitungen (E1, ..., En), das jeweilige erste Abtastsignal an die entsprechende erste, (i-1)-te, Abtastleitung (Si-1) und das jeweilige zweite Abtastsignal an die entsprechende zweite, i-te, Abtastleitung (Si) anzulegen, wobei i eine ganze Zahl von 1 bis n ist. 15
15. Verfahren zum Ansteuern einer Anzeigevorrichtung mit organischen Leuchtdioden nach einem der Ansprüche 1 bis 4, wobei das Verfahren umfasst: 20
- Laden einer Spannung in den ersten Kondensator (C1), der in den Bildpunkt einbezogen ist, während ein elektrischer Strom gezogen wird, um eine Elektronenbeweglichkeit des Ansteuerungstransistors (MD) zumindest im Wesentlichen zu kompensieren, wobei der elektrische Strom in den Ansteuerungstransistor (MD) des Bildpunkts gezogen wird, wenn ein erstes Abtastsignal an die erste dem Bildpunkt zugeordnete Abtastleitung (Si-1) angelegt wird; 25
- nach dem Laden der Spannung in den ersten Kondensator (C1) erfolgreiches Laden einer Spannung in den zweiten Kondensator (C2), der in den Bildpunkt einbezogen ist, durch Anlegen einer Datenspannung an den Bildpunkt, wenn ein zweites Abtastsignal an die zweite dem Bildpunkt zugeordnete Abtastleitung (Si) 30

angelegt wird;

Einschalten des vierten Transistors (M4) zum Konvertieren der im ersten Kondensator (C1) und im zweiten Kondensator (C2) geladenen Spannungen in eine Spannung; und Zuführen eines der konvertierten Spannung entsprechenden elektrischen Stroms zu der Leuchtdiode (OLED) des Bildpunkts. 35

16. Verfahren zum Ansteuern einer Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 15, worin der elektrische Strom auf einen elektrischen Strom eingestellt wird, der einen Lastkondensator einer dem Bildpunkt zugeordneten elektrischen Stromsenkenleitung (CSj) lädt. 40

17. Verfahren zum Ansteuern einer Anzeigevorrichtung mit organischen Leuchtdioden nach Anspruch 15 oder 16, worin das Konvertieren der Spannungen einschließt: elektrisches Parallelkoppeln des zweiten Kondensators (C2) mit dem ersten Kondensator (C1). 45

25 Revendications

1. Dispositif d'affichage à diode électroluminescente organique, comprenant :

des lignes de données (D1, ..., Dm) ;
des lignes de balayage (S1, ..., Sm) ;
des lignes de commande d'émission de lumière (E1, ..., En) ;
des lignes de collecte de courant électrique (CS1, CSm) ;
des pixels comprenant chacun :

une diode électroluminescente organique (OLED) ;
un transistor de commande (MD) apte à fournir un courant électrique à la diode électroluminescente organique (OLED), dans lequel une première électrode du transistor de commande (MD) est connectée à une source d'alimentation (ELVDD) et une seconde électrode du transistor de commande (MD) est connectée à la diode électroluminescente organique (OLED) ;
un deuxième transistor (M2) connecté électriquement entre une ligne respective parmi des lignes de collecte de courant électrique (CSj) et la seconde électrode du transistor de commande (MD), le second transistor (M2) étant apte à se mettre sous tension lorsqu'un premier signal de balayage est fourni à une première ligne respective des lignes de balayage (Si-1) associée au pixel ;
un troisième transistor (M3) connecté élec-

triquement entre une électrode de grille et la seconde électrode du transistor de commande (MD), le troisième transistor (M3) présentant une électrode de grille connectée à la première ligne respective des lignes de balayage (Si-1) ;

ledit chaque pixel étant **caractérisé en ce qu'il** comprend :

un premier condensateur (C1) et un second condensateur (C2) ayant chacun une première électrode connectée électriquement à une première source d'alimentation (ELVDD), ledit premier condensateur (C1) présentant une seconde électrode connectée électriquement à une électrode de grille du transistor de commande (MD) ;

un quatrième transistor (M4) connecté électriquement entre l'électrode de grille du transistor de commande (MD) et une seconde électrode du second condensateur (C2), le quatrième transistor (M4) présentant une électrode de grille connectée à une ligne respective des lignes de commande d'émission de lumière (Ei) ; un premier transistor (M1) connecté électriquement entre une ligne respective des lignes de données (Dj) et la seconde électrode du second condensateur (C2), le premier transistor (M1) présentant une électrode de grille connectée à une seconde ligne respective des lignes de balayage (Si) associée au pixel, dans lequel le premier transistor (M1) est apte à fournir une tension de signal de données audit second condensateur (C2) lorsqu'un second signal de balayage est fourni à la seconde ligne respective des lignes de balayage (Si) associée au pixel ; le premier signal de balayage étant fourni avant que le second signal de balayage ne soit fourni.

2. Dispositif d'affichage selon la revendication 1, dans lequel le premier condensateur (C1) est apte à être chargé par un courant électrique prédéterminé fourni à la ligne de collecte de courant électrique respective (CSj) lorsque le premier signal de balayage est fourni à la première ligne de balayage (Si-1) associée au pixel, et le second condensateur (C2) est apte à être chargé par la tension de signal de données lorsque le second signal de balayage est fourni à la seconde ligne de balayage (Si) associée au pixel.
3. Dispositif d'affichage selon la revendication 2, dans lequel le quatrième transistor (M4) est apte à être mis sous tension de manière à connecter le premier condensateur (C1) et le second condensateur (C2) en parallèle, de sorte qu'une tension chargée dans le premier condensateur (C1) et une tension chargée dans le second condensateur (C2) sont converties

en une tension unique lorsque le signal de commande d'émission de lumière est fourni à la ligne de commande d'émission de lumière respective (Ei) ; le transistor de commande (MD) étant apte à fournir un courant électrique correspondant à la tension convertie à la diode électroluminescente organique (OLED).

4. Dispositif d'affichage selon l'une quelconque des revendications 1 à 3, comprenant en outre un cinquième transistor (M5) couplé entre le transistor de commande (MD) et la diode électroluminescente organique (OLED), et dans lequel le cinquième transistor (M5) est apte à être mis sous tension lorsque le signal de commande d'émission de lumière est fourni à la ligne de commande d'émission de lumière respective (Ei).
5. Dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 1 à 4, comprenant :

un pilote de balayage (110) apte à fournir un signal de balayage respectif à chacune des lignes de balayage (S1, ..., Sn) et à fournir un signal de commande d'émission de lumière respectif à chacune des lignes de commande d'émission de lumière (E1, ..., En), les signaux de balayage respectifs incluant le premier signal de balayage et le second signal de balayage pour un pixel respectif ; et un pilote de données (120) apte à charger principalement le pixel respectif en collectant un courant électrique prédéterminé à travers la ligne de collecte de courant électrique (CSj) pour le pixel respectif, lorsque le premier signal de balayage est fourni à la première ligne de balayage (Si-1) du pixel respectif, et à charger secondairement le pixel respectif en fournissant une tension de signal de données à la ligne de données (Dj) du pixel respectif, lorsque le second signal de balayage est fourni à la seconde ligne de balayage (Si) du pixel respectif.

6. Dispositif d'affichage à diode électroluminescente organique selon la revendication 5, dans lequel le pilote de balayage (110) est apte à fournir le premier signal de balayage à la première ligne de balayage (Si-1) avant que le second signal de balayage ne soit fourni à la seconde ligne de balayage (Si), de sorte que la première ligne desdites au moins deux lignes de balayage charge principalement certains des pixels au cours d'une période de temps précédente, avant une période de temps subséquente au cours de laquelle la seconde ligne desdites au moins deux lignes de balayage charge secondairement d'autres pixels parmi les pixels.

7. Dispositif d'affichage à diode électroluminescente organique selon la revendication 5 ou 6, dans lequel le courant électrique est un courant électrique qui est apte à charger un condensateur de charge de chacune des lignes de collecte de courant électrique (CS1, ..., CSm).
8. Dispositif d'affichage à diode électroluminescente organique selon la revendication 7, dans lequel le courant électrique est défini à un niveau sensiblement identique à, ou supérieur à un courant électrique résultant en une luminance maximale provenant d'une diode électroluminescente (OLED) dans chacun des pixels.
9. Dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 5 à 8, dans lequel le pilote de données (120) inclut des sources de courant électrique couplées à chacune des lignes de collecte de courant électrique en vue de collecter le courant électrique.
10. Dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 5 à 9, dans lequel le pilote de données (120) inclut une source de courant électrique communément couplée aux lignes de collecte de courant électrique en vue de collecter le courant électrique.
11. Dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 5 à 10, dans lequel chacun des pixels est apte à convertir la tension principalement chargée et la tension secondairement chargée en une tension convertie, et à fournir un courant électrique correspondant à la tension convertie à un élément électroluminescent.
12. Dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 5 à 11, dans lequel le dispositif d'affichage est apte à charger la tension principalement chargée, ce qui compense au moins sensiblement une tension seuil et une mobilité des électrons du transistor de commande, dans le premier condensateur (C1), lorsque le premier signal de balayage respectif est fourni à la première ligne de balayage respectif (Si-1), et à charger la tension secondairement chargée, correspondant au signal de données, dans le second condensateur (C2),
13. Dispositif d'affichage à diode électroluminescente organique selon la revendication 12, dans lequel le dispositif d'affichage est apte à convertir les tensions chargées dans le premier condensateur (C1) et le second condensateur (C2) en une tension unique, lorsque le quatrième transistor (M4) est mis sous tension, et le transistor de commande (MD) fournit un courant électrique, correspondant à la tension convertie, à la diode électroluminescente (OLED).
14. Dispositif d'affichage à diode électroluminescente organique selon la revendication 12 ou 13, dans lequel le pilote de balayage (110) est apte à générer en sortie simultanément le signal de commande d'émission de lumière respectif à une « ième » ligne en cours des lignes de commande d'émission de lumière (E1, ..., En), le premier signal de balayage respectif à la première ième-1 ligne de balayage respective (Si-1) et le second signal de balayage respectif à la seconde ième ligne de balayage respective (Si), où i est un nombre entier compris entre 1 et n.
15. Procédé de commande d'un dispositif d'affichage à diode électroluminescente organique selon l'une quelconque des revendications 1 à 4, le procédé consistant à :
- charger une tension dans le premier condensateur (C1) inclus dans le pixel, tout en collectant un courant électrique, en vue de compenser au moins sensiblement une mobilité des électrons du transistor de commande (MD), le courant électrique étant collecté dans le transistor de commande (MD) du pixel lorsqu'un premier signal de balayage est fourni à la première ligne de balayage (Si-1) associée au pixel ;
postérieurement au chargement de la tension dans le premier condensateur (C1), charger une tension dans le second condensateur (C2) inclus dans le pixel, en fournissant une tension de signal de données au pixel lorsqu'un second signal de balayage est fourni à la seconde ligne de balayage (Si) associée au pixel ;
mettre sous tension le quatrième transistor (M4) en vue de convertir les tensions chargées dans le premier condensateur (C1) et le second condensateur (C2) en une tension unique ; et
fournir un courant électrique correspondant à la tension convertie à la diode électroluminescente (OLED) du pixel.
16. Procédé de commande d'un dispositif d'affichage à diode électroluminescente organique selon la revendication 15, dans lequel le courant électrique est défini sur un courant électrique qui charge un condensateur de charge d'une ligne de collecte de courant électrique (CSj) associée au pixel.
17. Procédé de commande d'un dispositif d'affichage à diode électroluminescente organique selon la revendication 15 ou 16, dans lequel la conversion des tensions consiste à coupler électriquement en parallèle le second condensateur (C2) au premier condensateur (C1).

FIG. 1

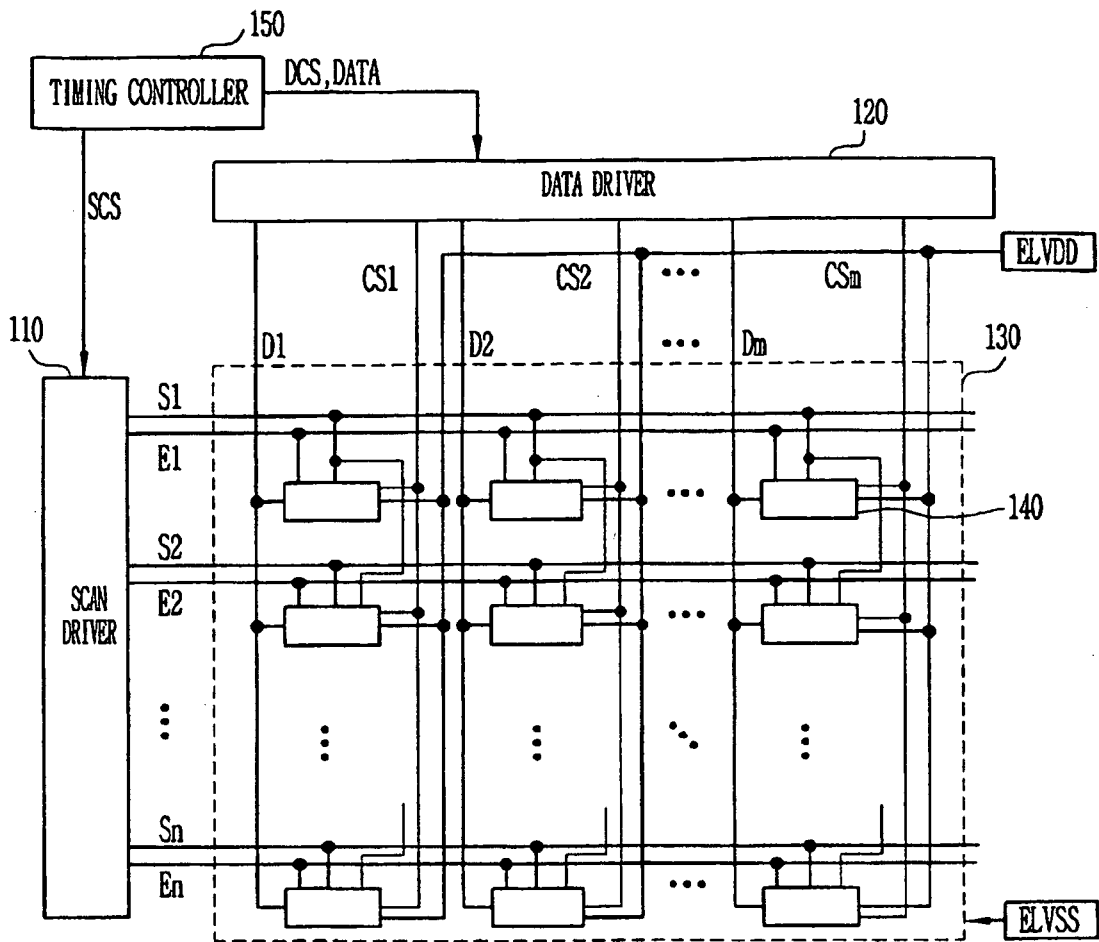


FIG. 2

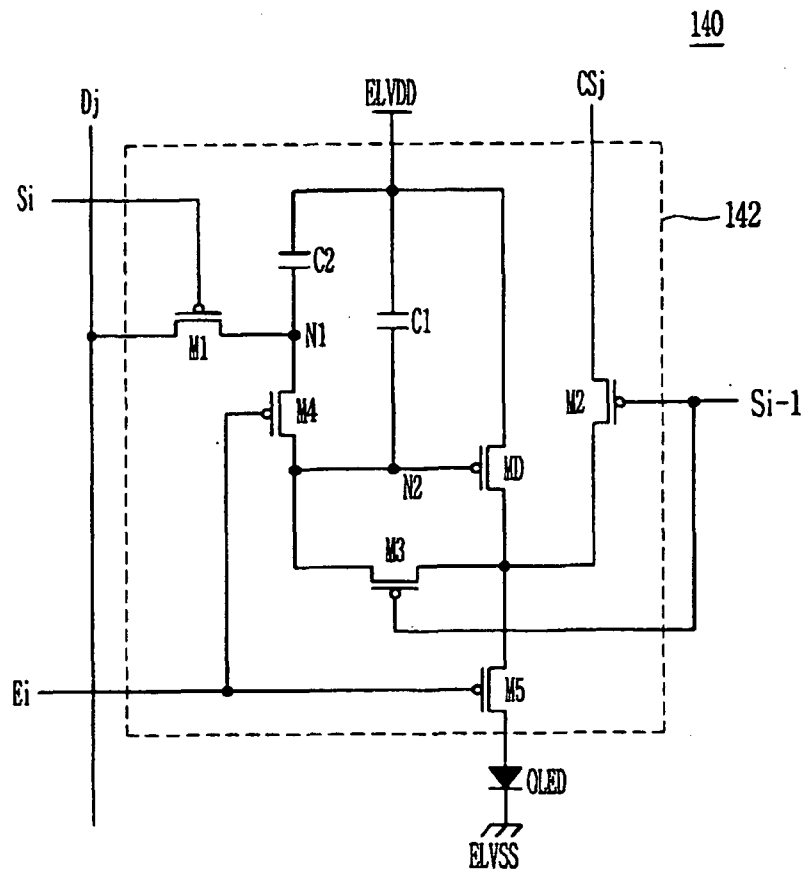


FIG. 3

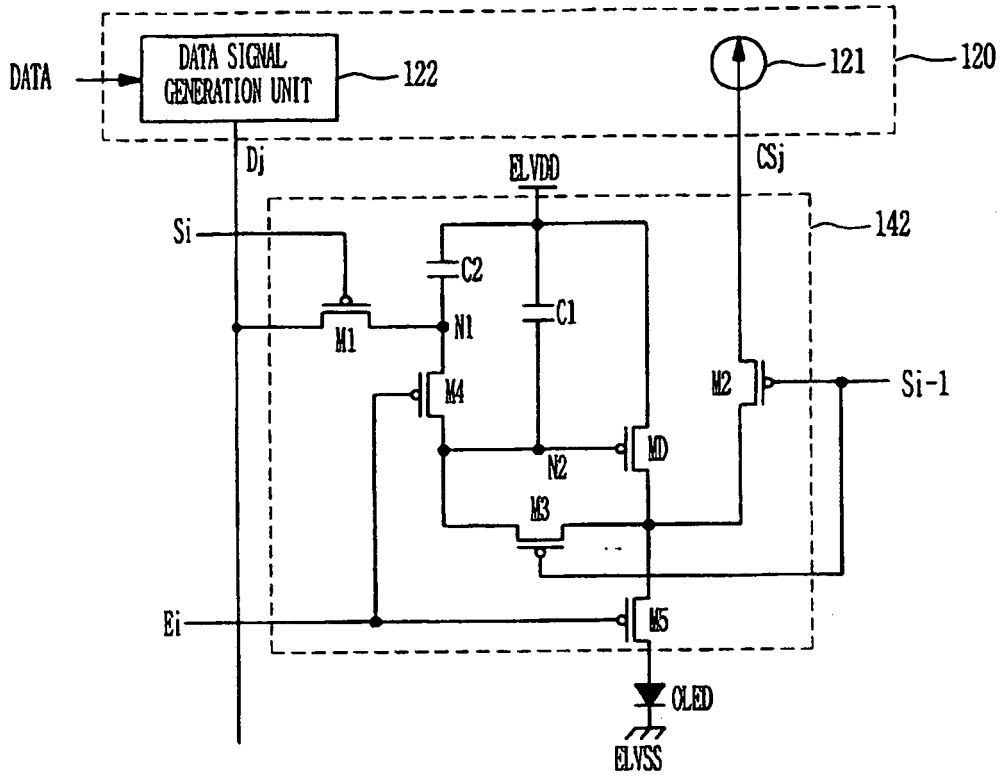
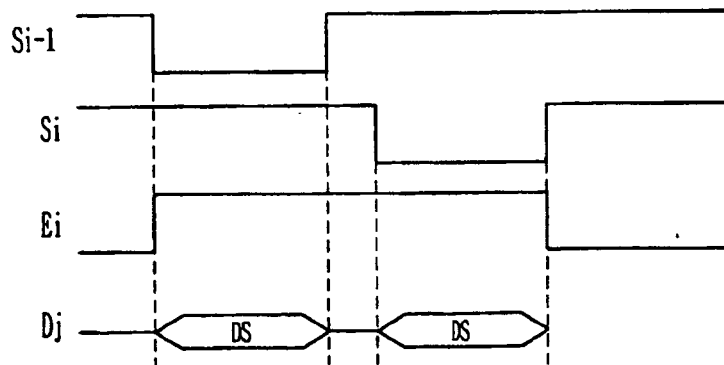


FIG. 4



REFERENCES CITED IN THE DESCRIPTION

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摘要(译)

一种电致发光显示装置，包括像素（140），每个像素适于通过相应的第一和第二线接收相应的第一和第二扫描信号。扫描驱动器（110），适于向各扫描线提供相应的扫描信号，并向各发光控制线提供相应的发光控制信号；数据驱动器（120），适于在第一扫描信号提供给第一扫描线时通过相应的电流吸收线吸收预定电流来对像素充电，并通过提供电压对相应像素进行二次充电当第二扫描信号被提供给与像素相关联的第二扫描线时，数据信号到相应的一条数据线。

