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(54) **Organic light emitting display device and power supply arrangement for the same**

Organische lichtemittierende Anzeigevorrichtung und für sie vorgesehene Stromversorgungsanordnung

Dispositif d'affichage électroluminescent organique et agencement d'alimentation électrique pour ce dispositif

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(73) Proprietor: **Samsung Mobile Display Co., Ltd.**
Yongin-city, Gyunggi-do 446-711 (KR)

(72) Inventor: **PARK, Sung-Cheon**
Chungcheongnam-do (KR)

(74) Representative: **Gulde Hengelhaupt Ziebig & Schneider**
Patentanwälte - Rechtsanwälte
Wallstrasse 58/59
10179 Berlin (DE)

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Description

BACKGROUND OF THE INVENTION

5 **1. Field of the Invention**

[0001] The present invention relates to an organic light emitting display device.

10 **2. Description of Related Art**

[0002] Recently, various flat panel display devices having less weight and volume than cathode ray tubes have been developed. As examples of flat panel display devices, there are liquid crystal display devices, field emission display devices, plasma display panels, organic light emitting display devices, etc.

15 [0003] Among flat panel display devices, organic light emitting display devices have various advantages such as excellent color reproducibility and a very thin profile. Accordingly, organic light emitting display devices have largely expanded their market into a variety of applications such as personal digital assistants (PDAs), MP3 players, and portable phones, to name but a few.

[0004] Organic light emitting display devices display images using organic light emitting diodes (OLEDs) that generate light by recombination of electrons and holes generated corresponding to a flow of current.

20 [0005] The organic light emitting diodes are positioned between a first power supply and a second power supply that has a lower voltage than the first power supply, and they control the current flowing between the first power supply and the second power supply by utilizing a data signal, thus emitting light corresponding to the amount of current flowing through the organic light emitting diode.

25 [0006] In an organic light emitting display device as described above, where the first power supply and the second power supply have poor voltage characteristics, the data signal fluctuates, causing the current flowing through the organic light emitting diode to fluctuate, thereby deteriorating picture quality.

[0007] US 2006/103322 A1 refers to an exemplary apparatus and method for driving an organic light-emitting diode of the state of art.

30 **SUMMARY OF THE INVENTION**

[0008] Accordingly, the invention provides the organic display device of claim 1. Preferred embodiments are subject of the dependent claims.

35 **BRIEF DESCRIPTION OF THE DRAWINGS**

[0009] The accompanying drawings, together with the specification, illustrate exemplary embodiments of the present invention, and, together with the description, serve to explain the principles of the present invention.

40 [0010] FIG. 1 is a block diagram of a first example not falling under the scope of the claims of an organic light emitting display device.

[0011] FIG. 2 is a block diagram of a power generator as shown in FIG. 1.

[0012] FIG. 3 is a schematic circuit diagram illustrating a pixel in a display unit as shown in FIG. 1.

[0013] FIG. 4 is a timing diagram illustrating the operation of the pixel shown in FIG. 3.

45 [0014] FIG. 5 is a block diagram of a second example not falling under the scope of the claims of an organic light emitting display device.

[0015] FIG. 6 is a block diagram of the embodiment of an organic light emitting display device according to the present invention.

50 **DETAILED DESCRIPTION OF EMBODIMENTS**

[0016] Hereinafter, certain exemplary embodiments according to the present invention will be described with reference to the accompanying drawings. Here, when a first element is described as being coupled to a second element, the first element may be directly coupled to the second element or may be indirectly coupled to the second element via a third element. Further, some of the elements that are not essential to the complete understanding of the invention are omitted for clarity. Also, like reference numerals refer to like elements throughout.

55 [0017] Hereinafter, embodiments of the present invention will be described with reference to the accompanying drawings.

[0018] FIG. 1 is a block diagram of an organic light emitting display device according to a first example not falling

under the scope of the claims. Referring to FIG. 1, the organic light emitting display device includes a display unit 100a and a driver integrated circuit (driver IC) 200a.

[0019] A plurality of pixels (not shown) are arranged in the display unit 100a, each of which includes an organic light emitting diode (not shown) that emits light corresponding to a flow of current. In the display unit 100a are arranged a plurality of scan lines (not shown) for sending scan signals (scan) in a row direction, a plurality light emitting control lines (not shown) for sending light emitting control signals (emission) in the row direction, and a plurality of data lines (not shown) for sending data signals (data) in a column direction.

[0020] Also, the display unit 100a is driven by receiving a first power ELVDD, a second power ELVSS, a third power MOSVSS, and an initialization voltage VINIT. Therefore, current flows through the organic light emitting diode in response to the scan signal (scan), the data signal (data), the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT so that the display unit 100a emits light, thereby displaying an image.

[0021] The driver IC 200a sends the scan signal (scan), the data signal (data), the light emitting control signal (emission), the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT to the display unit 100a. The driver IC 200a includes a signal generator 210a for generating the scan signal (scan), the light emitting control signal (emission), and the data signal (data), and a power generator 220a for generating the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT. The data signal (data) is sent to a selected pixel selected by the scan signal (scan), and a current in accordance with the data signal (data) is generated in the pixel by the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT, the current flowing through the organic light emitting diode depending on the state of the light emitting control signal (emission).

[0022] FIG. 2 is a block diagram of an example not falling under the block scope of the claims of the power generator 220a shown in FIG. 1. Referring to FIG. 2, the power generator 220a includes a resistor row 221 (e.g., a voltage divider) including a plurality of resistors coupled between a high-state voltage VGH and a low-state voltage VGL, a selecting unit 222 for selecting a voltage (e.g., a predetermined voltage) from the resistor row 221 to generate a reference voltage Vref, a charge pump 223 for receiving the reference voltage Vref and increasing it or multiplying it by an integer, and a regulator 224 for receiving the voltage generated by the charge pump 223 and outputting a first power ELVDD from regulator 224a, a second power ELVSS from regulator 224b, a third power MOSVSS from regulator 224c, and an initialization voltage VINIT from regulator 224d.

[0023] The power generator 220a increases the reference voltage Vref selected by the selecting unit 222 (e.g., by multiplying Vref by an integer) utilizing the charge pump 223 to generate a plurality of voltages. The charge pump 223 may be a conventional circuit known to those skilled in the art, and the invention herein is not limited to any particular embodiment of a charge pump. The power generator 220a increases an absolute value of, and inverts, the reference voltage Vref to enable the voltage of the third power MOSVSS to be stably output by the regulator 224c.

[0024] FIG. 3 is a schematic circuit diagram illustrating an example of one of the pixels provided in the display unit shown in FIG. 1. Referring to FIG. 3, the pixel includes a first transistor M1, a second transistor M2, a third transistor M3, a fourth transistor M4, a fifth transistor M5, a sixth transistor M6, a first capacitor Cst, a second capacitor Cboost, and the organic light emitting diode OLED.

[0025] A source of the first transistor M1 is coupled to a first node N1, a drain thereof is coupled to a second node N2, and a gate thereof is coupled to a third node N3.

[0026] A source of the second transistor M2 is coupled to a data line Dm, a drain thereof is coupled to the first node N1, and a gate thereof is coupled to a first scan line Sn.

[0027] A source of the third transistor M3 is coupled to the second node N2, a drain thereof is coupled to the third node N3, and a gate thereof is coupled to the first scan line Sn.

[0028] A source of the fourth transistor M4 receives the initialization voltage VINIT, a drain thereof is coupled to the third node N3, and a gate thereof is coupled to a second scan line Sn-1.

[0029] A source of the fifth transistor M5 is coupled to a first power supply ELVDD, a drain thereof is coupled to the first node N1, and a gate thereof is coupled to a light emitting control line En.

[0030] A source of the sixth transistor M6 is coupled to the second node N2, a drain thereof is coupled to an anode electrode of the organic light emitting diode, and a gate thereof is coupled to the light emitting control line En.

[0031] A first electrode of the first capacitor Cst is coupled to the third node N3, and a second electrode thereof is coupled to a third power supply MOSVSS.

[0032] A first electrode of the second capacitor Cboost is coupled to the first scan line Sn, and a second electrode thereof is coupled to the third node N3.

[0033] The anode electrode of the organic light emitting diode OLED is coupled to the drain of the sixth transistor M6, and a cathode electrode thereof is coupled to a second power supply ELVSS.

[0034] FIG. 4 is a timing diagram illustrating operation of the pixel shown in FIG. 3. Referring to FIG. 4, a first scan signal sn is sent through the first scan line Sn, a second scan signal sn-1 is sent through the second scan line Sn-1, a data signal data is sent through the data line Dm, and a light emitting control signal en is sent through the light emitting

control line En, to the pixel. Also, the initialization voltage VINIT is sent through an initialization line, and the first power ELVDD and the second power ELVSS, which enable the current to flow through the organic light emitting diode OLED, and the third power MOSVSS, which is utilized to stabilize a voltage of the first capacitor Cst, are sent to the pixel.

[0035] Herein, the second scan signal sn-1, which is a scan signal enabling the data signal (data) to be sent to a pixel in a previous line of pixels, enters a low voltage state before the first scan signal sn enters a low voltage state.

[0036] During operation, in a first period T1 during which the second scan signal sn-1 is in a low voltage state and the first scan signal sn and the light emitting control signal en are in a high voltage state, the fourth transistor M4 is in an on state so that the voltage of the third node N3 becomes substantially the same as the initialization voltage VINIT. At this time, because the fifth transistor M5 and the sixth transistor M6 are in an off state, current substantially does not flow through the organic light emitting diode OLED.

[0037] In a second period T2 during which the first scan signal sn is in a low voltage state and the second scan signal sn-1 and the light emitting control signal en are in a high voltage state, the second transistor M2 and the third transistor M3 are in an on state. When the third transistor M3 is in the on state, the voltage at the drain and the gate of the first transistor M1 becomes substantially equal and the first transistor is diode-connected. Therefore, a voltage corresponding to Equation 1 below is stored in the third node N3.

Equation 1

$$V_{N3} = V_{data} - V_{th1}$$

[0038] Herein, V_{N3} indicates the voltage of the third node N3, V_{data} indicates the voltage of the data signal (data), and V_{th1} indicates the threshold voltage of the first transistor M1.

[0039] In a third period T3 during which the first scan signal sn and the second scan signal sn-1 are in a high voltage state and the light emitting control signal en is in a low voltage state, because the voltage of the first scan signal sn rises from a low state to a high state, the voltage of the third node N3 coupled to the second capacitor Cboost also increases. Therefore, the voltage of the third node N3 substantially corresponds to Equation 2 below.

Equation 2

$$V_{N3} = V_{data} - V_{th1} + \Delta V$$

[0040] Herein, V_{N3} indicates the voltage of the third node N3, V_{data} indicates the voltage of the data signal (data), V_{th1} indicates the threshold voltage of the first transistor M1, and ΔV indicates the rise in the voltage of the first scan signal sn.

[0041] Because the light emitting control signal en is in a low voltage state, current flows through the organic light emitting diode OLED, wherein the amount of the current flowing through the organic light emitting diode OLED substantially corresponds to Equation 3 below.

Equation 3

$$I_{OLED} = (V_{gs} - V_{th1})^2 = (ELVDD - V_{data} - V_{th1} + \Delta V - V_{th1})^2 = (ELVDD - V_{data} - \Delta V)^2$$

[0042] Herein, V_{gs} indicates the voltage between the gate and the source of the first transistor M1, ELVDD indicates the voltage of the first power ELVDD, V_{data} indicates the voltage of the data signal (data), V_{th1} indicates the threshold voltage of the first transistor M1, and ΔV indicates the rise in the voltage of the first scan signal sn.

[0043] Therefore, the amount of current flowing through the organic light emitting diode OLED is substantially independent of the threshold voltage of the first transistor M1, thereby reducing or preventing an occurrence of brightness variation due to a variation of the threshold voltage of the first transistor M1. Also, in the case where the data signal (data) representing a "black" gray level is sent, which substantially does not generate a current through the organic light emitting diode OLED, the voltage of the third node N3 sent to the gate of the first transistor M1 is raised by the voltage of the first scan signal sn so that it is possible to more certainly prevent the current from flowing to the organic light emitting diode OLED. Thereby, the "black" gray level may be more precisely displayed.

[0044] In the pixel as described above, the third power MOSVSS is sent to the first electrode of the first capacitor Cst, and the second power ELVSS is sent to the cathode electrode of the organic light emitting diode OLED. The second power ELVSS may also be sent to the first electrode of the first capacitor Cst; however, if the voltage of the second

power ELVSS fluctuates, the voltage of the third node N3 may fluctuate by a coupling phenomenon through the first capacitor Cst, although the same data signal (data) is sent. When the voltage of the third node N3 fluctuates, the amount of the current flowing from the first power supply ELVDD to the second power supply ELVSS varies so that picture quality substantially deteriorates.

5 [0045] Also, in order to reduce power consumption, the voltage of the second power ELVSS may be varied according to the surrounding environment. In this case, when the voltage of the second power ELVSS fluctuates, it is undesirable to send the second power ELVSS to the first capacitor Cst. To address this issue, in various embodiments of the present invention, the third power MOSVSS, instead of the second power ELVSS, is generated to be sent to the first capacitor Cst.

10 [0046] FIG. 5 is a block diagram illustrating an organic light emitting display device according to a second example not falling under the scope of the claims. Referring to FIG. 5, the organic light emitting display device includes a display unit 100b, a driver IC 200b, and a power supply unit 300b.

15 [0047] A plurality of pixels (not shown) are arranged in the display unit 100b, each of which includes an organic light emitting diode (not shown) that emits light corresponding to a flow of current. In the display unit 100b are arranged a plurality of scan lines (not shown) for sending scan signals (scan) in a row direction, a plurality light emitting control lines (not shown) for sending light emitting control signals (emission) in the row direction, and a plurality of data lines (not shown) for sending data signals (data) in a column direction.

20 [0048] Also, the display unit 100b is driven by receiving a first power ELVDD, a second power ELVSS, a third power MOSVSS, and an initialization voltage VINIT. Therefore, current flows through the organic light emitting diode in response to the scan signal, the data signal, the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT so that the display unit 100b emits light, thereby displaying an image.

25 [0049] The driver IC 200b sends the scan signal (scan), the light emitting control signal (emission), and the data signal (data). The data signal (data) is sent to a selected pixel selected by the scan signal (scan) sent from the driver IC 200b, and a current in accordance with the data signal (data) is generated in the pixel by the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT, and flows through the organic light emitting diode depending on the state of the light emitting control signal (emission).

30 [0050] The power supply unit 300b generates the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT to send to the display unit 100b. The power supply unit 300b boosts an input voltage Vin to generate the first power ELVDD and inverts the input voltage Vin to generate the second power ELVSS. The third power MOSVSS is generated by inverting and boosting an input voltage Vin using a charge pump, a regulator, and/or any other suitable circuit or device known to those skilled in the art. To this end, the power supply unit 300b includes a booster amplifying the input voltage to generate the first power ELVDD, an inverter inverting the input voltage to generate the second power ELVSS, and the charge pump inverting and then amplifying the input voltage to generate the third power MOSVSS.

35 [0051] FIG. 6 is a block diagram illustrating an organic light emitting display device according to the exemplary embodiment of the present invention. Referring to FIG. 6, the organic light emitting display device includes a display unit 100c, a driver IC 200c, and a power supply unit 300c.

40 [0052] A plurality of pixels (not shown) are arranged in the display unit 100c, each of which includes an organic light emitting diode (not shown) that emits light corresponding to a flow of current. In the display unit 100c are arranged a plurality of scan lines (not shown) for sending scan signals (scan) in a row direction, a plurality light emitting control lines (not shown) for sending light emitting control signals (emission) in the row direction, and a plurality of data lines (not shown) for sending data signals (data) in a column direction.

45 [0053] Also, the display unit 100c is driven by receiving a first power ELVDD, a second power ELVSS, a third power MOSVSS, and an initialization voltage VINIT. Therefore, in the display unit 100c, the data signal (data) is sent to a pixel by the scan signal (scan), and a current in accordance with the data signal (data) is generated in the pixel by the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT, and flows through the organic light emitting diode depending on the state of the light emitting control signal (emission).

50 [0054] The driver IC 200c includes a signal generator 210c and a power generator 220c. The signal generator 210c generates the scan signal (scan), the light emitting control signal (emission), and the data signal (data). The power generator 220c generates the third power MOSVSS. The data signal (data) is sent to a selected pixel selected by the scan signal (scan) generated in the signal generator 210c, and a current in accordance with the data signal (data) flows in the pixel in response to the scan signal (scan), the data signal (data), the first power ELVDD, the second power ELVSS, the third power MOSVSS, and the initialization voltage VINIT. The power generator 220c receives the first power ELVDD generated in the power supply unit 300c and converts it into a negative voltage to generate the third power MOSVSS. Thereafter, the power generator 220c sends the third power MOSVSS to the display unit 100c.

55 [0055] The power supply unit 300c generates the first power ELVDD, the second power ELVSS, and the initialization voltage VINIT to send to the display unit 100c. The power supply unit 300c boosts input voltage Vin sent from the outside to generate the first power ELVDD, and inverts the input voltage Vin to generate the second power ELVSS.

Claims**1.** An organic light emitting display device comprising:

5 a display unit (100c) adapted to receive a scan signal, a light emitting control signal, and a data signal, and to enable a current to flow from a first power supply (ELVDD) to a second power supply (ELVSS), the current corresponding to the data signal, the display unit (100c) comprising a pixel comprising a driving transistor (M1) and a first capacitor (Cst) having a first terminal coupled to a control terminal of the driving transistor (M1) and a second terminal connected to a third power supply (MOSVSS), the first capacitor (Cst) being adapted to receive and store the data signal;

10 a power supply unit (300c) adapted to generate a first power of the first power supply (ELVDD) and a second power of the second power supply (ELVSS); and

15 a driver IC (200c) including a signal generator (210c) adapted to generate the data signal, the scan signal, the light emitting control signal, and a power generator (220c) adapted to generate a third power of the third power supply (MOSVSS),

wherein the second power and the third power are at a lower voltage than that of the first power,

wherein the power generator (220c) is configured to receive the first power from the power supply unit (300c) and invert it to generate the third power.

20 **2.** The organic light emitting display device as claimed in claim 1, wherein the driving transistor (M1) has a source coupled to a first node (N1) of the pixel, a drain coupled to a second node (N2) of the pixel, and a gate coupled to a third node (N3) of the pixel and wherein the pixel further comprises:

25 an organic light emitting diode (OLED);

a second transistor (M2) having a source coupled to a data line (Dm), a drain coupled to the first node (N1), and a gate coupled to a first scan line (Sn);

a third transistor (M3) having a source coupled to the second node (N2), a drain coupled to the third node (N3), and a gate coupled to the first scan line (Sn);

30 a fourth transistor (M4) having a source connected to an input for an initialization voltage (VINIT), a drain coupled to the third node (N3), and a gate coupled to a second scan line (Sn-1);

a fifth transistor (M5) having a source coupled to the first power supply (ELVDD), a drain coupled to the first node (N1), and a gate coupled to a light emitting control line (En);

a sixth transistor (M6) having a source coupled to the second node (N2), a drain coupled to the organic light emitting diode (OLED), and a gate coupled to the light emitting control line (En); and

35 a second capacitor (Cboost) having a first terminal coupled to the first scan line (Sn), and a second terminal coupled to the third node (N3).

40 **3.** The organic light emitting display device as claimed in one of the preceding claims, wherein the power supply unit (300c) is adapted to vary voltage of the second power (ELVSS).

Patentansprüche**1.** Organische lichtemittierende Anzeigevorrichtung, aufweisend:

45 eine Anzeigeeinheit (100c), die zum Erhalt eines Ansteuersignals, eines lichtemittierenden Steuersignals und eines Datensignals ausgebildet ist und dazu ausgebildet ist, dass ein Strom von einer ersten Energieversorgung (ELVDD) zu einer zweiten Energieversorgung (ELVSS) fließen kann, wobei der Strom dem Datensignal entspricht, wobei die Anzeigeeinheit (100c) einen Pixel aufweist, der einen Ansteuertransistor (M1) und einen ersten Kondensator (Cst) aufweist, der einen ersten Anschluss, der an einen Steueranschluss des Ansteuertransistors (M1) gekoppelt ist, und einen zweiten Anschluss, der mit einer dritten Energieversorgung (MOSVSS) verbunden ist, aufweist, wobei der erste Kondensator (Cst) zum Erhalt und zum Speichern des Datensignals ausgebildet ist;

50 eine Energieversorgungseinheit (300c), die zur Erzeugung einer ersten Energie der ersten Energieversorgung (ELVDD) und einer zweiten Energie der zweiten Energieversorgung (ELVSS) ausgebildet ist; und

55 einen Treiber IC (200c), der einen Signalgenerator (210c), der zur Erzeugung des Datensignals, des Ansteuersignals und des lichtemittierenden Steuersignals ausgebildet ist, und einen Energiegenerator (220c), der zur Erzeugung einer dritten Energie der dritten Energieversorgung (MOSVSS) ausgebildet ist, aufweist,

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wobei die zweite Energie und die dritte Energie eine niedrigere Spannung aufweisen als die erste Energie, wobei der Energiegenerator (220c) konfiguriert ist, die erste Energie von der Energieversorgungseinheit (300c) zu erhalten und sie derart zu invertieren, dass die dritte Energie erzeugt wird.

5 2. Organische lichtemittierende Anzeigevorrichtung nach Anspruch 1, wobei der Ansteuertransistor (M1) eine Source, die an einen ersten Knoten (N1) des Pixels gekoppelt ist, ein Drain, das an einen zweiten Knoten (N2) des Pixels gekoppelt ist, und ein Gate, das an einen dritten Knoten (N3) des Pixels gekoppelt ist, aufweist, und wobei der Pixel weiterhin aufweist:

10 eine organische lichtemittierende Diode (OLED);
einen zweiten Transistor (M2), der eine Source, die an eine Datenleitung (Dm) gekoppelt ist, ein Drain, das an den ersten Knoten (N1) gekoppelt ist, und ein Gate, das an eine erste Ansteuerleitung (Sn) gekoppelt ist, aufweist;
einen dritten Transistor (M3), der eine Source, die an den zweiten Knoten (N2) gekoppelt ist, ein Drain, das an den dritten Knoten (N3) gekoppelt ist, und ein Gate, das an die erste Ansteuerleitung (Sn) gekoppelt ist, aufweist;
15 einen vierten Transistor (M4), der eine Source, die mit einem Eingang für eine Initialisierungsspannung (VINIT) verbunden ist, ein Drain, das an den dritten Knoten (N3) gekoppelt ist, und ein Gate, das an eine zweite Ansteuerleitung (Sn-1) gekoppelt ist, aufweist;
einen fünften Transistor (M5), der eine Source, die an die erste Energieversorgung (ELVDD) gekoppelt ist, ein Drain, das an den ersten Knoten (N1) gekoppelt ist, und ein Gate, das an eine lichtemittierende Steuerleitung (En) gekoppelt ist, aufweist;
20 einen sechsten Transistor (M6), der eine Source, die an den zweiten Knoten (N2) gekoppelt ist, ein Drain, das an die organische lichtemittierende Diode (OLED) gekoppelt ist, und ein Gate, das an die lichtemittierende Steuerleitung (En) gekoppelt ist, aufweist; und
einen zweiten Kondensator (Cboost), der einen ersten Anschluss, der an die erste Ansteuerleitung (Sn) gekoppelt ist, und einen zweiten Anschluss, der an den dritten Knoten (N3) gekoppelt ist, aufweist.

25 3. Organische lichtemittierende Anzeigevorrichtung nach einem der vorhergehenden Ansprüche, wobei die Energieversorgungseinheit (300c) zum Variieren der Spannung der zweiten Energie (ELVSS) ausgebildet ist.

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Revendications

1. Dispositif d'affichage électroluminescent organique comprenant :

35 une unité d'affichage (100c) adaptée pour recevoir un signal de balayage, un signal de commande électroluminescent, et un signal de données, et pour permettre à un courant de circuler depuis une première alimentation électrique (ELVDD) jusqu'à une deuxième alimentation électrique (ELVSS), le courant correspondant au signal de données, l'unité d'affichage (100c) comprenant un pixel comprenant un transistor d'attaque (M1) et un premier condensateur (Cst) ayant une première borne couplée à une borne de commande du transistor d'attaque (M1) et une deuxième borne reliée à une troisième alimentation électrique (MOSVSS), le premier condensateur (Cst) étant adapté pour recevoir et stocker le signal de données ;
40 un bloc d'alimentation électrique (300c) adapté pour générer une première alimentation de la première alimentation électrique (ELVDD) et une deuxième alimentation de la deuxième alimentation électrique (ELVSS) ; et
un circuit IC pilote (200c) comprenant un générateur de signaux (210c) adapté pour générer le signal de données, le signal de balayage, le signal de commande électroluminescent, et un générateur électrique (220c) adapté
45 pour générer une troisième alimentation de la troisième alimentation électrique (MOSVSS), dans lequel la deuxième alimentation et la troisième alimentation présentent une tension inférieure à celle de la première alimentation,
dans lequel le générateur électrique (220c) est configuré pour recevoir la première alimentation à partir du bloc
50 d'alimentation électrique (300c) et pour l'inverser en vue de générer la troisième alimentation.

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2. Dispositif d'affichage électroluminescent organique selon la revendication 1, dans lequel le transistor d'attaque (M1) a une source couplée à un premier noeud (N1) du pixel, un drain couplé à un deuxième noeud (N2) du pixel, et une grille couplée à un troisième noeud (N3) du pixel et dans lequel le pixel comprend en outre :

une diode électroluminescente organique (OLED) ;
un deuxième transistor (M2) ayant une source couplée à une ligne de données (Dm), un drain couplé au premier noeud (N1), et une grille couplée à une première ligne de balayage (Sn) ;

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un troisième transistor (M3) ayant une source couplée au second noeud (N2), un drain couplé au troisième noeud (N3), et une grille couplée à la première ligne de balayage (Sn) ;

un quatrième transistor (M4) ayant une source connectée à une entrée pour une tension d'initialisation (VINIT), un drain couplé au troisième noeud (N3), et une grille couplée à une deuxième ligne de balayage (Sn-1) ;

5 un cinquième transistor (M5) ayant une source couplée à la première alimentation électrique (ELVDD), un drain couplé au premier noeud (N1), et une grille couplée à une ligne de commande électroluminescente (En) ;

un sixième transistor (M6) ayant une source couplée au deuxième noeud (N2), un drain couplé à la diode électroluminescente organique (OLED), et une grille couplée à la ligne de commande électroluminescente (En) ;

et

10 un deuxième condensateur (Cboost) ayant une première borne couplée à la première ligne de balayage (Sn), et une deuxième borne couplée au troisième noeud (N3).

3. Dispositif d'affichage électroluminescent organique selon l'une des revendications précédentes, dans lequel le bloc d'alimentation électrique (300c) est adapté pour faire varier la tension de la deuxième alimentation (ELVSS).

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FIG. 1

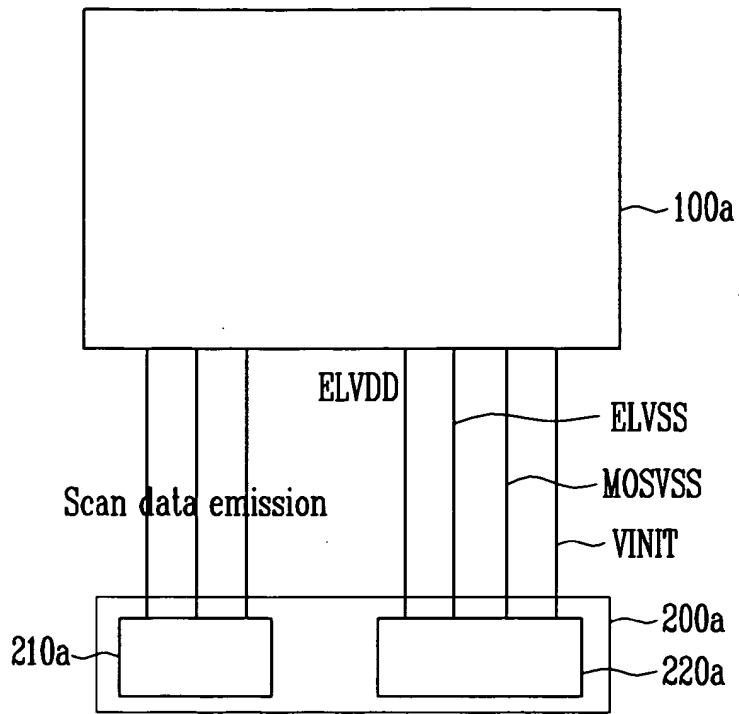


FIG. 2

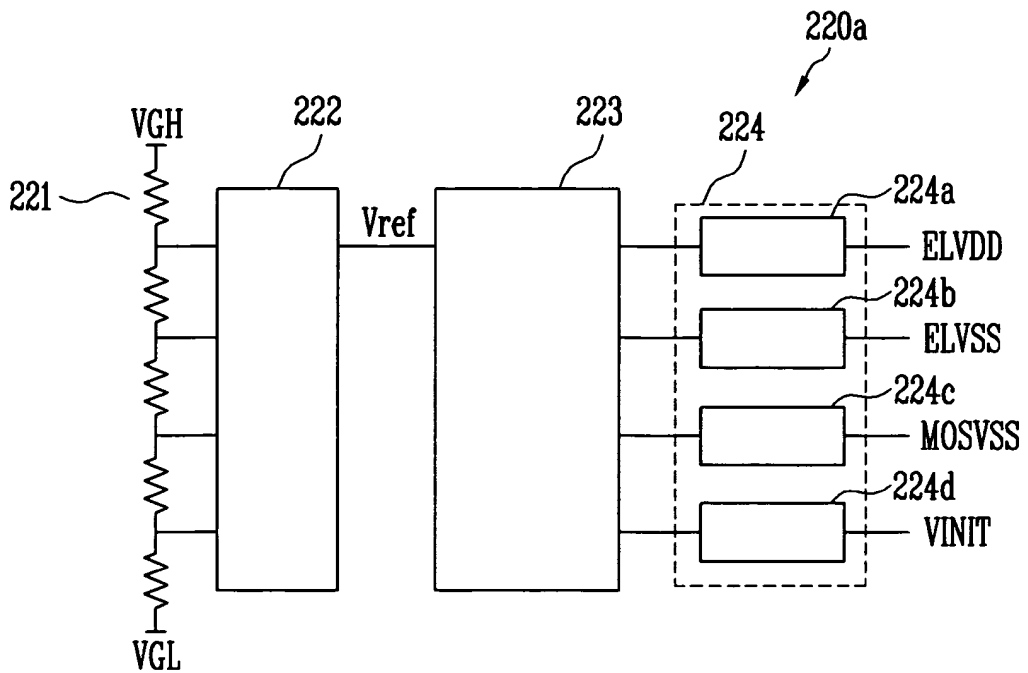


FIG. 3

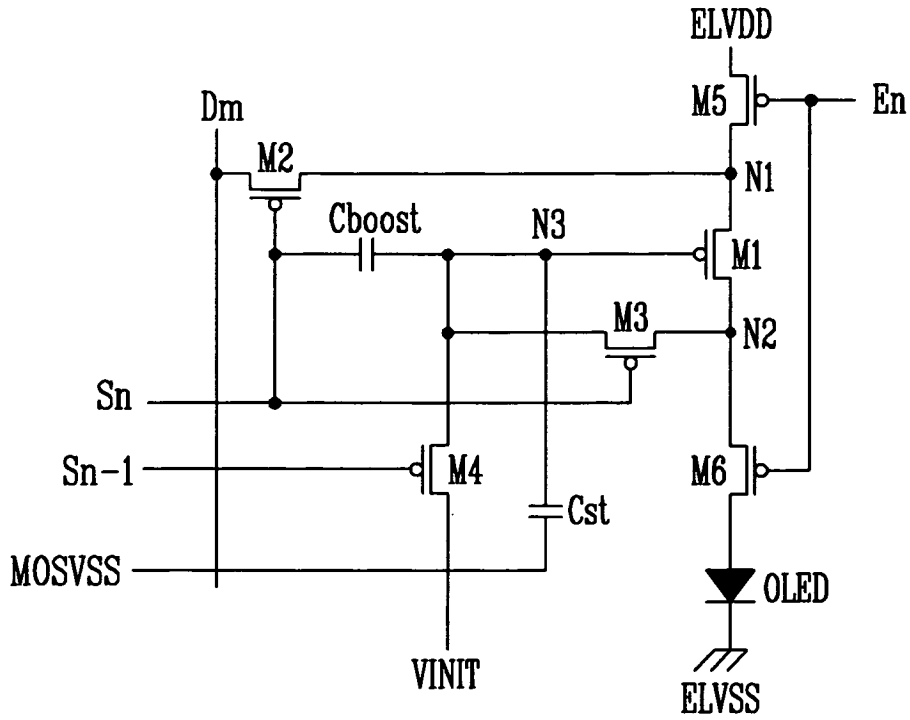


FIG. 4

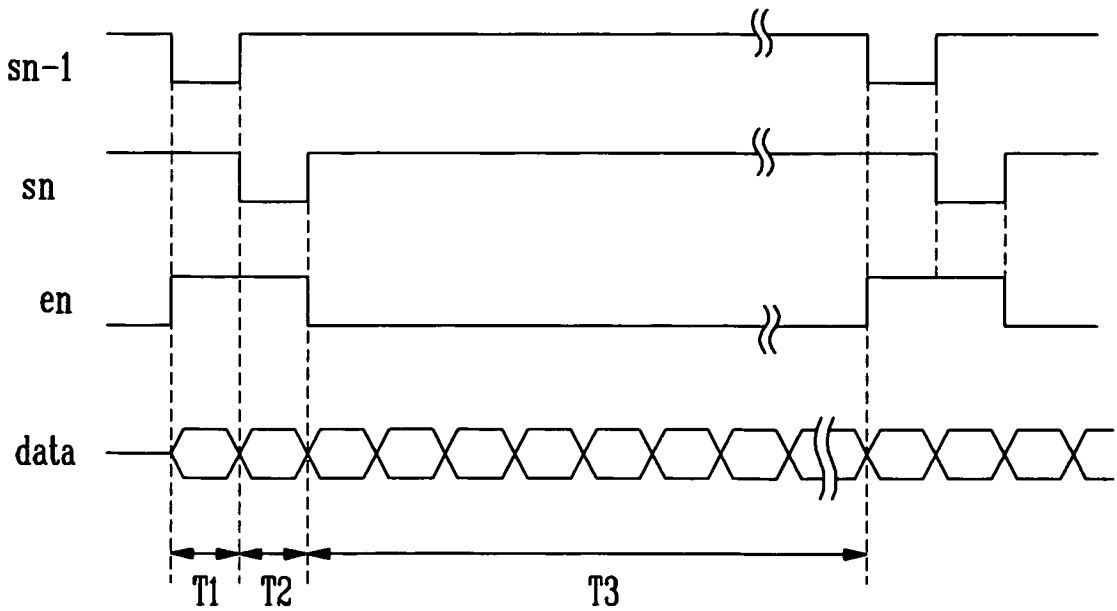


FIG. 5

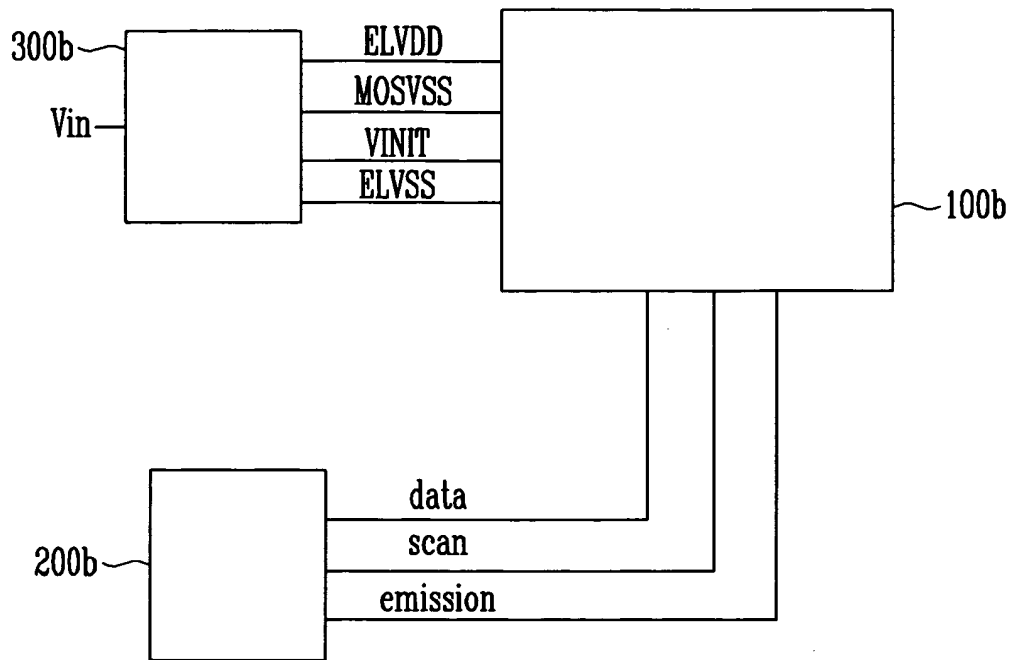
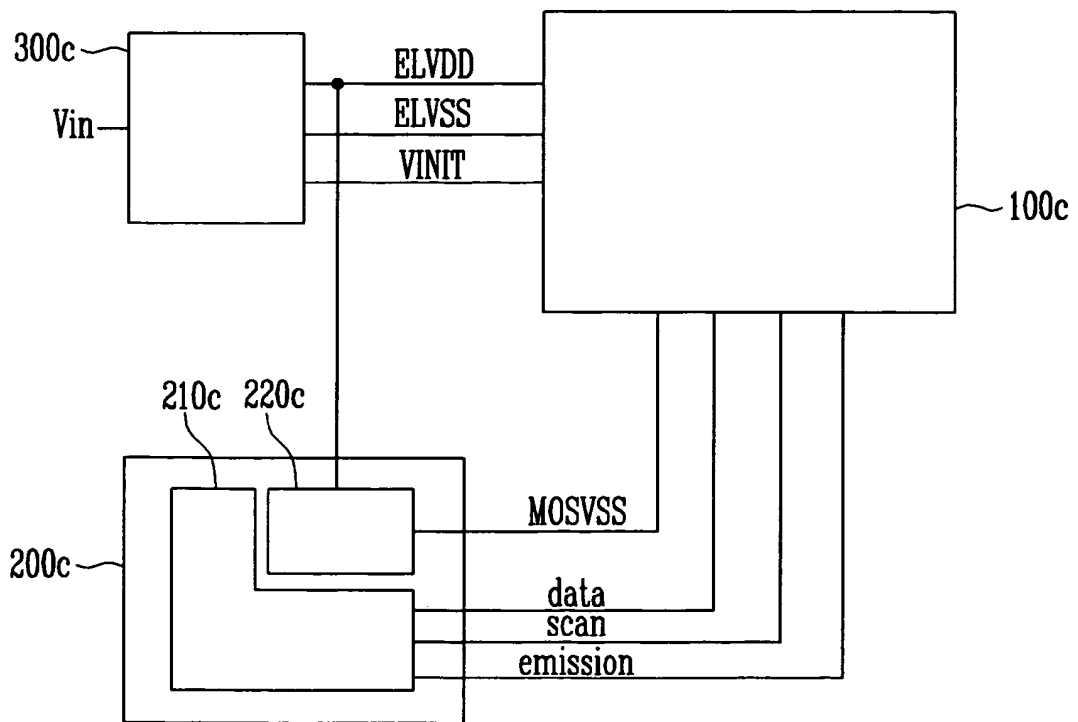


FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2006103322 A1 [0007]

专利名称(译)	有机发光显示装置和用于其的电源装置		
公开(公告)号	EP2151816B1	公开(公告)日	2012-04-25
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[标]申请(专利权)人(译)	三星显示有限公司		
申请(专利权)人(译)	三星移动显示器有限公司.		
当前申请(专利权)人(译)	三星移动显示器有限公司.		
[标]发明人	PARK SUNG CHEON		
发明人	PARK, SUNG-CHEON		
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外部链接	Espacenet		

摘要(译)

一种有机发光显示装置，包括用于将多个电压发送到显示单元的发电机。显示单元接收扫描信号，发光控制信号和数据信号，其使得对应于数据信号的电流能够从第一电源流到第二电源。显示单元包括像素电路，该像素电路包括存储电容器，该存储电容器适于存储数据信号并利用第三电源稳定存储的数据信号。驱动器IC包括用于产生数据信号，扫描信号和发光控制信号的信号发生器，并且还包括用于产生第一功率，第二功率和第三功率的功率发生器，其中第二功率和第三电源的电压低于第一电源的电压。

