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(54) **Driving apparatus for organic electro-luminescence display device**

Steuereinrichtung für eine organische elektrolumineszierende Anzeigevorrichtung

Appareil de commande pour dispositif d'affichage électroluminescent organique

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US-A1- 2003 184 237

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] This invention relates to an organic electro-luminescence display (ELD), and more particularly to a driving apparatus for an organic electro-luminescence display device that is adaptive for reducing a deterioration of organic light-emitting diode device in the organic electro-luminescence display device.

Description of the Related Art

[0002] US 2003/0184237 A1 discloses a drive method of a light-emitting display panel capable of emitting light in low luminance and of realizing light emission control in low luminance.

Further apparatus/methods for driving a luminescent display panel are known from EP-A-1 291 838 and EP-A-1 445 757.

[0003] Recently, there have been developed various flat panel display devices reduced in weight and bulk that is capable of eliminating disadvantages of a cathode ray tube (CRT). Such flat panel display devices include a liquid crystal display (LCD), a field emission display (FED), a plasma display panel (PDP) and an electro-luminescence (EL) display, etc. device.

[0004] In such flat panel display devices, the PDP has the most advantage for making a large dimension screen because its structure and manufacturing process are simple, but has a drawback in that it has low light-emission efficiency and large power consumption. The LCD has a difficulty in making a large dimension screen because it is fabricated by a semiconductor process, but has an expanded demand as it is mainly used for a display device of a notebook personal computer. However, the LCD has a drawback in that it has a difficulty in making a large dimension screen and it has large power consumption due to a backlight unit. Also, the LCD has characteristics of a large light loss and a narrow viewing angle due to optical devices such as a polarizing filter, a prism sheet, a diffuser and the like.

[0005] On the other hand, the EL display device is largely classified into an inorganic EL device and an organic EL device depending upon a material of a light-emitting layer, and is a self-luminous device. When compared with the above-mentioned display devices, the EL display device has advantages of a fast response speed, large light-emission efficiency, a large brightness and a large viewing angle. The organic EL display device can display a picture at approximately 10 [V] and a high brightness of ten thousands of [cd/m²].

[0006] Fig. 1 is a schematic section view showing a structure of a conventional organic EL display device.

[0007] In the organic EL display device 1, as shown in Fig. 1, an anode electrode 2 is formed from a transparent electrode pattern on a substrate 1. On the substrate 1, a hole carrier layer 3, a light-emitting layer 4 formed from an organic material, an electron carrier layer 5 and a cathode 6 made from a metal are disposed.

[0008] Fig. 2 is a circuit diagram of a driving apparatus for the conventional organic EL display device, and Fig. 3 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic EL display device shown in Fig. 2. Further, Fig. 4 is a driving waveform diagram of the organic EL display device shown in Fig. 2.

[0009] Referring to Fig. 2 to Fig. 4, the driving apparatus for the conventional organic EL display device includes a data voltage source Vdata connected to an anode of an organic light-emitting diode device 20, first and second scan voltage sources Vin1 and Vin2 connected to a cathode of the organic light-emitting diode device 20.

[0010] The data voltage source Vdata supplies a positive voltage to data lines DL1 to DLm of the organic EL display device while the first and second scan voltage sources Vin1 and Vin2 supply a negative voltage and a positive voltage to scan lines SL1 to SLn of the organic EL display device.

[0011] Generally, the driving apparatus for the organic EL display device applies the same voltage to the data voltage source Vdata supplying a positive voltage to the data lines DL1 to DLm and the second scan voltage source Vin2 supplying a positive voltage to the scan lines SL1 to SLn. A ground voltage GND is applied to the first scan voltage source Vin1 supplying a negative voltage to the scan lines SL1 to SLn.

[0012] Further, the driving apparatus includes switching devices 21 connected between the anode of the organic light-emitting diode device 20 and the data voltage source Vdata, and first and second switching devices 22 and 23 connected between the cathode of the organic light-emitting diode device 20 and the first and second scan voltage sources Vin1 and Vin2, respectively.

[0013] The first switching devices 22 are sequentially turned on in response to a control signal T1 to thereby sequentially apply a scanning pulse SCAN having a negative voltage, that is, a forward voltage to the scan lines SL1 to SLn. A data pulse DATA is synchronized with the scanning pulse SCAN applied to the scan lines SL1 to SLn to be applied to the data lines DL1 to DLm as a positive voltage.

[0014] More specifically, as the first switching device 22 connected to the first scan line SL1 is turned on in response to the control signal T1, the scanning pulse SCAN is applied to the first scan line SL1 as a negative voltage. At the same

time, the data pulse DATA is applied to the data lines DL1 to DLm as a positive voltage. When a negative voltage is applied to the first scan line SL1 and a positive voltage is applied to the data lines DL1 to DLm, the organic light-emitting diode device 20 at the first line is emitted by a forward bias. Thereafter, as the second switching device 23 connected to the first scan line SL1 is turned on in response to a control signal T1, the scanning pulse SCAN is applied to the first scan line SL1 as a positive voltage. While the control signal T2 supplying a positive voltage to the first scan line SL1 and the first control signal T1 supplying a negative voltage to the second scan line SL2 being applied, the organic EL display device sequentially emits a light to display a picture.

[0015] Fig. 5 is a detailed view of the A portion shown in Fig. 4.

[0016] Referring to Fig. 5, when the scanning pulse SCAN is switched from a negative voltage into a positive voltage, an overshoot phenomenon caused by the switching emerges from the scanning pulse SCAN. Such an overshoot phenomenon causes a deterioration of the organic light-emitting diode devices 20. This appears more seriously as a level of the positive voltage applied to the cathode of the organic light-emitting diode device 20 shown in Fig. 5 goes higher.

[0017] If the second scan voltage source Vin2 is supplied with a lower voltage than the data voltage source Vdata so as to reduce the overshoot phenomenon, then a voltage of the data voltage source Vdata supplied to the anode of the organic light-emitting diode device 20 becomes larger than that of the second scan voltage source Vin2 supplied to the cathode of the organic light-emitting diode 20. In this case, there is raised a problem in that, as the organic light-emitting diode devices 20 at the selected lines as well as the remaining organic light-emitting diode devices 20 of the organic EL display device are forwardly biased, a light-emission is made while a current flowing in all the organic light-emitting diode devices 20.

SUMMARY OF THE INVENTION

[0018] Accordingly, it is an object of the present invention to provide a driving apparatus for an organic electro-luminescence display device that is adaptive for reducing a deterioration of organic light-emitting diode device in the organic electro-luminescence display device.

[0019] In order to achieve these and other objects of the invention, a driving apparatus for an organic electro-luminescence display device as defined in claim 1 is provided.

[0020] Further features of the present invention are defined in the subclaims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] These and other objects of the invention will be apparent from the following detailed description of the embodiments of the present invention with reference to the accompanying drawings, in which:

[0022] Fig. 1 is a schematic section view showing a structure of a conventional organic electro-luminescence display device;

[0023] Fig. 2 is a circuit diagram of a driving apparatus for the conventional organic electro-luminescence display device;

[0024] Fig. 3 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 2;

[0025] Fig. 4 is a driving waveform diagram of the organic electro-luminescence display device shown in Fig. 2;

[0026] Fig. 5 is a detailed view of the A portion shown in Fig. 4;

[0027] Fig. 6 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a first embodiment of the present invention;

[0028] Fig. 7 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 6;

[0029] Fig. 8 is a driving waveform diagram of the organic electro-luminescence display device shown in Fig. 6;

[0030] Fig. 9 is a detailed view of the B portion shown in Fig. 8;

[0031] Fig. 10 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a second embodiment of the present invention;

[0032] Fig. 11 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 10;

[0033] Fig. 12 is a driving waveform diagram of the organic electro-luminescence display device shown in Fig. 10;

[0034] Fig. 13 is a detailed view of the C portion shown in Fig. 12;

[0035] Fig. 14 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a third embodiment of the present invention; and

[0036] Fig. 15 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 14.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0037] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0038] Hereinafter, the preferred embodiments of the present invention will be described in detail with reference to Figs. 6 to 14.

[0039] Fig. 6 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a first embodiment of the present invention.

[0040] Referring to Fig. 6, the driving apparatus for the organic EL display device according to the first embodiment of the present invention includes a data voltage source Vdata connected to an anode of an organic light-emitting diode device 40, first and second scan voltage sources Vin1 and Vin2 connected to a cathode of the organic light-emitting diode device 40.

[0041] The data voltage source Vdata supplies a positive voltage to data lines DL1 to DLm connected to the anode of the organic light-emitting diode device while the first and second scan voltage sources Vin1 and Vin2 supply a negative voltage and a positive voltage to scan lines SL1 to SLn connected to the cathode of the organic light-emitting diode device 40.

[0042] Further, the driving apparatus includes data switching devices 41 connected between the anode of the organic light-emitting diode device 40 and the data voltage source Vdata, first and second switching devices 42 and 43 connected between the cathode of the organic light-emitting diode device 40 and the first and second scan voltage sources Vin1 and Vin2, respectively, and a capacitor C connected, in parallel, between the second scan voltage source Vin2 and the second switching device 43.

[0043] The capacitor C charges a voltage applied from the anode of the organic light-emitting diode device 40 to the cathode thereof at a fast time when a scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative polarity into a positive polarity, thereby stabilizing a voltage of the output terminal to reduce an overshoot phenomenon.

[0044] Fig. 7 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 6, and Fig. 8 is a driving waveform diagram of the organic electro-luminescence display device shown in Fig. 6. Further, Fig. 9 is a detailed view of the B portion shown in Fig. 8.

[0045] Referring to Fig. 7 to Fig. 9, the first switching devices 42 are sequentially turned on in response to a control signal T1 to thereby sequentially apply a scanning pulse SCAN having a negative voltage, that is, a forward voltage to the scan lines SL1 to SLn. A data pulse DATA is synchronized with the scanning pulse SCAN applied to the scan lines SL1 to SLn to be applied to the data lines DL1 to DLm as a positive voltage.

[0046] More specifically, as the first switching device 42 connected to the first scan line SL1 is turned on in response to the control signal T1, the scanning pulse SCAN is applied to the first scan line SL1 as a negative voltage. The data pulse DATA is synchronized with the scanning pulse SCAN to be applied to the data lines DL1 to DLm as a positive voltage. When a negative voltage is applied to the first scan line SL1 and a positive voltage is applied to the data lines DL1 to DLm, the organic light-emitting diode device 40 at the first line flows a current to make a light emission by a forward bias. Thereafter, as the second switching device 43 connected to the first scan line SL1 is turned on in response to a control signal T2, the scanning pulse SCAN is applied to the first scan line SL1 as a positive voltage. While the control signal T2 supplying a positive voltage to the first scan line SL1 and the first control signal T1 supplying a negative voltage to the second scan line SL2 being applied, the organic EL display device sequentially emits a light to display a picture.

[0047] When the scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative voltage into a positive voltage, an overshoot caused by the switching emerges from the scanning pulse SCAN.

[0048] Such an overshoot appearing at the scan lines SL1 to SLn can be reduced by the capacitor C connected, in parallel, between the second scan voltage source Vin2 and the second switching device 43.

[0049] The capacitor C charges a voltage applied from the anode of the organic light-emitting diode device 40 to the cathode thereof at a fast time when a scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative polarity into a positive polarity, thereby stabilizing a voltage of the output terminal to reduce an overshoot phenomenon.

[0050] Fig. 10 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a second embodiment of the present invention.

[0051] The driving apparatus for the organic EL display device according to the second embodiment of the present invention as shown in Fig. 10 has the same elements as that according to the first embodiment of the present invention shown in Fig. 6 except that the capacitor C connected, in parallel, between the second voltage source Vin2 and the second switching device 43 is replaced by a Zener diode device 45 connected, in series, between the second voltage source Vin2 and the second switching device 43.

[0052] The Zener diode device 45 plays a role to limit a voltage of a second scan voltage source Vin2 applied to a

cathode of an organic light-emitting device 40 into a constant voltage, thereby reducing an overshoot phenomenon.

[0053] Fig. 11 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 10, and Fig. 12 is a driving waveform diagram of the organic electro-luminescence display device shown in Fig. 10.

[0054] Referring to Fig. 11 and Fig. 12, first switching devices 42 are sequentially turned on in response to a control signal T1 to thereby sequentially apply a scanning pulse SCAN having a negative voltage, that is, a forward voltage to scan lines SL1 to SLn. A data pulse DATA is synchronized with the scanning pulse SCAN applied to the scan lines SL1 to SLn to be applied to the data lines DL1 to DLm as a positive voltage.

[0055] When the scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative voltage into a positive voltage, an overshoot caused by the switching emerges from the scanning pulse SCAN.

[0056] Such an overshoot appearing at the scan lines SL1 to SLn can be reduced by the Zener diode device 45 connected, in series, between the second scan voltage source Vin2 and the second switching device 43.

[0057] The Zener diode device 45 acts as a constant voltage source for limiting a voltage of the second scan voltage source Vin2 applied to the cathode of the organic light-emitting diode device 40 into a constant voltage.

[0058] In other words, when the scanning pulse SCAN is switched from a negative voltage into a positive voltage, a positive voltage Vhigh applied to the scan lines SL1 to SLn results in a difference between a positive voltage supplied from the second voltage source Vin2 and a breakdown voltage Vz of the Zener diode device 45.

[0059] This can be expressed by the following equation:

$$V_{high} = V_{in2} - |V_z| \quad \dots (1)$$

[0060] Accordingly, when the scanning pulse SCAN is switched from a negative voltage into a positive voltage, the positive voltage Vhigh applied to the cathode of the organic light-emitting diode device 40 has a lower voltage than the prior art, thereby reducing an overshoot phenomenon. At this time, the breakdown voltage Vz of the Zener diode device 45 must be smaller than a threshold voltage Vth of the organic light-emitting diode device 40.

[0061] If the breakdown voltage Vz of the Zener diode 45 is larger than or equal to the threshold voltage Vth of the organic light-emitting diode device 40, then a difference between a voltage from the data voltage source Vdata connected to the anode of the organic light-emitting diode device 40 and a positive voltage Vhigh applied to the cathode of the organic light-emitting diode device 40 becomes larger than the threshold voltage Vth of the organic light-emitting diode device 40 when the second switching device 43 is turned on. Thus, a forward bias is applied to the organic light-emitting diode device 40 and a current flow in the organic light-emitting diode device by a voltage applied to the organic light emitting diode device 40, thereby allowing the organic light-emitting diode device 40 to make a light emission.

[0062] For this reason, the breakdown of the Zener diode device 45 must be lower than the threshold voltage Vth of the organic light-emitting diode device 40.

[0063] This can be expressed by the following equation:

$$|V_z| < V_{th} \quad \dots (2)$$

[0064] Fig. 13 is a detailed view of the C area shown in Fig. 12.

[0065] Referring to Fig. 13, a positive voltage applied to the scan lines SL1 to SLn becomes a difference between the voltage supplied from the second scan voltage source Vin2 and the breakdown voltage Vz of the Zener diode 45, which lowers a magnitude of the positive voltage applied to the cathode of the organic light-emitting diode device 40, thereby reducing an overshoot phenomenon.

[0066] Fig. 14 is a circuit diagram of a driving apparatus for an organic electro-luminescence display device according to a third embodiment of the present invention, and Fig. 15 is a circuit diagram for explaining an operation principle of an organic light-emitting diode device in the organic electro-luminescence display device shown in Fig. 14.

[0067] The driving apparatus for the organic EL display device according to the third embodiment of the present invention as shown in Fig. 14 has the same elements as that according to the first embodiment of the present invention shown in Fig. 6 except that it includes a Zener diode device 45 connected, in series, between the second voltage source Vin2 and the second switching device 43, and a capacitor C connected, in parallel, between the second scan voltage source Vin2 and the Zener diode device 45.

[0068] The Zener diode device 45 plays a role to limit a voltage of a second scan voltage source Vin2 applied to a cathode of an organic light-emitting device 40 into a constant voltage, thereby reducing an overshoot phenomenon.

[0069] Further, the capacitor C charges a voltage applied from the anode of the organic light-emitting diode device

40 to the cathode thereof at a fast time when a scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative polarity into a positive polarity, thereby stabilizing a voltage of the output terminal to reduce an overshoot phenomenon.

[0070] Referring to Fig. 15, when the scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative voltage into a positive voltage, an overshoot caused by the switching emerges from the scanning pulse SCAN.

[0071] Such an overshoot appearing at the scan lines SL1 to SLn can be reduced by the Zener diode device 45 connected, in series, between the second scan voltage source Vin2 and the second switching device 43. Also, the overshoot can be more reduced by the capacitor C connected, in parallel, between the second voltage source Vin2 and the Zener diode device 45.

[0072] The Zener diode device 45 acts as a constant voltage source for limiting a voltage of the second scan voltage source Vin2 applied to the cathode of the organic light-emitting diode device 40 into a constant voltage.

[0073] In other words, when the scanning pulse SCAN is switched from a negative voltage into a positive voltage, a positive voltage Vhigh applied to the scan lines SL1 to SLn results in a difference between a positive voltage supplied from the second voltage source Vin2 and a breakdown voltage Vz of the Zener diode device 45.

[0074] This can be expressed by the following equation:

$$V_{high} = V_{in2} - |V_z| \quad \dots (3)$$

[0075] Accordingly, when the scanning pulse SCAN is switched from a negative voltage into a positive voltage, the positive voltage Vhigh applied to the cathode of the organic light-emitting diode device 40 has a lower voltage than the prior art, thereby reducing an overshoot phenomenon.

[0076] As mentioned above, the breakdown voltage Vz of the Zener diode device 45 must be lower than a threshold voltage Vth of the organic light-emitting diode device 40.

[0077] This can be expressed by the following equation:

$$|V_z| < V_{th} \quad \dots (4)$$

[0078] Further, the capacitor C charges a voltage applied from the anode of the organic light-emitting diode device 40 at a fast time when a scanning pulse SCAN applied to the scan lines SL1 to SLn is switched from a negative polarity into a positive polarity, thereby stabilizing a voltage of the output terminal to reduce an overshoot phenomenon.

[0079] As described above, the driving apparatus for the organic EL display device according to the embodiments of the present invention includes any one of the Zener diode device connected, in series, between the second scan voltage source and the second switching device and the capacitor connected, in parallel, between the second scan voltage source and the Zener diode device.

[0080] Accordingly, the capacitor charges a voltage applied from the anode of the organic light-emitting diode device to the cathode thereof at a fast time, thereby stabilizing a voltage of the output terminal to reduce an overshoot phenomenon. Furthermore, the Zener diode device allows a positive voltage supplied to the cathode of the organic light-emitting diode device to have a lower voltage than the prior art when the scanning pulse is switched from a negative voltage into a positive voltage, thereby reducing an overshoot phenomenon. As a result, it becomes possible to reduce a deterioration of organic light-emitting diode device.

[0081] Although the present invention has been explained by the embodiments shown in the drawings described above, it should be understood to the ordinary skilled person in the art that the invention is not limited to the embodiments, but rather that various changes or modifications thereof are possible without departing from the scope of the invention. Accordingly, the scope of the invention shall be determined only by the appended claims.

Claims

1. An organic electro-luminescence display device, comprising:

- an organic light-emitting diode device (40) having an anode and a cathode;
- a driving apparatus comprising:
 - data voltage source for supplying a data signal (DATA) to the anode of the organic light-emitting diode device (40);
 - a first voltage source (Vin1) for generating a first negative or ground voltage;

a second voltage source (Vin2) for generating a second voltage higher than said first voltage;
 first (42) and second (43) switching devices for selectively applying said first and second voltages to the cathode
 of the organic light-emitting diode device (40); and
 voltage stabilizing means for stabilizing said second voltage to be supplied to the cathode of the organic light-
 emitting diode,
characterized in that the voltage stabilizing means comprises a Zener diode device (45) which is connected
 in series directly between the second voltage source (Vin2) and the second switches (43), wherein a cathode
 of the Zener diode device (45) is connected to the second scan voltage source (Vin2) and an anode of the Zener
 diode device (45) is connected to the second switches (43).

2. The driving apparatus according to claim 1, wherein the voltage stabilizing means further comprises a capacitor (C) connected, in parallel, to the anode of the Zener diode device (45).
3. The driving apparatus according to claim 1 or 2, wherein a breakdown voltage of the Zener diode device (45) is lower than a threshold voltage of the organic light-emitting diode device (40).
4. The driving apparatus according to claim 1 or 3, wherein a voltage applied to the cathode of the organic light-emitting device (40) is a difference voltage between a voltage supplied from the second voltage source (Vin2) and the breakdown voltage of the Zener diode device (45).

Patentansprüche

1. Organische Elektrolumineszenz-Anzeigevorrichtung, aufweisend:

eine organische licht-emittierende Diodenvorrichtung (40) mit einer Anode und einer Kathode;
 eine Steuereinrichtung aufweisend:

eine Datenspannungsquelle zur Bereitstellung eines Datensignals (DATA) an der Anode der organischen
 licht-emittierenden Diodenvorrichtung (40);
 eine erste Spannungsquelle (Vin1) zur Erzeugung einer ersten negativen oder Erdungsspannung;
 eine zweite Spannungsquelle (Vin2) zur Erzeugung einer zweiten Spannung, welche höher ist als die erste
 Spannung;
 erste (42) und zweite (43) Schaltvorrichtungen zum wahlweisen Anlegen der ersten und zweiten Spannung
 an die Kathode der organischen licht-emittierenden Diodenvorrichtung (40); und
 spannungsstabilisierende Mittel zum Stabilisieren der zweiten, der Kathode der organischen licht-emittie-
 renden Diode zuzuführenden Spannung,

dadurch gekennzeichnet, dass die spannungsstabilisierenden Mittel eine Zener-Diodenvorrichtung (45) aufwei-
 sen, welche direkt zwischen der zweiten Spannungsquelle (Vin2) und den zweiten Schaltern (43) in Reihe geschaltet
 ist, wobei eine Kathode der Zener-Diodenvorrichtung (45) mit der zweiten Scanspannungsquelle (Vin2) verbunden
 ist und eine Anode der Zener-Diodenvorrichtung (45) mit den zweiten Schaltern (43) verbunden ist.

2. Steuereinrichtung nach Anspruch 1, wobei die spannungsstabilisierenden Mittel ferner einen Kondensator (C) auf-
 weisen, der parallel zu der Anode der Zenerdiodenvorrichtung (45) angeschlossen ist.
3. Steuereinrichtung nach Anspruch 1 oder 2, wobei eine Durchschlagsspannung der Zenerdiodenvorrichtung (45)
 niedriger ist als eine Schwellenspannung der organischen licht-emittierenden Diodenvorrichtung (40).
4. Steuereinrichtung nach Anspruch 1 oder 3, wobei eine Spannung, welche an die Kathode der organischen licht-
 emittierenden Vorrichtung (40) angelegt ist, eine Differenzspannung zwischen einer von der zweiten Spannungs-
 quelle (Vin2) zugeführten Spannung und der Durchschlagsspannung der Zenerdiodenvorrichtung (45) ist.

Revendications

1. Dispositif d'affichage par électroluminescence organique, comprenant :

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un dispositif de diode électroluminescente organique (40) comportant une anode et une cathode;
un appareil de commande comprenant :

une source de tension de données pour fournir un signal de données (DATA) à l'anode du dispositif de diode électroluminescente organique (40);
une première source de tension (Vin1) pour générer une première tension négative ou de masse;
une deuxième source de tension (Vin2) pour générer une deuxième tension supérieure à ladite première tension;
des premiers (42) et deuxièmes (43) dispositifs de commutation pour appliquer sélectivement lesdites première et deuxième tensions à la cathode du dispositif de diode électroluminescente organique (40); et
un moyen de stabilisation de tension pour stabiliser ladite deuxième tension devant être fournie à la cathode de la diode électroluminescente organique,

caractérisé en ce que le moyen de stabilisation de tension comprend un dispositif à diode de Zener (45) qui est connecté en série directement entre la deuxième source de tension (Vin2) et les deuxièmes commutateurs (43), où une cathode du dispositif à diode de Zener (45) est connectée à la deuxième source de tension de balayage (Vin2) et une anode du dispositif à diode de Zener (45) est connectée aux deuxièmes commutateurs (43).

2. Appareil de commande selon la revendication 1, dans lequel le moyen de stabilisation de tension comprend en outre un condensateur (C) connecté, en parallèle, à l'anode du dispositif à diode de Zener (45).
3. Appareil de commande selon la revendication 1 ou 2, dans lequel une tension de claquage du dispositif à diode de Zener (45) est inférieure à une tension de seuil du dispositif de diode électroluminescente organique (40).
4. Appareil de commande selon la revendication 1 ou 3, dans lequel une tension appliquée à la cathode du dispositif électroluminescent organique (40) est une différence de tension entre une tension fournie depuis la deuxième source de tension (Vin2) et la tension de claquage du dispositif à diode de Zener (45).

FIG. 1
RELATED ART

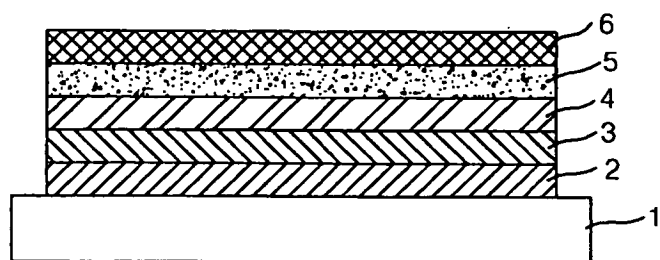


FIG. 2
RELATED ART

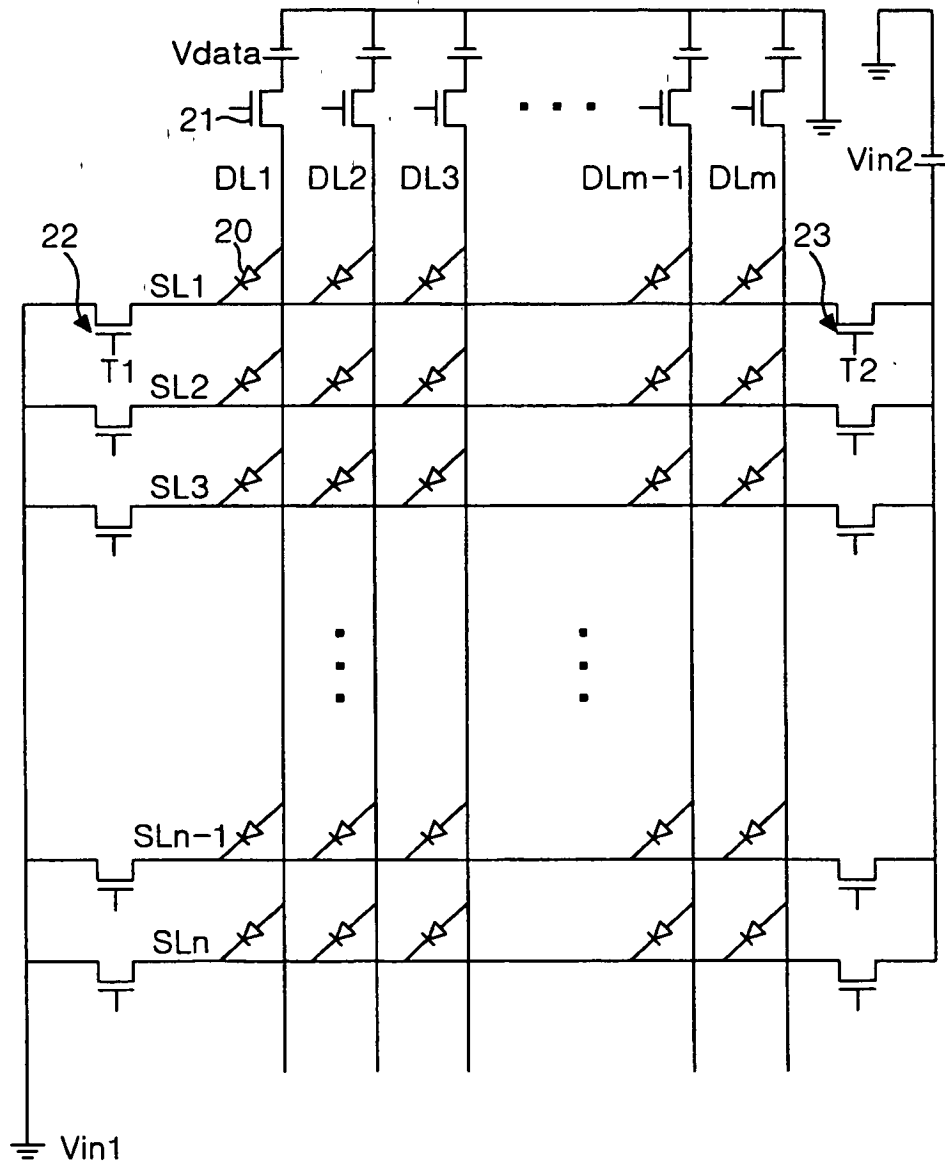


FIG. 3
RELATED ART

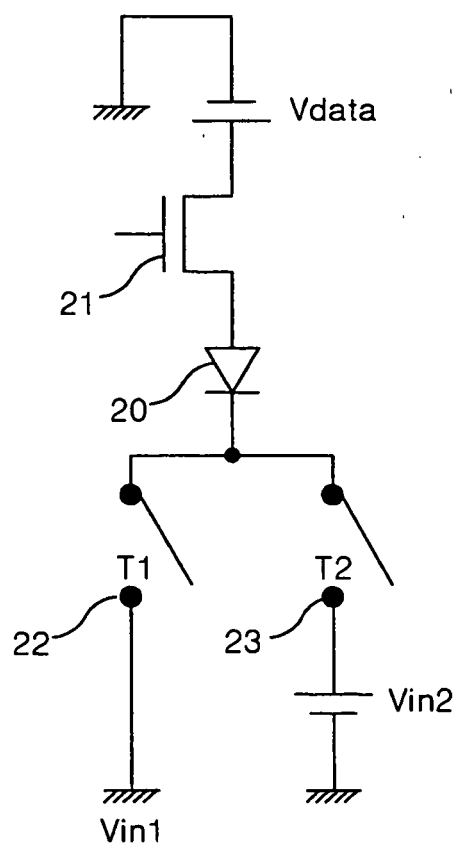


FIG. 4
RELATED ART

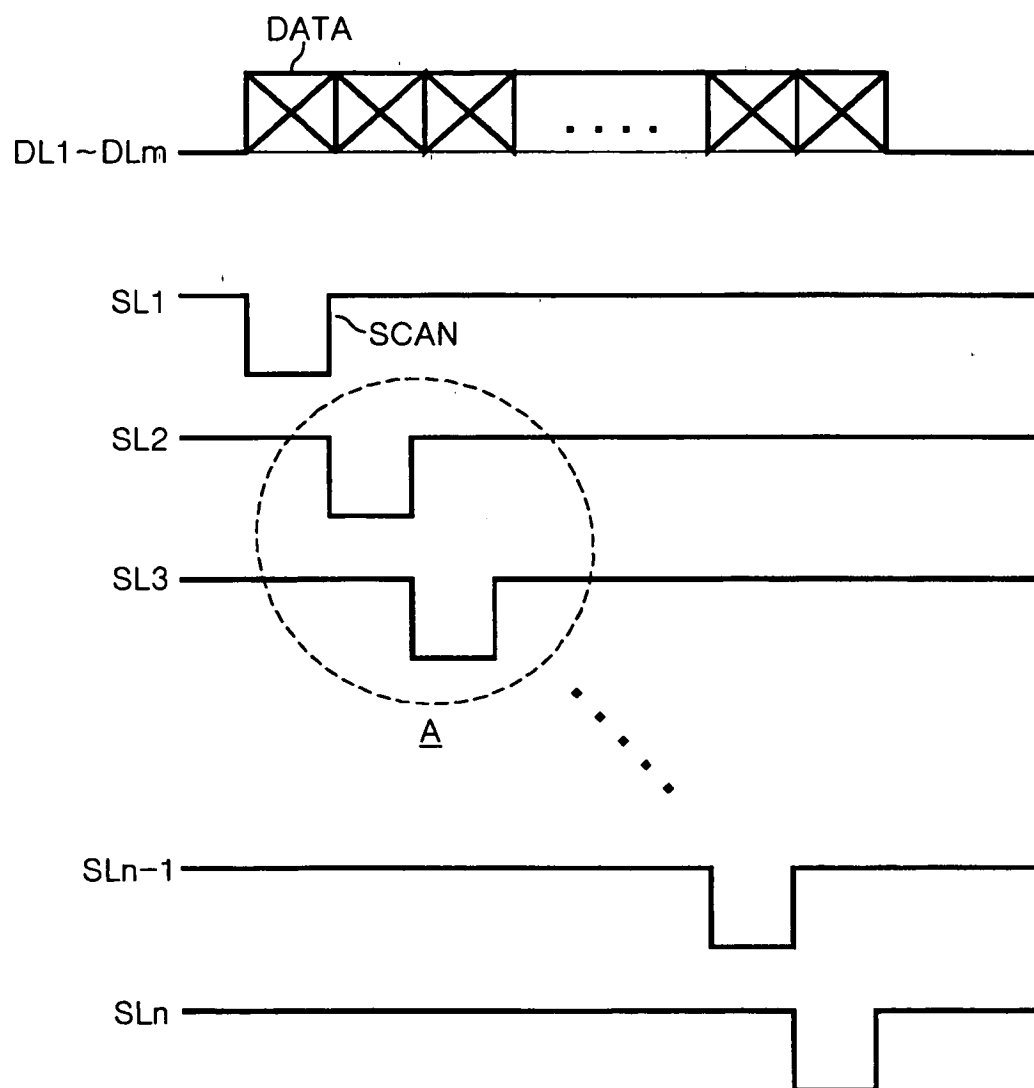


FIG. 5
RELATED ART

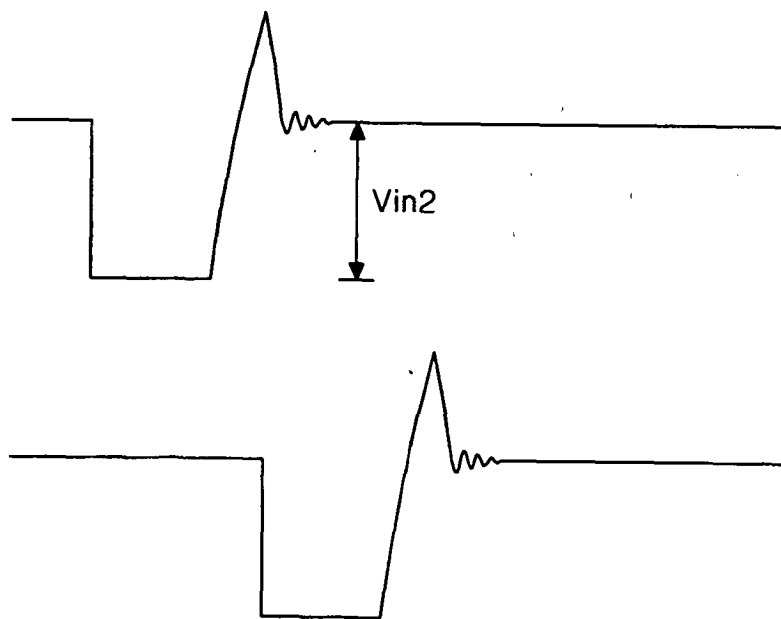


FIG. 6

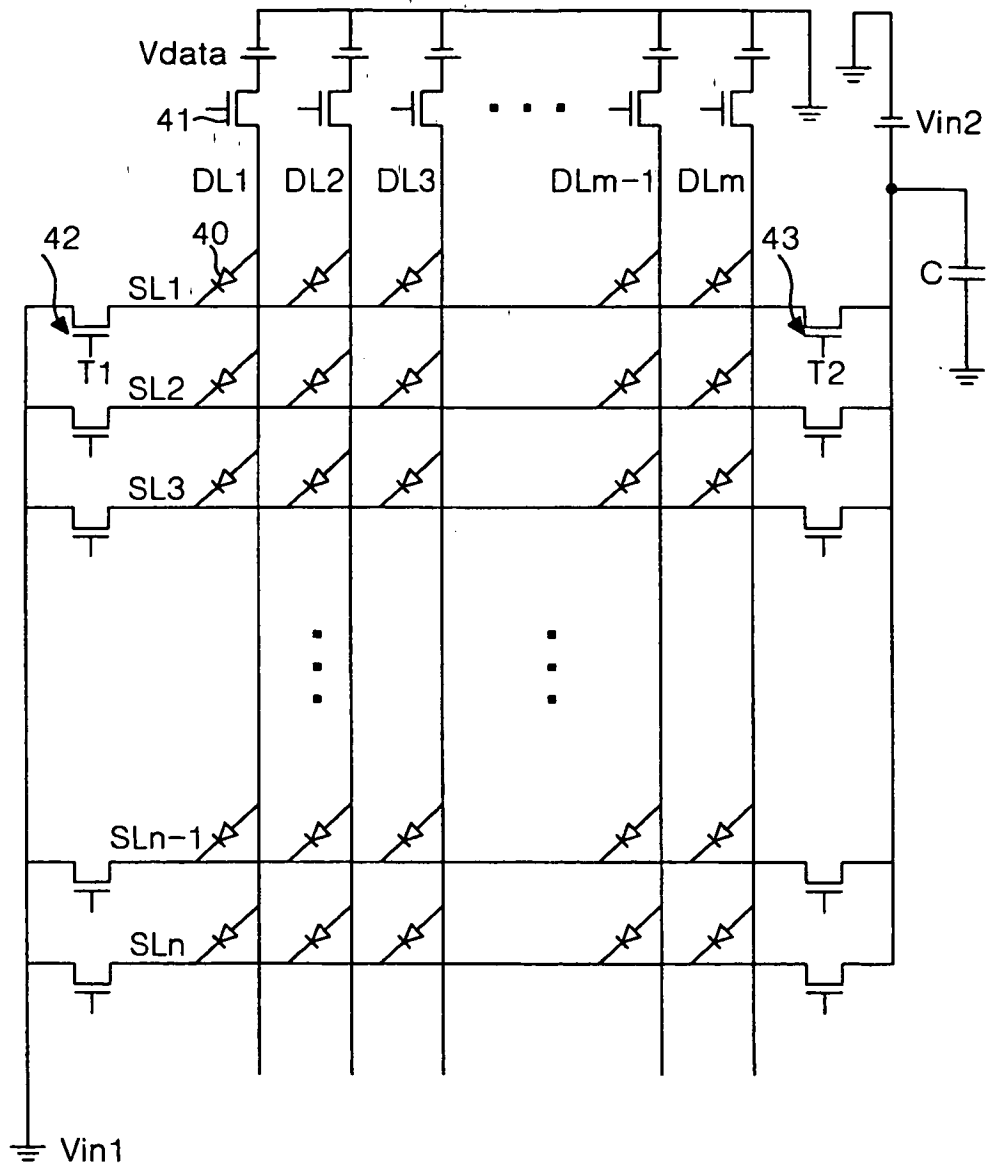


FIG.7

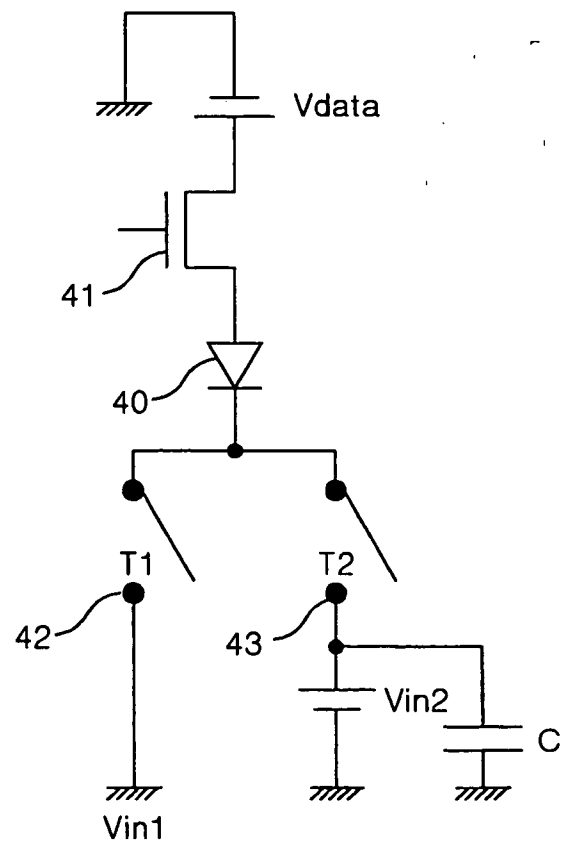


FIG. 8

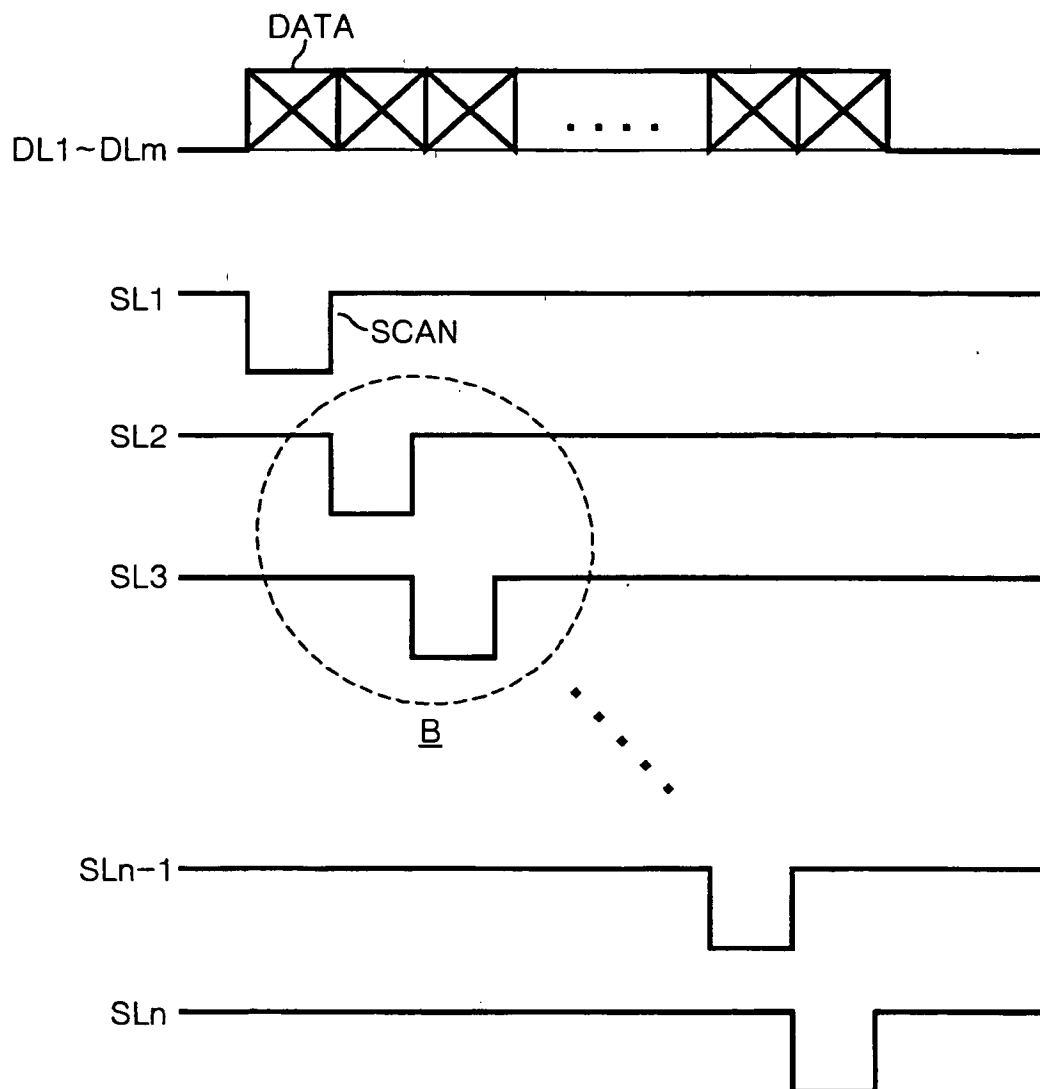


FIG.9

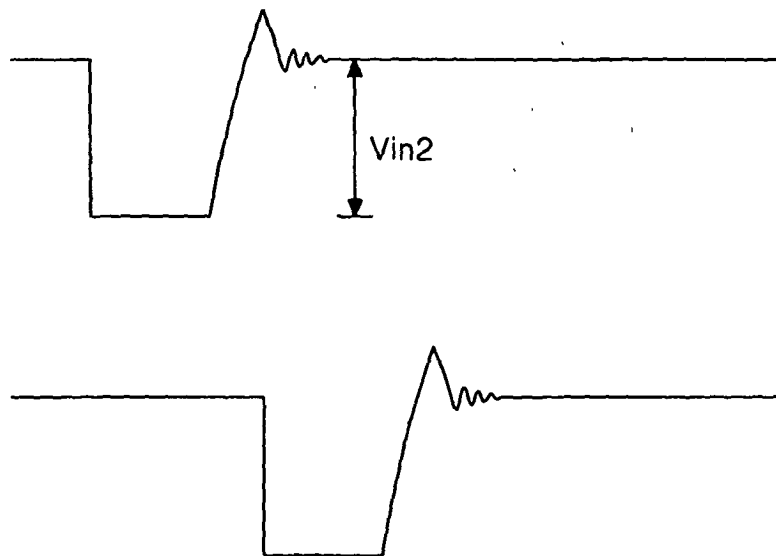


FIG.10

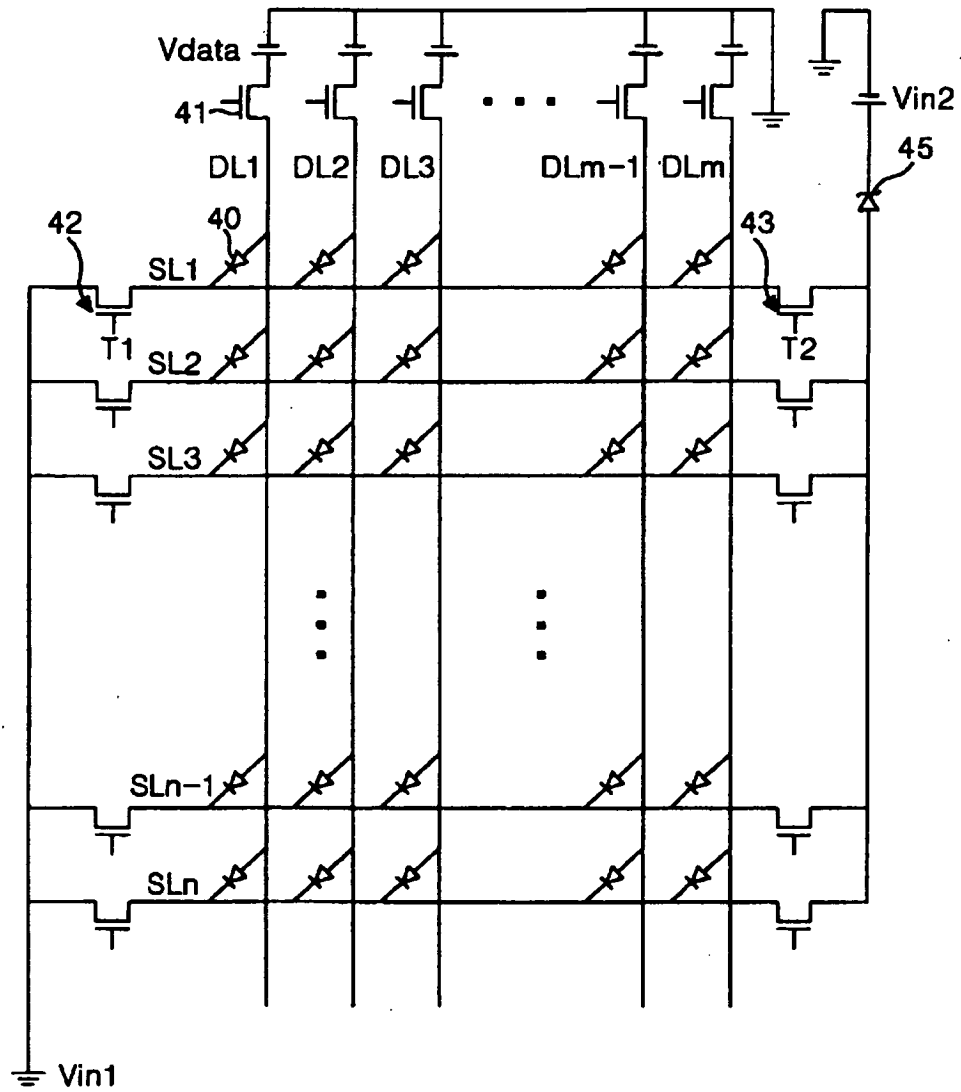


FIG.11

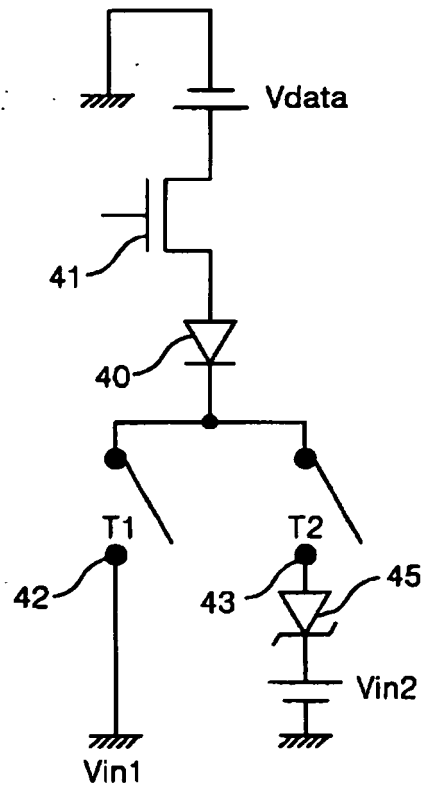


FIG.12

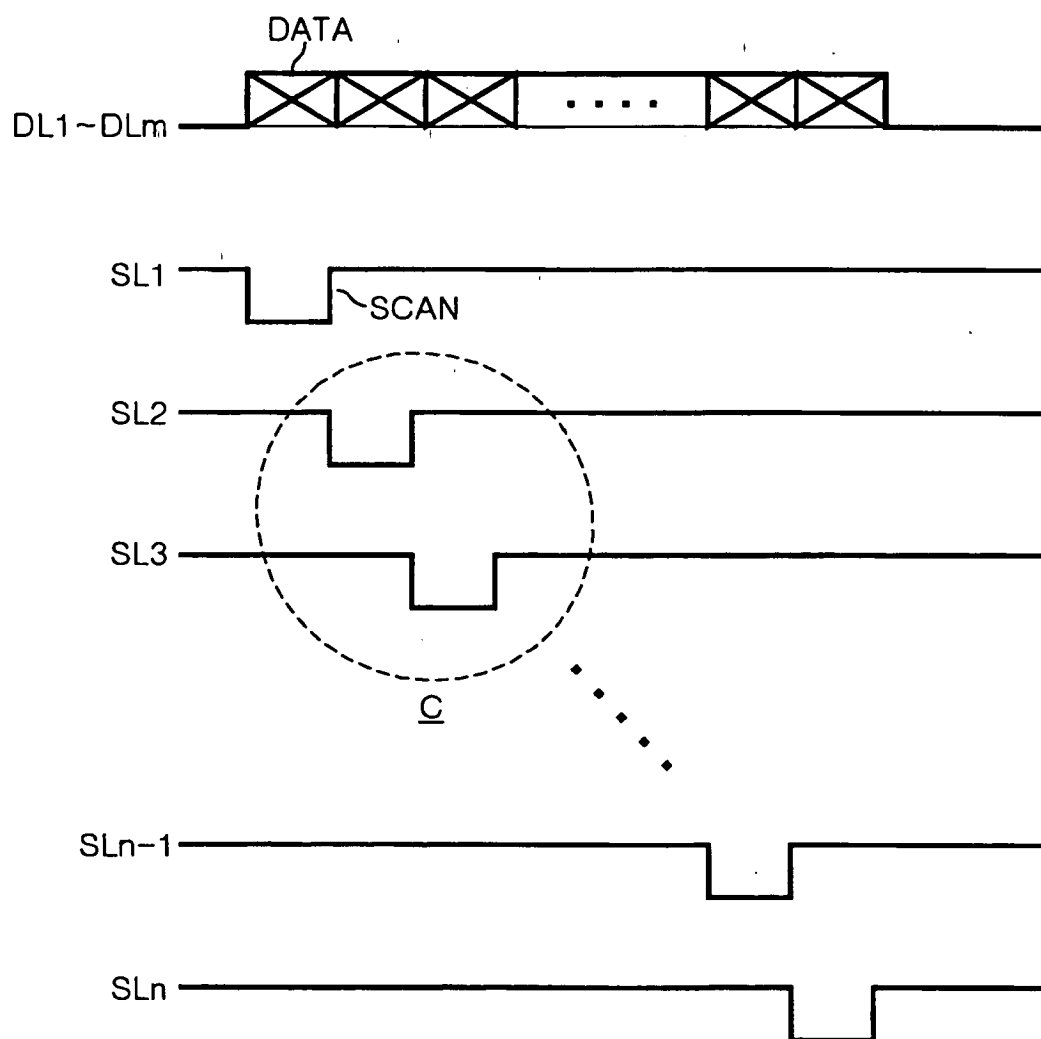


FIG.13

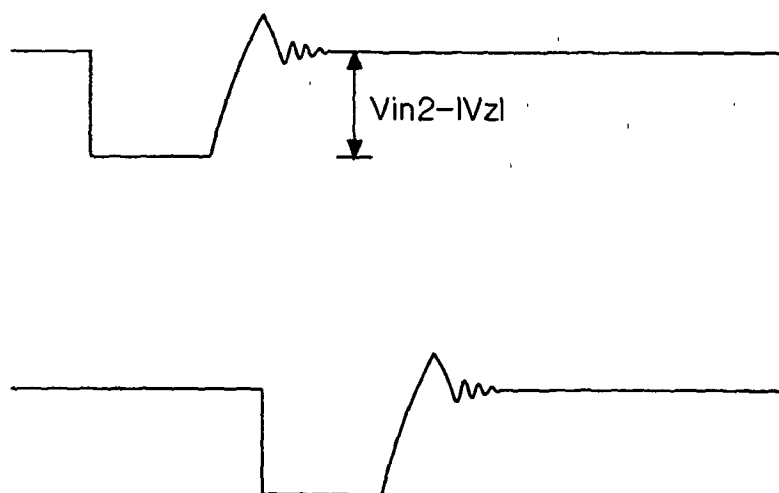


FIG.14

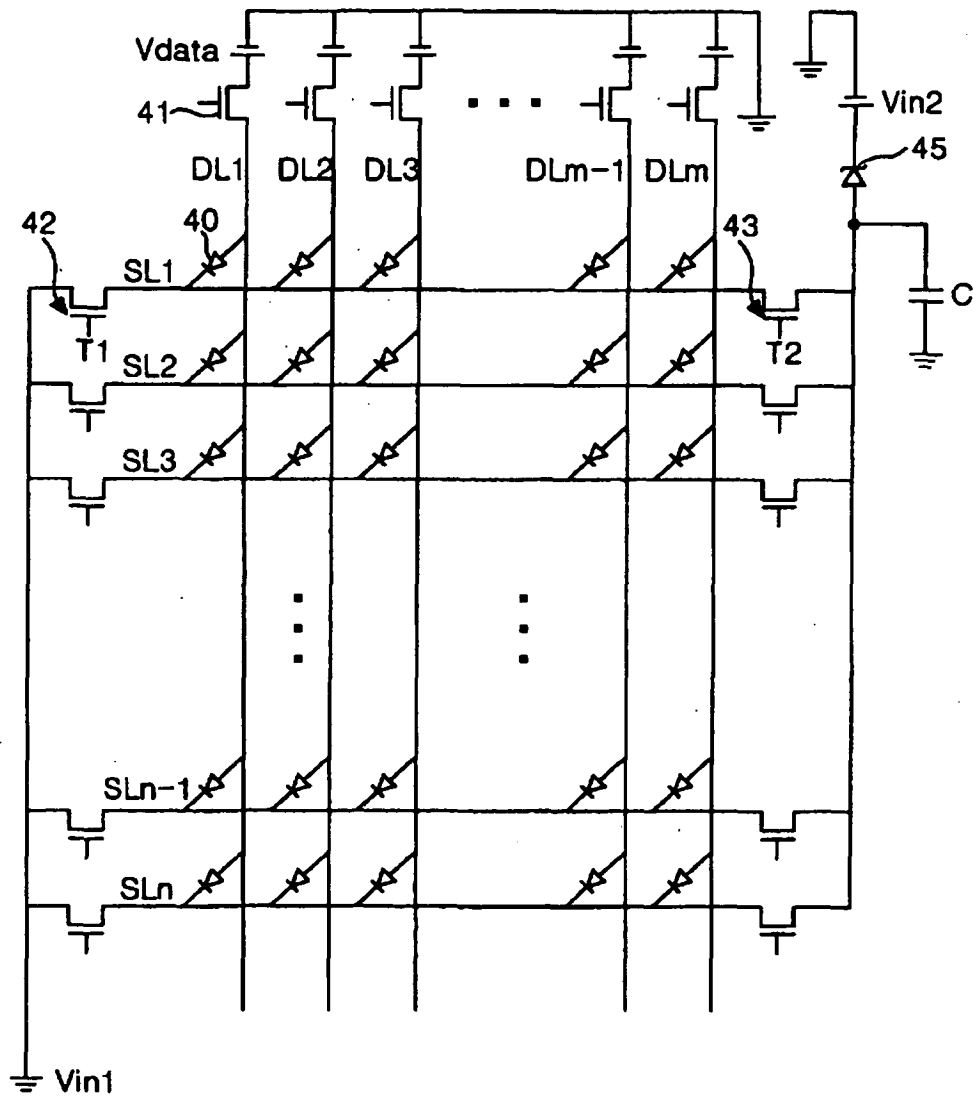
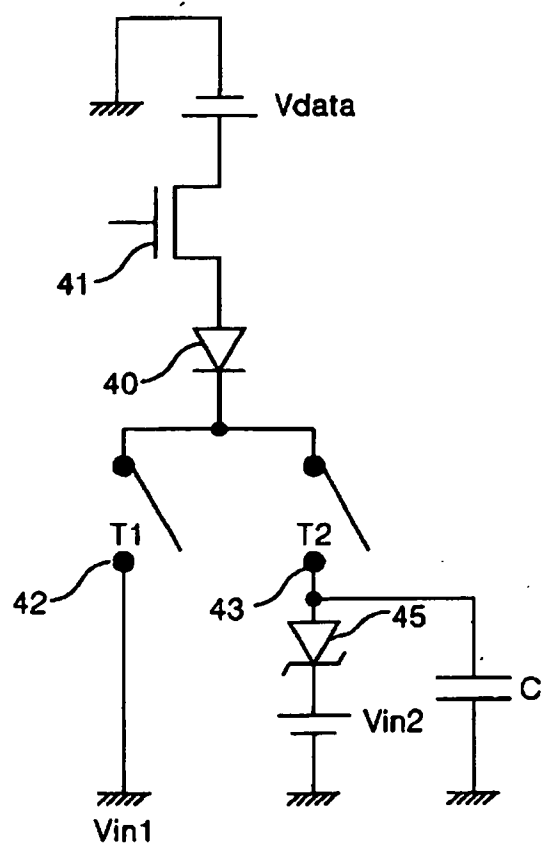


FIG.15



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20030184237 A1 [0002]
- EP 1291838 A [0002]
- EP 1445757 A [0002]

专利名称(译)	用于有机电致发光显示装置的驱动装置		
公开(公告)号	EP1643481B1	公开(公告)日	2009-08-26
申请号	EP2005002340	申请日	2005-02-04
申请(专利权)人(译)	LG电子株式会社.		
当前申请(专利权)人(译)	LG电子公司.		
[标]发明人	KIM JI HUN KIM HAK SU LEE HEE YOUNG		
发明人	KIM, JI HUN KIM, HAK SU LEE, HEE YOUNG		
IPC分类号	G09G3/32		
CPC分类号	G09G3/3216 G09G3/3266 G09G2320/043 G09G2330/04		
代理机构(译)	Kruspig , 福尔克马尔		
优先权	1020040078087 2004-09-30 KR		
其他公开文献	EP1643481A1		
外部链接	Espacenet		

摘要(译)

公开了一种用于有机电致发光显示装置的驱动装置，用于减少有机电致发光显示装置中的有机发光二极管装置的劣化。在驱动装置中，数据供应器将数据信号提供给有机发光二极管装置的阳极。第一电压源产生第一电压。第二电压源产生高于所述第一电压的第二电压。稳压器稳定所述第二电压以提供给有机发光二极管装置的阴极。第一和第二开关装置选择性地所述第一和第二电压施加到有机发光二极管装置的阴极。

$$V_{high} = V_{in2} - |V_2| \quad \dots (1)$$