

Description

FIELD OF THE INVENTION

[0001] The present invention relates to the field of organic light emitting display, and particularly to a pixel circuit for an organic light emitting display and a driving method thereof, and the organic light emitting display.

BACKGROUND OF THE INVENTION

[0002] With the continuous development of multimedia, the organic light emitting diode (OLED) has been increasingly used in high performance display. In order to be adapted to large display size, a shorter driving time for a single pixel is required for a traditional passive matrix OLED, and therefore an increased transient current is needed, resulting in the increased power consumption. At the same time, the use of large current may lead to a too large voltage drop in a pixel array, so that the operation voltage of OLED is too high and the efficiency is reduced. However, in the active matrix organic light emitting diode (AMOLED), the problems are well solved by progressively scanning input OLED current on a basis of line by line via a switch tube.

[0003] In AMOLED, pixel circuit formed with polysilicon thin film transistors is usually employed to provide corresponding current for the OLED device. Compared with a amorphous silicon thin film transistor, the polysilicon thin film transistor has higher mobility and more stable characteristics, so it is more suitable for AMOLED display. However, due to the limitation of the crystallization process, the polysilicon thin film transistors made on a large glass substrate usually have heterogeneity in electrical parameters such as threshold voltage and mobility, and the heterogeneity may lead to differences in the current and brightness of the OLED display device.

[0004] In addition, in the application of large size display, due to the resistance of the power line for the backplane and the fact that drive current for all the pixel units is supplied by the same power line, the supply voltage in a region closer to the power supply is higher than that in the region farther from the power supply in the backplane. This phenomenon is called IR Drop. Given the correlation of the current with the supply voltage, the IR Drop may also cause current differences in different regions, and accordingly the OLED display devices in different regions have uneven brightness.

[0005] In the prior art, a variety of technical solutions are utilized to solve the problem of brightness differences in the OLED display devices. For example, a South Korea patent application No. 1020100102872 disclosed a pixel compensation circuit. However, there are still many problems in the existing technical solutions, such as a large number of signal lines and complex peripheral drive circuits.

SUMMARY OF THE INVENTION

[0006] The object of the present invention is to provide a pixel circuit for an organic light emitting display and a driving method thereof, and the organic light emitting display, so as to eliminate the uneven light emitting of the display device, simplify the peripheral drive circuit and reduce the power consumption of the circuit.

[0007] In order to solve the above problems, the present invention provides a pixel circuit for an organic light emitting display, the pixel circuit including: a first MOS transistor, a second MOS transistor, a third MOS transistor, a fourth MOS transistor, a fifth MOS transistor, a sixth MOS transistor, a first capacitor and an organic light emitting diode, where a gate electrode of the first MOS transistor receives a first scanning signal, a first electrode of the first MOS transistor receives a data signal, and a second electrode of the first MOS transistor is connected to a first terminal of the first capacitor; a second terminal of the first capacitor is connected to a gate electrode of the second MOS transistor; a first electrode of the second MOS transistor is connected to a first power supply, and a second electrode of the second MOS transistor is connected to a first electrode of the third MOS transistor; a gate electrode of the third MOS transistor receives a control signal, and a second electrode of the third MOS transistor is coupled to a second power supply via the organic light emitting diode; a first electrode of the fourth MOS transistor is connected to the second terminal of the first capacitor, a second electrode of the fourth MOS transistor is connected to the second electrode of the second MOS transistor, and a gate electrode of the fourth MOS transistor receives the first scanning signal; a gate electrode of the fifth MOS transistor receives the control signal, a first electrode of the fifth MOS transistor receives a reference voltage, and a second electrode of the fifth MOS transistor is connected to the first terminal of the first capacitor; a gate electrode of the sixth MOS transistor receives a second scanning signal, a first electrode of the sixth MOS transistor receives the reference voltage, and a second electrode of the sixth MOS transistor is connected to the gate electrode of the second MOS transistor.

[0008] Correspondingly, the present invention further provides a driving method for the above-mentioned pixel circuit, the method including:

[0009] in an initialization stage, turning off the first MOS transistor and the fourth MOS transistor via the first scanning signal, turning off the third MOS transistor and the fifth MOS transistor via the control signal, turning on the sixth MOS transistor via the second scanning signal, so that the reference voltage is transmitted to the gate electrode of the second MOS transistor through the sixth MOS transistor;

[0010] in a data-writing stage, turning on the first MOS transistor and the fourth MOS transistor via the first scanning signal, so that the data signal is transmitted to the first terminal of the first capacitor through the first MOS

transistor, and the fourth MOS transistor is turned on, resulting in a diode connection formed in the second MOS transistor; and turning off the sixth MOS transistor via the second scanning signal, and turning off the third MOS transistor and the fifth MOS transistor via the control signal;

[0011] in a light emitting stage, turning off the first MOS transistor and the fourth MOS transistor via the first scanning signal, turning off the sixth MOS transistor via the second scanning signal, turning on the fifth MOS transistor and the third MOS transistor via the control signal, where a voltage across the first capacitor is reset due to a turning on of the fifth MOS transistor, a corresponding drive current is generated by the third MOS transistor based on the reset of the voltage across the first capacitor, and the drive current is configured to drive the organic light emitting diode to emit light.

[0012] Correspondingly, the present invention further provides an organic light emitting display, including: a scanning drive unit, a data drive unit, N scan lines, M data lines and multiple pixel circuits as described above; where the scanning drive unit is configured to provide scanning signals to respective scan lines; the data drive unit is configured to provide data signals to respective data lines; the multiple pixel circuits are respectively arranged in pixel areas formed by intersection of the N scan lines and the M data lines.

[0013] Compared with the prior art, the pixel circuit for the organic light emitting display and the driving method thereof, and the organic light emitting display according to the present invention have at least the following advantages:

[0014] In the pixel circuit according to the present invention, by virtue of the cooperation of the second MOS transistor, the fourth MOS transistor, the fifth MOS transistor and the first capacitor, the drive current generated by the third MOS transistor is independent of the supply voltage and the threshold voltage of the transistor, therefore the problem of uneven light emitting of the organic light emitting diode is eliminated.

[0015] Furthermore, in the embodiment of the present invention, the first scanning signal and the second scanning signal are independent of each other in time sequence, so as to simplify the structure of the peripheral drive circuit and improve the integrity of the circuit.

[0016] Moreover, in the embodiment of the present invention, it is not necessary to provide the data signal to the pixel circuit in the initialization stage and the light emitting stage, that is, the data line of the pixel circuit can be left floating in the initialization stage and the light emitting stage, thus the difficulty in the development of the circuit and the power consumption of the circuit are reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Fig.1 is a schematic diagram of a pixel circuit according to an embodiment in the prior art;

[0018] Fig.2 is a timing diagram of driving signals for the pixel circuit shown in Fig.1;

[0019] Fig.3 is a schematic diagram of a pixel circuit according to an embodiment of the present invention;

[0020] Fig.4 is a timing diagram of driving signals for the pixel circuit shown in Fig.3; and

[0021] Fig.5 is a schematic structural diagram of an organic light emitting display according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] To make the above object, features and advantages of the invention more obvious and easy to be understood, in the following, particular embodiments of the invention will be illustrated in detail in conjunction with the drawings.

[0023] More specific details will be set forth in the following descriptions for sufficient understanding of the invention. However, the invention can also be implemented in other ways different from the way described herein, and similar extensions can be made by those skilled in the art without departing from the spirit of the invention. Therefore, the invention is not limited to particular embodiments disclosed hereinafter.

[0024] As described in the prior art above, the AMOLED display devices have the problem of uneven brightness due to the influence of the threshold voltages of the polysilicon thin film transistors and the IR drop on the power line for the backplane. In order to solve this problem, a voltage driven pixel circuit including five polysilicon thin film transistors and one capacitor (5T1C) is usually used in the prior art. As shown in Fig.1, the pixel circuit the prior art includes a first PMOS transistor MP1, a second PMOS transistor MP2, a third PMOS transistor MP3, a fourth PMOS transistor MP4, a fifth PMOS transistor MP5, a capacitor Cth and an organic light emitting diode D1.

[0025] The gate electrode of the first PMOS transistor MP1 receives a scanning signal scan2, the source electrode of the first PMOS transistor MP1 receives a data signal Vdata, and the drain electrode of the first PMOS transistor MP1 is connected to the first terminal n1 of the capacitor Cth. The second terminal n2 of the capacitor Cth is connected to the gate electrode of the second PMOS transistor MP2. The source electrode of the second PMOS transistor MP2 receives a first power supply VDD, and the drain electrode of the second PMOS transistor MP2 is connected to the source electrode of the third PMOS transistor MP3. The gate electrode of the third PMOS transistor MP3 receives a control signal "emit", and the drain electrode of the third PMOS transistor MP3 is connected to the anode of the organic light emitting diode D1. The cathode of the organic light emitting diode D1 is connected to a second power supply VEE. The gate electrode of the fourth PMOS transistor MP4 receives a scanning signal scan1, the source electrode of the fourth PMOS transistor MP4 is connected to

the second terminal n2 of the capacitor Cth, and the drain electrode of the fourth PMOS transistor MP4 is connected to the drain electrode of the second PMOS transistor MP2. The gate electrode of the fifth PMOS transistor MP5 receives the control signal "emit", the source electrode of the fifth PMOS transistor MP5 receives a reference voltage Vref, and the drain electrode of the fifth PMOS transistor MP5 is connected to the first terminal n1 of the capacitor Cth.

[0026] Fig.2 shows a timing diagram of driving signals for the pixel circuit in Fig.1. The operational principle of the pixel circuit shown in Fig.1 will be described in further detail in conjunction with the Fig.2 as follows.

[0027] In Stage t1, both the scanning signal scan1 and the control signal "emit" are in low level. Therefore, the second PMOS transistor MP2, the third PMOS transistor MP3, the fourth PMOS transistor MP4 and the fifth PMOS transistor MP5 are all turned on. In this case, the second terminal n2 of the capacitor Cth is pulled down to a lower potential, and the initialization of the gate electrode of the second PMOS transistor MP2 is completed.

[0028] In Stage t2, the control signal "emit" is turned into high level, and the third PMOS transistor MP3 and the fifth PMOS transistor MP5 are turned off. Because the scanning signal scan1 and the scanning signal scan2 are in low level, the first PMOS transistor MP1 and the fourth PMOS transistor MP4 are turned on. In this case, the first terminal n1 of the capacitor Cth is connected to the data signal Vdata, the threshold voltage Vth of the second PMOS transistor MP2 is detected by the second terminal n2 of the capacitor Cth, and the potential is stored in the capacitor Cth.

[0029] In Stage t3, the scanning signal scan1 is turned to high level, and the fourth PMOS transistor MP4 is turned off. The voltage at the second terminal n2 of the capacitor Cth becomes $VDD-V_{th}$, the voltage at the first terminal n1 is Vdata, and the voltage difference across the capacitor Cth is $Vdata - (VDD-V_{th})$.

[0030] In Stage t4, the control signal "emit" is turned to low level. Accordingly, the third PMOS transistor MP3 and the fifth PMOS transistor MP5 are turned on, and the second PMOS transistor MP2 is also turned on. In this case, the voltage at the first terminal n1 of the capacitor Cth becomes Vref. According to the law of charge conservation, the voltage at the second terminal n2 of the capacitor Cth becomes $Vref - Vdata + (VDD-V_{th})$.

[0031] Then, the voltage difference between the source electrode and the gate electrode of the second PMOS transistor MP2 is $V_{sg} = VDD - Vref + Vdata - (VDD - V_{th}) - V_{th} = Vdata - Vref$. It can be concluded that the current flowing through the second PMOS transistor MP2 is $I_{m2} = k(Vdata - Vref)^2$, where k is a constant coefficient which is related to the mobility, the width to length ratio and the gate-source capacitance value of the MOS transistor. Thus the compensation for the threshold voltage Vth and the first supply voltage VDD is achieved.

[0032] However, the inventors have found that, in the pixel circuit described above, there is an overlap between

the scanning signal scan1 and the scanning signal scan2 in time sequence. Specifically, referring to Fig.2, both the scanning signal scan1 and the scanning signal scan2 are in low level in Stage t2. The structure and operation of the peripheral drive circuit for the pixel circuit with such structure are complicated.

[0033] In addition, in the pixel circuit described above, it is needed to continuously provide the data signal Vdata with a high potential to the drain electrode of the first PMOS transistor MP1. That is to say, the data line connected to the first PMOS transistor MP1 can not be left floating; otherwise the compensation for the threshold voltage Vth and the first supply voltage VDD can not be achieved in this circuit. This is because the drain electrode of the first PMOS transistor MP1 is connected to the drain electrode of the fifth PMOS transistor MP5. In Stage t1, when the fifth PMOS transistor MP5 is turned on, the voltage at the drain electrode of the fifth PMOS transistor MP5 is Vref. If the data line is left floating, a leakage current may occur in the drain electrode of the first PMOS transistor MP1, leading to an unstable voltage at the first terminal n1 of the capacitor Cth. Hence, the voltage difference across the capacitor Cth may change, and thus the compensation for the threshold voltage and the first supply voltage can not be actually achieved. Moreover, the need to continuously provide the data signal with high potential increases both the difficulty in IC development and the power consumption of the circuit.

[0034] In order to solve the above problems, the present invention provides a pixel circuit for an organic light emitting display, whereby the waveform of each driving signal can be corrected to simplify the structure of the drive circuit and the power consumption of the circuit can be reduced. Specifically, Fig.3 shows a schematic circuit diagram of a pixel circuit for an organic light emitting display according to an embodiment of the present invention.

[0035] As shown in Fig.3, the pixel circuit according to the embodiment of the present invention includes a first MOS transistor M1, a second MOS transistor M2, a third MOS transistor M3, a fourth MOS transistor M4, a fifth MOS transistor M5, a sixth MOS transistor M6, a first capacitor C1 and an organic light emitting diode D1.

[0036] The gate electrode of the first MOS transistor M1 receives a first scanning signal S1, the first electrode of the first MOS transistor M1 receives a data signal VDATA, and the second electrode of the first MOS transistor M1 is connected to the first terminal N1 of the first capacitor C1. The second terminal N2 of the first capacitor C1 is connected to the gate electrode of the second MOS transistor M2. The first electrode of the second MOS transistor M2 is connected to a first power supply VDD, and the second electrode of the second MOS transistor M2 is connected to the first electrode of the third MOS transistor M3. The gate electrode of the third MOS transistor M3 receives a control signal EMIT, and the second electrode of the third MOS transistor M3 is coupled to a second power supply VEE via the organic light emitting diode

D1. The first electrode of the fourth MOS transistor M4 is connected to the second terminal N2 of the first capacitor C1, the second electrode of the fourth MOS transistor M4 is connected to the second electrode of the second MOS transistor M2, and the gate electrode of the fourth MOS transistor M4 receives the first scanning signal S1. The gate electrode of the fifth MOS transistor M5 receives the control signal EMIT, the first electrode of the fifth MOS transistor M5 receives a reference voltage VREF, and the second electrode of the fifth MOS transistor M5 is connected to the first terminal N1 of the first capacitor C1. The gate electrode of the sixth MOS transistor M6 receives a second scanning signal S2, the first electrode of the sixth MOS transistor M6 receives the reference voltage VREF, and the second electrode of the sixth MOS transistor M6 is connected to the gate electrode of the second MOS transistor M2.

[0037] Specifically, in this embodiment, the first MOS transistor, the second MOS transistor, the third MOS transistor, the fourth MOS transistor, the fifth MOS transistor and the sixth MOS transistor are all PMOS transistors. The first electrode refers to the source electrode of each of the PMOS transistors. The second electrode refers to the drain electrode of each of the PMOS transistors.

[0038] It should be noted that in the other embodiment, the first MOS transistor, the second MOS transistor, the third MOS transistor, the fourth MOS transistor, the fifth MOS transistor and the sixth MOS transistor may also be all NMOS transistors. Of course, the invention is not limited thereto, and other variations can be made to the first MOS transistor to the sixth MOS transistor by those skilled in the art as required. For example, some of the transistors may be PMOS transistor(s), and the other may be NMOS transistor(s). Any circuit that can realize the object of the present invention should fall within the scope of protection of the present invention.

[0039] Fig.4 shows a timing diagram of the scanning signals and the control signal for the pixel circuit according to the present invention. The operational principle of the pixel circuit according to the present invention will be described in further detail in conjunction with the Fig.3 and the Fig.4 below.

[0040] Referring to the Fig.4, in Stage T1, both the first scanning signal S1 and the control signal EMIT are in high level. Thereby, the first MOS transistor M1, the third MOS transistor M3, the fourth MOS transistor M4 and the fifth MOS transistor M5 are turned off. Furthermore, the second scanning signal S2 is in low level and thereby the sixth MOS transistor M6 is turned on. The reference voltage VREF is transmitted to the gate electrode of the second MOS transistor M2 through the sixth MOS transistor M6, that is, the voltage at the second terminal N2 of the first capacitor C1 is VREF.

[0041] In Stage T2, the first scanning signal S1 is turned to low level, and thus the first MOS transistor M1 is turned on. Thereby, the voltage at the first terminal N1 of the first capacitor C1 is VDATA. Furthermore, the

fourth MOS transistor M4 is turned on, so that a diode connection is formed in the second MOS transistor M2. In this case, the voltage at the second terminal N2 of the first capacitor C1 is $VDD-V_{th}$ (V_{th} is the threshold voltage of the MOS transistor), and thus the voltage difference across the first capacitor C1 is $V_{DATA}-(VDD-V_{th})$. Moreover, the second scanning signal S2 is turned to high level, and thus the sixth MOS transistor M6 is turned off. The control signal EMIT is still high level, and thus the third MOS transistor M3 and the fifth MOS transistor M5 are turned off.

[0042] In Stage T3, the first scanning signal S1 is turned to high level, and thus the first MOS transistor M1 and the fourth MOS transistor M4 are turned off. The second scanning signal S2 is in high level, and thus the sixth MOS transistor M6 is turned off. The control signal EMIT is turned to low level, and thus the third MOS transistor M3 and the fifth MOS transistor M5 are turned on. The voltage at the first terminal N1 of the first capacitor C1 is reset because the fifth MOS transistor M5 is turned on. Accordingly, the voltage at the first terminal N1 of the first capacitor C1 is VREF. According to the law of charge conservation, the voltage at the second terminal N2 of the first capacitor C1 is $VREF - V_{DATA} + (VDD - V_{th})$. Thereby, the voltage difference between the source electrode and the gate electrode of the second MOS transistor M2 is $V_{sg} = VDD - VREF + V_{DATA} - (VDD - V_{th}) - V_{th} = V_{DATA} - VREF$. It can be concluded that the current flowing through the second MOS transistor M2 is $I_{m2} = k(V_{data} - V_{ref})^2$, where k is a constant coefficient which is related to the mobility, the width to length ratio and the gate-source capacitance value of the MOS transistor. The organic light emitting diode D1 is driven to emit light when the third MOS transistor M3 is turned on.

[0043] It can be known from the above mentioned operational principle that the compensation for the threshold voltage V_{th} and the first supply voltage VDD has been achieved through the pixel circuit according to the embodiment of the present invention. Moreover, it can be seen from the Fig.4 that the first scanning signal S1 and the second scanning signal S2 are independent of each other in time sequence. Accordingly, a more simple drive circuit can be used to provide the drive signals, and the operation of the drive circuit is more convenient. In addition, since the drive signals are independent of each other in the time sequence, the multi-channel selection of the pixel circuit can be achieved so as to improve the integrity and convenience of the pixel circuit.

[0044] In addition, according to the embodiment of the present invention, in an initialization stage (i.e. Stage T1), it is not necessary to continuously provide the data signal VDATA to the pixel circuit. This is because the fourth MOS transistor M4 is not turned on in the initialization stage, so there is no resistance drop by the second PMOS transistor MP2 and the third PMOS transistor MP3 as shown in Fig. 1, but the second terminal N2 of the first capacitor C1 is charged to the potential VREF directly. Meanwhile, neither the first MOS transistor M1 nor the

fifth MOS transistor M5 is turned on. Therefore the leakage current does not occur at the first terminal N1 of the first capacitor C1. Accordingly, the data line connected to the first MOS transistor M1 can be left floating. The pixel circuit with this structure reduces the difficulty in IC development and the whole power consumption of the circuit, since it is not necessary to continuously provide the data signal VDATA with a relatively high potential.

[0045] Correspondingly, the present invention further provides a driving method for the pixel circuit shown in Fig.3. The driving method includes the following stages. In an initialization stage, the first MOS transistor M1 and the fourth MOS transistor M4 are turned off via the first scanning signal S1, the third MOS transistor M3 and the fifth MOS transistor M5 are turned off via the control signal EMIT, the sixth MOS transistor M6 is turned on via the second scanning signal S2, and the reference voltage VREF is transmitted to the gate electrode of the second MOS transistor M2 through the sixth MOS transistor M6.

[0046] In a data-writing stage, the first MOS transistor M1 and the fourth MOS transistor M4 are turned on via the first scanning signal S1, the data signal VDATA is transmitted to the first terminal of the first capacitor C1 through the first MOS transistor M1, and the fourth MOS transistor M4 is turned on, resulting in a diode connection formed in the second MOS transistor M2; the sixth MOS transistor M6 is turned off via the second scanning signal S2, and the third MOS transistor M3 and the fifth MOS transistor M5 are turned off via the control signal EMIT.

[0047] In a light emitting stage, the first MOS transistor M1 and the fourth MOS transistor M4 are turned off via the first scanning signal S1, the sixth MOS transistor M6 is turned off via the second scanning signal S2, the fifth MOS transistor M5 and the third MOS transistor M3 are turned on via the control signal EMIT. The voltage across the first capacitor C1 is reset due to the turning on of the fifth MOS transistor M5, a corresponding drive current is generated by the third MOS transistor M3 based on the reset of the voltage across the first capacitor C1, and the drive current is configured to drive the organic light emitting diode D1 to emit light.

[0048] Preferably, the data signal is provided in the data-writing stage, while the data signal is not provided in the initialization stage and the light emitting stage. In other words, the data line can be left floating in the initialization stage and the light emitting stage.

[0049] Correspondingly, the present invention further provides an organic light emitting display. As shown in Fig.5, the organic light emitting display includes: a scanning drive unit 10, a data drive unit 20, N scan lines (S1, S2,..., Sn), M data lines (D1, D2, ..., Dm) and multiple pixel circuits (P11, P12, ..., P1m, P21, P22, ..., P2m, ..., Pn1, Pn2, ..., Pnm). The structures of the pixel circuits are similar to that of the pixel circuit shown in Fig.3, and descriptions thereof are omitted herein.

[0050] Specifically, the scanning drive unit 10 is configured to provide scanning signals to respective scan lines (S1, S2,..., Sn). The data drive unit 20 is configured

to provide data signals to respective data lines (D1, D2, ..., Dm). The multiple pixel circuits are respectively arranged in pixel areas formed by intersection of the N scan lines and the M data lines.

[0051] Preferably, in each of the pixel circuits for the organic light emitting display according to the present invention, the gate electrodes of the first MOS transistor M1 and the fourth MOS transistor M4 are both connected to the nth scan line, and the gate electrode of the sixth MOS transistor M6 is connected to the (n+1)th scan line, where $1 \leq n < N$.

[0052] In other embodiments, of course, the gate electrode of the first MOS transistor M1, the gate electrode of the fourth MOS transistor M4 and the gate electrode of the sixth MOS transistor M6 may also be connected to the scan lines in other way, which should not be limited to the above preferred embodiment.

[0053] Compared with the drive circuit in the prior art, the scanning drive circuit for the organic light emitting display according to the embodiment of the present invention is simpler in structure and more convenient in operation for employing the pixel circuit shown in Fig.3. In addition, it is not necessary to continuously provide the data signal with relatively high potential to the data line in the initialization stage. Therefore, the power consumption of the organic light emitting display according to the embodiment of the present invention is also lower than that in the prior art.

[0054] Though the present invention is disclosed by way of preferred embodiments as described above, those embodiments are not intended to limit the present invention. Based on the methods and the technical aspects disclosed above, possible variations and changes may be made to the technical solutions of the present invention by those skilled in the art without departing from the spirit and the scope of the present invention. Therefore, any simple change, equivalent alternation and modification made to the above embodiments according to the principle of the present invention, which do not depart from the subject matters of the present invention, fall within the scope of protection of the present invention.

Claims

1. A pixel circuit for an organic light emitting display, **characterizing in** comprising: a first MOS transistor, a second MOS transistor, a third MOS transistor, a fourth MOS transistor, a fifth MOS transistor, a sixth MOS transistor, a first capacitor and an organic light emitting diode, wherein:

a gate electrode of the first MOS transistor receives a first scanning signal, a first electrode of the first MOS transistor receives a data signal, and a second electrode of the first MOS transistor is connected to a first terminal of the first capacitor; a second terminal of the first capacitor

is connected to a gate electrode of the second MOS transistor; a first electrode of the second MOS transistor is connected to a first power supply, and a second electrode of the second MOS transistor is connected to a first electrode of the third MOS transistor; a gate electrode of the third MOS transistor receives a control signal, and a second electrode of the third MOS transistor is coupled to a second power supply via the organic light emitting diode; a first electrode of the fourth MOS transistor is connected to the second terminal of the first capacitor, a second electrode of the fourth MOS transistor is connected to the second electrode of the second MOS transistor, and a gate electrode of the fourth MOS transistor receives the first scanning signal; a gate electrode of the fifth MOS transistor receives the control signal, a first electrode of the fifth MOS transistor receives a reference voltage, and a second electrode of the fifth MOS transistor is connected to the first terminal of the first capacitor; a gate electrode of the sixth MOS transistor receives a second scanning signal, a first electrode of the sixth MOS transistor receives the reference voltage, and a second electrode of the sixth MOS transistor is connected to the gate electrode of the second MOS transistor.

2. The pixel circuit according to claim 1, wherein the first scanning signal and the second scanning signal are independent of each other in time sequence.
3. The pixel circuit according to one of the previous claims, wherein the first MOS transistor, the second MOS transistor, the third MOS transistor, the fourth MOS transistor, the fifth MOS transistor and the sixth MOS transistor are all PMOS transistors.
4. The pixel circuit according to one of claims 1 or 2, wherein the first MOS transistor, the second MOS transistor, the third MOS transistor, the fourth MOS transistor, the fifth MOS transistor and the sixth MOS transistor are all NMOS transistors.
5. A driving method for the pixel circuit according to one of the previous claims comprising:

in an initialization stage, turning off the first MOS transistor and the fourth MOS transistor via the first scanning signal, turning off the third MOS transistor and the fifth MOS transistor via the control signal, turning on the sixth MOS transistor via the second scanning signal, so that the reference voltage is transmitted to the gate electrode of the second MOS transistor through the sixth MOS transistor;
in a data-writing stage, turning on the first MOS

transistor and the fourth MOS transistor via the first scanning signal, so that the data signal is transmitted to the first terminal of the first capacitor through the first MOS transistor, and the fourth MOS transistor is turned on, resulting in a diode connection formed in the second MOS transistor; and turning off the sixth MOS transistor via the second scanning signal, and turning off the third MOS transistor and the fifth MOS transistor via the control signal; and in a light emitting stage, turning off the first MOS transistor and the fourth MOS transistor via the first scanning signal, turning off the sixth MOS transistor via the second scanning signal, turning on the fifth MOS transistor and the third MOS transistor via the control signal, wherein a voltage across the first capacitor is reset due to the turning on of the fifth MOS transistor, a corresponding drive current is generated by the third MOS transistor based on the reset of the voltage across the first capacitor, and the drive current is configured to drive the organic light emitting diode to emit light.

6. The driving method according to claim 5, wherein the data signal is provided in the data-writing stage and the data signal is not provided in the initialization stage and the light emitting stage.
7. An organic light emitting display **characterizing in** comprising: a scanning drive unit, a data drive unit, N scan lines, M data lines and a plurality of pixel circuits according to any one of claims 1 to 4; wherein the scanning drive unit is configured to provide scanning signals to respective scan lines; the data drive unit is configured to provide data signals to respective data lines; the plurality of the pixel circuits are respectively arranged in pixel areas formed by intersection of the N scan lines and the M data lines.
8. The organic light emitting display according to claim 7, wherein the gate electrodes of the first MOS transistor and the fourth MOS transistor are both connected to the nth scan line, and the gate electrode of the sixth MOS transistor is connected to the (n+1)th scan line, where $1 \leq n < N$.

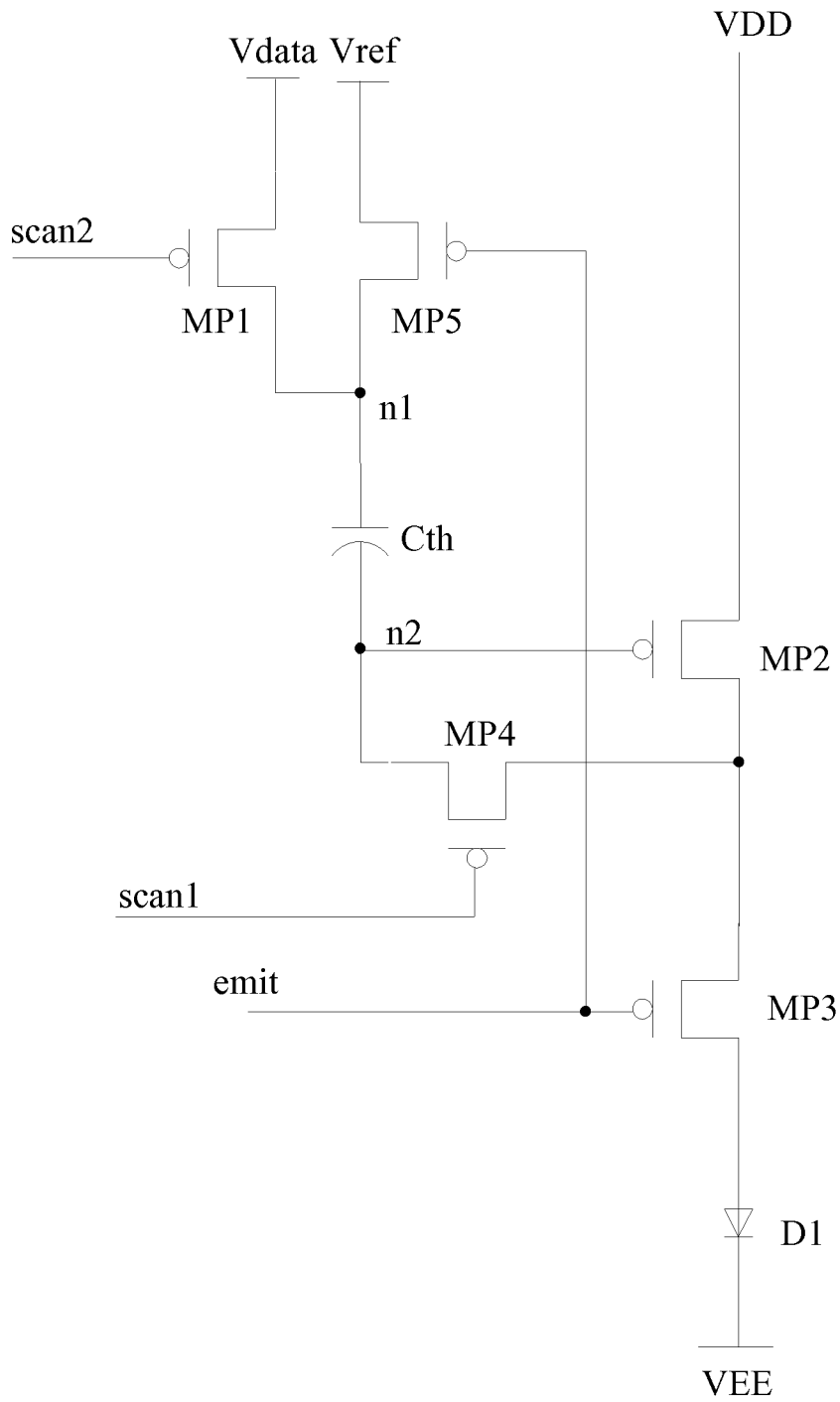


Fig. 1

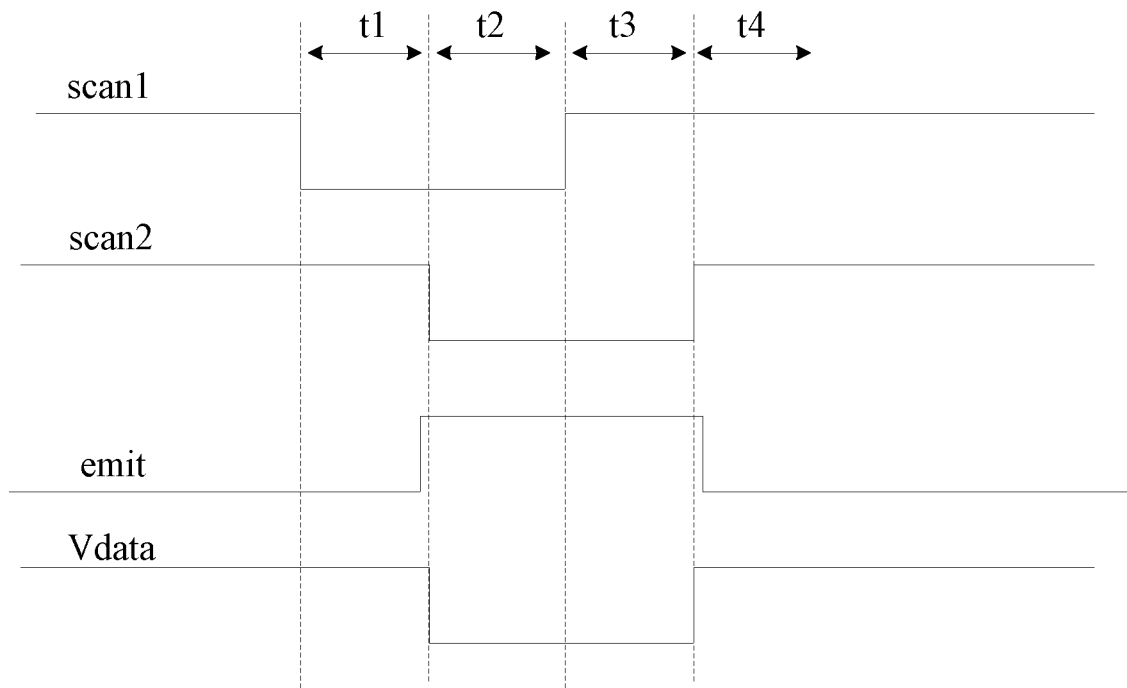


Fig. 2

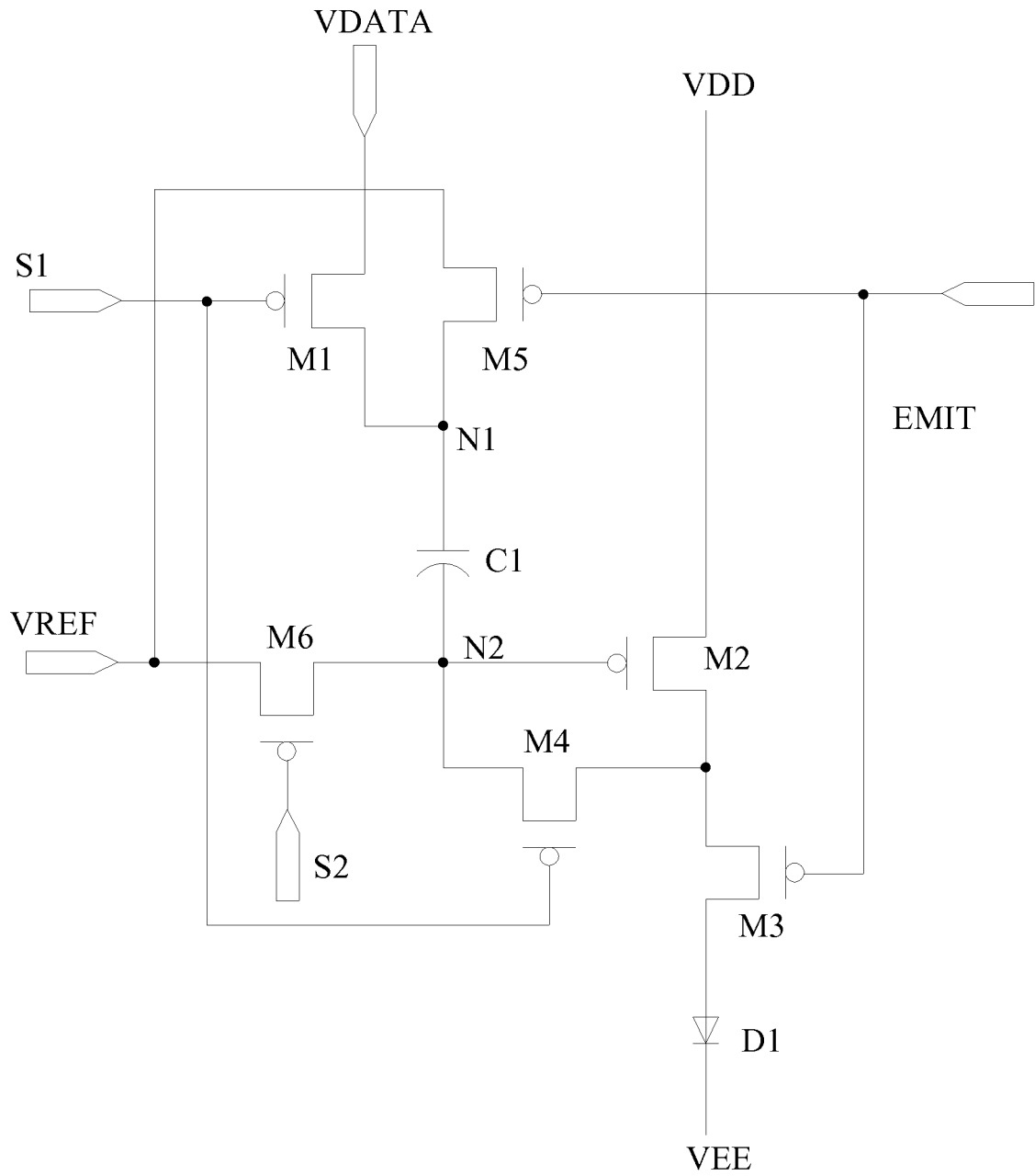


Fig. 3

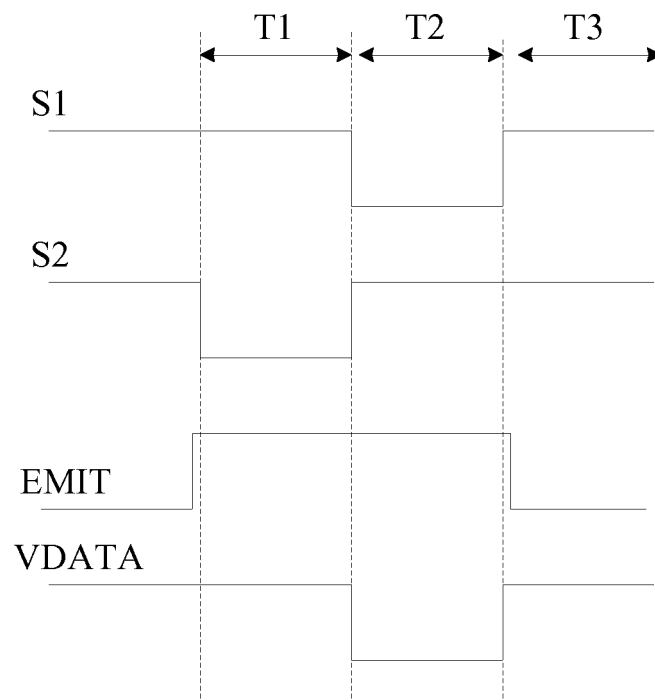


Fig. 4

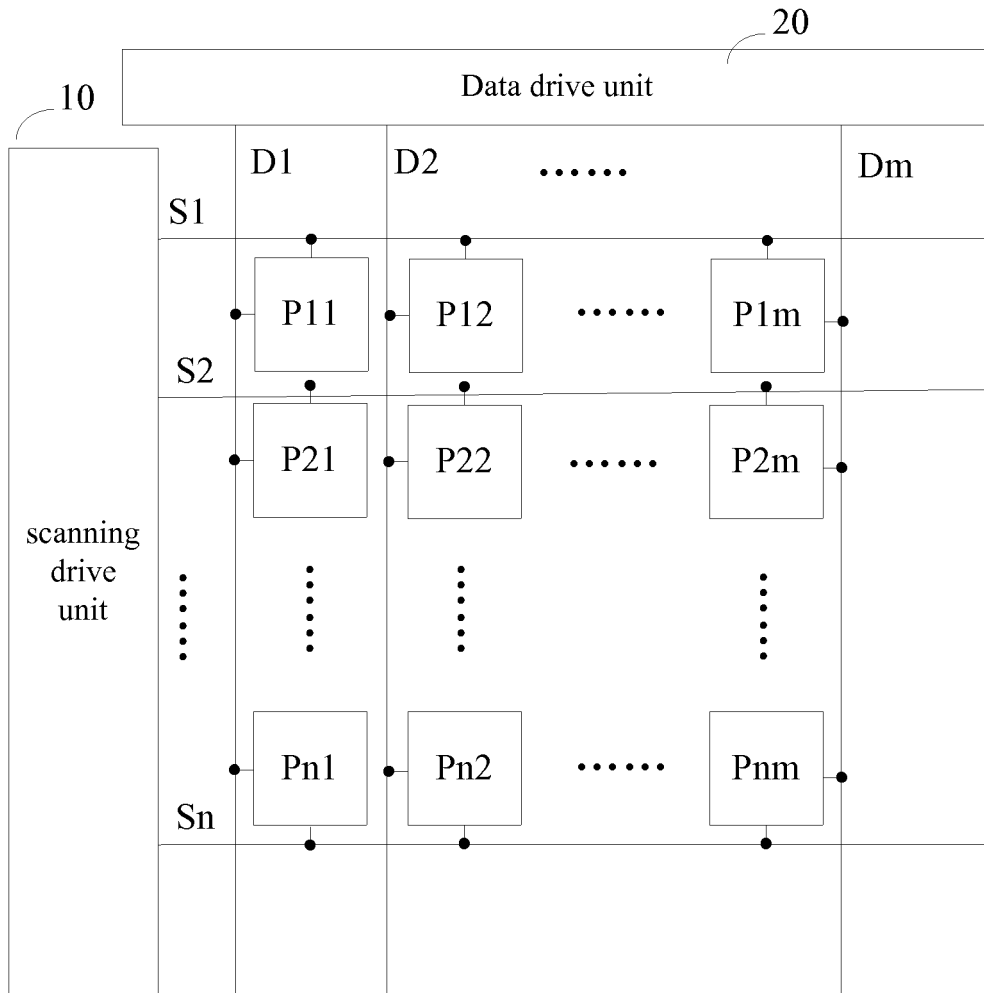


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 13 16 5100

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/167648 A1 (LG DISPLAY CO LTD) 2 July 2009 (2009-07-02) * paragraphs [0057] - [0061]; figures 8,9 *	1-8	INV. G09G3/32
X	----- US 2010/073266 A1 (NA HYUNG-DON [KR] ET AL) 25 March 2010 (2010-03-25) * figures 2,3 *	1	
A	----- EP 1 939 846 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 2 July 2008 (2008-07-02) * figures 3,4 *	2-8	
A	-----	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 January 2014	Vázquez del Real, S
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