US 20150302801A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2015/0302801 A1**

(43) **Pub. Date: Oct. 22, 2015**

Tan et al.

(54) **ACTIVE MATRIX ORGANIC LIGHT EMITTING DIODE PIXEL UNIT CIRCUIT AND DISPLAY PANEL**

(71) Applicants: **BOE TECHNOLOGY GROUP CO., LTD.**, Beijing (CN); **CHENGDU BOE OPTOELECTRONICS TECHNOLOGY CO., LTD.**, Chengdu, Sichuan (CN)

(72) Inventors: **Wen Tan**, Beijing (CN); **Xiaojing Qi**, Beijing (CN); **Bo Wu**, Beijing (CN)

(73) Assignees: **Chengdu BOE Optoelectronics Technologies Co., Ltd.**, Chengdu, Sichuan Province (CN); **BOE Technology Group Co., Ltd.**, Chaoyang District, Beijing (CN)

(21) Appl. No.: **14/235,319**

(22) PCT Filed: **Oct. 9, 2013**

(86) PCT No.: **PCT/CN2013/084919**

§ 371 (c)(1),
(2) Date: **Jan. 27, 2014**

(30) **Foreign Application Priority Data**

Jun. 26, 2013 (CN) 201310259706.5

Publication Classification

(51) **Int. Cl.**

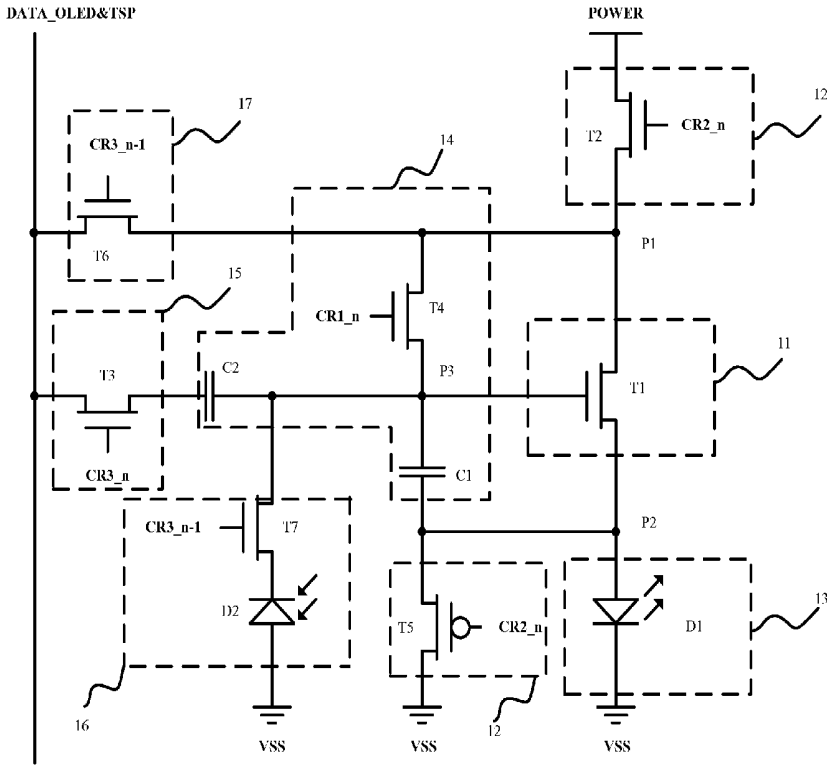
G09G 3/32	(2006.01)
G06F 3/041	(2006.01)
H01L 27/32	(2006.01)

(52) **U.S. Cl.**

CPC ***G09G 3/3258*** (2013.01); ***H01L 27/323*** (2013.01); ***H01L 27/3248*** (2013.01); ***G06F 3/0412*** (2013.01); ***G06F 3/0416*** (2013.01); *G09G 2300/0426* (2013.01); *G09G 2300/043* (2013.01); *G09G 2300/0819* (2013.01); *G09G 2310/0291* (2013.01); *G09G 2320/0219* (2013.01)

(57) **ABSTRACT**

The present invention provides an active matrix organic light emitting diode, AMOLED pixel unit circuit and a display panel for integrating a touch screen circuit into the AMOLED pixel unit circuit, and manufacturing an AMOLED display panel having the functionality of a touch screen. The AMOLED pixel unit circuit comprises a driving module, configured to amplify a induction signal generated by a touch sensing module, output the induction signal through a induction signal output module, and drive a light emitting module; the light emitting control module, configured to control the light emitting module to emit light; a threshold compensation module, configured to compensate a threshold voltage of the driving module; a charging module, configured to charge the threshold compensation module; the touch sensing module, configured to generate the induction signal and output the induction signal to the driving module; and the induction signal output module, configured to output the induction signal amplified by the driving module.



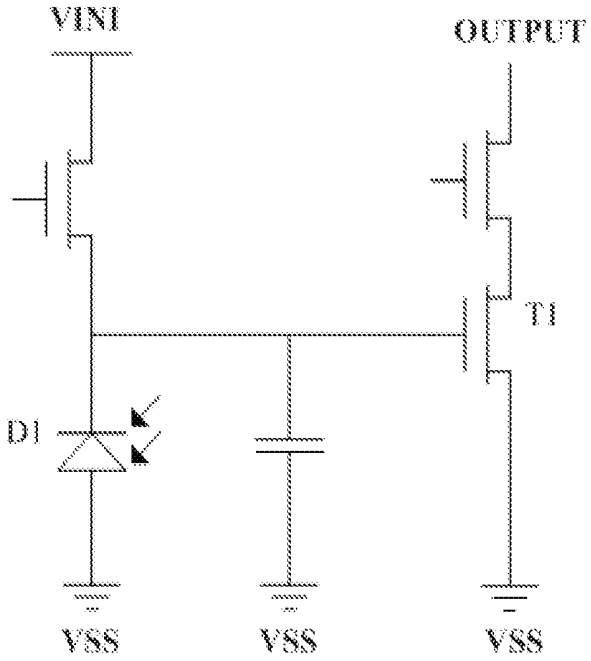


Fig. 1(a)

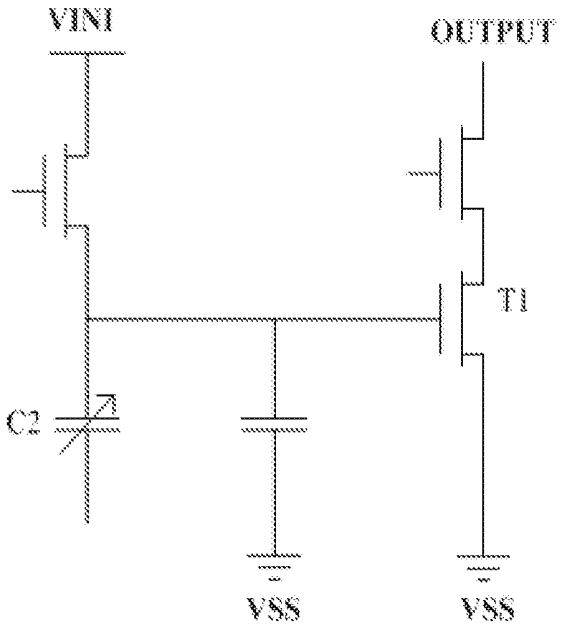


Fig. 1(b)

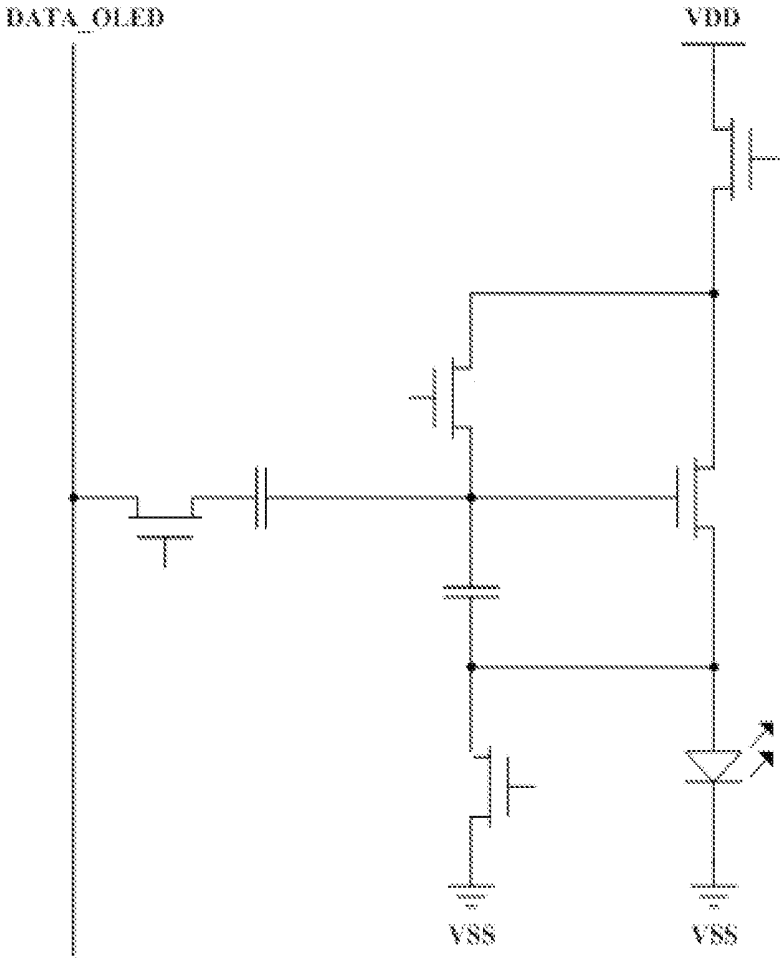


Fig. 2

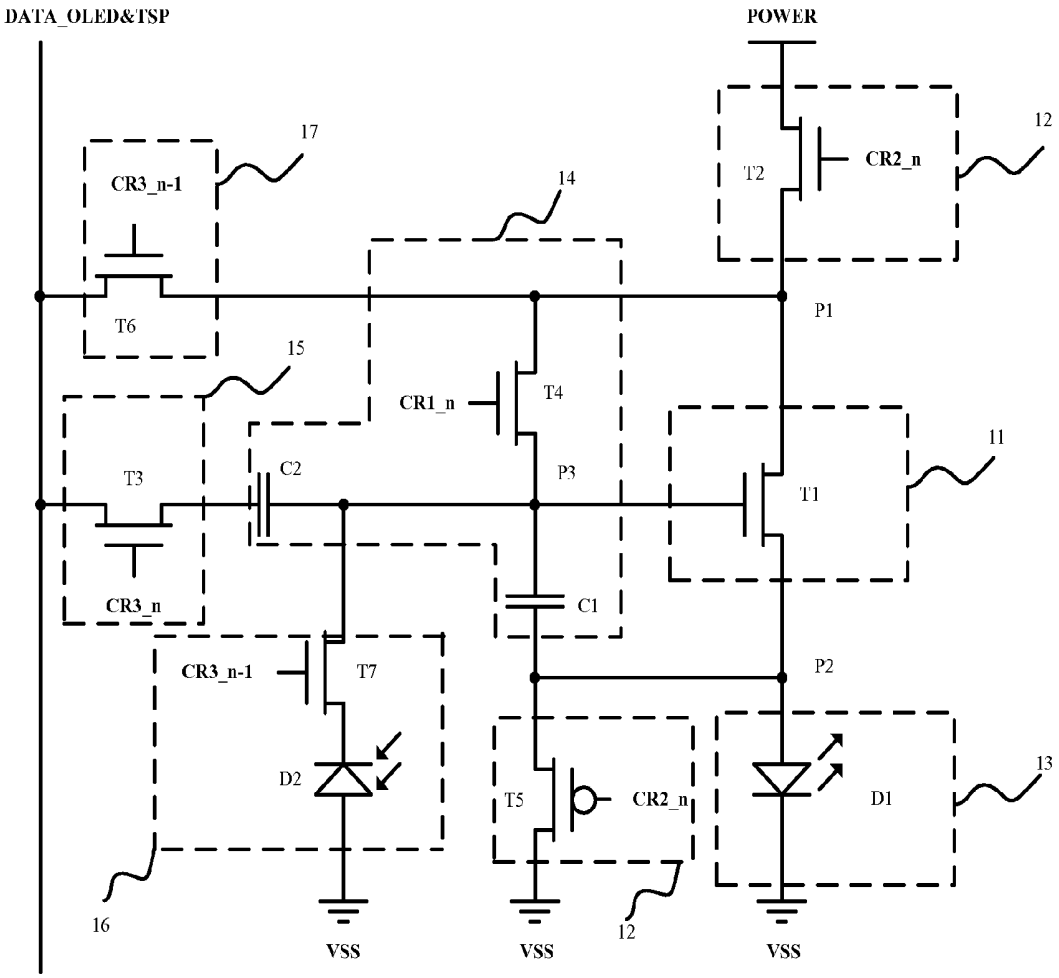

DATA_OLED&TSP
POWER
17
CR3_n-1
14
T2
CR2_n
12
T6
P1
15
CR1_n
T4
11
T3
C2
P3
T1
CR3_n
C1
CR3_n-1
T7
P2
D2
T5
CR2_n
D1
13
16
VSS
VSS
12
VSS

Fig.3

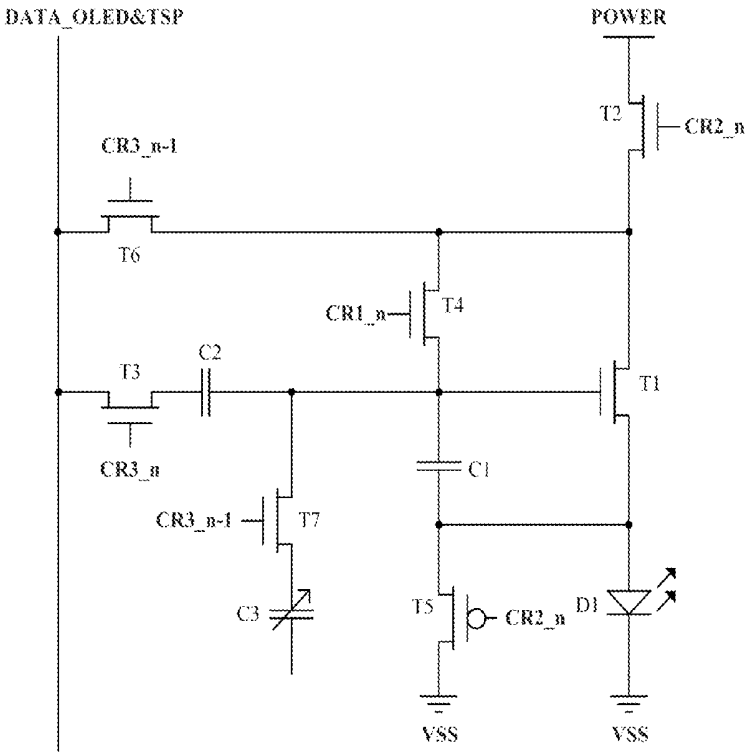

DATA_OLED&TSP
POWER
T2
CR2_n
CR3_n-1
T6
CR1_n
T4
C2
T3
T1
CR3_n
C1
CR3_n-1
T7
C3
T5
CR2_n
D1
VSS
VSS

Fig. 4

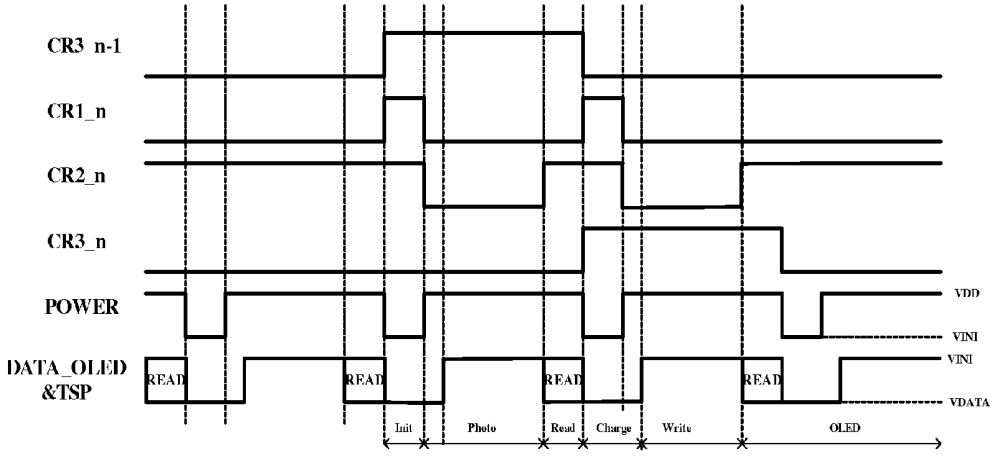

CR3 n-1
CR1_n
CR2_n
CR3_n
POWER
DATA_OLED &TSP
READ
READ
READ
READ
VDD
VINI
VINI
VDATA
Init
Photo
Read
Charge
Write
OLED

Fig. 5

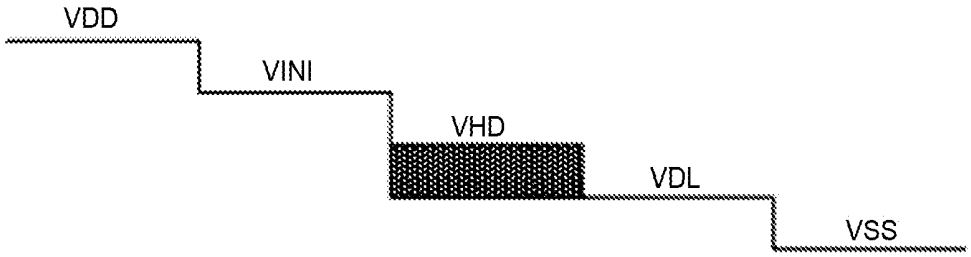


Fig. 6

ACTIVE MATRIX ORGANIC LIGHT EMITTING DIODE PIXEL UNIT CIRCUIT AND DISPLAY PANEL

TECHNICAL FIELD

[0001] The present invention relates to the field of display, in particular to an active matrix organic light emitting diode pixel unit circuit and a display panel.

BACKGROUND

[0002] Touch Screen Panel (TSP) in Cell technique is to manufacture a TSP sensor and a driving circuit thereof on an array substrate by an array process. The TSP sensor is integrated with a liquid crystal cell of the panel of the Liquid Crystal Display (LCD) so that the product is light and thin and has versatile functionalities. Therefore, the reliability of the touch panel is effectively improved.

[0003] FIG. **1**(*a*) and FIG. **1**(*b*) show a basic light induced TSP in Cell circuit in the prior art. As shown in FIG. **1**(*a*), the sensor senses light using a photodiode D**1** and generates electric leakage to detect a touch signal. As shown in FIG. **1**(*b*), the sensor senses light using a sensitive capacitor C**2** and detects the touch signal by the coupling of the sensitive capacitor and the change of the capacitor. Thin-Film Transistor (TFT) T**1** functions as an amplifying transistor to amplify the voltage change across D**1** after detecting the touch signal, increase the driving capability of the TSP in Cell circuit output, so that an external readout circuit for TSP may correctly read out the detection result.

[0004] Active Matrix Organic Light Emitting Diode (AMOLED) has a faster response speed, a higher contrast ratio and a wider angle of view as compared with a traditional liquid crystal panel. AMOLED Pixels are driven to emit light by a relevant driving circuit on the array substrate. FIG. **2** shows an AMOLED pixel unit circuit according to an embodiment.

[0005] If the TSP in Cell circuit as shown in FIG. **1**(*a*) or FIG. **1**(*b*) is simply integrated into the AMOLED pixel unit circuit as shown in FIG. **2**, except for the existing five TFTs and two capacitors, three TFTs and one capacitor are required to be added, and respect to the control signals, except for the existing three control signals and two power sources, three control signals are required to be added. However, there is not enough space in the AMOLED pixels for the addition of these TFTs and signal lines. Therefore, in the prior art, the TSP in Cell circuit cannot be integrated into the AMOLED pixel unit circuit.

SUMMARY

[0006] An embodiment of the present invention provides an active matrix organic light emitting diode pixel unit circuit and a display panel for integrating a touch screen circuit into the AMOLED pixel unit circuit and manufacturing a AMOLED display panel having the functionality of a touch screen.

[0007] An embodiment of the present invention provides an active matrix organic light emitting diode AMOLED pixel unit circuit, comprising a light emitting module, a driving module, a charging module, a threshold compensation module, a light emitting control module, a touch sensing module and a induction signal output module, wherein, the driving module is configured to amplify a induction signal generated by the touch sensing module, output the induction signal through the induction signal output module, and drive the light emitting module;

[0008] the light emitting control module is configured to control the light emitting module to emit light;

[0009] the threshold compensation module is configured to compensate a threshold voltage of the driving module;

[0010] the charging module is configured to charge the threshold compensation module;

[0011] the touch sensing module is configured to generate the induction signal and output the induction signal to the driving module; and the induction signal output module is configured to output the induction signal amplified by the driving module.

[0012] An embodiment of the present invention provides a display panel, comprising the above AMOLED pixel unit circuit.

[0013] According to above technical solution, a few circuit components are added into the AMOLED pixel unit circuit according to an embodiment of the present invention, and the TSP in Cell circuit is integrated into the AMOLED pixel unit circuit using common data lines, circuit components and control signals and so on.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1**(*a*) and FIG. **1**(*b*) are schematic diagrams showing touch screen circuits in the prior art;

[0015] FIG. **2** is a schematic diagram showing an AMOLED pixel unit circuit in the prior art;

[0016] FIG. **3** is a schematic diagram showing an AMOLED pixel unit circuit according to an embodiment of the present invention;

[0017] FIG. **4** is a schematic diagram showing an AMOLED pixel unit circuit according to another embodiment of the present invention;

[0018] FIG. **5** is a time sequence diagram of a control signal of the AMOLED pixel unit circuit according to an embodiment of the present invention;

[0019] FIG. **6** is a diagram showing the level size relationship among the control signals of the AMOLED pixel unit circuit according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0020] An embodiment of the present invention provides an active matrix organic light emitting diode pixel unit circuit and a display panel for integrating the touch panel circuit into the AMOLED pixel unit circuit and manufacturing the AMOLED display panel having the functionality of a touch screen.

[0021] As shown in FIG. **3**, an embodiment of the present invention provides an active matrix organic light emitting diode pixel unit circuit, comprising a light emitting module **13**, a driving module **11**, a charging module **15**, a threshold compensation module **14**, a light emitting control module **12**, a touch sensing module **16** and a induction signal output module **17**; wherein

[0022] The driving module **11** is configured to amplify a induction signal generated by the touch sensing module **16**, output the induction signal through the induction signal output module **17**, and drive the light emitting module **13**.

[0023] The light emitting control module **12** is configured to control the light emitting module **13** to emit light.

[0024] The threshold compensation module **14** is configured to compensate a threshold voltage of the driving module **11**.

[0025] The charging module **15** is configured to charge the threshold compensation module **14**.

[0026] The touch sensing module **16** is configured to generate the induction signal and output the induction signal to the driving module **11**.

[0027] The induction signal output module **17** is configured to output the induction signal amplified by the driving module **11**.

[0028] Preferably, the driving module **11** comprises a first transistor T**1**, the gate electrode thereof is connected to the threshold compensation module **14** through a node P**3**, as shown in FIG. **3**. The other two electrodes of the first transistor T**1** are connected to a first node P**1** and a second node P**2** of the light emitting control module **12** respectively.

[0029] Preferably, the light emitting control module **12** comprises a second transistor T**2** and a fifth transistor T**5**. Wherein, the gate electrode of the second transistor T**2** is connected to a second signal control line of the AMOLED pixel unit circuit at the same stage (corresponding to the second control signal CR**2**_*n* of the AMOLED pixel unit circuit at the same stage), the other two electrodes of the second transistor T**2** are connected to a power source line (corresponding to the power control signal POWER) and the first node P**1**, respectively. The gate electrode of the fifth transistor T**5** is connected to the second signal control line of the AMOLED pixel unit circuit at the same stage, and the other two electrodes are connected to the second node P**2** and a low voltage level VSS signal line, respectively.

[0030] Preferably, the light emitting module **13** comprises a first light emitting diode D**1**, and one end thereof is connected to the second node P**2** and the other end thereof is connected to the low voltage level signal line (corresponding to the low voltage level signal VSS).

[0031] Preferably, the threshold compensation module **14** comprises a fourth transistor T**4**, a first capacitor C**1** and a second capacitor C**2**.

[0032] Wherein, the gate electrode of the fourth transistor T**4** is connected to a first signal control line of the AMOLED pixel unit circuit at the same stage (corresponding to the first control signal CR**1**_*n* of the AMOLED pixel unit circuit at the same stage), the other two electrodes are connected to the first node P**1** and the gate electrode of the first transistor T**1**, respectively. The first capacitor C**1** is connected between the gate electrode of the first transistor T**1** and the second node P**2**. The second capacitor C**2** is connected between the charging module **15** and the gate electrode of the first transistor T**1**.

[0033] Preferably, the charging module **15** comprises a third transistor T**3**, the gate electrode thereof is connected to a third signal control line of the AMOLED pixel unit circuit at the same stage (corresponding to the fourth control signal CR**3**_*n*), the other two electrodes of the third transistor T**3** are connected to a data line (corresponding to the data signal DATA_OLED&TSP) and the second capacitor C**2** of the threshold compensation module **14**, respectively.

[0034] Preferably, the touch sensing module **16** comprises a seventh transistor T**7** and a second light emitting diode D**2**. Wherein, the gate electrode of the seventh transistor T**7** is connected to the third signal control line of the AMOLED pixel unit circuit at the previous stage (corresponding to the third control signal CR**3**_*n*−1 of the AMOLED pixel unit circuit at the previous stage), the other two electrodes of the seventh transistor T**7** are connected to the second light emitting diode D**2** and the gate electrode of the first transistor T**1**. One end of the second light emitting diode D**2** is connected to the seventh transistor T**7**, and the other end of the second light emitting diode D**2** is connected to the low voltage level signal line. Or

[0035] FIG. **4** is a schematic diagram showing an AMOLED pixel unit circuit according to another embodiment of the present invention. As shown in FIG. **4**, the touch sensing module comprises the seventh transistor T**7** and a sensing capacitor C**3**. Wherein, the gate electrode of the seventh transistor T**7** is connected to the third signal control line of the AMOLED pixel unit circuit at the previous stage, the other two electrodes of the seventh transistor T**7** are connected to the sensing capacitor C**3** and the gate electrode of the first transistor T**1**, respectively. One end of the sensing capacitor C**3** is connected to the seventh transistor T**7**, and the other end needs to contact with external environment, for example, a human body, so as to change the voltage of the first capacitor C**1** based on the coupling of the sensing capacitor and the change of the capacitor.

[0036] Referring back to FIG. **3**, preferably, the induction signal output module **17** comprises a sixth transistor T**6**, the gate electrode thereof is connected to the third signal control line of the AMOLED pixel unit circuit at the previous stage, and the other two electrodes of the sixth transistor are connected to the date line and the first node P**1**, respectively.

[0037] Preferably, the anode of the second light emitting diode D**2** is connected to the low voltage level signal line, and the cathode is connected to the seventh transistor T**7**.

[0038] Preferably, the anode of the first light emitting diode D**1** is connected to the second node P**2**, and the cathode is connected to the low voltage level signal line.

[0039] Preferably, the first transistor T**1**, the second transistor T**2**, the third transistor T**3**, the fourth transistor T**4**, the sixth transistor T**6** and the seventh transistor T**7** are all N type thin film transistors TFTs, the fifth transistor T**5** is a P type TFT.

[0040] After the touch sensing module **16** generates the induction signal, the induction signal is amplified and output by the first transistor T**1**. At this time, the sixth transistor T**6** is on, the current outputted from the first transistor T**1** is transmitted to the data line, a signal generated by touching is read out through the data line.

[0041] When the seventh transistor T**7** is on, sensing component D**2** or C**3** is capable of generating the induction signal and the induction signal is inputted into the first transistor T**1**.

[0042] The touch sensing module **16** also uses the capacitor C**1** as a storage capacitor and also uses the power line. The power line alternatively inputs required levels for the TSP in cell circuit and the AMOLED circuit.

[0043] According to an embodiment of the present invention, the low voltage level signal VSS is a cut-off level and the value of the cut-off level is maintained constant.

[0044] The difference between the structure shown in FIG. **4** and the structure shown in FIG. **3** is that if the sensing component is a sensing capacitor, one end of the sensing capacitor is connected to the seventh transistor, and the other end of the sensing capacitor needs to be connected to the external environment such as a human body, and the voltage of the first capacitor is changed according to the coupling of the sensing capacitor and the change of the capacitor. There are no differences among other connections.

[0045] The specific operating principle of the circuit according to an embodiment of the present invention will be described in detail with reference to FIG. **3**, FIG. **5** and FIG. **6**.

[0046] FIG. **5** shows the time sequences of the operating signals according to an embodiment of the present invention. The circuit according to an embodiment of the present invention works in six operating phases, which are an Init phase (an initial phase), a sensing Photo phase, a Read phase, a Charge phase, a Write phase and an organic light emitting diode OLED phase. As shown in FIG. **5**, VDATA is a grayscale voltage of the data line DATA_OLED&TSP, the range of the grayscale voltage is [VDL, VDH], and the brightness of D**1** is different under different grayscale voltages. Each phase will be described as below. FIG. **6** shows the size relationship among the signal levels shown in FIG. **5**. The size of the level is shown in the vertical direction, the level is bigger when the height is higher and the level is smaller when the height is lower. As shown in FIG. **6**, VSS<VDL<VDH<VINI<VDD, these values of the levels are preset, and the specific level may be set according to actual requirements.

[0047] Init Phase: T**7** is on, the photodiode D**2** functioned as the TSP sensor is connected to the gate electrode of T**1** which functioned as an amplifying TFT, C**1** is the storage capacitor for the amplifying TFT T**1**. T**2** and T**4** are on, the level of POWER is VINI. TSP is initialized, that is the storage capacitor C**1** connected to the gate electrode of T**1** is pre-charged to the initialized level VINI so that T**1** operates in a saturated and amplified states during the subsequent phases.

[0048] Photo Phase: T**2** and T**4** are off, and T**7** is on. The photodiode D**2** detects the touch status of a panel. When the panel is touched by a finger, an external light source cannot illuminate the photodiode D**2**, D**2** receives fewer light and its light induced leakage current is small, thereby the change of the voltage level of C**1** caused by electric leakage is smaller during the Photo Phase. When the panel is not touched by a finger, the external light source can illuminate the photodiode D**2**, D**2** receives more light and generates larger light induced leakage current, thereby the change of the voltage level of C**1** caused by electric leakage is larger during the Photo Phase. Therefore, if the panel is touched, the difference between the voltage of the gate electrode of T**1** and the initial voltage is small, and if the panel is not touched, the difference between the voltage of the gate electrode of T**1** and the initial voltage is large.

[0049] Read Phase: the level generated during Photo Phase is stored in C**1**. At this time, T**6** is on, and T**3** and T**4** are off. DATA_OLED&TSP functions as a readout line for TSP output result. The voltage of the gate electrode of T**1** is amplified through the first node P**1** and T**6**, and is outputted to the readout line, which is also outputted to an external TSP readout circuit.

[0050] TSP in Cell is working in the above three phases, the touch from outside maybe sensed and the induction signal is outputted. After the work phases of TSP in Cell are finished, the circuit proceeds into the work phases of the AMOLED circuit.

[0051] Charge Phase: T**6** and T**7** are off. Firstly, POWER is at the voltage V_{INI} which is slightly smaller than VDD. T**2** and T**4** are on, the voltage of C**1** is V_{INI}. Secondly, POWER is at VDD, T**2** and T**4** are off, C**1** is discharged to voltage V_{TH} which is the threshold voltage of T**1**.

[0052] Write Phase: T**3** is on. The grayscale voltage V_{DATA} is inputted into the data line during the Charge Phase previously, and then the voltage V_{INI} is inputted into the data line during the Write Phase. Therefore, the voltage of C**1** (i.e. the voltage of the gate electrode of T**1**) becomes

$$V_{TH}+(V_{INI}-V_{DATA})\cdot\frac{C_2}{C_1+C_2}.$$

[0053] OLED Phase: T**2** is on, and T**3** and T**5** are off. T**1** works and D**1** emits light. The current I_{T1} outputted by T**1** is

$$I_{T1}=k\cdot\left[V_{TH}+(V_{INI}-V_{DATA})\cdot\frac{C_2}{C_1+C_2}-V_{TH}\right]^2=k\cdot\left[(V_{INI}-V_{DATA})\cdot\frac{C_2}{C_1+C_2}\right]^2$$

wherein k is a preset constant, and the range of V_{DATA} is from VDL to VDH.

[0054] An embodiment of the present invention further provides a display panel, comprising the AMOLED pixel unit circuit mentioned above.

[0055] In summary, according to an embodiment of the present invention, the time sequences and the levels of the operating signals are redesigned, a few circuit components are added into the existing AMOLED pixel unit circuit, and the TSP in Cell circuit is integrated into the AMOLED pixel unit circuit using a common data line, common circuit components and common control signals and so on.

[0056] It is obvious that a person skilled in the art may make further improvements and modifications without departing from the spirit and scope of the present invention, and the present application intends to cover all of the improvements and modifications if they fall into the claims of the present application and the equivalents thereof.

1. An active matrix organic light emitting diode AMOLED pixel unit circuit, comprising a light emitting module, a charging module, a threshold compensation module, a driving module, a light emitting control module, a touch sensing module and a induction signal output module, wherein,

the driving module is configured to amplify a induction signal generated by the touch sensing module, output the induction signal through the induction signal output module, and drive the light emitting module;

the light emitting control module is configured to control the light emitting module to emit light;

the threshold compensation module is configured to compensate a threshold voltage of the driving module;

the charging module is configured to charge the threshold compensation module;

the touch sensing module is configured to generate the induction signal and output the induction signal to the driving module; and

the induction signal output module is configured to output the induction signal amplified by the driving module.

2. The circuit according to claim **1**, wherein, the driving module comprises a first transistor, the gate electrode thereof is connected to a third node of the AMOLED pixel unit circuit, the other two electrodes of the first transistor are connected to a first node and a second node of the AMOLED pixel unit circuit respectively, wherein the third node is a connection point which connects the driving module and the threshold compensation module, the first node is a connection

point which connects the driving module and the light emitting control module, and the second node is a common connection point which connects the driving module, the light emitting control module and the light emitting module.

3. The circuit according to claim **2**, wherein, the light emitting control module comprises a second transistor and a fifth transistor, wherein, a gate electrode of the second transistor is connected to a second signal control line of the AMOLED pixel unit circuit at the same stage, the other two electrodes of the second transistor are connected to a power source line and the first node respectively; a gate electrode of the fifth transistor is connected to the second signal control line of the AMOLED pixel unit circuit at the same stage, and the other two electrodes of the fifth transistor are connected to the second node and a low voltage level signal line respectively.

4. The circuit according to claim **3**, wherein, the light emitting module comprises a first light emitting diode, and one end of the first light emitting diode is connected to the second node and the other end of the first light emitting diode is connected to the low voltage level signal line.

5. The circuit according to claim **4**, wherein, the threshold compensation module comprises a fourth transistor, a first capacitor and a second capacitor;

wherein, a gate electrode of the fourth transistor is connected to a first signal control line of the AMOLED pixel unit circuit at the same stage, the other two electrodes of the fourth transistor are connected to the first node and the gate electrode of the first transistor respectively, the first capacitor is connected between the gate electrode of the first transistor and the second node, the second capacitor is connected between the charging module and the gate electrode of the first transistor.

6. The circuit according to claim **5**, wherein, the charging module comprises a third transistor, the gate electrode of the third transistor is connected to a third signal control line of the AMOLED pixel unit circuit at the same stage, the other two electrodes of the third transistor are connected to a data line and the second capacitor of the threshold compensation module respectively.

7. The circuit according to claim **6**, wherein, the touch sensing module comprises a seventh transistor and a second light emitting diode, wherein, a gate electrode of the seventh transistor is connected to a third signal control line of the AMOLED pixel unit circuit at the previous stage, the other two electrodes of the seventh transistor are connected to the second light emitting diode and the gate electrode of the first transistor, one end of the second light emitting diode is connected to the seventh transistor, and the other end of the second light emitting diode is connected to the low voltage level signal line.

8. The circuit according to claim **6**, wherein, the touch sensing module comprises a seventh transistor and a sensing capacitor, wherein, a gate electrode of the seventh transistor is connected to a third signal control line of the AMOLED pixel unit circuit at the previous stage, the other two electrodes of the seventh transistor are connected to the sensing capacitor and the gate electrode of the first transistor respectively.

9. The circuit according to claim **7**, the induction signal output module comprises a sixth transistor, a gate electrode of the sixth transistor is connected to the third signal control line of the AMOLED pixel unit circuit at the previous stage, and the other two electrodes of the sixth transistor are connected to the date line and the first node respectively.

10. The circuit according to claim **7**, wherein, an anode of the second light emitting diode is connected to the low voltage level signal line, and a cathode of the second light emitting diode is connected to the seventh transistor.

11. The circuit according to claim **4**, wherein, an anode of the first light emitting diode is connected to the second node and the cathode of the first light emitting diode is connected to the low voltage level signal line.

12. The circuit according to claim **2**, wherein, the first transistor, the second transistor, the third transistor, the fourth transistor, the sixth transistor and the seventh transistor are all N type thin film transistors TFTs, the fifth transistor is a P type TFT.

13. A display panel, comprising the active matrix organic light emitting diode AMOLED pixel unit circuit according to claim **1**.

14. The circuit according to claim **8**, the induction signal output module comprises a sixth transistor, a gate electrode of the sixth transistor is connected to the third signal control line of the AMOLED pixel unit circuit at the previous stage, and the other two electrodes of the sixth transistor are connected to the date line and the first node respectively.

15. The circuit according to claim **8**, wherein, an anode of the second light emitting diode is connected to the low voltage level signal line, and a cathode of the second light emitting diode is connected to the seventh transistor.

* * * * *

专利名称(译)	有源矩阵有机发光二极管像素单元电路和显示面板		
公开(公告)号	US20150302801A1	公开(公告)日	2015-10-22
申请号	US14/235319	申请日	2013-10-09
[标]申请(专利权)人(译)	京东方科技集团股份有限公司 成都京东方光电科技有限公司		
申请(专利权)人(译)	京东方科技集团股份有限公司. 成都京东方光电科技有限公司.		
当前申请(专利权)人(译)	成都京东方光电科技有限公司. 京东方科技集团股份有限公司.		
[标]发明人	TAN WEN QI XIAOJING WU BO		
发明人	TAN, WEN QI, XIAOJING WU, BO		
IPC分类号	G09G3/32 G06F3/041 H01L27/32		
CPC分类号	G09G3/3258 H01L27/323 H01L27/3248 G06F3/0412 G09G2320/0219 G09G2300/0426 G09G2300/043 G09G2300/0819 G09G2310/0291 G06F3/0416 G06F3/042 G09G3/3233 G09G2300/0861 G09G2310/0262 G09G2320/0233 G09G2320/043		
优先权	201310259706.5 2013-06-26 CN		
其他公开文献	US9530354		
外部链接	Espacenet USPTO		

摘要(译)

本发明提供一种有源矩阵有机发光二极管，AMOLED像素单元电路和用于将触摸屏电路集成到AMOLED像素单元电路中的显示面板，以及制造具有触摸屏功能的AMOLED显示面板。 AMOLED像素单元电路包括驱动模块，用于放大触摸感应模块产生的感应信号，通过感应信号输出模块输出感应信号，并驱动发光模块;发光控制模块，用于控制发光模块发光;阈值补偿模块，用于补偿所述驱动模块的阈值电压;充电模块，用于对所述阈值补偿模块进行充电;触控感测模块，用于产生感应信号并将感应信号输出至驱动模块;感应信号输出模块，用于输出驱动模块放大的感应信号。