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(54) **LCD PANEL AND LCD DEVICE**

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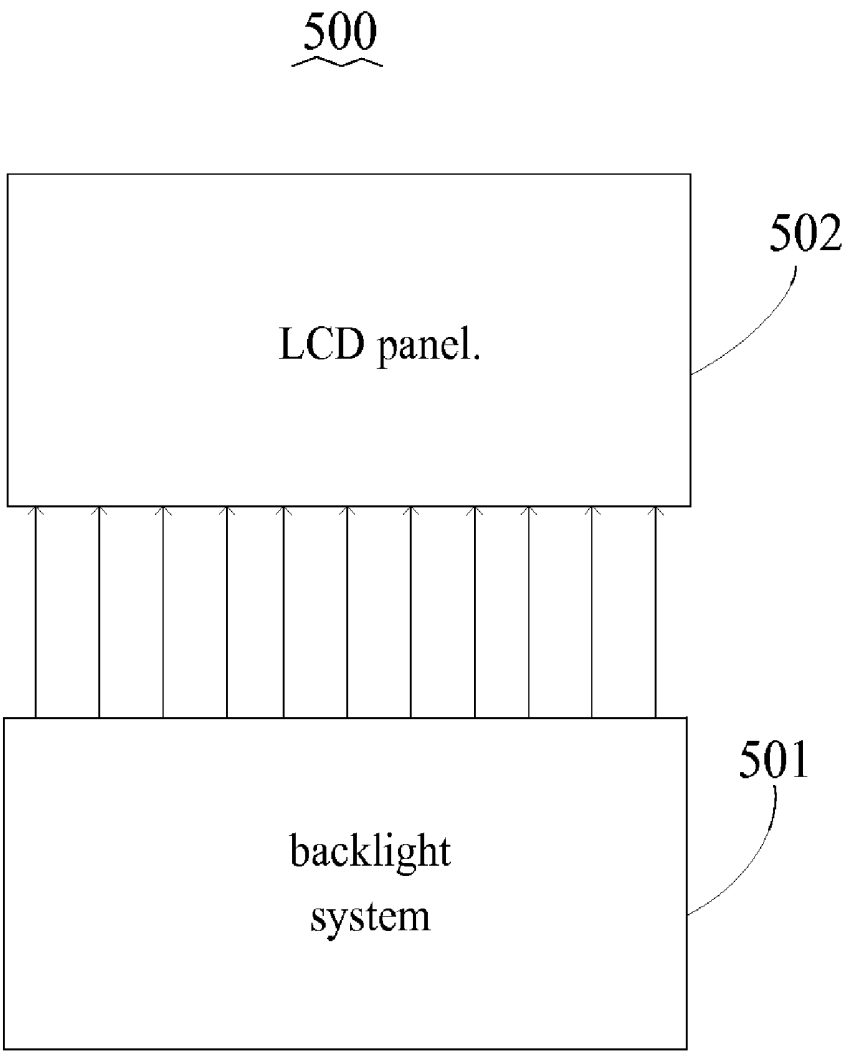
(57) **ABSTRACT**

The present invention provide an LCD panel comprising, comprising an array substrate; a color filter substrate disposed relatively to the array substrate; and a data driver IC and a scan driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate; wherein, an electric field shielding layer connected to the ground is further disposed between the wire on array and the color filter substrate. The present invention also provides an LCD device comprising an LCD panel. Accordingly, the present invention can avoid driver ICs malfunctioning due to the voltage change of the wire on array in order to improve display quality of the LCD panel.



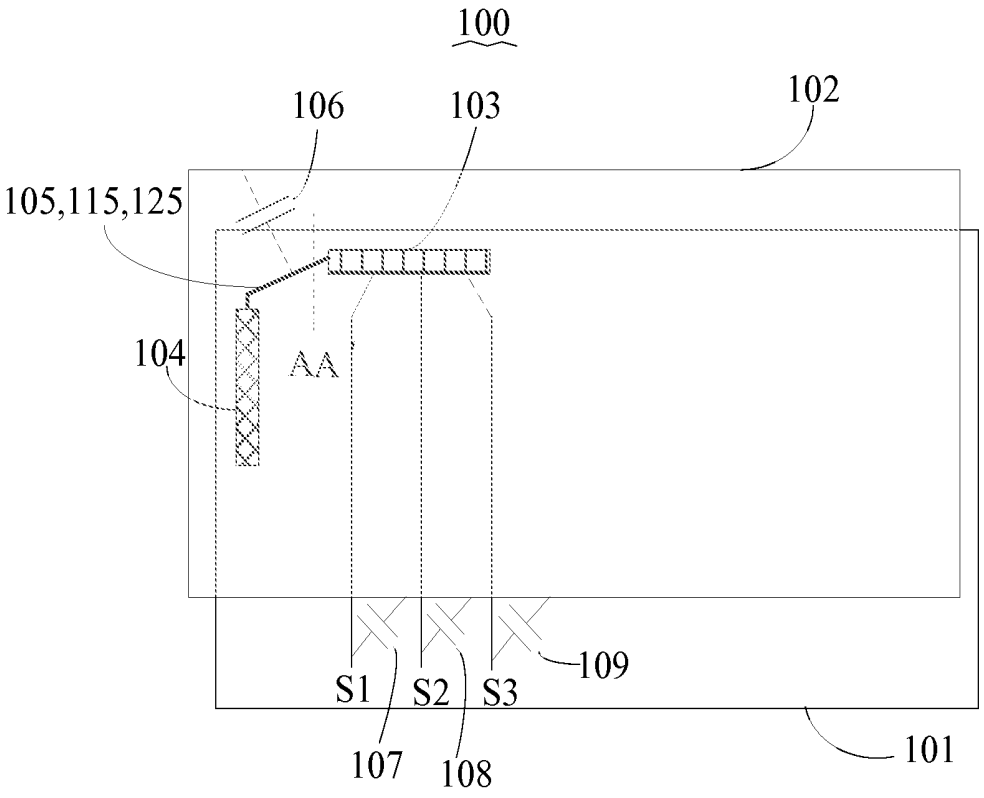


Figure 1

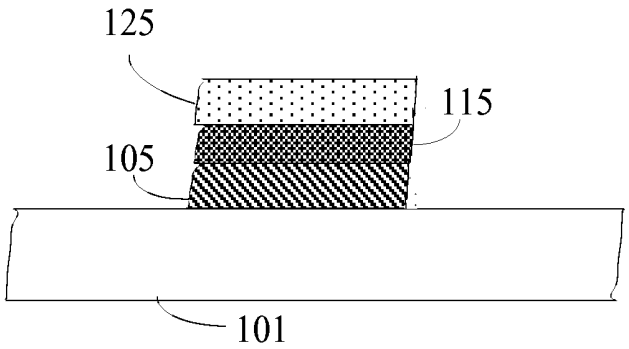


Figure 2

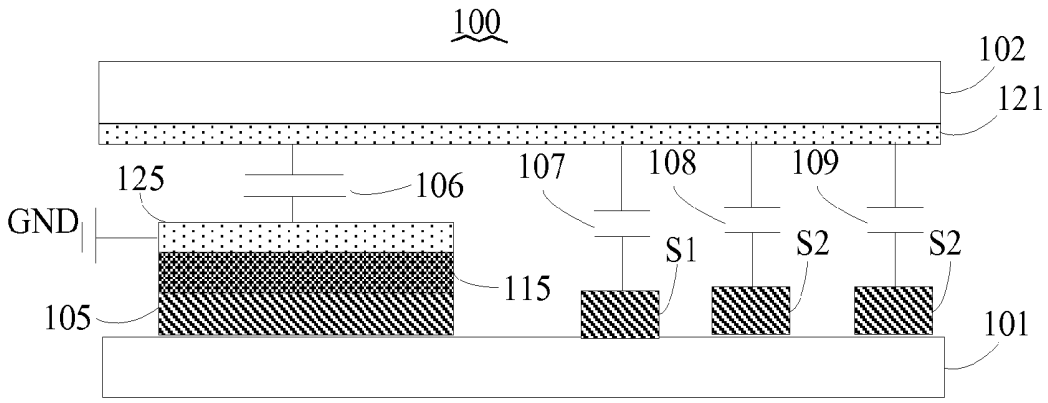


Figure 3

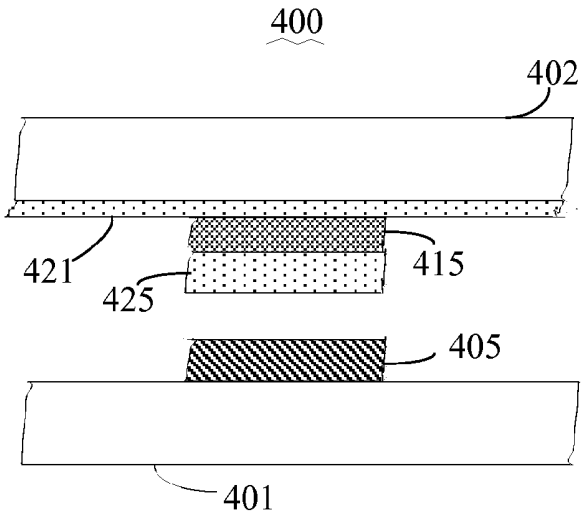


Figure 4

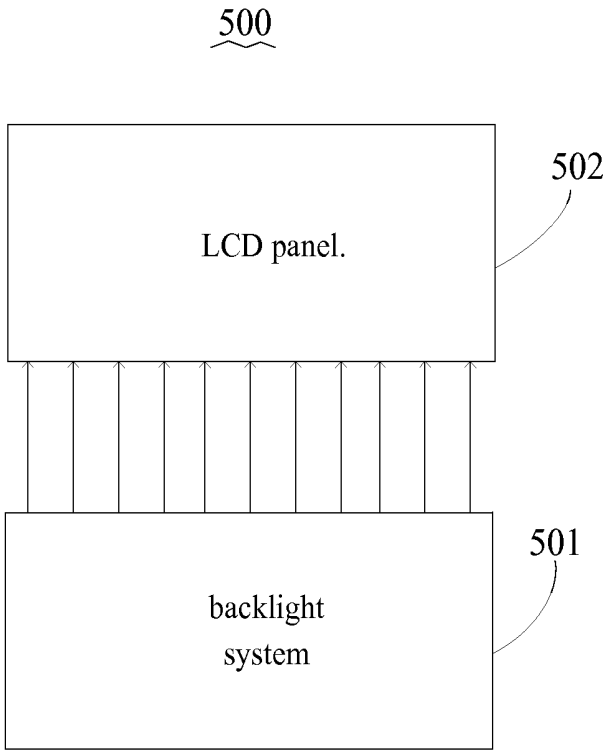


Figure 5

LCD PANEL AND LCD DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to the field of display technology, and more particularly to an LCD panel and an LCD display device.

[0003] 2. Description of Related Art

[0004] LCD panel includes a TFT (Thin Film Transistor) substrate and a CP (Color Filter) substrate, wherein, the TFT substrate includes multiple data lines and multiple scan lines, and the data lines connect to data diver IC (also known as source driver IC), and the scan line connect to scan driver IC (also known as gate driver IC). A wire on array is disposed on the TFT array and between the data driver IC and the scan driver IC to achieve signal transmission. The CF substrate usually provides with ITO (Indium-Tin Oxide) transparent conductive film having equal area as the CF substrate.

[0005] The above conventional structure results in forming capacitors between the ITO transparent conductive film of the CF substrate and the data lines of LCD panel. And it also forms a parasitic capacitor between the ITO transparent conductive film of the CF substrate and the WOA connected between the data driver IC and scan driver IC. Therefore, when the LCD panel is displaying, the data lines of the TFT substrate transmit signals at the same time such that the voltage of ITO transparent conductive film on the CF substrate is influenced by the transmitted signals of the data lines. And the voltage change of the ITO transparent conductive film on the CF substrate also makes the voltage of WOA change. Because the driver IC will be affected by the voltage of the WOA, the voltage change of the WOA easily make the driver IC malfunction and cause the

[0006] screen to display exceptionally.

SUMMARY OF THE INVENTION

[0007] The main technical problem solved by the present invention is to provide a liquid crystal display (LCD) panel and liquid crystal display device to eliminate malfunction phenomenon of driver ICs caused by the voltage change of wire on array. Thereby, it improves the display quality of the liquid crystal display panel.

[0008] To solve the above technical problem, a technical solution provided by the present invention is: an LCD panel comprising: an array substrate; a color filter substrate disposed relatively to the array substrate; and a data driver IC and a scan, driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate; wherein, an electric field shielding layer connected to the ground is disposed above the wire on array and the array substrate, and an insulating layer is disposed between the wire on array and the electric field shielding layer, and at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

[0009] Wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

[0010] Wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

[0011] To solve the above technical problem, another technical solution provided by the present invention is; an LCD panel comprising; an array substrate; a color filter substrate disposed relatively to the array substrate; and a data driver IC and a scan driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate; wherein, an electric field shielding layer connected to the ground is further disposed between the wire on array and the color filter substrate.

[0012] Wherein, the electric field shielding layer is disposed on the color filter substrate and is correspondingly disposed above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

[0013] Wherein, the electric field shielding layer is disposed on the array substrate and above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

[0014] Wherein, at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

[0015] Wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

[0016] Wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

[0017] To solve the above technical problem, another technical solution provided by the present invention is: an LCD device comprising a backlight system and an LCD panel, wherein, the LCD panel comprises: an array substrate; a color filter substrate disposed relatively to the array substrate; and a data driver IC and a scan driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate; wherein, an electric field shielding layer connected to the ground is further disposed between the wire on array and the color filter substrate.

[0018] Wherein, the electric field shielding layer is disposed on the color filter substrate and is correspondingly disposed above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

[0019] Wherein, the electric field shielding layer is disposed on the array substrate and above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

[0020] Wherein, at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

[0021] Wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

[0022] Wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

[0023] The beneficial effects of the present invention is: comparing to the prior art, the present invention provides the electric field shielding layer connected to grounded between the wire on array and the color filter substrate so that the voltage of the electric field shielding layer maintain constant. Therefore, it eliminates the influence to the wire on array **105** generated from the voltage change of the conductive film **121**,

and avoid the voltage of the wire on array generating change in order to avoid the driver IC malfunctioning so as to improve display quality of the LCD panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. **1** is a partial structural schematic drawing of the first embodiment of the LCD panel of the present invention;

[0025] FIG. **2** is a sectional view of the LCD panel shown in FIG. **1**;

[0026] FIG. **3** is a schematic drawing of the distribution of the capacitors of the LCD panel shown in FIG. **1**;

[0027] FIG. **4** is a partial structural schematic drawing of the second embodiment of the LCD panel of the present invention;

[0028] FIG. **5** is a structural schematic drawing of an LCD device of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0029] The following content combines figures and embodiments for detailed description of the present invention.

[0030] With reference to FIG. **1**, FIG. **1** is a partial structural schematic drawing of the first embodiment of the LCD panel of the present invention. As shown in FIG. **1**, An LCD display panel **100** of the invention comprises an array substrate **101**, a color filter substrate **102**, a data driver IC **103**, and a scan driver IC **104**.

[0031] Wherein, the array substrate **101** and the color filter substrate **102** are disposed relatively, and the data driver IC **103** and the scan driver IC **104** are used to driver the LCD panel **100**. Wherein, the data driver IC **103** connects to multiple data lines, S**1**, S**2**, and S**3**, as shown in FIG. **1**. The data driver IC **103** and the scan driver IC **104** are electrically connected by a wire on array **105** (WOA) disposed on the array substrate **101** so as to realize the signal transmission between the data driver IC **103** and the scan driver IC **104**.

[0032] The data driver IC **103** transmit a control signal, a TFT on-state voltage Von, a TFT off-state voltage Voff, or other signals required by the scan driver IC **104** to the scan driver IC **104** through the wire on array **105** (WOA)

[0033] It should be understood that FIG. **1** only shows the wire on array **105** with one line as an example. In practical situation, the LCD panel **100** includes the wire on array **105** with multiple lines. For example, it at least includes one line of the wire on array used to transmit the control signal to the scan driver IC **104**, another line of the wire on array used to transmit the TFT on-state voltage Von, and another line of the wire on array used to transmit the off-state voltage Voff.

[0034] In this embodiment, an electric field shielding layer **125** connected to ground is further disposed between the wire on array **105** and the color filter substrate **102**, and an insulating layer **115** is disposed between the wire on array **105** and the electric field shielding layer **125**,

[0035] Specifically, with reference to FIG. **2**, FIG. **2** is a sectional view of the LCD panel shown in FIG. **1** along dotted line AA'.

[0036] With reference to FIG. **2**, the wire on array **105** is disposed on the array substrate **101**, and the electric field shielding layer **125** is disposed above the wire on array **105**, and the insulating layer **115** is disposed between the wire on array **105** and the electric field shielding layer **125**. Furthermore, the insulating layer **115** and the electric Held shielding layer **125** are disposed correspondingly above the extension direction of the wire on array **105**, that is, the shape of the insulating layer **115** and the electric field shielding layer **125** are similar to the shape of the wire on array **105**.

[0037] Wherein, the width of the insulating layer **115** and the electric field shielding layer **125** are greater than or equal to the width of the wire on array **105** so as to completely shield the wire on array **105** and achieve the ideal shielding effect.

[0038] In this embodiment, the electric field shielding layer **125** connects to the ground in order to maintain a zero voltage state. In this embodiment, it uses data driver IC **103** to provide the ground voltage for the electric field shielding layer **125**, Specifically, at least one pin of the data driver IC **103** electrically connects to one terminal of the electric field shielding layer **125**, and the pin of the data driver IC **103** connected to the electric field shielding layer **125** is ground. Accordingly, the data driver IC **103** transmits a around voltage to the electric field shielding layer **125** such that the electric field shielding layer **125** maintain the zero voltage state.

[0039] Please also refer to FIG. **3**, FIG. **3** is a schematic drawing of the distribution of capacitors of the LCD panel shown in FIG. **1**.

[0040] As shown in FIG. **3**, a conductive film **121** with area equal to the color filter substrate **102** is disposed on the surface of the color filter substrate **102** relative to the array substrate **101**.

[0041] In this embodiment, the conductive film **121** and the electric field shielding layer **125** are preferably ITO transparent conductive film or IZO (investigation of In-doped ZnO) transparent conductive film.

[0042] In the LCD panel **100**, capacitors are formed between the data lines S**1**, S**2**, and S**3** and the conductive film **121** of the color filter substrate **102**, as the capacitors **107**, **108**, and **109** shown in FIG. **1** and FIG. **3**. Similarly, a capacitor is also formed between the electric field shielding layer **125** and the conductive film **121**, as a capacitor **106** shown in FIG. **1** and FIG. **3**. Clearly, a capacitor between the conductive film **121** and the wire on array **105** become the capacitor **106** between the conductive film **121** and the electric field shielding layer **125**. It is worth noting that there also exists a capacitor (not shown) between the wire on array **105** and the electric field shielding line **125**, but capacitance of the capacitor (not shown) between the wire on array **105** and the electric field shielding line **125** is smaller, and does not change.

[0043] As described above, in present invention example, although the voltage of the conductive film **121** is easily influenced by the multiple data lines S**1**, S**2** and S**3** such that the voltage is changeable. However, the capacitor **106** between the electric field shielding layer **125** and the conductive film **121** isolates the wire on array **105** from being influenced by the changeable voltage of the conductive film **121**. Meanwhile, the electric field shielding layer **125** maintain zero voltage state by connecting to the ground such that the changeable voltage of the conductive film **121** will not influence the voltage of the electric field shielding layer **125**, The voltage of the electric field shielding layer **125** maintains constant in order to avoid the relative voltage change of the wire on array **105** by the influence of the voltage change of the conductive film **121**. Therefore, it eliminates the influence to the wire on array **105** generated from the voltage change of the conductive film **121**. Thereby, it avoids the driver IC, in particular the scan driver IC **104** to malfunction.

[0044] With reference to FIG. **4**, FIG. **4** is a partial structural schematic drawing of the second embodiment of the LCD panel of the present invention. The sectional view along the dotted line AA' shown in FIG. **1** is used as an example. The main difference between an LCD panel **400** of the embodiment and the LCD panel **100** shown in FIG. **1** is that an electric field shielding layer **425** of the LCD panel **400** is disposed on a color filter substrate **402** in this embodiment. Specifically, a wire on array **405** is disposed on the array substrate **401**, and a transparent conductive layer **421** is disposed on the surface of the color filter substrate **402**, and an electric field shielding layer **425** is disposed on the transparent conductive layer **421** and the upper location corresponding to the wire on array **405**, and the insulating layer **415** is disposed between the transparent conductive layer **421** and the electric field shielding layer **425**.

[0045] Furthermore, the insulating layer **415** and the electric field shielding layer **425** are disposed above the array line **405** and correspondingly along an extension direction of the array line **405**, that is, the disposition shape of the insulating layer **415** and the electric field shielding layer **425** are similar to the wire on array **405**. Wherein, the width of the insulating layer **415** and the electric field shielding layer **425** is greater than or equal to the width of the wire on array **405** to completely shield the wire on array **405** so as to achieve the ideal shielding effect.

[0046] Wherein, the working principle of the LCD panel **400** is the same with the LCD panel **100**, not discussed again here.

[0047] With reference to FIG. **5**. FIG. **5** is a schematic drawing of an LCD device of the present invention. As shown in FIG. **5**, an LCD device **500** of the present invention comprises a backlight system **501** and an LCD panel **502**.

[0048] Wherein, the backlight system **501** provides light for the LCD panel **502**, and the LCD panel **502** is the LCD panel shown in any embodiment in FIG. **1** to FIG. **4**.

[0049] In summary, the present invention provides the electric field shielding layer connected to grounded between the wire on array and the color filter substrate so that the voltage of the electric field shielding layer maintain constant. Therefore, it eliminates the influence to the wire on array **105** generated from the voltage change of the conductive film **12** L and avoid the voltage of the wire on array generating change in order to avoid the driver IC malfunctioning so as to improve display quality of the LCD panel.

[0050] The above embodiments of the present invention are not used to limit the claims of this invention. Any use of the content in the specification or in the drawings of the present invention which produces equivalent structures or equivalent processes, or directly or indirectly used in other related technical fields is still covered by the claims in the present invention.

What is claimed is:

1. An LCD panel comprising:

an array substrate;

a color filter substrate disposed relatively to the array substrate; and a data driver IC and a scan driver IC for driving the LCD panel wherein, the data driver IC and the scan driver IC are electrically connected through a. wire on array disposed on the array substrate;

wherein, an electric field shielding layer connected to the ground is disposed above the wire on array and the array substrate, and an insulating layer is disposed between the wire on array and the electric field shielding layer, and at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

2. The LCD panel according to claim **1**, wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

3. The LCD panel according to claim **1**, wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

4. An LCD panel comprising:

an array substrate:

a color filter substrate disposed relatively to the array substrate; and

a data driver IC and a scan driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate;

wherein, an electric field shielding layer connected to the ground is further disposed between the wire on array and the color filter substrate,

5. The LCD panel according to claim **4**, wherein, the electric field shielding layer is disposed on the color filter substrate and is correspondingly disposed above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

6. The LCD panel according to claim **4**, wherein, the electric field shielding layer is disposed on the array substrate and above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

7. The LCD panel according to claim **4**, wherein, at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

8. The LCD panel according to claim **4**. wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

9. The LCD panel according to claim **4**, wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

10. An LCD device comprising a backlight system and an LCD panel, wherein, the LCD panel comprises:

an array substrate;

a color filter substrate disposed relatively to the array substrate; and

a data driver IC and a scan driver IC for driving the LCD panel, wherein, the data driver IC and the scan driver IC are electrically connected through a wire on array disposed on the array substrate;

wherein, an electric field shielding layer connected to the ground is further disposed between the wire on array and the color filter substrate.

11. The LCD device according to claim **10**, wherein, the electric field shielding layer is disposed on the color filter substrate and is correspondingly disposed above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

12. The LCD device according to claim **10**, wherein, the electric field shielding layer is disposed on the array substrate and above the wire on array, and an insulating layer is disposed between the wire on array and the electric field shielding layer.

13. The LCD device according to claim **10**, wherein, at least one pin of the data driver IC electrically connects to one terminal of the electric field shielding layer, and the pin of the data driver IC connected to the electric field shielding layer is ground.

14. The LCD device according to claim **10**, wherein, the electric field shielding layer is an ITO conductive film or an IZO conductive film.

15. The LCD device according to claim **10**, wherein, the width of the insulating layer and the electric field shielding layer are greater than or equal to the width of the wire on array.

* * * * *

专利名称(译)	LCD面板和LCD设备		
公开(公告)号	US20140009369A1	公开(公告)日	2014-01-09
申请号	US13/583001	申请日	2012-07-09
[标]申请(专利权)人(译)	王金杰 陈鸿		
申请(专利权)人(译)	王，华锦界 陈，CHENG-HUNG		
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优先权	201210229696.6 2012-07-04 CN		
外部链接	Espacenet USPTO		

摘要(译)

本发明提供一种LCD面板，包括：阵列基板;相对于阵列基板设置的滤色器基板;用于驱动LCD面板的数据驱动器IC和扫描驱动器IC，其中，数据驱动器IC和扫描驱动器IC通过设置在阵列基板上的导线阵列电连接;其中，连接到地的电场屏蔽层还设置在阵列上的导线和滤色器基板之间。本发明还提供了一种包括LCD面板的LCD装置。因此，本发明可以避免驱动器IC由于阵列上的导线的电压变化而发生故障，以便改善LCD面板的显示质量。