

|   |   |                             |             |
|---|---|-----------------------------|-------------|
| <br><b>INNOLUX DISPLAY CORP.</b> | <b>工程變更客戶通知書</b><br><b>Engineering Change Notices to Customer</b> | 保管單位<br>Storage             | AVQA/<br>CS |
|   |   | 保存年限<br>Retention<br>Period | 3 年         |

**Subject of Change :**

7SD NJ070NA-23A 設計變更  
7SD NJ070NA-23A **design change**

客戶確認

**For customers' acceptance**

|  |                     |
|--|---------------------|
| <p>客戶名稱<br/>Customer Name:</p> <p>核准人<br/>Approved by:</p> <p>核准日期<br/>Date:</p> | <p>印章<br/>Seal:</p> |
|--|---------------------|

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### 變更主題

#### Subject of Change

7SD NJ070NA-23A 設計變更

7SD NJ070NA-23A design change

### 變更原因

#### Reason of Change

Novatek IC 2021/12 EOL, 無替代 IC 可切換,需換玻璃 & IC

Novatek IC 2021/12 EOL, no compatible IC,need change panel & drive IC

### 變更內容

| Item | Detail            | Before        | After         | Remark  |
|------|-------------------|---------------|---------------|---|
| 1    | Panel             | Old<br>(7041) | New<br>(7005) | Panel 外形尺寸：<br>161.90mm*94.72mm→161.81mm*94.52mm<br>Outline dimension:<br>161.90mm*94.72mm→161.81mm*94.52mm   |
| 2    | 背光膠框<br>Housing   | In house      | In house      | 由於 Panel 外形尺寸變更，玻璃擋牆相關尺寸隨之調整<br>Due to the outline dimension of the panel changed, the relevant dimension of the panel retaining wall was adjusted accordingly.   |
| 3    | 軟性電路板<br>Main FPC | 弘信            | 景旺            | 1.由於 Panel 更換，FPCA Bonding 區寬度變更<br>2.輸入端 FPC 從單層變成兩層，為了滿足 LVDS 信號差分阻抗符合 LVDS 規格要求。<br>3. Main FPC layout 變更,增加 gamma 電阻。<br>4.元件數量增加，元件區尺寸隨之擴大，背面補強板外形尺寸增加；為防止絕緣保護膠帶 Peeling，增大膠帶尺寸<br>1.Due to the panel changed, the width of FPCA Bonding area changed.<br>2.Change main FPC to 2layers for keeping LVDS differential impedance.<br>3. Main FPC layout change, add Gamma resistors.<br>4.As the number of components increases,the size of the component area expands,and the size of the back stiffener plate increases; to prevent the insulation protection tape from peeling,increase the size of the tape. |
| 4    | 鐵框<br>Bezel       | In house      | In house      | 由於 FPCA Bonding 區寬度變更，Bezel 相關尺寸變更<br>Due to the width of FPCA bonding area changed, the relevant dimension of bezel changed.   |

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| Item | Detail          | Before                          | After                                  | Remark  |
|------|-----------------|---------------------------------|--|---|
| 5    | Drive IC        | NOVATEK<br>NT51008+<br>NT52003B | Fitipower<br>EK79001AX+<br>EK73215BCGA | 因 Novatek driver IC,更換為 Fitipower,搭配新玻璃。Novatek Driver IC will EOL, change Driver IC to Fitipower for matching new cell.  |
| 6    | Bottom BEF      | With                            | With out                               | 因為 7005 panel 穿透高於 7041 panel , 為降低亮度調整 film 材架構。<br>Because the penetration of 7005 panel is higher than 7041 panel, adjust the film material structure to reduce the brightness.  |
| 7    | Bottom Diffuser | 1PCS                            | 2PCS                                   |   |
| 8    | 異方性導電膠<br>ACF   | Dexerials<br>CP538SA            | Dexerials<br>PAF1000                   | Vendor Hitachi change name to Showa   |
|      |                 | Hitachi<br>AC-7813YM            | Showa<br>AC-7813YM                     |   |
| 9    | Lightbar FPC    | 同泰                              | 同泰                                     | 由於 FPCA 上焊盤位置有調整, 為保證焊接正常, Lightbar FPC 需加長, 保護膠帶貼附位置隨之變更。<br>Due to the adjustment of the pad position on FPCA , Lightbar FPC needs to be lengthened to ensure normal welding, the position of the protective tape is changed accordingly. |

### Contents of Change

#### 1、外觀差異 Look difference

■Yes    □No

#### 2、功能差異 Function difference

■Yes    □No

1. 輸入電源電壓有變,如下表.

Input power Voltages are changed as below table.

變更前/Before

| Item                     | Symbol           | Values               |                      |                      | Unit | Remark |
|--------------------------|------------------|----------------------|----------------------|----------------------|------|--------|
|                          |                  | Min.                 | Typ.                 | Max.                 |      |        |
| Power voltage            | DV <sub>DD</sub> | 3.0                  | 3.3                  | 3.6                  | V    | Note 2 |
|                          | AV <sub>DD</sub> | 10.8                 | 11                   | 11.2                 | V    |        |
|                          | V <sub>GH</sub>  | 19.7                 | 20                   | 20.3                 | V    |        |
|                          | V <sub>GL</sub>  | -6.5                 | -6.8                 | -7.1                 | V    |        |
| Input signal voltage     | V <sub>COM</sub> | 3.3                  | 3.8                  | 4.3                  | V    | Note 4 |
| Input logic high voltage | V <sub>IH</sub>  | 0.7 DV <sub>DD</sub> | 0.9 DV <sub>DD</sub> | DV <sub>DD</sub>     | V    | Note 3 |
| Input logic low voltage  | V <sub>IL</sub>  | 0                    | 0.1 DV <sub>DD</sub> | 0.3 DV <sub>DD</sub> | V    |        |

變更后/After

### 5.ELECTRICAL SPECIFICATION

| Item                         | Symbol   | Specification |      |      | Unit | Note |
|------------------------------|----------|---------------|------|------|------|------|
|                              |          | Min.          | Typ. | Max. |      |      |
| Digital power                | VDD      | 2.8           | 3.3  | 3.5  | V    | (1)  |
| Analog power                 | AVDD     | 11.9          | 12   | 12.1 | V    | (1)  |
| TFT gate on voltage          | VGH      | 14.5          | 15   | 15.5 | V    | (2)  |
| TFT gate on voltage          | VGL      | -10.5         | -10  | -9.5 | V    | (3)  |
| TFT common electrode voltage | Vcom(DC) | 4.05          | 4.55 | 5.05 | V    | (4)  |

2. 取消 CABC 功能/Cancel CABC function

變更前/Before

## 工程變更客戶通知書

### Engineering Change Notices to Customer

|                             |             |
|-----------------------------|-------------|
| 保管單位<br>Storage             | AVQA/<br>CS |
| 保存年限<br>Retention<br>Period | 3 年         |

|    |         |     |   |       |
|----|---------|-----|---|-------|
| 25 | GND     | P   | Ground                                  |       |
| 26 | NC      | --- | No connection                           |       |
| 27 | DIMO    | O   | Backlight CABC controller signal output |       |
| 28 | SELB    | I   | 6bit/8bit mode select                   | Note1 |
| 29 | AVDD    | P   | Power for Analog Circuit                |       |
| 30 | GND     | P   | Ground                                  |       |
| 31 | LED-    | P   | LED Cathode                             |       |
| 32 | LED-    | P   | LED Cathode                             |       |
| 33 | L/R     | I   | Horizontal inversion                    | Note3 |
| 34 | U/D     | I   | Vertical inversion                      | Note3 |
| 35 | VGL     | P   | Gate OFF Voltage                        |       |
| 36 | CABCEN1 | I   | CABC H/W enable                         | Note2 |
| 37 | CABCEN0 | I   | CABC H/W enable                         | Note2 |
| 38 | VGH     | P   | Gate ON Voltage                         |       |
| 39 | LED+    | P   | LED Anode                               |       |
| 40 | LED+    | P   | LED Anode                               |       |

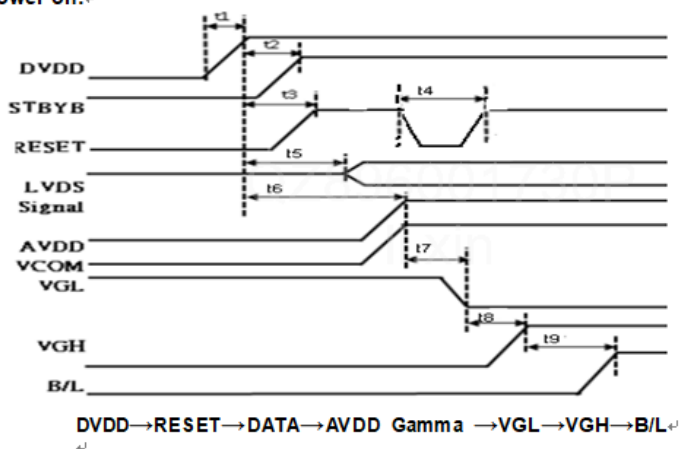
#### 變更后/After

|    |      |     |                          |       |
|----|------|-----|--------------------------|-------|
| 25 | GND  | P   | Ground                   |       |
| 26 | NC   | --- | No connection            |       |
| 27 | NC   | --- | No connection            |       |
| 28 | SELB | I   | 6bit/8bit mode select    | Note1 |
| 29 | AVDD | P   | Power for Analog Circuit |       |
| 30 | GND  | P   | Ground                   |       |
| 31 | LED- | P   | LED Cathode              |       |
| 32 | LED- | P   | LED Cathode              |       |
| 33 | L/R  | I   | Horizontal inversion     | Note2 |
| 34 | U/D  | I   | Vertical inversion       | Note2 |
| 35 | VGL  | P   | Gate OFF Voltage         |       |
| 36 | NC   | --- | No connection            |       |
| 37 | NC   | --- | No connection            |       |
| 38 | VGH  | P   | Gate ON Voltage          |       |
| 39 | LED+ | P   | LED Anode                |       |
| 40 | LED+ | P   | LED Anode                |       |

### 3. 開關機時序/Power On/Off Sequence.

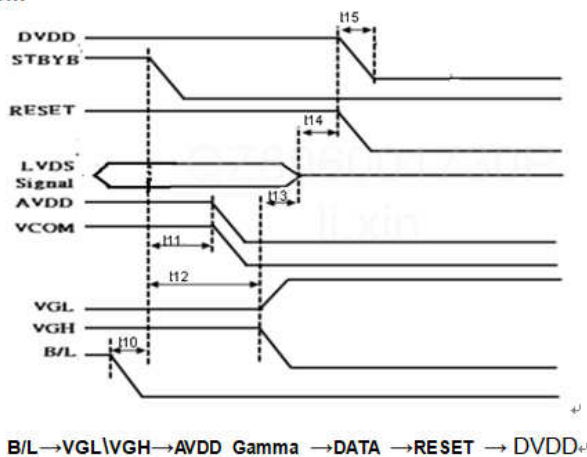
#### 變更前/Before

a. Power on:



| Symbol | SPEC |      |      | Unit |
|--------|------|------|------|------|
|        | Min. | Typ. | Max. |      |
| t1     | 0.5  | 5    | 20   | ms   |
| t2     | 0    | 0.25 | 0.5  | ms   |
| t3     | 0.5  | 1    | 3    | ms   |
| t4     | 1    | 2    | 5    | ms   |
| t5     | 3    | 15   | 20   | ms   |
| t6     | 40   | 45   | 50   | ms   |
| t7     | 0.04 | 3    | 10   | ms   |
| t8     | 0.04 | 8    | 10   | ms   |
| t9     | 100  | 180  | 200  | ms   |

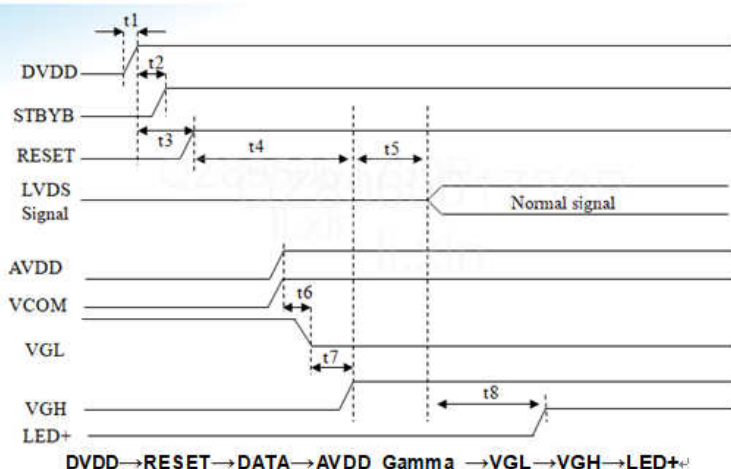
b. Power off:



| Symbol | SPEC |      |      | Unit |
|--------|------|------|------|------|
|        | Min. | Typ. | Max. |      |
| t10    | 0    | 5    | 20   | ms   |
| t11    | 70   | 75   | 80   | ms   |
| t12    | 100  | 105  | 110  | ms   |
| t13    | 50   | 70   | 100  | ms   |
| t14    | 0    | 50   | 100  | ms   |
| t15    | 0    | 10   | 20   | ms   |

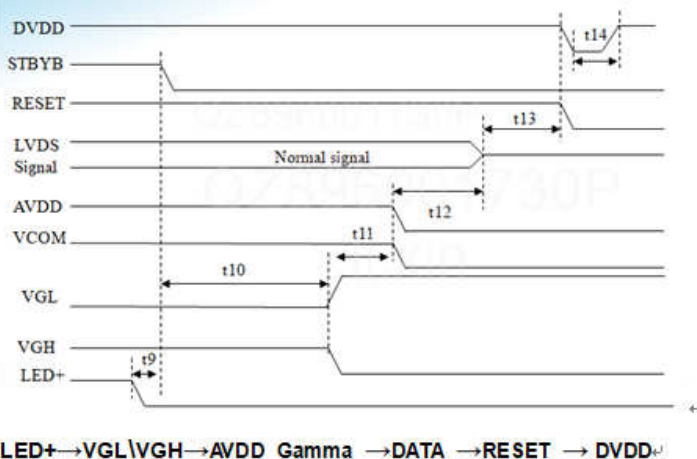
變更后/After

a. Power on:



| Symbol | SPEC |              |      | Unit |
|--------|------|--------------|------|------|
|        | Min. | Typ.         | Max. |      |
| t1     | 0.5  | 5            | 20   | ms   |
| t2     | 0    | 0.25         | 0.5  | ms   |
| t3     | 1    | 10(RC Delay) | 12   | ms   |
| t4     | 90   | -            | 150  | ms   |
| t5     | 30   | -            | 50   | ms   |
| t6     | 20   | -            | 75   | ms   |
| t7     | 20   | -            | 75   | ms   |
| t8     | 150  | -            | -    | ms   |

b. Power off:



| Symbol | SPEC |      |      | Unit |
|--------|------|------|------|------|
|        | Min. | Typ. | Max. |      |
| t9     | 0.1  | 1    | 10   | ms   |
| t10    | 120  | 150  | 200  | ms   |
| t11    | 50   | 100  | 200  | ms   |
| t12    | 1    | 10   | 20   | ms   |
| t13    | 0.1  | 10   | 100  | ms   |
| t14    | 500  | -    | -    | ms   |

變更管理

|   |  |                             |             |
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|   |  | 保存年限<br>Retention<br>Period | 3 年         |

### **Change Control**

- 1、規劃時間 Planning Time: 2021 年 11 月
- 2、切換時間 Switching Time: 2022 年 2 月
- 3、產品包裝 Product Package  
☒The same box    ☐The different box
- 4、產品規格書 Product Spec  
☐No change        ☒Change