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(22) 2000 09 08

(71)

908 - 14

(72)

14 - 1102

(74)

:

(54)

ce) (Thin Film Transistor: TFT) (Liquid Crystal Device: LCD) (sour

· TFT - ;

· ; -

· ,

· , 가 ;

· , / (overcharging)

가 .

6a

, , ,

1	TFT	가	.
2			.
3a			.
3b			.
4a		-	.
4b		-	.
5			.
6a			.
6b		(Op - Amp)	.
7	6a		.
8a		-	.
8b		-	.
9			.
**		**	

610: D/A 620:
630: 632:
634: 640: LCD

ce) (Thin Film Transistor: TFT) (Liquid Crystal Device: LCD) (sour

(Liquid Crystal Device: LCD)

(Thin Film Transistor:TFT) LCD / TFT

TFT가 / TFT

(130) TFT(132) (134)

(Cs)

TFT (source) (column) (D1~DN)

(120) TFT (gate) (row)

(S1~SM) (110) N x M (, SVGA 800x600, XGA 1024x768, UXGA 1600x1200)

(120) (ROW)

1 (134) TFT(132) (drain) TFT 가 가

(120) 가 (134) 가 ITO

(Vcom) 가

(Cs) (ITO) 가

(Cs) (storage on gate)

가 가 (inversion) 가

가 가

(TFT 가) (Vcom) (+)

(-)

2 , D/A (21) , (22), (

23), (24), (MUX: 25)가

2 , D/A (21)

()

D/A (21) (22)

가 , (24) (23) (25) (25) 가

MUX 가 가 ,

가

가 3a

3a, VSS '0V', VDD '10V', (VCOM) '5V'.
 (inversion) 가 (VH) 7.75V, (VL) 2.25V (VL).
 (VH)

3a C D) , 3b V_H V_L (3a B), (V_2 V_1 5 (, N) (C_{LOAD}) 2 1 1/5(N , 1/N)

1

$$P_{CONV} = CV_2(V_2 - V_1)F$$

2

$$P_{STEP} = CV_2 \frac{(V_2 - V_1)}{5} F = \frac{1}{5} P_{CONV}$$

3b (C_{LOAD}) N (column line) (capacitance) ,
 N 1 1/2 .

4a
 (VH:7.75, VL:2.25V) / 4b (Overcharging)
 VL (overcharging) (VH, VL) VH ,
 VH (, VL (Overcharging) 가 가 .

(Op - Amp)

, TFT

가

;

, TFT

5

5, VSS '0V', VDD '10V', 가 (VCOM) '5V' .
 , 1H, 2H,... (, / (A,C))
 (B,D) , 1H 가 가 , 2H 가 가
 , VCH (+) , VCL
 (-)

(VH, VL) / , (Image)
 (VCH, VCL) /

6a , 6b 6a
 (Op - Amp)

6a , (, -) (,
) (610) (polarity modul
 ator: 620), (630), (sw1a, sw1b, sw2a, sw2b) LCD (6
 40) 가 , (630) (632)
 (632) 6b , (634), PMOS (M_P), NMOS (M_N)

1 (sw1a) (620) (VD) V_H , (620)
 (VS) V_L , GND V_L . 2 (sw1b)
 VDD V_H

3 (sw2a) (620) (VD) V_H , (62
 0) (VS) V_L GND V_L . 4 (sw2b)
 VDD V_H

6b , (634) D/A (610) (-) (+)
 (A₀) , (634) V_H V_L
 P (M_P) N (M_N) V_O

, 6a 6b - /

V_I V_O V_H 가 PMOS (632) V_I 6.5V 가 , (620) V_I
 V_H 가 (Input Amp: 634) (High) PMOS
 (M_P) - (Cutoff) , V_I V_O
 (Overcharging) .

2.

634) V_I (Low) NMOS (620) (632) V_L 가 (Input Amp: (Cutoff)
 , V_I .

7 6a / .

7 (negative image) , (discharging) ,
 (positive image) , (charging) 가 . 1 (line t
 ime) $22\mu s$ 가 (frame 가 75Hz 1600 × 1200 UXGA 1 line time $1/(75 \times 1200)$ 1
 $1.1\mu s$ 2 가), (line time) /
 . 7 ' A' 1 () , ' B'
 1 ' C' 2 () , '

6a 7 , A sw1a가 (on) , (620)
 , (620) B SW
 1a, sw2a가 (off) , sw1b, sw2b가 (on) (630) VDD, VSS
 (630) () 가 .

C , sw2a가 (on) , D
 B on/off (, sw1a, sw2a가 off , sw1b, sw2b가 on) 가 .

1 .

[1]

	A	B	C	D
SW1a				
SW1b				
SW2a				
SW2b				

8a - , 8b

- .

8a 8b (stepwise charging) /
 (Overcharging) , 5 (Image) 80
 % 가 .

, (6a) (2) ,
 (630) Op - Amp LCD
 (MUX) 가 ,
 가 ,
 9 .
 9 (620) 7 (C₁~C₇)
 (C₁~C₇) (VS) (SW1~SW7), (C₁~C₇) (VD)
 (SW8~SW14) 2 (D₁, D₂) .
 - (VH: 6.5V) (C₇) (VS) 가
 (D₁) 가 , - (VL:3.5V) (VD) (C
 1) 가 (D₂) 가 , (62
 0) 7 14 ,
 , (Op - Amp)
 ,
 / (overcharging) 가

(57)

1.

2.

3.

2 ,

4.

3 , (V_I) , (V_I)
 PMOS (M_P) , 가 (V_I) 가
 NMOS (M_N) 가

5.

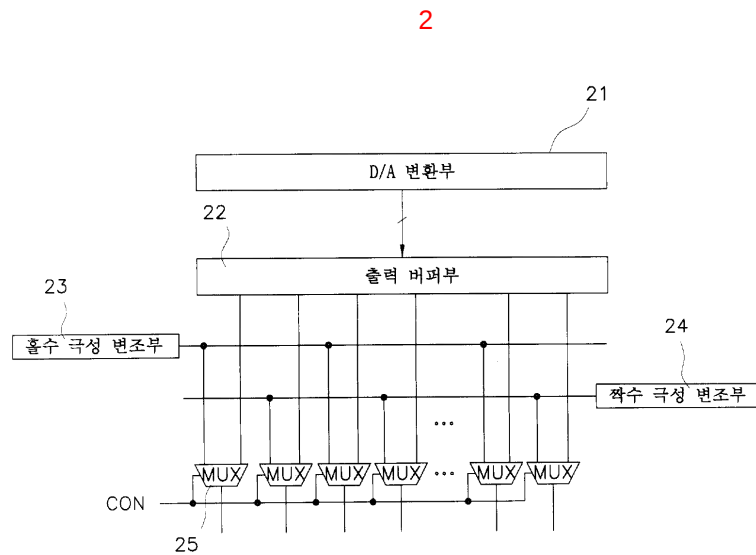
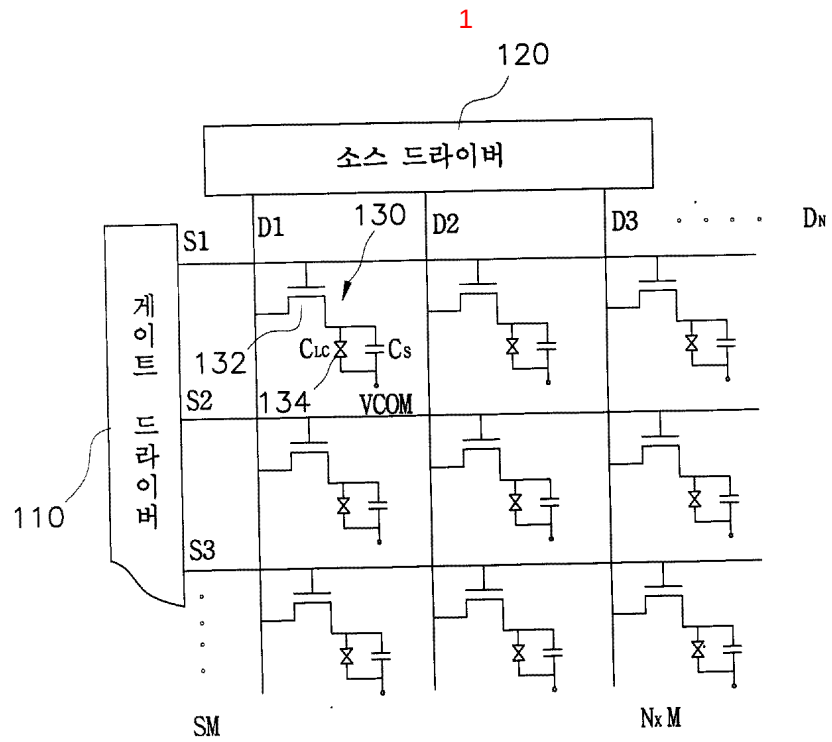
3 , 1 (SW1a) , /
 VDD, VDD, GND GND
 VDD, GND 4 3 (SW1b),
 (SW2b)

6.

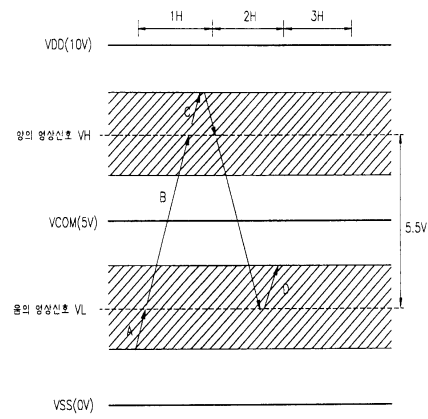
5 , 1 1 () , 1
 , 2 () , 2 ,
 2 1 () , 1 , 2
 () , 2 ,
 3 1 () , 1 ,
 2 () , 2 ,
 4 1 () , 1 , 2
 () , 2

7.

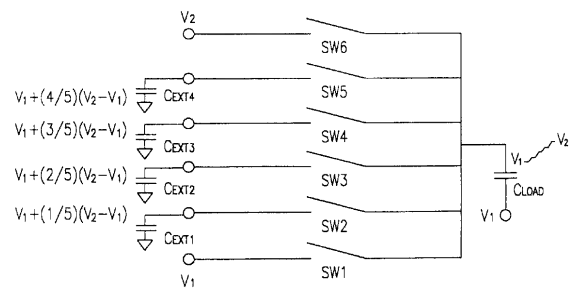
2 , N N , -
 (V_S) 가 (D_1) , -
 C_1 가 (D_2) C_N (VD)



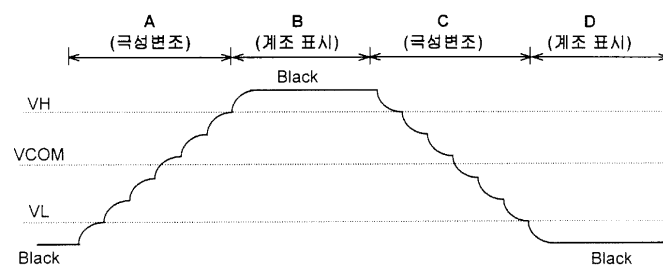
3a



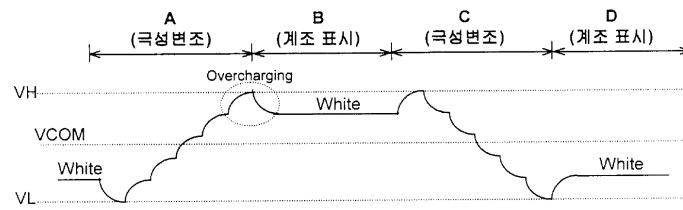
3b



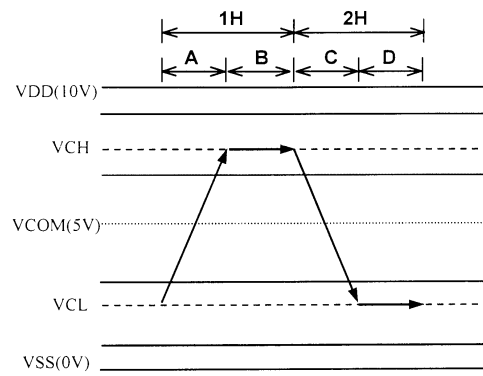
4a



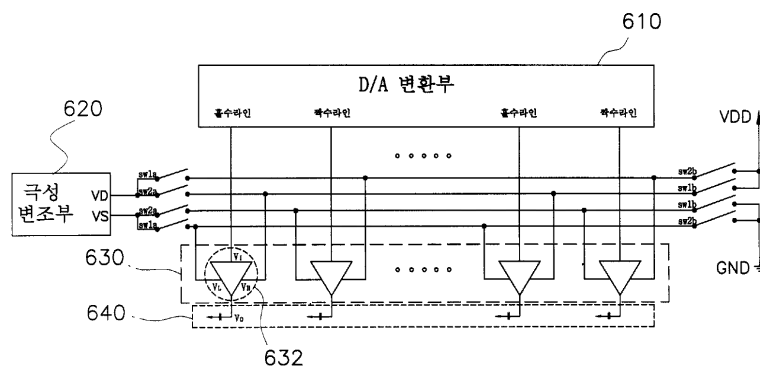
4b



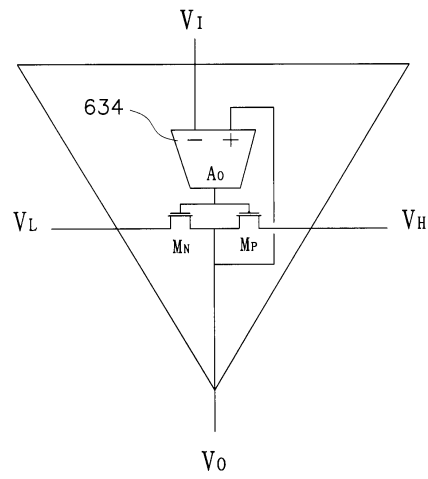
5



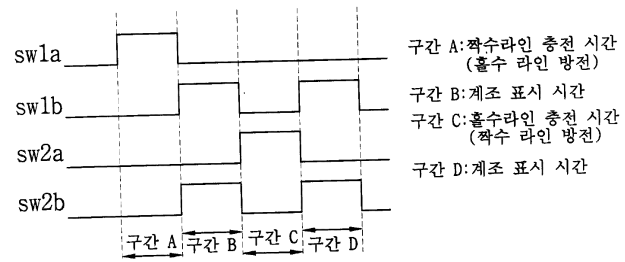
6a



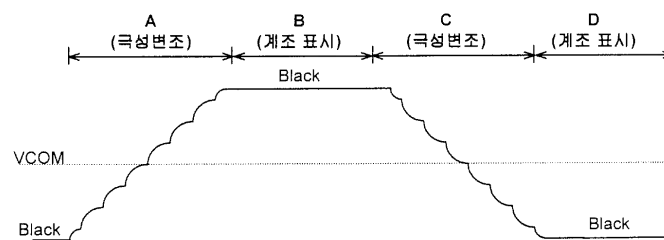
6b



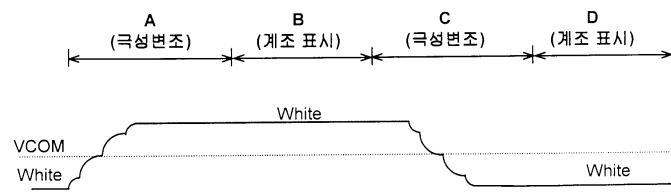
7



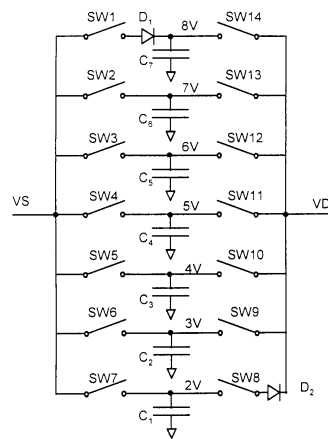
8a



8b



9



专利名称(译)	低功率源驱动电路和液晶显示器的驱动方法		
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当前申请(专利权)人(译)	我们的服务资产服务有限公司		
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代理人(译)	KIM , YOUNG CHOL		
其他公开文献	KR100366315B1		
外部链接	Espacenet		

摘要(译)

本发明涉及薄膜晶体管 (TFT) 液晶显示器 (LCD) 的源极驱动电路。在低电源驱动电路本发明的用于沿TFT液晶显示装置的数据线将视频数据驱动，用于将数字视频数据转换为一个模拟信号到模拟转换器的电路；极性调制单元，用于提供用于极性调制的多级充电/放电电压；数字接收从模拟转换器输入的图像信号，但被充电和放电被连接到在所述调制周期的极性极性调制的调制器的极性，充电电压调制部极性电荷比视频信号与视频信号电平饱和和高级，当在放电的放电电压极性调制部低于视频信号被饱和到的视频信号，用于从所述灰度显示周期中的数据施加调制的输出极性的输出缓冲器；和极性调制周期极性调制部分以在输出缓冲器，以及切换装置，用于在灰度显示周期的输出缓冲器连接到电源。因此，根据其在根据所述视频信号控制本发明仅将电平是可能的不防止过度充电（过充电）或过度放电通过充电/放电，以防止不必要的电力消耗固定在极性调制时的电压电平。图6a 指数方面 低功耗，极性反转，极性调制，源驱动 - 1 -

