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(43)

10-2004-0085653
2004 10 08

(21)

10-2003-0020432

(22)

2003 04 01

(71)

575

(72)

14 1102

(74)

:

(54)

1 3 가 . 1 2 가 1

1 1 2 , 1 2

1 1 2 . 2 1

2 3 , 2 1 2

3 1 2 3 1 2

3 1 가 2 가 .

5

EL, , , , ,

1 .

2 가 .

3 가 .

4 EL .

5, 7, 9, 11, 13, 14 15 1 7 가

6, 8, 10, 12 16 5, 7, 9, 11 15

(electroluminescent, EL) .
 EL , N×M
 1
 (ITO), (metal) 가
 (emitting layer, EML), (electron transport layer, ETL)
 (hole transport layer, HTL), (electron transport layer, ETL)
 ron injecting layer, EIL) (hole injecting layer, HIL)

(passive matrix) (thin film transistor, TFT) MOSFET (active matrix) .
 ITO(indium tin oxide) ,
 가 (voltage programming)
 g) (current programming) .

2 3 EL
 .
 2 EL (OLED) , N×M
 (M1) 2 , (M1)가
 , 가 (M2) (C1)가 (M1)
 (M2) (S_n) , (D_m)
 (M2)가 , (M2) 가
 (D_m) (M1) 가
 (C1) (V_{GS}) (M2) (I_{OLED})가
 (I_{OLED}) EL (OLED)가
 , EL (OLED) 1 .

$$I_{OELD} = \frac{\beta}{2} (V_{GS} - V_{TH})^2 = \frac{\beta}{2} (V_{DD} - V_{DATA} - |V_{TH}|)^2$$

TH , I_{OLED} EL (OLED) , V_{GS} (M1) , V
 (M1) , V_{DATA} , β .

1 (OELED) , 2 EL 가 가 EL

(V_{TH}) (electron mobility) 3V 8 (256) 12mV(=3V/256) 가 100mV 1 β

가 -

3 EL 3 , EL (OLED) (M1)가 , N×M (M1) (M2) 가 , (S_n) (M2, M3)가 , (M1) (S_n) (D_m) (I_{DATA}) (C1) , (E_n) 가 가 (M2, M3)가 (VDD) , EL (OL ED) 2 가 EL (OLED) .

$$I_{OLED} = \frac{\beta}{2} (V_{GS} - V_{TH})^2 = I_{DATA}$$

, V_{GS} (M1) , V_{TH} (M1) , β

2 (I_{DATA}) EL (I_{OLED}) , EL (I_{OLED}) (I_{DATA}) 가 30pF 가 μs nA nA (line time) ms

3 , 1 2 가 . 가 , 1 , 1 1 2 가 . 1 2 , 1 2

[illegible]

, C_1 C_2 (C1, C2) .

(M1) (I_{OLED}) 6 , (I_{OLED})가 (M4)
EL (OLED) EL (OLED) (T3) (C1, C2)

$$I_{OLED} = \frac{\beta}{2} \left\{ \frac{C_1}{C_1 + C_2} (|V_{GS}(T2)| - |V_{TH}|) \right\}^2 = \left(\frac{C_1}{C_1 + C_2} \right)^2 I_{DATA}$$

6

) 6 , EL (OLED) (I_{OLED}) (M1) EL (V_{TH})
) (I_{OLED}) (I_{DATA}) C₁/(C₁+C₂)
C₂가 C₁ M (C₂=M*C₁) , (I_{OLED}) (M+1)² (I_{DATA}) E
L (OLED) (I_{DATA}) (D₁-D_m)

1 (M1-M5) PMOS 7 8 , NMOS

7 2 가 , 8 7

7 (M1-M5)가 NMOS (M1) 가 (M5)
) 가 (M1) (M3)가
(C1) (M1) (C2) (M5)
1 (M5) 2 (M1) (M3, M5)
(X_n, Y_n) (CS1_n, CS2_n)가 가 (M2) (S)
n) (SE_n) (D_m) (I_{DATA}) (M1)
(E_n) (M4) (M1) EL (OLED) (M4) (VDD)
(EM_n)가 가 EL (OLED)

7 NMOS 8 7
6 가 2

7 8 1 (M1-M5)가 (10)

1 2 (M1-M5) PMOS NMOS ,

1 2 (CS1_n, CS2_n) 9 1

2 , 9 3 가 , 10 9

9 , 3 (M2, M5) 1

가 . (M2) NMOS (M5) (S_n) , (M2, M5)
 (S_n) . , (SE_n)
 .
 10 , (T1) (CS1_n) (SE_n) (M3, M5)가
 (M1) (M3) (M1) (C1, C2)
 EL (V_{TH}) (OLED) 가 . (EM_n) (M4)가
 (T2) (SE_n)가 (M2)가 (M5)가
 (C1) 4 (V_{GS}(T2)) (SE_n)
 (M2)가 (C2) , (M2)가
 , (SE_n)가 (M3) (M2)가 (M3)
 (CS1_n)
 3 1 3
 , (CS2_n) (Y₁-Y_N)
 3 (M1, M3-M5) PMOS (M2)
 NMOS 12 11
 11 4 가 , 12 11
 .
 11 , 4 (M2)가 PMOS
 (M1, M3-M5)가 NMOS , 9
 12 11 10
 가 . 4 3
 .
 1 4 (C1, C2) (VDD) , 13 14
 (C1, C2) (VDD)
 13 5 가 .
 13 , 5 (C1, C2) (M5)
 (M3) 1 가 (C1, C2) (M1)
 (M5) (C1, C2) (VDD)
 .
 5 1 , 6 1
 3 .
 , (T1) (CS1_n) (M3) 가 (M1)
 (V_{TH}) , (C2) 0V (M1) (C1) (EM_n)
 (M4)가 EL (OLED) 가 .
 (T2) (CS2_n)가 (M5)가 (SE_n)가
 (M2)가 . (M2) (D_m) (I_{DA})
 TA)가 (M1) , (M1) - (V_{GS}(T2)) 4
 (V_{TH}) (C1) (V_{C1}) (C1, C2)
 7 .

7

$$V_{C1} = |V_{TH}| + \frac{C_2}{C_1 + C_2} (|V_{GS}(T2)| - |V_{TH}|)$$

(T3) (CS1_n) (SE_n) (M3, M2)가
 M3)가 (CS2_n) (EM_n) (M5, M4)가 (M1)
 (V_{GS}(T3)) (C1) (V_{C1}) (T3) (I_{OLED}) 8
 (I_{OLED})가 (M4) EL (OLED)

8

$$I_{OLED} = \frac{\beta}{2} \left\{ \frac{C_2}{C_1 + C_2} (|V_{GS}(T2)| - |V_{TH}|) \right\}^2 = \left(\frac{C_2}{C_1 + C_2} \right)^2 I_{DATA}$$

(M1) 5 (V_{TH}) 1 가 EL (OLED) (I_{OLED}) (C₁ + C₂)/C₂
 (I_{DATA}) EL (OLED) (I_{DATA})
 (D₁ - D_M)

5 (M1-M5) PMOS 14 NMOS

14 6 가

14 , 6 (M1-M5)가 NMOS

13 , 13 가 14 8 6
 5

1 6

15 16

15 7 가 , 16 15

15 , 7 (M3, M5, M6, M7) 1
 E_{n-1}) 가 (M1) (M3) (S_{n-1}) (S
 D_m) (SE_n) (M1) (M7) (S_n)
 (M5) (M5, M6) (C2) (M1) (M7) (M7)
 (EM_n) (S_{n-1}) (SE_{n-1}) (M6) (E_n)

16 15

16 , (T1) (SE_{n-1}) (M3, M5)가
 (M5) (C1, C2) (M1)
 (M1) (M3) (M1) (SE_n) (C1, C2)
 (V_{TH}) (EM_n)

(M2, M7, M4, M6) .

(T2) (SE_{n-1})가 (M3)가 , (S
E_n) (M7)가 (M1) (S
E_{n-1}) (M5)가 (C2) .
(SE_n) (M2)가 (D_m) (I_{DATA})가 (M1)
(V_{GS}(T2)) 1 (M1) 4 (V_{GS}(T2))
, - .
, (T3) (SE_n)가 (M2, M7)가 ,
(EM_n) (M4, M6)가 (M6)가 (C1, C2)
(M1) - (V_{GS}(T3)) 1 5
6 (I_{OLED})가 (M4) EL (OLED)
.
7 (CS1_n, CS2_n) , (CS1_n, CS2_n)
15 (M7) 7 (CS1_n)
1_n) (M6) 7 (M3) (SE_{n-1}) (CS
(CS2_n) (M5) (CS2_n) 가 15
(SE_{n-1}) (EM_n)
.
, 1 7 PMOS / NMOS
, PMOS, NMOS PMOS NMOS ,

가 , EL
가 EL
가 .

(57)

1.

가 ,

가 ,

가 ,

1 2 (main electrode) 가

1 ,

1 1 ,

2 1 1 ,

2 ,

- 1 2 2 ,
- 3 1 3
- ,
- 1 2 가 1 2 3 1
- 2.
- 1 ,
- 2 , 3 .
- 3.
- 1 ,
- 1 3 1 .
- 4.
- 1 ,
- 1 3 1 .
- 5.
- 1 ,
- 4 2 1 1
- , 2 1 1 1 1 4 1 2 2
- 1
- 6.
- 5 ,
- 2 ,
- 4 .
- 7.
- 5 ,
- 1 .
- 8.
- 7 ,
- 1 2 1 1
- 2 3 .
- 9.

5 ,

2 3 .

10.

9 ,

4 5 ,

4 5 3

.

11.

5 ,

1 , 2

3 .

12.

1 ,

1 1 2 4

,

1 4 2 1 1 1

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2 4 2 1 2

1 .

13.

1 ,

, 1 3 1 , 2

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1 2 , 1

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14.

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가 ,

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1 1 1 1 ,

1 2 1

1 1 ,

1 1 2 ,

1 1 2 ,

1 1 2 3 ,

1 2 1 3 4 ,

가 4 2 2 2
 ,
 3 가 1 1 1
 ,
 3 가 1 1 2

15.

14 ,
 2 1 1 1 ,
 1 1 1 3 2 2
 1 .

16.

15 ,
 1 3 1 3 , 1 3
 .

17.

16 ,
 1, 2 3 ,
 1 1 2 가 가 ,
 2 1 1 가 가 ,
 3 2 3 가 가 .

18.

15 ,
 2 1 , 3
 .

19.

18 ,
 1, 2 3 ,
 1 1 가 가 ,
 2 1 1 가 가 ,
 3 3 가 가 .

20.

19 ,
 1 1 가 가 .

21.

15

,
 1 1 1 가
 2 , ,
 2 2 3 , 2 1 1
 2 3 .

22.

15

,
 2 1 가 2
 3 , ,
 3 3 , 1 2 3 2 2
 3 2 3 .

23.

15

,
 1 1 1 가
 2 , 2 2 3 ,
 2 2 3 , 2 1 1
 2 2 3 , 3 3 , 1 4 5 2
 2 .

24.

14

,
 1 1 1 3 2 1
 ,
 2 1 1 3 2 2
 1 .

25.

1 2 가 ,
 가

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 1 1 1
 1 1 ,
 2 2 1
 2 2 ,

1 2 1 3
 , 3

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3

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26.

25

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27.

25

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3

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1

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28.

1 2

가

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가

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가

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가

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가

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2

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1

2

가

3

가

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1

3

가 ,

3

3

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29.

28

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3

2

1

1

가

1

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30.

28

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1

3

1

3

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31.

28

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2 1 , 2 1 1

32.

31 ,

1 1 가 가

33.

28 ,

1 1 1 가
2 ,

1 2 2 1

34.

28 ,

2 1 가 2
3 ,

1 3 2 1 2 3

35.

28 ,

1 1 1 가
2 ,

2 2 3 ,

1 2 2 1 ,

1 3 2 1 2 3

36.

1 ,

1 2 가 1 2 가 3 가 1
1 , 3 , 4 ,
1 ,

1 , 1 2
2 ,

1 , 1 2
3 가 , 3
3

,

3 1 2 .

37.

36 ,

가 2 1 , 2 1 .

38.

36 ,

가 1 1 1 2 1 .

39.

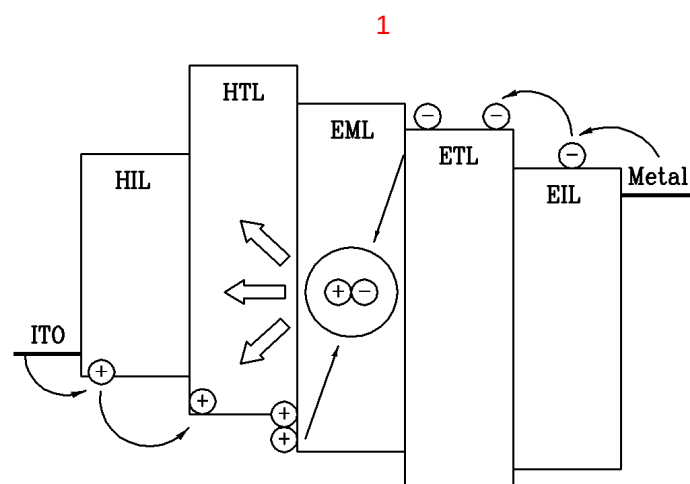
36 ,

가 2 1 2 3 1 .

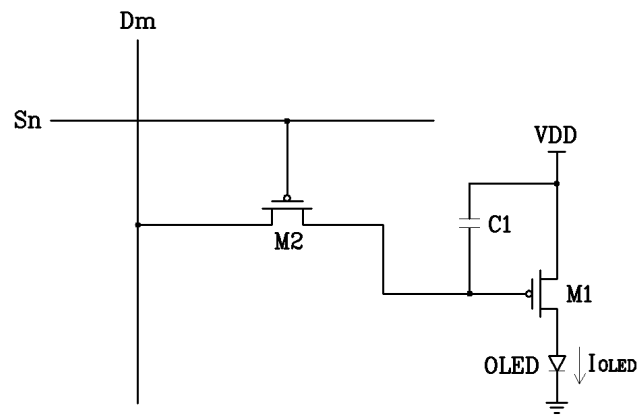
40.

36 ,

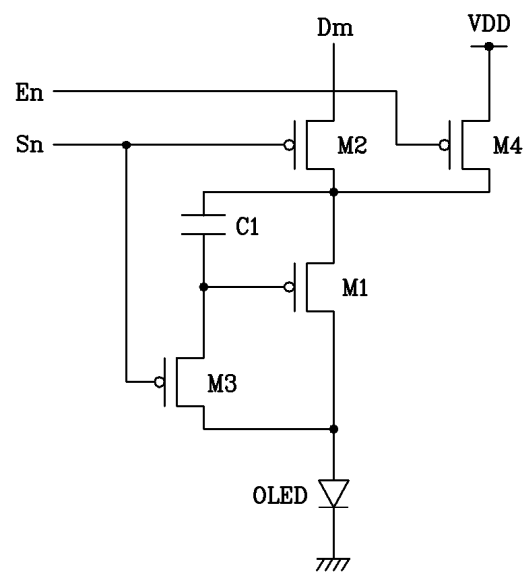
가 1 1 1 2 1 ,
2 2 3 .



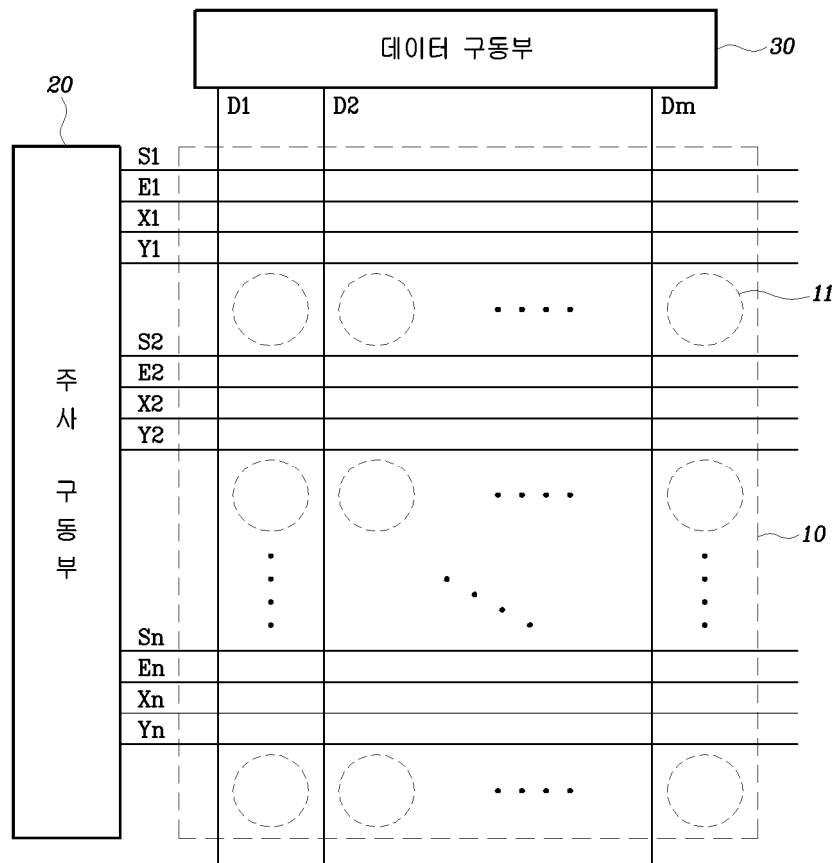
2



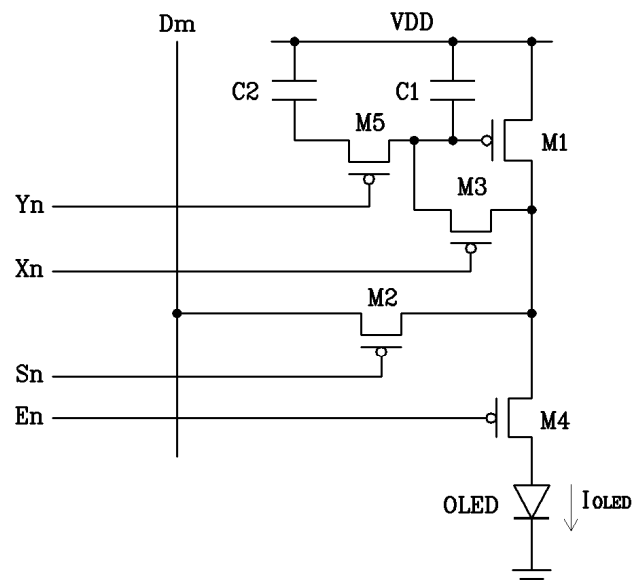
3



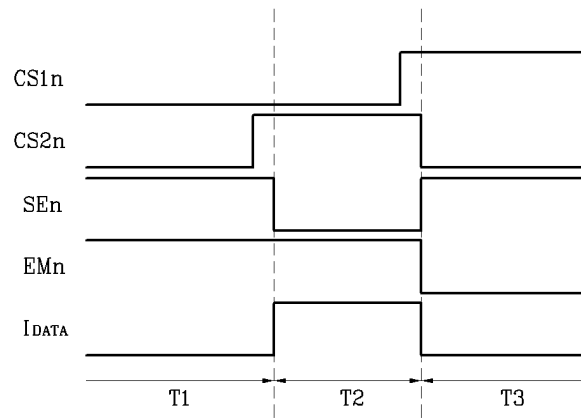
4



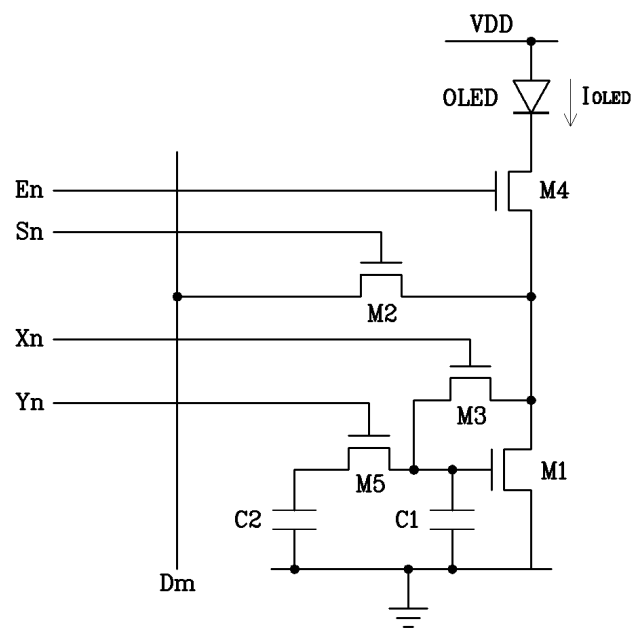
5



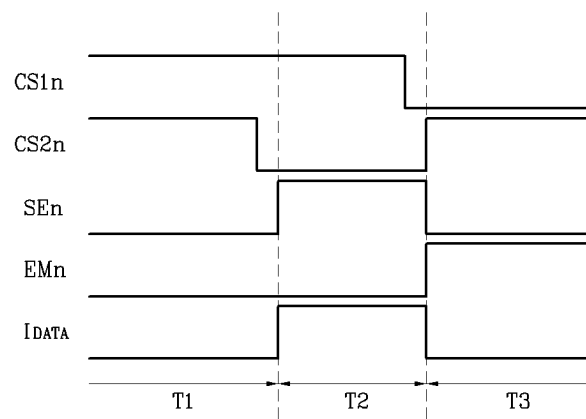
6



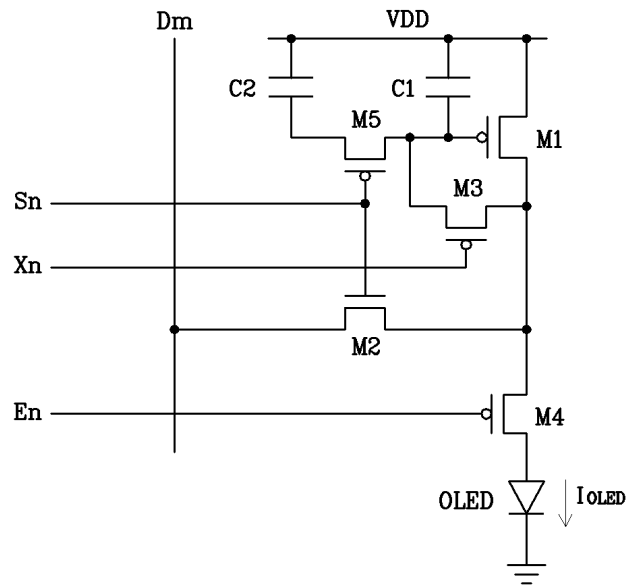
7



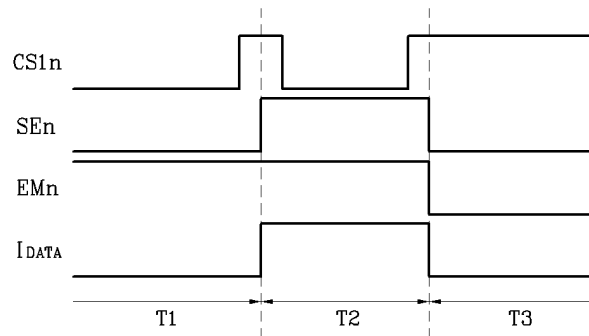
8



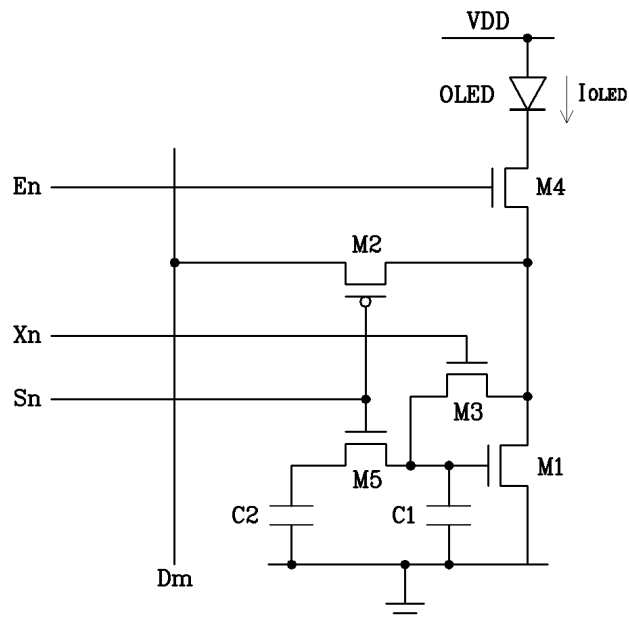
9



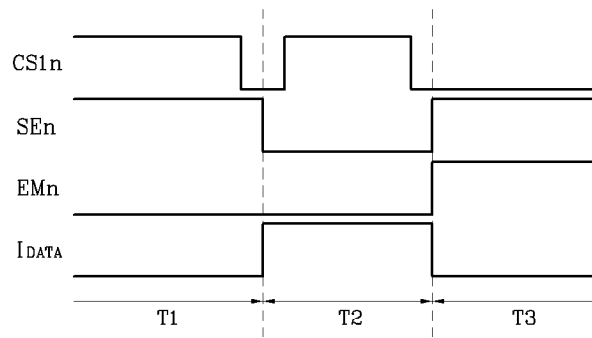
10



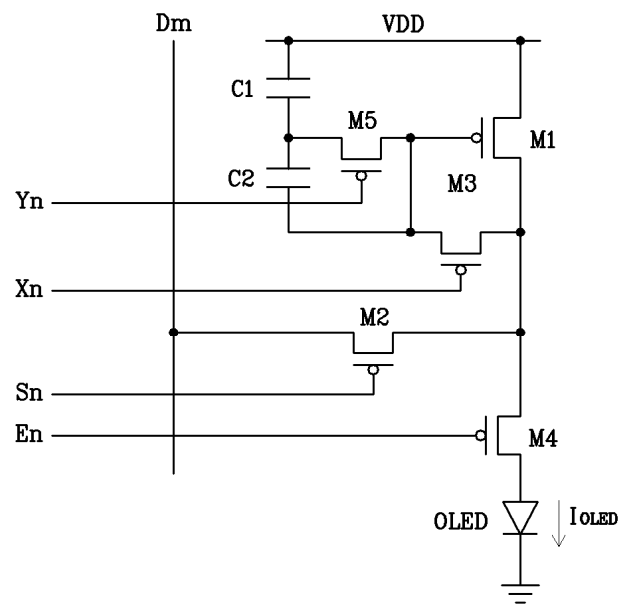
11



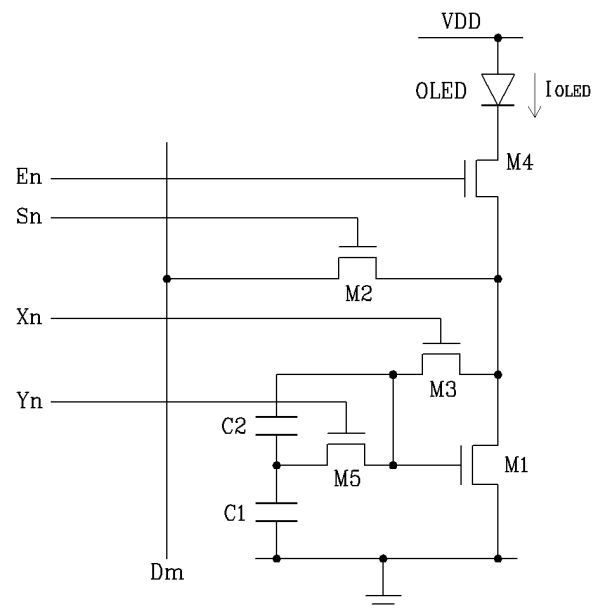
12



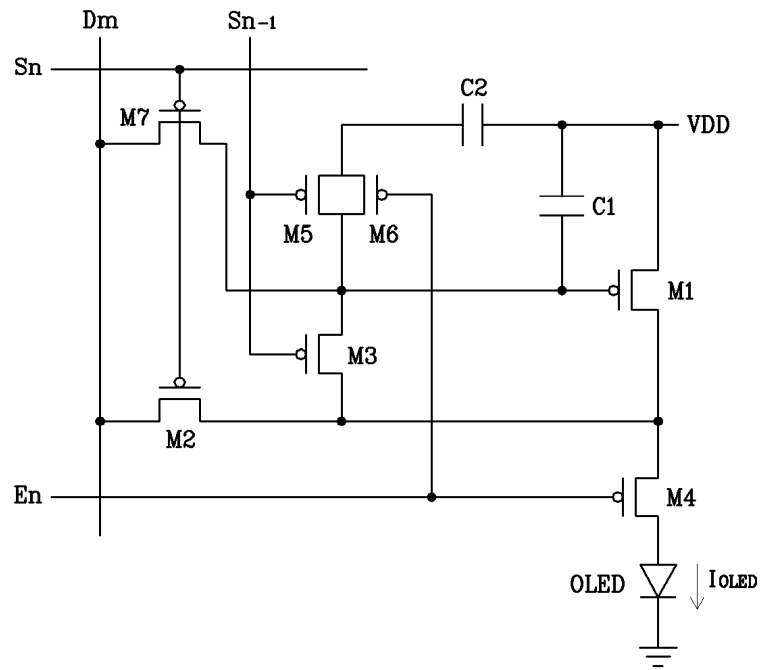
13



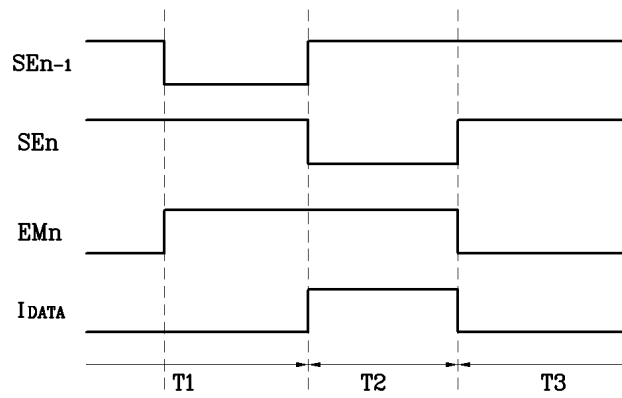
14



15



16



专利名称(译)	发光显示设备，显示面板，		
公开(公告)号	KR1020040085653A	公开(公告)日	2004-10-08
申请号	KR1020030020432	申请日	2003-04-01
申请(专利权)人(译)	三星SD眼有限公司		
当前申请(专利权)人(译)	三星SD眼有限公司		
[标]发明人	KWON OHKYONG 권오경		
发明人	권오경		
IPC分类号	G09G3/30 G09G3/14 G09G3/36 H05B33/00 H01L51/50 G11C11/00 H05B33/14 G09G3/32 G09G3/20		
CPC分类号	G09G2300/0852 G09G2300/0861 G09G3/325 G09G2310/0262 G09G2310/0251 G09G2320/0233 G09G2320/0223		
代理人(译)	您是我的专利和法律公司		
其他公开文献	KR100502912B1		
外部链接	Espacenet		

摘要(译)

晶体管和第一至第三开关元件形成在有机发光显示器的像素电路中。晶体管提供用于使有机电致发光元件发光的驱动电流，并且具有第一和第二主电极以及控制电极。第一开关元件响应于第一控制信号以二极管形式耦合晶体管，并且第一存储元件响应于第二控制信号存储对应于晶体管的阈值电压的第一电压。第二开关元件响应于来自扫描线的选择信号从数据线传输数据信号，第二存储元件存储对应于来自第一开关元件的数据电流的第二电压。第三开关元件响应于第三控制信号将驱动电流从晶体管传输到有机电致发光元件。并且，通过分别存储第一和第二电压的第一和第二存储元件的耦合确定的第三电压被施加到第一晶体管，使得驱动电流被提供给有机电致发光元件。五 指数方面 有机EL，电容器，晶体管，耦合，阈值电压，电流驱动

