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(43)

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(71) 가 가
가 가 398

(72) 가 가 398가 가

(74)

:

(54)

EL 가 가 TFT
TFT 가 , 가 , 가 EL 가 ,
가 TFT 가 , , EL 가
TFT , TFT -

1

, TFT, - , ,

1 , ,

2 TFT ,

3 1a ,
 4 , ,
 5 , ,
 6 , ,
 7 TFT , ,
 8 TFT ,
 9 ,
 10 ,
 11 ,
 12 , ,
 13 ,
 14 ,
 15 ,
 16 ,
 17 16 ,
 18 ,
 19 18 ,
 20 가 ,
 21 , ,
 22 .

* *

101 : 102 :
 103 105 : 1 3 TFT 106 :
 107 : 108 : EL
 109, 110 :

(, TFT)

(Electro Luminescence:EL) 가 가 (LCD)

, EL 가 (), 3

() . , ,

EL , () Tang / / / 가 EL 가

/ / / 가 EL / / /

/ EL EL EL

2a 2b , 2a 2b (201), (202), T(204), P (205), (206), EL (207), (208) 가 2a TFT(203), TF TFT(204) N TFT(203) , TFT(20

, TFT 1 2 . TFT ON, OFF , (TFT -) , TFT가 ON , TFT 가 TFT가 OFF , TFT 가

TFT(203) (202) 1 (201) 2 T(204) EL (207) (Anode) T(204) 1 (206) , (Cathode) , (208) (206) TFT(204) (205) , TFT(204) ,

(202) 가 TFT(203)가 ON , (201) T(204) , T(204) (, T(204))가 EL (207) .

TFT , , TFT , , , 가 , , 가 가 .

TFT , 8 가, ASIA DLSPLAY 2001, page 315, 'Amorphous SilicoN Thin-Film Transistors Based Active-Matrix organic Light-Emitting Displays' .

8 , (801), (802), TFT(803), TFT(804), T FT(805), (806), (807), EL (808), (809) , TFT 803 805 N TFT

TFT(803) , (802) , 1 (801) ,
2 TFT(804) 1 , EL (808) ,
2 , 2 TFT(805) 1 . TFT(805)
(807) (806) , EL (808) , (809) ,
(807) , TFT(804) 가 . (807)

2a 8 , TFT N TFT 2c
, 2a 2b , (206)- TFT(204)-EL (207)- (208)
, TFT(204) N , EL (207)

(206) 가 V_{DD} , EL (207) 가 V_A , 가 V_C , T
FT(204) , EL (207) 가 V_{Sig} 가 TFT(204) - V_{GS} , $V_{GS} = (V_{Sig} - V_A)$
 $V_{GS} - V_A$, EL (207) V_{EL} , $V_{EL} = (V_A - V_C)$.

2d , TFT(204) EL (207) - TFT(204) -
EL (207) - , EL (207)
 V_A 가 . EL (207) - 211, TFT(204) - 213
215가 , $V_A = V_{A1}$, TFT(204) -
 V_{GS} , $V_{GS} = (V_{Sig} - V_{A1})$.

, EL (207)가 212 . , EL (207)가 ,
EL (207) 216 , $V_A = V_{A2}$ 가 , TFT(204) - ,
TFT(204) N TFT , EL (207)
 V_{GS} , $V_{GS} = (V_{Sig} - V_{A2})$,
217 , EL (207) , TFT(204) 214 가 ,
TFT(204) 가 .

, EL , EL TFT N TFT ,
EL

TFT , EL EL TFT 가 ,
EL 가 , TFT - 가 , EL 가 EL 가
, TFT

, (bootstrap) 가 , TFT

, TFT가 ON , TFT , EL 가 ,
 , TFT 가 TFT
 , EL 가 TFT -
 () TFT TFT 가
 , TFT TFT
 ,
 ,
 가 2 1 2 , ,
 ,
 1 2 1 , 1
 2 ,
 1 2 1 1
 , 2 1 , 1
 2 2 2 ,
 2 3 ,
 1
 ,
 가 2 1, 2 3 , ,
 ,
 1 2 1 , 1
 2 ,
 1 2 1 1
 , 2 1 , 1
 2 2 2 ,
 2 3 ,
 1
 ,
 2 3 1 1 , 2 3 , 3
 ,
 ,
 가 2 1, 2 3 , ,
 ,

1 2 1 , 1

1 2 1 1 1

2 2 2 ,

2 3 ,

1 1 , 3

2 3 2 1 .

가 2 1, 2 3 , ,

1 1 , 1

2 1 2 1 1

1 2 1 3 ,

2 2 2 ,

2 3 ,

1 .

3 V_3 , $V_1 > V_2$ $V_1 > V_3$. N , 1 V_1 , 2 V_2

2 V_2 3 V_3 , $V_2 < V_3$.

3 V_3 , $V_1 < V_2$ $V_1 < V_3$. P , 1 V_1 , 2 V_2

2 V_2 3 V_3 , $V_2 > V_3$.

가 , 1 2 , 1 , 1, 2 3 , ,

1 1 1 1 , 1

1 2 1 1 , 1

2 1 2 ,

2 2 3 1 , 2

2 3 2 , 3

2 2 ,

2 1 .

, ,

가 , , , 1, 2 3 , ,

,

1 1 , 1 1

2 2 1 1 1

2 1 , 1

, ,

2 2 3 1 , 2

2 ,

3 , 3 2

, ,

2 2 ,

2 1 .

, ,

가 , 1, 2 3 , , 1, 2, 3 4 ,

, ,

1 1 1 1 , 1

1 2 2 1 1 1 1

2 1, 2 3 , 2 3

, ,

2 2 3 1 , 2

2 ,

2 3 2 , 3

, ,

2 2 ,

2 1 ,

1 4 3 , 4 2 2

1 2 1 , 1 , 2 4

. ,

, ,

가 , 1 2 , , 1, 2, 3 4 ,

, ,

1 1 1 1 , 1

1 2 1 1 1 1 , 1

2 1 ,

1 2 , 2 ,

2 2 3 1 , 2

2 3 1 , 3

2 2 2 ,

2 2 1 ,

1 4 2 2 , 4 2 2

1 2 1 , 1 , 2 4 2 2

.

, ,

가 , 1, 2 3 , , 1, 2, 3 4 ,

, ,

1 1 2 1 1 , 1 1

2 2 1 1 , 1

1, 2 3 , 2 3

, ,

2 2 3 1 , 2

2 3 2 , 3

, ,

2 2 2 1 ,

1 4 3 , 4 2 1

.

, ,

가 , 1 2 , , 1, 2, 3 4 ,

, ,

1 1 2 1 1 , 1 1

2 2 1 1 , 1

1 2 , 2 ,

2 2 3 1 , 2

2 3 1 , 3

, ,

2 2 ,

2 1 ,

1 4 2 4 1

1 1 , 4 2 1

.

,

가 , 1, 2 3 , 1, 2, 3 4 ,

,

1 1 1 1 , 1 1

1 2 2 1 1 1 , 1

2 1, 2 3 , 2 3

,

2 2 3 1 , 2

2 ,

2 3 , 3

,

2 2 ,

2 1 , 가 2

1

4 2 2 , 2 3

1 1 ,

.

,

가 , 1 2 , 1, 2, 3 4 ,

,

1 1 1 1 , 1 1

1 2 2 1 1 1 , 1

2 1 2 , 2 ,

2 2 3 1 , 2

2 ,

2 3 1 , 3

,

2 2 ,

2 1 , 가 2

1

4 2 2 , 2 2

1 1 , 4 2

.

1 3 , .

2 2 N V 1 , 1

V 2 , 2 V 3 , V 1 > V 2 V 1 > V 3 .

V 3 , V 2 > V 3 . N , 1 V 2 2

V 2 , 2 2 P V 1 , 1

V 3 , V 1 < V 2 V 1 < V 3 .

V 3 , V 2 < V 3 . P , 1 V 2 2

가 2 1 2 , ,

1 2 1 , 1

1 2 1 2 1 1

2 2 2 ,

2 3 ,

1 ,

1 2 1 1 ,

1 2 가 2 ,

가 3

3 , 가 - 1

가 2 1, 2 3 , ,

1 2 1 , 1

1 2 2 1 1

2 2 2 ,

2 3 ,

1 ,

2 3 1 1 , 2 3 ,

1 2 1 1 ,

1 2 가 2 ,

가 3 ,

3 - 가 ,

4 ,

3 , 가 - 1 .

가 2 1, 2 3 , ,

1 1 , 1

2 ,

1 2 1 1 1

2 2 2 ,

2 3 ,

1 ,

2 3 1 1 , 3

1 2 ,

1 1 ,

1 2 가 2 ,

가 3 ,

3 - 가 ,

4 ,

3 , 가 - 1 .

가 2 1, 2 3 , ,

1 2 1 , 1

1 2 1 1 1

2 2 3 1 1 ,

2 2 2 ,

2 3 ,

1 ,

1 2 1 1 ,

1 2 가 2 ,

3 가

3 ,

3 , 4 ,

3 , 가 - 1

[]

(1)

1a , (101), (102), 1
 3 TFT(103 105), (106), (107), EL (108), (109, 110) . TFT(103)
 , (102) , 1 (101) , 2 TFT(104)
 . TFT(104) 1 (107) , TFT(105)
 1 EL 1 . TFT(105) (102)
 2 , (110) 2 . EL (108) 2 , (109) (106)
 , TFT(104) 2 , TFT - .
 , TFT(103 105) N TFT , - , ON , EL
 (108) , 1 , 2 . V_A , (109)
 V_C , (107) V_{DD} , (110) V_{SS} .
 V_{Sig} .

(D) 3a , 1a, 1b 3a-3c . , TFT(104) (G), (S)

3a , (102) TFT(103, 105)가 ON . (101) 가
 , TFT(104) , 가 V_{Sig} 가 . , TFT(105)가 ON
 $V_A = V_{SS}$ 가 . , $V_{SS} \leq V_C$, EL (108) 가
 $V_{SS} > V_C$, EL (108) 가 , $(V_{Sig} - V_{SS})$
 A 가 , (106) , TFT(103, 105)가 OFF , (106)
 , 가 , TFT(104) - $(V_{Sig} - V_{SS})$ (3b).
 $(V_{Sig} - V_{SS})$ 가 TFT(104) , TFT(104)가 ON (107) EL
 가 (3c), TFT(104) 가 가 . , TFT(104)
 , (106) TFT(104) - ,
 , 가 , TFT(104, 105) ,
) , (106) ,

, TFT(104) , TFT(104) .

151 , 1b EL 152 153 TFT(104) 154 155 EL (108)
 V_A TFT(104) , 156 TFT(104) - V_G , V_{GS}

가 , 1b i , (102) , H , EL (108) ,
 V_A , TFT(104) , V_G 가 , TFT(105)가 ON , EL (108)
 V_{SS} , TFT(104) - V_{GS} 가
 $V_A = V_{SS} < V_C$, V_{Sig} , EL (108)

ii (102) L , TFT(103, 105)가 OFF .
 $V_{GS} = (V_{Sig} - V_A)$ 가 , (106) .

iii 가 , , TFT(104) - V_{GS} 가
, TFT(104)가 ON 가 , EL (108)가 , TFT(104)
, TFT(104) , TFT(104)

, EL (108)가 . EL 가 , EL (108)
 V_A , V_G , V_{GS} 가 V_A 가 ,

V_{Sig} 가 7a 7h , 2b 가 가
, TFT(204) TFT(204) V_G , EL (207)가 V_A 가
(7g, 7h). , TFT(204)
- , EL (207) 가 가 , EL (207)가 ,
, EL , EL

, V_{SS} , V_C . , $V_{SS} < V_C$, EL
가

, TFT(103, 105) , 가 , 1a , TFT(103, 105) ,
TFT (102) 가 1 2 TFT
, TFT(103, 105)가 ,
가

(2)

1a V_{SS} 5 , , , (V_{DD}), V
C 1

9 , 1 , TFT(906) 2 (V_{SS})
가 i , TFT(906) 2 , i+1 (900)

, H , TFT(904) -
, TFT(904)가 V_{Sig} OFF , L , L V_{SS}

i , L , V_{SS} , H , V_{SS} , TFT(904, 906)가 ON , $i+1$, TFT(906) EL , V_A , 1

i , TFT(906) 2 , H , TFT(906)가 ON , V_{SS} , $i-1$ 가

1 , TFT(904, 906) (902)

(3)

TFT - , EL , EL 100%, 0% 2 , TFT

2 , TFT

가

$10a$, 1 () , (sustain)()

$10b$, $2^{(n-1)} : 2^{(n-2)} : \dots : 2:1$, () , EL

EL 가 , $10a$ $10b$, 4 , 1

4 , $2^4 = 16$ 가

2 ,

() 가

() , ()

$10b$, $Ts3$ Ts

4 , 2 () 가 SF1 SF2 ,

2 ()

, EL

가

$4a$, 1 , 2 (403) TFT(407) 가 , 2

(403) , TFT(405) 2 , 1 , TFT(405) (408) 2 , 2

1 (402) , 가 , 1 TFT(407) OFF

V_{Sig} , TFT(405)가 ON , 2 , L , TFT(405)가 OFF

()

$11a$, $10a$, 1 , $4a-4c$ $11a-11c$, 4 , $Te3$ $Te4$

$SF3$, $SF4$

$10b$, TFT(405) - V_{GS} 가 EL

3) (410)가 H, TFT(407)가 ON, 4c, TFT(405)가 OFF, EL (410)가, EL (410)가, 11c, () Ts3, 2, (403)가, Te3, 1, (402)가, (412), TFT(406) 2, (412), TFT(407) 2, (403), TFT(406) 2, 2, (403).

(4)

5a, 3, TFT (508) 1, (512), TFT(507), 3, (503)가 H, TFT(507)가 ON, 5c, TFT(505)가, V_{GS}가, V_{SS}가, TFT(505), V_{SS}, V_{GS}, V_{GS} ≤ 0, TFT(505)가 OFF, EL (510)가, 1, (502)가, TFT(507), 5a, TFT(506) 2, (512), (512), TFT(507) 2, (503), TFT(506) 2, 2, (503).

(5)

6a, 3, 4, TFT, T, FT(607)가, TFT(605) 1, (601)가, 1, (602), TFT(606) H, TFT(604)가 ON, V_A, V_{SS}, TFT(607) ON, V_{SS} ≤ V_C, EL (610)가, (608), 1, (602)가, TFT(605)가, V_{GS}, (603), TFT(607)가 ON, 6d, 가, V_A가, TFT(607)가 ON, V_C, (602), TFT(607, 605), EL (610)가, EL (610), 1, V_A가, V_C, T(607)가 OFF, (609), EL (610), (603), L, EL (610), TF

가 , 1 (602) 가 , 가

, TFT(607) , TFT(605) 1 , EL (610) (609)
EL (610) TFT(607) , EL (610)

(602) TFT(604, 606) , 가 (610)
(602) TFT(604, 606) 가 (610)

(6)

3 5 , TFT 가 , ,
TFT 가 ,

21a , 1 , TFT(2104, 2106)
(2102, 2103)

() , 21b (2107) TFT(2105) -
가 EL (2109)

6) 2 , 2 (2103) 가 TFT(2106) ON , TFT(210
(2111) , EL (2109) 가 (2109) , (2110)
, EL (2109) 가 , 21c

(2111) ,

(7)

EL TFT , N TFT TFT P T
FT 가 12a

1a N TFT , EL (1208)
, TFT(1204) 2 가 V_{SS} , (1209) 가 V_A , (1210) 가 V_{DD}
(1207) $V_{SS} < V_{DD}$ $V_A < V_{DD}$
, $V_{SS} < V_{DD}$ $V_A < V_{DD}$

12b 12d , TFT P ,
L ON , H OFF

(1202) L , TFT(1203, 1205)가 ON (1201)
가 12b , TFT(1204) 가 V_{Sig} 가 , TF
T(1205)가 ON , EL (1208) V_C , $V_C = V_{DD}$ 가 , $V_A \leq V_{DD}$
, EL (1208) 가 , (1206)
, TFT(1204) - , $(V_{Sig} - V_{DD})$ (1202)
H , TFT(1203, 1205)가 OFF , (1206) 가 ,
TFT(1204) - $(V_{Sig} - V_{DD})$ (12c).

, $(V_{Sig} - V_{DD})$ 가 TFT(1204) , TFT(1204)가 ON , (1209), E
L (1208) (1207) 가 (12d), TFT(1204) 가
, TFT(1204) , (1206) TFT(1204) -

12a , TFT P TFT , TFT(1203, 1205)
, (1202) , TFT(1203, 1205)가 , TFT

()

(1)

a , (1601) , 가 (1602) 16
(1603) 1, 2 (1604, 1605) 가
16a , 2 , 1a 4a 5a 2
, 가,
(1603), 1, 2 (1604, 1605)
(Flexible Print Circuit:FPC)(1606)

16b , (1611), (1612), (1613) 가
, 가
17a ,
(1701) , (FF)(1702) , (S-CLK), (S-CLKb),
(S-SP)가 , 가
(1701) (1703)
(1704) , (SW)(1705) , 가
, 가 , (1705)가 ON
, 가 가,

16c , 1, 2 (16
04, 1605) 17b 1
(1711), (1712) 가 , (G-CLK1), (G-CLKb1), (G-SP1)
2 (1605)

, 1
21 . . . G_{m1} , 2 1 G₁₁, G
m2 가 2 G₁₂, G₂₂ . . . G
, 3 G₁₃, G₂₃ . . . G_{m3}
가

, D-
,

(2)

, 18a
, (1801) , 가 (1802) 가
(1803) 1, 2 (1804, 1805) 가
18a , 2 , 1a 4a 5a 2
, 가,
(1803), 1, 2 (1804, 1805)
(Flexible Print Circuit:FPC)(1806)

18b ,
 14) 가 . , (1811), 1 (1812), 2 (1813), D/A (18
 1, 2 (1804, 1805) , 1 ,
 . 19a ,
 (1901) , (FF)(1910) , (S-CLK), (S-CLKb),
 (S-SP)가 가 .
 (1901) , 1 (1902) . 1 (1902) ,
 가 , 가 , 1 .
 , 1 3 3 1 가 .
 1 (1902) , 가 , 2 (19
 03) (Latch Pulse)가 , 1 (1902) , 2 (19
 (1903) , 2 (1903) , 1 , D/A (1
 904) .
 2 (1903) 가 D/A (1904) , (19
 01) 가 , 1 .
 D/A (1904) , - ,
 , 1 , 가 .
 , 1 , ,
 (3)
 2 , D/A - , 19b , D/A
 , , , EL 가 , 1 2 1 가 .
 , , 가 ,
 (4)
 , , TFT TFT 가 TFT
 13a 14c .
 (5000) , , .
 , (5000) .
 1) (5000) (5001) 2 (500) .
 2 .
 , (5001) 1 CVD SiH₄, NH₃ N₂O 가
 (5001a) 10 20[nm](50 100[nm]) .

(5001a) 50[nm] (5001) 2 (5001b) 50 200[nm]
 CVD SiH₄ N₂O 가 (5001b) 100[nm]
 (100 150[nm])

(5001) (5002 5005) (5002 5006) 25 80[nm]
 (5002 5005) (, LPCVD , CVD) (, RTA)
 30 60[nm] (5002 5005)

CVD 55[nm] 500[] , 1
 550[] 4 (5002 5005)

YAG , YVO₄ , YLF ,
 YAlO₃ , Ti: YAG, YVO₄ , YLF, YAlO₃
 Cr, Nd, Er, Ho, Ce, Co, Ti Tm , 1[μm]

가 Nd:YVO₄ (1064 [nm]) 2 4 (532[nm]) 3
 (355[nm])

10[W] YVO₄ YVO₄
 YVO₄

0.01 100[MW/cm²] (0.1 10[MW/cm²])가 , 10 200
 0[cm/s]

300[H
 z] 100 700[mJ/cm²] (200 300[mJ/cm²]) , YA
 G 2 1 300[Hz]
 300 1000[mJ/cm²] (350 500[mJ/cm²]) , 100 1000[μm] (50 98[%]
 400[μm])]

가 , 가 (RTA) 50 100[nm]
 가

(5002 5005) , TFT ()

(5002 5005) (5006) (5006) , CVD
 40 150[nm] 115[nm]
 (5006) CVD (5006)
 (5006)

(5006) CVD TEOS(Tetraethyl Ort

hosilicate) O_2 , 40[Pa], 300 400[] . (13.56[MHz])
 0.5 0.8[W/cm²] ,
 400 500[] , (5006) .
 , (5006) 20 100[nm] 1 (5007) , 100 400[nm] 2
 (5008) , 30[nm] TaN 1 (5007) ,
 370[nm] W 2 (5008) .
 , 1 (5007) TaN , Ta
 , 2 (5008) W , W .
 6 (WF₆) CVD .
 가 , W 20[$\mu\Omega$ cm] . W ,
 , W , W(99.9999[%]) 가 . W ,
 가 , , W(99.9999[%]) W .
 , 9 20[$\mu\Omega$ cm] .
 , 1 (5007) TaN , 2 (5008) W , 1 (5
 007) 2 (5008) . 1 (5007) 2 (5008) ,
 Ta, W, Ti, Mo, Al, Cu, Cr Nd ,
 . ,
 . AgPdCu
 , (5009) 1
 . 1 , 1 2 (13b).
 , ICP(Inductively Coupled Plasma:)
 가 CF₄ Cl₂ O₂ , 가 25:25:10[sccm] . 1.0[Pa]
 500[W] RF(13.56[MHz])
) 150[W] RF(13.56[MHz]) , (-) 가 .
 , 1 W 1 (5007) .
 , (5009) 2 , 가 CF₄ Cl₂
 , 가 30:30[sccm] . 1.0[Pa] 500[W] RF(13.56[MH
 z]) 15 () 20[W] RF(13.56[
 MHz]) , 가 2 (5006)
 2 (5008) . 가 ,
 , 10 20[%] 가 .
 1 , 가
 1 (5007) 2 (5008) 가 , 1
 (5007) 2 (5008) 1 (5010 5014) ,
 (5006) , 1 (5010 5014) 20 50nm ,
 가 .
 , (5009) 2 (13c). 2 , 가
 SF₆ Cl₂ O₂ , 가 24:12:24(sccm) . 1.3Pa
 700W RF(13.56 MHz) 25 ()
 10W RF(13.56MHz) , 가 , W
 , 2 (5015 5019) . 1 (5015a 5018a) ,
 .
 , (5009) 1 , (5002 5005) N
 가 1 ,
 , 1×10¹³ 5×10¹⁴ [atoms/cm²] , 가 40 80[keV]
 , 5.0×10¹³ [atoms/cm²] , 가 50[keV] . N
 , 15 (P) (As)
 (P) , 2 (5015 5019) N .

1×10^{18} ~ 1×10^{20} [atoms/cm³] (N--)(5020 5023) . , 1 (5020 5023)
) 가 가 .
 (5009) , (5024) , 1
 가 , 1×10^{13} ~ 3×10^{15} [atoms/cm²] ,
 가 , 60 120[keV] , 3.0×10^{15} [atoms/cm²] ,
 가 65[keV] , 2 (5015b 5018b) 가 가
 , 1 (5015a 5018a)
 .
 5×10^{19} [atoms/cm³] , 1 1×10^{19} ~ 5×10^{21} [atoms/cm³] (N- ; Lov)(5026, 5029) 1×10^{18} (N+)
)(5025, 5028, 5031, 5034) , 1, 2 (5002 5005) , 가 가 가
 가 가 가 가 가 가
 가 가 (5027, 5030, 5033, 5036) , 1
 1 (N--)(5020 5023) , 2 (5024)
 , 1 (N-- , LDD)(5032, 5035) .
 , 2 (N-)(5026) 3 (N+)(5025
 , 5028, 5031, 5034) .
 ,
 , 14a (5037) , CVD (5024) 1 (5037) 1
 (5037) , CVD , 100 200[nm]
 , CVD 100[nm]
 , 1 (5037) ,
 , 가 , 가 가
 0.1[ppm] , 400 700[] , 가 1[ppm] , 가
 , 410[], 1 (RTA) .
 , 1 (5037) 가 , 1 (5015a 5019a) 2
 (5015b 5019b) 가 , 1
 (5037)()
 .
 , 1 (5037)()
 , 1 (5037)
 (dangling bond)가 .
 , 가 , 가 .
 , 1 (5037) () , 3 100[%] , 3
 00 450[] 1 12 가 .
 , 1 (5037) , 2 (5038) , 2 (5038) ,
 , CVD , SOG(Spin On Glass)
 , 2 (5038) , ,
 , BCB() ,
 .
 TFT , 1.6[μ m] , 2 (5038) , (5000) 가
 , 2 (5038) 가
 ,

6) , , 2 (5038), 1 (5037) (500
(5025, 5028, 5031, 5034) .

Indium Tin Oxide:ITO), (5039) . (

가 EL .

, ITO 110[nm] , (5039) .

40 5046) , 100[nm] Ti , (5040 5046) 350[nm] Al , 100[nm] Ti , (50
 ,

, 3 , Al Ti , 2 , 4 , TaN Al Cu ,
Ti .

, (5039) , (5045) , (5045) (5039)
(14b).

14b , N TFT , TFT, TFT

26)(Lov), N TFT , 1 (5015a) (5025) (50
(5025) .

, N TFT , (5032)(Loff) ,
(5031) .

, 3 (5047) . 3 (5047) , SOG(Spin On Glass)
 ,

2 (5038) 3 (5047) .

2 (5038) , , 3 (5038) (

5047) , SOG , 2 , SOG

CVD , 2 (5038) , SOG (5047) CVD

(5047) , 2 (5038) (5047) , 3 CVD

, 2 (5038) , 2 (5038) , 3 CVD

, 3 (5047) , CVD CVD

3 (5047) (5039) . 3 , (bank)

EL 가 가 . , 가 .

3 (5047) , 1×10^{-6} 1×10^{-12} [Ω m])(가 , 1×10^{-8} 1×10^{-10} [Ω m]))가 ,
가 .

, 3 (5047) (5039) , EL (5048) .

EL (5048) , .

가 20
가 10[μm]
EL (5048) Tang
20[nm] (Cupc) EL (5048) 70[nm]
-8- (quinolinolato) (Alq₃)
(quinacridon), (perylene) DCM1 가
14c, R(), G(), B()
EL (5048)
20[nm] (PEDOT)
EL (5048) 100[nm], PPV π (phenylene vinylene)(PPV)
가
EL (5048), EL (5048)
가,
() , EL (5048) ()
, EL (5048) (5049)
EL MgAg (1 2) (5049)
가
(5049) EL 가 , EL () (5039), EL (5048)
() (5049)
EL (5050) (5050)
가
(5050) DLC()
DLC 100[] 가
EL (5047) , DLC 가
EL (5048) 가
3 (5047) (5050) ()
14c , 가 가 ()
() ()
() EL
(5000)
(: FPC)

(5)

15a, TFT가 15c 15a B-B' 15b 15a

A-A' 15c 15a B-B' . 15b 15a

(4001) (4002) , (4003) , 1 2 (4004 a, 4004b) , (4009)가 , (4002) , (4003) , 1 2 (4008)가 , (4002) , (4004a, 4004b) , (4001), (4009) (4008) , (4210) .

(4001) (4002) , (4003) , 1 2 (4004a, 4004b) , TFT 가 15b , (4010) , (4003) TFT(, N TFT P TFT)(4201) , (4002) TFT(4202) .

TFT(4201, 4202) () (4301) , TFT(4202) () (4203) , (4203) 가 .

가

(4203) (4302) (4302) (4203) 가 (4203) (4204) (4204) () ()

(4204)

(4204) () (4205) , (4205) (4204) 가 (4205) 가

(4205)

() (4203), (4204) (4205) (4303)가 (4303) , (4303) (4302) (4209) . (4209) , ()

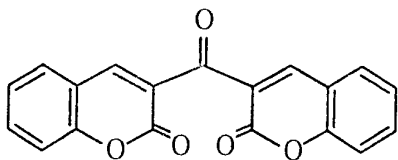
4005a , TFT(4202) 1 (4005a) (4009) (4001) , (4300) FPC(4006)가 FPC (4301)

(4008) , () , PVF() (Mylar) , FRP(Fiberglass-Reinforced-Plastics) , PVF() PVF

, (4103)
 , PVC() , , , PVB() EVA(
 , (4103) ()
 (4008) (4001) (4007) (4207) (4207)
 (4207) (4007) (4208) (42
 08) (4207) (42
 07) (4207)
 (4303)
 15c (4203) (4005a) (4203a)
 , (4300) , (4300a) (4001) FPC(4006)
 (4001) (4203a) FPC(4006) FPC (4301) , (4300a)
 (6)
 , 3 가 가
 , 3 .(T.Tsutsui, C.Adachi, S.Saito, P
 hotochemical Processes in Organized Molecular Systems, ed.K.Honda, (Elsevier Sci.Pub., Tokyo, 1991) p. 4
 37.)

(coumarin)

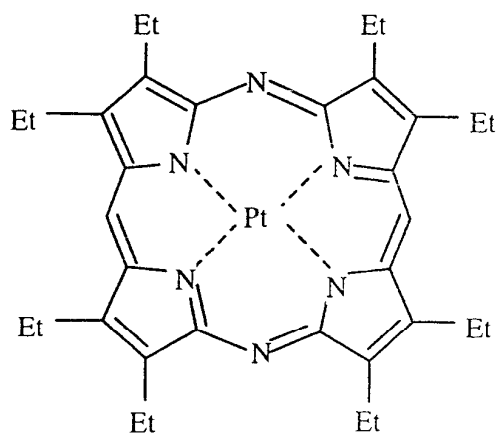
[1]



(M.A.Baldo. D.F.O' Brien, Y.You, A.Shoustikov, S.Sibley, M.E.Thompson, S.R.Forrest, Nature 395(1998) p.15
 1.)

(Pt)

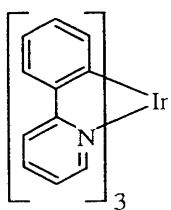
[2]



(M.A.Baldo, S.Lamansky, P.E.Burrows, M.E.Thompson, S.R.Forrest, Appl.Phys.Lett.,75(1999) p.4.)(T.Tsutsui, M.-J.Yang, M.Yahiro, K.Nakamura, T.Watanabe, T.tsuji, Y.Fukuda, T.Wakimoto, S.Mayaguchi, Jpn.Appl.Phys.,38(12 B)(1999) L1502.)

(Ir) .

[3]



3

3 4 가

가 .

(7)

, , 가 , 가 . , , (, ,), , (, Digital Versatile Disc(DVD) , 가 , 가 , 20 .

20a , (3001), (3002), (3003), (3004), (3005) 가 , , TV , 가 .

20b , (3101), (3102), (3103), (3104), (3105) , (3106) , (3102) .

20c , (3201), (3202), (3203), (3204), (3205), (3206) , (3203) .

20d , (3301), (3302), (3303), (3304), (3305)
 . (3302) .

20e (DVD) , (3401), (3402),
 (A)(3403), (B)(3404), (DVD) (3405), (3406), (3407)
 . (A)(3403) , (B)(3404) .
 , (A, B)(3403, 3404) 가

20f () , (3501), (3502), (3503) .
 (3502) .

20g , (3601), (3602), (3603), (3604), ((3605),
 (3606), (3607), (3608), (3609), (3610) .
 (3602) .

20h , (3701), (3702), (3703), (3704), (3705), (370
 6), (3707), (3708) . (3703) . ,
 (3703) .
 , 가 ,
 , 가 .
 , CATV(가 가) .
 , ,
 , ,
 . ,
 , 1 6 , 가 . ,
 (8)

21a 22 .

22 , TFT 1 (2102), 2 (2103) TFT . , ,
 TFT (2101) (2108) , EL () 1 (,
) .
 , 1 (2102) 가 TFT(2104)가 . TFT(2104) , 2
 2 () . , TFT(2104) , 3
 .

FT , TFT TFT(2105) (L) . , L , T

가, 2 (2103) TFT(2106) 가 . ,
 (2107)가 .

TFT , ()
 , () GOLD

EL 가 , EL , TFT, TFT - N TFT
 가 가 . , ,
 , , .
 , ,
 , (TFT),
 , SOI ,

(57)

1.

2.

1

3.

1

4.

5.

4

6.

4

7.

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

8.
7 ,
 $V_3, V_1 > V_2^N V_1 > V_3, V_1, 1 V_2 2$

9.
7 ,
 $V_2 2 V_3, V_2 < V_3$

10.
7 ,
 $V_3, V_1 < V_2^P V_1 < V_3, V_1, 1 V_2 2$

11.
7 ,
 $V_2 2 V_3, V_2 > V_3$

12.
7 ,
,

13.
7 , , , , , ,

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

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

15.
14 ,
N
V₃ , V₁ > V₂ V₁ > V₃ , V₁ , 1 V₂ 2
.

16.
14 ,
1 V₂ 2 V₃ , V₂ < V₃ .

17.
14 ,
P
V₃ , V₁ < V₂ V₁ < V₃ , V₁ , 1 V₂ 2
.

18.
14 ,
1 V₂ 2 V₃ , V₂ > V₃ .

19.
14 ,
 ,
 .

20.
14 , , , , , ,
 , , , .

21.
 ,
2 1, 2 3 ,
 ,
1 1 , 1
2 ,
1 2 1 1
 , 2 ,
2 2 1 ,
2 2 ,
2 2 ,

1 ,

2 3 1 1 1 , 3

21

22.

21 ,

V_3 , $V_1 > V_2$ $V_1 > V_3$, V_1 , 1 V_2 2

23.

21 ,

1 V_2 2 V_3 , $V_2 < V_3$.

24.

21 ,

V_3 , $V_1 < V_2$ $V_1 < V_3$, V_1 , 1 V_2 2

25.

21 ,

1 V_2 2 V_3 , $V_2 > V_3$.

26.

21 ,

27.

21 , , , , , ,

28.

2 1, 2 3 ,

1 2 1 , 1

2 1 2 1 1

2 2 1 ,

2 2 2 ,

1

29.

28 ,

35

,
2 N , 1 V_2 2 V_3 , $V_2 > V_3$
.

38.

35

2 2 P , V_1 , 1 V_2
 V_3 , $V_1 < V_2$ $V_1 < V_3$.

39.

35

2 P , 1 V_2 2 V_3 , $V_2 < V_3$
.

40.

35

, , .

41.

35

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42.

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

43.

42

1 3 , .

44.

42

2 2 N , V_1 , 1 V_2
 V_3 , $V_1 > V_2$ $V_1 > V_3$.

45.

42

,
2 N , 1 V_2 2 V_3 , $V_2 > V_3$
.

46.

42

2 V_3 , $V_1 < V_2$ $V_1 < V_3$ P , V_1 , 1 V_2
.

47.

42

2 P , 1 V_2 2 V_3 , $V_2 < V_3$
.

48.

42

49.

42

50.

,
1, 2 3 , 1, 2, 3 4 ,
1 1 1 , 1 1
2 2 1 1 ,
1, 2 3 , 2 3
2 2 3 1 , 2
2 3 2 , 3
2 2 2 ,
2 1 ,
4 3 , 4 2 2
1 2 1 , 1 , 2 4
.

51.

50

2 2 V_3 , $V_1 > V_2$ $V_1 > V_3$, V_1 , 1 V_2

52.

50 ,

2 N , 1 V_2 2 V_3 , $V_2 > V_3$

53.

50 ,

2 2 V_3 , $V_1 < V_2$ $V_1 < V_3$, V_1 , 1 V_2

54.

50 ,

2 P , 1 V_2 2 V_3 , $V_2 < V_3$

55.

50 ,

56.

50 , , , , , , ,

57.

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, 1 2 , , 1, 2, 3 4 ,

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

2 2 3 1 , 2

2 3 1 , 3

2 2 ,

2 1 ,

1 4 2 2 , 4 2 2
1 2 1 , 1 , 2 4
.

58.

57 ,

1 3 , .

59.

57 ,

2 2 V_3 , $V_1 > V_2$ $V_1 > V_3$, V_1 , 1 V_2 .

60.

57 ,

2 V_3 , $V_2 > V_3$, 1 V_2 2 V_3 , $V_2 > V_3$.

61.

57 ,

2 2 V_3 , $V_1 < V_2$ $V_1 < V_3$, V_1 , 1 V_2 .

62.

57 ,

2 V_3 , $V_2 < V_3$, 1 V_2 2 V_3 , $V_2 < V_3$.

63.

57 ,

, .

64.

57 , , , , , , , .

65.

, 1, 2 3 , 1, 2, 3 4 ,

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

2 2 3 1 , 2

2 3 2 , 3

2 2 ,

2 1 ,
4 3 , 4 2 1
1 1 , 4 2 1
.

66.

65

2 2 N , V₁, 1 V₂
V₃ , V₁>V₂ V₁>V₃ .

67.

65

2 N , 1 V₂ 2 V₃ , V₂>V₃
.

68.

65

2 2 P , V₁, 1 V₂
V₃ , V₁<V₂ V₁<V₃ .

69.

65

2 P , 1 V₂ 2 V₃ , V₂<V₃
.

70.

65

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71.

65

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72.

, , 1 2 , , 1, 2, 3 4 ,
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1 1 1 1 , 1 1
2 2 1 1 , 1
2 1 2 , 2 ,
2 3 1 , 2
2 3 1 , 3
2 2 ,

2 1 ,
4 2 4 1
1 1 4 2 1
.

73.
72 ,
1 3 , .

74.
72 ,
2 2 N V₁ , 1 V₂
2 V₃ , V₁ > V₂ V₁ > V₃ .

75.
72 ,
2 N , 1 V₂ 2 V₃ , V₂ > V₃ .

76.
72 ,
2 2 P V₁ , 1 V₂
2 V₃ , V₁ < V₂ V₁ < V₃ .

77.
72 ,
2 P , 1 V₂ 2 V₃ , V₂ < V₃ .

78.
72 ,
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79.
72 , , , , , .

80.
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 , 1, 2 3 , , 1, 2, 3 4 ,
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1 1 1 1 , 1
1 2 1 1 1 , 1
2 1, 2 3 1 , 2 3
 ,

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

81.

80 ,
2 2 N V₁ , 1 V₂
2 V₃ , V₁ > V₂ V₁ > V₃ .

82.

80 ,
2 N , 1 V₂ 2 V₃ , V₂ > V₃
.

83.

80 ,
2 2 P V₁ , 1 V₂
2 V₃ , V₁ < V₂ V₁ < V₃ .

84.

80 ,
2 P , 1 V₂ 2 V₃ , V₂ < V₃
.

85.

80 ,
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86.

80 , , , , , , .

87.

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 , 1 2 , , 1, 2, 3 4 ,
 ,
1 1 1 1 , 1
2 2 1 1 , 1
1 1 ,

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

88.

87 ,
1 3 , .

89.

87 ,
2 2 N V₁ , 1 V₂
2 V₃ , V₁ > V₂ V₁ > V₃ .

90.

87 ,
2 N , 1 V₂ 2 V₃ , V₂ > V₃
.

91.

87 ,
2 2 P V₁ , 1 V₂
2 V₃ , V₁ < V₂ V₁ < V₃ .

92.

87 ,
2 P , 1 V₂ 2 V₃ , V₂ < V₃
.

93.

87 ,
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94.

87 , , , , , , ,
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95.

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가

96.

95

97.

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97

99.

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3

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1 2 1 , 1
1 2 1 2 1 1
, 2 2 1 ,
2 2 2 ,
2 2 ,
1 ,
2 3 1 1 2 1 3
2 1 , 1 1
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1 2 ,
1 1 ,
1 2 가 ,
가 ,
3 - 가 ,
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100.
99 ,
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101.
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2 1, 2 3 ,
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1 2 1 , 1
2 ,
1 2 1 1
, 2 ,
2 2 1 ,
2 2 ,

1 , , 3
2 3 1 1 1 ,
1 2 ,
1 1 ,
1 2 가 ,
가 ,
3 - 가 ,
가 ,
1 , 가 -
102.
101 ,
103.
2 1, 2 3 ,
1 1 , 1
2 ,
1 2 1 1
2 2 1 3 ,
2 2 1 ,
2 2 ,
1 ,
1 2 ,
1 2 가 ,
3 가 ,
3 ,

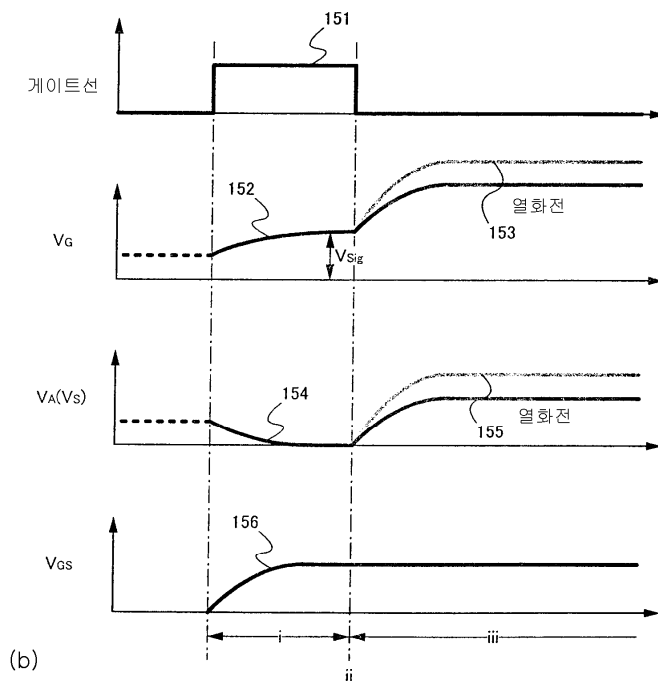
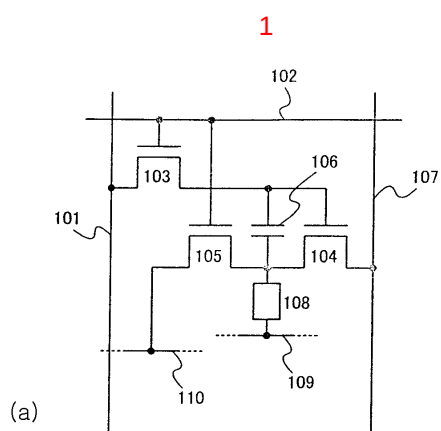
3

가

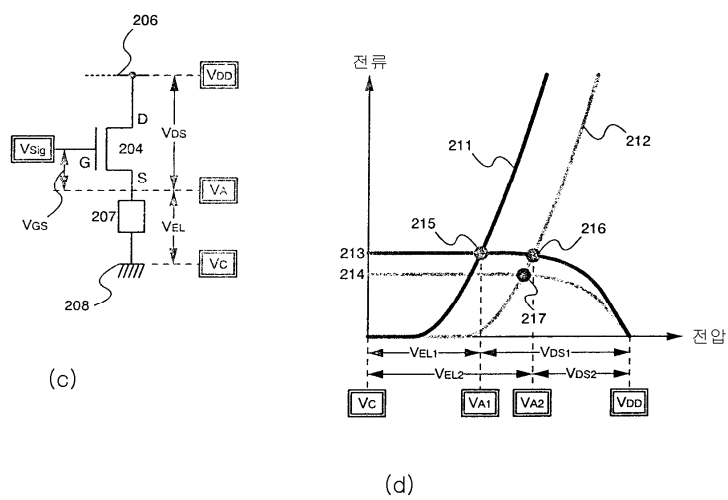
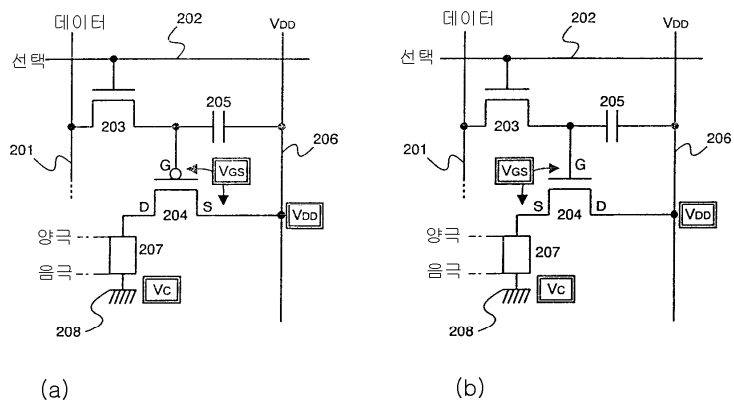
1

104.

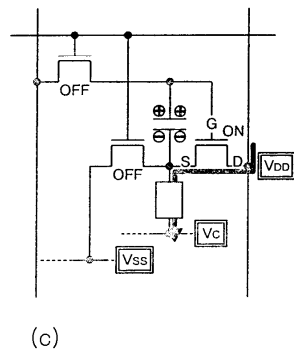
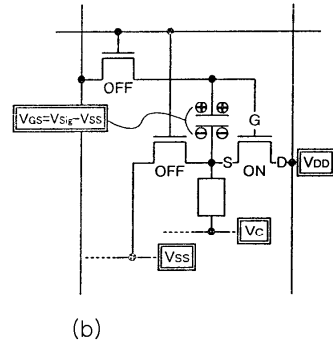
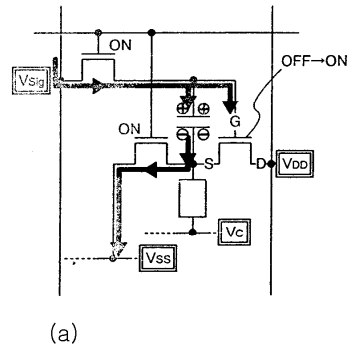
103



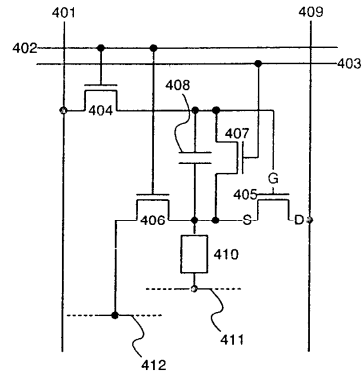
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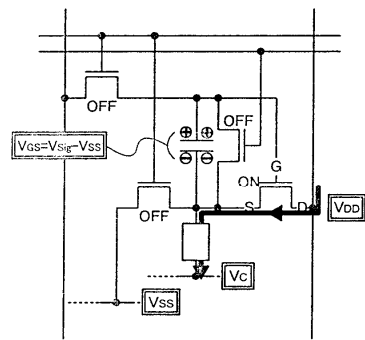
3



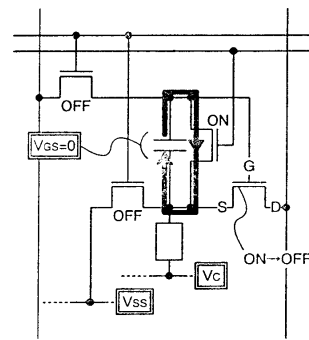
4



(a)

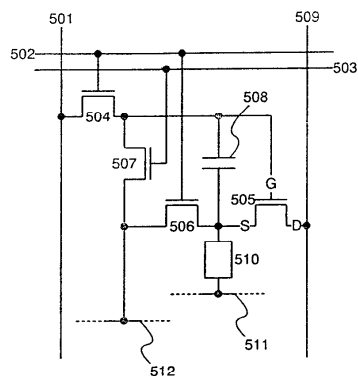


(b)

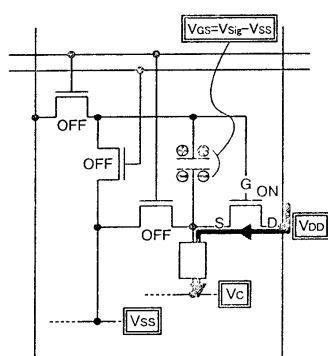


(c)

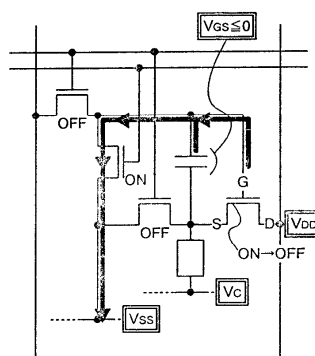
5



(a)

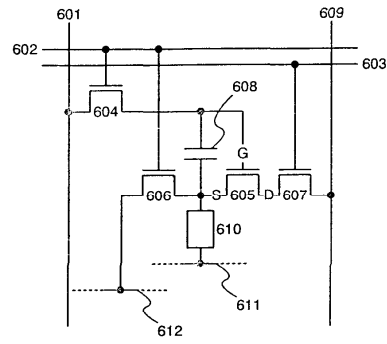


(b)

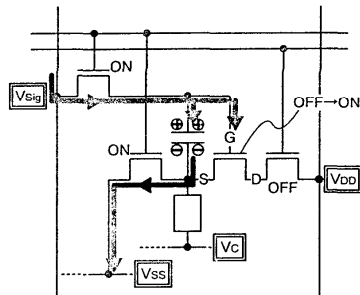


(c)

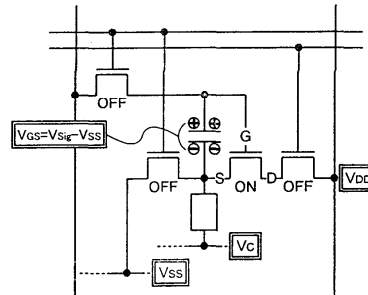
6



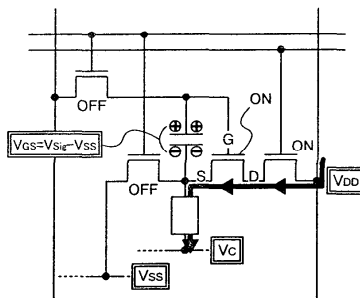
(a)



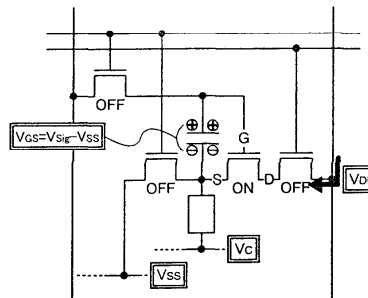
(b)



(c)

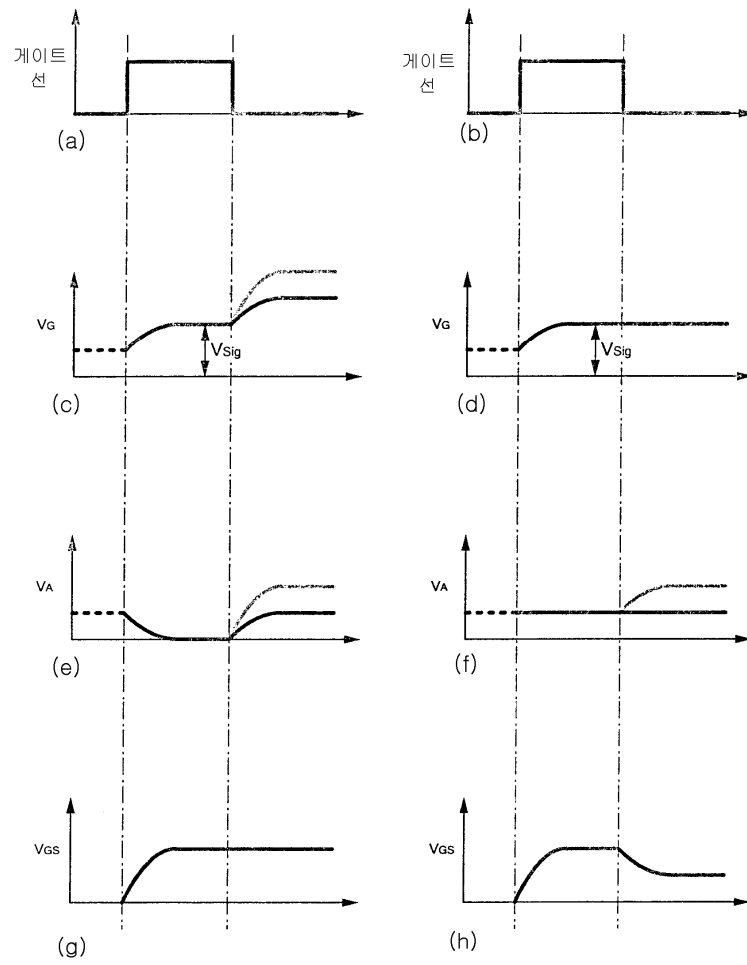


(d)

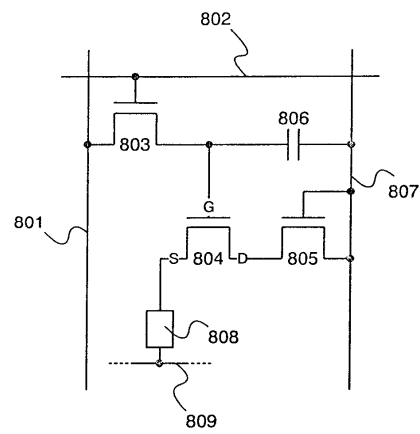


(e)

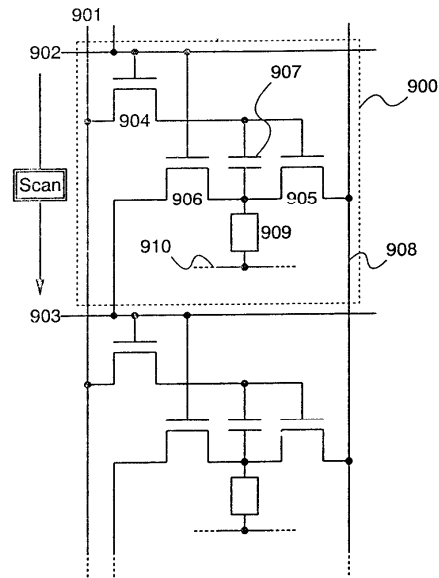
7



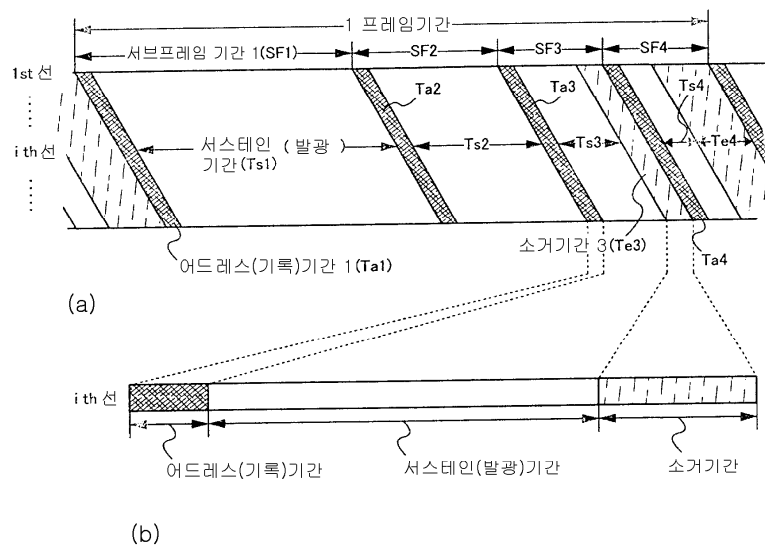
8



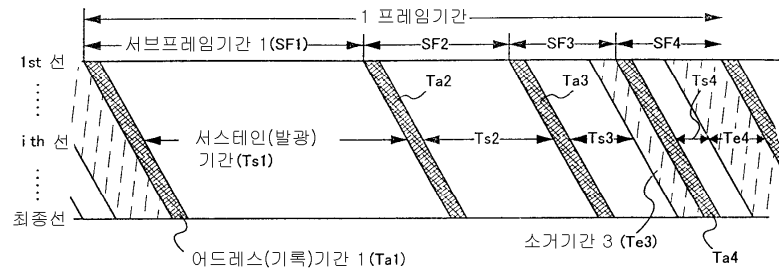
9



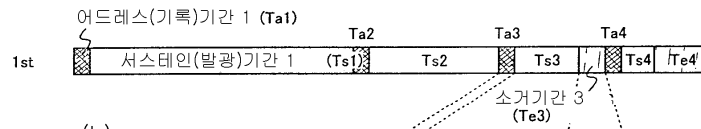
10



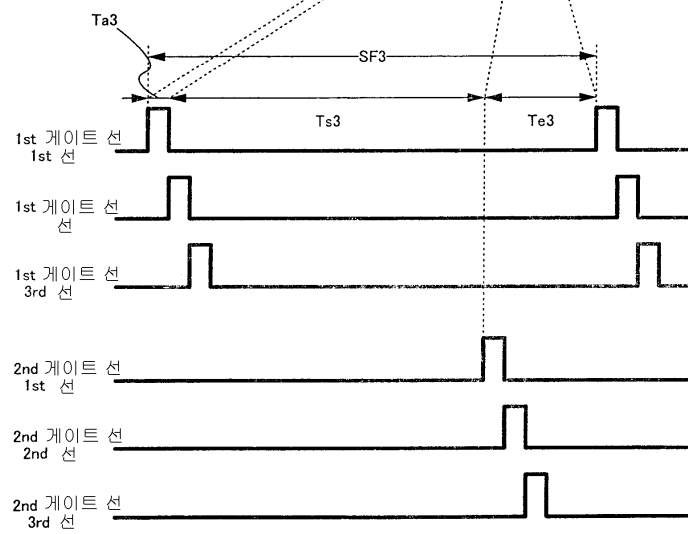
11



(a)

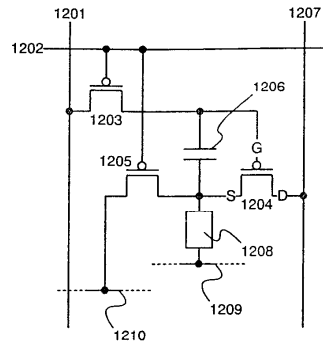


(b)

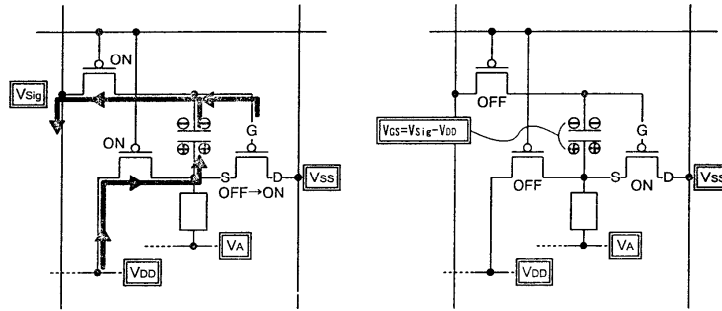


(c)

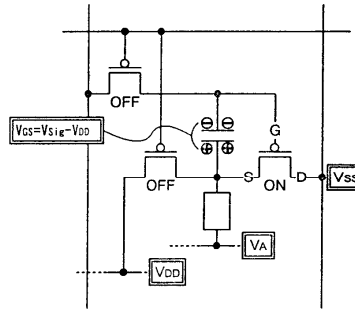
12



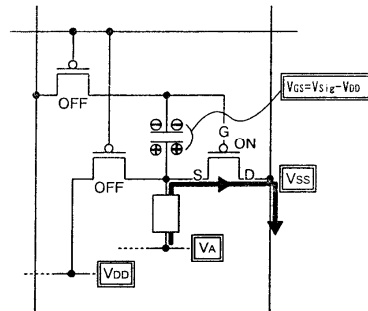
(a)



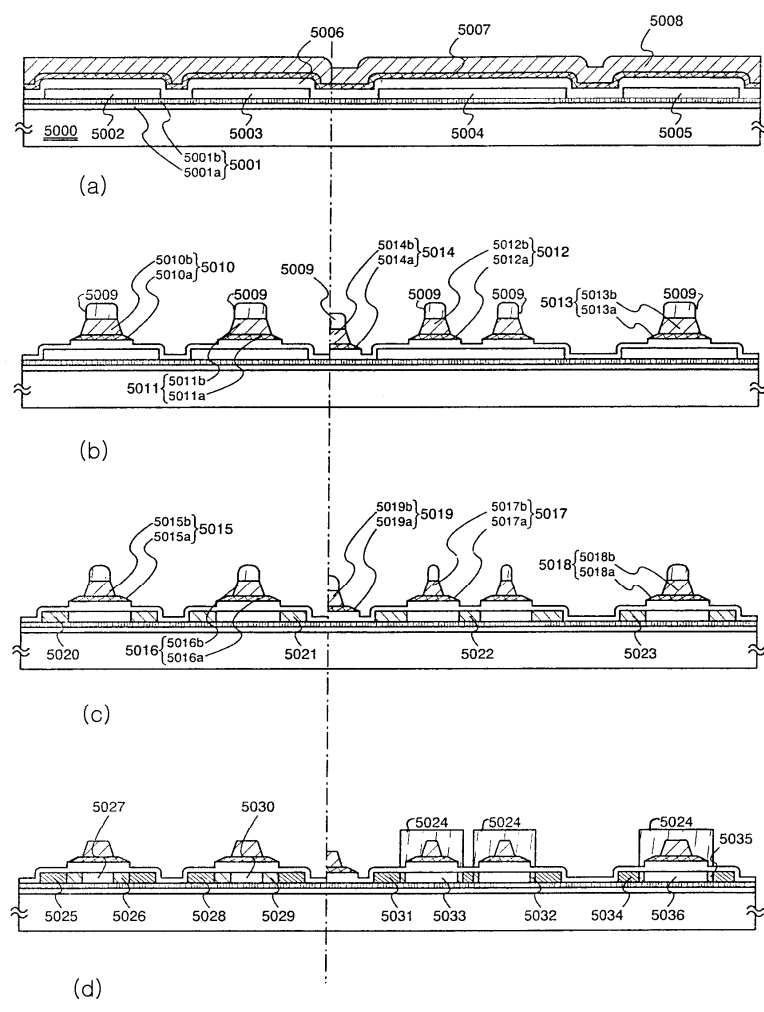
(b)



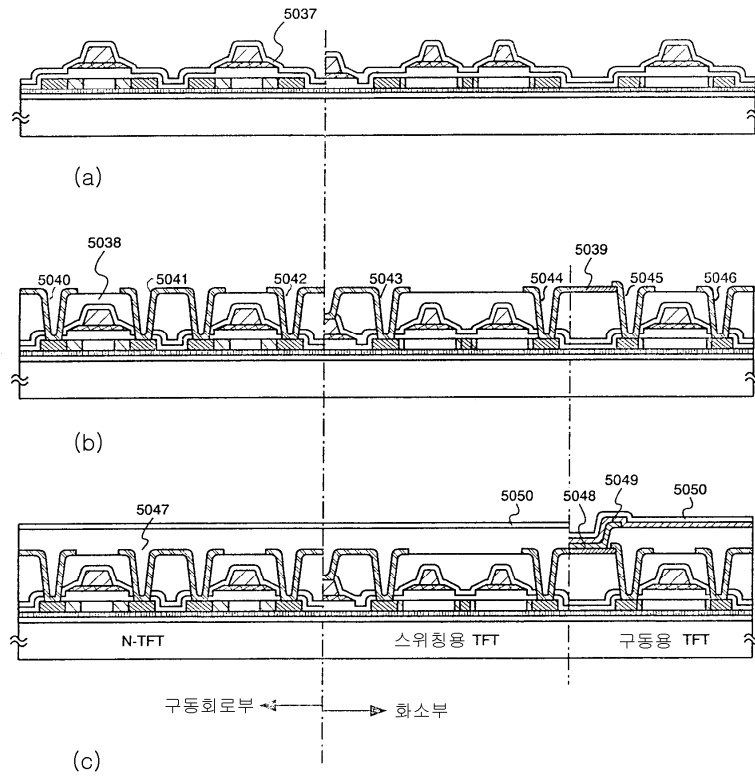
(c)



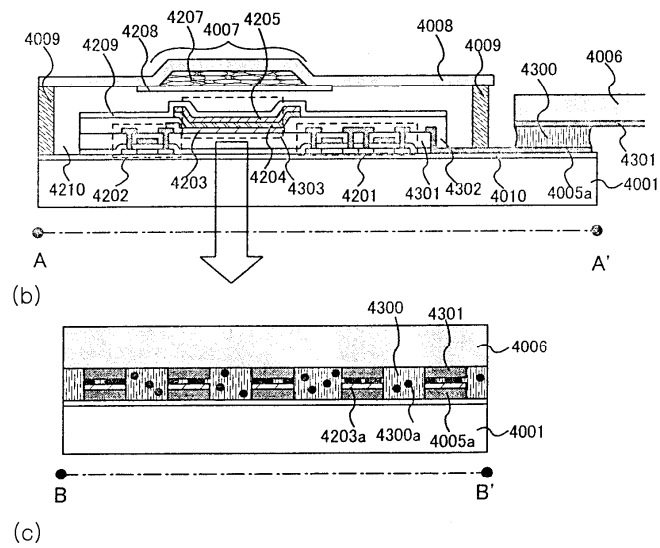
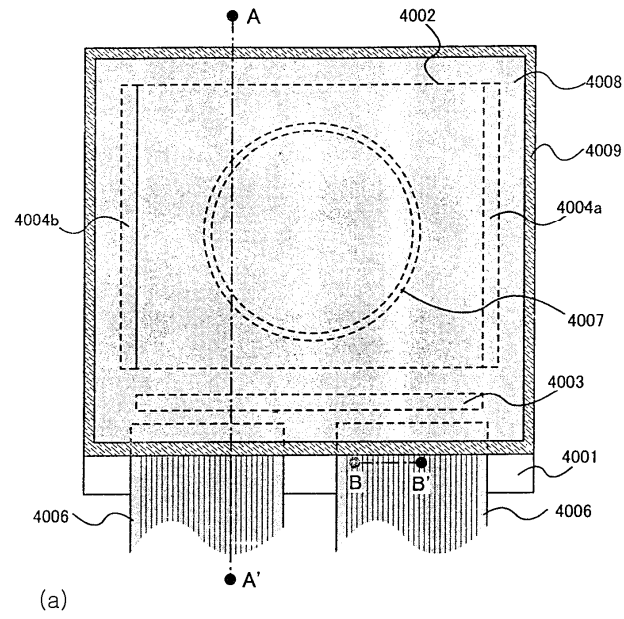
(d)



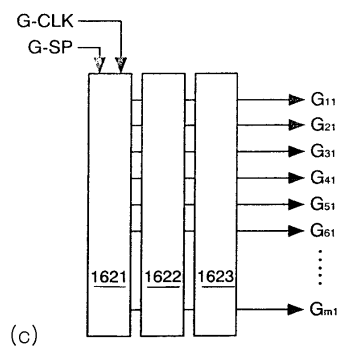
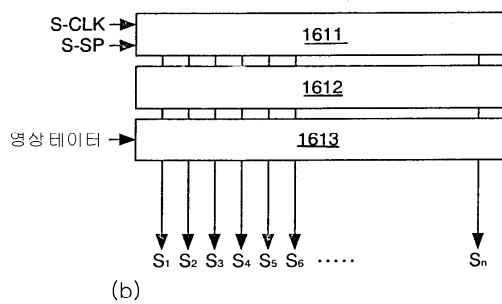
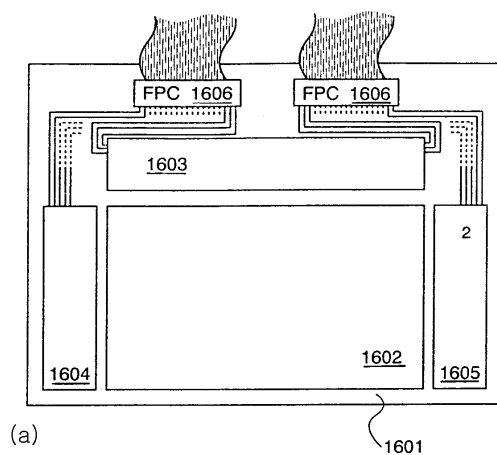
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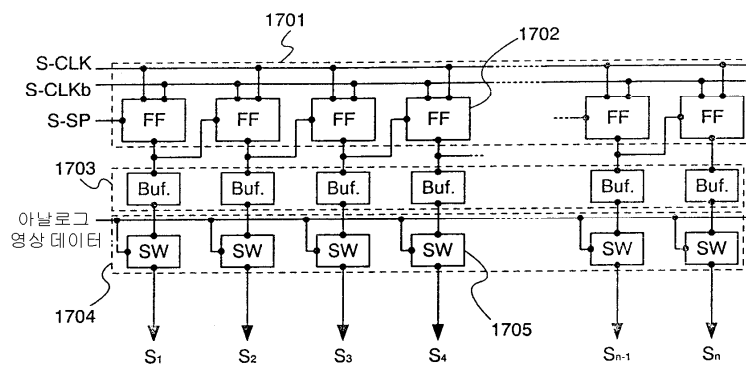
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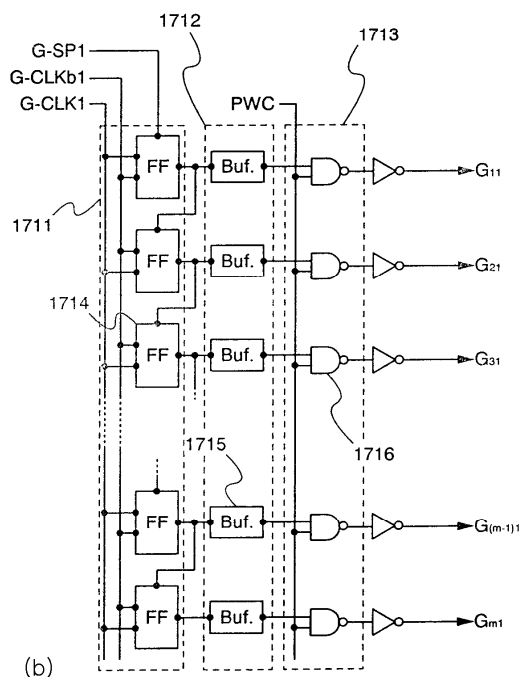
16



17

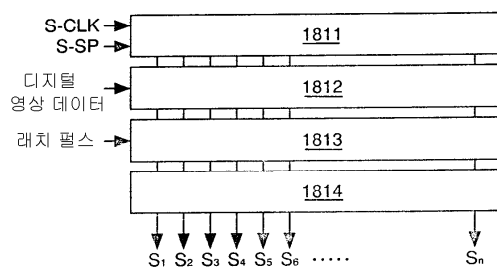
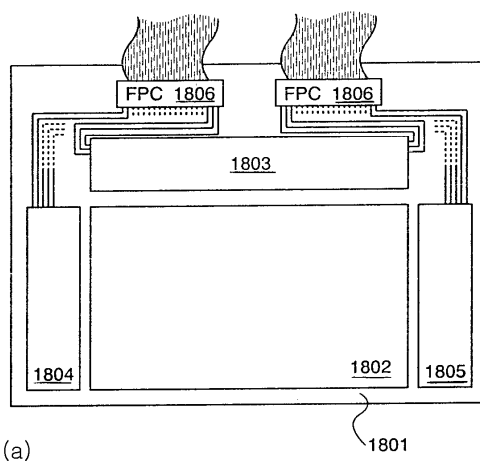


(a)

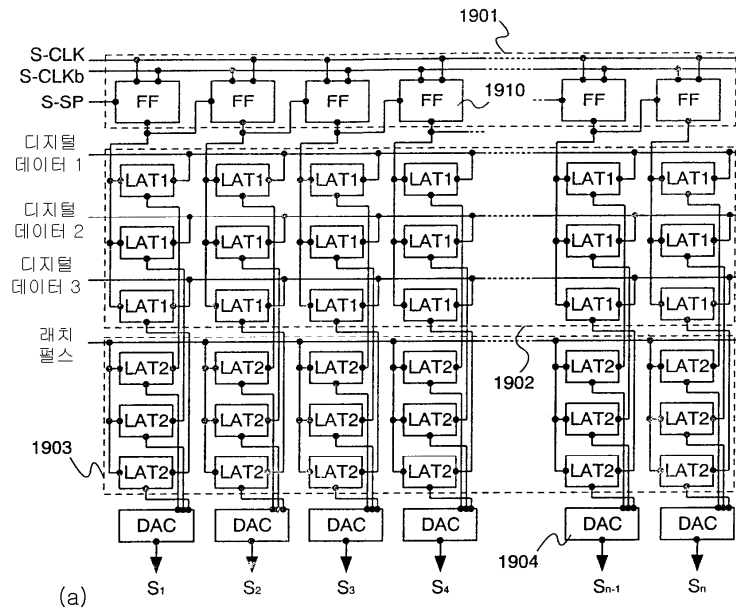


(b)

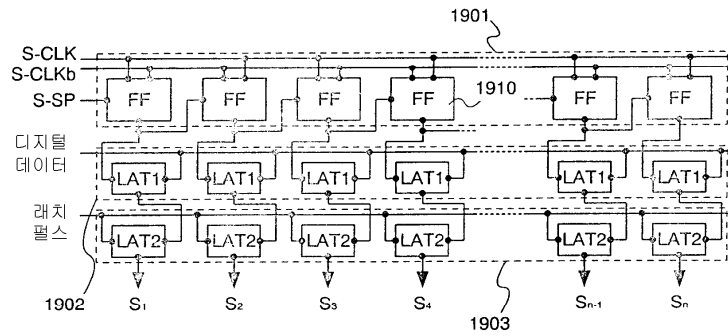
18



19

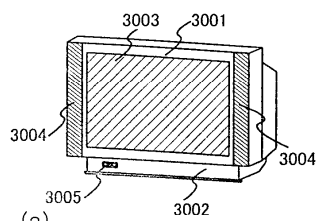


(a)

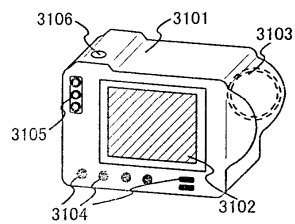


(b)

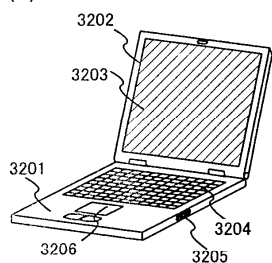
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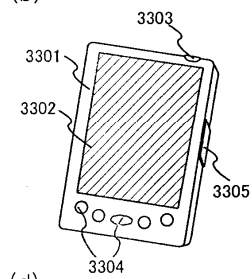
(a)



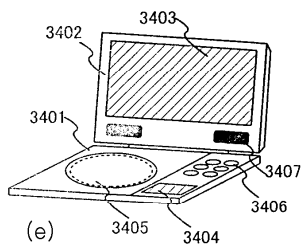
(b)



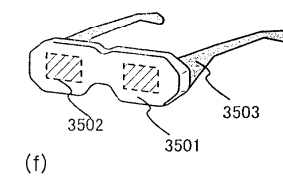
(c)



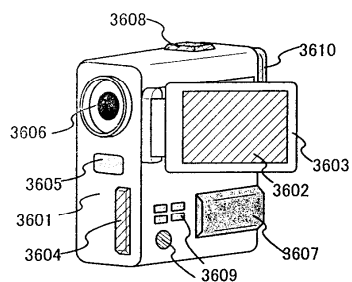
(d)



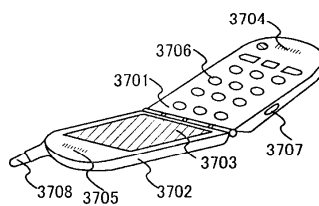
(e)



(f)

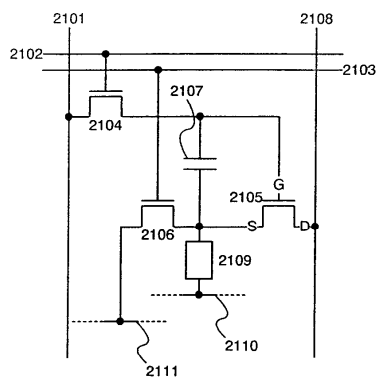


(g)

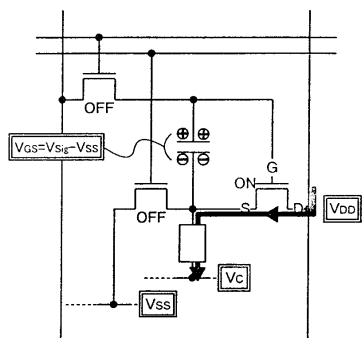


(h)

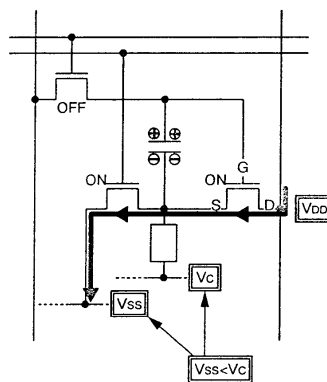
21



(a)

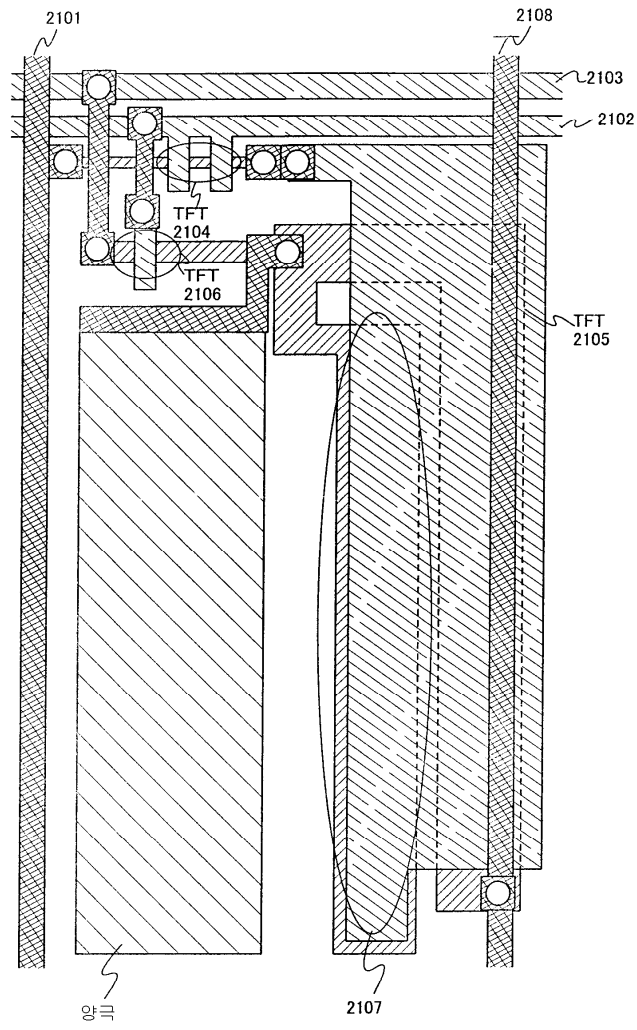


(b)



(c)

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专利名称(译)	显示装置及其驱动方法		
公开(公告)号	KR1020030040056A	公开(公告)日	2003-05-22
申请号	KR1020020068075	申请日	2002-11-05
[标]申请(专利权)人(译)	株式会社半导体能源研究所		
申请(专利权)人(译)	株式会社绒布器肯kyusyo极限戴哦		
当前申请(专利权)人(译)	株式会社绒布器肯kyusyo极限戴哦		
[标]发明人	KIMURA HAJIME		
发明人	KIMURA,HAJIME		
IPC分类号	G09G3/20 G09G3/30 G09G3/32 H01L27/32 H04M1/73		
CPC分类号	G09G2330/08 G09G2310/061 G09G2300/0842 H01L27/3244 G09G2310/027 G09G2330/10 H01L27/1255 G09G2300/0426 G09G2320/043 G09G2310/0251 H04W52/027 G09G3/3233 G09G3/3266 G09G2310/0256 G09G3/2022 G09G3/3291 Y02D70/00		
代理人(译)	权泰BOK LEE HWA我		
优先权	2001348032 2001-11-13 JP		
其他公开文献	KR100940342B1		
外部链接	Espacenet		

摘要(译)

本发明提供的结构的半导体器件难以通过电致发光单元的劣化产生电流值变化。电容元件安装在驱动TFT的栅极和源极之间。在图像信号输入到栅电极源之后处于浮置状态。此时，如果电压大于驱动TFT的栅极 - 源极之间的阈值，则驱动TFT转动。例如，电致发光电池降级。它随着驱动TFT的栅电极的电位由浮动状态构成的量而增加，换句话说，其中驱动TFT的阳极电位上升的源电荷上升，并且电容元件的键合是相同的。因此，阳极的电位随着电致发光单元的劣化而上升。而且此外，电位使得电压升高的电平固定在驱动TFT的栅极 - 源极之间的栅电极电位中。显示装置，驱动TFT，栅极 - 源极，电子器件和发光器件之间的电压。

