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2002 07 12

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(73) 가 가
5-7-1

(72) - 5 7-1 ()

(74)

:

(54)

(16) , (301 303) (V1 V3) D/A
(20) , (22A) ,
1 (24) ,
, , VDD
(26) 1 , ((VSS
301) (V1) (22A) , (301) ,
2 (302) (V2) (22A) ,
2 (302) .

1

, , , ,

1
2

1

.

3 11-145768

4 3
5 1
6 1
7 1
8 7
9

EL 가

* *
10, 10A 12, 12A
14, 14A, 14B 16, 16A D/A
18 20
22 22A
24 26
28 TFT 301 30K
40 50

()

, , TFT-LCD(
) EL

() ,
, ,

, 가 , 가 , 가 ,

가 PDA, , (手持式 ;)

, 가 , TFT-LCD TFT-LCD

, TFT-LCD (靜消費)

, TFT-LCD , TFT-LCD

LCD , TFT-LCD , TFT-LCD

, EL 가

, (階調) , 7-13528 7-104703 ,
LCD , LCD

, , , , ,

, , , , ,

, 가 , , ,

, 가 , 가 ,

, 7-173506 , -

, , , ,

[illegible]

, D/A (22) 1 (16) , (20) , 3 (301) , 3 D/A
 (16) (V1) , (20) (201) (22A) (301) .
 (302) , D/A (16) (V2) , (202) (22A) .
 (22A) , (303) D/A (16) (V3) , (203) (22A) .
 j-1) (30)(3j) , D/A (16) K 가 , (30)(3j-2), (30)(3
) , K/3가 가 M(, M=K/3 , K/3 가 , K/3 1
 (24) (302) (22A) (241) (301) , (24
 -2), (30)(3j-1) (30)(3j) D/A (16) 3 (20) (30)(3j
 1 , (24) , (30)(3j-2), (30)(3j-1)
 (30)(3j) .
 , (20) (24) , (40) .
 , (20)(3j-2) (24)(3j-2)(, (201) (241))가, (40) .
 (S1) , 가 , 가 , (20)(3j-) .
 (24)(3j-1)(, (202) (242))가, (40) (S2) ,
 가 , 가 , (20)(3j) (24)(3j)(, (2
 203) (243))가, (40) (S3) , 가 , (24)(3j-1)
 가 .
 (26) , (30i) (26i)(i=1 K) (VDD)
 (VSS) (30i) (26i) , (30i) (VDD) ,
 VSS) (30i) (VSS) 3 가 , (30i) (VDD) (VDD) ,
 (SO) , (POL) , (26i) , (40) .
 , (26i) , (SO)가 , (D0i)(i=1 K) D/A (16)
 , (30i) (VDD) (VSS) (D0i) (POL) (26i) ,
 (SO)가 (VDD) (POL) (26i) , (30
 i) (VDD) , (VSS) (D0i) , (26i) (D0i)
 가 (D0i) , 가 , (Vcom)
 , (POL) , (18) ,
 (POL) 1 , 2 , 1
 , (POL)가 「1」 ()
 , (POL)가 「0」 ()
 , (POL)가 「1」 ()
 (POL)가 「1」 () (Vcom)
 (VSS) , (POL)가 「0」 () (Vcom)
 (VDD) .
 1 () 가, (12) (14)
 D/A (16) 1 K 가, (18)
 S) , 가 (Vi)(i=1 K) (POL)가 「1」 ()
 , (VDD) (18) , 가 (VS)
 , 2 가 「1」 , D/A (16)
 (V1) , (Vm) 가 「0」 , D01=1 ,
 D02=0 (V2 V3) , (Vm) .
 (Vm) , N , N (36)
 , N 가 N , N (36)
 1 , 1 가, 3 1 , 1
 , 2 , 1 , 3 , 1
 (301) (303) (304)

(301) (303) (40)
 2 (SO) (S1, S2, S3) (26) D/A (16) (D0i) (POL (30i)
) (30i) (VDD) (VSS)
 (POL)가 (301)
 (D01)가 「1」 D/A (26)
 V1 (VDD) (VSS) (Vm) (VDD) (26)
 (261) (VDD) (301) (D02)가 「0」 D/A
 (302) (V2) (VDD) (VSS) (Vm) (VSS)
 (26) (262) (VSS) (302) (D03)가 「0」
 (26) (263) (303) (VSS) (303) (VSS)
 (301) (30K) (VDD) (VSS)
 (Vi) 가 (VSS)
 3 2 (40) (S
 O) (30i) (VDD) (VSS) D/A
 (40) (Vi) 가 (S1) (S2, S3)
 (20) (201) (24) (241)가 (202, 203) (261)
 242, 243) (V1) (22A) (V1) (22A) (241)
 (301) (301) (VDD) (301) (VSS)
 D/A (Vm) (22A) (V1) (VDD) (301)
 2 (301) (40) (S1) (S2)
 (202) (242)가 (S3) (201) (241)가
 A) (302) (22A) D/A (16)가 (243) (V2) (22
 (V2) (302) (VSS) (302) (VSS)
 D/A (Vm) (22A) (V2) (VDD) (302)
 3 (40) (S1) (201) (241)
 (S2) (202) (242)가 (S3) (203) (243)가 (303)
 D/A (16)가 (22A) (243) (303) (22A)
 (V3) (303) (VSS) (303) (VSS)
 D/A (Vm) (V3) (VDD) (VSS)
 (303) (303) (V3) (VSS)
 2 가 1 {N+1} 가 {N+1} (36) N
 가 1 (40) (SO) (S1, S2, S3)
 (POL)가 「1」 ()
 (POL)가 「0」 () (Vco
 m') (VDD) (18) 가 (VSS) D/A
 (VDD)

[illegible]

가 11-145768

11-145768

1

(22A) (261, 262, 263)

(100) (200)

(26) (26i) (30i) (T2)

(VSS)(VDD) (VSS) (112) (T2)

DD)(100) (212) (200)

(100) , NMOS (101, 102) (212)가, (101) , VDD (103)

(111)가 (101) (20)

(T1) (101) (101)

(21)가 (T1) (VSS) (104) (122)가

(102) (22A) (T3) , VDD (123)가

(102) (105) (124)가

(T3) (VSS) I(11), (105) I(13)

(04) , PMOS (251, 252) , VSS (253)

(211)가 (251) (251) (T1)

(251) (221)가 (T1)

(254) (222)가 (252) (252)

(2A) (T3) , VSS (253) (254) (T3) VDD (252)

(224)가 (253) (254) I(21),

I(23)

(112, 212) (100, 200) (D

(POL) (40) (SO) (SO1, SO2, SO3, S

(26i) (POL) (D0i) (SO) (112, 212)

가 (POL) OR (D0i) OR (POL) (112, 212)

(D0i) 가가 (POL) (D01)가, 2 OR (501)

OR (501) (261) (112, 212) OR (502)

(POL) (262) (112, 212) OR (503) (POL) (263)

(D03)가, OR (503)

(22A) (100) (200) 가 (POL)

(D0i) (S1) (22A) (401) , 2 OR (400)

(D02) (S2) (D03) (S3)

OR (400) , 2 OR (400)

(403) , 2 OR (400)

(200) 가가 (200)가

Vin

(100) Vin 가 OFF (100) (100)가

Vin 가 OFF (200)

(100) (200)

(200) (SO1, SO2, SO3) (111, 211)

, (SO1) , (121, 122, 221, 222) , (SO2)
 , (123, 124, 223, 224) , (SO3)
 4 , 3 (t1-t4), 2 (t4-t7), 3 (t7-t0) (P)(t
 0-t1), 1 (POL) 1 (POL)가 , 1 가 , 4
 (SO)가 , (SO1, SO2, SO3, S1, S2, S3)
 , (100, 200)
 (302) (301) (D01)가 「1」 ,
 (D03)가 「0」 가 (261) (303) (D01)가
 「1」 , D/A (VDD) (VSS)
 (212) (Vm) (112) (301) (VDD) (D02)가 「0」 ,
 D/A (VDD) (VSS)
 (Vm) (212) (302) (VSS) (112)
 , (212) 가 (263) (D03)가 「0」
 D/A (VDD) (VSS)
 (Vm) (303) (VSS) (112)
 (212) 3 (t1-t0) , (SO)가
 (t1-t0) ,
 (112, 212)
 1 (t1-t4) , 2 (S1)
 (S2 S3) , (201, 241)가 , (401)가
 (301) (D01)가, (100, 200)
 OR (400) (301)
 (D01)가 「1」 , (200)가 (t1-t4)
 (211, 221, 222, 223, 224) 4 , (111, 112, 121, 122, 123, 124
)
 (t1) , (SO1) (211)가 , (251, 252) (V
 20) (VSS) (t2) , (SO1) (211)가 , (V2
 0) (t2) (SO2) (221, 222)가 , (V20)
 (Vin) (251) Vgs251(I21)
 V20=Vin+Vgs251(I21) , Vgs251(I11) 가 I21
 (t3) , (SO3) (223, 224)가 , (241)
 (252) (t0-t1) (VDD) (301)
 (Vout) , (V20) (252) Vgs252(I23)
 , Vout=V20-Vgs252(I23) , Vgs252(I23) 가 I23
 , Vgs251(I21) Vgs252(I23) , (I21, I23) 2
 (Vout) (Vin) , VSS-Vgs252(I23) ≤ (Vout) ≤ VDD가
 1 (t4), (SO2 SO3) (221, 222, 223, 224)
 2 (t4-t7) , 2 (S2)
 (S1 S3) , (202, 242)가 , (402)가
 (302) (D02)가, (100, 200)
 OR (400) (302)
 (D02)가 「0」 , (100)가 (t4-t7)
 (111, 112, 121, 122, 123, 124) 4 , (211, 221, 222, 223, 2
 24)
 (t4) , (SO1) (111)가 , (101, 102) (V
 10) (VDD) (t5) , (SO1) (111)가 , (V
 10) (t5) (SO2) (121, 122)가 , (V10)
 (Vin) (101) Vgs101(I11)
 10=Vin+Vgs101(I11) , Vgs101(I11) 가 I11

(t6) , (SO3) (123, 124)가 , (242) (102)
 0) (102) (tO-t1) (VSS) (302) , (V1
 102(I13) , Vgs102(I13) Vgs102(I13) , Vout=V1O-Vgs
 , Vgs101(I11) Vgs102(I13) 가 I13 ,
 (Vout) (Vin) , (I11, I13) 2 ,
 , VSS ≤ Vout ≤ VDD-Vgs102(I13)가
 2 (t7), (SO2 SO3) (121, 122, 123, 124)
 3 (S1 S2) , 2 (S3) (403)가 ,
 (303) , (203, 243)가 (100, 200)
 OR (400) , (303)
 (D03)가 「0」 , (100)가 (t7-t10)
 (111, 112, 121, 122, 123, 124) 4 , (211, 221, 222, 223, 2
 24) (t7) , (SO1) (111)가 , (101, 102) (V
 10) (VDD) (t8) , (SO1) 가 , (V10)
 (t8) , (SO2) (121, 122)가 , (V10)
 (Vin) (101) Vgs101(I11) , V10=
 Vin+Vgs101(I11)
 (t9) , (SO3) (123, 124)가 , (243) (102)
 0) (102) (tO-t1) (VSS) (303) , (V1
 102(I13) , Vgs102(I13) Vgs102(I13) , Vout=V1O-Vgs
 13)가 , (Vout) , Vgs101(I11) Vgs102(I13) (I11, I
 3 (t10) , (SO2 SO3) (121, 122, 123, 124)
 (t0 t11) 1 ,
 { VDD-Vgs102(I13) } { VSS-
 Vgs252(I23) }
 (100, 200) ,
 (V10, V20) 가 , (100, 200) ,
 가 , (22)
 (100, 200)
 3 , (253, 254 103, 104)
 (211, 111) 5 , 1 1
 5 , 1 가 (10) (12) , (50)가
 가 , (18)
 가 , (50) (14) , 5 , 1
 , 3 (100, 200) , 5 , (22)
 6 , 1 1 , (301) (803)
 , (304) , (301) (303)
 6 , (14) , (S1 S3) , D/A
 , 3 , D/A
 (14) (26i)가 , 1 (D0i) , (14)
 (26) D/A (16A) , (20) (20i) , (16A)
 가 6 , D0i D5i) D/A 가 6
 (14) 가

, (20) (20i) , 6 , 1

, (301) (D01 D51) (201) (302) (D03

(D02 D52) (202) (303) (16A) (16B) 1/3

D 53) , D/A (16A) , 1 D/A (16) , ,

6 , , ,

1 D/A (16A) D/A (16B) (22A) , ,

(D0i) , (14) (26) ,

1 , 1 6 가, 2 (12) (14)

1 () 3 1 , D/A (16A) (20) (Vi)(

i=1 K) , D/A (16A) , N 가 , N (36)

, N (36) 가 N (34)가 , 1

가, 3 1 , 1 6 , 1

3 (301) (303) (303)

(304) , , (301) (301)

2 , 1 (40)

, (SO) , (S1, S2, S3) , ,

(26) , (14) (D0i) ,

(30i) (VDD) (VSS) (30i) ,

(POL)가 가 (301) (301) (VDD)

(D01)가 「1」 (26) (261) (D02)가 「0」 (302)

(26) (262) (302) (VSS) (26) (263) (302)

(VSS) (D03)가 「0」 , (301) (301) (

30K) 가 (VDD) (

VSS) ,

3 , 2 (40) , (SO)

, (S1, S2, S3) , ,

(301) (30K) , (VDD) (VSS) ,

D/A 가 ,

(S2, S3) , (20) (S1) (201) (24)

(241)가 , (202, 203) (242, 243) (301) (301)

D/A (16B) (D01 D51)가, (14) (201) D/A (16A)

(V1) , (22A) , (16B)가 (241)

(301) , (301) (VDD) (V1) ,

D/A (301) (VDD) (VSS)

(Vm) , (22A) , (VDD) (V1)

(301) , (301) (S1) , (S2)

2 , (40) , (201) (241)가 ,

(202) (242)가 (203) (243) , (302)

) D/A (16B) (D02 D52)가, (14) (202) D/A (16A)

(V2) , (22A) , (16B)가 (242)

(302) , (302) (VSS) (V2) ,

D/A (302) (VDD) (VSS)

(Vm) , (22A) , (VSS)

(302) , (302) (V2) .
 3 , (40) , (S1) (S2)
 , (202) (242)가 (S3) , (201) (241) (303)
 D/A (16B) (D03 D53)가, (203) (243)가 (203) D/A (16A) (16B)가
 (V3) (303) (22A) (V3) (22A) (243)
 (303) (303) (VSS) (V3) (303) (VSS)
 D/A (Vm) (22A) (V3) (VDD) (VSS)
 (303) 2 , (303) (V3) , N
 가 , { N+1 } 가 , { N+1 } (36)
 , 6 , (40) , (SO) (S1, S2, S3)가
 , 7 , 1 , 1 6 , 3 (100, 200)
 , (301) (303) (303)
 (304) , (301) (303)
 7 , , 1 , 1 (7
 , 3 , 1
 , 2 , 가, 1 ,
 , 1 3 , (301)
 3 , (30)(3j-2)(j=1 , 1 K/3) (D01 D51)가, (14A
) , 2 (14A) (302) 3 (3j-1) (D0
 2 D52)가, 1 (14A) 3 (303) 3 (3j-1)
 3j) , (D03 D53)가, (14A) (14A) , 1 (3j12)
 , 1 (301) 3 (3j12) (D01 D51
)가, 1 (14B) , 1 2 (302) 3 (3j-1) (14A)
 , (D02 D52)가, 1 (14B) , 2 3 (303) 3
 , (3j) (D03 D53)가, 3 (14B) .
 , (40) (14A) (14B) , { 1 } / { + 1 }
 , (12A) , 1 (10) (12) 1/3 (10A)
 , (14A) (14B) , 1 (14) 1/3 (14) 2/3
 , 7 , D/A 6 , D/A (16A) D/A (16B)
 (14B) , D/A (16A) D/A (16B)
 (26) (26i) , (14A) (D0i)
 , (POL) , (SO) , (S1 S2) , (301) (D
 01) (261) , (SO) , VDD VSS , 가가 (30
 2) (D02) (262) , (POL) , VDD VSS , 가가
 (D02) (POL) , VDD VSS , 가가

(302) (263) (S2) VDD VSS
 (D03) (POL)
 가가
 1 7 가, 3 8 1
 7 () , 1 8 , 4 , 1 3
 , 4 , (301) (303) (303)
 (304) (301) (303)
) 1 () () , N 가 , N
 (36) , N (36) 가 N
 (34)가 (34)가
 , 1 () (301) D01 D51)가,
 3 (12A) (30)(3j-2) (8) (S1, S2, S3)
 (40) (14A) (SO) (301) (VDD) (V
 (D01) (26) (14A) (301) (POL)가 가
 SS) (301) (POL)가 (D01)가 「1」
 (26) (261) (301) (VDD) (D01)가 「1」
 1 ()
 (302) 3 (30)(3j-1) (302)
 D02 D52)가, (12A) (14A) , 1 ()
) ((301) D01 D51)가, 3 (30)(3i-2) ()
 (14A) (14B)
 , 8 , 1 (40) , (S1)
 (SO) (S2, S3) (26) ,
 (14A) (302) (VDD) (VSS) (D02) (POL)
 , (302) 1 (POL)가 (302)
 (302) (D02)가 「0」 , (26)
) (262) (302) (VSS) (VDD) (VSS)
 , (301) , 가
 D/A (40)가, (S1) (S2, S3)
 301) (24) (241)가 , (242, 243) ()
 (D01 D51)가, (14B) D/A (16A) D/A
 (16B) (301) D/A (16B)가
 (V1) (22A) , (241)
 (301) (301) (V1) (301)
 (301) (VDD) (301)
 D/A (Vm) (V1) , (VDD) (VSS)
 (301) (22A) , (VDD) (V1)
 1 ()
 2 (303) 3 (30)(3j) (303)
 D03 D53)가, (12A) (14A) , 1 ()
) ((302) D02 D52)가, 3 (30)(3j-1) ()
 (14A) (14B)
 , 8 , 2 (40) , (S2)
 (SO) (S1, S3) (26) ,
 (14A) (303) (VDD) (VSS) (D03) (POL)
) , (303) (303) (303)
 1 (POL)가
 (D02)가 「0」

Figure 1 is a block diagram of a semiconductor device 100. The device 100 includes a first semiconductor layer 110, a second semiconductor layer 120, a third semiconductor layer 130, a fourth semiconductor layer 140, a fifth semiconductor layer 150, a sixth semiconductor layer 160, a seventh semiconductor layer 170, an eighth semiconductor layer 180, a ninth semiconductor layer 190, a tenth semiconductor layer 200, an eleventh semiconductor layer 210, a twelfth semiconductor layer 220, a thirteenth semiconductor layer 230, a fourteenth semiconductor layer 240, a fifteenth semiconductor layer 250, a sixteenth semiconductor layer 260, a seventeenth semiconductor layer 270, an eighteenth semiconductor layer 280, a nineteenth semiconductor layer 290, a twentieth semiconductor layer 300, a twenty-first semiconductor layer 310, a twenty-second semiconductor layer 320, a twenty-third semiconductor layer 330, a twenty-fourth semiconductor layer 340, a twenty-fifth semiconductor layer 350, a twenty-sixth semiconductor layer 360, a twenty-seventh semiconductor layer 370, a twenty-eighth semiconductor layer 380, a twenty-ninth semiconductor layer 390, a thirtieth semiconductor layer 400, a thirty-first semiconductor layer 410, a thirty-second semiconductor layer 420, a thirty-third semiconductor layer 430, a thirty-fourth semiconductor layer 440, a thirty-fifth semiconductor layer 450, a thirty-sixth semiconductor layer 460, a thirty-seventh semiconductor layer 470, a thirty-eighth semiconductor layer 480, a thirty-ninth semiconductor layer 490, a fortieth semiconductor layer 500, a forty-first semiconductor layer 510, a forty-second semiconductor layer 520, a forty-third semiconductor layer 530, a forty-fourth semiconductor layer 540, a forty-fifth semiconductor layer 550, a forty-sixth semiconductor layer 560, a forty-seventh semiconductor layer 570, a forty-eighth semiconductor layer 580, a forty-ninth semiconductor layer 590, a fiftieth semiconductor layer 600, a fifty-first semiconductor layer 610, a fifty-second semiconductor layer 620, a fifty-third semiconductor layer 630, a fifty-fourth semiconductor layer 640, a fifty-fifth semiconductor layer 650, a fifty-sixth semiconductor layer 660, a fifty-seventh semiconductor layer 670, a fifty-eighth semiconductor layer 680, a fifty-ninth semiconductor layer 690, a sixtieth semiconductor layer 700, a sixty-first semiconductor layer 710, a sixty-second semiconductor layer 720, a sixty-third semiconductor layer 730, a sixty-fourth semiconductor layer 740, a sixty-fifth semiconductor layer 750, a sixty-sixth semiconductor layer 760, a sixty-seventh semiconductor layer 770, a sixty-eighth semiconductor layer 780, a sixty-ninth semiconductor layer 790, a seventieth semiconductor layer 800, a seventy-first semiconductor layer 810, a seventy-second semiconductor layer 820, a seventy-third semiconductor layer 830, a seventy-fourth semiconductor layer 840, a seventy-fifth semiconductor layer 850, a seventy-sixth semiconductor layer 860, a seventy-seventh semiconductor layer 870, a seventy-eighth semiconductor layer 880, a seventy-ninth semiconductor layer 890, an eightieth semiconductor layer 900, an eighty-first semiconductor layer 910, an eighty-second semiconductor layer 920, an eighty-third semiconductor layer 930, an eighty-fourth semiconductor layer 940, an eighty-fifth semiconductor layer 950, an eighty-sixth semiconductor layer 960, an eighty-seventh semiconductor layer 970, an eighty-eighth semiconductor layer 980, an eighty-ninth semiconductor layer 990, and a ninetieth semiconductor layer 1000. The device 100 is configured to perform a specific function, such as data storage or processing, by utilizing the various semiconductor layers and their interconnections.

가 . , 2 (位)

$\frac{V_{DD}}{2}$

가

가 , { - } 3/4 1/4 가 . ,

1 5 6 , , TFT

(18) 가가 (POL)

(100, 200)

9 , EL 가 . 9
, EL (MP1) , (MP2) 가
, 가, (MP2) , (MP2) (OLED) ,
() . (MP2)

D 98 DIGEST 11 14, R. M. A. Dawson	EL, SI
con active -Matrix Organic LED Display」	「4.2 Design of an Improved Pixel for a Polysili

1. _____, _____ (_____)

가 11-145768

가 ,

(57)

1.

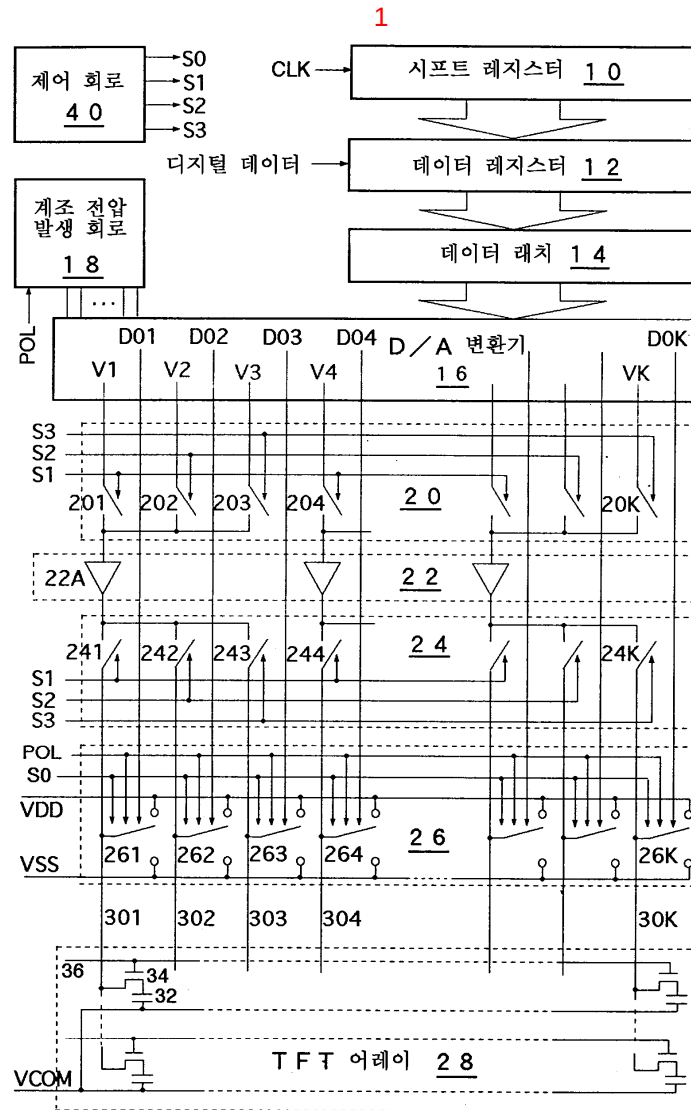
1

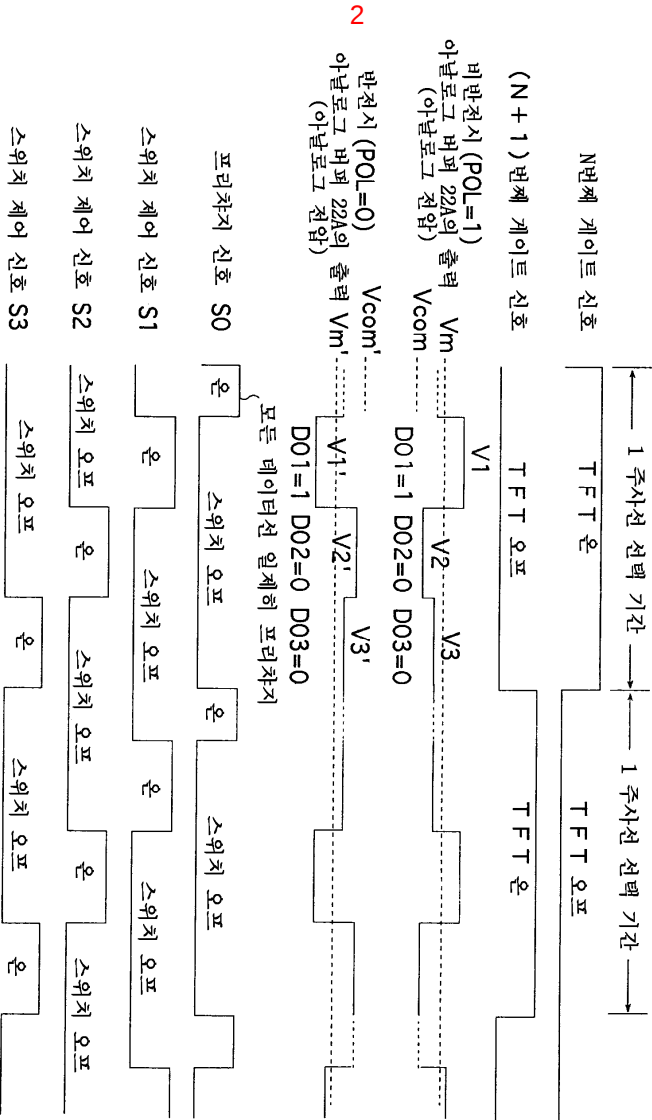
7.

6 ,
 1 , 가 , 가 1 PMOS , 1 PMOS
 1 2 PMOS , 2 PMOS 1 ,
 1 PMOS 1 PMOS 2 , 1 ,
 4 , 3 2 PMOS 2 ,
 5 , 1 가 , 1 1 5
 2 가 , 1 가 , 1 2 PMOS 2 3
 , , 4 5 , 1 5 가

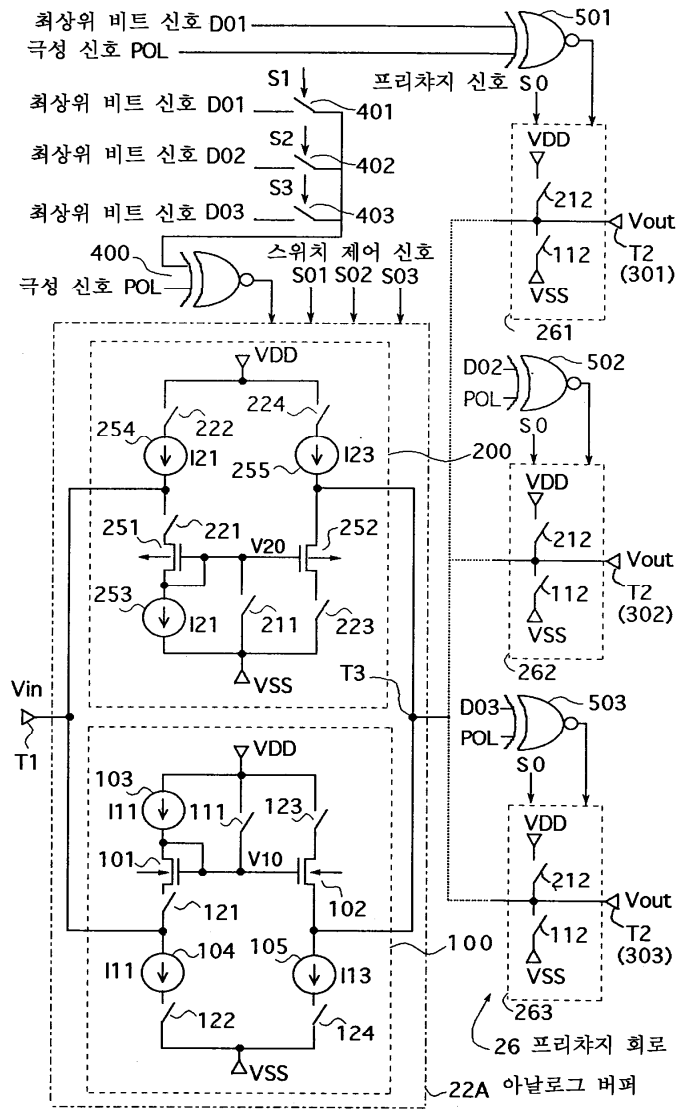
8.

7 ,
 2 , 가 , 가 1 NMOS , 1 NMOS
 1 2 NMOS , 2 NMOS 6 ,
 1 NMOS 3 ,
 1 NMOS 7 ,
 8 , 2 NMOS
 9 , 2 NMOS 6 가 , 6 1 6 10 7 8
 4 가 , 6 가 , 6 10 가

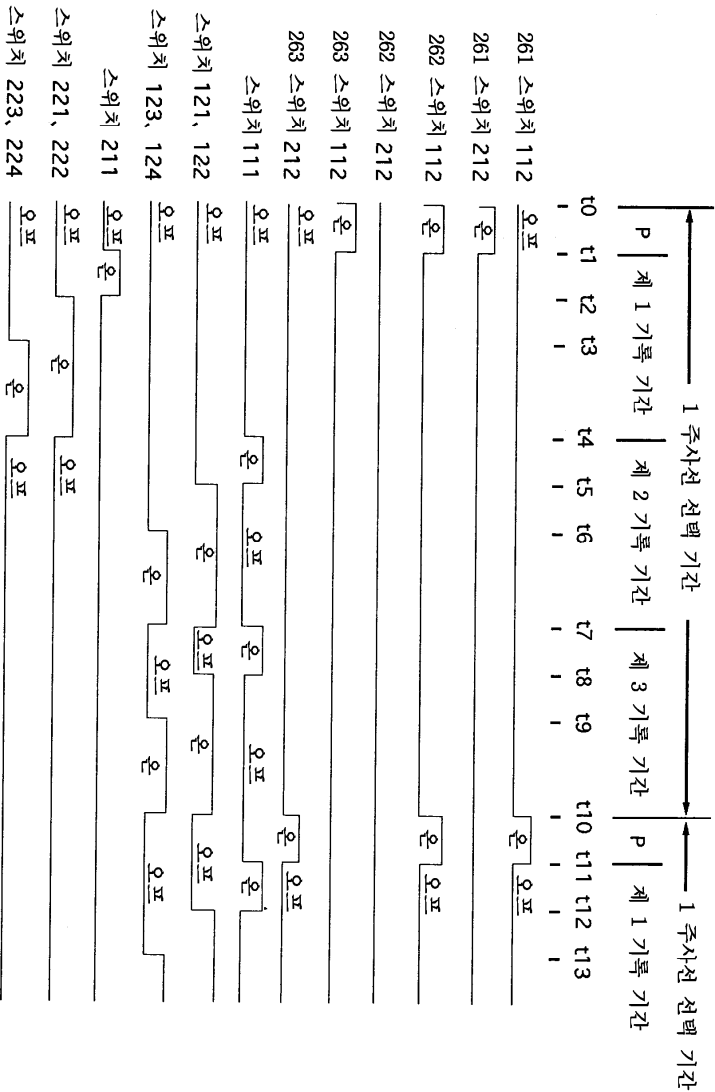




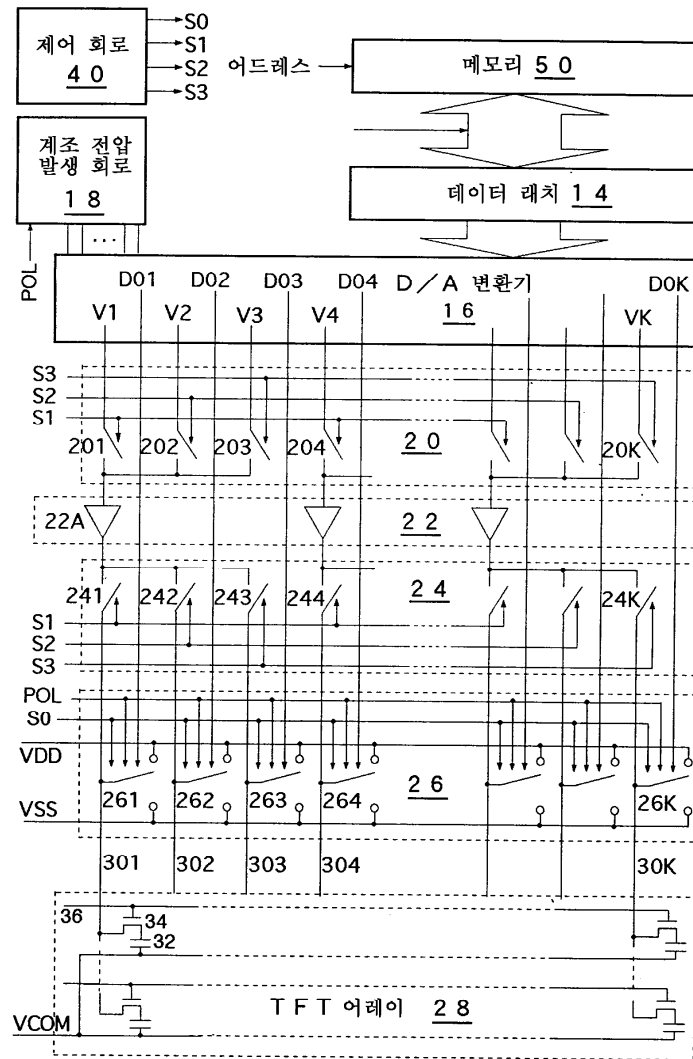
3

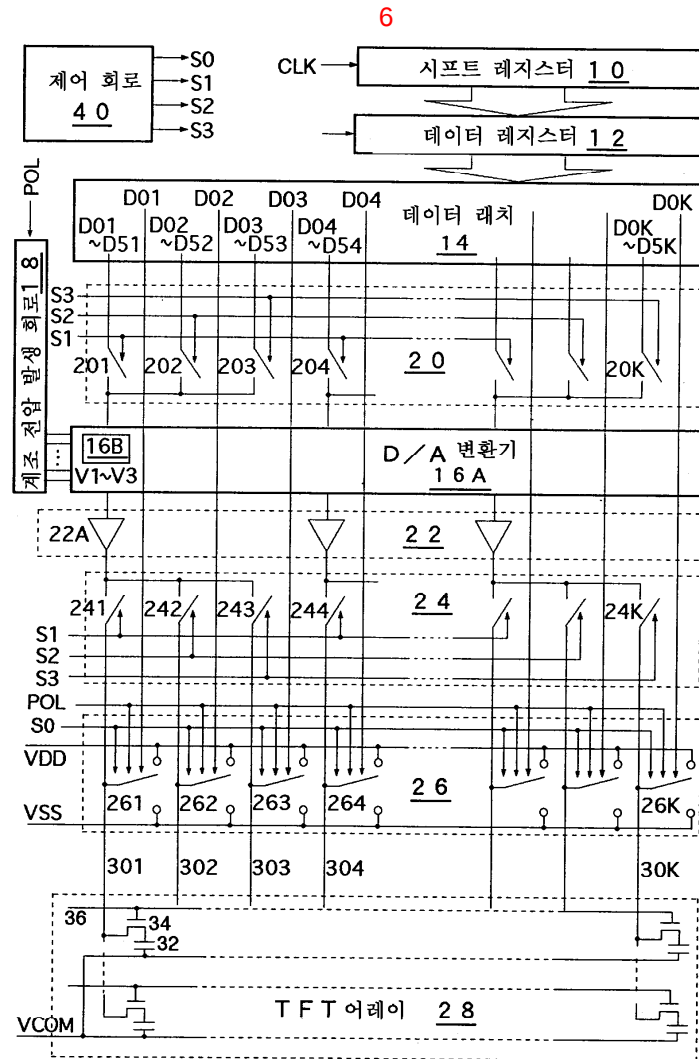


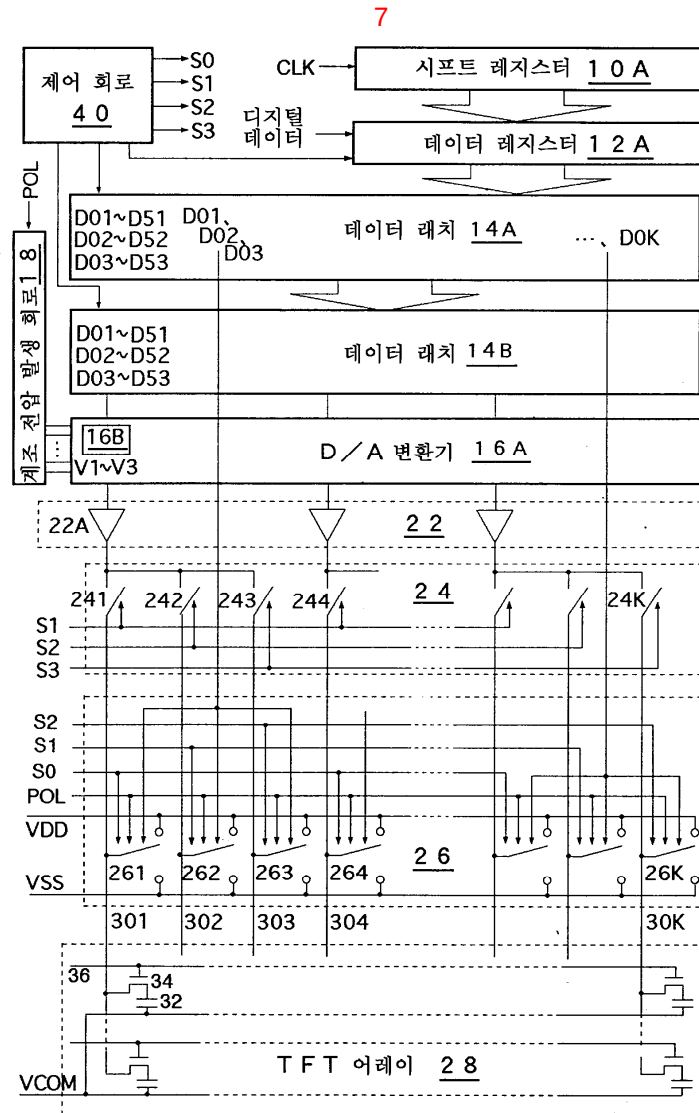
4



5







专利名称(译)	面板显示装置的数据线驱动电路		
公开(公告)号	KR100413137B1	公开(公告)日	2003-12-31
申请号	KR1020010069957	申请日	2001-11-10
申请(专利权)人(译)	日本地方可否让来.)		
当前申请(专利权)人(译)	日本地方可否让来.)		
[标]发明人	TSUCHI HIROSHI		
发明人	TSUCHI,HIROSHI		
IPC分类号	G09G3/30 G09G3/20 H04N5/66 G02F1/133 G09G3/32 G09G3/36		
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代理人(译)	李, 何炳		
优先权	2000343562 2000-11-10 JP		
其他公开文献	KR1020020059222A		
外部链接	Espacenet		

摘要(译)

一种用于液晶显示器的数据线驱动电路，包括选择电路20，用于从D/A转换器16接收对应于液晶显示器的数据线301至303的多个电压V1至V3，用于输出所选择的一个。接收电压，连接到选择电路输出的模拟缓冲器22A，接收模拟缓冲器输出的分配电路24，用于选择性地将模拟缓冲器的输出分配给所选择的一条数据线，以及预充电电路26在每个扫描线选择周期开始的预充电周期期间，根据相应数字数据的至少最高有效位将每条数据线预充电到VDD或VSS。在预充电时段之后的第一写入时段期间，对应于数据线301的电压V1被提供给模拟缓冲器22A，并且模拟缓冲器的输出被提供给数据线301。在后续和第二写入时段期间。对应于数据线302的电压V2被提供给模拟缓冲器22A，并且模拟缓冲器的输出被提供给数据线302。

