

(19)
(12)

(KR)
(B1)

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(11)
(24)

2002 07 20
10 - 0343922
2002 06 27

(21)
(22)

10 - 2000 - 0039126
2000 07 08

(65)
(43)

2001 - 0015252
2001 02 26

(30)

1999 - 196212

1999 07 09

(JP)

(73)

가 가

가 4 6
가 가
3681

(72)

가

가 460

3 29 39

가 가 1179

(74)

:

(54)

가 , 가 ,
.
1 , ,
 ,
 ,
 .

7

, , , ,

1 TFT .

2 1 가 .

3 1 가 .

4 , (D)

5 1 .

6 5 .

7 .

8 1 (tDD) .

9 6 .

10 (tDD) .

11 7 .

12 11 (HIZCNT) (PRECNT)

.

13 11 (PRET, PREN, DECT, DECN) .

14 11 (ACKEP, ACKOP, ACKEN, ACKON)

.

15 .

16 (D) , 가

.

17 6 , .

18 6

.

19 6

•

20 (Voff) 가 .

21 1 .

22 1 .

23 1, (A)가 H.

24 1, (B)가 H.

25 1 .

26 1 , (Voff) 가

27 1 , (Voff) 가

28 1 , (Voff) 가

29 1 .

30 29

31 30 .

32 29 .

33 32 .

34 1 .

35 29 .

36

37

38 가 .

10 : (TFT - LCD)

21, 22, 33 :

30 :

31, 278, 279 :

32 :

35, 36, 37, 403 :

38 :

100 :

110 :

120 :

121, 122 :

123 :

124 :

130 :

131, 132, 134, 135, 141, 142 :

133 :

140 :

151a, 151b :

152 :

153 :

154 :

155 :

156 :

157 :

158a, 158b :

261 :

262, 264 :

263 :

265 :

271 :

272 :

400 :

401 : PORN

402 :

410 :

420 :

430 :

440 :

450:

D : ()

G : ()

ITO1, CX :

ITO2 :

CT :

CL :

TFT :

CLC, Cp1x :

CSTG :

CADD : 가

Cstg :

PM, PA, PB : PMOS

NM, NA, NB : NMOS

TG :

LS :

TRP :

NAND : NAND

AND : AND

NOR : NOR

INV :

OP :

F :

EXOR :

가 가 () , , . (,) 가 , . ; ,) 가 , 가 (, 가 가 . , TFT(ThinFilm Transistor,) (TFT - LCD) , TFT 가 . TFT , 1 , () , 1 . , 8 - 86668 .

, TFT , XGA 1024 × 768 , SXGA 1280 × 1024 , UXGA , 1600 × 1200 가 .

가 가 , 1
(tDD)
, XGA , 1 20μs (tD
D) 10 20μs
,
,
, () , ,
,
(: 狹額縁化)
,
(MOS)
,
() ,
(tDD)
, 64 256 가 ,
1 (,)
,
, 가 ()
,
가
가
가
()
가 , 1
;
;
1 2 1 ;
2 ; 1
1 , 2 ;

[1]

<

1 , TFT () .

1 (LCM) , (TFT - LCD: 10) (130)가
, , (10) (140), (100)가 .

(100) , , (130), (140)
TCP(Tape Careeier Package) .

< 1 (10)

2 1 (10) 가 .

2 , (10) .

(G) 2 [(D) (G)] , 2 [(D)]

[TFT(1), TFT(2)] 가 , [TFT(1), TFT(2)]
[ITO(1)] .

, [ITO(1)] [ITO(2)] , [ITO(1)] [ITO
(2)] (CLC) 가 .

, [TFT(1), TFT(2)] (G) 가 (CADD)

3 1 (10) 가 .

2 가 , (G) 가 (CADD) , 3
(COM) (CSTG)

가 가 , , 가 가 (G) 가 가 (CADD)
(IT01) 가 , , 가 가 ,
가 가 .

, 2, 3 가 , 2, 3 , AR

, 2, 3 , .

2, 3 (10) (D) (TFT) 가
 (130) (D) , (D) 가
 , (TFT) (G)
 , (G) 1 (TFT) (140)
 () (140) .
 < 1 (100)
 1 (100) (110) (120) .
 (110) 1 (LSI) , , (R · G · B) ,
 (130) (140) . (110) (135) (133)
 가 1 (130) , 1 (130) .
 , (110) , (130) (CL2)[, (CL2)] (131) .
 6 , 1 , (R), (G), (B) 1 .
 , 1 (130) 1 (130) .
 1 (130) 가 2 (130) , 2 (130) .
 , 가 , (130) ,
 가 .
 (110) , , 1 가 , 가 (130)
 (10) (D) (132)
 (CL1) [, (CL1)] (130) .
 , (110) , 1 가 , 1 .
 (142) (140)
 , (110) , 1 (10)
 (G) 가 (141) (140) 1
 (CL3) .

, (10) (G) (TFT)가 1

, (10) .

< 1 (120)

1 (120) , (121), (122), ()
(123), (124) .

(121), (122) , (121)
5 (V"0 V"4) , (122) 5 (V"5 V"9)

(V"0 V"4) (V"5 V"9) (130)

, (130) (110) (; M) (1
34) .

(123) [ITO(2)] 가 , (124)
(TFT) 가 () .

< 1

, () 가 가 ,

, , 가 가 / , ,
가 .

가 , 2가 .

, 가 가 ,

, , 가 , 가 가

, [ITO(1)] 가 2 가 ,

N 가 .

1 , , .

4 , , (130)
(D) (, [ITO(1)] 가)

, (130) , 4 (D) , [ITO(2)] 가
 (VCOM) (4) , , (4
 (D) , [ITO(2)] 가
) 가 .
 , , , (D) (130) (D)
 가 .
 , , 4 , , ,
 (130) (D)
 (D) 가 .
 , , , (130) (D)
 , , (D) 가 .
 , (D) 가 , [ITO(2)]
 ITO(2)] (TFT) 가
 .
 , [ITO(2)] 가 가 , [ITO(2)]
 .
 < 1 130
 5 , 1 (130)
 , (130) 1 (LSI) .
 , (151a) (121) 5
 (V"0 V"4) 64 , (158a)
 (157) .
 (151b) (122) 5 (V"5
 V"9) 64 , (158b) (157)
 .
 , (130) (152) (153) , (110)
 (CL2) , (154) , (15
 4) .
 (154) , (153) ,
 (110) (CL2) , 6 .
 (155) , (110) (CL1) (154)
 .
 (155) (156) (157) .

1 (157) , 64 , 64
 1 (64 1) , (D) .

6 , (157) , 5 (130)

153 5 (152) , 156 5
 (265) , 5 (154)
 (155) , , (: 261), (263), (263)
 (2)2647, 5 (157) .

1)262 (2)264 , (M) .

, Y1, Y2, Y3, Y4, Y5, Y6 , 1 , 2 , 3 , 4 , 5 , 6 (D)

6 (130) , (1)262 (265)[,
 5 (154)] ,
 (265) .

(261) , (151a) (158a) 64
 (265)[, 5 (155)]
 (158b) 64 (278) , (151b)
 (265)
 (279) .

(278) (279) (265) .

(263) , (271) (272) .

(271) (271) (278) ,
 (271) .

(272) (272) (279) ,
 (272) .

(271) , (272) , (263)
 (271) (272) , (271) (272)
 (271) (272) , (1)262 (165)
 , (265)
 (271) (272) (2)264
 (D), , 1 (Y1)
 (D)
 4 (Y4) ,
 가 .

7 , (130) .

, 7 , (278), (279), (271)
 (272) , , (D), , 1 (Y1) 4
 (Y4) .

7 , (TG1 TG4) , 6 (2)264 1 .

, PAD(21, 22) , , 1 (Y1) 4 (Y4)
 () .

1) , (279) , (272) , (278) (27
 : 30) (, ,
 .

(30) , (278) (271)
 (TG31) , (279) (272) (

TG32) .

(TG31, TG32) (DECT, DECN)
 (278) (279) (271) (272)

. ,

, (30) , (TG33) (TG34) .

(TG33, TG33) , (PRET, PREN)
 (271) (, , ,)
 (VHpre) , , (272) (, , ,)
) (VLpre) .

< (130) (tDD)

8 , 1 (130) (tDD)
 .

, 8a 1 , , 6 (2)264 .

, 8a , (31) 6 (278) (279)
 , (32) 6 (271) (272) , , (33)
 7 PAD(20) PAD(21) .

9 , 6 (278) (279)
 .

9 , 6 (278) (279) , 가 MO
 S MOS 가 (TRP2, TRP3) .

, (130)
 , (278) (279) (13

0) MOS .

, (278) (279) .

, (278) (279) (271) (272) 가

, (278) (279) (271)

(272) (271)

(272)

(278) (279) (271)

(272)

, 8b (D) (VLCH)

(tDD)

10 (130) (tDD)

10a , 1 , 6 (2)264

10a (31) 7 (278) (279)

(32) 7 (271) (272) (33)

7 PAD(20) PAD(21)

(278) (279)

가 (271) (272) (TG31) (278) (279)

(279) (TG32)가

(TG31, TG32) (271)

(272)

(278) (279) 8

가

(271) (272) (V

Hpre) (VLpre) (D)

(VHpre) (VLpre)

(271) (272) (D)

(278) (279)

(271) (272) (D) (VL

CH)

10b (tDD) 8

가

가 1

(D) (VHpre)

(VLpre) (D)

(VLCH) 가

, 10b (D) , (VLCL)
(tDD) 8 가 .

, 6 - 337400 , 10 - 187100

, (278)
(279) MOS 가 , (2
78) (279) (tDD)

< (30)

11 , 7 (30)

11 (HIZCNT) (TG1 TG4) 가 (ACKEP, ACKOP, ACKEN, ACKON) (HIZCNT) (CL1) High
(, , H) (CL2) 8 H .

(271) (272)

(HIZCNT) (271, 272) (D)

(HIZCNT)가 H , (ACKEP, ACKOP) Low (, , L
) , , (ACKEN, ACKON) H .

(TG1 TG4) 가 .

11 (PRECNT) (TG31 TG34) 가
(PRET, PREN, DECT, DECN) , (PRECNT) (HIZCNT)
(CL2) 4 H , (CL1) L .

(DECT) (PREN) H L , , (DECN)
(PRET) L H .

(TG31, TG32)가 , , (tD1)
(TG33, TG34)가 .

(PREN) (DECT) L H , , (PRET) (DE
CN) H L .

(TG33, TG34)가 가 , , (tD2)
(TG31, TG24)가 .

12 , 11 (HIZCNT) (PRECNT)

12 , D (F30) (CL2) (CL1) , D
(F30) (CL2) D (F31 F38)

D (F38) , NAND (NAND31) , , NAND
(NAND31) , D (F30)

, NAND (NAND31) , (CL1) H , (CL2) 8 , L

NAND (NAND31) (INV) , 11 (HIZCNT)가

, D (F34) D (F39) , D
(F39) D (F34) H

, D (F39) (CL1) , D (F39) (CL1)
L

, D (F39) , (HIZCNT) (CL2) 4 H
, (CL1) L 가

(35) , 11 (PRECNT)가

13 , 11 (PRET, PREN, DECT, DECN)

13 (PRECNT) , (36) (tD1) (P
RECNT) NAND (NAND32) (PRET)가 , (PRET)
(INV) (PREN)가

, (INV) (/PRECNT) , (37) tD2
(/PRECNT) NAND (NAND33) (DECN)가 , (DECN)
(INV) (DECT)가

14 , 11 (ACKEP, ACKOP, ACKEN, ACKON)

, 14 , LS1 LS4

14 , NAND (NAND1) NOR (NOR1) (M)가, NAND (NAND2)
NOR (NOR2) (INV) (M)가

, NAND (NAND1, NAND2) (HIZCNT)가, NOR (NOR1, NOR2) (INV)
(HIZCNT)가

1 , NAND (NAND1, NAND2) NOR (NOR1, NOR2) ,
(TG1 TG4)

[1]

HIZCNTT	M	NOR1	NAND2	NAND1	NOR2	TG1	TG2	TG3	TG4
H	*	L	H	H	L	OFF	OFF	OFF	OFF
L	H	L	H	L	H	OFF	OFF	ON	ON
L	H	L	H	L	ON	ON	OFF	OFF	

1 (HIZCNT)가 H , NAND (NAND1, NAND2) H , N
OR (NOR1, NOR2) L , (TG1 TG4) 가 .

1 (HIZCNT)가 L , (M) H L
NAND (NAND1, NAND2)가 H L , NOR (NOR1, NOR2)가 H
L .

(TG1) (TG2)가 , (TG3)
(TG4)가 .

(LCM) , 가 0
5V, 5 10V , (272) 0 5V ,
(271) 5 10V .

(TG1)가 (TG4)가 ,
(TG1) MOS 10V 가 .

(TG1 TG4) MOS . 10V
MOS 가 .

<

15 .

15 , (278), (279), (271)
(272) , (D), , 1 (Y1) 4
(Y4) .

15 , (38) , (3
8) 1 (VH1pre), 2 (VH2pre)
(271) 가 ,

가 (272) , (38) , 1
(VL1pre) 2 (VL1pre)
(272) 가 .

<

, (271) (VHpre) 64
(272) (VLpre)

64

, (121), (271) 5 (VHpre) 1
 (272) 5 (V"5 V"9) (VLpre) 1 (122)

, (271) (VHpre) , 64
 가 () 가 가 , 가
 가 가 가 (,)
 가 가 (272) (VLpre)
 , 64 가 가 가 ,
 가 가 가 (,
) 가 가 .

16a , (D) , (130) , (130)
 가 .

16a , (D) (,
 (VHpre), (VLpre)) 가 ,
 (130) , (130) 가 .

, (VHpre) .

, (VHpre) , 16a ,
 (130) 가 .

, 16b , (VHpre)
 가 , (130) (,
 Vs1) , (130) 가 (Vs2)
 가 (Vs1 = Vs2) 가 .

가 , (VLpre) , 가
 가 .

<

, 6 (271) (272) , , 17
 , (OP) (-) 가 , (+)가

, (272) (OP) , , 18
 , (271) (OP) , , 19

, , (OP) (Voff) .

(OP) 가, , 18 19
 (Voff) , 18 19 , PMOS
 (PM51, PM52) NMOS (NM61, NM62), NMOS (NM
 63, NM64) PMOS (PM53, PM54) .

MOS (Vth), MOS / / (W/L) ,
 , (Voff) 0 가 .
 , 20 , (OP)가 (Voff)
 , (Vin) , (Vout) (Vin= Vout) , (OP)가
 (Voff) (Vin) (Vout) , (Vout)
 (Vin) (Voff) 가 (Vout=Vin+Voff) .
 , 20 , (Voff) 가 , 20 , ROP
 (Voff) , VOS (Voff) .
 , (5 157) (6 271)
 (6 272) , 17 , (D)
 , 가 .
 , 가
 , .
 21 (130) (272)
 , 22 (130) (271)
 .
 21 (272) 18 .
 (1) 18 , PMOS (PM51) () (+)
 (-) (NA1, NB1) , PMOS (PM52)
 (+) (-) (NA2, NB2) , NMOS
 (NM65) PMOS (PM51) (2) PMOS
 (PM52) (NA3, NB3) , NMOS
 (NM63, NM64) PMOS (PM51) PMOS
 (PM52) (NA4, NB4)가 가 .
 (2) (2) NMOS (NM1) NMOS (NM1)
 , PMOS (PM4), NMOS (NM2) NMOS (NM3) 가
 .
 , NMOS (NM1) , ((D)) (+)
 가 (D) (D)
 (,).
 22 (271) , , 19 .
 (1) 21 (272) 가 , 19 (P
 A1 PA4, PB1 PB4)가 가 .

(2) , PMOS (1) PMOS (PM1) PMOS (PM1) 가
(PM3), PMOS (PM2) NMOS (NM4)

, NMOS (NM4) , (D) (+)
가 (D) , (D)
(,).

, (NA1 NA4, PA1 PA4) (A)가 가 , ,
(NB1 NB4, PB1 PB4) (B)가 가 .

21 (272) , (A)가 H , (B)가 L
23 , , (A)가 L , (B)가 H 24

, 23, 24 , 23, 24

, 23, 24 , NMOS (NM1) NMOS (NM1)
, PMOS (PM1), NMOS (NM2) NMOS (NM3)

23, 24 MOS , (272) , (Vin) 가
(Vout) MOS

, 23 1 , (Vout) (Vin)
(Voff) 가 .

1

$$V_{out} = V_{in} + V_{off}$$

, 24 , 2 , (Vout) (Vin)
(Voff) .

2

$$V_{out} = V_{in} - V_{off}$$

25 (130) .

25 , Vofh (271) Vofl
(272) (272) (D) , (271)
(272) . (271)

, VH (271)가 (271)
, VL (272)가
(272) .

, 25, (A) (B) 2.

, 25, Vofh (271) Vofl
 (272) (D),
 (271) (VH+Vofh), 3 (271) (V
 H - Vofh) (271) (Vofh).

, (272) (VL+Vofl), 4
 (272) (VL - Vofl),
 (272) (Vofl).

, 26, (271) (272) (Vofh,
 Vofl) 4, 25
 가 가.

, 25 (A) (B) 2 2
 (A) (B) 2, 2
 27, 28.

27, (A)가 H (271)가 (+) (Vofh),
 (272)가 (+) (Vofl).

, 28, (A)가 H (271)가 (+) (Vofh),
 (272)가 (-) (Vofl).

, (271) (272) (Vofh, Vofl)
 4,
 가.

, (A) (B) 2, 27, 28
 2, () ()
 10) 가.

, 27 28, 1 2 (A) (B)
 , 2 가.

, (A) (B)
 (271, 272) (D).

< (A) (B)
 , (A) (B).

29, (130) (152).

53), (400), (130) (152) (1
(430), (440), (410), (420),
(450)가 .

30 , 29 (400) , 31 , 30
(400) .

(400) (CL1) , (CL1) , 31 , D
(F1) 2 (HCL1) , (HCL1) D (F2) 2 ,
(CL1) 4 (QCL1) .

(400) , (FLMN)가 .

(FLMN) .

(FLMN) (INV) (FLMIP) .

(FLMIP) , 31 , D (F3) 2 (HCL1) , ,
(HCL1) D (F4) 2 , (FLMN)가 4 (QFLM) .

(QCL1) (QFLM) , (EXOR1) (EXOR1)
(CHOPA)가 , (CHOPA) (INV) (CHOPB)가 .

(CHOPA, CHOPB) (A) (B)가 .

(A) (B) 2 2 .

(A) (B) 2 (FLMN) 4
(QFLM) (CHOPA) , , (CHOPA) (INV) (CHOPB)

(EXOR1) , 30 (400) , D (F1, F2)

(400) , D (F1, F2) (FLMN) .

, D (F3, F4) PORN (401) (PORN) .

PORN (401) (VDD) (402) (402)
(403) .

(VDD) 1 (120) DC/DC () ,
(VDD) .

, PORN (401) (PORN) L
, D (F3, F4) .

<

(FLMN) .

(FLMN) , 가 .

, (140) (110) 가 , (130) (FLMN) 가 .

, (130) () 가 , , 가 .

, 가 EMI(electro magnetic interference) .

, 가 .

, (110) (130) , (,) , (,) (FLMN) .

32 29 (410) , 33 32 (410) .

, (CL2) 4 , (CL2) 1 .

32 , D (F11 F13) (CL2) .

, (CL2) D (F11) , (STEIO) .

1) (STEIO) (CL2) D (F12) , (Q1) , , (Q (CL2) D (F13) , (Q2)가 .

(Q2) D (F14) , , D (F14) (D) (STEIO)가 .

14) , Q 가 (CL2) 4 , D (F (Q H .

, D (F14) Q (FSTENBP) H (FSTENBP) , (FSTENBP) H .

, D (F14) Q (STEIO) , NAND (NAND11) , NAND (N AND11) (FLMN) , (FLMN) (CL2) 2 (L .

, Q 가 (CL2) 1 , D (F1 4) Q L .

, (FSTENBP) L , , (FLMN) H .

, D (FI1 F14) (RESETN) .

, (RESETN) (CL1) .

, (CL2) 4

, 가 L

(FLMN)가 가 , 가 .

, 1 (130) , (110)

가 ,

, 2 (130) , (110)

가 , 2 (130) ,

, (130)

가 .

, 29 (440) (CL2) 4

, 가 , (440)

(130) .

<

, (130) , .

34 , 29 (130) (152)

. .

34 , (420) , 가 , H

(EENB) (430) .

, (430) , (CL2) ,

(153) .

, (153)

, (154) 가 , (SFT1 SFTn+3) ,

, SFTn , (CL2) 1 (130)

. .

, SFT1 SFTn (154) 1 n

, SFTn+1 SFTn+3 (154)

. .

SFTn+1 SFTn+3 (130)

. .

, 34 , (450) , SFTn SFTn+ 3 ,

(CL2) 4 .

가 (FSTENBP) L , (1)

(450) (, SFTn) ,

30) .

가 , (FSTENBP) H , (

450) (130) .

(450) , 35 가 .

35 (450) , SFTn , D (F21) Q

(INV) SFTn+3 , D (F2

2) Q .

, D (F21) D (F22) Q (EXOR2) ,

(EXOR2) (CL2) 4

.

(130) , ,

(130) 가 ,

(130) , 가

.

<

, 21 (272) , (1)

.

가 , 22 (271) , (2)

.

(1) , (2) 64 , (

D)

36 , .

, 36 , 1 , 7 (30) 6

(2)264 .

, 36 , (31) 6 (278) (279)

, (32) 6 (271) (272) .

, (1) (2) , 「0」, 「1」

.

, 36 「1」 NAND (NAND41)

, (D) (2) .

, 「1」 , NAND (NAND41) L , L

(INV31) H , PMOS (PM31) 가 , PMOS (PM31)

가 , (D) (2) .

가 , 「0」 , NOR (NOR41) H , H
 (INV32) L , NMOS (NM31) 가 , NMOS (N
 M31)가 , (D) (1) .
 , (INV31, INV32) (1) (2) .
 , (INV31, INV32) 「0」 , 「1」
 (D) 가 .
 , 「1」 AND (AND41) , , 「0」
 NOR (NOR42) , AND (AND41) NOR (NOR42) OR (OR41)
 (TG41) , (32) (D)
 .
 , 36 , 64 , 「1」
 , , , 「0」
 , (D) 가 .
 36 , 「1」 「0」
 (TG41)가 , (32) 가
 .
 , (232)가 18 , 37
 가 .
 37 , 「1」 AND (AND51) , ,
 「0」 NOR (NOR51) , AND (AND51) NOR (NOR51)
 NOR (NOR52) PMOS (PM11) NMOS (MM11)
 가 .
 , 37 , 「1」 「0」 NOR (NOR52)가
 「0」 (2) 가 , , PMOS (PM11)가 (32)
 , (32)
 , 「1」 「0」 , NOR (NOR52)가 「1」
 , NMOS (NMI1)가 (32) (1)가 가
 , (32)
 , , , 가 .
 , , 가 .
 38 , 가 .
 2 3 , [ITO(2)]
 가 , (CL) TFT (CT), (CT) (VCOM)
 , (Cpix) (PX) (CT) 가 , (PX)
 (CT) (Cstg) .

가, 1, 1, [ITO(1)] [ITO(2)] 가

가 가

(1) (tDD) 가

(2) 가 가 (tDD)

(3) 가

(57)

1.

가

1

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1 ;

2 ;

1 1 , , 2

2.

가

1

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가

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1 ;

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1 ; 1 , , 2

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3.

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2

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2

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4.

1 ,

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5.

1 ,

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6.

1 ,

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7.

1 ,

가 가 가 , 가 가
가 가 가 , 가 가
가

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8.

1 ,

1 2

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1

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9.

8 ,

1 , 1 1
1 , 1

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10.

8 ,

2 , 2 2
2 , 2

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11.

2 ,

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1

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2 ;

3 ;

4 ;

2

5 ;

2

6 ;

2

2 7 ;

2 8 ;

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1 , 3 , 5 , 7 , 2 , 4 , 6 , 8 ,

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12.

2 ,

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, n

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13.

12 ,

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가 ,

14.

2 , , n , n .

15.

14 , , , , , .

16.

13 , , , .

17.

2 , , 1 .

18.

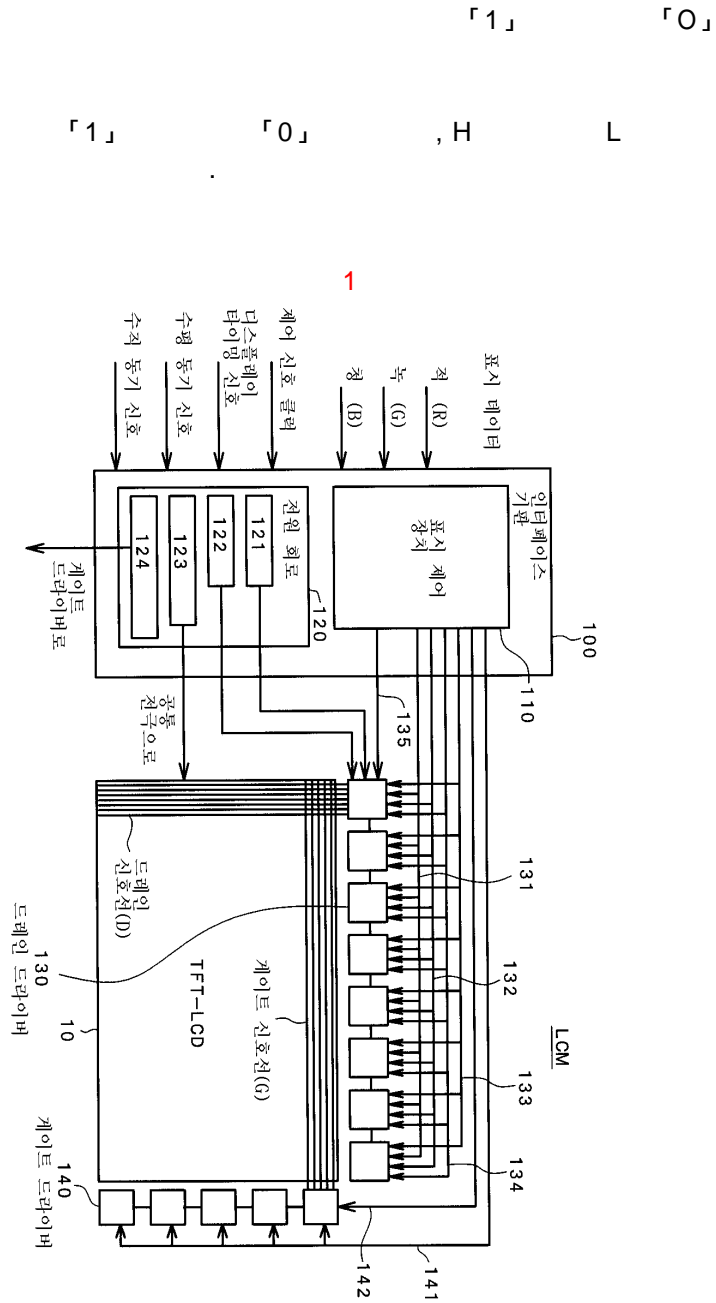
7 , .

19.

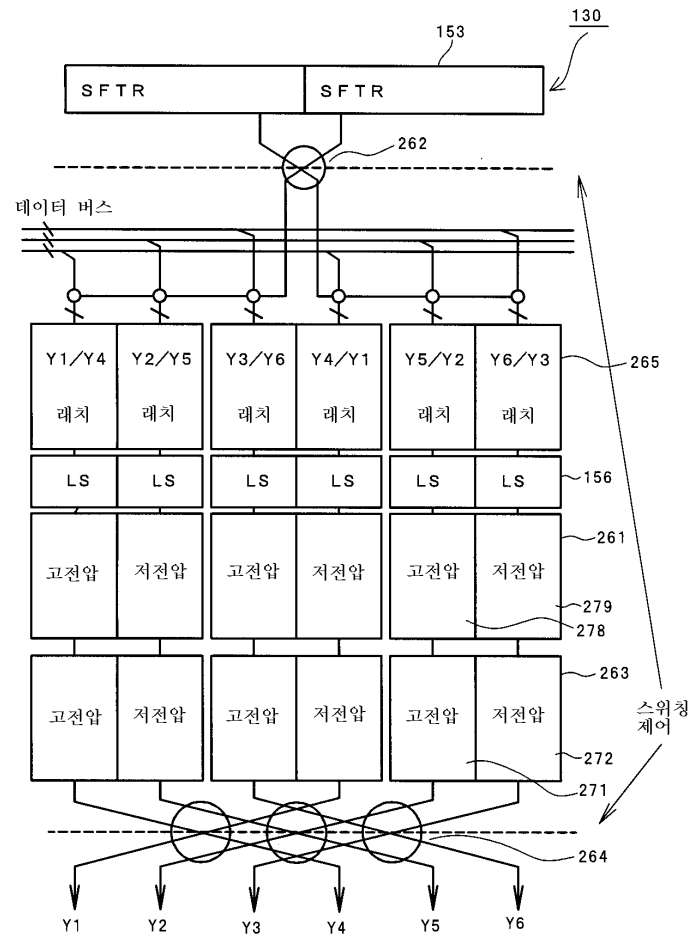
1 , 「1」 「0」 , ; , 「1」 「0」 , 3

20.

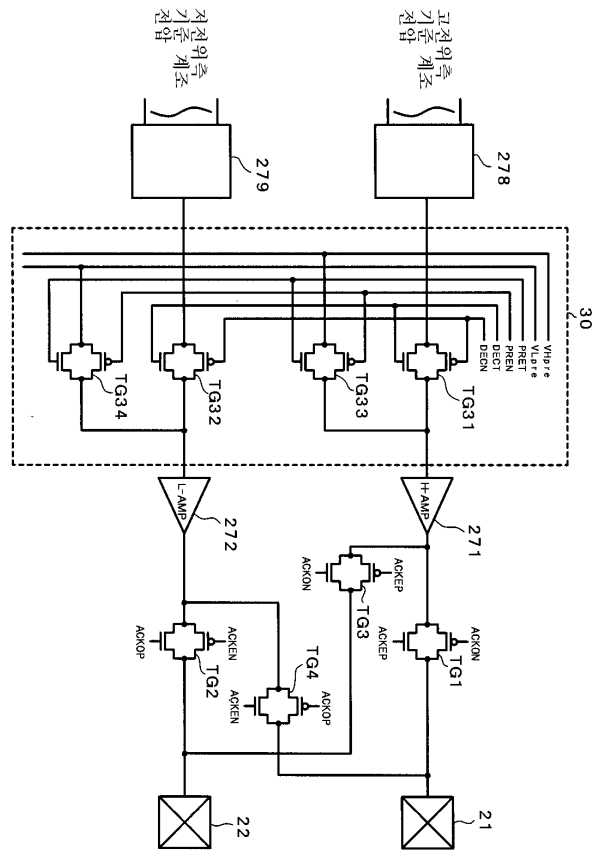
19



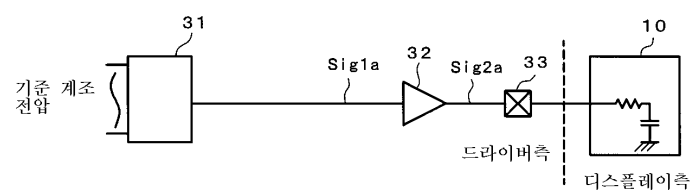
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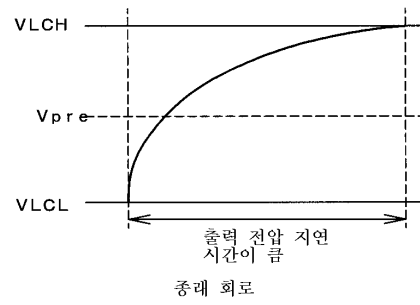
7



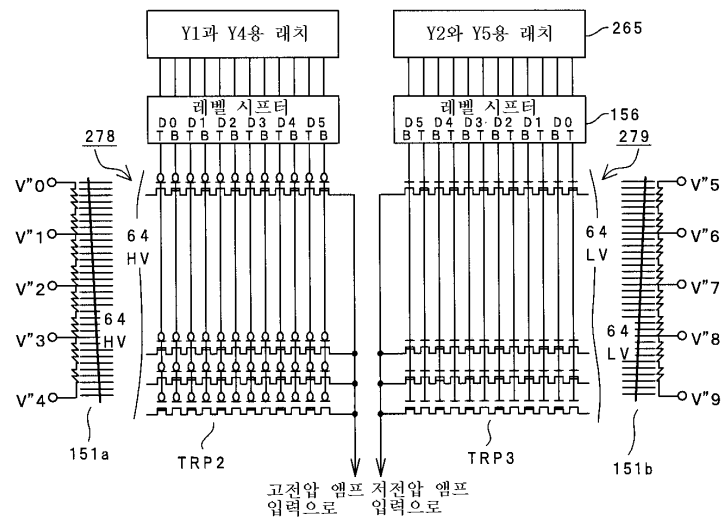
8a



8b



9



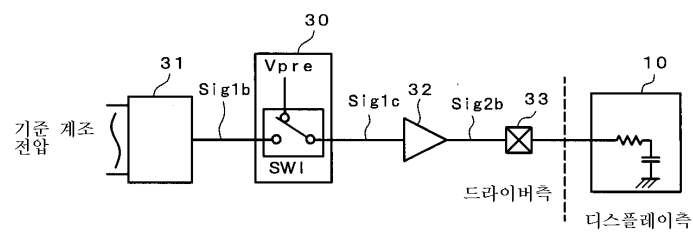
N 채널 MOS

P 채널 MOS

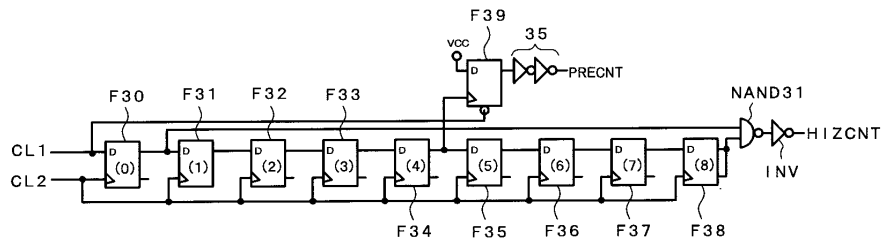
공핍형 N 채널 MOS

공핍형 P 채널 MOS

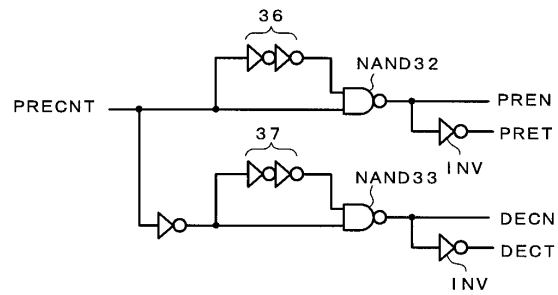
10a



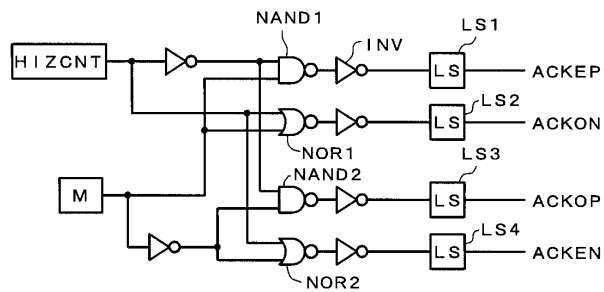
12



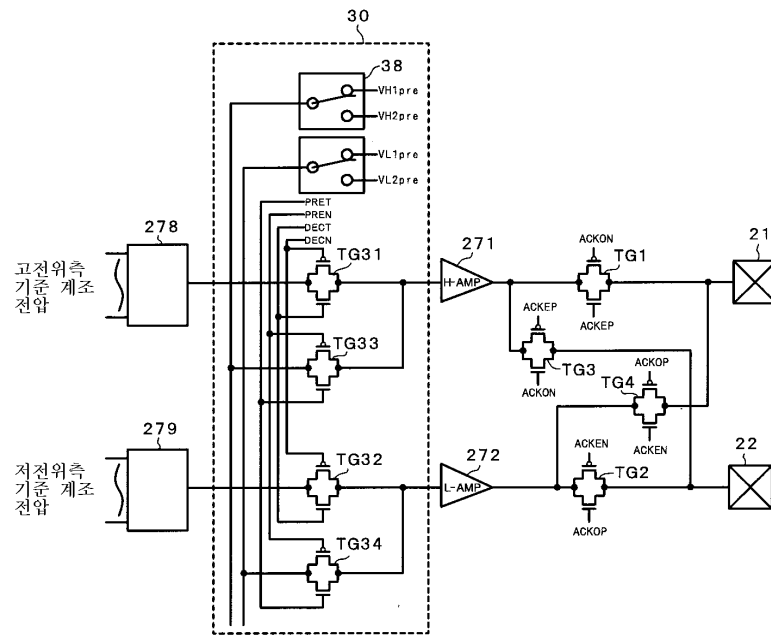
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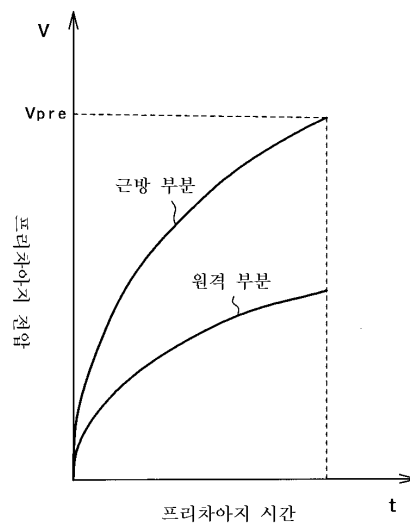
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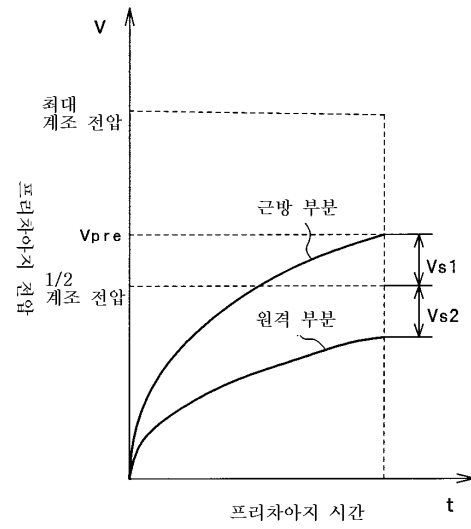
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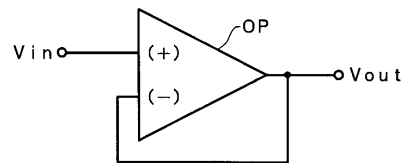
16a



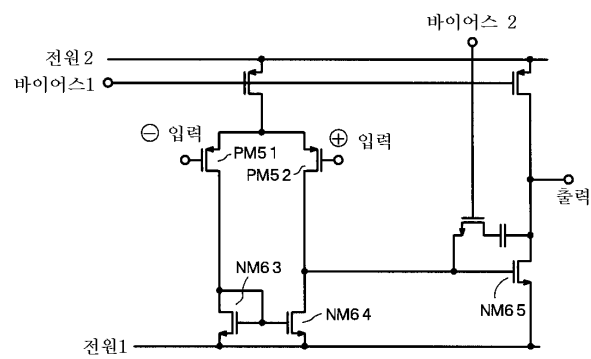
16b



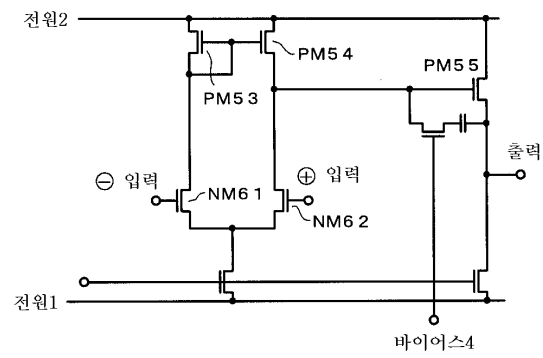
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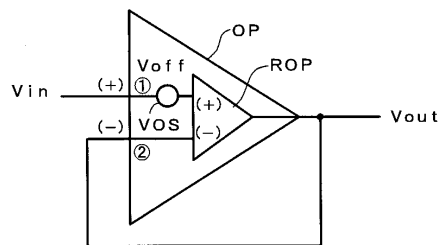
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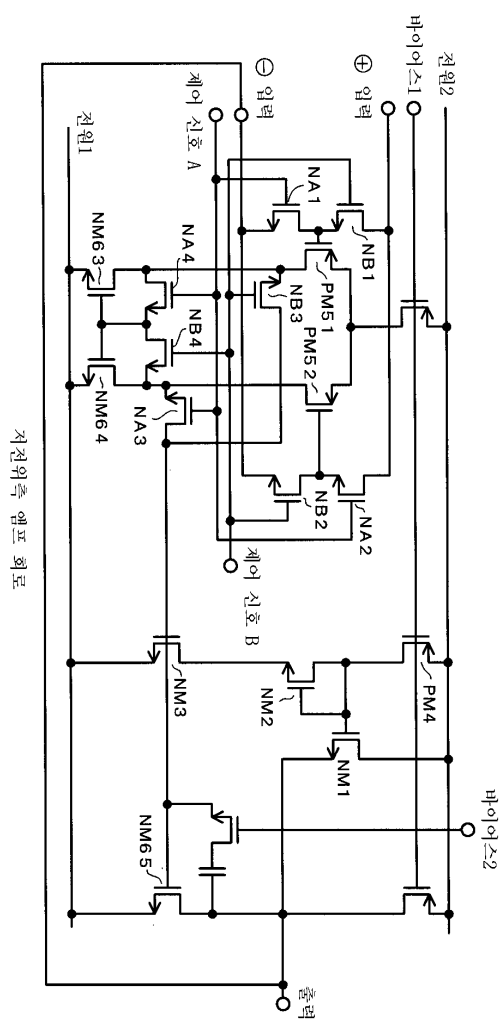


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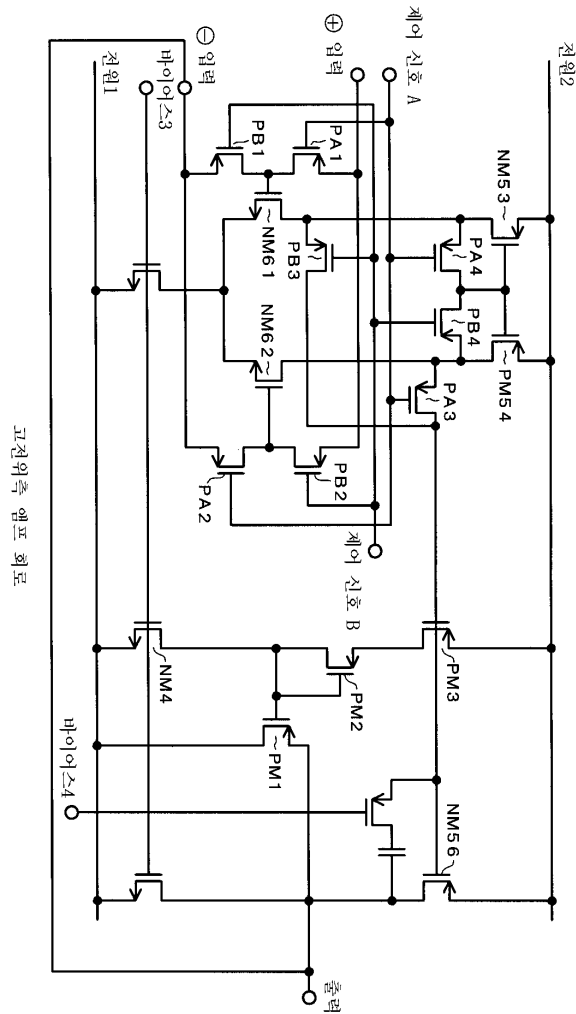

 $V_{out} = V_{in}$ (오프셋 전압이 없는 경우)

 $V_{out} = V_{in} + V_{off}$ (오프셋 전압이 있는 경우)

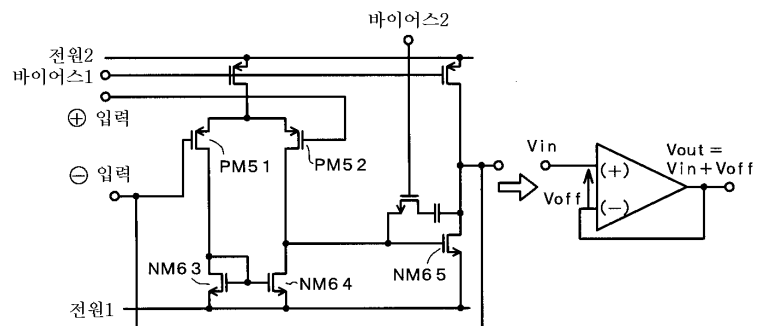
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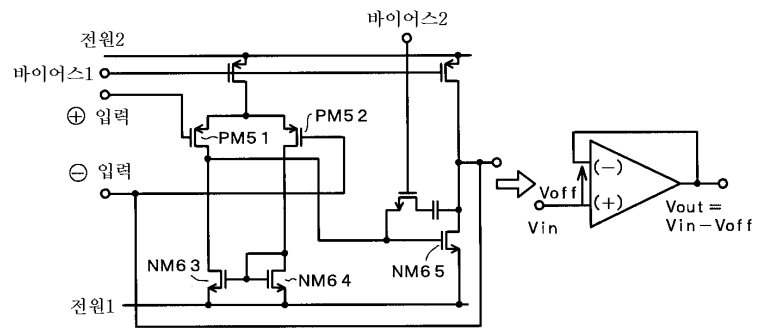
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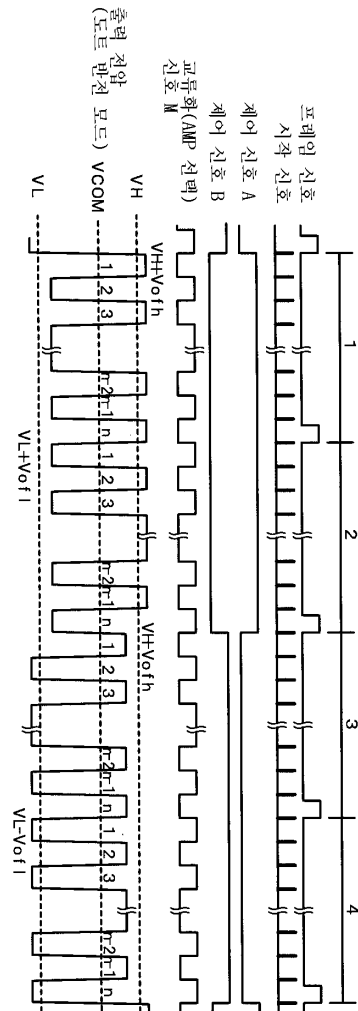
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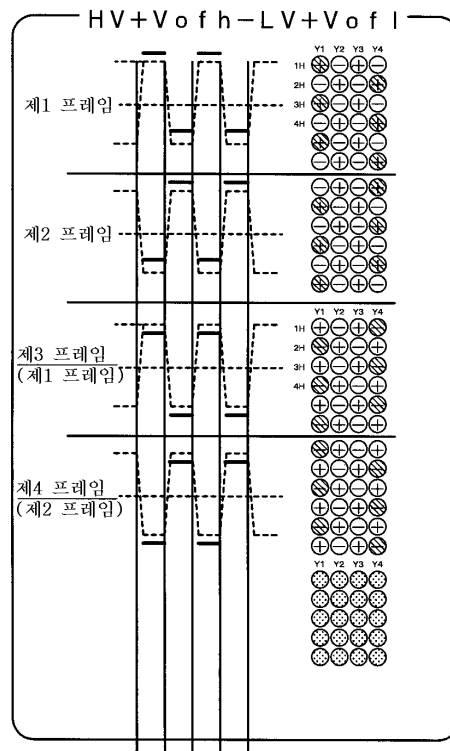


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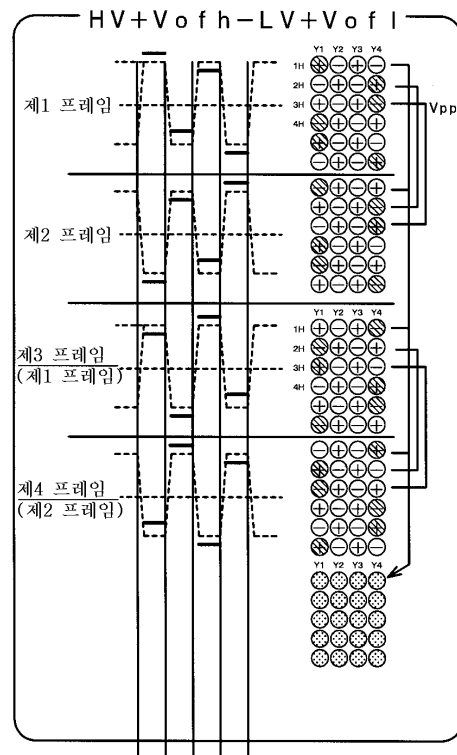


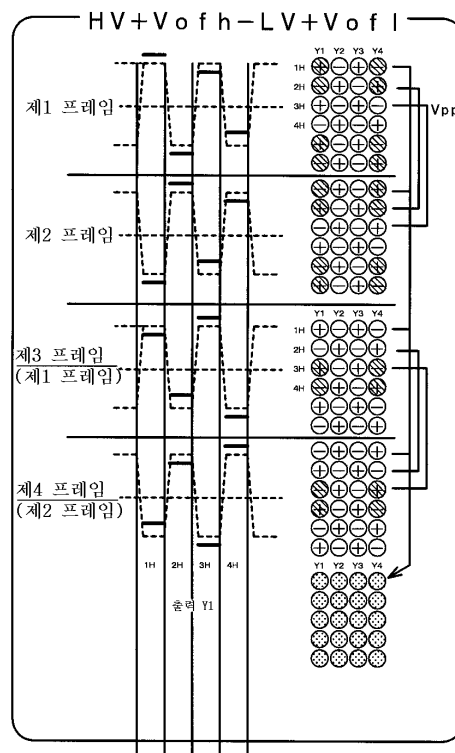
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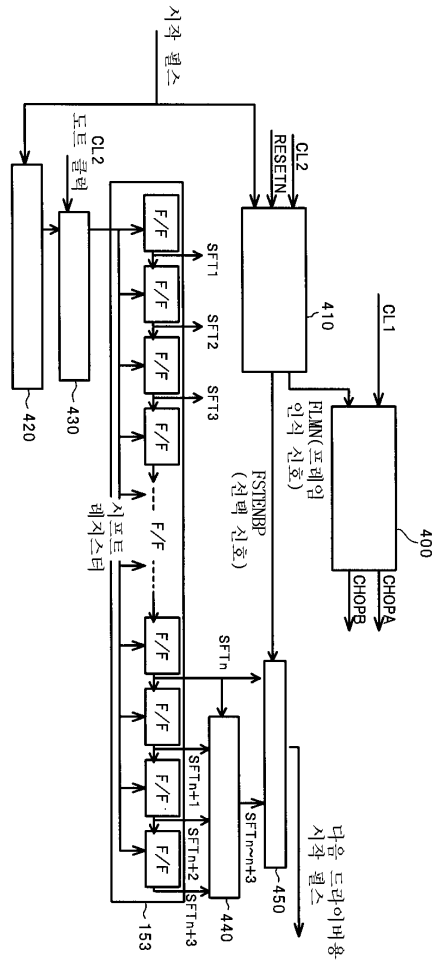


27

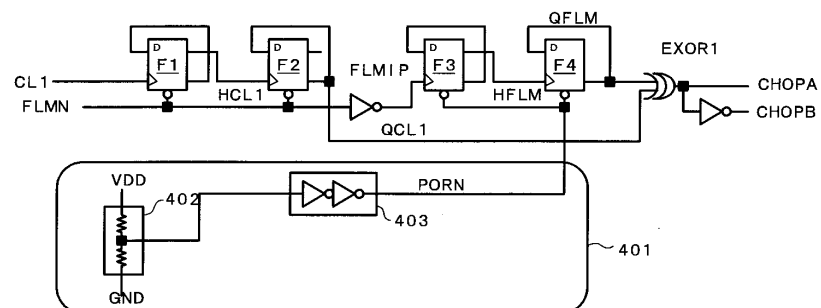




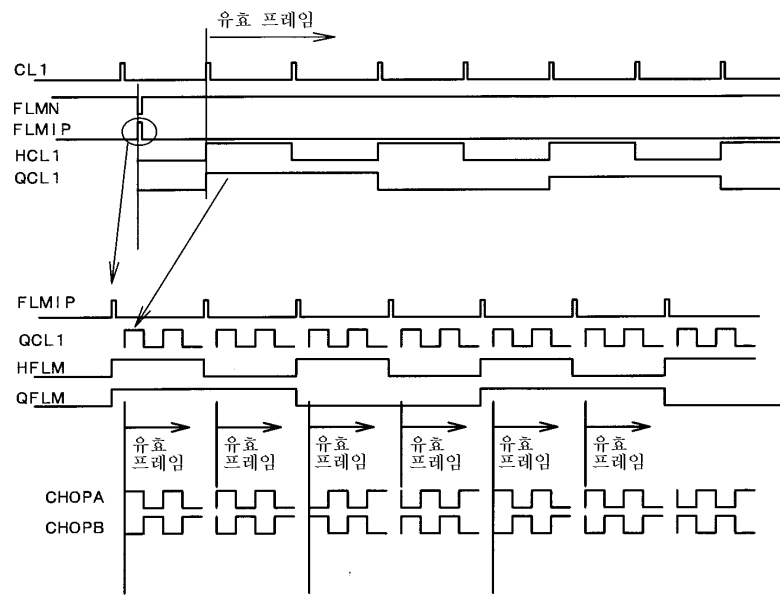
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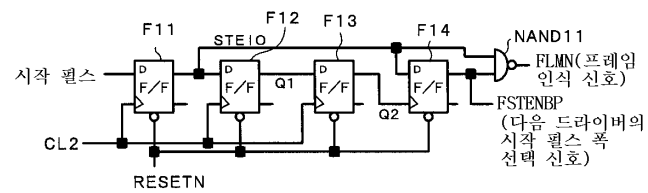
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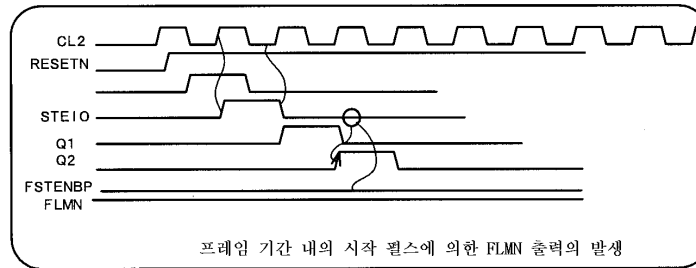
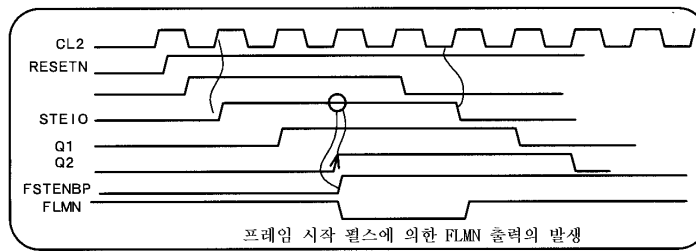
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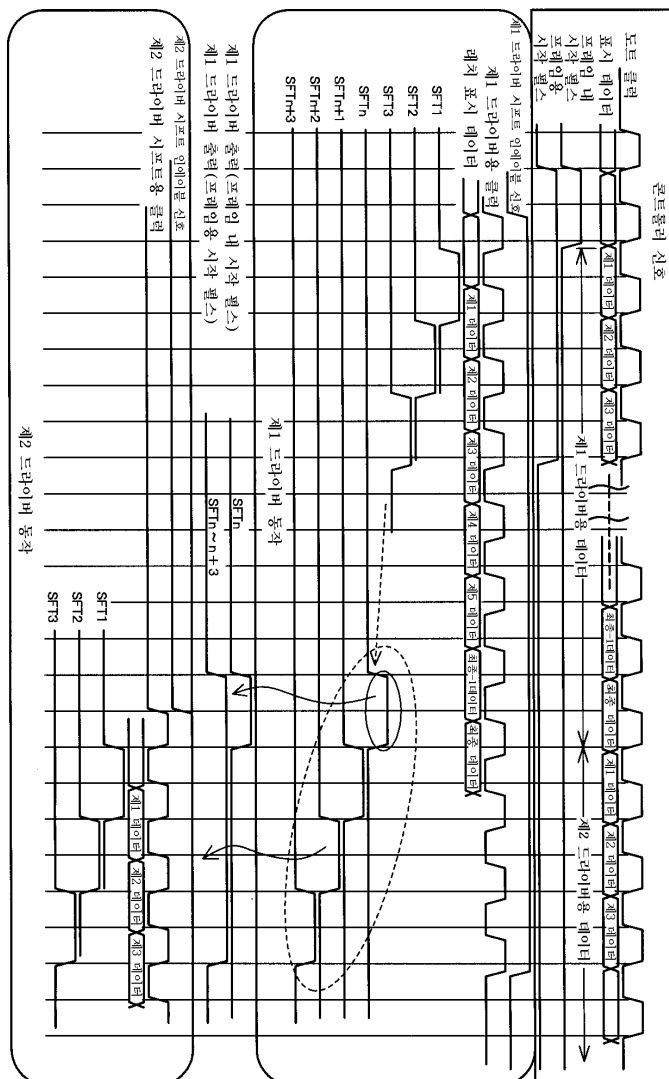


32

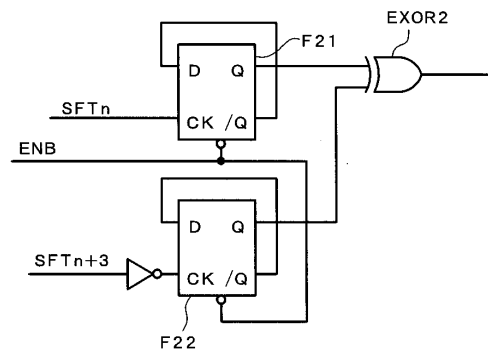


33

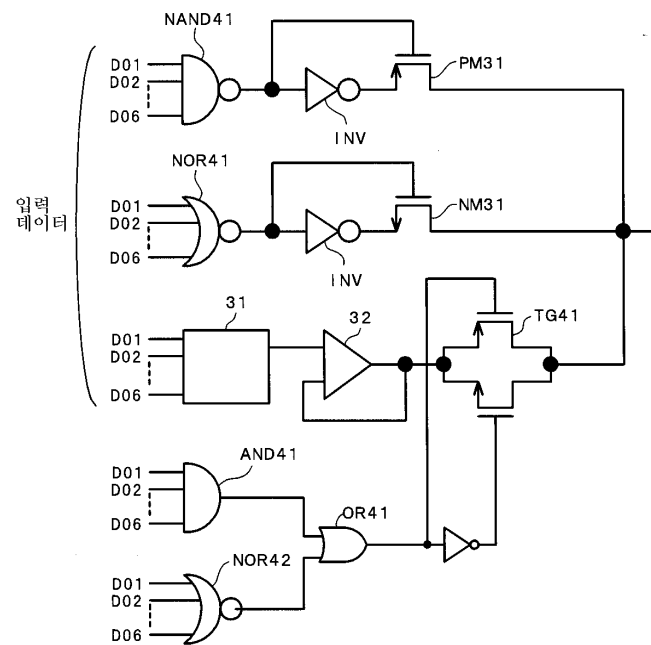




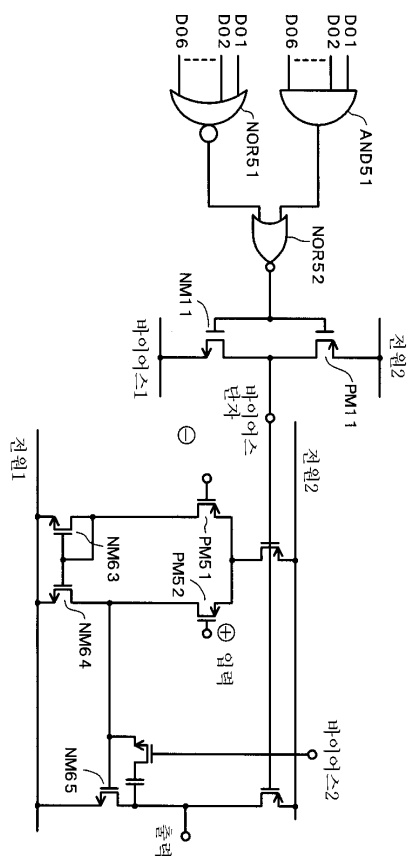
35



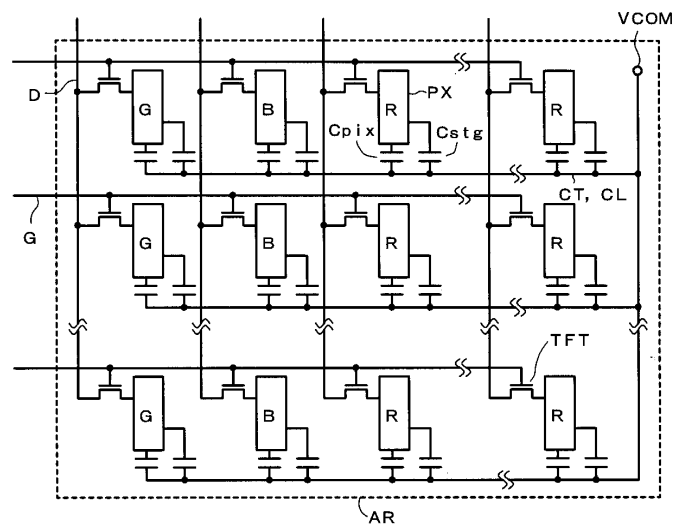
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37



38



通过液晶显示装置，能够实现液晶显示装置的大屏幕，能够实现高速操作，提高显示在液晶显示装置上的显示画面的显示品质。半导体集成电路器件是包括图像信号线驱动装置的液晶显示器，该图像信号线驱动装置提供与液晶显示器件的每个图像信号线中的显示数据相对应的灰度电压，它包括液晶显示器件，并且至少一个半导体集成电路器件包括多灰度电压选择装置，用于选择与多个灰度电压之间输入的显示数据相对应的灰度电压和与输入的显示数据相对应的灰度电压，多个AMP电路输出它放大的每个图像信号线。多个和每个灰度级电压选择装置，以及安装在每个AMP电路之间的预充电控制电路。液晶显示装置，灰度电压，蜂鸣电荷，大屏幕，图像信号。

