

(19)
(12)

(KR)
(B1)

(51) 。 Int. Cl.7
G11C 5/14

(45)
(11)
(24)

2004 07 03
10-0439026
2004 06 24

(21) 10-2001-0065522
(22) 2001 10 23

(65)
(43)

10-2003-0033517
2003 05 01

(73) 416

(72) 1 127 502

(74)
:

(54)

| | | | | | |
|--------|------|------|------|---|------|
| | 가 | 가 | 가 | 1 | 1 |
| , 1 | 2, 3 | 2, 3 | 3, 4 | | |
| , 1, 2 | 1, 3 | 1, 2 | 2, 4 | | |
| 3 | , 2 | 2 | 1, 3 | | 1, 2 |
| , 3 | , 1 | 3 | , 4 | | , 4 |
| | 2 | | 4 | 4 | |
| | , 3 | | | | |
| | 4 | | | | |
| | , | | | | |

9

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

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

5 2-1, 32-2, 32-3), (C4 ~ C7), (34-1 ~ 34-4), NMOS (30), (N5 ~ N9) (3)

5 T) 가 (30) (ACT) (P6) (P7, P8, P9) (AC (32-1
 , 32-2, 32-3) (N9) (F) (VDD-VT)((C, D, E) (VT) NMOS (N9)
 NMOS (P9)가 (F)가 (VPP-VDD) (F) NMOS (VPP) (N8)가
 (VPP) (VDD) (F) (VPP-VDD) (F) (F) (VPP-VDD) (C4, C6)
 (P8) (P7) (D) (C, E) (2VDD) (C7) (C5) (P9)
 (VDD) (F) (2VDD) (34-1, 34-3) (P7) (VDD)
 (VPP) (VPP) (34-2) (P8) (VDD)
 VPP) (C, D) NMOS (N5) (34-3) (34-1) (P7) (VPP) (N6) (34-2)
 (N7) (VPP) (D, F) NMOS (E, F)
 (34-3) NMOS (N8) (34-4) (VPP)
 (F) 가 (VPP) (VPP) 6 5

6 5 (ACT) 가 (30)가 (ACT) (P6)
 (VDD) (ACT) 가 (T7) (VDD) (P7) (T8)
 (P8) (T9) (VDD) (P9) (ACT) 가
 (T6) (32-1 ~ 32-3)
 (30) (P6)가 (C4) (C)가
 (C, D, E) (F) (VPP-VDD) (P7)가 (P7) (VPP)
 (T7) (VDD) (34-1) (VDD) (C, D) 가 (C, D) (1.5
 (2VDD) NMOS (N5)가 (C6) (E)가 (2VDD) (N7)가 (34-3)
 VDD) (VDD) (P7) (VPP) NMOS (N7)가
 (E, F) 가 (E, F) (0.5VPP+0.5VDD)
 (T8) (VDD) (P8)가 (C5) (D, E)
 (2.5VDD) NMOS (34-2) (VDD) (P8) (VPP)
 (0.25VPP+1.5VDD) (N6)가 (D, F) 가 (D, F)

(T9) (0.25VPP+2.5VDD) (VDD) (P9)가 (C7) (F)가
P) , NMOS (N8)가 (F) (VDD) (P9) (VPP) 가 (VP
(VPP) .
5 6 (VDD) (F) (0.25VPP+2.5VDD)
가 (2.5VDD) (VPP) 5 , 3
(0.25VPP+2.5VDD)
7 5 (32-4) 가
NMOS (N9) (F) (32-4) 가 (C, D, E)
7 (F)가
8 7 , 8 7
8 (P6, P7, P8, P9) 6 (30) (P6)가
(T6) , ' ' 가 (C, D, E, F)
(32-1 ~ 32-3, 32-4)
(T7) (VDD) (P7)가 (C4) (C)가
(2VDD) , NMOS (34-1) (VDD) (P7) (VPP)
VDD) (N5)가 (C, D) 가 (C, D) (1.5
(VDD) (C6) (E)가 (2VDD) , NMOS (N7)가 (34-3)
(E, F) 가 (P7) (VPP) (E, F) (1.5VDD)
(T8) (VDD) (P8)가 (C5) (D, E)
(2.5VDD) , NMOS (34-2) (VDD) (P8) (VPP)
(2VDD) (N6)가 (D, F) 가 (D, F)
(T9) (VDD) (P9)가 (C7) (F)가
(3VDD) , NMOS (N8)가 (F) (VDD) (P9) (VPP) 가 (VPP) (V
PP) (3.0VDD)
7 (VDD) 8 (F) , 3
(VPP)
5 7 (VDD) (ACT) 가 3 (VPP)
3 6 8 (T9) (VPP)
3 9 (42-1, 42-2, 42-3), (C8 ~ C11), (44-1 ~ 44-4), (40), (INV),
(N10 ~ N14) , NMOS
9 (40) (ACT) 가 (ACT) (P10)
, ' ' (ACT) 가 (ACT) (P10)
(INV) (P10) (P10B) (42-3) (P11, P12)
(P10B) (G, I) (N14) (J) (VDD-VT) (42-1, 42-2)
(H) (J) , NMOS (VDD) (J) (C8) (P12)
(P10) (J) (H) (VDD) (J) (C8) (P10) (G, H)
VPP) . NMOS (N10) (44-1) (VDD) (P10) (G, H)
(VDD) (C9) (P11) (44-1) (H) (P10) (44-2)
) (VDD) (P11) (VPP) . NMOS (N11) (44-2) (44-2)
(I) (H, J) (C10) (P10) (P10)
NMOS (N12) (44-3) (VDD) (P10) (VPP)
(C11) (P12) (44-3) (J) (I, J)
(P12) (VPP) . NMOS (N13) (44-4) (VDD)
(P12) (VPP) (J) (44-4) (44-4)

10 9 (J) (VPP) 10 9
 (ACT) 가 (40)가 (ACT) (P10)
 (ACT) (P10B) (T11) (VDD)
 (P11) (T12) (VDD) (P12) (P10)
 (C8, C10) (T10) (VDD) (P10)
 44-1, 44-3) (VDD) (G, I) (2VDD) (NMOS) (N10,
 N12) (VPP) (P10) (VPP) (I, J)
 (G, H) (1.5VDD) (I, J) (0.5VDD+0.5VPP)
 (T11) (VDD) (P11) (C9)가 (H)
 (2.5VDD) (NMOS) (N11) (VDD) (P11) (VPP)
 (H, J) (1.5VDD + 0.25VPP) (H, J)
 (T12) (VDD) (C11)가 (J)
 (2.5VDD + 0.25VPP) (NMOS) (N13) (44-4) (VDD) (P12) (V
 PP) (J)가 (VPP) (J) (VP
 P) (J)
 9 가 (VDD) (2.5VDD + 0.25VPP)
 , 9 (ACT) 가 1
 3 (ACT) 가 (T12) 2
 , 9 10 (ACT) 가
 2 (T11) (T12) 5 7

(57)

1. 1 가 2, 3, 4 2, 3, 4
 ; 1, 2, 3 1, 2, 3 ; 3, 4
 2 1, 3 1, 2
 1, 2 ; 2, 4 3
 ; 4 4 ; 4
 4 4 , 4 4
2. 1 1 ; 1 ;
 2 1 ;
 2 1 ;
 1 1, 2 1NMOS
3. 1 , 2

| | | | | | | | | |
|-----|------------|------|------------|---|------------|---|---------|-------|
| | 2 | | 1 | 2 | 2 | ; | | |
| | 2 | | | | | | | |
| | 2 | | | | | | 3, 4 | 2NMOS |
| | 4. | | | | | | | |
| 1 | , | 3 | | | | | | |
| | 3 | | 2 | | 3 | ; | | |
| | 3 | | | 3 | | ; | | |
| | 3 | | | | | | 2, 4 | 3NMOS |
| | 5. | | | | | | | |
| 1 | , | 4 | | | | | | |
| | 4 | | 4 | | 4 | ; | | |
| | 4 | | | 4 | | ; | | |
| | 4 | | | | | | 4 | 4N |
| MOS | 6. | | | | | | | |
| 1 | , | | 1 | 4 | 2 | 가 | 5NMOS | |
| | 7. | | | | | | | |
| 1 | 1 | | | 가 | 2, 3, 4 | | 2, 3, 4 | |
| | | | | | | | | |
| | 1 | | 1, 2, 3, 4 | | 1, 2, 3, 4 | | | |
| | 2 | | 1, 3 | | 1, 2 | | 3, 4 | |
| | 3 | 1, 2 | | | | | | 3 |
| | | | 2 | | 2, 4 | | | |
| | 4 | | | | | | | 4 |
| | 4 | | 4 | | 4 | | | |
| | 8. | | | | | | | |
| 7 | , | 1 | | | | | | |
| | 2 | | 1 | | 1 | ; | | |
| | 2 | | | 1 | | ; | | |
| | 1 | | | | | | 1, 2 | 1NMOS |
| | 9. | | | | | | | |
| 7 | , | 2 | | | | | | |
| | 2 | | 1 | | 2 | ; | | |
| | 2 | | | 2 | | ; | | |
| | 2 | | | | | | 3, 4 | 2NMOS |
| | 10. | | | | | | | |
| 7 | , | 3 | | | | | | |
| | 3 | | 2 | | 3 | ; | | |
| | 3 | | | 3 | | ; | | |
| | 3 | | | | | | 2, 4 | 3NMOS |
| | 11. | | | | | | | |
| 7 | , | 4 | | | | | | |
| | 4 | | 4 | | 4 | ; | | |
| | 4 | | | 4 | | ; | | |
| | 4 | | | | | | 4 | 4N |
| MOS | 12. | | | | | | | |
| 1 | 1 | | | 가 | 2, 3 | | 2, 3 | |
| | | | | | | | | |

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

13.

12 , 1 1 1 ;
 1 1 1 ;
 1 1, 2 1NMOS

14.

12 , 2 1 2 ;
 1 1 2 ;
 2 2 ; 3, 4 2NMOS

15.

12 , 3 2 3 ;
 2 2 ; 3 ;
 2 3 ; 2, 4 3NMOS

16.

12 , 4 4 4 ;
 3 3 4 ;
 3 4 4 4N

MOS

17.

12 , 1 4 2 가 5NMOS

18.

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

19.

18 , 1 1 1 ;
 2 1 1 ; 2
 2 1 1 ;
 1 1 1 ;
 2 1 1 ;
 2 3 2 ;
 2 2 ; 3 4
 2 2 2 2

20.

18 3 , 2 2 3 ;
3 3 ;
3 2 4
3

21.

18 3
4 , 4 ;
4 4 ;
4 4 ;
4 4

22.

, ; ;
가 ;

23.

22 ,

24.

23 ,

25.

22 ,

26.

25 ,

27.

1 가 1 1, 2, 3 ; 1,
2 가 3, 4 2 2 1, 3 ; 2,
4 가 3 3 3 1, 2 ; 4
가 4 3 4 4 ; 4
4 4

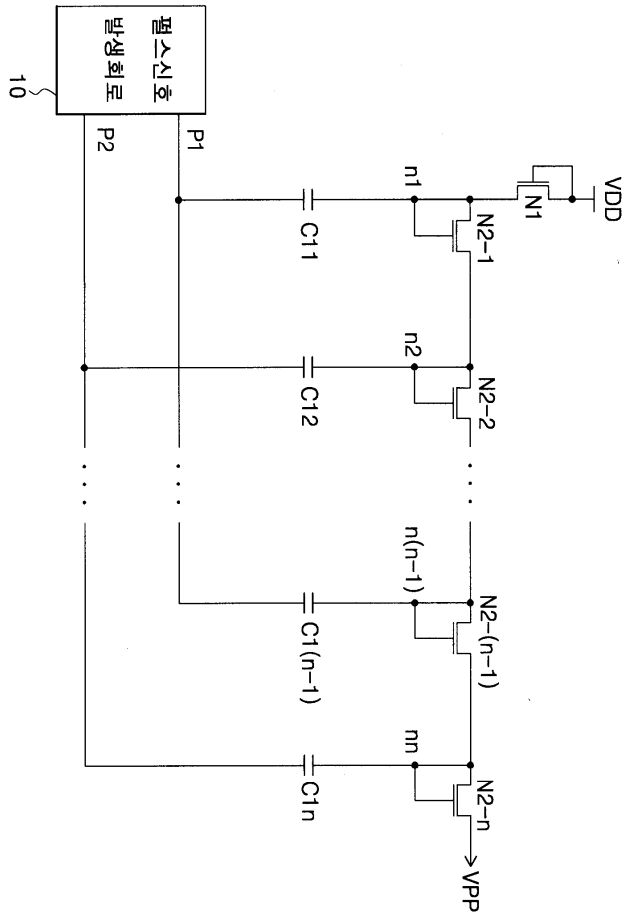
28.

27 ,

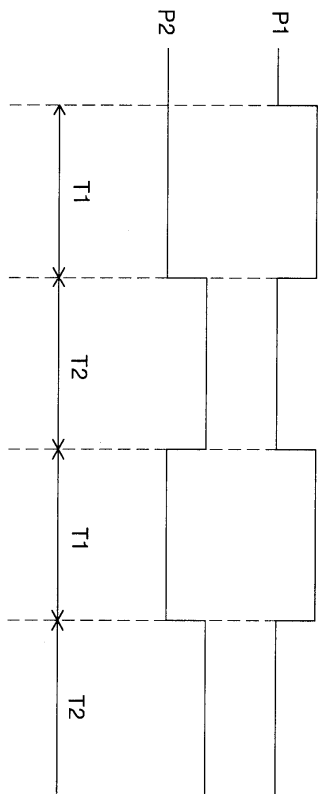
29.

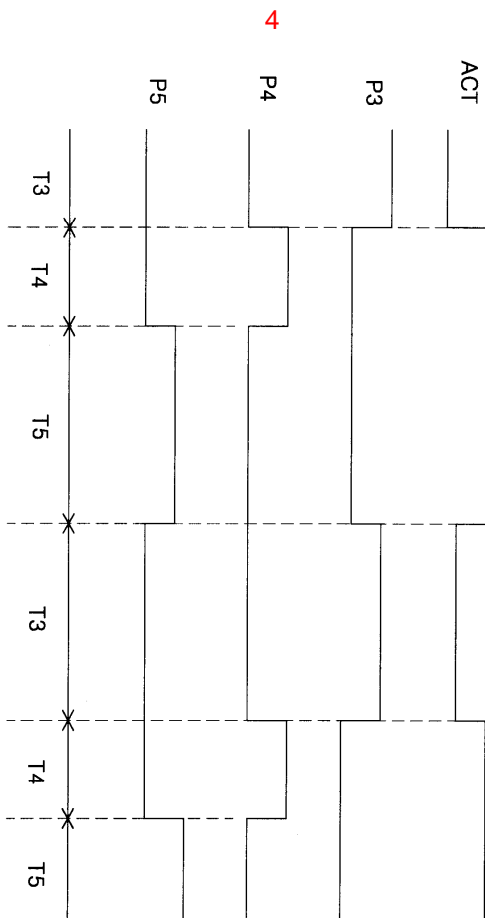
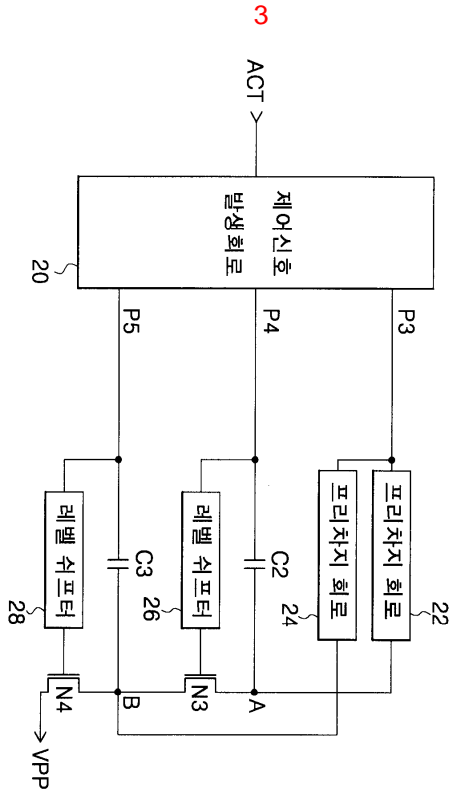
1 가 1 1, 3 , 1, 2 3, 4
1, 2, 3 ;
1 가 1, 2 2 2, 4
3 ;
1 가 3 1, 3 ; 1 2 ; 2
3 ; 3 4 4 4

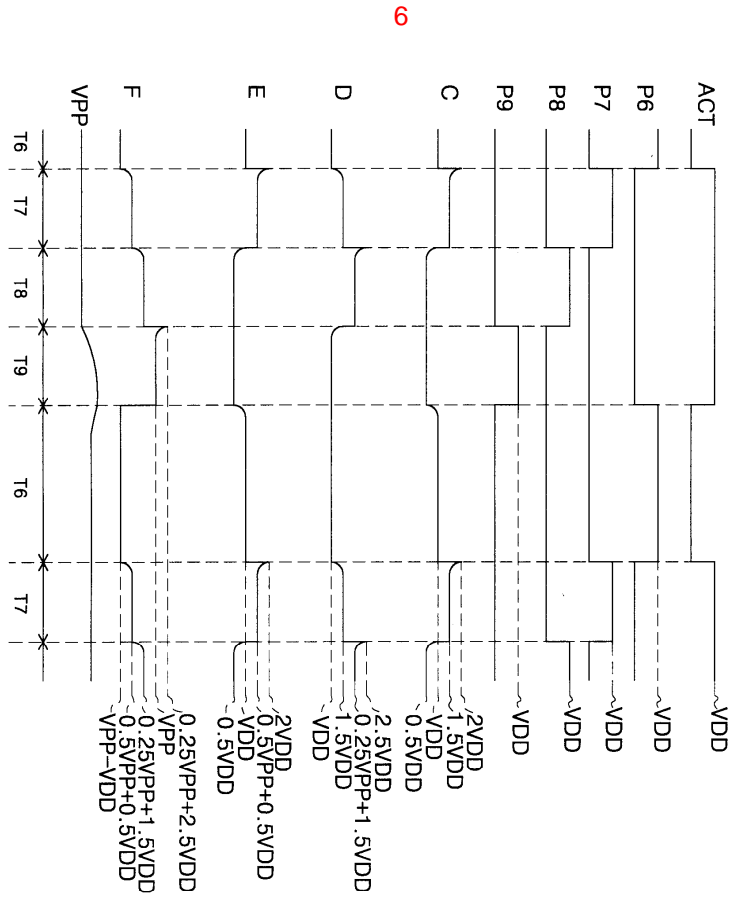
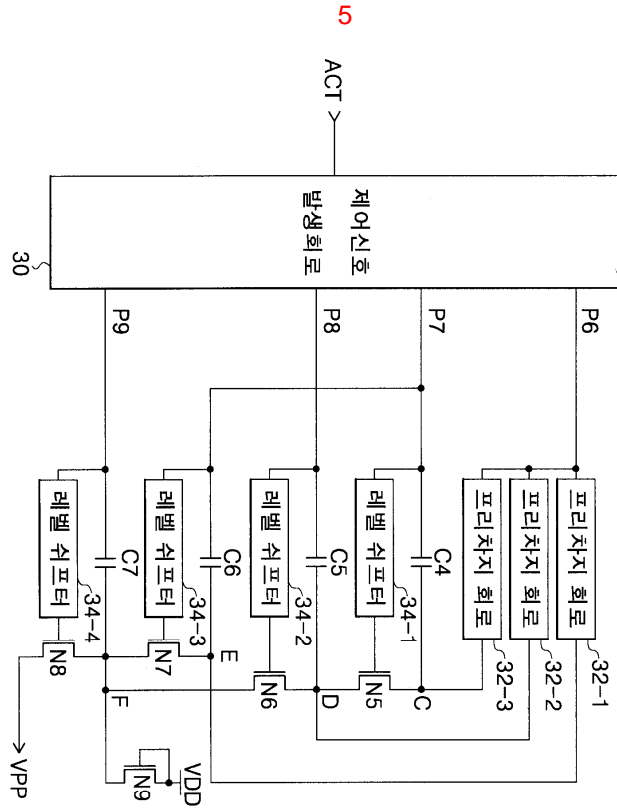
1



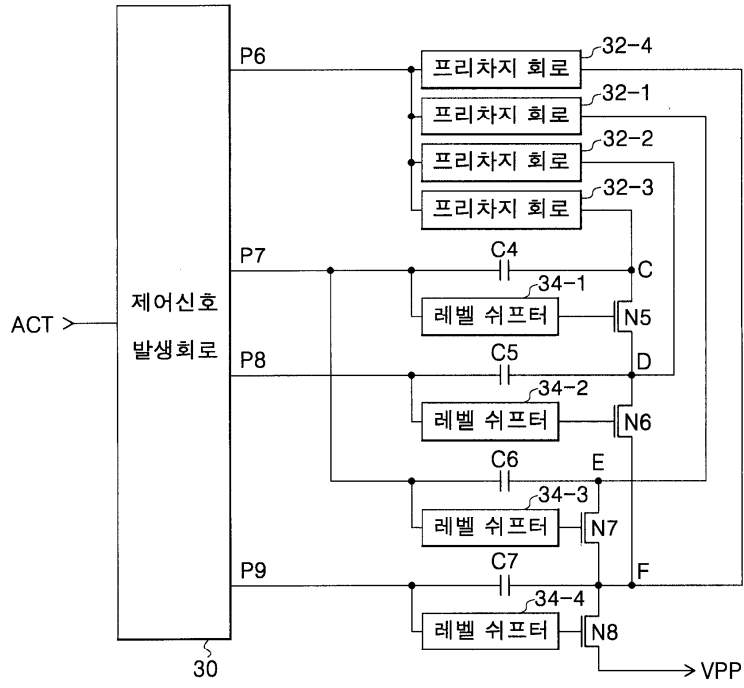
2



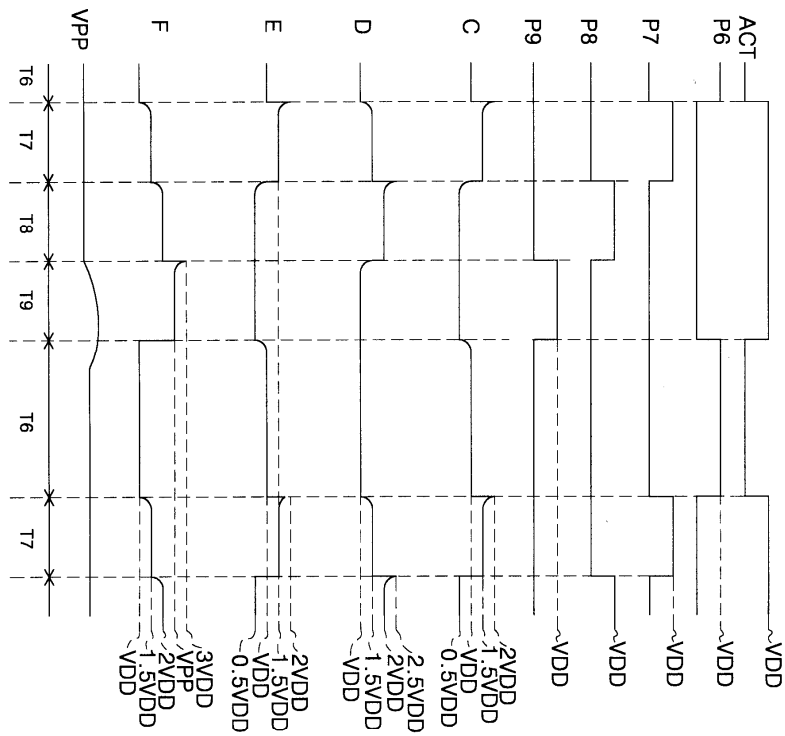




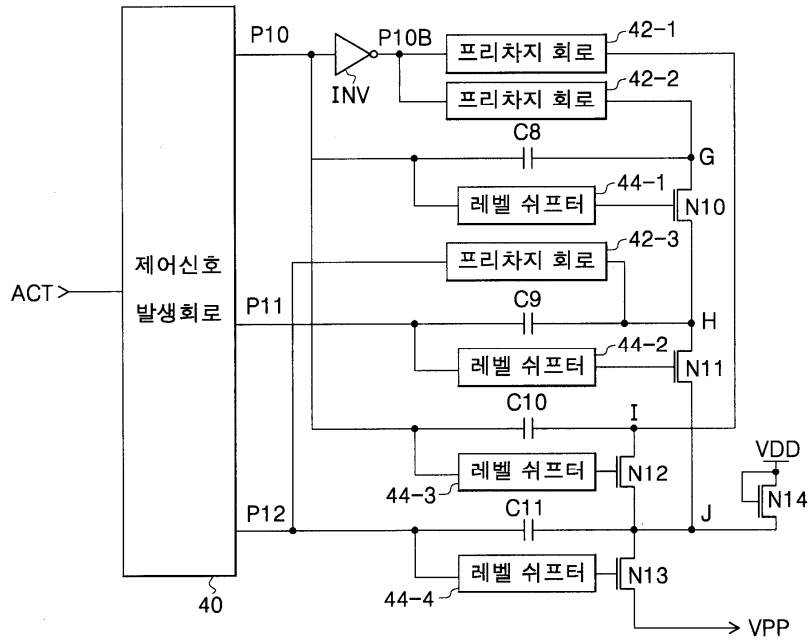
7



8



9



10

