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2004 10 12

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(71) 가 가 2- 4-1  
100-6334

(72) 2 4-1가 가  
2 4-1가 가  
가 2 4-1가 가  
2 4-1가 가  
1 5-1 가 가  
1 5-1 가 가  
1 5-1 가 가

(74)

:

(54)

MM00 , MG0 8V , SLO 5V ,  
CG0 1.5V 가 , (9) 0, (15) Hi ,  
(14) Lo 가 , (12) 1μA 가 ,  
BL0 1μA , MM00 .

2

, , , , , ,

1

2 1

3 2

4 1 / /

5 1

6 1 가 가

7 1 가 가

8 7

9

10 1 , ,

11 10

12 10 CG

< >

1 : ( )

1a : ( )

2 :

3 :

4 :

5 :

6 :

7 :

8 :

9 :

10 :

11 :

11a : ( )

12 : ( )

13 :

14 :

15 :

16 : ( )

17 :

18 :

18a, 18b :

19, 20 :

21 : CPU( )

22 : CPG

23 : DMAC

24 :

25 : SCI

26 : ROM

27 : BSC

28 : RAM

100 :

101 :

102 :

103 :

104 :

105 :

MM : ( )

ZM : MOS

CM : ( )

MC : ( )

IOP1 IOP9 :

BL :

CG :

MG :

SL :

LBL :

MBL :

ductor) , , MONOS(Metal Oxide Nitride Oxide Semico

가

가 MONOS

, MONOS

( , 0.77 V )  $10\mu A$

가 ( ( 1 ) ).  
0V

( 2 ) .

, AG-AND(Assist Gate AND) 2

4V

, SSI(Source Side channel hot electron Injection) , 1

MOS

< 1 >

2001-148434

< 2 >

2002-197876

가

MONOS ( )  
 MOS 가 .  
 MOS Lg MOS ,  
 가 .

가 , 가 .

가 ,  
 , 1 , , .

가 ( )  
 가 ,

가 ,

(1) , -

(2) , -



BL1 BLn (9) 가 .

(9) , (15) (12), (13), (14), MOS(Met

al Oxide Semiconductor) . (12), (13) , N

BL0 , (12), (13) MM00 MMn0 , BL0 .

MM00 MMn0 (102)( 4) (100)( 4) , CG0, MG0 , (103)( 4) , SL0 .

) (12) , (14) (11a)가 , (12) , (12) 가

, (13) (15) 가 , (13)

(13) , ON , OFF가 ,

(15) , (14) 가 , (14)

, (12)

3a , (12) (12) ,

, (12) , , 2

, 3b , (12) (12) , 3b

, (12) , 2 ,

, 3c - - - 3c ,

, (12) , - -

, (16) (11a) , ( ) (16) (17) , (12) 가 (16) ,

, MM , / / 4 .

1 MM , 4 , MOS MOS 2 MM , (103), (104)

(103)- (104) (105) (102)가 , (101), (100)가 ,

(101) , , .

MM (103) 5V , (105) 0V 4a 가 , , (102), (100) 8V , (104) , (104) )- (103) 1 $\mu$ A 가 가 가 , , (101) . 가 .

MM (102) 1.5V 가 , (103), (104) , (105) 0V (100) MM 가 (100) 10V 가 , (101) .

4b , (100) 8V 가 , (100) 가 .

MM (104) 1.0V , (100), (103) , (105) 0V (102) 1.5V , (100) 4c , (100) 0V 가 , (100) 가 .

(1) .

MM00 (9) .

MG0 , 8V , SL0 5V , CG0 1.5V 가 .

Lo 가 (9) , 0, (15) Hi , (14) BL0 1  $\mu$ A (12) , 1 $\mu$ A 가 , MM00 .

MM01 , 8V , 5V , 1.5V 가 가 , MM01 (9) , 1 (15) Lo , (14) Hi 가 .

Hi 01 MOS , 1.5V 가 ON , (9) , BL1 1.5V , MM 가 , MMn0, MMn1 , (100), (103), (102) .

(12) . , 가 , 4 .

5 , (1) .

5 , CG0, MG0, SL0, BL0, BL1 .

SL0 5V , MM00 BL0, BL1 1.5V , 가 , CG0 1.5V MG0 가 8V 가 , (12) .

BL0, BL1 , MG0 8V 가 1.5V 가 .

CG0, SL0, MG0 BL0, MM00 (9)

2, 5, MM01, MM00, MM01 (9), BL

BL1 가

MMn0, MMn1 CGn, SLn, MGn

OV

(9) 5, MM00 (9), BL0, BL1

MM01 (9)

6, (1) (10)가 가

(9), (11a) 2

MM( 4), (100), (103), CG0 CGn, MG0 MGn, (102), SL0 SLn

MM MBL (104), LBL, MOS ZM

Z0 MBL, (9)가, MOS ZM

5V, MM00, CG0, (15), 1.5V Hi, MG0, Z0, 1.5V, 8V, (14), SL0, Lo 가

(9)

(12), MM00, 1μA 가, MBL0, 1μA

Lo 가, MM01, (100) 8V, (103) 5V, (102) 1.5V (15)

MM01 (14) Hi 가 (9)

Hi MM01, MOS, 1.5V 가 ON, (9), MBL1, 1.5V

MMn0, MMn1 (100), (103), (102) 가

가, 6, SL0, 5V, Z, 1.5V 가, 1.5V 가, 5, LBL, 1.5V

7, (1) (10)가 가

MM( 4), (100), (103), CG0 CGn, MG0 MGn, (102), SL0 SLn

M1, MM MBL (104), LBL, MOS ZM0, Z

LBL, CM ( ) CM (18)가 (18), (17)

(18), 2 (18a), P MOS (18a, 18b)가 (18b) N MOS

(12) N MOS NMOS (18)

CM P MOS PMOS

(18a), (18b) (18a, 18b) (11a) (17)가 CM 가

MBL, MOS ZM0, ZM1 LBL 2 LBL

MBL (9)가 LBL

MOS ZM0, ZM1 Z0, Z1

(9), 2 가 (12), (13)

(15), 2 (19, 20)가 (11a)

(19, 20), N MOS (19) (12)

(19) (20) 가 (20)

(VSS)가

(19) ON/OFF (15) 가 (15)

ON/OFF (20) 가

MM00 CG0 1.5V MOS Z0 MG0 1.5V 가 8V SL0 5V

(9) n1 Lo 가 0, (15) Hi (19, 20)가 ON

(12), 1μA 가 MBL0, 1μA

MM00

5V 가 MM01 (100) 8V (103) 5V (102) 1.

MBL0 LBL1 MOS ZM1

MM01

LBL1, 1.5V CM CM1 LBL1

가 LBL CM

P MOS

CM LBL, 0.5μA

2, CM LBL (9) BL 1.5V 가 7

(9) 1.5V (9) 1.5V

(9) (20)가 OFF, n1, (15) (9) Lo MBL1, (19),  
 (9) 1.5V MMn0, M  
 Mn1, MMn2, MMn3, (100), (103), (102) 가  
 7 가 CM 1 $\mu$ A, (9) 0.5 $\mu$ A  
 (12)) 1.5 $\mu$ A 가  
 CM 가 CM  
 OS 7, (12) N MOS, CM P M  
 (11a) CM  
 (19, 20)  
 7 MM00 8  
 8 Z0, LBL0, LBL1, LBL2, LBL3, CG0, MBL0, MBL1 MG0, SL0, MOS  
 가, CG0 1.5V 가, SL0 5V, MOS Z0 1.5V  
 가, CM ON, LBL0, LBL1, LBL2, LBL3 1.5V  
 MG0 8V 가  
 LBL0, LBL1, LBL2, LBL3, MG0 8V 가 1.5V 가  
 CG0, SL0, MG0 MBL0, MM00 (9)  
 7 MM02, MM02  
 8 MBL1, MM00, MM02 (9), MBL  
 가  
 MMn0, MMn1, MMn2, MMn3 CGn, SLn,  
 MGn 0V  
 (9) 8 MM00 (9),  
 MM02 (9), MBL0, MBL1  
 9, ( ) MC  
 MC, (1)(1) CPU( )  
 (1a) LSI CPU( ) (21), CPG(22), DMAC(23),  
 (24), SCI(25), ROM(26), BSC(27), RAM(28), IOP1 IOP9  
 CPU(Central Processing Unit)(21), ROM(26) MC

ROM(Read Only Memory)(26) , CPU(21) . RAM(Random Access Memory)(28) , CPU(21) , CPU(21) .

DMAC(Direct Memory Access Controller)(23) , ROM(26), RAM(28)

SCI(Serial Communication Interface)(25) , (24) ,

CPG(Clock Pulse Generator)(22) , IOP1 IOP9 ,

IOP1 IOP5가 MC , CPU(21), (1a), ROM(26), RAM(28), DMAC(23), IAB, IDB .

(24) SCI(25) IOP1 IOP9 , PAB, PDB

BSC(27) , IAB, IDB PAB, PDB

MM (12) , MM 가 가 , (1, 1a)

(1) (10)가, 2, 6, 7

10, 11 , 2 MM00 MMn0 (102) 가 CG0 1.2V 10 가 , 2 (100)

1.2V CG 가 1.5V 가 , (100) (100)

CG 1.2V 가 , (100) 가

12 CG , CG 가 CG 가 1.5V 1.2V

, 1.2V CG 1.5V 가 ,

1.5V 1.2V 가 ,

가 가 ,

(1)

(2) , (1)

(3) , (1), (2)

(57)

1.

2.

3.

2

가

가,

4.

2

3

가

, 1

가

5.

1

가

가



, 1 가 , , .

9 13. , 가 , , , , 가 , , .

9 14. 13 , 가 , , , , 가 , , .

9 15. 14 , 2 , .

15 16. , , , .

17. , , , .

1 가 , 2 가 , , .

1 , 2 3 3 가 4 .

17 18. , 가 1 1 3 , 4 1 1 .

18 19. , 1 3 4 .

20.

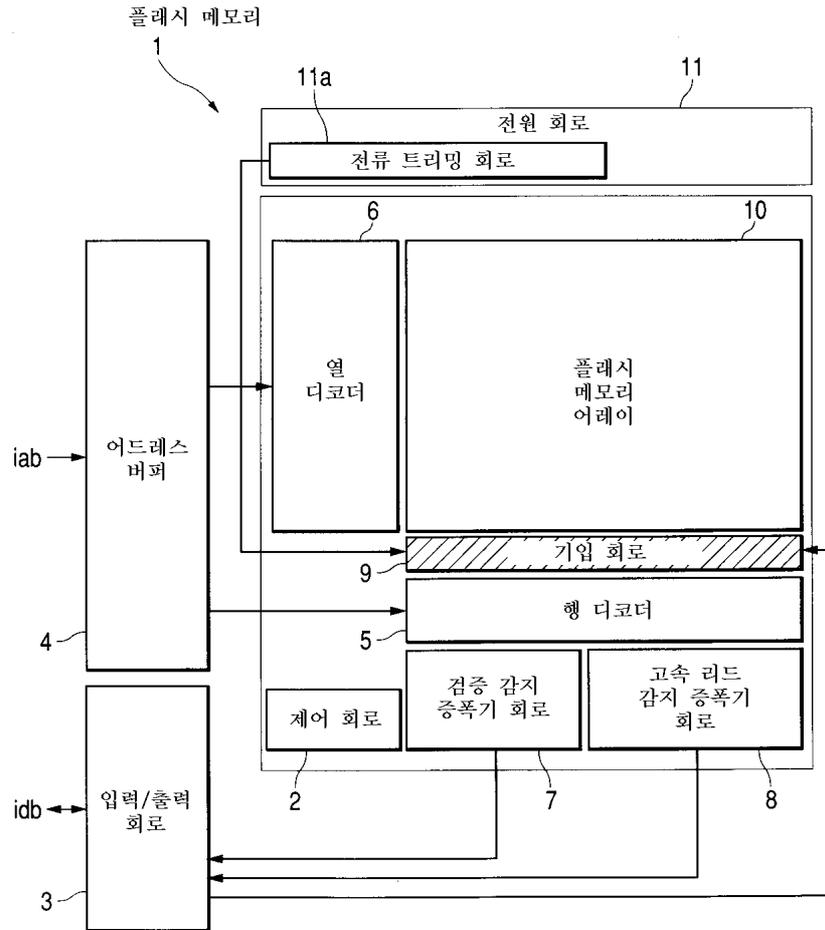
18

1

3

4

1

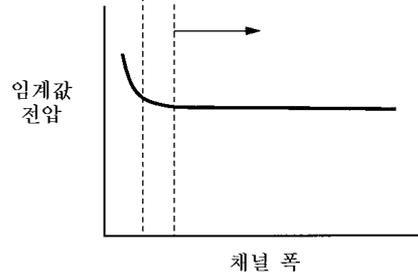




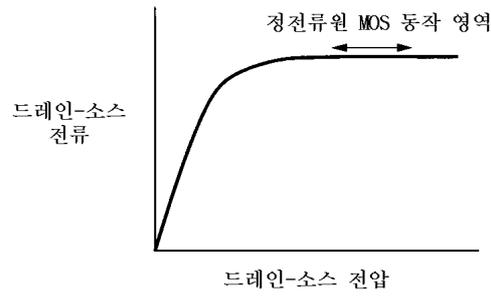
3b

메모리셀 트랜지스터의  
채널 폭

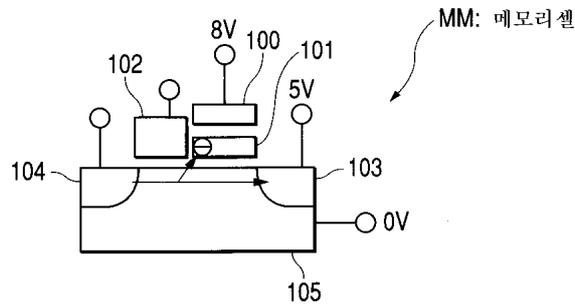
정전류원 MOS 트랜지스터의  
채널 폭



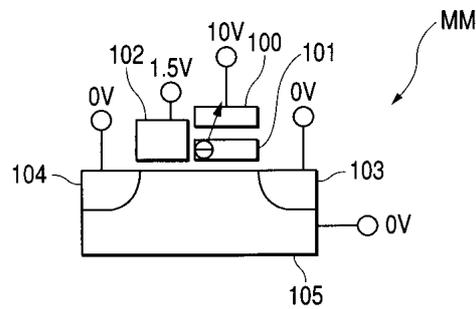
3c



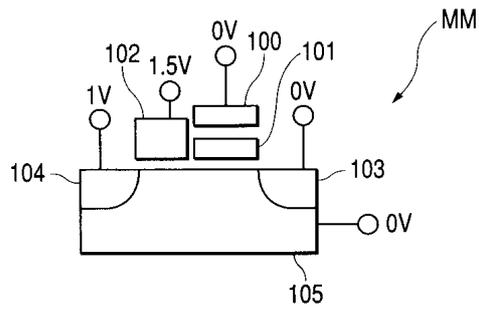
4a



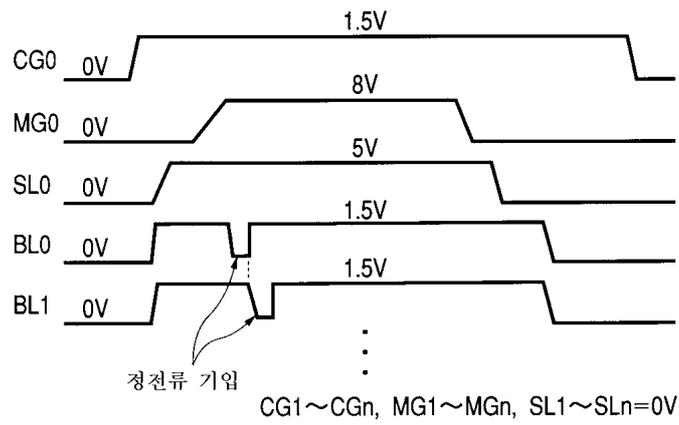
4b



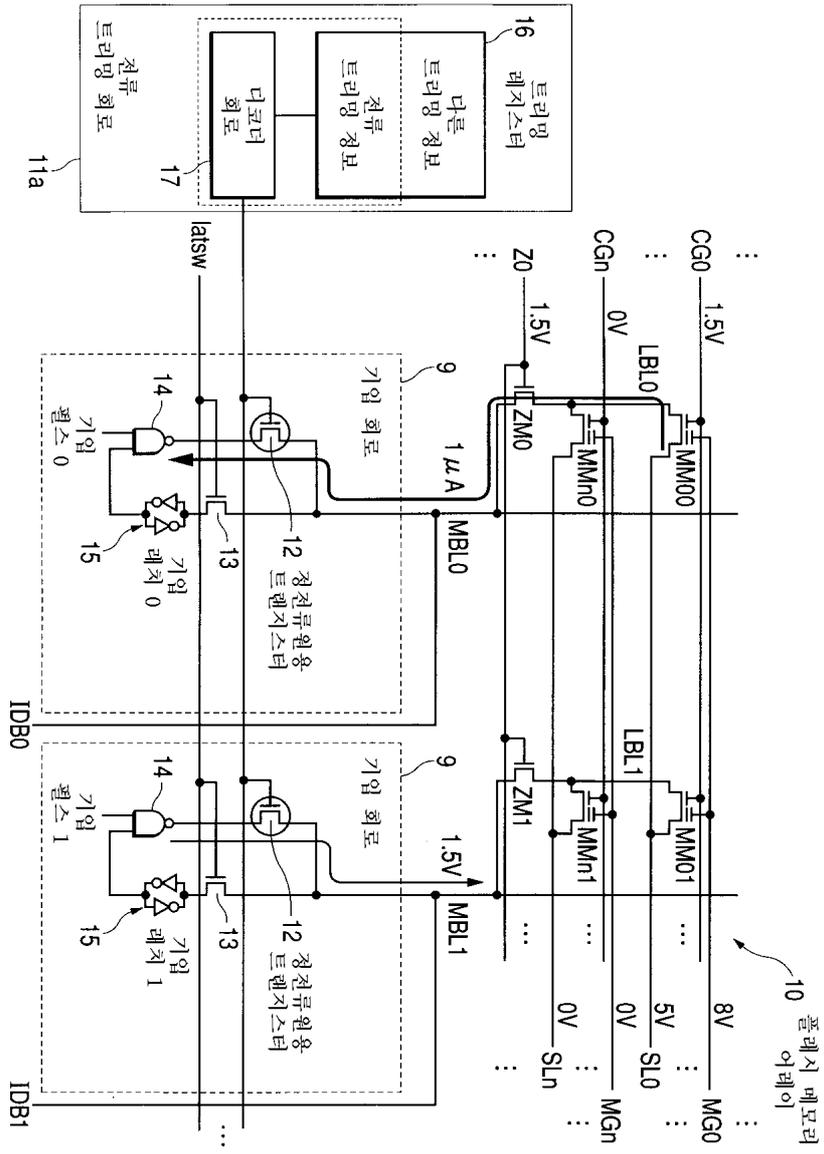
4c



5

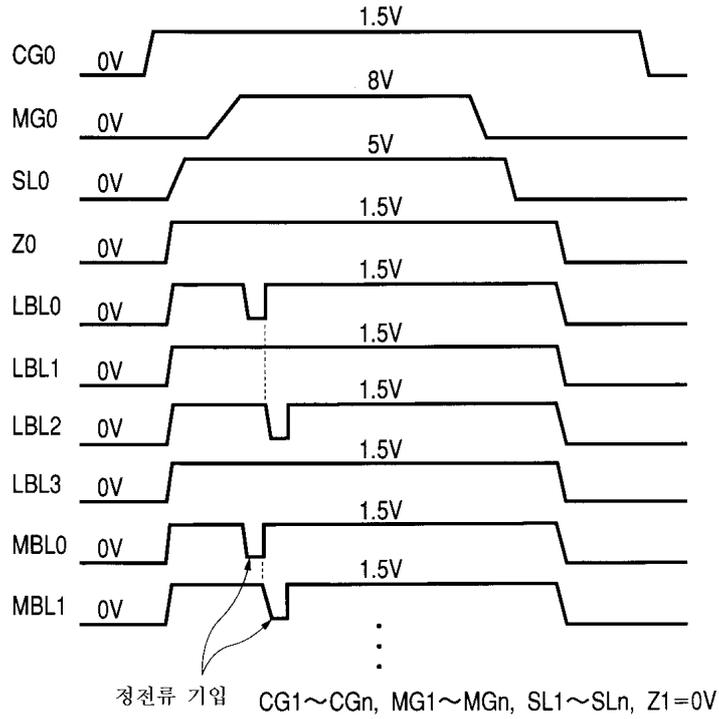


9

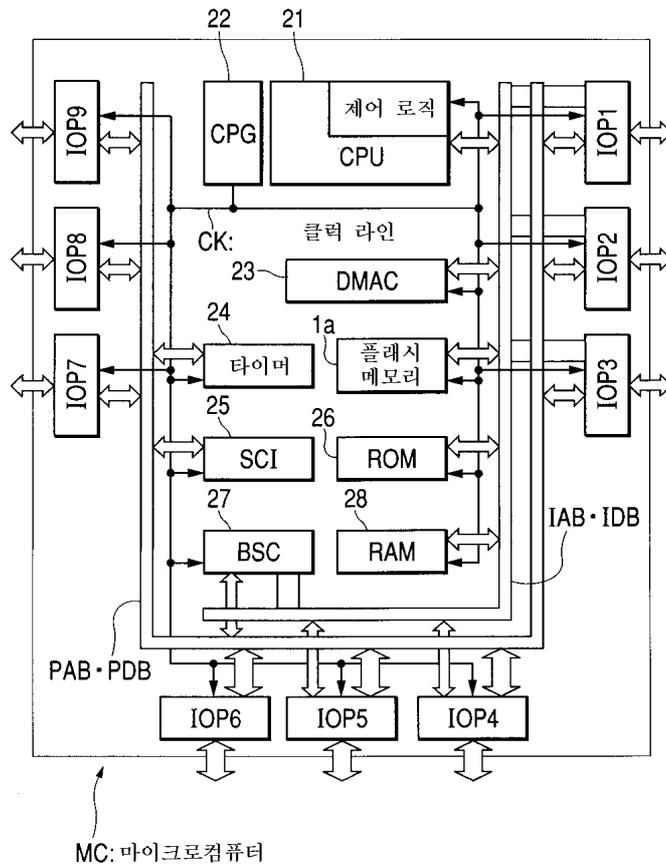




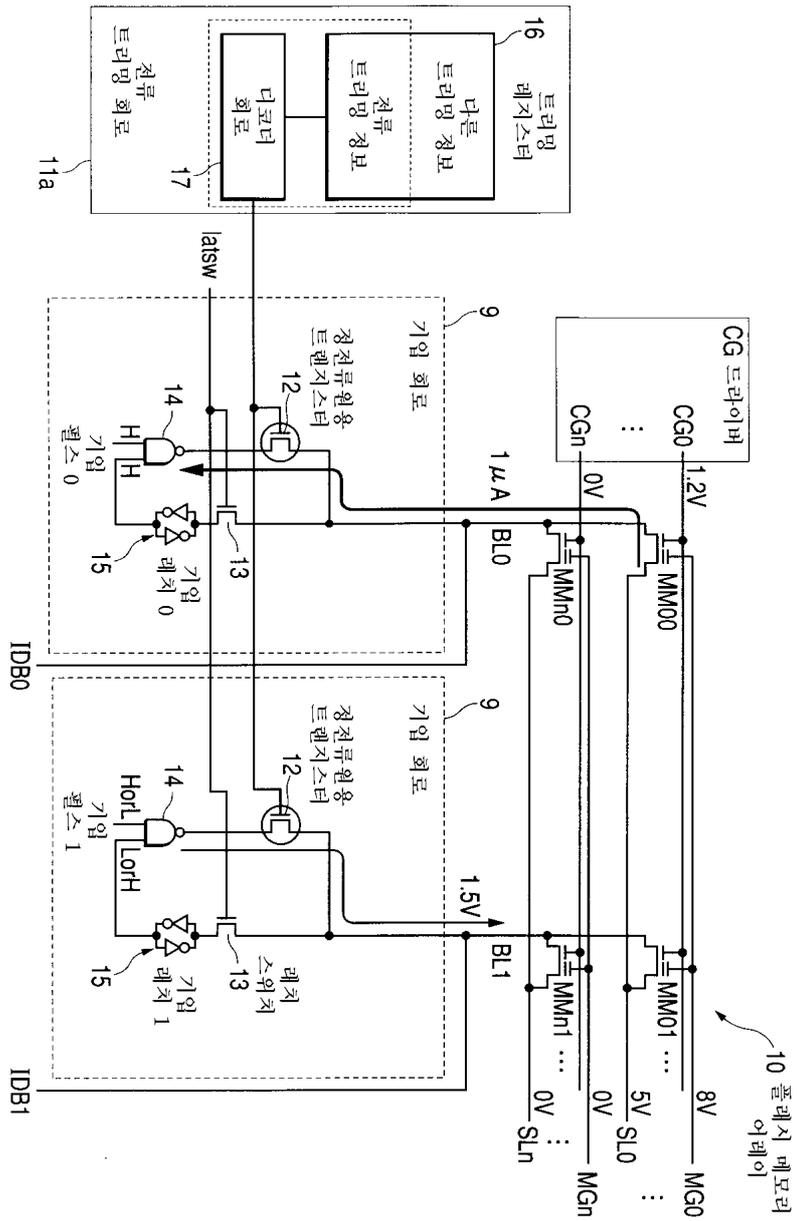
8



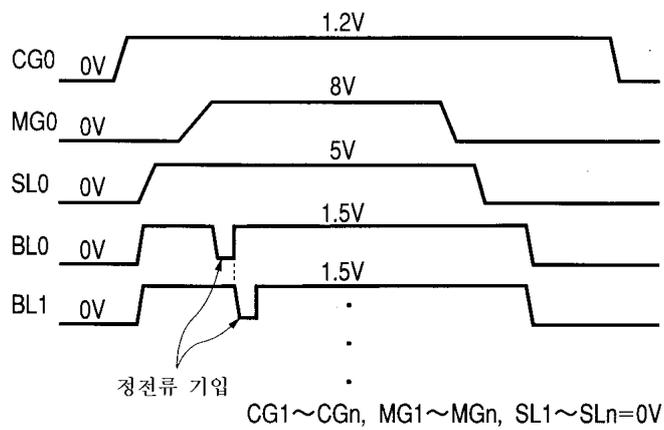
9



10



11



12

