

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. <sup>6</sup>  
G11C 29/00

(45)  
(11)  
(24)

2001 09 03  
10 - 0300144  
2001 06 14

(21) 10 - 1997 - 0045839  
(22) 1997 09 04

(65) 1998 - 0079348  
(43) 1998 11 25

(30) 97 - 066973 1997 03 19 (JP)

(73) 가           가

$$2 \quad 2 \quad 3$$

(72) 2 - 2 - 3                      가                      가

2 - 2 - 3                      가            가

(74)

• •

(54)

1	1	,
2	2	,
3	3	,
4	4	,
5	5	,
6	6	,
7	MT - CMOS	,
8		.

5 : p MOSFET ( ) 6 : n MOSFET ( )

11 : 12 :

14, 15 : p MOSFET ( )

16, 17 : n MOSFET ( )

20 :

21, 21<sub>1</sub> 21<sub>n</sub> : ( )

22, 22<sub>1</sub> 22<sub>n</sub> : ( )

23, 24, 23<sub>1</sub> 23<sub>n</sub>, 24<sub>1</sub> 24<sub>n</sub> : ( )

48 : ( 1 , 2 )

49 : ( 1 , 2 )

58<sub>1</sub> 58<sub>n</sub>, 59<sub>1</sub> 59<sub>n</sub> :

(LSI)

가 .

, LSI

MOSFET

가

MOSFET

가

가

7 , 7 - 212218 MT - CMOS(Multi - thresho  
 Id CMOS) (1), (2) (5) p MOSFET , (3), (4) (6)  
 n MOSFET . p MOSFET(1), (2) p MOSFET(5)  
 , n MOSFET(3), (4) n MOSFET(6)  
 ( , 「 」 ). , MOSFET(1)  
 (4)가 2 NAND (11) , p MOSFET(5) (12) 가  
 (9) , n MOSFET(6) 가 (10)  
 (13) , CSB1 ,  
 CS1 .

2 NAND (11) , CS1  
 CSB1 (9) . p MOSFET(5) n MOSFET(6) 가  
 , 가 (12) V<sub>DD</sub> MOSFET(5) , 가 (10) (11) NAND , MOS  
 13) V<sub>GND</sub> (11) , (12) V<sub>DD</sub> 가  
 FET(1) (4) ( ) , (12) V<sub>DD</sub> 가  
 가 .

(11)가 CS1 , CSB1  
 . , p MOSFET(5) n MOSFET(6) , 가 (9) 가  
 (10) (12) (13) . , p MOSFET(5) n MOSFET  
 (6) ( ) MOSFET(1) (4) ,  
 .

, MOSFET

가 .

(11)가

, MOSFET(1)

(4) MOSFET(5), (6)

7 (11)가 2 NAND

, LSI

가

, 2 NAND

가

, 8 2

. , (14), (15) p MOSFET, (16), (17) n MOSFET , ( )  
 ) . (5) p MOSFET, (6) n MOSFET , ( )  
 . MOSFET(14) (17) (20)가 , (18), (19)가 .

CS1 CSB1 (20)가  
 , p MOSFET (14), (15) n MOSFET(16),(17)  
 , (18), (19) .

, CS1 CSB1 가 , MOSFET  
 (14) (17) MOSFET(5), (6) , (18), (  
 19) (18)가 (19)가  
 , MOSFET(14) (17) p MOSFET(15) n MOSFET(16)  
 , p MOSFET(15) n MOSFET(16) 2  
 (19)가 (18)가  
 (18), (19) ,  
 가 . 가

1 , , 1  
 1 가

2

( 1)

1 1 (1), (2)  
 p MOSFET, (5) p MOSFET, (3), (4) n MOSFET, (6) n MOSFET, (23), (24)  
 . , p MOSFET(1), (2) p MOSFET(5)  
 , n MOSFET(3), (4) n MOSFET(6)  
 ( , 「 」 ). , MOSF

ET(1) (4)가, 2 NAND (11) , MOSFET(5), (6)  
 , p MOSFET(5) (12) 가 (9) ,  
 CSB1 , n MOSFET(6) 가 (10) (13) ,  
 CS1 .

, (14), (15) p MOSFET, (16), (17) n MOSFET , (20) .  
 , (21), (22) MOSFET(14) (17) (23), (24)가  
 . MOSFET(14) (17) , (18), (19)가  
 , p MOSFET(14), (15) VC1 (21) , n MOSFET(16), (17) VD1 (22)

(11) CS1 , CSB1  
 , p MOSFET(5) n MOSFET(6) , 가  
 (9) (12)  $V_{DD}$  , 가 (10) (13)  $V_{GND}$   
 , 2 NAND (11) NAND , MOSFE  
 T(1) (4) ( ) , (12)  
 가 .

(11) CS1 , CSB1  
 , p MOSFET(5) n MOSFET(6) , 가 (9) 가  
 (10) (12) (13) . , p MOSFET(5) n MOS  
 FET(6) ( ) MOSFET(1) (4) ,

, (20) CS2가 ,  
 (21) p MOSFET(14), (15) VC1  $V_{DD}$  (21) p MOSFET(14), (15) n  
 22) n MOSFET(16), (17) VD1  $V_{GND}$  ,  
 (20) . (20) p MOSFET(14), (15) n  
 MOSFET(16), (17) , (18), (19)  
 . , (20)가 CS2가 ,  
 (21) VC1  $V_{DD}$  , (22) VD1  $V_{GND}$   
 , p MOSFET(14), (15) VC1 (12)  
 , n MOSFET(16), (17) VD1  
 (12) 가 , (20) (12)  
 (13) .

, 1 , (20) MOSFET  
 ,  
 가 . , (11) (20) MOSFET  
 . 가 1  
 CS1 CS2 , 가  
 가 가 .

( 2)

2 2 ,  
 (20) 1 ,  
 2 (11)가 MOSFET(5), (6) MOSF  
 ET(1) (4)

2 (11) CS1  $V_{GND}$   
 CSB1  $V_{DD}$  MOSFET  
 MOSFET  
 MOSFET(5), (6) 1 가

( 3)

3 3 (L  
 SI) , (11<sub>1</sub>) (11<sub>m</sub>)  
 CSB1<sub>1</sub> CSB1<sub>m</sub> p MOSFET(5<sub>1</sub>) (5<sub>m</sub>) CS1<sub>1</sub> CS1<sub>m</sub> n MOSFET(6  
 1) (6<sub>m</sub>) , (20<sub>1</sub>) (20<sub>n</sub>) CS2<sub>1</sub> CS2<sub>n</sub>  
 (21<sub>1</sub>) (21<sub>n</sub>), (22<sub>1</sub>) (22<sub>n</sub>) (23<sub>1</sub>) (23<sub>n</sub>), (24<sub>1</sub>) (24<sub>n</sub>)  
 2 2

(11<sub>1</sub>) (11<sub>m</sub>) , p MOSFET(5<sub>1</sub>) (5<sub>m</sub>) CSB1<sub>1</sub>  
 CSB1<sub>m</sub> 2 p MOSFET(5) , n MOSFET(6<sub>1</sub>) (6<sub>m</sub>)  
 CS1<sub>1</sub> CS1<sub>m</sub> 2 n MOSFET 가 (21<sub>1</sub>) (21<sub>n</sub>) 1 (21) 가 CS2<sub>1</sub> CS2<sub>n</sub>  
 (20<sub>1</sub>) (20<sub>n</sub>) p MOSFET (23<sub>1</sub>) (23<sub>n</sub>) (20<sub>1</sub>) (20<sub>n</sub>) 1 (22) 가 (20<sub>1</sub>) (20<sub>n</sub>) n MOSFET (23<sub>1</sub>) (23<sub>n</sub>)  
 CS2<sub>1</sub> CS2<sub>n</sub> CSB1<sub>1</sub> CSB1<sub>m</sub>, CS1<sub>1</sub> CS1<sub>m</sub> CS2<sub>1</sub> CS2<sub>n</sub>

(11<sub>1</sub>) (11<sub>m</sub>) CSB1<sub>1</sub> CSB1<sub>m</sub>, CS1<sub>1</sub> CS1<sub>m</sub>  
 (11<sub>1</sub>) (11<sub>m</sub>) , (20<sub>1</sub>) (20<sub>n</sub>)  
 가 CS2<sub>1</sub> CS2<sub>n</sub> (20<sub>1</sub>) (20<sub>n</sub>)

3 ,  
 MOSFET , 가

2

, 1

( 4)

$CS1_1$   $CS1_m$   $CSB1_1$   $CSB1_m$  (48)  
 ( 1 ), (49) ( 1 ),  
 $(50_1)$   $(50_m)$   $BE_1$   $BE_m$  ,  $(51_1)$   $(51_m)$   $BE_1$   $BE_m$   
 $(50_1)$   $(50_m)$   $(51_1)$   $(51_m)$ 가  
 $V_H, V_L$   $V_{DD}$  (48)  $V_{GND}$   
 $(49)$   $(50_1)$   $(50_m)$   $ND1_1$   
 $ND2_1, \dots, ND1_m$   $ND2_m$  ,  $(51_1)$   $(51_m)$  .  
 $ND3_1$   $ND4_1, \dots, ND3_m$   $ND4_m$   $BE_1$   $BE_m$  .  
 $CSB1_1$   $CS1_1, \dots, CSB1_m$   $CS1_m$  3 3

3 m  $(11_1)$   $BE_1$ 가  
 $(50_1)$   $(51_1)$  ,  $CSB1_1$   $CS1_1$   $V_{GND}$   $V_{DD}$   
 $CSB1_1$  3  $(50_1)$   $V_{DD}$   $BE_1$   $ND1_1$   $V_H$   
 $CS1_1$   $(51_1)$  가  $(11_1)$   $ND4_1$   $V_L$   
 $(50_m), (51_m)$   $BE_m$  . 가

가

가

4

( 5)

5 5 ,  $(58_1)$   $(58_n)$   
 $(21_1)$   $(21_n)$  (MUX),  $(59_1)$   $(59_n)$  (22  
 $(22_n)$  (MUX) 4 ,

3  $(20_1)$   $CS2_1$  (58  
 $V_{DD}$  가  $(23_1)$  ,  $(59_1)$   
 $V_{GND}$  가  $(24_1)$  ,  $CS2_1$  ,  
 $(58_1)$   $V_H$ 가  $(23_1)$  ,  
 $(59_1)$   $V_L$   $(24_1)$  ,  
 3

5 , .  
 , ,  
 가 . , 5 ( 2 )(48) ( 2 )(49) 4  
 ,  
 5 . , 3 .  
 ,  
 가 .

( 6)

6 6 , , (62) ,  
 (DRAM) 가 MOSR  
 AM , (63) ,  
 3 .  
 SRAM 가 MO  
 가 , (48) (49)  
 , 3 .  
 $V_H, V_L$  (63) ,  
 6 , DRAM  
 가 ,  
 ,  
 ,

1 , 1  
 가 , 가 1 1  
 , 가 1  
 , 가 .  
 ,  
 가 ,  
 가 .

2 ,  
 가 , 가  
 1 가 .

(57)

1.

1 1 ,

2 2 ,

2 , 1 ,

1 2 , 2

,

3 1 , 1

3 1 1 3 , 2 1

3 1 2 1

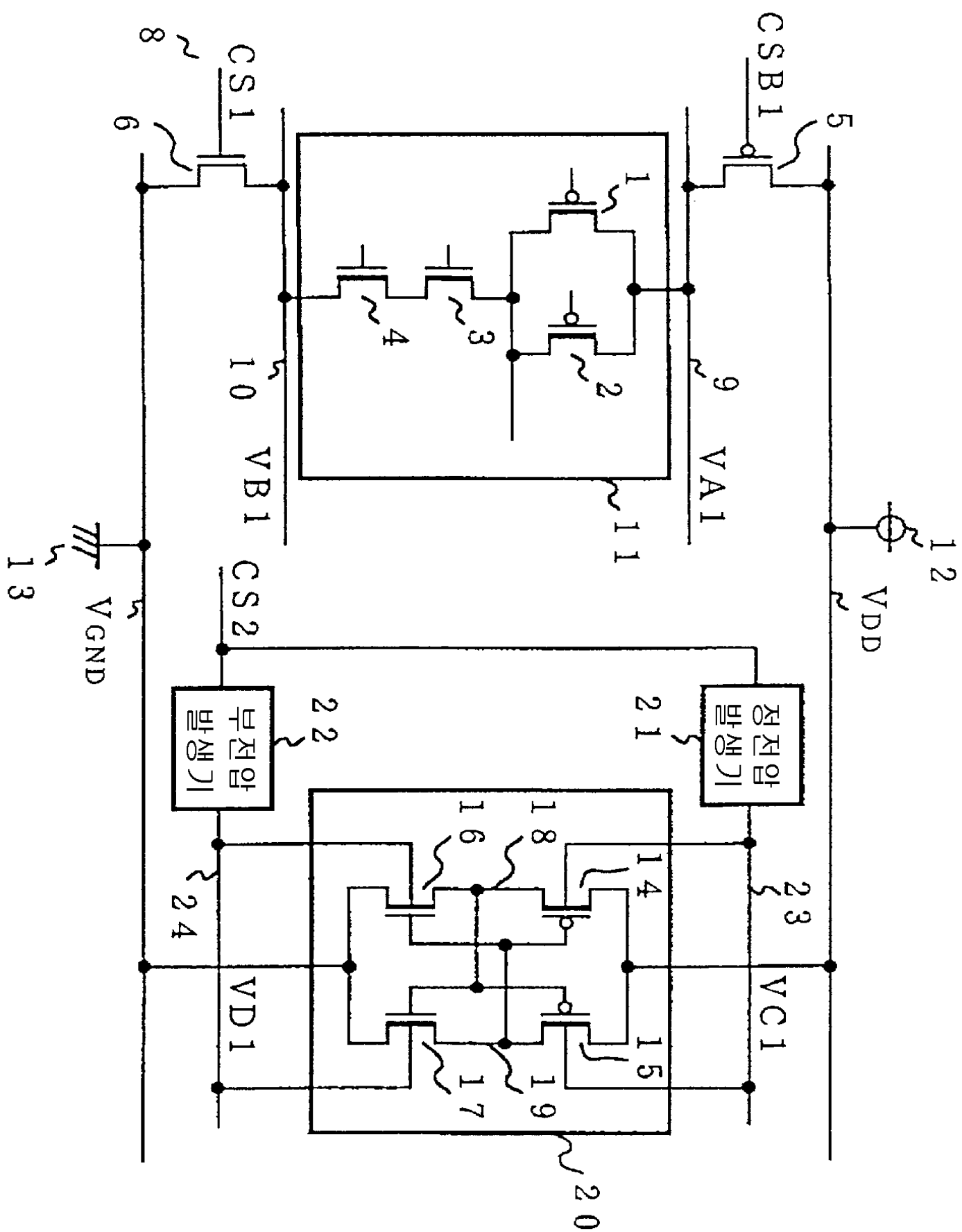
2.

,

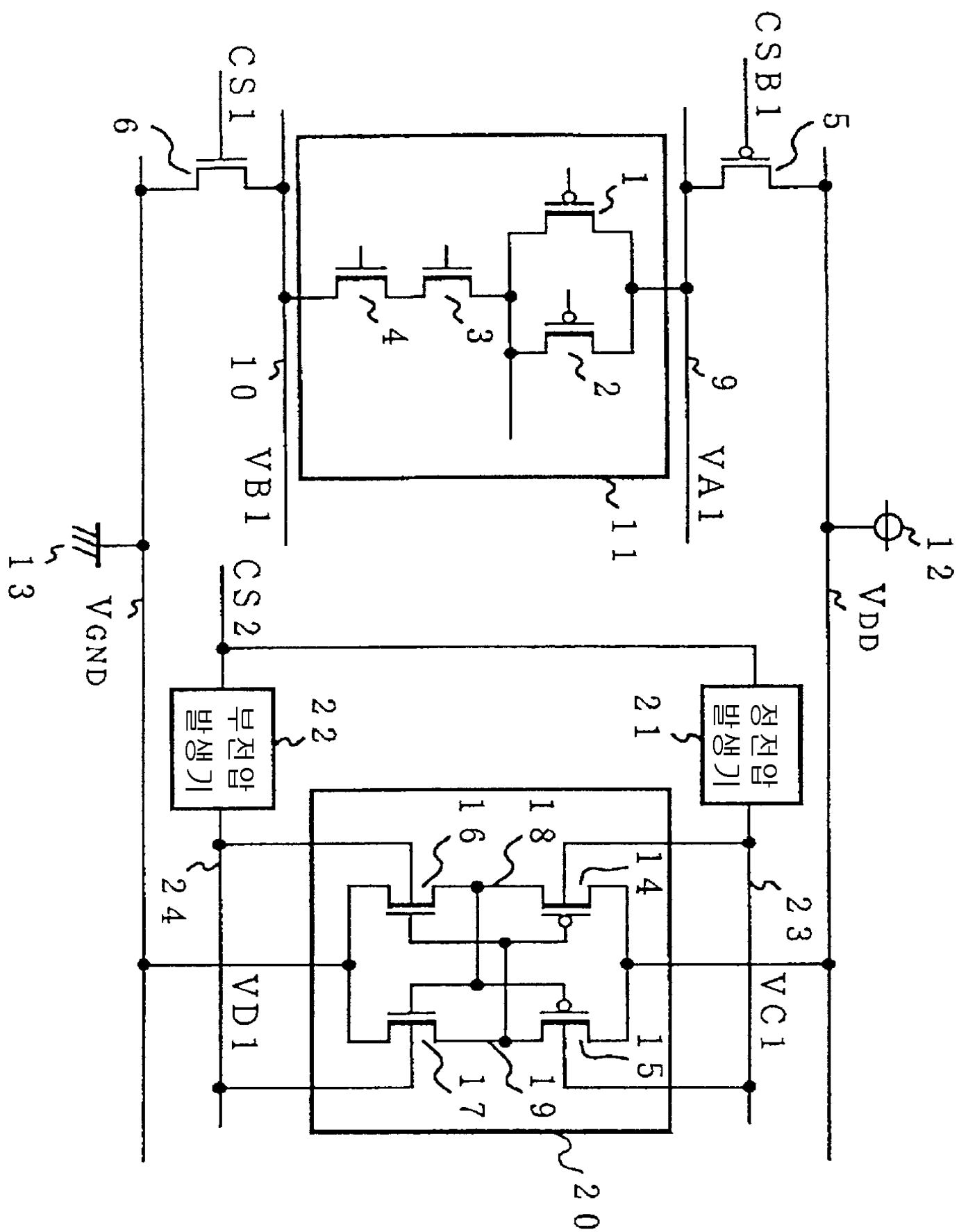
,

.

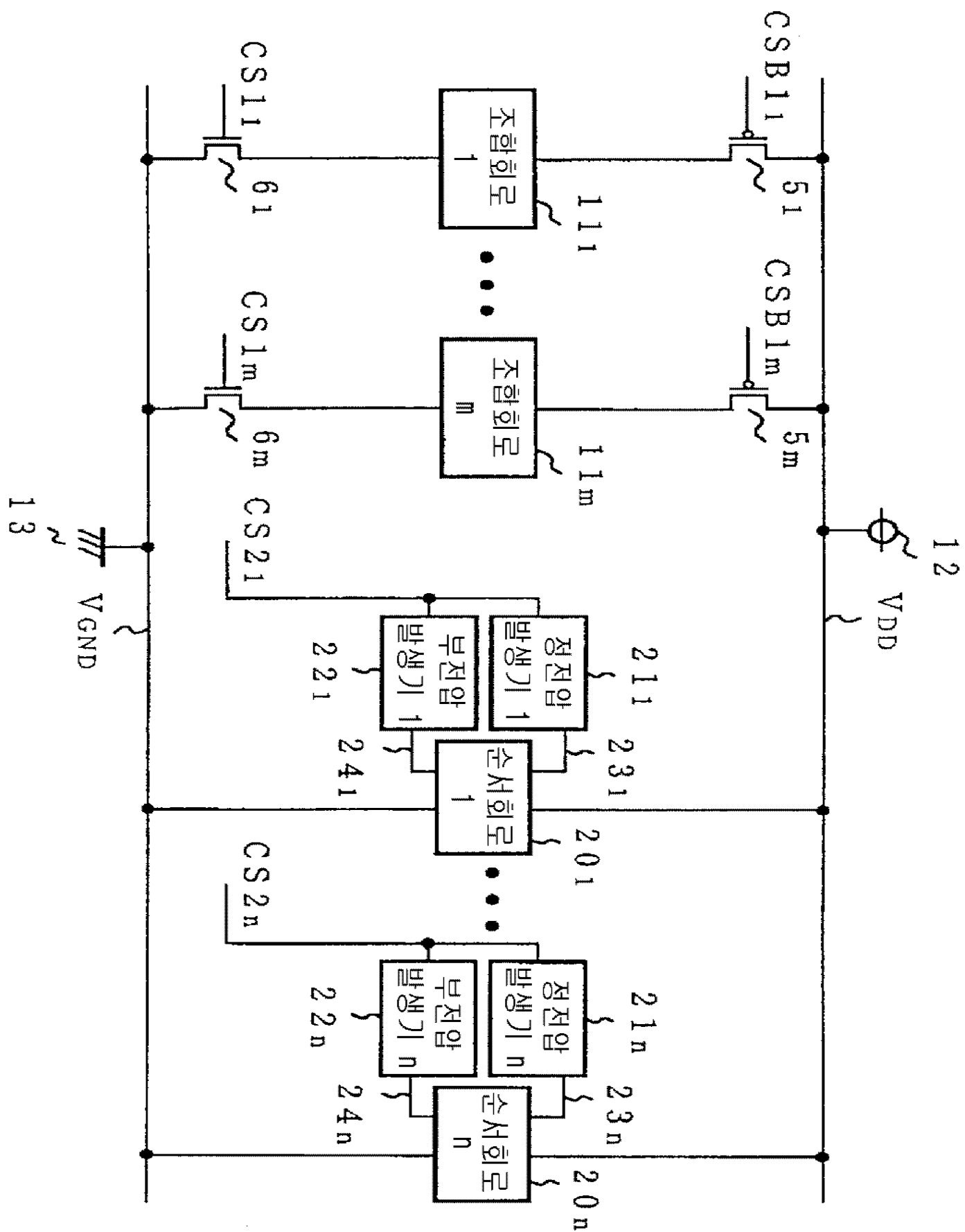
1



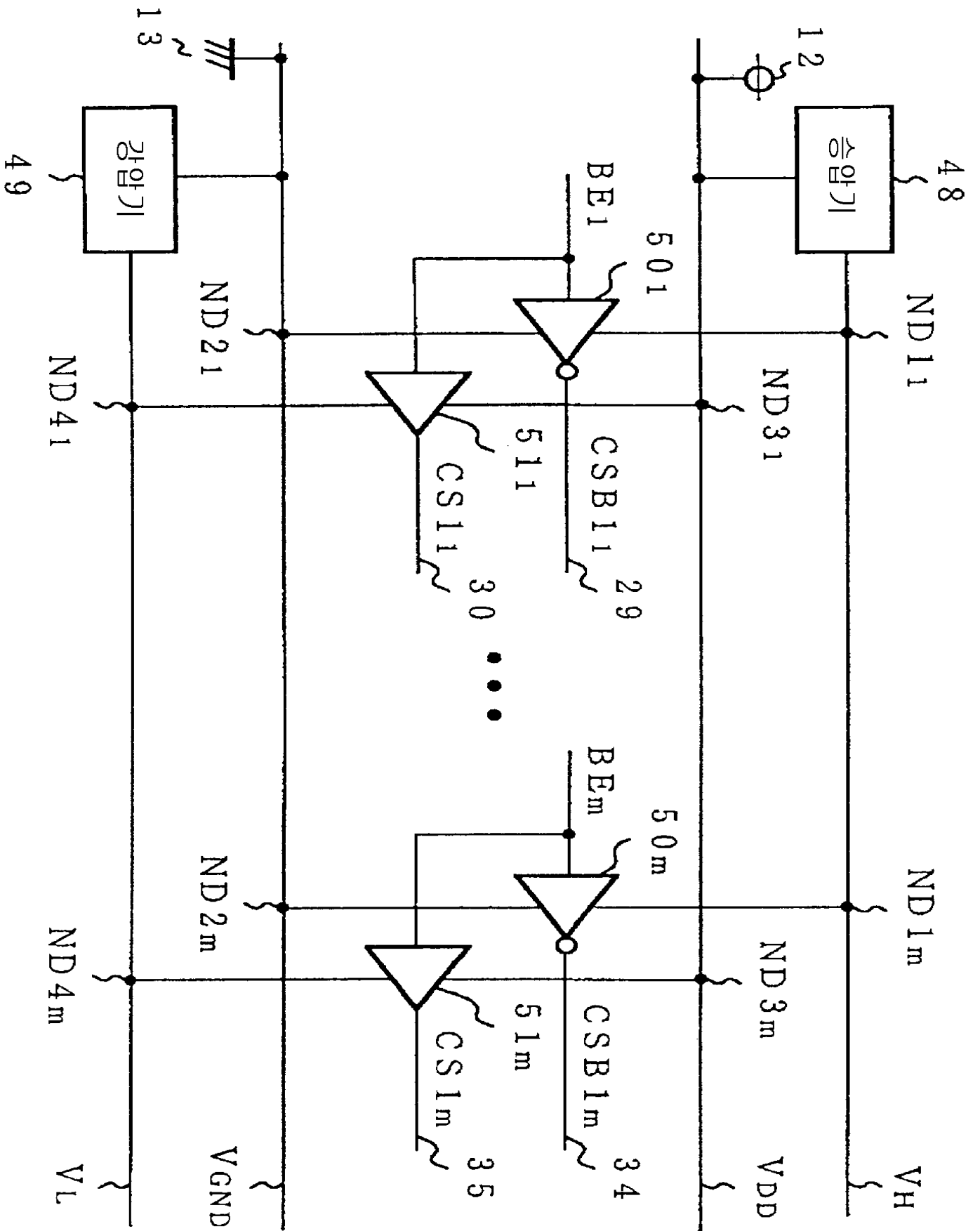
2



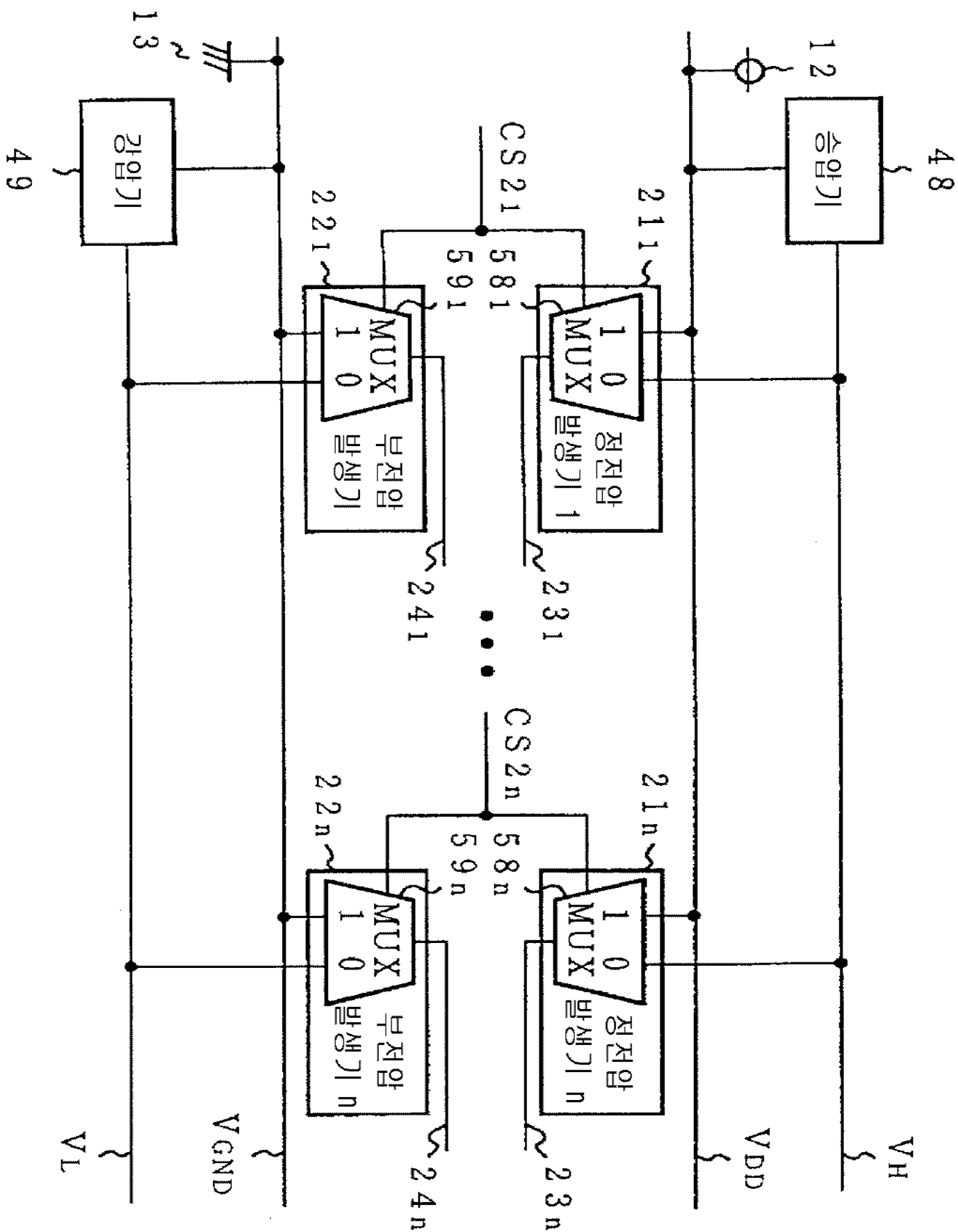
3

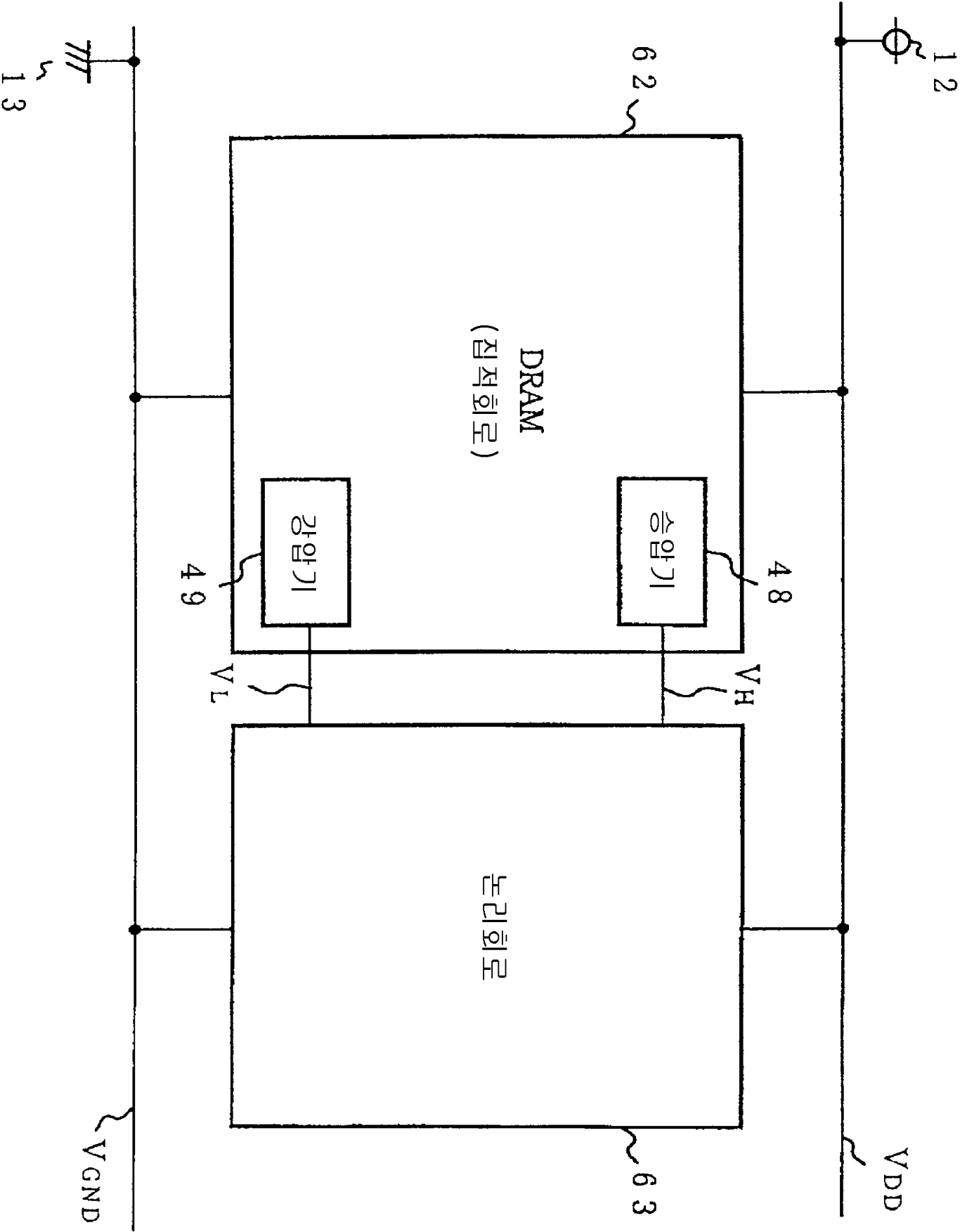


4

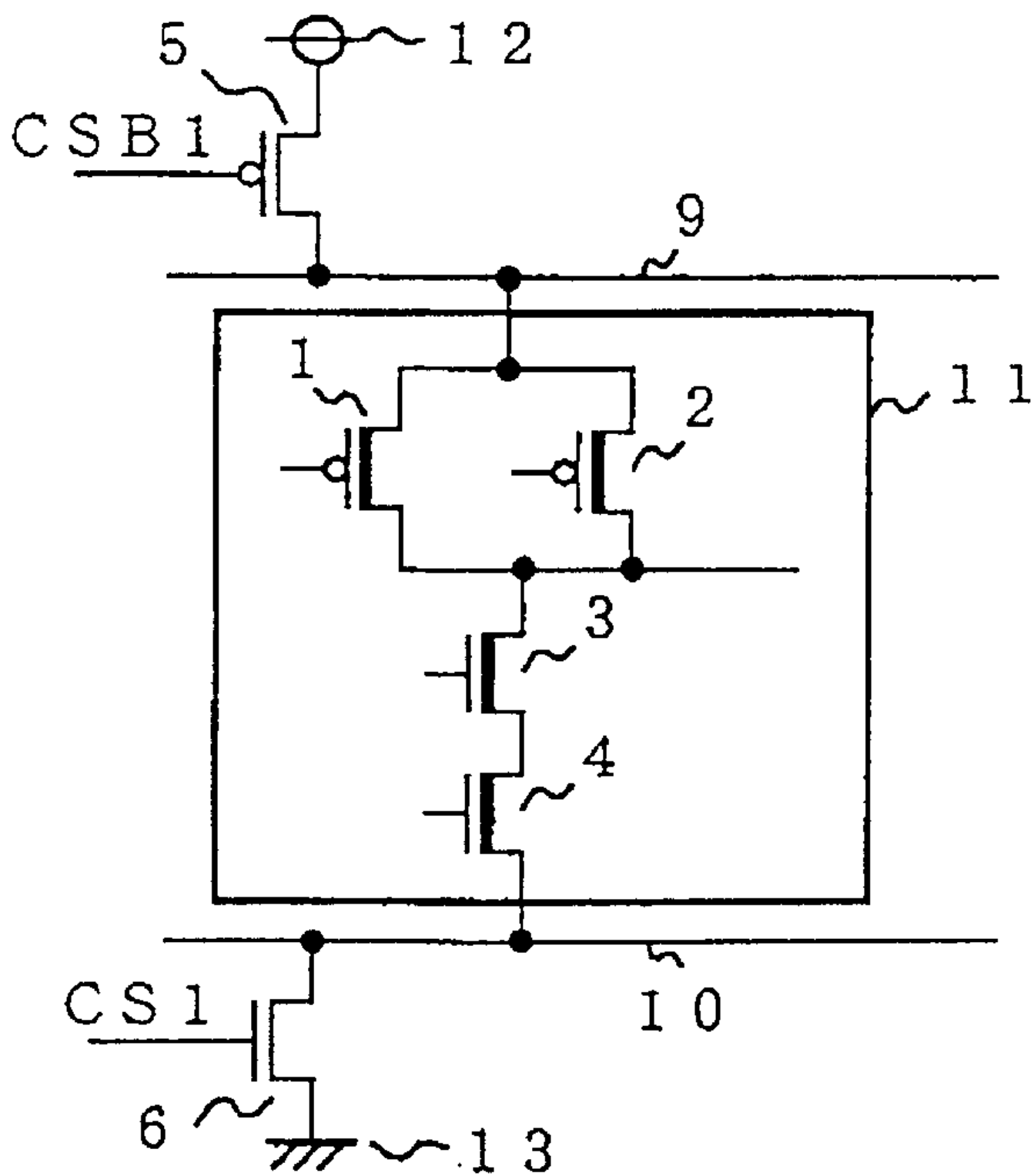


5





7



8

