

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl.<sup>7</sup>  
G11C 11/22

(45)  
(11)  
(24)

2004 09 04  
10-0447224  
2004 08 25

(21) 10-2001-0058279  
(22) 2001 09 20

(65)  
(43)

10-2003-0025406  
2003 03 29

(73)

136-1

(72)

181

307 1403

359-29 3-401

97

101-1102

2 1048

(74)

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(54)

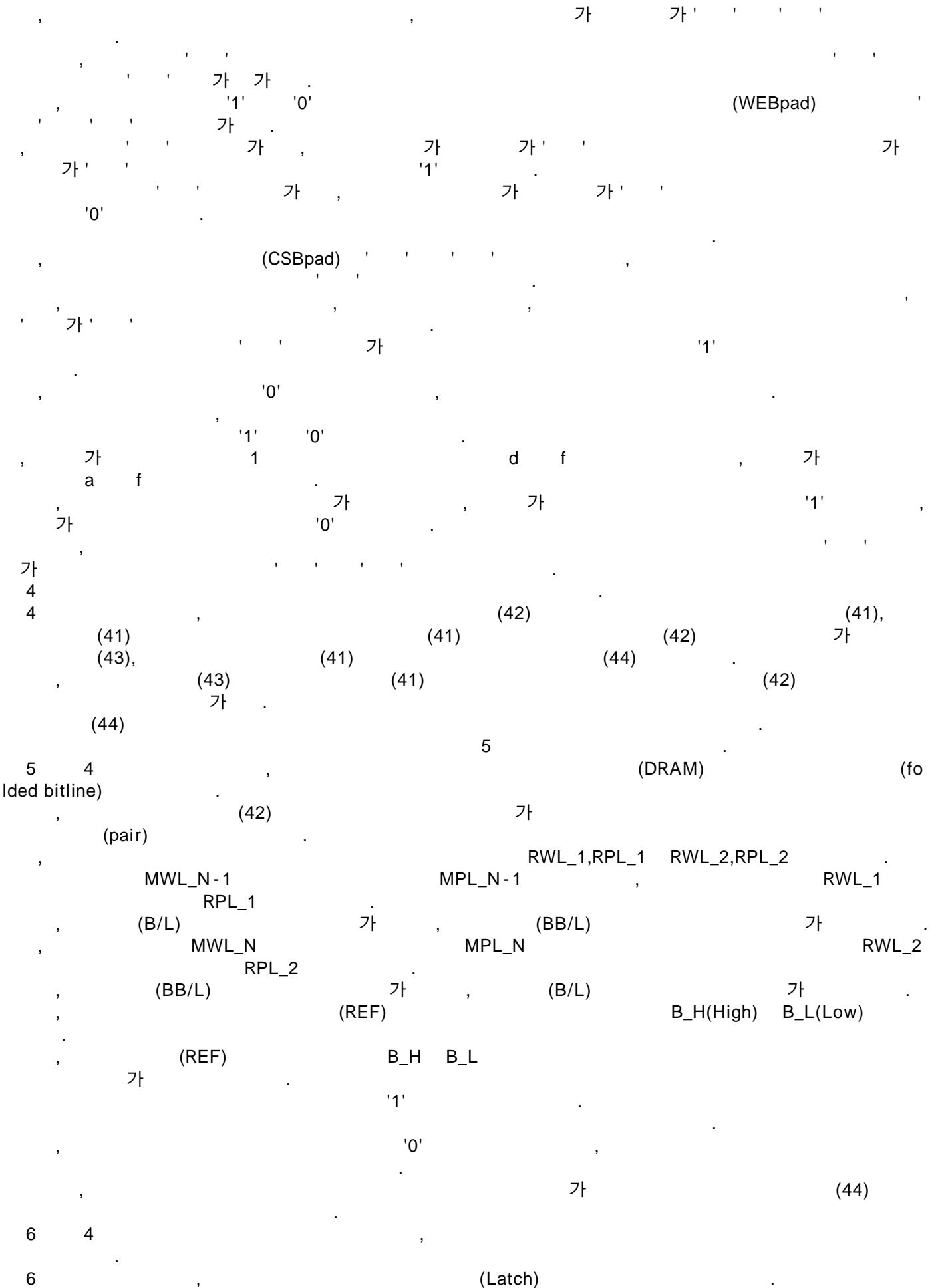
가

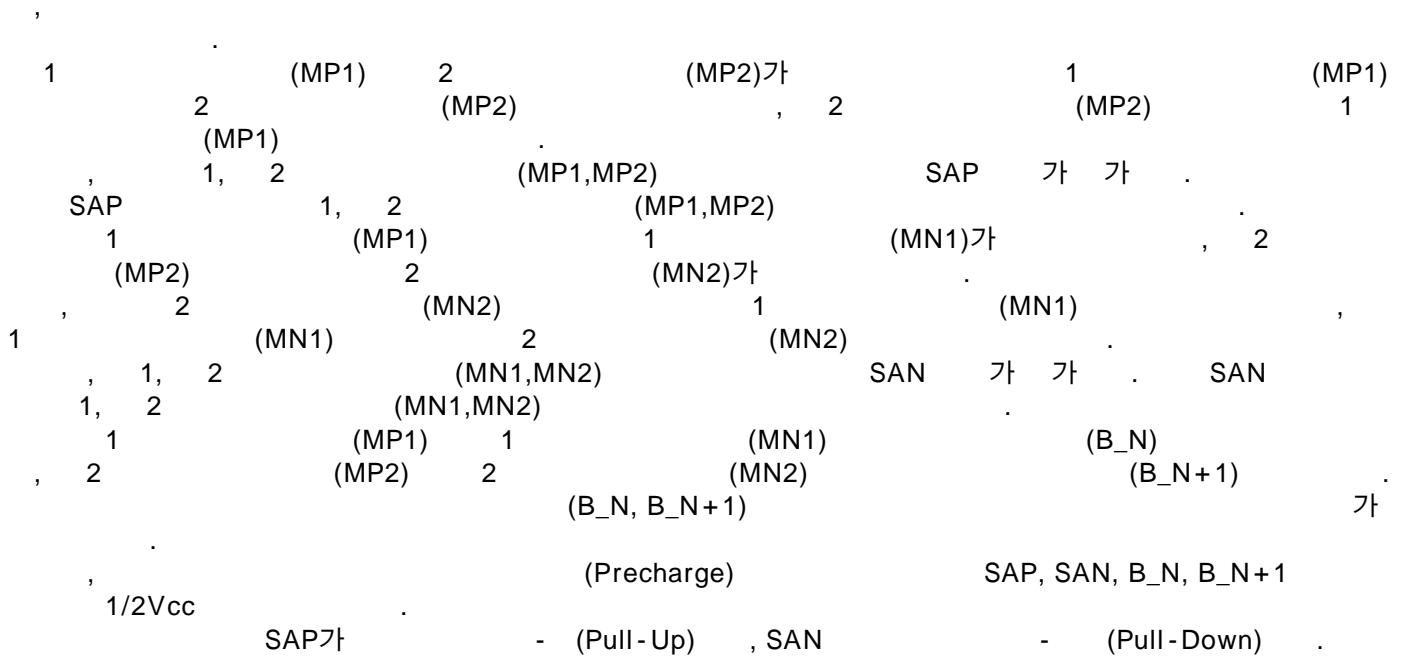
가

7

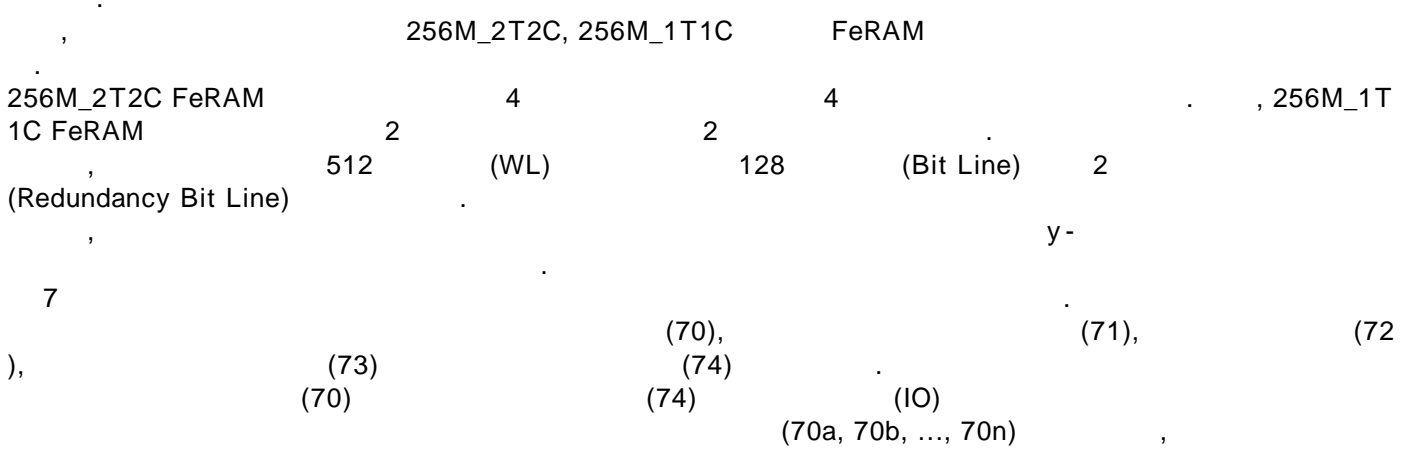
(Ferroelectric memory)







가 가 가 가 가



(71) (IO) (71a, 71b, ..., 71m)

(72) (72a 72n) (72a 72n) (72i)

(72i-1) (72i-2) 가

(REDY) (72i-1) (72i-1) (REDY)

(74) (71) (IO) (70) (MIO)

(71) (73) (70) (MIO)

(REDY) (74) (IO) (Redwlrhc)

(71) (74) (IO) (81)

8 (82) 19 (83) 19 (84) (81)

(81) (MF : Master Fuse)

(82) 18 (81) (MF) (C) (INV1)

(N1, N2, N3) (P1) VDD 1(Node1) (C) (GND)

(N1)가 (N1) (C) (INV1) (GND) 1(Node1) 1(Node1) (C) (GND)

(N1) (N2) (P1) (N2) (P1) (N2, N3) VDD (GND)

(N3) (CRED) (Stand-by) (CRED)가 가 2 (Disable)

3(Node3) (81) (P1) (N2)

(82) 가

2 (y<0>, yb<0>, y<3>, yb<3>, z<0>, zb<0>, z<3>, zb<3>)가

(82) y , z

(81) 3 (F1, F2) (NM1, NM2), (NM3, NM4) (F3, F4) (F5, F6) (NM5, NM6) (NM7, NM8) (F7, F8) (F9, F10) (NM9, NM10) (F1, F2) (NM9, NM10)

(81) 3 y

4 z 가 z<0>, zb<0>, z<3>, zb<3> 8 (NM11 NM18) 8 (F11 F (NM17, NM 18) NM11, NM12) 3 (P2) (P2) VDD (P4)

(83) (P2) (P2) (P2) (P2) 4(Node 4) (P2) VDD (P4)

(P2) 5(Node 5) 6(Node 6) (84) RYPCGB 가 가

2 (P2) (REDY)가 가 (P3, P4) RYPCGB 가 가

RYPCGB 9 (one) 가 (Short Pulse) 'L'

'H' 가

가 'H' 가 .  
 , (REDY)가 (H)  
 , RYPCGB 3, 4 (P3, P4)가 4, 5(Node4, 5)  
 , (H)가 (P5) (P6) VDD 4, 5 (GND)  
 , y, z 'H' 4, 5 'H'  
 , (84) 4 5 (NOR) , (REDY) (NOR) , (INV2, INV3)  
 , (NOR) (REDY) (83) (P2)  
 , (INV4) .  
 , 10 (CSBpad) 가 (MF) (L) (CRED)가  
 , (L) (H) (H), (L) , 2 (L) 3 (H)가  
 , 4, 5 (H) (L) (REDY) (L)가 (MF) ,  
 , 11  
 ,  
 , y<4>, y<3>, y<2>, y<1>, y<0>(11111), z<3>, z<2>, z<1>, z<0>(0000) 가  
 y<4>, y<3>, y<2>, y<1>, y<0> yb<4>, yb<3>, y  
 b<2>, yb<1>, yb<0> , z y  
 z<3>, z<2>, z<1>, z<0> zb<3>, zb<2>, zb<1>, z  
 b<0>  
 , (CSBpad)가 (L) (CED)가  
 , 1 2 (L) (H) 2 (H)  
 3 (L)가 3 4, 5 (L)  
 4, 5 (L) (H)가 , 4, 5 (L)  
 , (REDY) (H)가 .  
 , (REDY) (73) (NS1 NS16)  
 NS1 (NS1 NS16) 12 (FS1 FS16) , (NS1 NS16) ( )  
 NS16 (NS1 NS8) (REDY)가 (IO)  
 (MIO) (FS1 FS8) (70a, 70b, ..., 70n)  
 , (NS9 NS16) (74) (IO)  
 (RIO) (FS9 FS16)  
 , FS1 NS1 NS9 FS9 IO<0> , FS2, NS2, NS10, FS10 ,  
 FS3, NS3, NS11, FS11 , FS4, NS4, NS12, FS12 , FS5, NS5, NS13, FS13 , FS6, NS6, NS14, FS14 , FS7  
 NS7, NS15, FS15 , FS8, NS8, NS16, FS16  
 , (REDY)가 'H'  
 , (NS1 NS16) , (74) IO<0>  
 , FS1 FS9 (RIO)  
 13 (73) (73) (NOR1 NOR8) , (NAND) , (INV11  
 INV15) , (NM20 NM27) (NOR1 NOR4) (72)  
 , (REDY)가 2  
 , (NOR1) REDY<0> REDY<1> , (NOR2) REDY<2> REDY<3> ,  
 (NOR3) REDY<4> REDY<5>가, (NOR4) REDY<6> REDY<7> ,

(NOR5 NOR8) (NOR1 NOR4) (w  
 wlrhc) (NOR5) (NOR1) (w  
 lrhc) (NOR6 NOR8) (NOR2 NOR4)  
 (wlrhc)  
 (INV11 INV14) (NOR5 NOR8)  
 (71) /  
 (Redwlrhc)  
 (NAND) (NOR1 NOR4)  
 (INV15) (NAND) 7(Node7)  
 (NM20 NM27) (NM20 NM27)  
 (70) (MIO) (74)  
 (IO)  
 (Redwlrhc) 7(Node 7) 가 (REDY)가 (L)가 (NM20  
 NM27) (ON) (MIO) 가 (H)가 (74) (IO) (IO)  
 (MIO) 가 가 (MIO)  
 (IO) (74) (70a 70n)  
 (70) (71) (71a 71m)  
 (71)  
 (70) (MIO) 14a  
 DBTOP, DBBOT DBLCH, DBSEN  
 (wlrhc)가 DBEQB,  
 14b DBEQB, DBTOP, DBBOT DBLCH, DBSEN  
 (RIO) DBEQB, DBTOP, DBBOT DBLCH, DBSEN  
 (Redwlrhc) (wlrhc) (73)  
 14a 14b 가  
 DBEQB, DBLCH,  
 DBSEN, (Redwlrhc) DBBOT (RIO)  
 DBTOP DBBOT  
 (14b-2) , (14b-3) , / (14b-4) , (14b-1) , (14b-5)  
 / (14b-1) VDD DBTOP  
 DBEQB가 가 (P21) , VDD DBEQB가 가 (P22) ,  
 DBBOT DBBOT DBTOP 가 DBB  
 OT (P23) (14b-2) VDD가 가 8(Node 8) (P2  
 4) , VDD가 가 9(Node 9) 8(Node 8)  
 (P25) , DBEQB 8(Node 8) 9(Node 9) 8(Node 8) 가  
 DBEQB (P24) 8(Node 8) 9(Node 9) (P26)  
 , 8(Node 8) 9(Node 9) .  
 BTOP DBBOT (N21, N22) , (N21) (N22) D  
 10(Node 10) (GND) DBSEN가 가

(N23)  
 DBLCH (14b-3) DBLCH (INV21)  
 DBLCH (INV21) 8(Node 8) 9(Nod  
 DBTOP DBBOT (TS1)(TS2)  
 DBLCH (NAND11) (INV22) (INV22)  
 (NAND11)  
 (RIO) DBTOP (TS3)  
 (14b-4) (Redwlrhc) (INV23)  
 (INV23) (RIO) (NAND1  
 VDD 가 가 (P27) (INV23) (INV24)  
 ND12) (INV23) (INV24)  
 (14b-5) (INV23) (INV24)  
 8(Node 8) 9(Node 9) (TS4)(TS5)  
 (TS5) (INV23) (INV24) (TS4) (INV25)  
 (TS6) 가 (INV25) (RIO)  
 (TS7) (TS1) (TS2) DBLCH (IN  
 V21) (TS4, TS5, TS6) (TS7)  
 (INV23)(INV24) / /  
 (71a 71m) (71) , m  
 edwlrhc<3>, ..., Redwlrhc<m>가 Redwlrhc<0>, Redwlrhc<1>, R  
 15 16 (MIO) (RIO) DBTOP  
 DBBOT  
 15 (REDY) (L)  
 (REDY) (L) (Red  
 wlrhc) (H) 7(Node 7) (H) (Write) 가  
 (74) (IO) (MIO) 가  
 (Read) (74) (IO) DBTOP, DBBOT 가 (MIO)  
 (74) (IO) 16 IO<0> (74) REDY<0> (H),  
 REDY<1-7> (L)가 (73) REDY<0> (H) REDY<1> (L) Redwlrhc<0>  
 (L) , Redwlrhc<1-3> (H) , 7(Node 7) (L)  
 (73) (FS1) (cutting) (FS9) (no cutting)  
 IO<0> MIO<0> RIO IO<0> IO<0> (RIO)  
 (70) 4  
 IO<0> 7  
 , x8 가 .  
 , 가 .  
 , 가 .

(57)

1.



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/ ;

2.

3.

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1 / ,

1 2 가 ,

1, 2 / 1 ,

1, 2 1 ,

1 ,

1

4.

3 , (wlrhc) (INV23) ,

(INV23) (INV23) (INV24) , (NAND

12) , (RIO) (RIO) 가 (NAN

D12) (VDD) (RIO) 가 (NAN

5.

3 , 1 (DBLCH) (INV21) ,

(DBLCH) (INV21) (TS1)(TS2) ,

1, 2 (wlrhc) (NAND1

1) , (NAND11) (INV22) (NAND11) (INV22) ,

1 (TS3)

6.

3 , 1 (RIO) (TS6) ,

(INV26) (TS6) (INV26) ,

(INV25) ,

(INV25)(INV26)

(TS4)(TS5) ,

(INV25) (INV26)

(TS7)

7.

1 ,

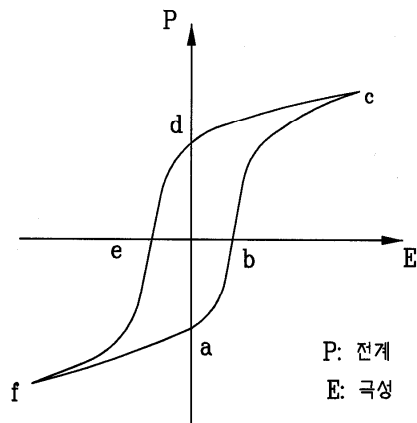
2 / ,

3, 4 가 ,  
 2 / ,  
 3, 4 2 ,  
 2 .  
**8.** (Redwlrhc) (INV23)  
 ) , (INV23) (INV23) (INV24) , (INV23)  
 12) , (VDD) (RIO) (RIO) 가 (NAND  
 D12) (NAN

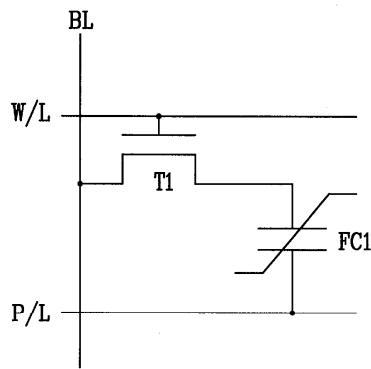
**9.** 2 (DBLCH) (INV21) ,  
 7 , 2 (DBLCH) (INV21) (INV21) ,  
 (DBLCH) 3, 4 (Redwlrhc) (TS1)(TS2) ,  
 (NAND11) , (NAND11) (INV22) , (INV22) , (TS3)  
 (INV22) 2 (NAND11) (TS3)

**10.** 2 (TS6) , (TS6)  
 7 , 2 (INV26) (INV26) , (INV26)  
 (INV25) , (INV25)(INV26)  
 (TS4)(TS5) , (INV26) (INV26)  
 (TS7)

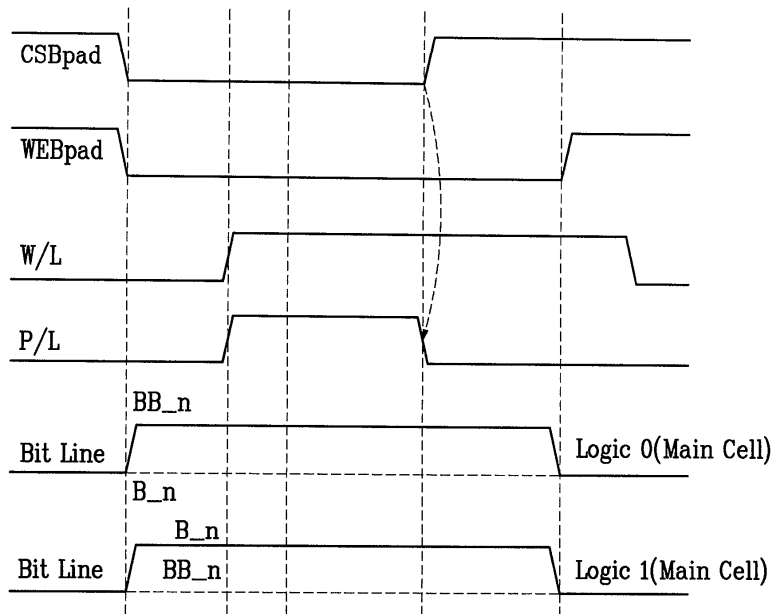
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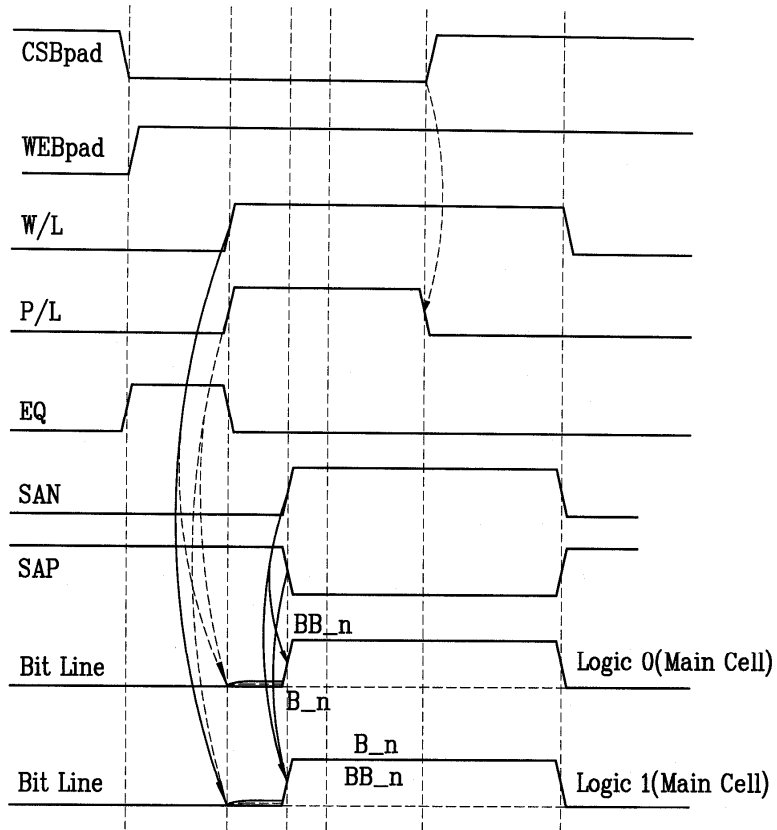
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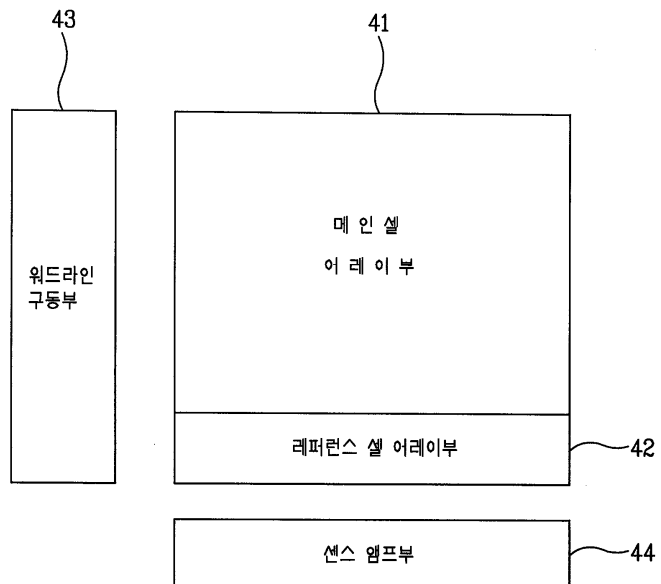
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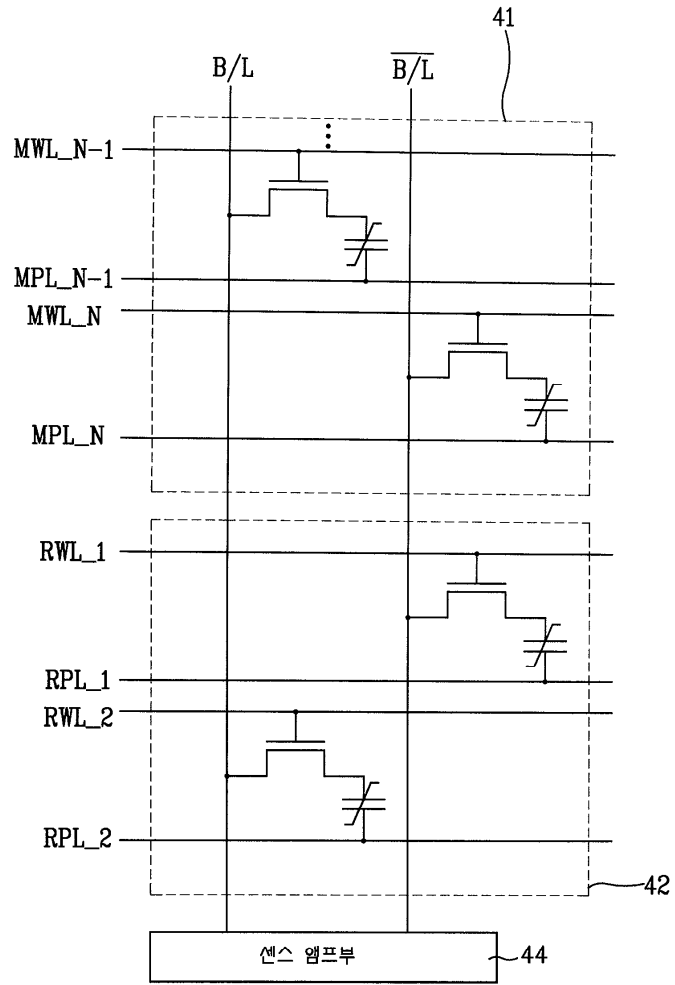


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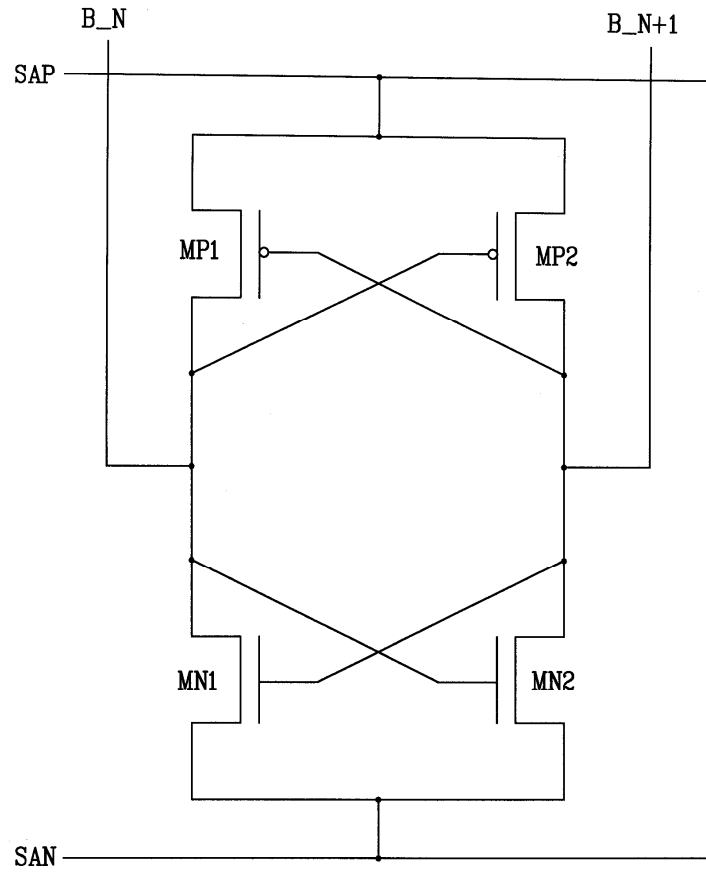


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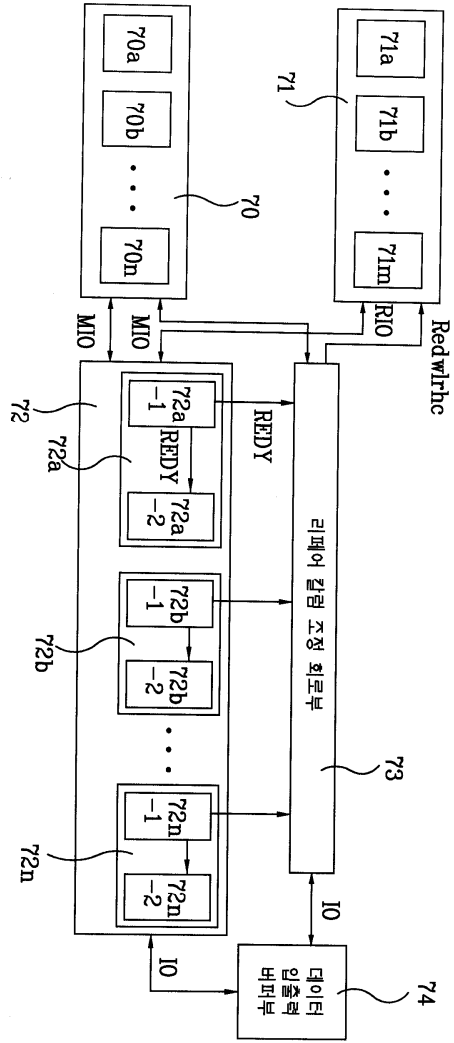




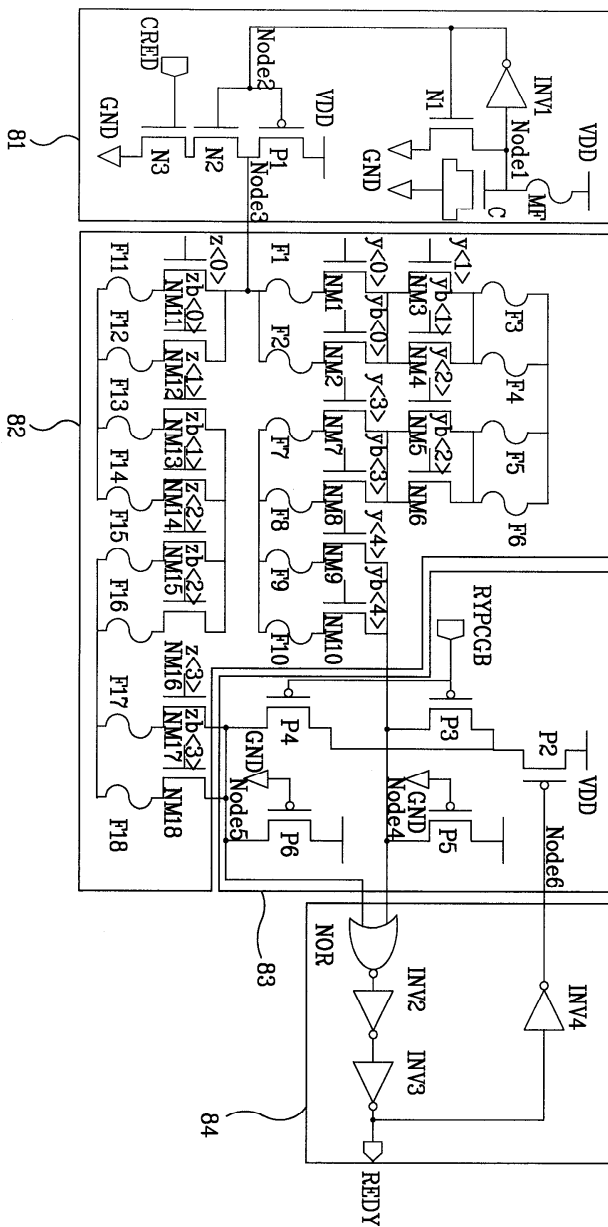
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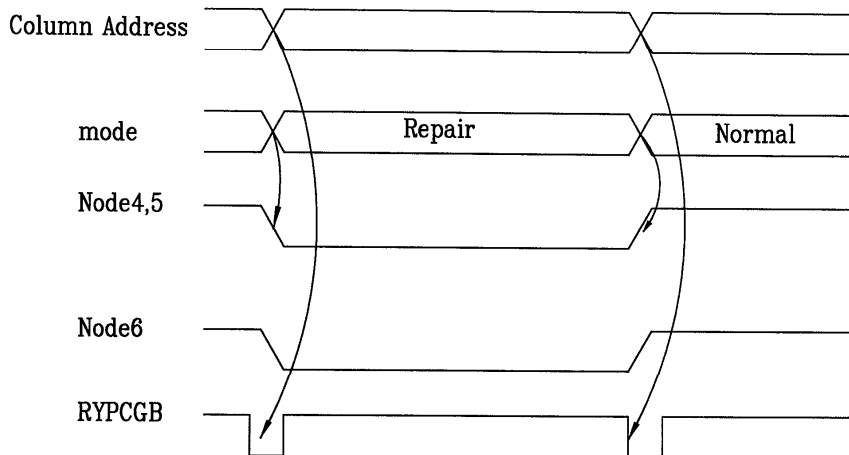
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8

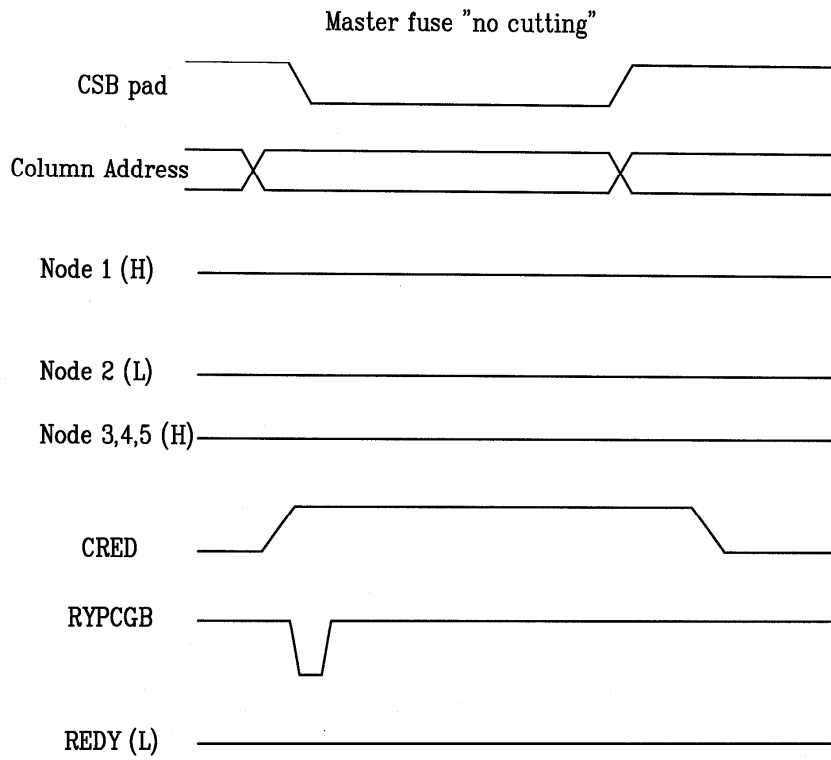


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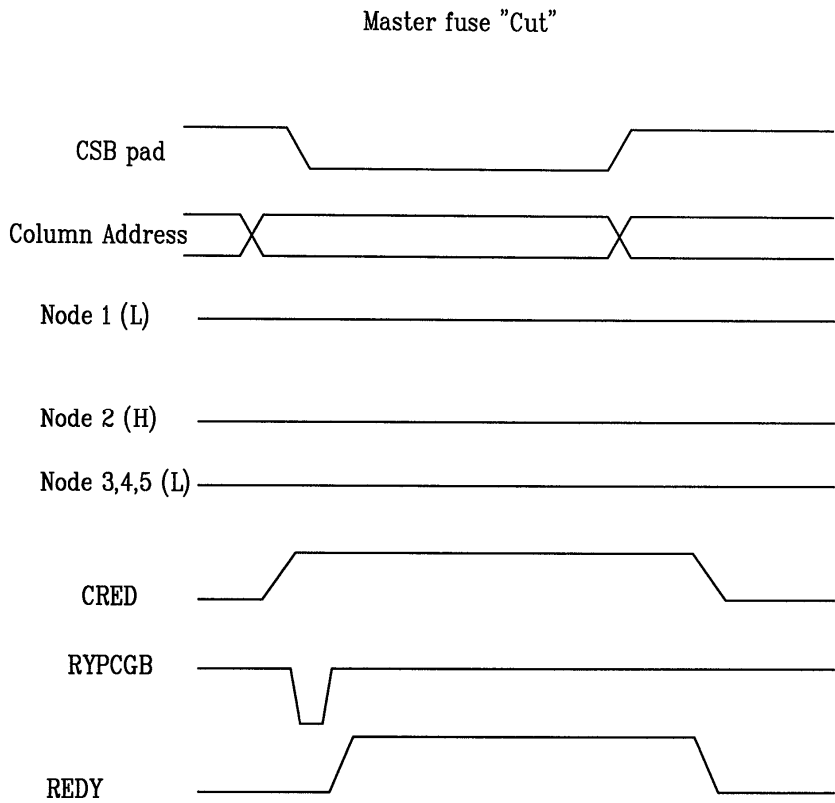


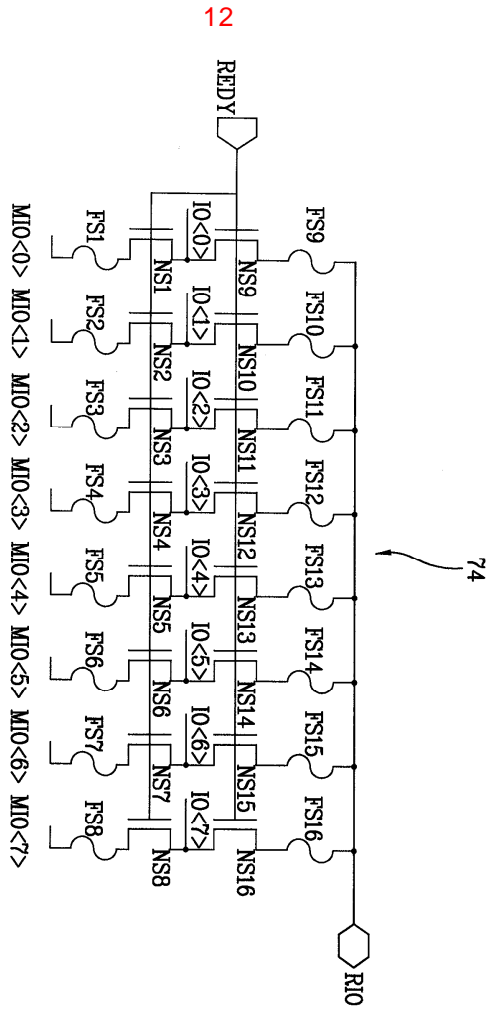


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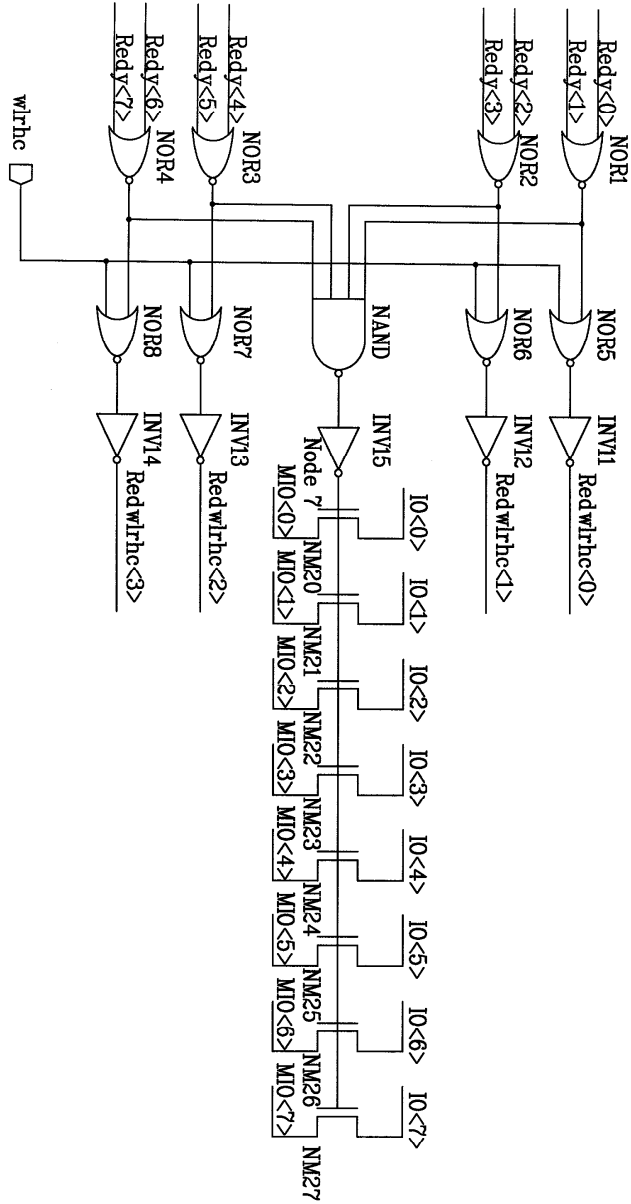


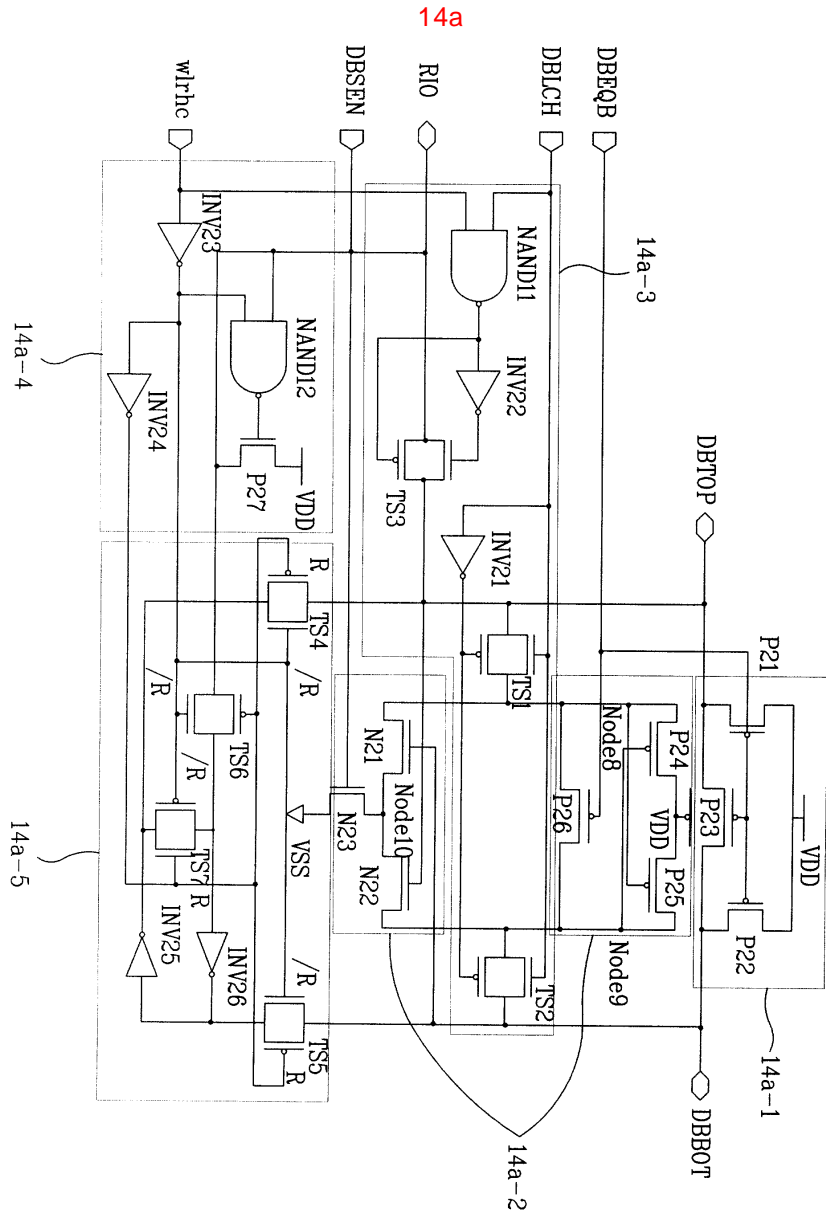
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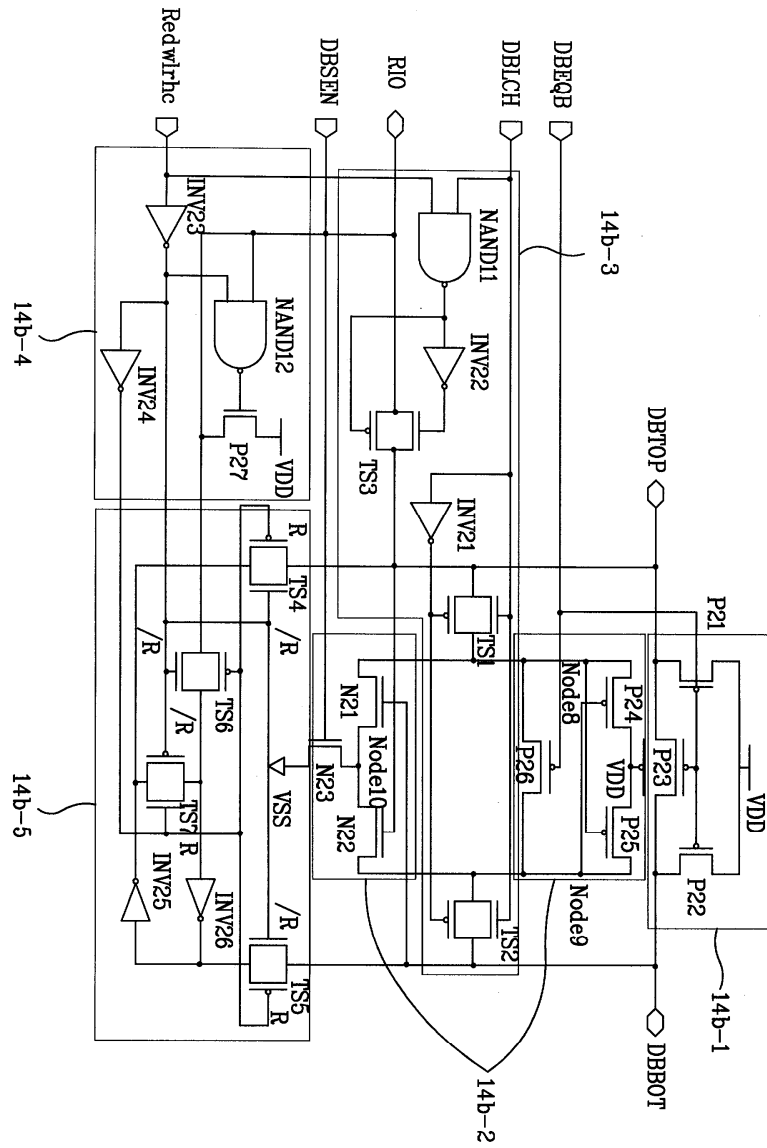


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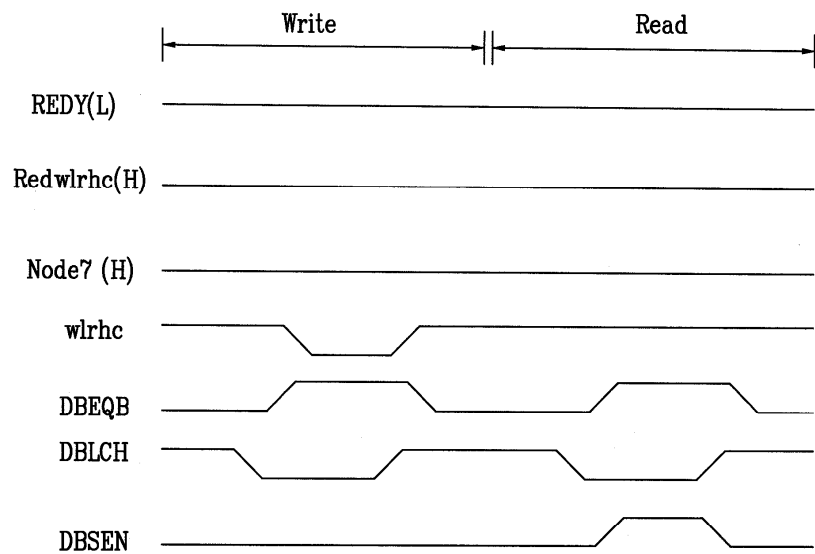




14b



15



16

