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(71) 가 가
100-6334 2- 4-1

(72) 2- 4-1

(74)

:

(54)

1 (WL1) 1 가 1
 (16) (11) 2 (12) 1
 , 1 (18) 2 (WL1)
 가 가 (12) 가 가 (WL2)
 2 (12)

1

, , , , , MOS,

1 1

2 1

3 1 1
 4 1 2
 5 2 1
 6 2 2
 7 1 2 1
 8 2
 9 3
 10 9
 11 4
 12 4
 13 CAM
 14 CAM
 15 14 1
 16 14 2
 17 5
 18 5
 19 6
 20 6 2
 21 6 2
 22 21 1
 23 21 1
 24 7
 25
 26 7

* *

11, 11L, 61 : 1

12, 12R, 14, 15, 36, 71 : 2

13 : CAM 15a, 15b :

16 19, 20A, 20B, 62, 72, 75 :

21 24, 25A, 25B, 37 :

26 : 27 :

30A, 30B, 31 34 :

, MOS RAM .

, 가 . , 3 가 3 , 1 1 1
, 1 , 3 , 1 .

[1]

6-349275

, 가 . , 가
, 1 가 , 3 1 가 ,
가 1 .

1 , 1 2 , 1
, 1 , 2 2 , 1 2 , 2
1 , 2 3 2 , 2 2 가
1 3 , 2 2 가 2 , 3 ,
1 , 1 가 2 .

[]

< 1>

()

1 1 .

2) 1 , 1 (11)(1) 2 (12)(1)

2 (WL1(1 ()) WL2(3 , 2)가 (12) 1 (11) WL1(

31 AD1 , RE1 WE1
16(1) 21 22 .

32 AD2 , RE2 WE2
17(2) 23 .

16 1 (WL1) ()
) , (17) 2 (WL2)

4 21 31 , 1 BL1 · (bar) BL1
DIO11<7:4> BL1 · BL1 1 (11)

) 22 31 , 1 BL21 · BL21 BL21 · BL21(1
(12) 4 DIO12<3:0> . 2

) 23 32 , 2 BL22 · BL22 BL22 · BL22(2
(12) 4 DIO2<3:0> . 2

, (22 24) (SA) (WD) 가 .

()

2 1 (11) 2 (12) , ()
, 2x2)

1 (11) ms00, ms01, ms10 ms11 .

ms00 ms11 , (41, 42) , 41 (42)
NMOS Q11 , 42 (41) NMOS Q

12 .

1 WL1<0> WL1<1> 51 52(, (16)())

WL1<0> ms00 ms01 , NMOS Q11 Q12 1
1 , WL1<1> ms10 ms11 , NMOS Q11 Q12

ms00 ms10 1 BL1<0> · BL1<0> ,
ms00 ms10 , NMOS Q11 1 BL1<0> BL1<0>
, NMOS Q12 1 BL1<0>

s01 ms11 ms01 ms11 1 BL1<1> · BL1<1> , m
MOS , NMOS Q11 1 BL1<1> BL1<1> , N
Q12 1 BL1<1>

, 2 (12) md00, md01, md10 md11

md00 md11 , 41 42 , 41 NMOS Q12 Q22

Q11 Q21 , 42

2 WL2<0> WL2<1> 53 54(, (17)())

WL1<0> md00 md01 , NMOS Q11 Q12 1 W

L2<0> , NMOS Q21 Q22 2

WL1<1> md10 md11 , NMOS Q11 Q12 1 W

L2<1> , NMOS Q21 Q22 2

md00 md10 1 BL21<0> · BL21<0> ,

md00 md10 , NMOS Q11 1 BL21<0> BL21<0>

, NMOS Q12 1 BL21<0>

md00 md10 2 BL22<5> · BL22<0> ,

md00 md10 , NMOS Q21 2 BL22<0> BL22<0>

, NMOS Q22 2 BL22<0>

md01 md11 1 BL21<1> · BL21<1> ,

md01 md11 , NMOS Q11 1 BL21<1> BL21<1>

, NMOS Q12 1 BL21<1>

md01 md11 2 BL22<1> · BL22<1> ,

md01 md11 , NMOS Q21 2 BL22<1> BL22<1>

, NMOS Q22 2 BL22<1>

, 1 2 3 , \diamond () , \diamond 가

, $\langle n-1:0 \rangle$, 0 , $\langle n-1 \rangle$ n

()

, 1 2 , 1 , 1 (11) 2 2 (12) n()x

m()

, 1 가 , AD1 RE1 RE1 (16)

) , n 1 WL1<n-1:0> 1 WL1<i>(i=0 n-1)

0 msim 2 (12) WL1<i> 1 (11) msi

가 , mdi0 mdim NMOS Q11 Q12가

BL1 · BL1 BL21 · BL21

, m 1 AD1 (31) 21 22

BL1 · BL1 BL21 · BL21 4 ,

> 8 DIO11<7:4> DIO12<3:0>

1 , 1 가 , WE1 WE
 (16) , n 1 WL1<n-1=0> 1 WL1<i>(i= 0 n-1)
 0 msim 2 1 WL1<i> 1 (11) msi
 가 , (12) mdi0 mdim NMOS Q11 Q12가
 41 42가 1 BL1 BL1 BL21 BL21
 , 21 22 , DIO11<7:4> DIO12<3:0>
 , m 1 AD1 (31) , 21 22
 BL1 BL1 BL21 BL21 4 'L' 'H'
 가 , 2 가 , RE3 RE2
 17 , n 2 WL2<n-1:0> 2 WL2<i>(i=0 n-1)
 0 mdim 2 NMOS Q21 Q22가 가 , 2 mdi
 BL22 BL22 (12) 2
 2 , BL22 AD2 32 23 , m
 BL22 4 DIO2<3:0> 4
 2가 , 2 가 , WE2 WE
 (17) , n 2 WL2<n-1:0> 2 WL2<i> 32
 0 mdim 2 NMOS Q21 Q22가 , 2 mdi
 BL22 BL22 (12) 41 42가 2
 , , DIO2<3:0> 23
 2 , BL22 AD2 32 23 , m
 BL22 4 'L' 'H'
 , 1 , 1 (11) 2 가 가 (12) 4
 8 가 가
 , 2 , 2 (12) 4 가 가
 , 4
 4 , 1 , 8 , 4 1 2 4 가 ,

(11) 2 1 , (12)가 (16) 가 1 2
 , 1 , 4 (11) 2 1 가 가 , 2
 , 4 가 , .
 ()
 3 4 1 (11) MS . 4 2 3
 , 2 42 PMOS 41 PMOS P1 NMOS N1 CMOS
 , 2 42 PMOS P2 NMOS N2 CMOS .
 3 OS W0 , PMOS P1, P2 N NW , NMOS N1 NM
 Q11 P PW1 , NMOS N2 NMOS Q12 P P
 . P PW0 P PW1 N NW .
 N NW , P+ FLP1 PL1 PMOS P1
 , P+ FLP2 PL2 PMOS P2 .
 P PW1 , N+ FLN1 PL1 NMOS N1
 , N+ FLQ11 PL11 NMOS Q11 .
 P1 PL1 N NW P PW1 , NMOS N1 PMOS
 P PW0 , N+ FLN2 PL2 NMOS N2
 , N+ FLQ12 PL2 NMOS Q12 .
 P2 PL2 N NW P PW0 , NMOS N2 PMOS
 , PL1 PL12 PL2
 , PL11 FLP1, FLN1 FLQ12가 PL2
 , FLP2, FLN2 FLQ11 .
 , PMOS P1, NMOS N1 NMOS Q12
 , PMOS P2, NMOS N2 NMOS Q11 , ,
 MS HC1 2 () . , ,
 P+ FLP1, FLP2 P , , N+ FLN1, FLN2,
 FLQ11, FLQ12 N , , 3 , .
 P PW1 , N+ FLN1 LG1(1) CH
 FLN1) PL11 GC 1WL1(1)
) CH FLQ11 1BL1(1)
 , 1 CH 1 () , GC
 N NW , FLP1 LV1(1) CH
 FLP1 , FLP2 LV1

CH FLP2

P PW0, FLQ12 1BL1(1) CH
 GC FLQ1 PL12 1WL1 LG1
 CH PL12 FLN2
 CH FLN1 P+ FLP1 1
 AL11, FLN1 CH
 P+ FLP1 PL2 SC
 AL11 P+ FLP1 PL2
 FLN2 P+ FLP2 1
 AL12, FLN2 CH
 + FLP2 PL1 (shared contact) SC
 AL12가 P+ FLP2 PL1
 4 LG2(2) VH1 LG1(
) LV2(2) VH1
 LV1()
 2WL1(2) VH1 1WL1()
 3WL1(3) VH2 2WL1 1WL1
 3WL1 1 2 1 WL1
 3WL1 P PW0, PW1 N NW VH1 1, 2 (
) VH2 2, 3 ()
 2BL1(2) VH1 1BL1()
) 2BL1(2) VH1 1BL1(
 2BL1, 1BL1 2BL1, 1BL1, 1 2 1 BL1
 BL1
 2BL1, 2BL1, LG2 LV2, P (PW1, PW0) N (NW)
 5 6 2 (12) 2 MD 5
 1 6 2
 , 2 41 PMOS P1 NMOS N1 CMOS
 , 42 PMOS P2 NMOS N2 CMOS
 5 , PMOS P1, P2 N NW , NMOS N1 NM
 OS Q21 Q22 P PW1 , NMOS N2 NMOS Q11 Q
 12 P PW0 . P PW0 P PW1 N NW

N NW, P+ FLP1 PL1 PMOS P1
 , P+ FLP2 PL2 PMOS P2
 P PW0, N+ FLN1 PL1 NMOS N1
 , N+ FLQ11 FLQ12 PL10 NMOS Q11 Q12
 N1 PMOS P1 N NW P PW1 , NMOS Q11 Q12
 PL10 NMOS

P PW1 , N+ FLN2 PL2 NMOS N2
 , N+ FLQ21 FLQ22 PL20 NMOS Q21 Q22
 N2 PMOS P2 PL2 N NW P PW0 PL20 NMOS , NMOS Q21 Q
 22

PL1 PL20 PL2
 PL10 FLP1, FLN1, FLQ21 FLQ22가
 FLP2, FLN2, FLQ11 FLQ12가

, PMOS P1, NMOS N1, Q21 Q22 , PMOS
 P2, NMOS N2, Q11 Q12 , 2 MD
 HC2 MS 2 (HC2=HC1).

P+ PLP1, FLP2 P , N+ FLN1, FLN2,
 FLQ11, FLQ12, FLQ21 FLQ22 N , 5

P PW0 , N+ FLN1 LG1 CH FLN1
 FLQ11 FLQ11 PL10 1BL21(1 GC) 1WL1 CH
) CH FLQ12 FLQ12 1BL21(1
 , N+ FLQ11 PL1 SC ,
 PL1 N+ FLQ12

N NW , FLP1 LV1 CH FLP1
 FLP2 FLP2 LV1 CH CH

P PW1 , FLQ21 1BL22(1) CH
 1 FLQ21) CH FLQ22 1BL22(
 0 PL20 1WL2(1) LG1 GC PL2
 N2 FLN2) LG1 CH FL

FLN1 P+ FLP1 1
 AL11 , FLN1 CH ,
 P+ FLP1 PL2 PL2 SC ,
 AL11 P+ FLP1

FLN2 P+ FLP2 1
 AL12 , FLN2 CH , P
 + FLP2 PL1 PL1 SC ,
 AL12가 P+ FLP2

6 , LG2 VH1 LG1()
 , LV2 VH1 VH1 LV1()

VH2 2WL1 VH1 1WL1() 3WL1
 2WL1 1WL1 3WL1 1 2 1

WL1

2WL2(2) VH1 1WL2() ,
 3WL2(3) VH2 2WL2) 1WL
 2 3WL2 1 2 2 WL2

3WL1 3WL2 , P PW0, PW1 N NW

2BL21(2) VH1 1BL21()
 , 2BL21(2) VH1 1BL21(
)

2BL22(2) VH1 1BL22()
 , 2BL22(2) VH1 1BL22(
)

21 2BL21, 1BL21 2BL21, 1BL21 , 1 2 1 BL
 2 BL21 , 2BL22, 1BL22 2BL22, 1BL22 , 1
 2 BL22 BL22

N 2BL21, 2BL21, 2BL22, 2BL22, LG2 LV2 , P PW1, PW0
 NW

7 1 (11) 2 (12) MS 2
 MD , 7 1

MS 2 MD (HC1=HC2)
 MS 2 MD
 VH1() (39) 1WL1 GC

< 2>

8 2 2 , 1
 (60)(1) 2 (70)(2) , 1

60 1 (61), (62), 60 70
 61 1 WL1(1) (63) (64) .1
 WL21(2) 2 WL22(3)가 , 71 1

63 AD1 , RE1 WE1
 1)) (62) 1 WL1 64 62(1) (

4 64 63 1 BL1 BL1 1 BL1 BL1
 DIO11<7:4> . (61)

73 70 2 71, 1 (72(1 (2)),
 74 2 (75(2), 76 (2)), 77

73 AD1 , RE1 WE1
 , 72 74 . 72
 1 WL21

4 74 73 , 1 BL21 · BL21 2 BL21 · BL21 71
DIO11<3:0>

76 AD2 , RE2 WE2
75 WL22 77 75

4 77 76 , 2 BL22 · BL22 2 BL22 · BL22 71
DIO2<3:0>

64, 74 77 가 .

2 , 2 (12) 가, 2 1 (16) 1 (11)
71 , 62 72 1 2
1 , 2 , 1 61 2 가, 71 4 AD1
1 가 . 8

2 , 2 가 71 . , 4 4 가, AD2

4 , 2 , 8 , 4 1 2 4 가 ,

(61) 2 2 , (71) 60 70 , 1 62 63
가 1 가가 , 1 (61) 2 AD1 (71)

2 (71) 1 , 1 WL1 WL21 62 , 1 (61) 2
72

2 62 72 1 (61) 2 (71)가 가
1 (16) 가

1 1 2 , 8 1 , 8 , () (

< 3>

9 3 .

18(1) 1 (11L)(1
(12R)(2) 1
11L 1 WL1L(1) , 2 12R
1 WL1R(2) 2 WL2(3)가 .

18 가 1 WL1L WL1R .
1 1 .

WL1L³ WL1R¹ (11L)² (12R)¹
 (18) , 1 (11L), 2 (12R)

10 9 (18) 18
 18a , 30 AD1 ,
 65 OL<0> OL<n-1> 'H' .

OL<0> OL<n-1> DRL<0> DRL<n-1> DRR<0> DRR
 <n-1> DRL<0> DRL<n-1> WL1L<0> WL1L<n-1> ,
 DRR<0> DRR<n-1> WL1R<0> WL1R<n-1> , WL1L<i>
 WL1R<i> , OL<i> ('H') .

3 , 1 가 , .
 3 (12R) 1 WL1L, WL1R (11L), 2
 1

가 , 3 (18) 가 , 1 (16)
 2 .

WL1L³ WL1R¹ (11L)² (12R)¹
 (12R) , 1 가 , 1 WL1 (11L)² 1
 , 2

< 4>
 ()

11 4 .

(13)(²)¹ (11) (CAM : Content Addressable Memory)
 2 () WL1(1 ()) , CAM 13 1 WL1((11)
 16, 31, 21, 22 1 1 , .
 33 (add) ME , 26 27 .

26 33 , m (search line pairs) SL
 DI2<m-1:0>, 1 CAM 13 .

27 33 M0 B0 CAM 13 ML
 , .

()

12 1 (11) CAM (13) , ()
 , 2x2) .

1 (11) , 2 1 , .

, CAM (13) mc00, mc01, mc10 mc11 .

mc00 mc11 , 41 42 , 41 NMOS Q23 Q26
 Q11 , 42 , NMOS Q12 , NMOS

42 41 NMOS Q23 Q24 , 가
 N23 , N23 NMOS Q25 Q26

WL1<0> mc00 mc01 , NMOS Q11 Q12 1
 , NMOS Q25 Q26 ML<0>

WL1<1> mc10 mc11 , NMOS Q11 Q12 1
 , NMOS Q25 Q26 ML<1>

mc00 mc10 1 BL21<0> . BL21<0>
 mc00 mc10 , NMOS Q11 1 BL21<0> BL21<0>
 , NMOS Q12 1 BL21<0>

10 , mc00 mc10 SL<0> . SL<0> mc00 mc
 , NMOS Q23 SL<0> , NMOS Q24
 SL<0>

mc01 mc11 1 BL21<1> . BL21<1>
 mc01 mc11 , NMOS Q11 1 BL21<1> BL21<1>
 , NMOS Q12 1 BL21<1>

11 , mc01 mc11 SL<1> . SL<1> mc01 mc
 , NMOS Q23 SL<1> , NMOS Q24
 SL<2>

ML<0> ML<1> 55 56(, 27())

()

, 11 12 , 2 , 1
 , 2 (12)가 CAM (13) 1

, 2 (11)
) CAM (13) n()x m()=2x2 , , 1

2 , ML<0> ML<1> 'H'
 ME , ML<0> ML<1> , DI2<1:0>

26 , ML<0> ML<1>

'H' 26 , DI2<1:0> , SL<0> . SL<0> SL<1> . SL<1>
 'L' , CAM 13 mc00 mc11

, SL<0> . SL<0> , 가 '1'(SL<0> .
 SL<0> 'H' . 'L')

Q23 , mc00 '1' (41 'L'(42 'H')) , NMOS
 , NMOS Q24가 , 'L' N23 , NMOS
 Q25 Q26 , ML<0> 'H' ().

23 , mc00 '0'(41 'H'(42 'L')) , NMOS Q
 , NMOS Q24가 , 'H'가 N23 , NMOS
 Q25 Q26 가 , ML<0> 'L' (lead) ().

SL<1> · SL<1> SL<0> · SL<0> mc01 mc11 mc10 ML<1>
 ML<0> ML<1>

mc00 mc01 가 ML<0> 'H'가 ,
 가 ML<0> 'L' .

mc10 mc11 가 ML<1> 'H'가
 가 ML<1> 'L' .

ML<0> ML<1> 55 56 , 12
 (27) , ML 가 2 B0 M0 . M
 ML 1 B0 'H'가 , B0 'L' .

L 'H' () , 1 1 (11) CAM (13) 4
 8 가 가 .

2 CAM (13) 4 가 .
 4

4 , 8 4 ,
 4

4 CAM (13) 가 (16) 1
 (11) 가 가 .

()

13 CAM MC 41 PMOS
 P1 NMOS N1 CMOS , 42 PMOS P2 N
 MOS N2 CMOS .

WL, BL, BL, ML, SL · SL , 12
 mc00 .

14 16 CAM MC 14
 15 1 .
 16 2 , 14

15 , PMOS P1, P2 N NW , NMOS N1 N
 MOS Q23 Q26 P PW1 , NMOS N2 NMOS Q11 Q
 12 P PW0 . P PW0 P PW1 N NW

N NW , P+ FL110, FL101 PL1 PMOS
 P1 , P+ FL100, FL111 PL2 PMOS P
 2 .

FL110 PL2 .

16 , LG2 VH1 LV1(LG1())
 , LV2 VH1

VH2 2WL1 VH1 1WL1() 3WL1 11 13 1
 2WL1 2WL1 1WL1 3WL1
 WL1

2ML VH1 1ML() 3ML 11 13 2 VH2
 2ML 1ML 3ML

ML 3WL1 3ML , P PW0, PW1 N NW

2BL21 VH1 1BL21()
 2BL21 VH1 1BL21()

2SL(2) VH1 1SL()
 2SL(2) VH1 1SL

L21 2BL21, 1BL21 2BL21, 1BL21 , 11 13 1 B
 SL BL21 , 2SL, 1SL 2SL, 1SL , 11 13 SL,

2SL 2ML 2DL(2) 2DL
 2DL

2BL21, 2BL21, 2SL, 2SL, LG2, LV2 2DL , P P
 W1, PW0 N NW

, CAM MC , MS (HC1=CHC)
 , 7 1 가 , MS CAM MC
 1 1WL1 GC VH

()

, CAM (16) , 3 , (18) 1 (11)
 (13) , 3

< 5>

()

17 5

, 2 14(1) 2 12 1
 , 2 14 1 WL1(1
 1(2 ()) 2 WL3 , 2 12 1 WL
 ()) 2 WL2(3)가

(16, 17), (31, 32), (21 23) , 1 1 ,
 , 21 1 , BL11 BL11

34 AD3 RE3 WE3
 , (18) 24 .

19 34 , 2 14 2
 WL3 .

4 24 34 2 BL12 BL12
 , DIO3<3:0> BL13 2 14

24 (SA) (WD) 가 .

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18 2 14 2 12
 , (, 2x2) , 2 12 2

2 14 mw00, mw01, mw10 mw11

mw00 mw11 , 41 42 , 41 NMOS
 Q11 Q31 , 42 Q12 Q32 .

2 WL3<0> WL3<1> 57 58(, 19())

WL1<0> mw00 mw01 , NMOS Q11 Q12 1
 L3<0> , NMOS Q31 Q32 2 W

WL1<1> mw10 mw11 , NMOS Q11 Q12 1
 L3<1> , NMOS Q31 Q32 2 W

mw00 mw10 1 BL11<0> BL11<0>
 mw00 mw10 , NMOS Q11 1 BL11<0> BL11<0>
 , NMOS Q12 1 BL11<0>

mw00 mw10 2 BL12<0> BL12<0>
 mw00 mw10 , NMOS Q31 2 BL12<0> BL12<0>
 , NMOS Q32 2 BL12<0>

mw01 mw11 1 BL11<1> BL11<1>
 mw01 mw11 , NMOS Q11 1 BL11<1> BL11<1>
 , NMOS Q12 1 BL11<1>

mw01 mw11 2 BL12<1> BL12<1>
 mw01 mw11 , NMOS Q31 2 BL12<1> BL12<1>
 , NMOS Q32 2 BL12<1>

()

, 2 14 2 2 12
 , , 1 , .

12가 , 가 5 , (16) 2 2 14 2 가 1
 (2)
 2 2 (, 17 2 가 3 , 2 4)
 ()
 5 6 1 2 (12) 가 2
 14 , 2 12 2 14 .
 ()
 2, 2 16 14 , 3 , 3 18 2 1
 < 6 >
 ()
 19 6 .
 , 1 11 2 36(2) 1
 ()) WL2(3 , 2)가 . , 1 36 1 (11) WL1(2 (WL1(1))
 16, 17, 31 21, 22 , 1 1 , .
 35 AD2 RE2 ,
 17 37 37 .
 37 35 RBL 2 , 2 RBL 4
 0 > DO2<3:
 , 37 가 .
 ()
 20 2 36 1 2 38 .
 , 42 PMOS 41 PMOS P2 NMOS P1 NMOS N1 CMOS
 , 41 (42) Na NMOS N3 1 BL21
 , 42 Nb NMOS N4 1 BL21
 , NMOS N3 N4 1 WL1 .
 NMOS N5 Na , NMOS N6 2 NMOS WL2
 N6 RBL , NMOS

()

, 19 20 , 2 , 2
 36 n()x m() , 1 , 1 ,
 RBL 'H' , RE2 RE2가
 가 , AD2 5 17
 , n 2 WL2<n-1:0> 2 WL2<i>(i=0 n-1)
 NMOS , 2 Q21 2 Q22가 , 2 36 RBL
 , 2 NMOS 38 '0' (Na가 'H' 가) , NMOS N5 2 WL
 2 NMOS N6 , RBL 'L'
 2 WL2 38 '1' (Na가 'L' 가) , NMOS N5가 , 2
 NMOS N6 , RBL 'H'
 , 2 38 RBL
 , RBL 4 AD2 35 37 , m
 DO2<3:0> 4 , 1 1 11 2 36 4
 8 가가
 4 , 2 2 36 4 가 ,
 4 , 6 , 8 , 4 1 2 4 가 ,
 , 6 (11) 2 (36) 가 (16) 1 2
 가 1 () ,

(2)

1 가 2 1 2
 , 6 가 2 , 2 (3) , 2
 (17)

()

21 23 2 36 2 38 21
 . 23 2 . 22 1 .
 21
 22 , PMOS P1, P2 N NW , NMOS N1 N
 MOS N5 N6 P PW1 , NMOS N2 NMOS N3 N4
 P PW0 . P PW0 P PW1 N NW 흥

N NW , P+ FL110, FL101 PL1 PMOS
P1 , P+ FL100, FL111 PL2 PMOS P
2

P PW1 , N+ FL201, 211 FL213, FL201 P
L1 NMOS N1 N5 , N+ FL230, 213
W1 PL4 NMOS N6 , PL1 N NW P P
, NMOS N1, N5 PMOS P1

P PW0 , N+ FL200, FL210 PL2 NMOS
L3 N2 , N+ FL210, FL220 FL212, FL221 P
W10 NMOS N3 N4 , PL2 N NW P P
PL3 NMOS , NMOS N2 PMOS P2 ,
, PL4 PL1 PL3 , PL2

, PMOS P1, NMOS N1, N3 N5 , PMOS
P2, NMOS N2 N6 , 2 38 , PMOS
MS 가 2 (CH3=HC1). CH3

P+ FL1 . . . P , N+ FL2 . . . N

P PW0 , N+ FL200 LG1 CH FL200
220 1BL21 PL3 GC , 1WL1 , FL
1BL21 CH FL220 , FL221
CH FL221

, N+ FL212 PL1 SC ,
PL1 N+ FL212가

N NW , FL101 FL100 LV1 LV1 CH CH FL100
, FL101 LV1 CH FL101

P PW1 , FL230 1RBL(1) CH
FL230

L202 PL4 1WL2 GC PL4 , F
FL201 LG1 LG1 CH FL202 FL201 ,
LG1 CH

P PW0 FL210 N NW FL111 1
AL102 , FL210 CH ,
FL111 PL1 SC , AL102가 ,
FL111 PL1

P PW1 FL211 N NW FL110 1
AL103 , FL211 CH ,
FL110 PL2 SC , AL103 ,
FL110 PL2

23 , LG2 VH1 LG1()
LV2 VH1 LV1()

VH2 2WL1 VH1 1WL1() 3WL1 19 20 1
 2WL1 2WL1 1WL1 3WL1
 WL1

VH2 2WL2 VH1 1WL2() 3WL2 19 20 2
 2WL2 2WL2 1WL2 3WL2
 WL2

3WL1 3WL2 , P PW0, PW1 N (NW)

2BL21(2) VH1 1BL21()
 , 2BL21(2) VH1 1BL21(
)

2RBL(2) VH1 1RBL()

BL21 2BL21, 1BL21 2BL21, 1BL21 , 19 20 1
 BL21 BL21 , 2RBL 1RBL , 19 20 RBL

NW 2BL21, 2BL21, 2RBL, LG2 LV2 , P PW1, PW0 N
 , 2 38 , MS (HC1=CH3)
 , 7 1 , MS 2 38
 , 1WL1 GC VH1

()

1, 2 16 36 , 3 , 3 18 1 1

< 7>

()

24 7

15a(1) , 15b(3)가
 (15a, 15b, 15m)가 15m(2)가
 1 1 15a, 15b

30A AD1 RE1 WE1
 , 20A 25A

30B AD2 RE2 WE2
 , 20B 25B

20A(1) 1 WL1(1, 2)
)) , 20B 2 WL2(3)

25A 30A 1 BL1 · BL1 1 1 BL1 · BL1
 , DIOA 1 11

25B , 30B 2 , 2 BL2 BL2 2 BL2 BL2
 , DIOB .

25A, 25B SA WD 가 .

()

25 1 15a, 15b 6(6a, 6b)

44 , 43 PMOS P12 NMOS P11 NMOS N12 N11 CMOS
 , 44 (PMOS P12 NMOS N12)가 .

b) (6) 43 (Na) NMOS N13 , 44 (N
 NMOS N13 N14 DBL WL(WL1, WL2) , NMOS N14 , NMOS
 N13 DBL .

26 2 15m 1 15a, 15b 15m
 2x2) , (

20A 1 WL1 , 1 WL1 'H'
 20B 2 WL2 , 1 2 WL2 'H' .

2 1 Q21 , 5 , 42 41 42 , 41 NMOS Q12 Q22 NMOS Q1
 L1 2 5 , NMOS Q21 Q22 Q1.2 2 1 WL2 W

BL1 2 5 NMOS , NMOS Q11 Q12 1 BL1,
 L2, BL2 Q21 Q22 2 B

) 1 1 15a 6a , NMOS , NMOS N13 N14 (1
 DBL0 DBL1 WL1 . N13 N14 N14

) 1 2 15b 6b, NMOS , NMOS N13 N14 N14 (2
 DBL1 DBL1 WL2 . N13 N13 N14

7 2 15m 1
 15a, 15b .

()

(6) 1 15a 6a

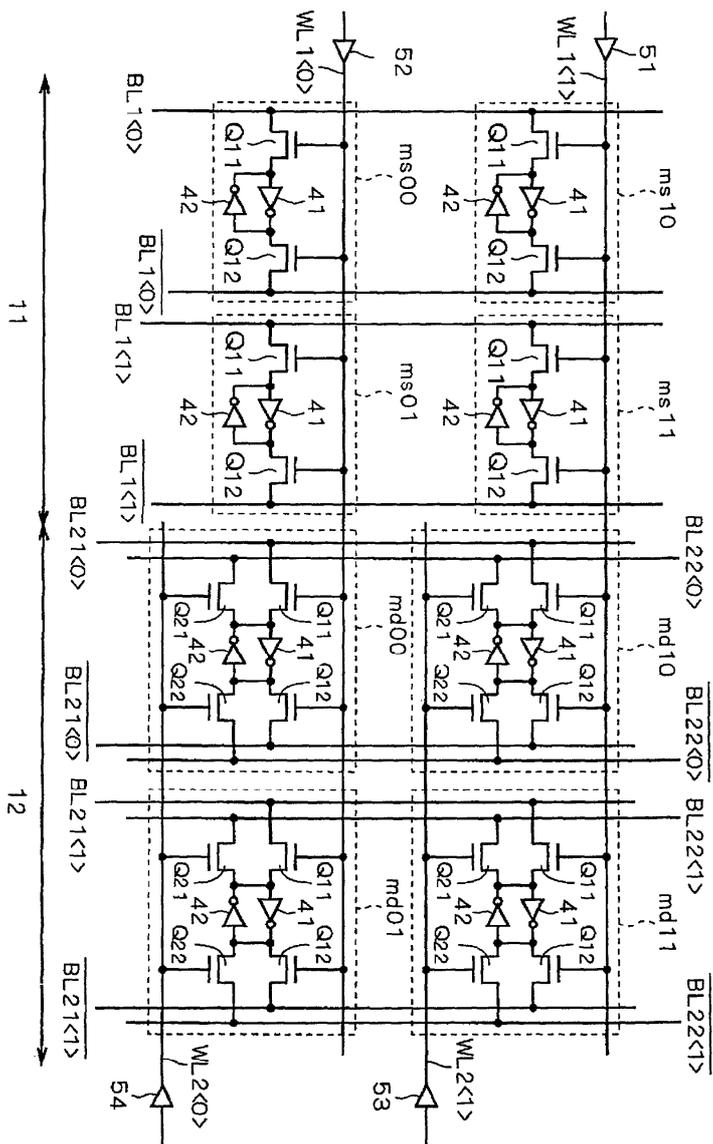
1, 2 DBL, DBL 15m 1 15a 1
 0 1, WL1 'H' 6a , DBL0 1 가 'L' WL1 'H' , DBL
 , 'L' DBL 25A (15m SA 2 5
) , 2 2 15m 2
 , 6a 2 5 ,
 , 6b , 2
 , 6a 1 5 , 6b 2
 , 2 15m 2 , 2 2
 ()
 (6) , 2 15m 2 5 1
 2 , 2 , 1 , 1 2 (3,
 4, 7) 2 (12) (5 7)
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 15a, 15b 15a, 15b , 1 1
 , 7 , 가 , 2 5
 가 가 , 1 2 , 1 가 1 1 2

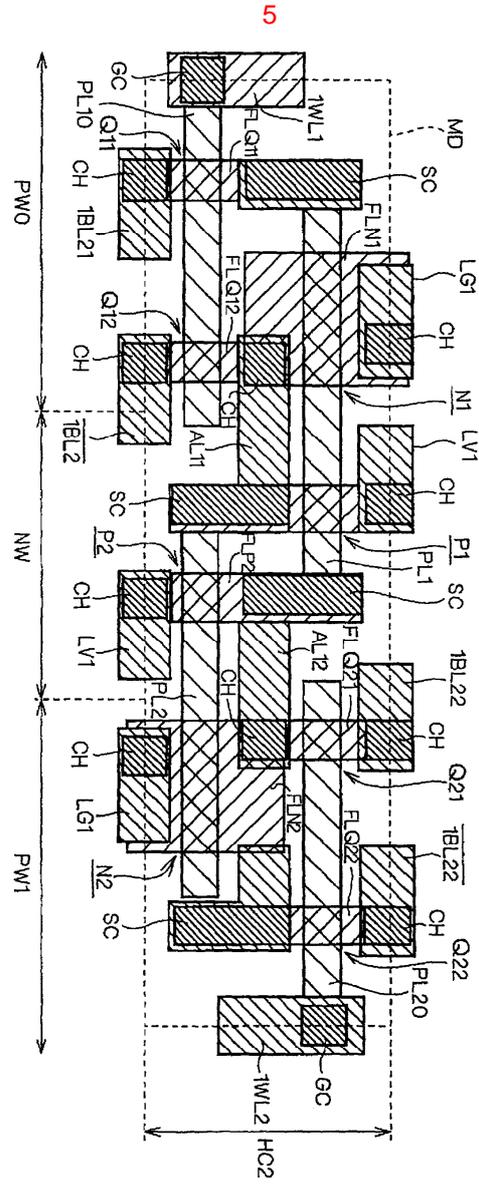
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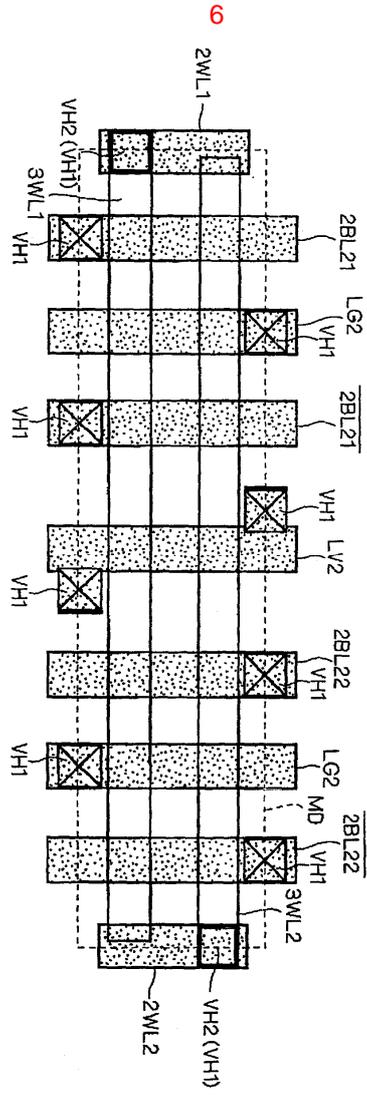
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 1 2 ,
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 1 2 ,
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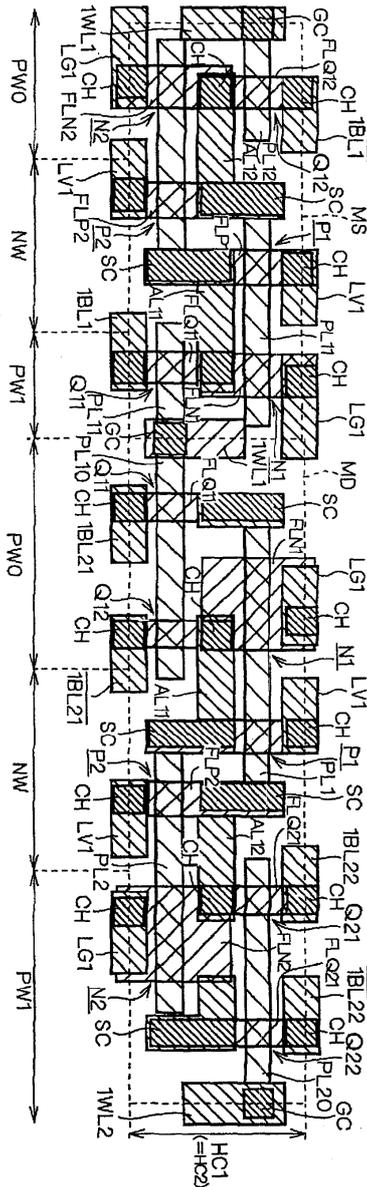
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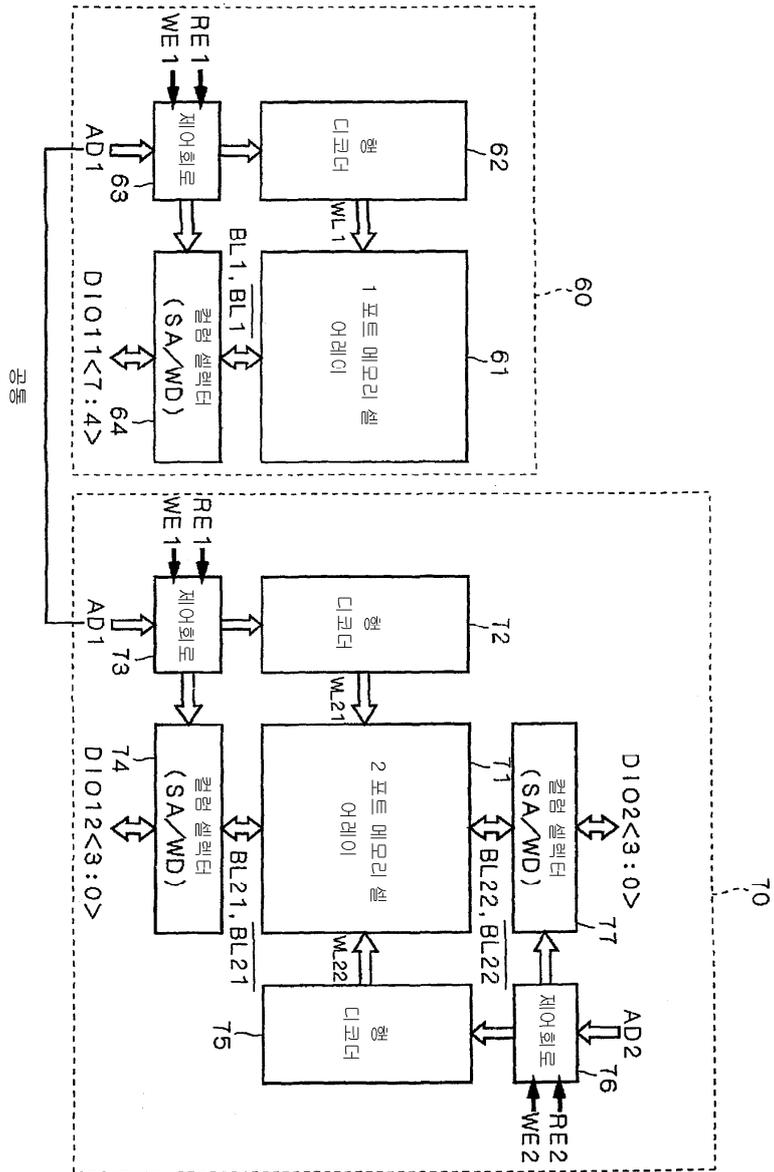


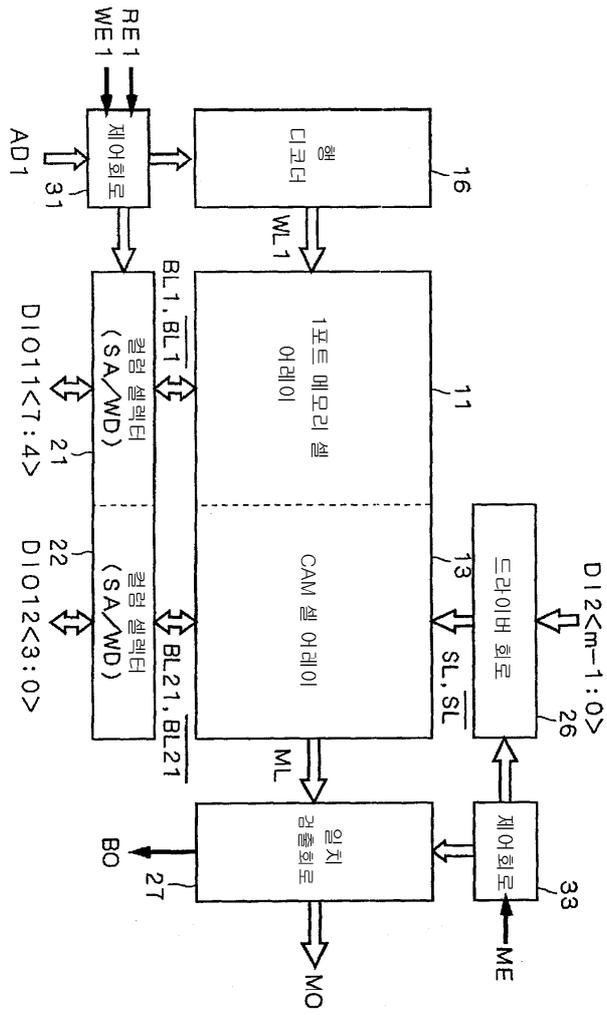


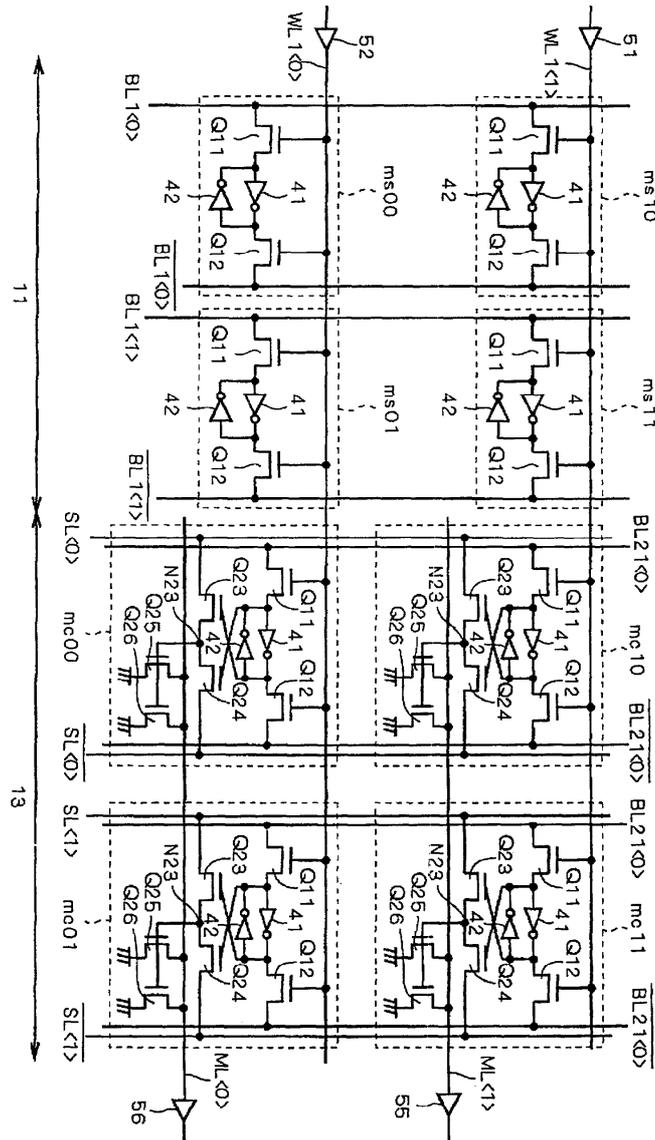
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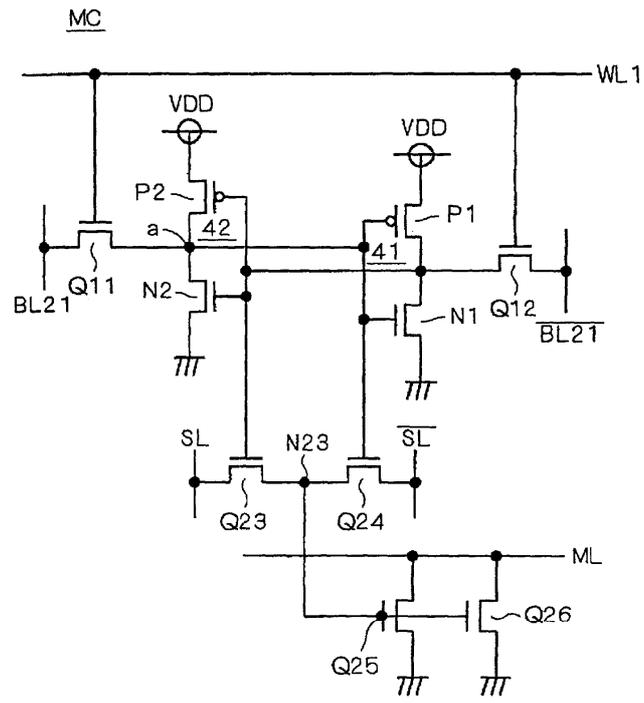
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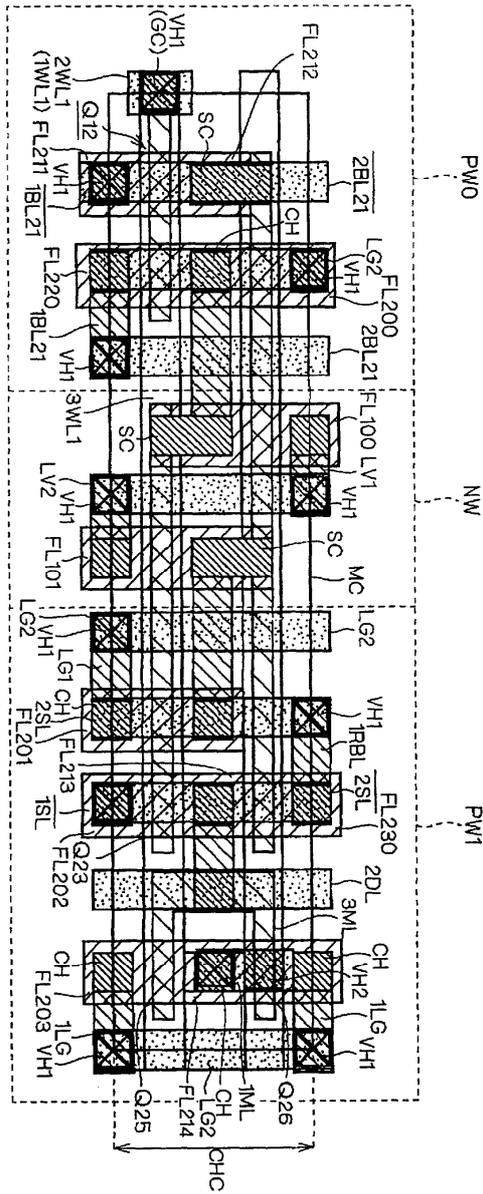


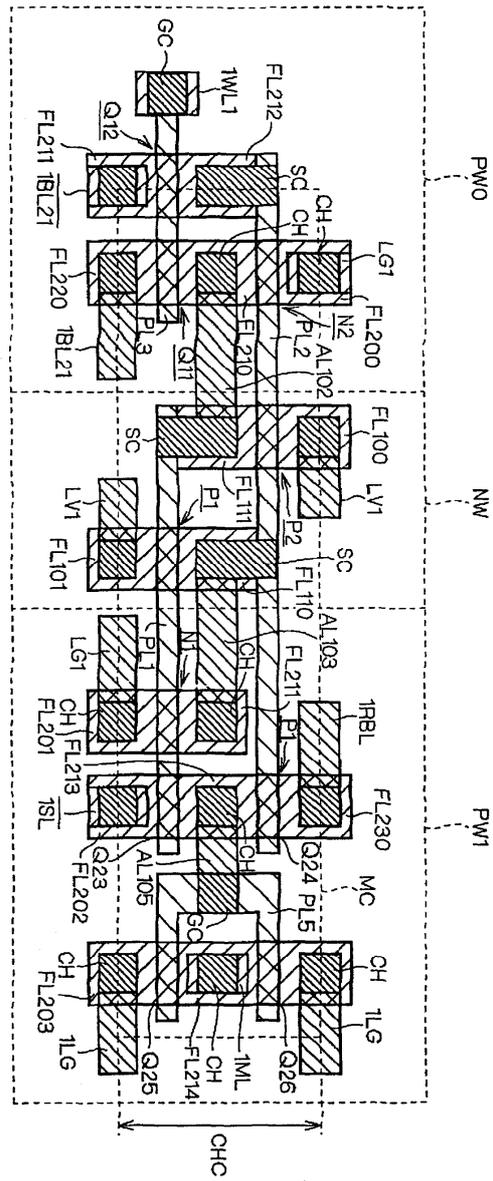




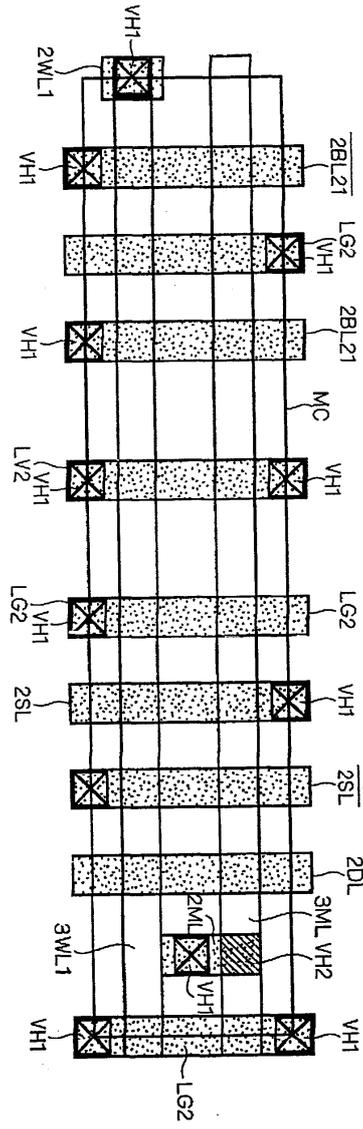
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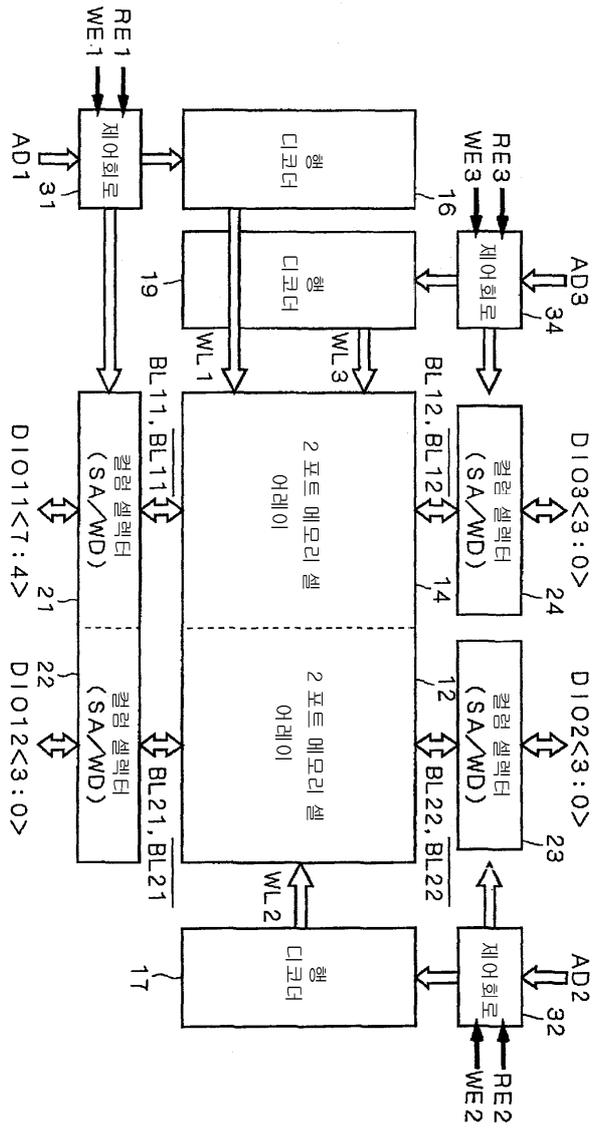




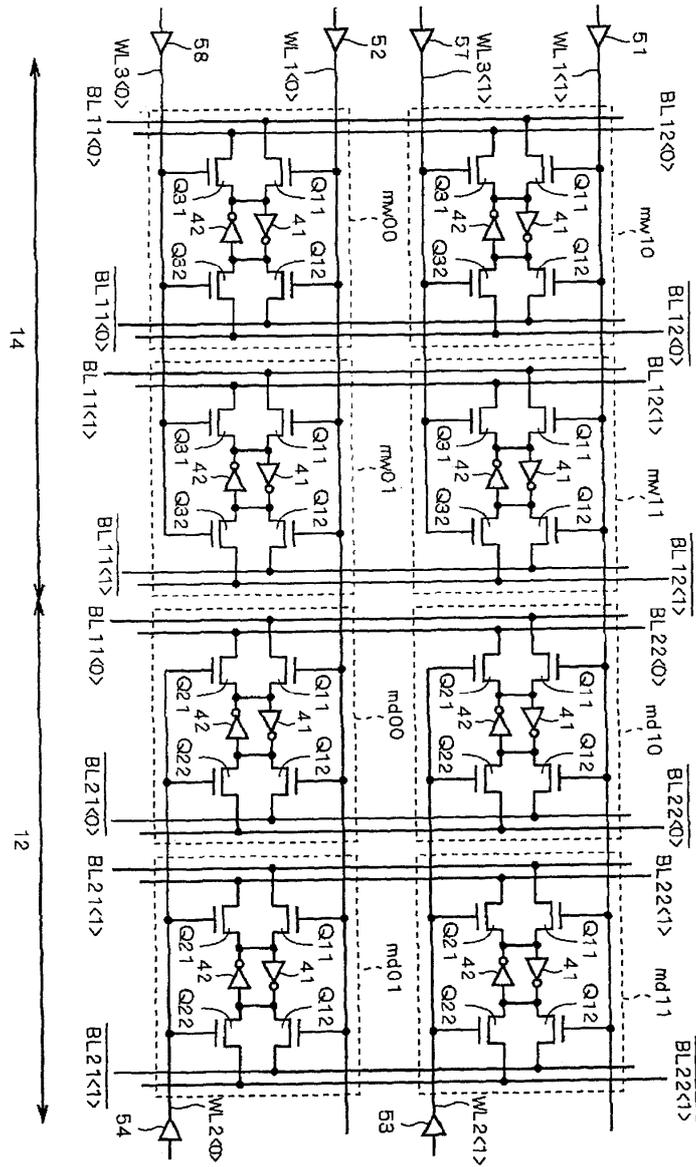


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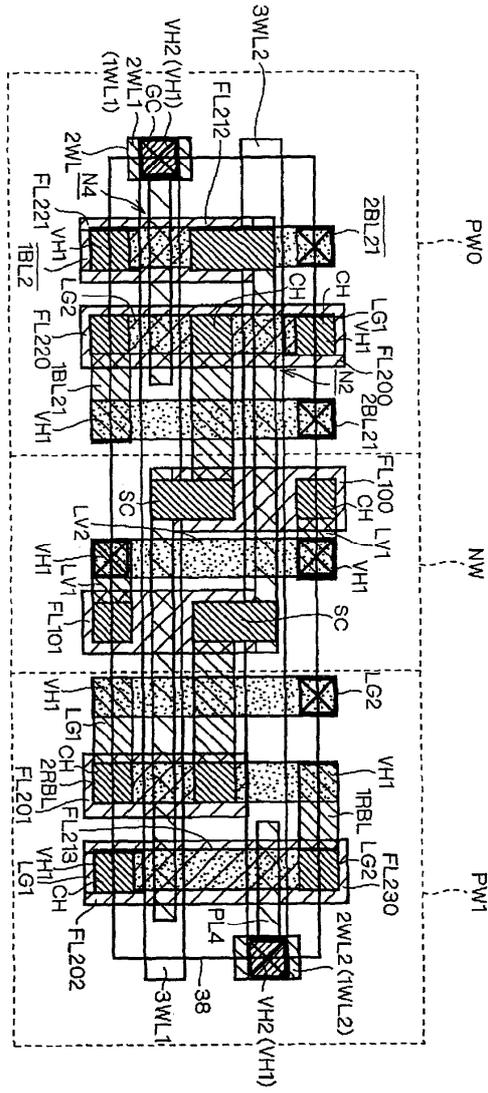


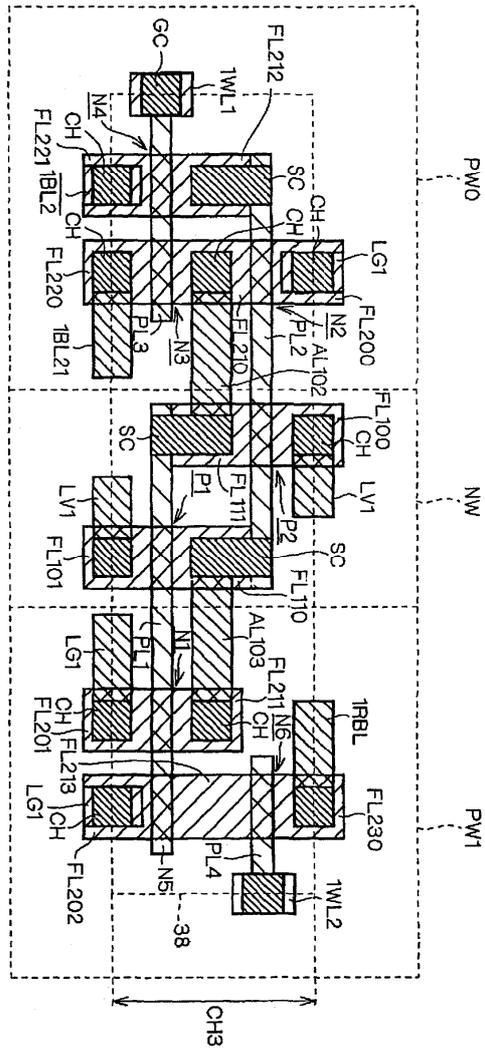


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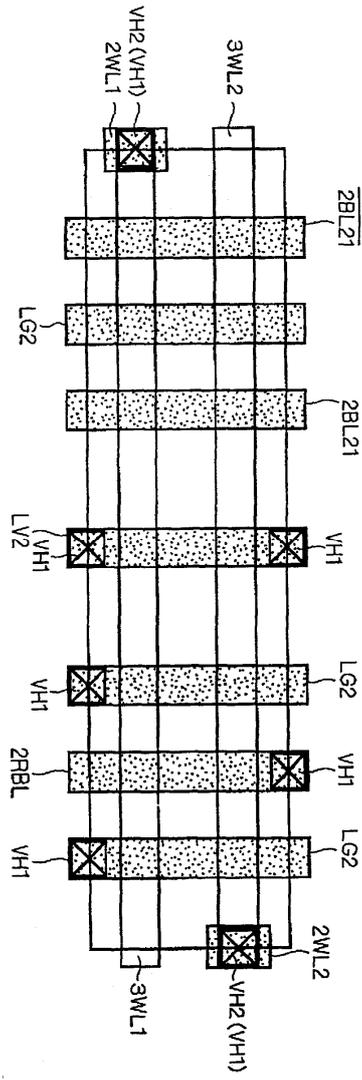


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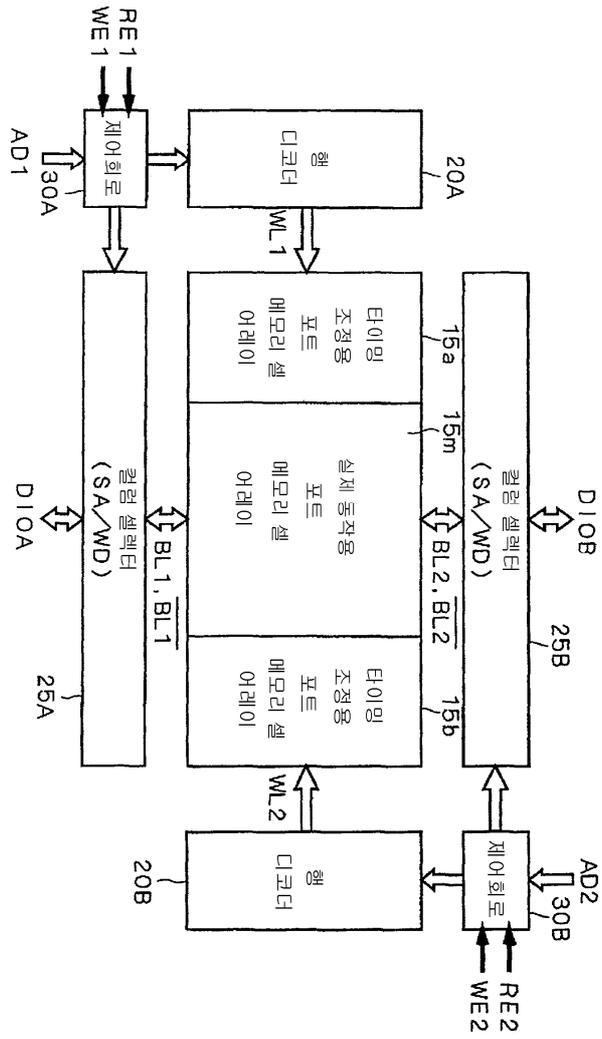




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