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(11)  
(24)

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(22) 2000 03 04

(65) 2001 - 0020647  
(43) 2001 03 15

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(73) 가 가 , 2 2 3

(72) 가 2 2 3 가 가  
2 2 3 가 가

(74)  
:

(54)

가 ,

가 (1~3) , (5)가 , (4)가 , (6)가 , /

1                    1                    10                    ,  
 2                    1                    ,  
 3                    ,  
 4    SPF                    ,  
 5                    1  
 ,  
 6                    2                    ,  
 7                    3                    ,  
 8                    4                    ,  
 9                    5                    ,  
 10                    6                    ,  
 11                    7                    ,  
 12                    8                    /                    ,  
 13                    9                    /                    ,  
 14                    10                    ,  
 15                    11                    ,  
 16                    12                    ,  
 17                    12                    ,  
 18                    13                    .

1:        ( 1        ) 2:        ( 2        )  
 3:        ( 3        ) 4:        (        )  
 5:                (        )  
 6:        (        ) 7:        ( 4        )  
 8:        (        ) 9, 10:        ( 4        )  
 11:                (        )

100, 200, 300 :

, , /

/ , , RC ,

가 .

, , 가 , , 가 .

가 , 가 .

, / , 가 .

/ , / , .

, / , , 1 , , / , 3 , 1 , 2 , 3 , 2

, , 가 ,

1

1

1

1

1

가

1

가

1

가

1

가

가

가

가

/

가 가 가

4

4

(back annotate)

1

1

2

3

가

4

4

/ / / , ,

.

,

,

.

( 1)

1 1 1 10 (100) , 2

1 (1)

( ST1) ( 1 ), (2)

( ST2) ( 2 ), (3)

( ST3) ( 3 ) .

(4) (1) , (2) , (3)

( ) . (5)

( ) .

(6) (5) ,

( ) ,

/ (7) ( ) . (7) (6)

/ ( 4 ) . (8) ( )

) ,

(100) , (4), (5), (6), (1, 2, 3, 7)

(8)

2 .

3 , SPICE x .

, SPICE

, SPICE

SPF (Standard Parasitic Format)가 OVI(Open Verilog International)

ST1, ST2, ST3

4 SPF 5 (100) (4)

3,4 가 , (c) x , x

1 가 (100) (4) , 5a 5c ,  
(8) ( ST7). (1)  
( ST4) ( 5a ),  
( ST5) ( 5b ). 5b

(100) (4) 5b ( ST5) ,

(1) / , / / .

(2) / 가 . ,

(3) , ( × ), (40)

100) , / ( ST6) . (40) , 1 (

1 , (1,2,3) , , (100) (4)가 ,  
(40) (40) , ,  
/ (40) , ,  
가 .

( 2)

6 2 2 1 1 , , .

(100) (4)가, 6a 6c ,

6a , (1) , / ,  
, , × , 6b ,

6b , 6c  
(50) 가 (50) . ,

, 2 , (100) (4)가, (1) ,

가 .

( 3)

7 3 1 1 , 3

7 (100) (4)가, (1) , 7a ,

, 7b , M1 M7 , M1 M7  
C M3 , A B M1, M2 , B  
7c .

7c (8) ,

, 3 , (100) (4)가, (1) , (8)

가 , 가 . /

( 4)

8 4 1 1 ,

8 / , 8a , (100) (4)가, (1) ,



(71, 72) , 8b C , 가 , (71, 72) (71, 72) (4) ( )

4 , (100) (4)가, (1) , ( 8b C) (71, 72) ( ) / 가 .

( 5)

9 5 1 1 , , 5 9 가 , (100) (4)가, 1 (40) (81) , (40) (82) (4)가, (2) SPICE (81) (82) , (1)

5 , (100) (4)가, (1) , (2) (40) 가 (81) , (40) (82) (81) / (5)가 가 .

( 6)

10 6 6 1 1 , , 10 , (100) 가 (4)가, (1) (91, 92) , , 가 ,

(4) .

(1) / NMOS (91) ,

(2) / PMOS (92) ,

(1) , .

6 , (100) (4)가, (1) ,

2) , 가 (91, 9

가 ,

( 7)

11 7 7 1 1 , .

11 , (100) (4)가 (1) (101, 1

02) , ,

(4) .

(1) / PMOS (101) ,

(2) / NMOS (102) ,

(1) , .

7 , (100) (4)가 (1) ,

102) , 가 (101,

가 ,

( 8)

12 8 /  
 , 8 , 1 1 ,  
 , 12 (100) (4)가, (1)  
 11, 112) , / 가 (1)  
 , (4)  
 (1) / , PMOS (111)  
 (2) / , NMOS (112) ,  
 , (1)  
 , 8 , (100) (4)가 (1) ,  
 1, 112) , / 가 (11)  
 가 ,  
 가 , ,

( 9)

13 9 /  
 , 9 , 1 1 ,  
 , (100) (4)가 (1)  
 1) , 13 가 가 (12)

(5) / , 50 (6)가  
 , 50 / (8)

(9) , (100) (4)가, (1)가  
 , 가 가 , (6)가  
 (8) / , 가 , 가 가 /  
 , 가 , 가

( 10)

14 10 10  
 1 1 , 10

(100) 14 (4)가, (1)  
 (8)  
 / (5)가 (4) (8)

10 (100) (4)가 (1)  
 (5) / (8)  
 / 가

( 11)

15 11 (200) (9)  
 ( 4 ) , (6) / , ,  
 , 11 (200) , 1 1 ,

(200) (6) , , ,  
 , (9)

, 11 , (6)가 , , , , (9) , , , (1) , , , , 가 , 가 , , , 가 . , , , (9) , , , 가 .

( 12)

16 12 (300) 17 , ( 4 , / (10) ( ) , / ( ST8) . (11) ( ) , (10) ST9). , 12 (300) , 1 1

, (300) (6) / , ( ) / (11) , (10) ( ST8). 9). (11) , (10) , ( ST

/ , 12 , (300) (6) / , / , / (11) , 가 .

( 13)

18 13 13 , 16 12 , , (300) (4)가, , (5)가 , (6)가,

13 (4)가, (1)  
 (6)가 (5)가  
 가 가 가

1, 2, 3 /

가 ( )  
 가 / 가  
 가 가

가 가 가  
 가 가 / 가

/ 가

4 가 4 가  
가 .

/ 가 /

1 가 가

가 가

(57)

1.

/ 1 2 3  
1 3 2

2.





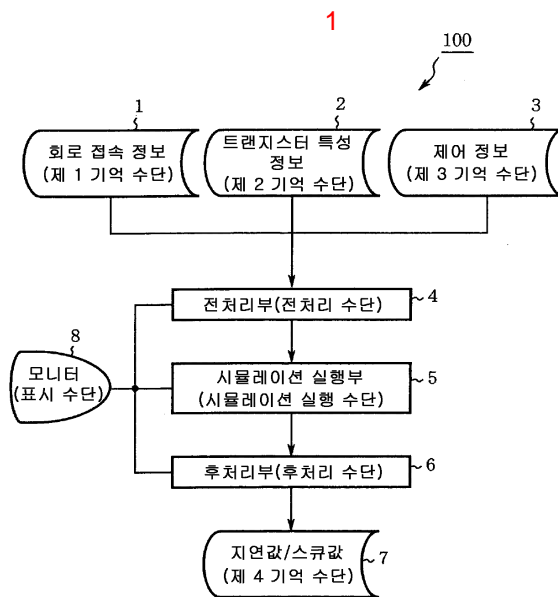
3.

1

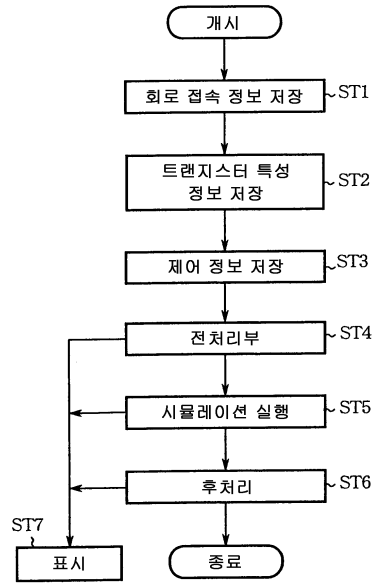
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3

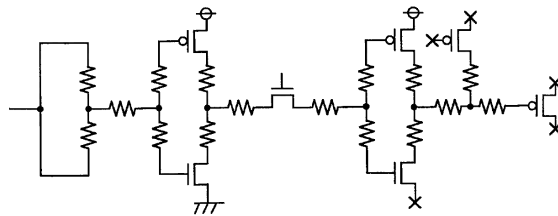
가



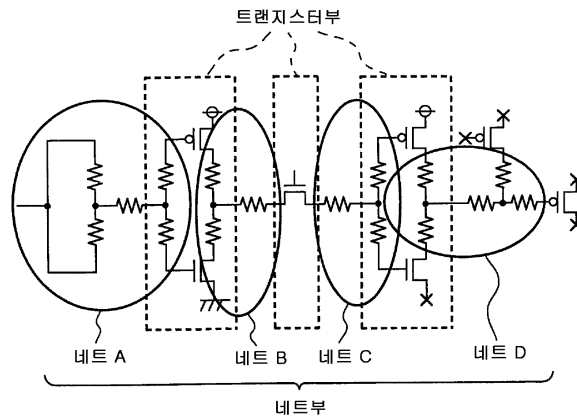
2



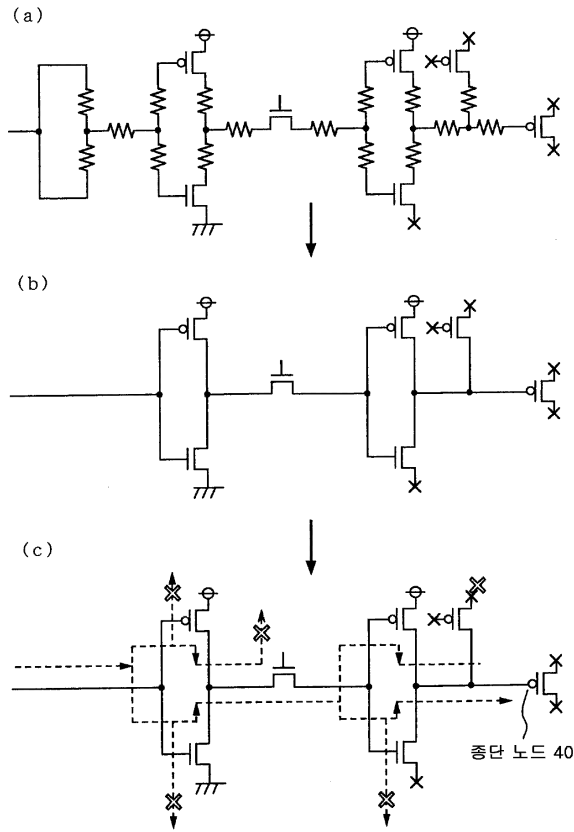
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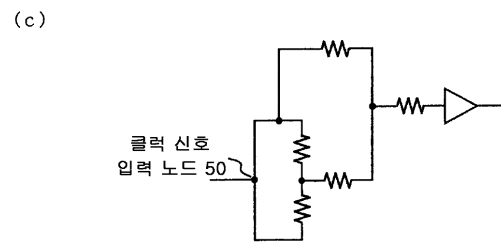
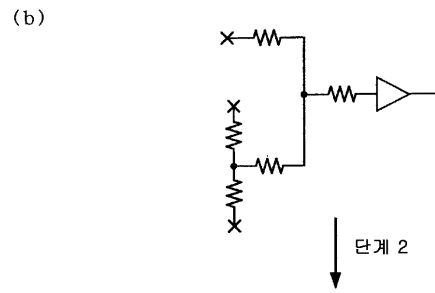
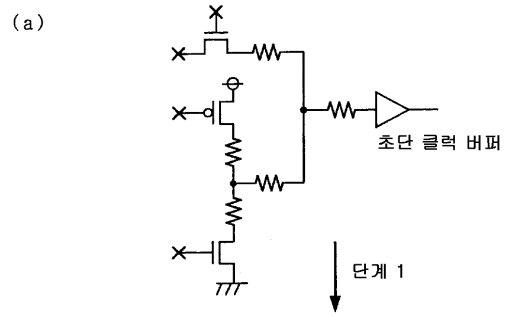
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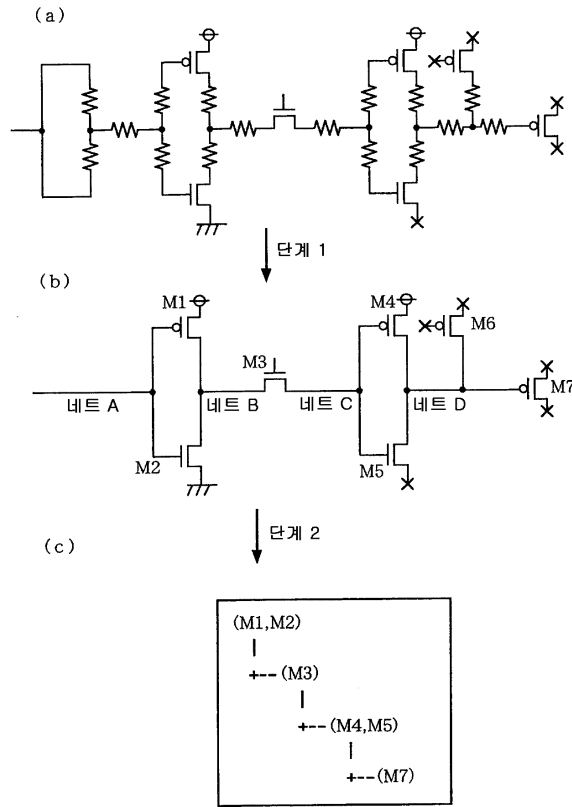
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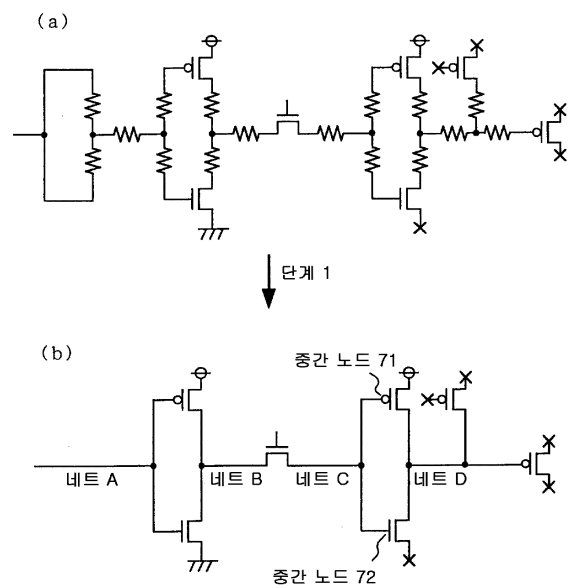
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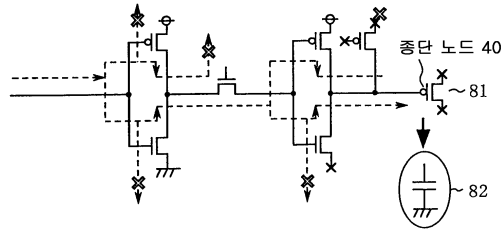
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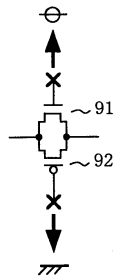
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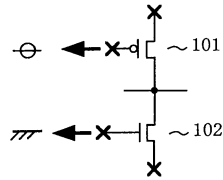
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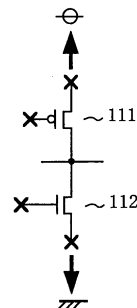
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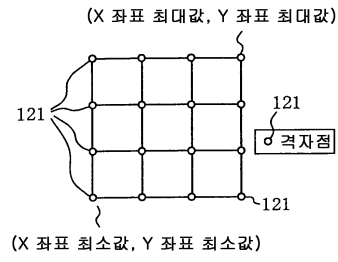
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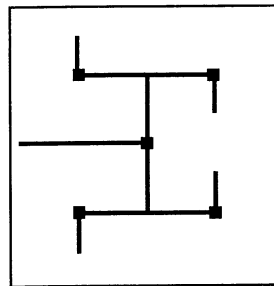
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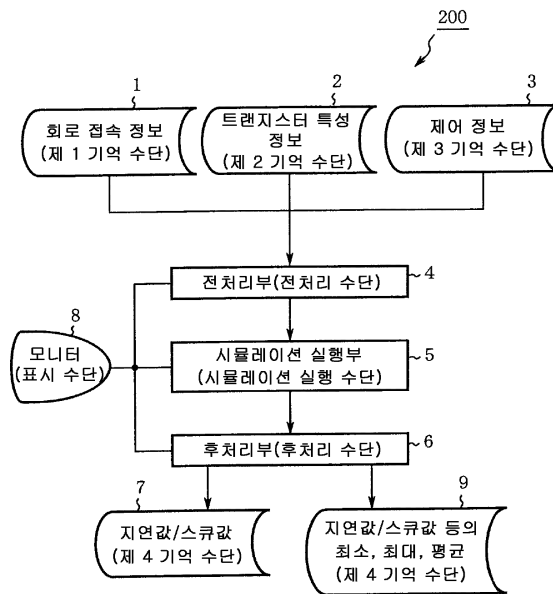
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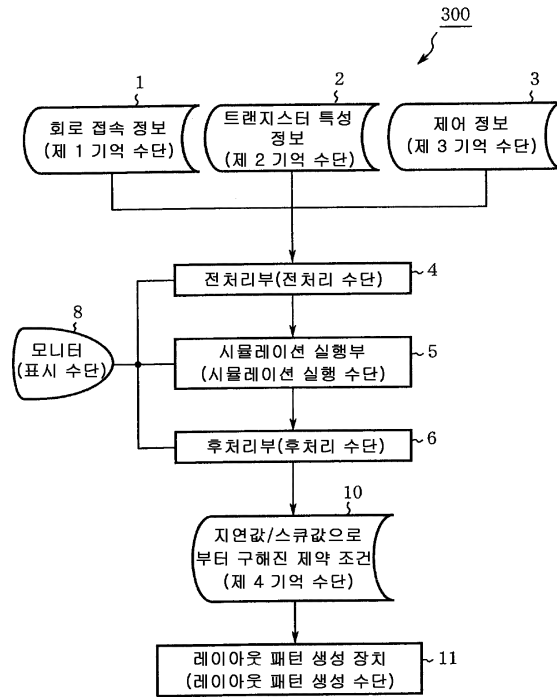
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15

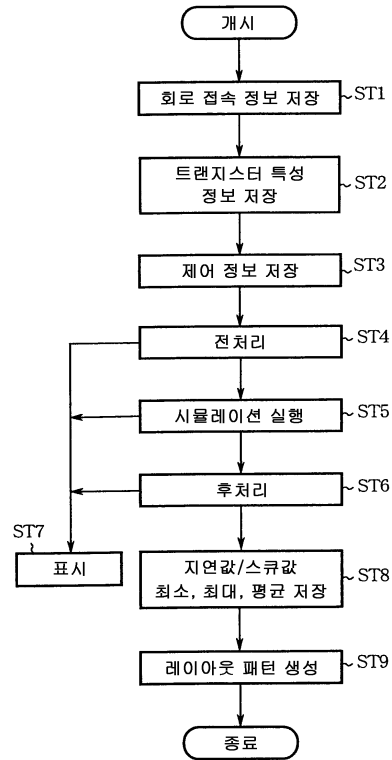


16





17



18

지연값의 큰 변화  
(>10 피코초)

