

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl. ⁷
H01L 29/78

(11)
(43)

2002 - 0008751
2002 01 31

(21) 10 - 2001 - 0037975
(22) 2001 06 29

(30) 2000 - 220697 2000 07 21 (JP)
2001 - 076117 2001 03 16 (JP)

(71) 가 가

2 5 5

(72) 986 - 5 - 2 - 407

가 가 2623 - 1 - 206

(74)

:

(54)

가

1 2 (6, 7) , 2
(4) , 1
(4) , 2 2 (7) (6)

3

MOS

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

< >

1 :

2 :

3 :

4 :

5 :

6 :

7 :

8A, 8B :

가

MOS MOS²

LOCOS LOCOS P (101) (102) (17 (a)).

(101) 17 (b) (102) (103)

3) 17 (c) (104) (MOS (104)) (MOS (103)) (103) (104) (105)

(103) (104) MOS 18 (a) (105)

18 (b) (103) (105) (106A, 106B)

(106A, 106B) N [(107, 108, 109, 110)] (103)

(107, 108, 109, 110) MOS (105) MOS

(c) C), (102) (103) (102) 가 (17 (104) (103) (101) (105) 가

, , 1 2
1 2 , 2 ,
2 2 1 2 ,

, , 1 2
1 , , 1
1 , 2 2 1
2 , 2 2

, 1 가 , 2 가 , 1 가
MOS 가 , 2 MOS 가

, 1
1
1 1

가

1 .

2 MOS () 2 ()

MOS

LOCOS (1) LOCOS

(2) 450nm (1 (a)). P

(1) N 가 .

(3) (1) (3) 20nm (2) (2)

(4) 20nm .

1 (c) (3) (4) (MOS) (3)

(5) (4) MOS) (3)

(5) (5) (4)

2 (a) (5) 2 (b)

(4) (3) (3) (3)

(2) (103)(, 100nm) (2 (b)

A).

2 (c) (43) (1) 1

(: 6) 90nm .

3 (a) MOS (4)

(3) 3 (b) (1) MOS

2 (: 7) 7nm (3)

(2) (3) 가 20nm (3)

40nm (103)(, 100nm)

(3 (a) B).

3 (c) (6) (7)

((WSix)) ,

(8A, 8B) .

(8A, 8B) N [(9, 10, 11, 12)] (9,

10, 11, 12) (6) MOS

, P MOS (29) , N SLED MOS (28) P SLED MOS N MOS
 3 (27) . (26) , (27)
 , 20nm , (103)(, 100nm)
 S , N SLED MOS (28) P SLED MOS N MOS P MO
 80nm 1 (30)(1) (6) .
 , 7 , 1 N P [, LN (31), LP (32)] . , , 120KeV 가 , $8 \times 10^{12} / \text{cm}^2$
 LN (31) , (33) LP , $8.5 \times 10^{12} / \text{cm}^2$
 LP (32) , 120KeV 가 , 1100 N_2 , 2)
 LN (31) LP (32) .
 , 8 , P N SLED MOS
 (34) SLP (35)] 2 N P [, SLN LN (31) LP (32) . SLN
 , 120KeV 가 , $1.5 \times 10^{12} / \text{cm}^2$ (36) SLP
 LN (31) SLN (34) . , 140KeV 가 , 2 .
 $5 \times 10^{12} / \text{cm}^2$ LP (32) SLP (35) . , LN
 (31) SLN (34) LP (32) SLP (35) ,
 , 9 , N P [, N⁺ (37), P⁺
 (38)] . , , N⁺
 N⁺ (37) , 80KeV 가 , $2 \times 10^{15} / \text{cm}^2$
 , 2 , 140KeV 가 , $2 \times 10^{15} / \text{cm}^2$ P⁺ (38)
 , 10 , SLN (34) SLP (35) (8)
 SLP (35) LN (31) SLN (34) LP (32)
 P (40) N (41) , SLN (34) SLP (35)
 $12 / \text{cm}^2$ P (40) , 2 , 120KeV 가 , 5×10
 , 190KeV 가 (42) N , $5 \times 10^{12} / \text{cm}^2$
 N (41) , 8 10
 가 , P (40) N (41) .
 , 11 , (42) (28) .
 , 12 , N P MOS [P (2
 2] 2 P (SPW : 44) 2 N (SNW : 45) .

, N MOS
P (22), 190KeV 가, $1.5 \times 10^{13} / \text{cm}^2$ 1
50KeV 가, $2.6 \times 10^{12} / \text{cm}^2$ 2
2 P (44) P MOS
(46) P (22) 380KeV 가, $1.5 \times 10^{13} / \text{cm}^2$
 $10^{13} / \text{cm}^2$ 2 N (45) 380KeV 가 가
2가 190KeV 가, $1.5 \times 10^{13} / \text{cm}^2$
140KeV 가, $4.0 \times 10^{12} / \text{cm}^2$

, 13, (47) N P MOS
) 2 (2 (27), 14 (7nm
)(48)

, (27) (26) (27)
가 20nm (103)(, 100nm)
20nm (26) 450nm

P SLED MOS N MOS P MOS, N SLED MOS
MOS P MOS 1 (30), N
N MOS 2 (48),
1, 2, 3 3 (27) (14).

, 14, 100nm
nm SiO₂ 100nm, POCl₃
(49A, 49B, 49C, 49D, 49E, 49F, 49G) SiO₂ MOS (WSix), 150

, 15, N P MOS
(50, 51)

, N MOS
N⁻ 20KeV 가, $6.2 \times 10^{13} / \text{cm}^2$
(50) P MOS
2 20KeV 가, $2 \times 10^{13} / \text{cm}^2$ (52) P⁻
(51)

, 16, (49A, 49B, 49C, 49D, 49E, 49F, 49G) 250nm
TEOS (53) LPCVD N P MOS
() TEOS (53)
16 (49A, 49B) (53A)

TEOS (53)

(49A) N P (53A) MOS (49B) (53A) (54, 55)

N MOS

N⁺ (54) 100KeV 가 , $5 \times 10^{15} / \text{cm}^2$ P MOS

2 (55) 40KeV 가 , $2 \times 10^{15} / \text{cm}^2$ (56) P⁺

TEOS BPSG 600nm

(37, 38, 54, 55) EL

N MOS N MOS P MOS 가

N MOS N MOS P MOS 가

N MOS N SLED MOS P SLED MOS 가

2 MOS EL

가 (7nm, 20nm, 80nm) 가

가

SLED MOS P P N

DMOS 가 P N

P N DMOS

가 가

DMOS 가 가

DMOS 가

SLED MOS P N

가 가

가

, DMOS 가가 (, EL 가) , 1 가가 .

, MOS 가 SLED MOS

.

,

,

.

가

,

.

(57)

1.

1 2

,

2

1

1

,

2

2

.

2.

1

,

1

2

1

2

.

3.

1 2

1 2

,

2

,

1

1

,

2

2

2

.

4.

1 2

1 2

,

1 2

,

1

,

1

1

1

,

2

2

2

.

5.

3

4

,

1

2

가

,

1

MOS

가

2

MOS

가

.

6.

4

,

1

.

7.

3

4

,

1

,

.

.

,

,

1

1

.

8.

7

,

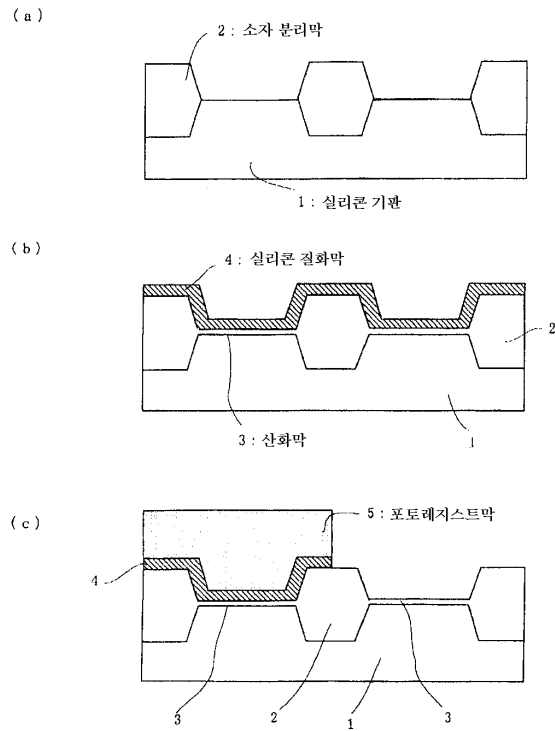
.

.

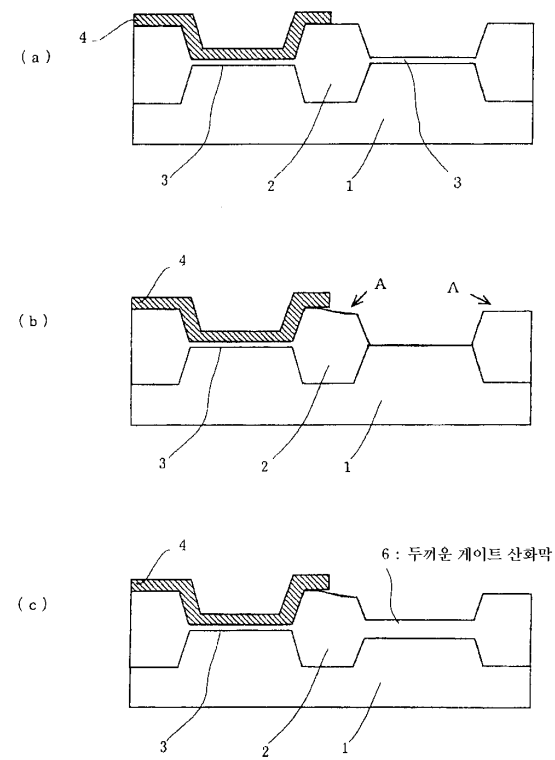
9.

7

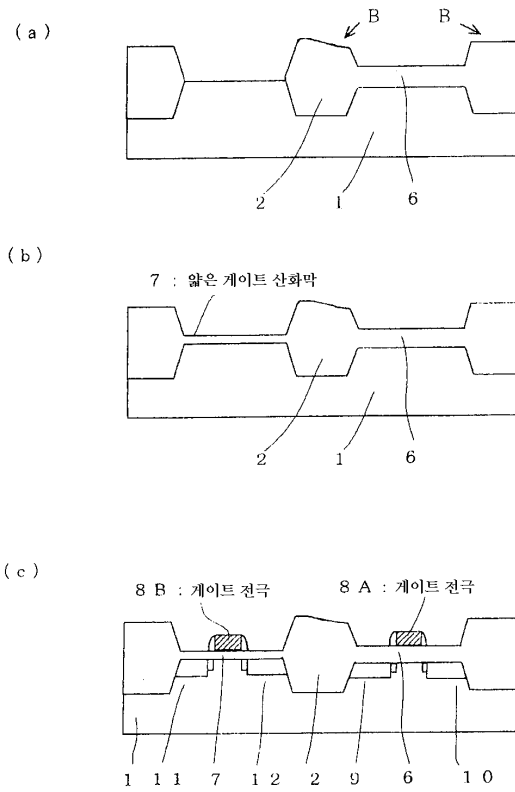
1



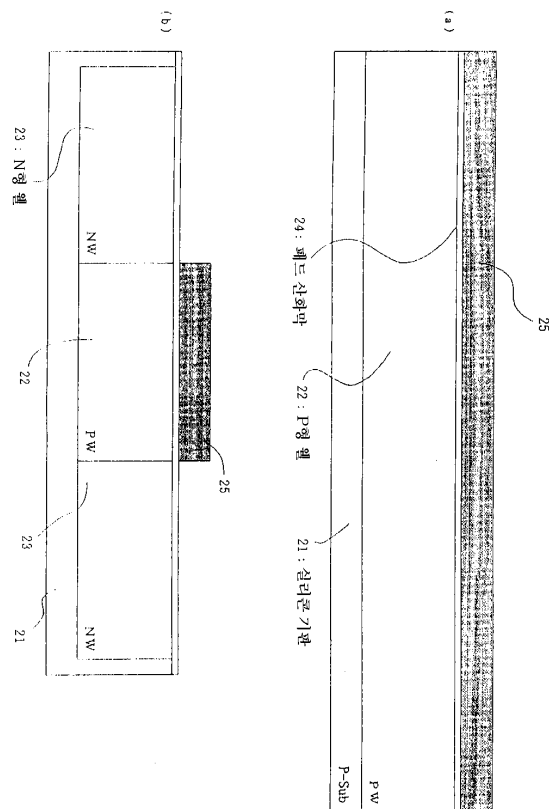
2



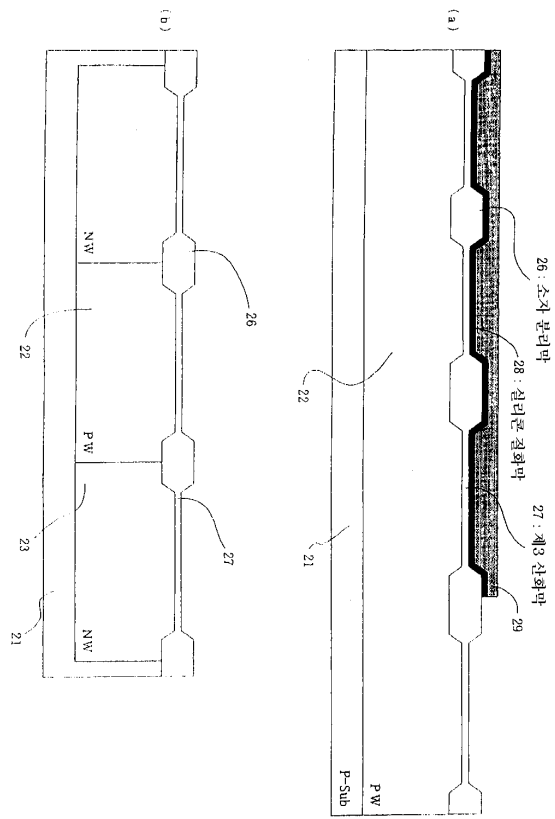
3



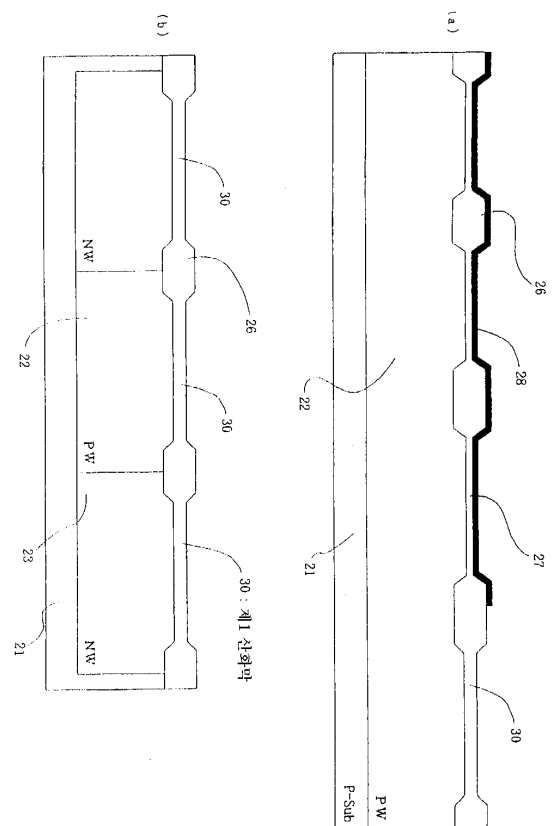
4

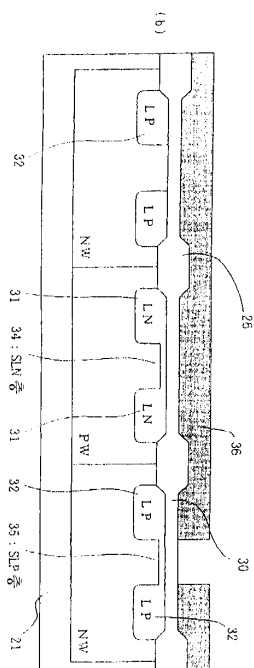
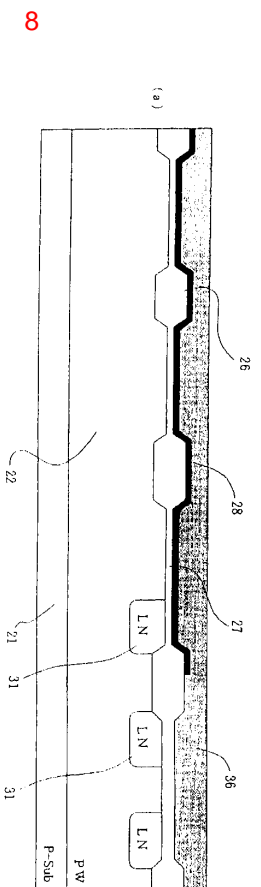
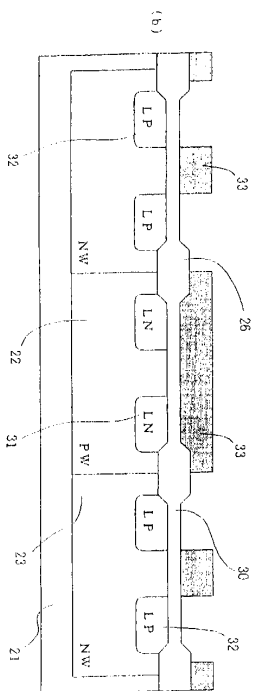
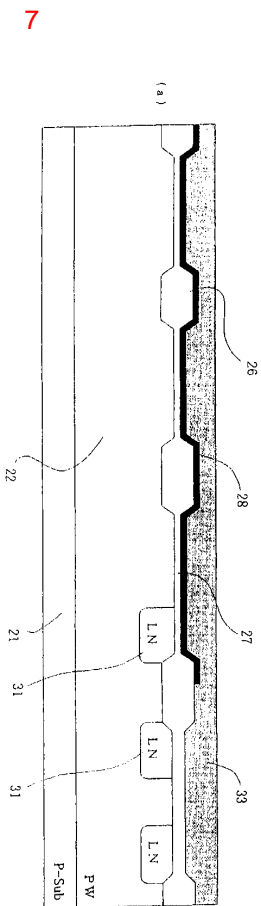


5

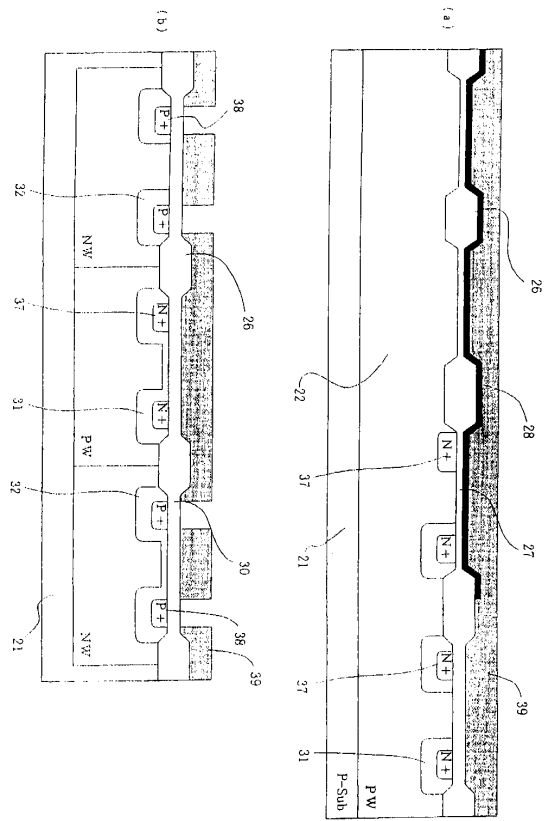


6

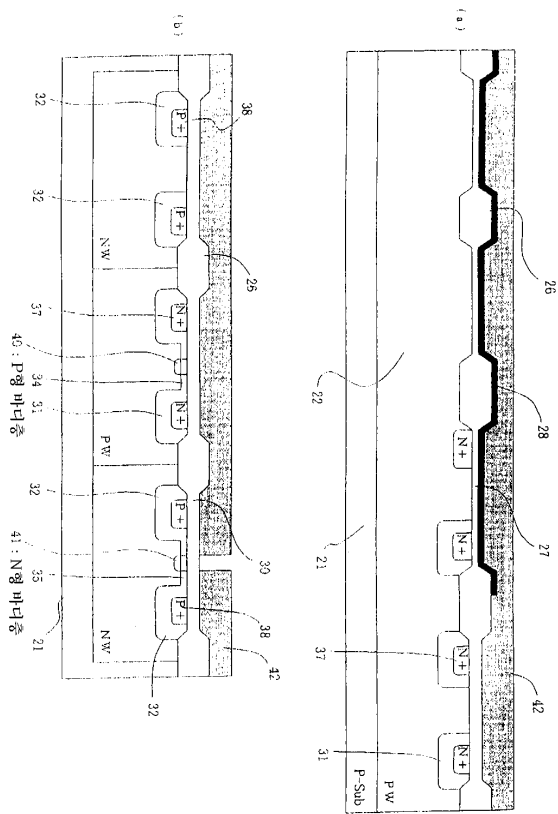




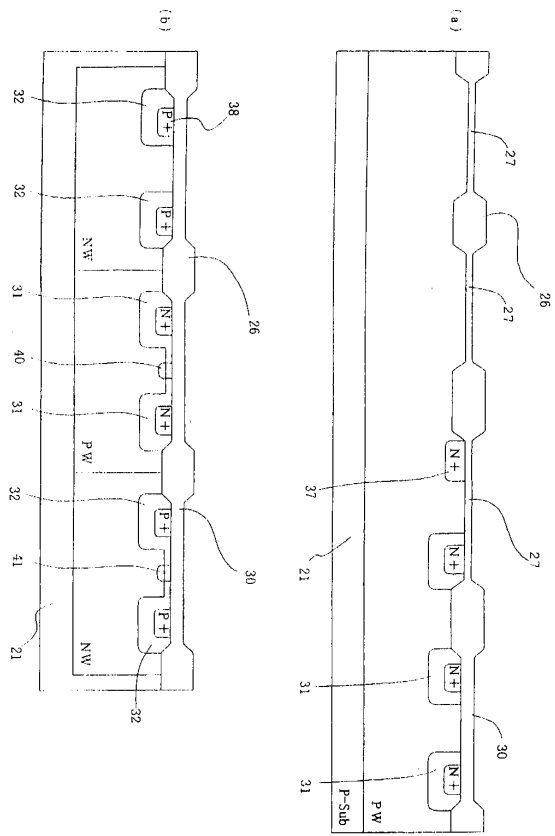
9



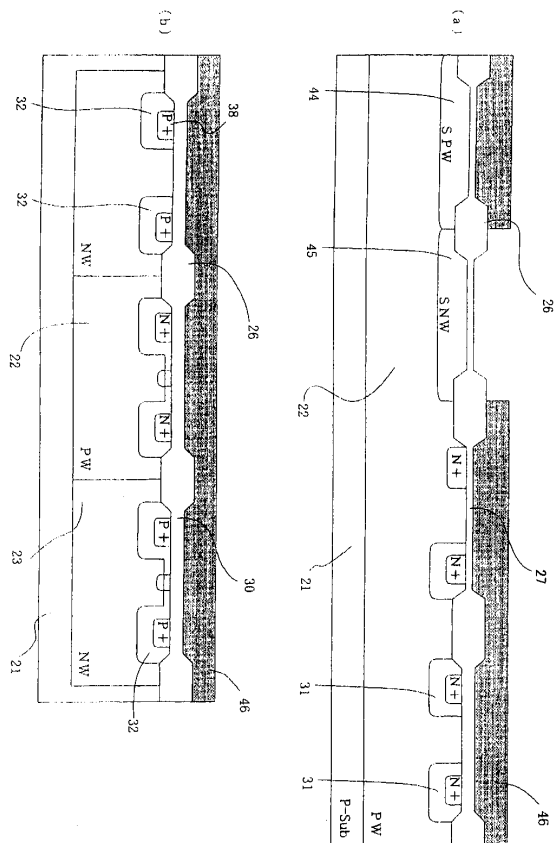
10



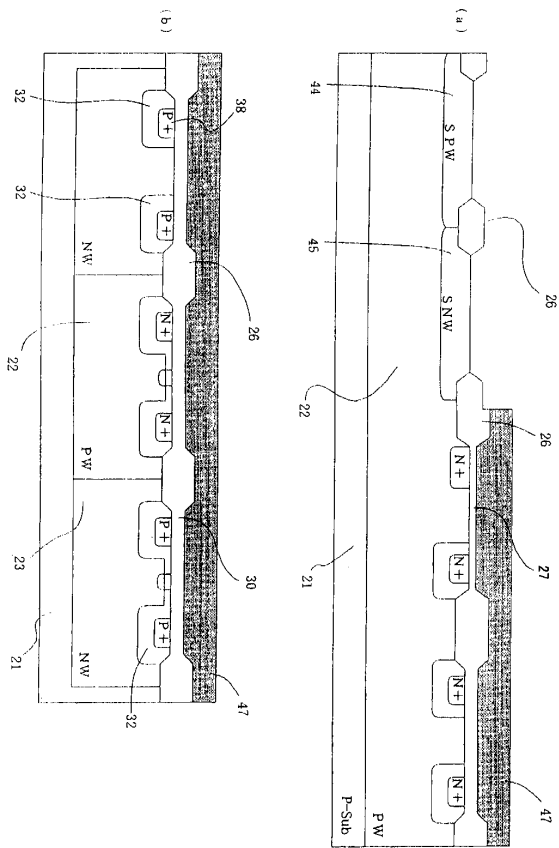
11



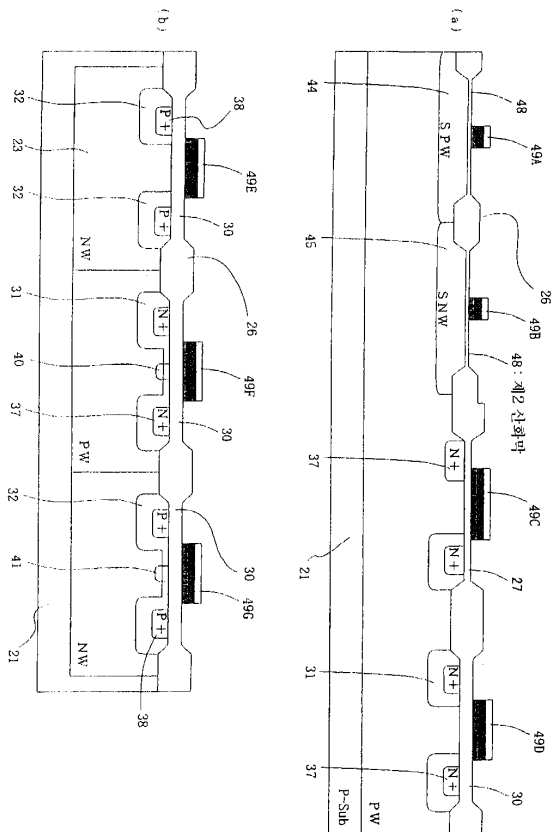
12



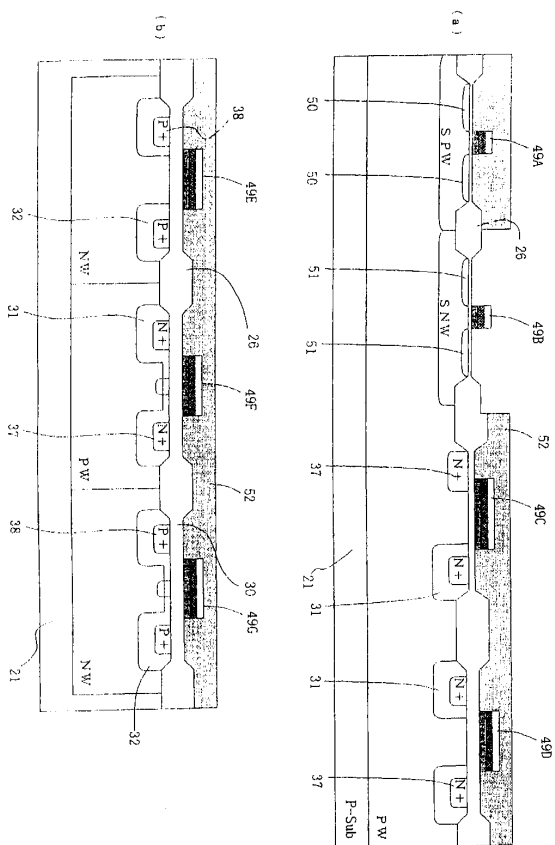
13



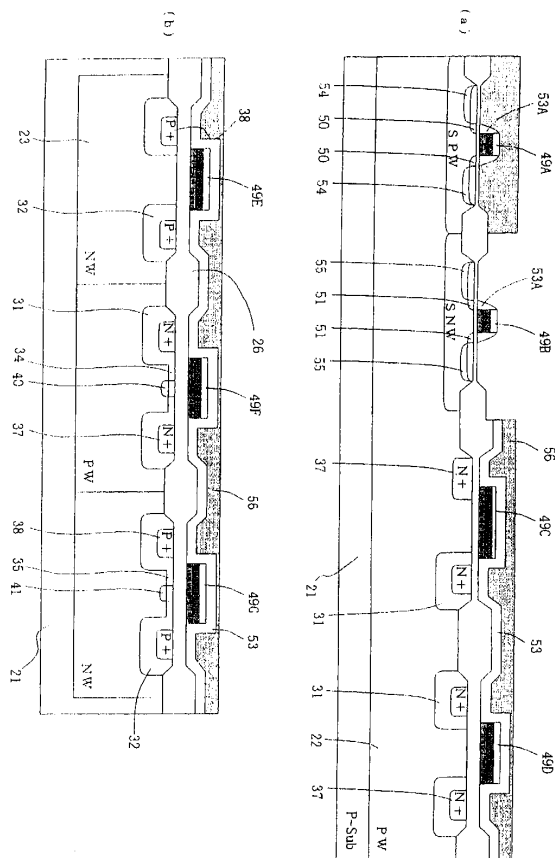
14



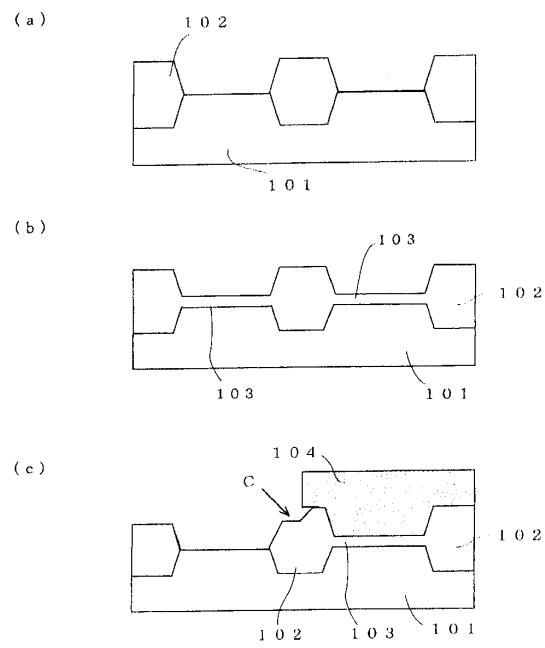
15



16



17



18

