

(19)
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2004 03 04(21) 10-2001-0037537
(22) 2001 06 28(65)
(43)10-2002-0004836
2002 01 16

(30) 2000-202341 2000 07 04 (JP)

(73) 가 가 1 1 1

(72) 가 가 가 가 1 가 가

(74)

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(54)

IGBT
, N⁻
N⁺
, P⁺, N⁻
, N⁻
(10) N⁻ N⁺ (5) P N⁻
P N⁻
P P⁺, P⁺
, P⁺ N⁻

2

1 IGBT
2 IGBT
2 2 1
4a 4i 1 IGBT
5 2 IGBT

6

3

MOSFET

IGBT
 1 IGBT
 1
 (102) P (103), N SOI (101) N - (102) N -
 N + (105) N + (104) (105) P (103) P + (103)
 P + (106) (107; (103) N + (105)
 (106) P (104) P + (108) (109;
 P (103) N - (102) N + (105) MOS
 (110) (111) N - (102)
 IGBT
 (109) (107) (110) "HIGH
 " (112) N + (105)
 가 N - (102) , N (104) N - (102) , P +
 (108) , P (103) PNP 가 ,
 IGBT " " 가 N - (102)
 (110) "LOW" , IGBT " "
 , PNP 가 (111) (110)
 N - (102) () 가
 (110) (113) 가
 , IGBT (112) 가 N - (102) ()
 가 , (110) 가 (113)
 (破壞耐量)

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P +
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(8)
) P +
MOS
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N -
(2)
P
IGBT
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, N
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N -
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, P +
(8)
가 N -
(2)
, P
(3)
PNP
(10) "LOW"
, 가
, IGBT
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N
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(31)
, 4a
, N -
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P
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, (34)
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LOCOS
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, 4d
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, (37)
N -
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, SOI
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P +
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P +
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, 4h P + (6) , (40) , SOI (1) , P (4)
 3) (42) , (43) P N + (3) P + (6) N
 , 4i N + (5) , (42) , SOI (1) , N
 (44) , (45) , P + (8) (44) N + (5) P + (6)
) (46) ,
 (, 3 , 4i (7;) , (9;) ,
 , 1 IGBT가 (10) (13) N - (2)
 IGBT P (14) P (14) , N - (2)
 () PN (14) N - (2) (13)
) IGBT (13) ,

$$\frac{2}{5}$$
 2 IGBT (13) (11)
 5 , 2 가 1 (35)
 (13) (13) N - (2) P (14) ,
 (13) , 1 가 (13)

$$\frac{3}{6}$$
 3 MOSFET (4) P + (8) N
 6 , 3 가 1 IGBT가 MOSFET(2 MOSFET)
 + (15) , IGBT가 MOSFET(2 MOSFET)
 , (9) , (7) (10) "HIGH"
 , , N + (5) , (9) , , N + (7)
 (2) , (10) "HIGH" , N + (5) N
 N - (2) N (4) N + (15) , P (3) , N +
 (5) MOSFET가 MOSFET " " , N + (5) N - (2)
) (10) "LOW" , MOSFET " " , MOSFET " " ,
 IGBT MOSFET MOSFET (2) () , 가 , 가
 , 1 3 , ,
 , N (4) , N - (2) , , N (4)
 가 , P + (3) 가 , (7) 가 , P + (3) ,
 , 가 , N (4) 가 , P + (3)
 , , (9) , (7) (7)
 , (9) , (7) 가 ,
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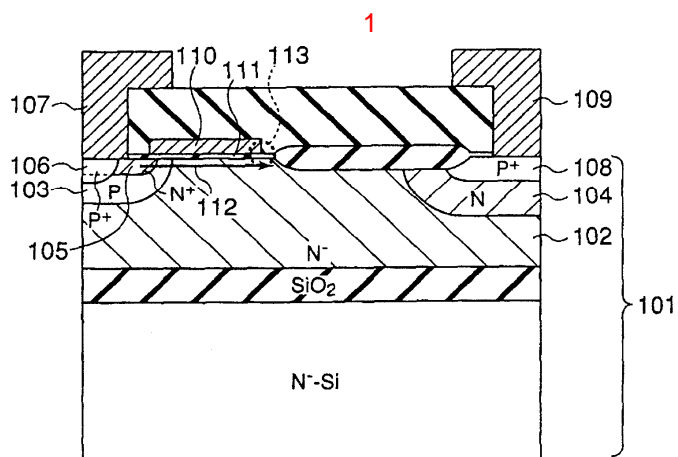
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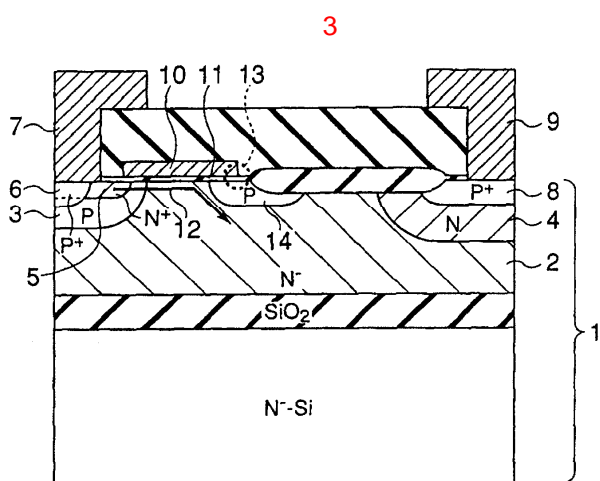
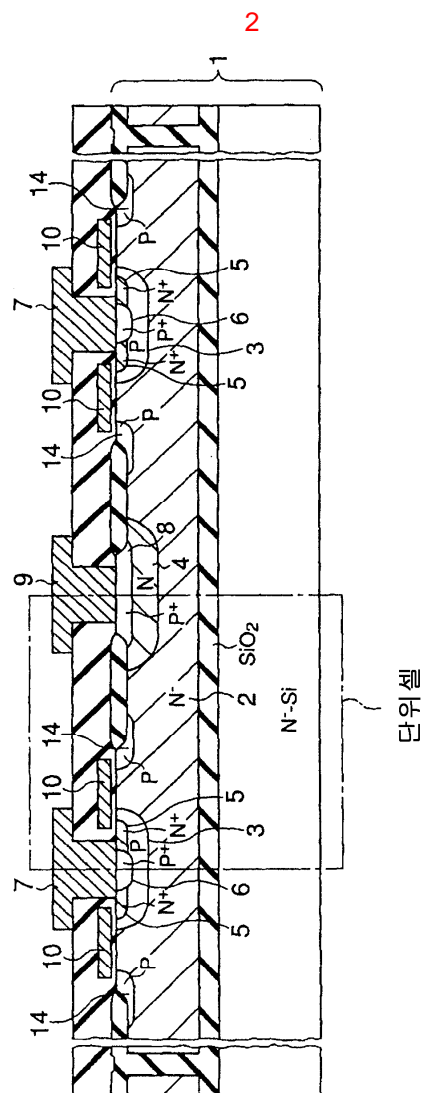
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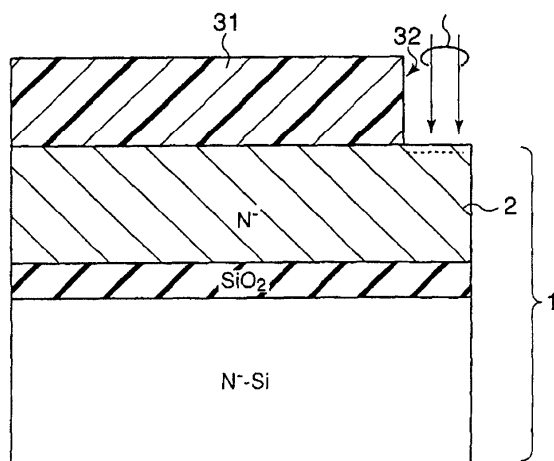
11	14.	,	.		
12	15.	,	.		
13	16.	,	.		
11	17.	,	1	,	2
	MOSFET	.			
12	18.	,	1	,	2
	MOSFET	.			
13	19.	,	1	,	2
	MOSFET	.			
14	20.	,	1	,	2
	MOSFET	.			





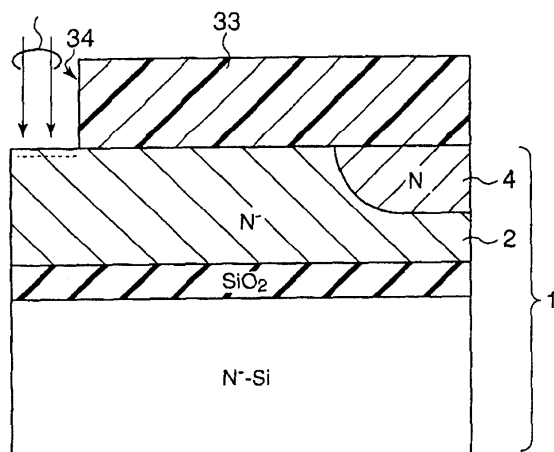
4a

N형 불순물

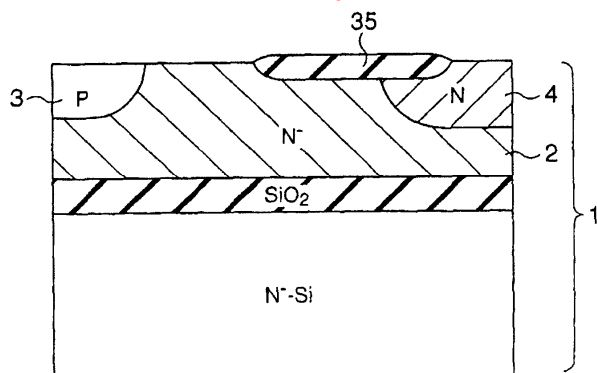


4b

P형 불순물

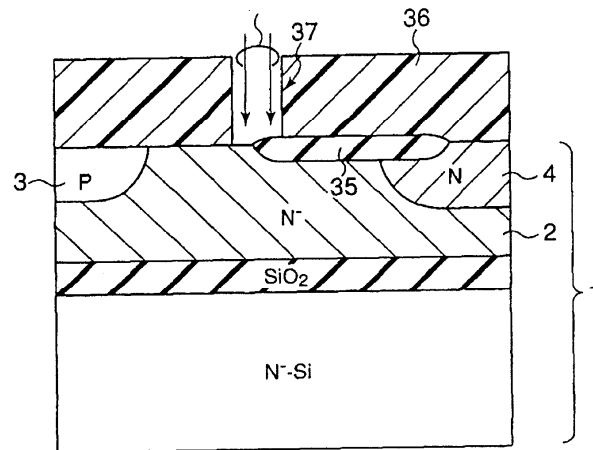


4c

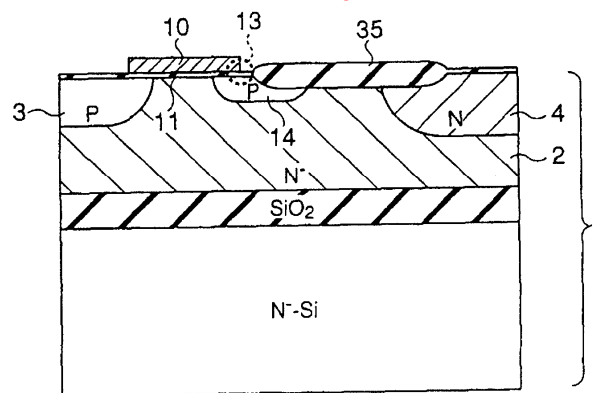


4d

P형 불순물



4e



4f

P형 불순물

