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2 7 1 -

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5,897,372

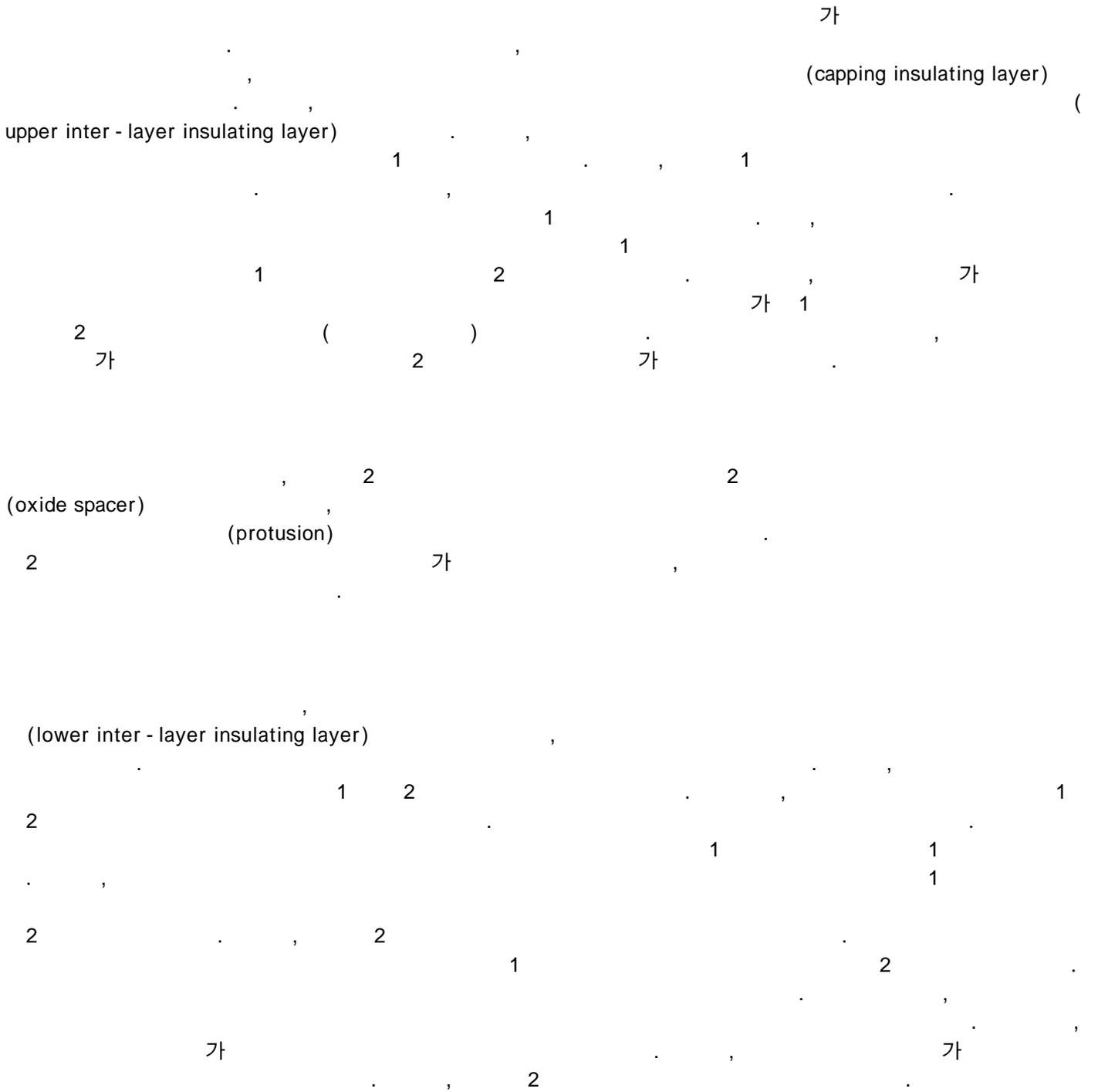
5,897,372

(silicon - rich silicon nitride layer)

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1 , P (2) , (2) 가
 (4a, 4b) (4a, 4b) (2) N (2)
 (4a, 4b) 1 (4a) (6d) (6d) (2) N
 (6d) 1 (6s') 2 (4b) (6s')

1 (6s') 1 (6s') 1 (10a),
 1 가 (10b), 2 가 (6s') 2 (6s')
 2 (6d) (10d)가 (6d) (10d)
 (6d) (4a, 4b) 가
 (2) 1 2 (19) 1 (19) (10d) (10d) 가
 , 2 (19) (14) () (10d)

2 7 1 -

2 , P (1)
 (2a) 가 (1 4a 4b)
 N / (1 6d, 6s'
 6s') (8) BPSG , PSG / (8)
 (8) (USG) (9) (9) /
 N (8) (9) (8)
 (6s') (6d) 1 (6s'), 2
 (1 10a, 10b 10d)

3 (10a, 10b, 10d) (8) (1
 2), (HTO) (12)

(1 10d) (1 14) .
 (19) (protection layer; 20) (19) (16)
 (18) (20) (20) (HTO)
 (18)

4 , / (20), (19) (12)
 (8) (10a, 10b, 10d) 1 2 (22)
 (20a) (22) (22) 3
 (18a) (19a) (12a), (19a)
 가 (16a)
 (19a)

(8), (10a, 10b, 10d) (22) , ,
 (24) (24) 50 100 ,
 (24) (24)
 (22) (24)
 (26) (USG), BPSG, PSG (HTO) (26)

5a , (26) (27) 1 2
 (10a, 10b) (26) (27)
 (26) (24) (27)
 1 2 (10a, 10b) 1 1 (32)
 , 1 (32) , 1 (32)
 CF₄가 CHF₃가
 (27) (2)
 2) 1 (32) (2)
 2)

5b 1 (32)

5b , 5a (26) (27)
 (27) 150 200
 (27a) (27a)
 (26) (27) (26)
 (27a) (26) (24)
 1 (32)

5c, 1 (32) (26)
 (HTO) (dense)
 (28) (26)
 (30) (30)

(30) 1 2 (10a, 10b)
 (22) (19a) 가
 (30) 1 (32) 가
 (28) (30) (26)
 (24) 1 2 (10a, 10b) 1 (3
 (28) (30) (28)
 (30) 1 (32)

6 (27) (27a) 1
 (32) (32a) 2 (32a)
 (26) (shrank upper inte
 r - layer insulating layer; 26a) (22) (24)
 (24) (26) (24)
 (26) (26)
 (hydrofluoric acid; HF) (buffered oxide etchant
 ; BOE)

(24) (24)
 (24) 1 (32)
 2 (32a) (22)
 2 (32a) 500 (24) (24)
 34) (24a)가 (34) (HTO) (24) (34)
 (34) 2 (32a)

7 (24) (24a) 1 (32)
 (10a, 10b) 1 2 (34) 5a
 5c 1 (32)
 (24) (24a)

(34) (24a) (34) (24) (24b)가

1 (32) (10a, 10b) 2 (10a, 10b)
2 (32a) 2 (32a) (24)
(24) (34)
1 (32) 가

(34) (36) 가
(24) (24a)가 50 100
(34) (34)

(34) (24) (24a)

(36)가 2 (32a) (10a, 10
b) 2 (32a)
(NH4OH), (hydro - peroxide; H2O2) (DI water)가
(buffered oxide etchant; BOE) (34)가 (3

32a) (38) (26a) 2 (

7 (38) (22) (24), (3
4) (36)가 (24) (36)가 100
(22)
(34) (24) (36)
(38) (19a)
가

(57)

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BPSG , PSG ,

(USG)

(HTO)

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(HTO)

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(hydrofluoric acid; HF)

(buffered oxide etchant; BOE)

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(HTO)

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CF₄ 가 CHF₃ 가 가

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16 ,

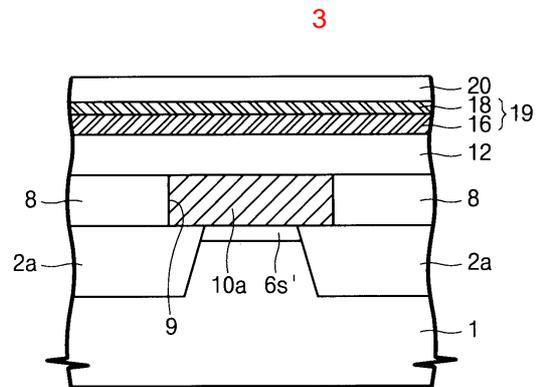
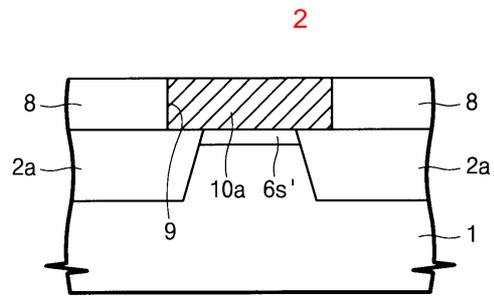
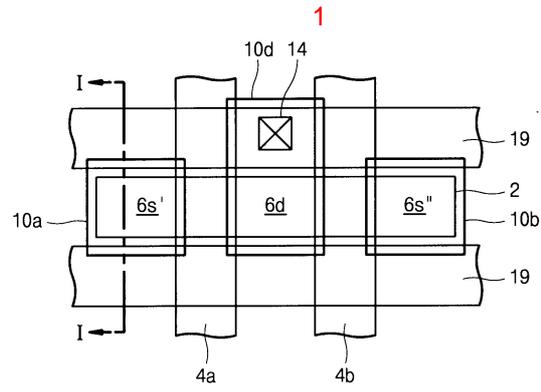
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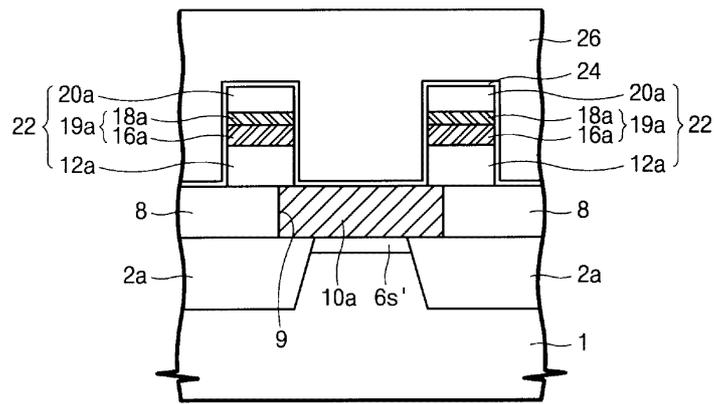
29 ,

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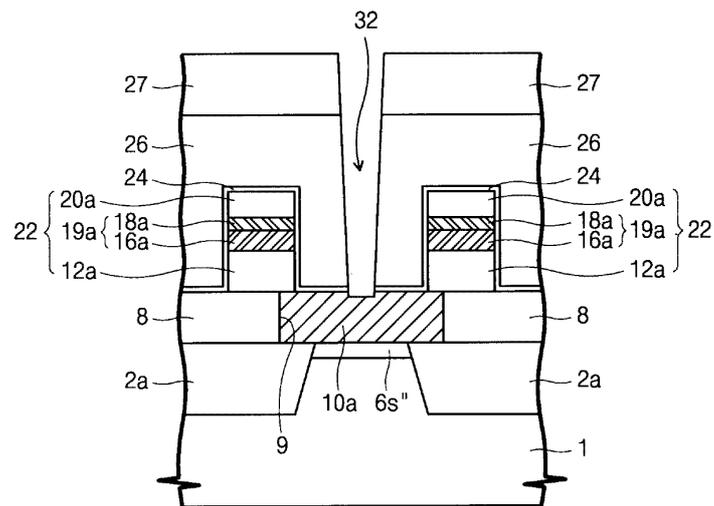
30 ,



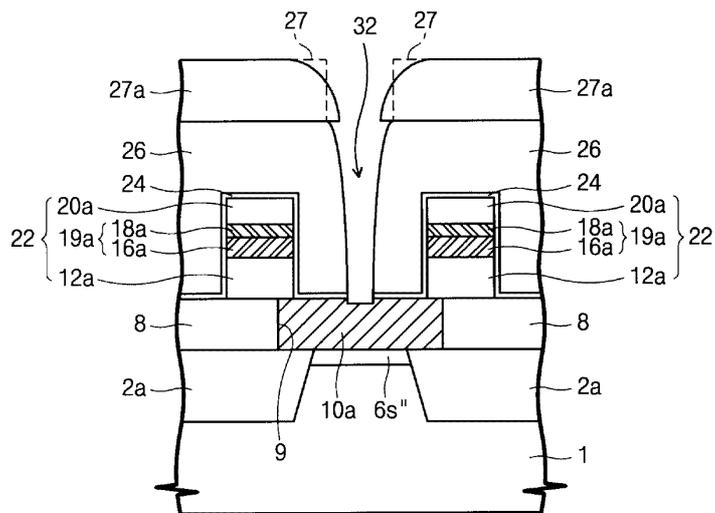
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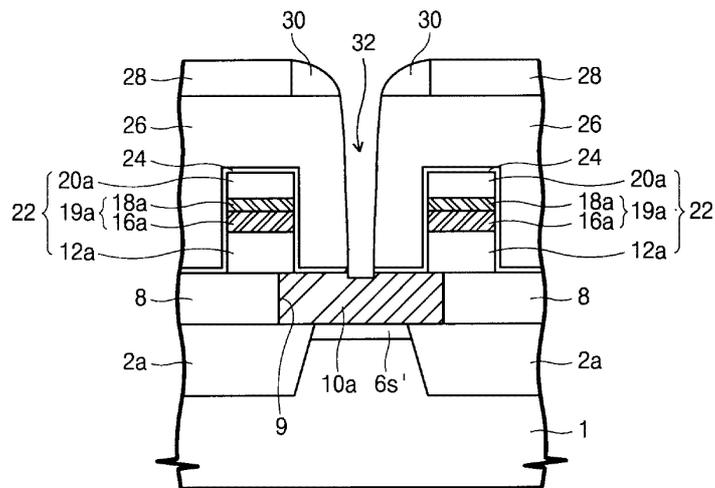
5a



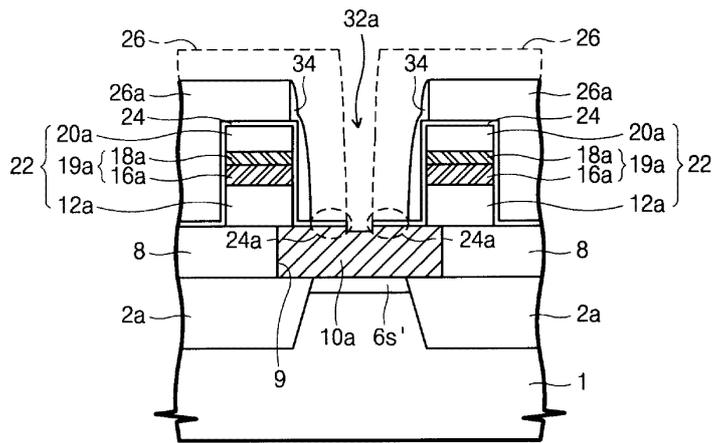
5b



5c



6



7

