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136-1

(72)

5 111-88

301

136-1

543-1

2

202-1904

(74)

:

(54)

가 , (void)
HDP CVD (high density plasma chemical vapor deposition)
HDP CVD
가 CD - (non-void) HDP CVD
가 .

6b

1a 1d 1
2 1
3 2
4a 4e 1
5 1

6 2 .
 < >
 11,31,51 : 13,33 :
 15,35 : 17,36 :
 18,19,21,23,25,37,39,41,43,44,45,59,61 : HDP CVD
 27,57 : 53 : , BPSG
 55 : 63 :

(void) 가 , HDP CVD (dishing)
 HDP CVD 가 가
 , 가
 1a 1d 1
 가 (gap fill)
 1a (11) (13) (15)
 (11) () (15), (13)
 (17) HDP CVD
 , HDP CVD 가 가
 1a 1HDP CVD (18) '19' 1 HDP CVD (18) 1
 1b 1d , '19', '21', '23' '25' (17)
) , '27' (void) 가
 2 1d 가
 3 BPSG 가 가 (gap fi
 BPSG 가 (cleaning)
 II) (bridge) 가
 HDP CVD BPSG 가
 가
 HDP CVD HDP
 CVD

(non - void) HDP CVD 가 1 CD -
 , BPSG ,
 , HDP CVD ,
 가 HDP CVD ,
 , HDP CVD 800 1200 , ,
 HDP CVD HDP CVD 80 가 60 가
 W, HDP CVD RF 3000 30000 W, RF 1000 10000
 HDP CVD RF 0 1200 W 가 50 70 sccm , 가 80 120 sccm
 , HDP CVD (vacuum break)
 , 200 20000 sccm RF 가 3000 30000 W, 1500 15000 W, 2500
 25000 W 2
 , 4a 4e 1 ,
 4a , (31) HDP CVD (33) (35) ,
 , (31) () (36) (35), (33)
 , (36) 1HDP CVD (37,) ,
 , 1HDP CVD (37) 가 가 ,
 , 1HDP CVD (37) 1 '39'
 4b 1HDP CVD (37) CD 가 1HDP CVD (37)
 4c 4e , '41' '43', '44', '45' HDP CVD '41'
 5 1 , 2 가
 6a 6c 2 ,
 6a 6b (51) (53) (53) ,
 , 가 가 () (53) BPSG
 , (51) (55) (55) BPSG
 , (55) (cleaning) ,
 , (53) BPSG (57)가 ,
 reak) 가 HDP CVD (59) 800 1200 (vacuum b (55)
 (51) , '61' HDP CVD (59) ,
 , (over hang) , (55) 80
 , 가 60 가 ,
 , HDP RF 3000 30000 W , RF 1000 1
 가 80 120 sccm 가 0 1200 W , 가 50 70 sccm ,
 , 가 200 20000 sccm , RF 3000
 30000 W, 1500 15000 W, 2500 25000 W ,
 6c , (55) (63) ,

, HDP CVD
가

가

(57)

1.

CVD

HDP CVD

HDP

가

CD

-

(non-void) HDP CVD

2.

BPSG

HDP CVD

HDP CVD

가

3.

2

HDP CVD

800

1200

4.

2

HDP CVD

80

가

60

가

5.

2

HDP CVD

HDP CVD

RF

3000

30000 W,

RF

1000

10000

W,

6.

2

HDP CVD

가

50 70 sccm

,

가

80 120 sccm

7.

2

HDP CVD

(vacuum break)

8.

2

200

20000 sccm

가

9.

2

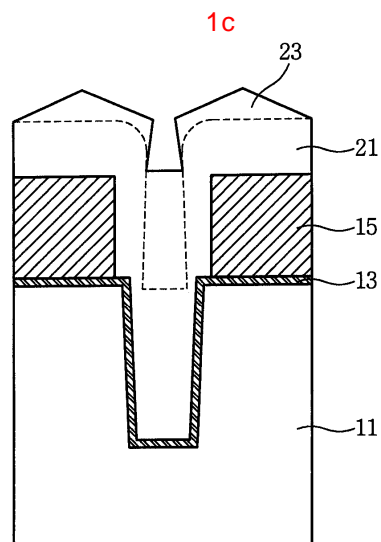
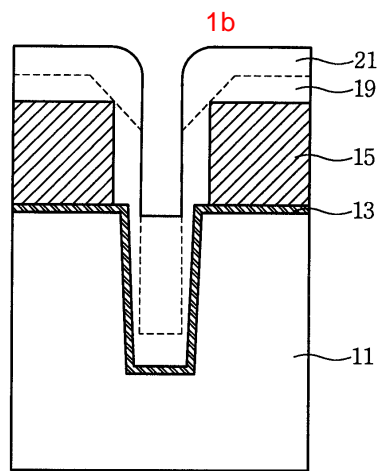
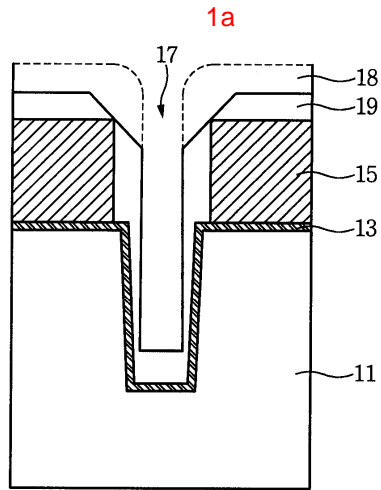
RF

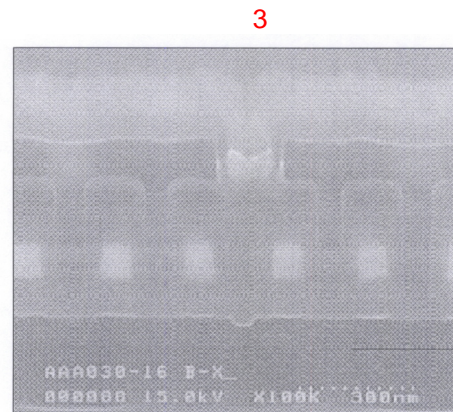
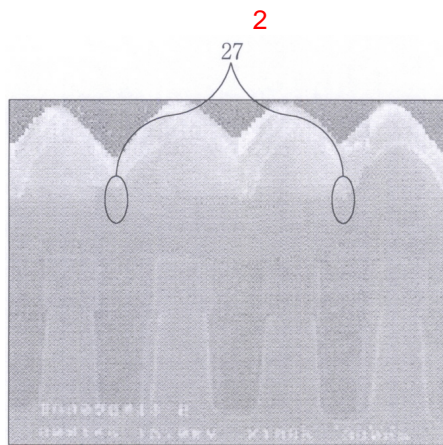
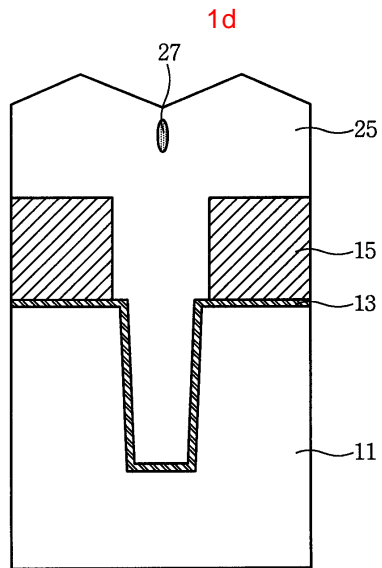
3000

30000 W, 1500

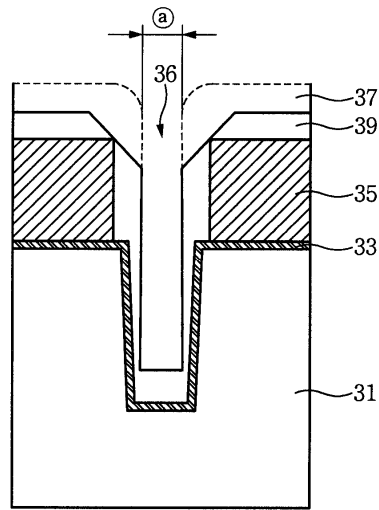
15000 W, 2500

25000 W

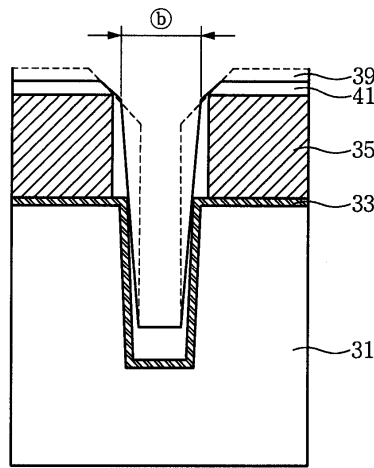




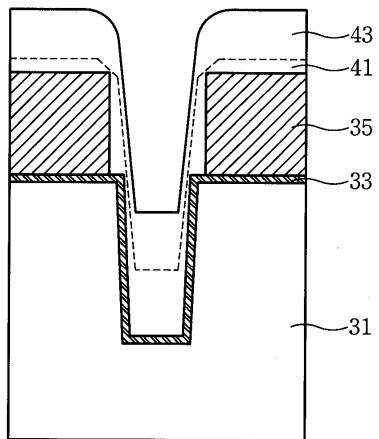
4a



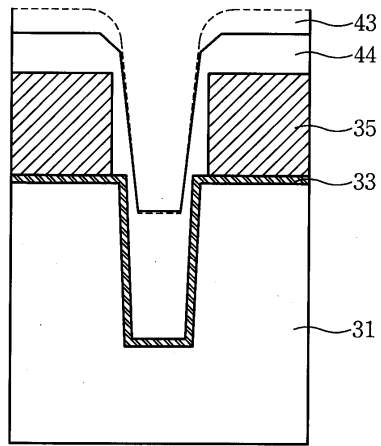
4b



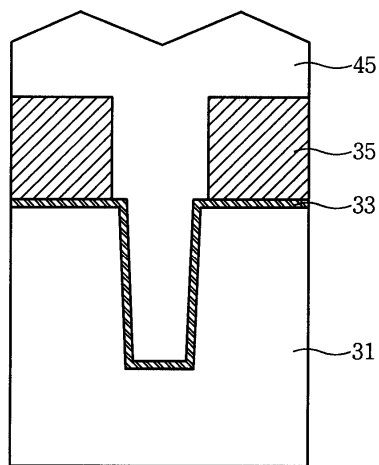
4c



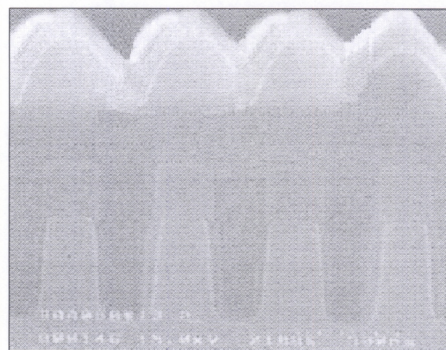
4d



4e



5



6a

