

가 , (void) 가 가 , (high density plasma oxide)

SOG

1 3 SOG

1 (10) (35) (20), (30) (35)

) (35) (10) (

1 (41) 2 (42) 1 (41) 2 (42)

, 1 (41) 4 , 2 (42) 4

1 2 (41, 42)가 SOG (50)

SOG (50) 1 (41) SOG (50)

, SOG (50)

, SOG (50) SOG (50) 2 (42) , 가

SOG (50) 1 (41) 2 (42) 가 ,

가 SOG (50)

2 SOG (50) SOG (50) 가 1 2 SOG (51, 52)

(51) 2 SOG (52)

(20) (20) , 1 2 SOG

(51, 52) (10) , 1 2 SO

G (51, 52) 1 2 SOG (51, 52) (10)

USG (undoped silicate glass layer)

(30) (30) (20)

(60)

1 SOG SOG 가

SOG (50) 1 2 SOG (51, 52) SOG (50) 2 (42) 1 SOG

(51) 2 SOG (52) 2 SOG (52)

(10) 1 SOG (51) 1 (41)

SOG (50) 1 SOG (51) 1 (41)가

(60) 2 SOG (52)

(10) SOG (50) (10) 2

3 , 2 SOG (52) (60) (20)

20) (52) , (99) 2 SOG (60) (10) (52) (10) (99) (60) , 2 SOG (

SOG

1 2 , 1 2 SOG
1 1 1 2 , 2 1 1 2
1 2 2 , 1 1 2 ,
1 2 가 , 2 가
1 2 가 , 2
1 2 , 1
1 1 2 가 ,
1 2 가
(SOG)

(High Density Plasma Oxide)

(USG)

1 SOG 2 1 2 1
1 2 2 1
USG 가 SOG

4, 5, 6a, 7a, 8 9

4 (100)

(120)

(110)

(125)

() ,

(125) (100) 1
 (1) 2 (2) 1 (131) 2 (132) (131)
 1 (131) (125) 1 (131)
 (125) 2 4 (132) 4 2 (132)
 (125) ()
 (120)
 1 2 (131,132)
 5 1 (131) 2 (132) (140)
 (140) (150)
 (160) (160) SOG (160)
 (150)가 SOG SOG SOG
 1 (1) (160) 1 (131)
 0) 2 (2) (132) 2 (2) (16) (131)
 2 (2) (160) 2 (132) 가 가
 (140) 1 2 (131, 132) (10)
 0) 110 (150)
 (160) (140) (100)
 (150) (160)
 (150) (150)
 (160) 가
 (150)
 (low pressure chemical vapor deposition,LPCVD)
 1 (131) (150)
 6a (150) 30 140 (150)
 1 (1) (160) 2 (2) (160)
 (190) (190) 2
 (2) (160) 1 (161) 2 (162)
 2 (162) (190) 2 (2) (160) 2 (132)
 2 (162) (100)
 1 (161) (190) (162)
 (162) 2
 1 (161) 1 (131) (160) 1 (1) 1 (125)
 (161) 1 (131) 1 (1)
 1 2 (161, 162) (150)
 (HF)
 7a 1 (161) 1 (131)
 (164) (164)
 (HF)
 2 (132) 2 (162)
 (164)
 2 (132) ()
 3 99) 가 2 (162) 2 (100)
 (162) (3 99)
 2 (162) (100)

(164) (3 99)
 (100) 500
 (164) 1 (131)
 가 (164) 1 (131)
 (164) (164) 가
 8 2 (164) 2 (162) 가
 (164) SOG (164) (164)
 SOG 가
 (164) 1 (131) 2 (132)
 USG USG (164)
 1 (131) 가 1 (131)
 (150)
 100 LPCVD
 (120) (150)
 (170) (152)
 (chemical mechanical polishing, CMP)
 (170) (100) 가
 (120) (120)
 (170) 9 (120) (110) (10)
 0) (120)
 (110) 가
 (120) (110)
 (110) (170)
 SOG 1 2 (131, 132) (170) SOG
 (164) (164)
 2 (3 99) (160) 4, 5, 8 6a 7a
 (132) 9
 6b 6b 7b
 6b 5 (160) 1 (131)
 (164) 2 (132) 3 (166)
 7a (164) (100) 500
 (164) 1 (131) 가 4 가
 (166) (164)
 7b 1 (1) (190)
 2 (132) 3 (166) (190) (190)
 (164) 1 (131) 2 ()
 132) 10
 10 (100) 1 (1) 2 (2)
 1 (131) 2 (132)가 1 (1) 2 (2) 가
 , 4

1 (1), 4 가 2 (2)
 1 (131) 4 (132) 4 (140) (1
 52) 1 (131) 2 (132) (152) (140)
 (140) 110 (152) 30 140
 (152) 1 (131) (100)
 (164) (164) (100)
 500 (140) (152)
 1 (131) (164) 3
 (164) 2 (132)
 1 (131) (164) (100)
 500 (164) 1 (131)
 (164) 2 (132)
 (170) 1 (131)
 (131) (170) 2 (131) (170) 1
 2 (132) (170) (170) (170)
 (170) (100)
 (164) SOG (170) HDP USG 가

(57)

1. 1 2 1 2 ;
 1 2 가 1 ;
 1 ; 2 ;
2. 1 , 1
3. 1 , 2
4. 1 , 2 ;
5. 1 ,
 1 2 가 ; ;
 2 ; 2 ;
 2 ; ;

1

1

6.

5 ,

(SOG)

7.

5 ,

8.

1 ,

1 2 가

1

2
2

;

;

;

;

9.

8 ,

(SOG)

10.

8 ,

11.

1 ,

;

12.

11 ,

13.

14.

1 ,

(High Density Plasma Oxide)

(USG)

가

15.

1 ,

16.

1 1
2 2

2

1

2

;

;

;

1

1

2
(SOG)

17.

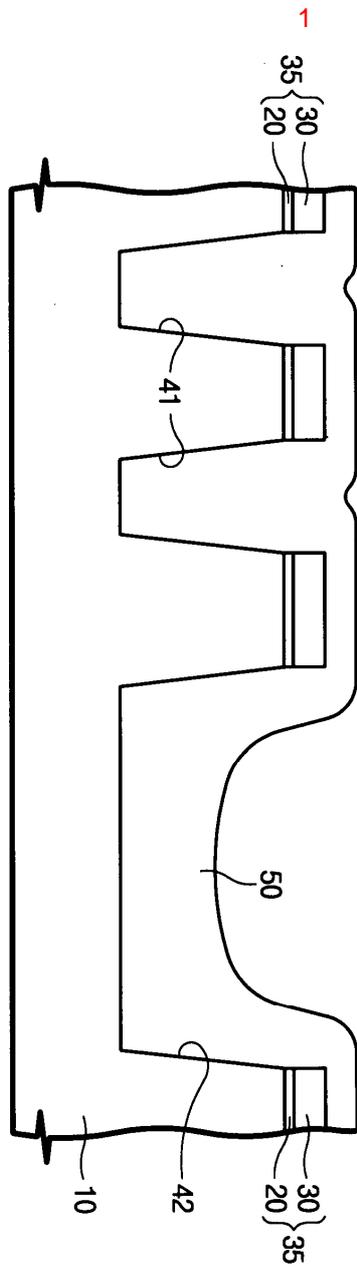
18.

19.

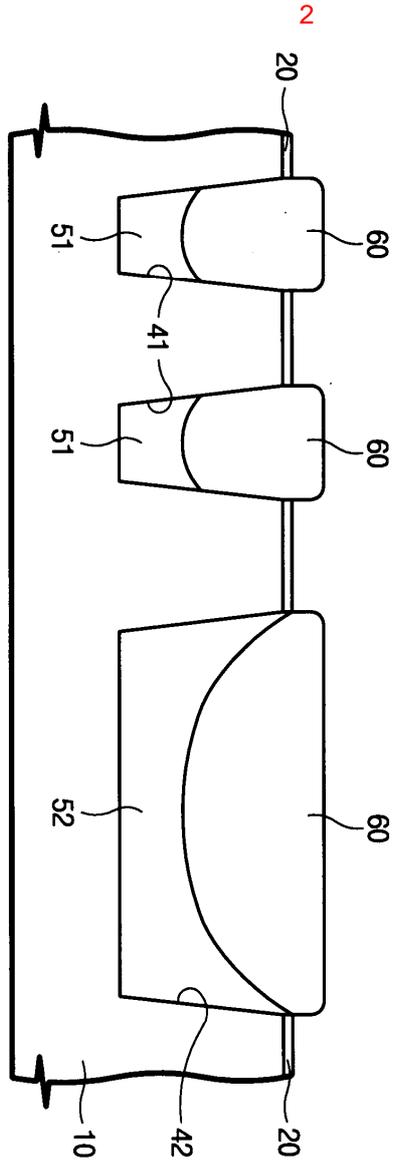
16 ,

(USG)

가

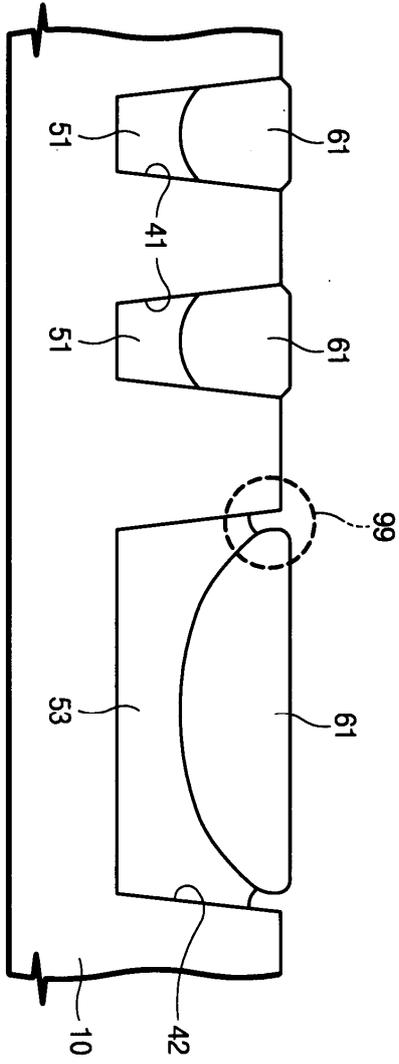


(종래 기술)



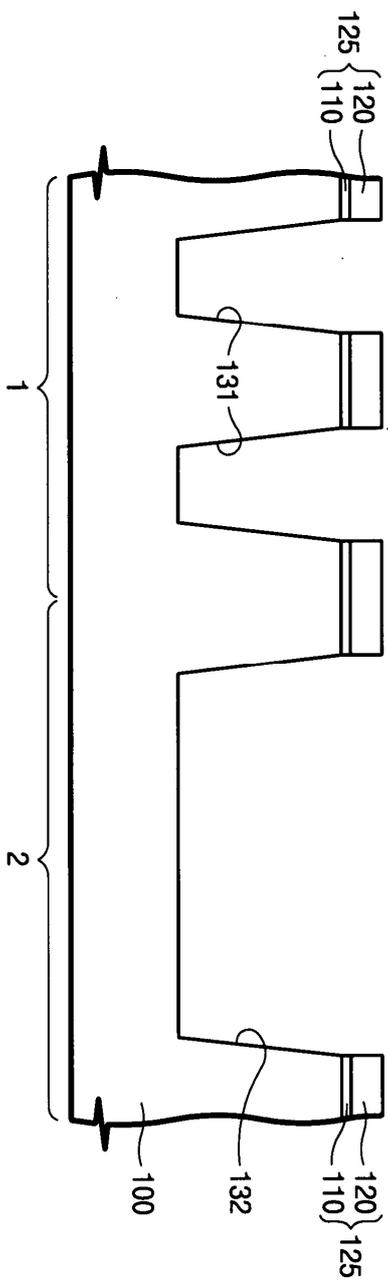
(종래 기술)

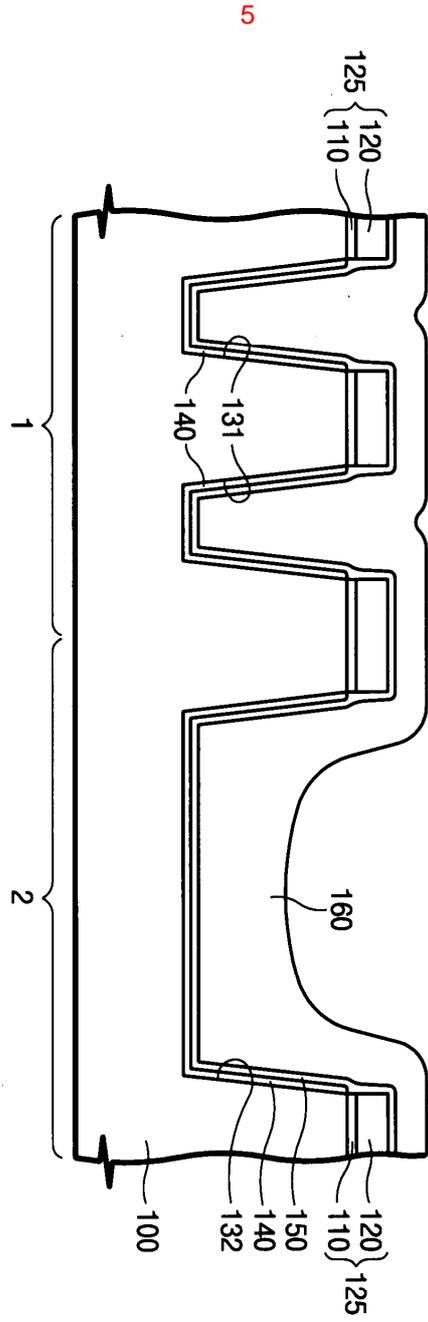
3



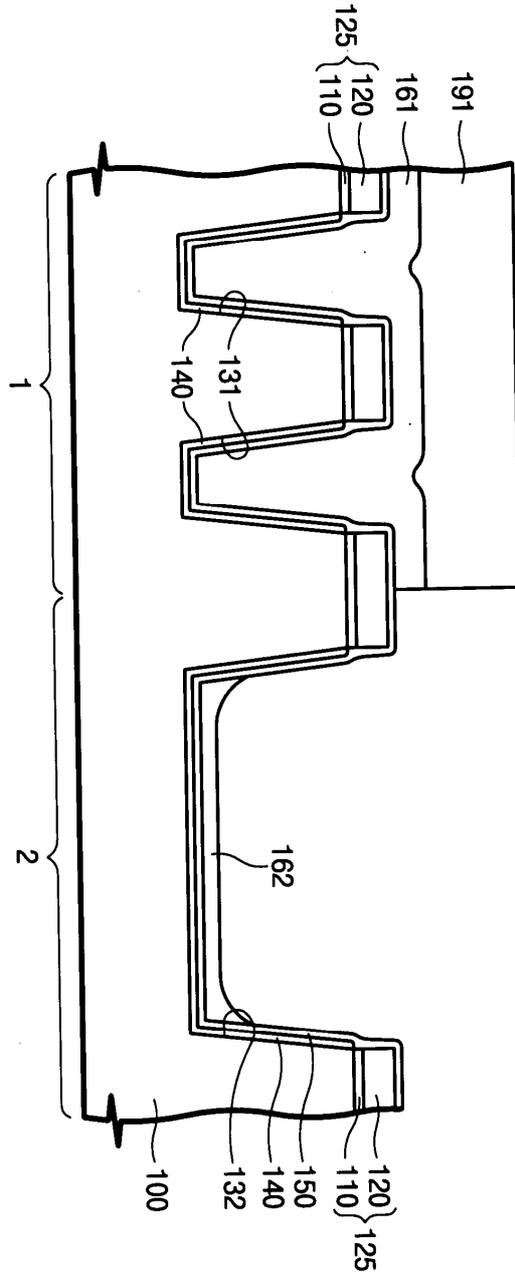
(종래 기술)

4

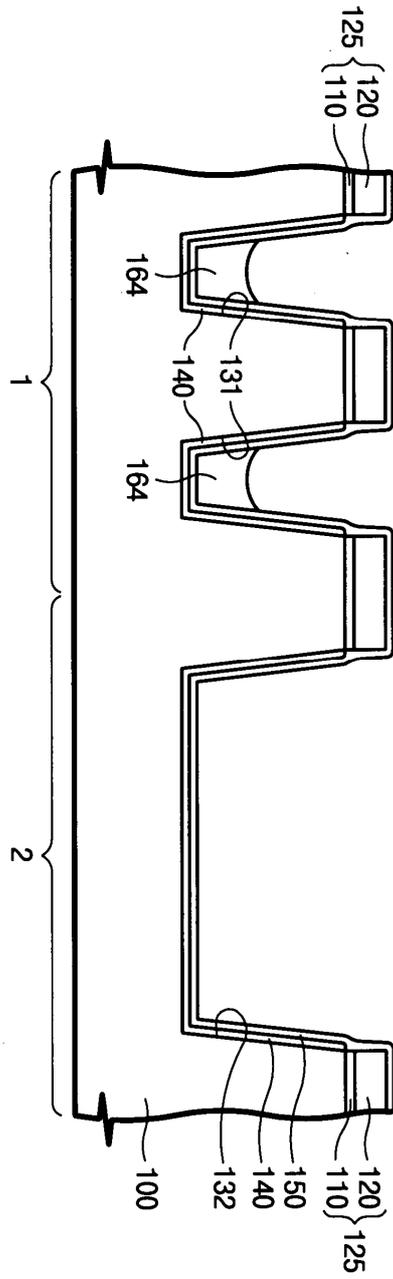




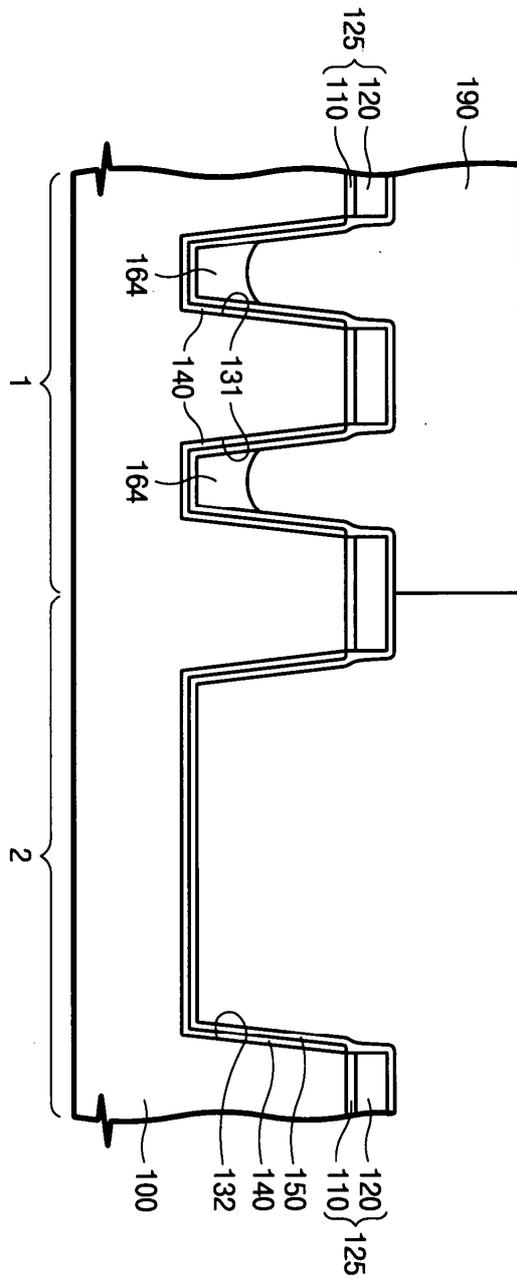
6a



7a



7b



8

