

(19) (KR)  
(12) (B1)

(51) 。 Int. Cl.7  
H01L 21/28

(45)  
(11)  
(24)

2004 11 12  
10-0455724  
2004 10 26

(21) 10-2001-0061885  
(22) 2001 10 08

(65)  
(43)

10-2003-0029398  
2003 04 14

(73) 136-1

(72) 825 2402

899-1 102 1303

(74)  
:

(54)

1500 BPSG 2000 3000 7000  
LPCVD UHVCVD  
1000 3000

13

1 4  
5  
6  
7 8  
9 13  
\*

SEM

41 :            43 :  
 45 :            47 :  
 49 : 1            51 :  
 53 :            55 : 2

가 (SEG) 가  
 가  
 (CMP) 0.16 μm  
 (gap-fill)  
 가  
 (CMP) (silicon recess etch)  
 가  
 (SEG; selective epitaxial growth)  
 (SEG) )  
 (SAC; self-aligned contact)  
 (SEG) (selectivity), (thermal st  
 ress) (facet generation)  
 (LPCVD) 850  
 가 (thermal budget)가 가  
 1 4  
 ( ) (3) 1 (3) (1)  
 (5) (5) (1)  
 ( ) (3) (7) (5) (1) (7) CMP  
 2 (7) ( ) (9),  
 3 (9) (9) (7)  
 (9) (11) CMP (9) (  
 ) (11a)  
 0.16 μm  
 (high aspect ratio)  
 가

5  
 (27) (29) (23) (21) (25)  
 (31) (21)  
 (33) ( )  
 5 가  
 가  
 가  
 6 'A' T (100) (110)  
 7 8 SEM 7 (100) SEM  
 8 30 SEM 8 30  
 가 T T  
 가 T  
 T  
 가

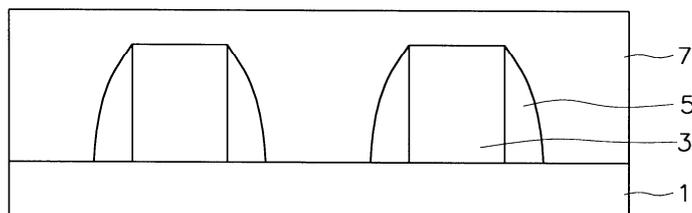
LPCVD 3000 7000 BPSG  
 UHVCVD 1500 2000  
 1000 3000  
 ( )  
 9 13  
 41) ( ) ( )

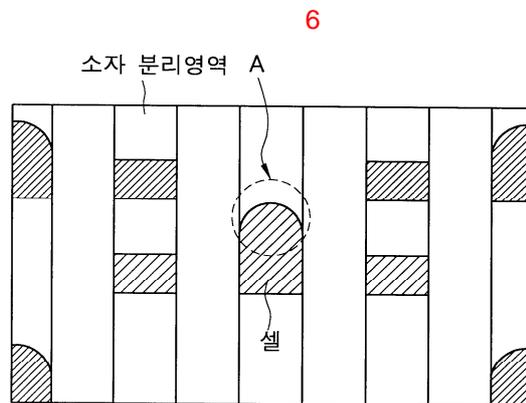
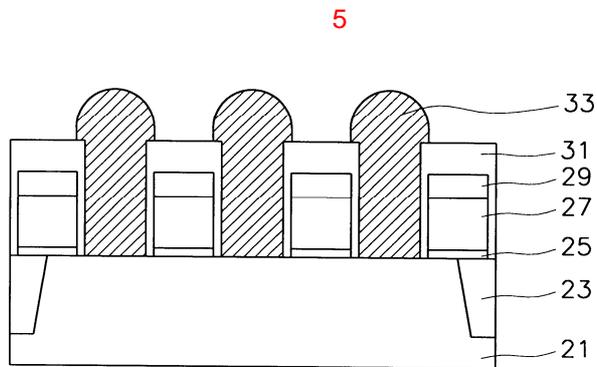
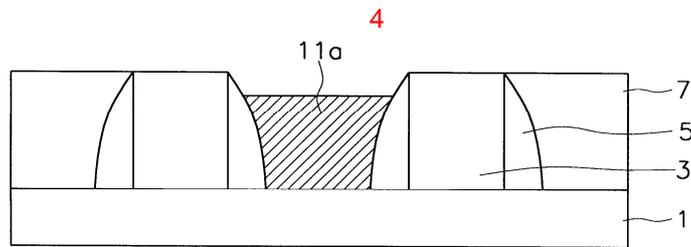
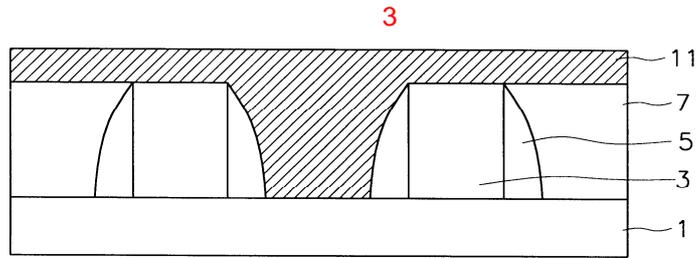
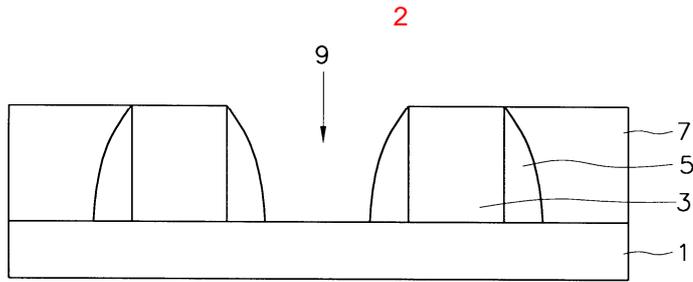
9	(45)	(43)	(41)	(41)	( )	(43)
(47)	(43)	500	(41)	1500	500	1500
(43)	(13)	(14)	(27)	(41)	(49)	LPCVD
10	UHV CVD	1	1500	2000	1	1
(49)	가	1	(49)	1500	2000	
가	LPCVD	1	(49)	, 800	1000	1 5
10	500 sccm	, 5 Torr	300 Torr		SiH <sub>2</sub> Cl <sub>2</sub> 가	HCl 가
0 mTorr	UHV CVD	2	(49)	, 400	800	0.1 mTorr 2
11	Si <sub>2</sub> H <sub>6</sub> Cl <sub>2</sub> 가	1	(49)	, 400	800	0.1 mTorr 100 Torr
(51)	HDP CVD	(51)	(51)	, LPCVD	PECVD	3000 7000 BPSG
12		1	(49)	( )	( )	( )
( )		2	(53)	(49)	2	(55)
13		2	(55)	1	(49)	(49)
2	(55)	2	(55)	1	(49)	(49)
						LPCVD
						가
		가		(gap filling)		가
						가 가

- (57)
- |       |         |      |      |   |
|-------|---------|------|------|---|
| BPSG  | 3000    | 7000 | ;    |   |
| LPCVD | UHV CVD | 1500 | 2000 | ; |
| 1000  | 3000    |      |      |   |

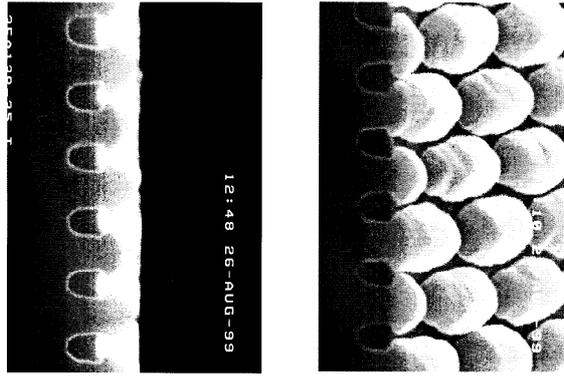
- 1 2.
- 2 3. 500 1500 500 1500
- 2 4. 1000 3000
- 4 5. LPCVD PECVD
- 2 6. 100 500
- 6 7. LPCVD PECVD
- 8.
- 9.
- 1 10. LPCVD , 800 1000 1 5
- 1 11. SiH<sub>2</sub>Cl<sub>2</sub> 가 HCl 가 LPCVD , 5 300Torr  
10 500sccm
- 1 12. UHVCVD , 400 800 0.1 2  
0mTorr
- 1 13. UHVCVD , 400 800 0.1mTorr  
100Torr SiH<sub>2</sub>Cl<sub>2</sub> 가 Cl<sub>2</sub> 가
- 14.
- 15.
- 16.

1

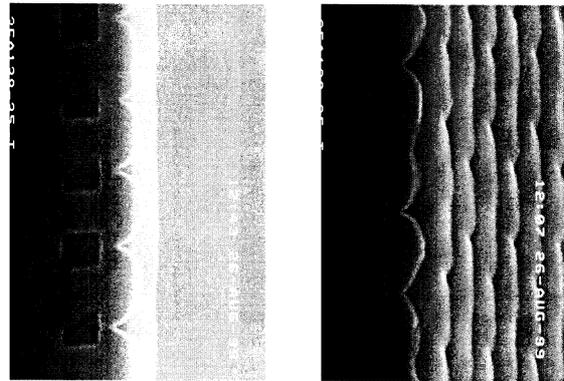




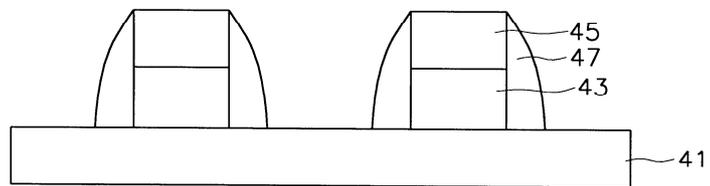
7



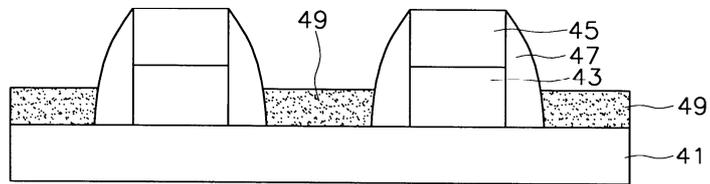
8



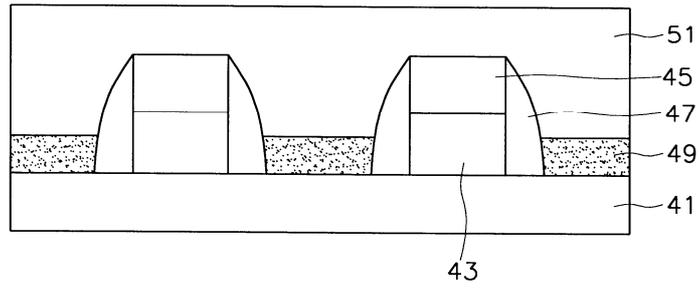
9



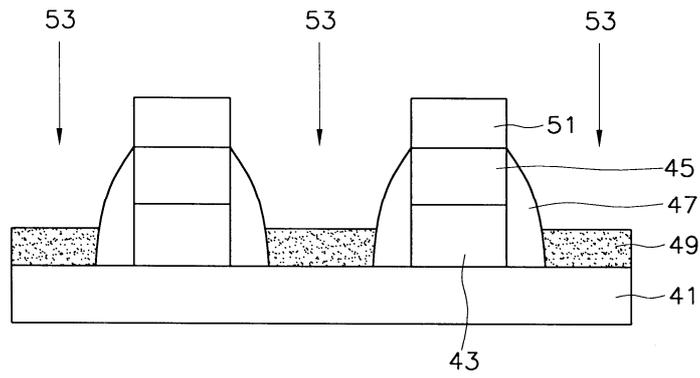
10



11



12



13

