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(12)

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(22) 2000 08 11

(65)  
(43)

2002-0013154  
2002 02 20

(73)

3 416

(72)

1

103 1501

1

201 1406

(74)

:

(54)

가

가

1a

1a

1



10% 50%  
 가  
 가  
 가  
 $Al_2O_3, TiO_2, ZrO_2, Ta_5O_3, CeO_2$   
 100 50 10 15  
 10% 50%  
 $Al_2O_3, TiO_2, ZrO_2, Ta_5O_3$   
 50 100 1

1a  
 (10) LOCOS(LOCAl Oxidation of Silicon)  
 (12) (T)가 (12)  
 (14), (16) (18) (14) (10) (14)  
 20) (12) (14) (T)가 (10) (22)가 (T)  
 ) (24) (24) (10) (24) (T  
 ) (24) 2 (28) (26)

(30)가 (30) (26) (24) 2  
 (18) (32)가 (16) (34)  
 (28) (34), (36) (38) (34)  
 (38) , Pt, Ir, Ru, Rh, Os  
 Pd SrTiO<sub>3</sub>, BaTiO<sub>3</sub>, (Ba,Sr)TiO<sub>3</sub>, Pb(Zr,Ti)O<sub>3</sub>, SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub>, (Pb,La)(Zr,Ti)O<sub>3</sub>, Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>  
 (32)  
 (38) 2 (28)  
 1 (40, 42) 1 (40, 42) (46) 3  
 (44) (46) 2 ( (48, 50) (52)  
 48, 50) 2 (48, 50) (42, 50)  
 1 (40, 42) 2 (48, 50) (36)  
 (40, 48)  
 1 (40) 1 (42)  
 2 (48) 2 (50) 1  
 3 (44)  
 1 (40) 2 (48) 1 (42) 2 (50) , Al<sub>2</sub>O<sub>3</sub>  
 O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, CeO<sub>2</sub> (42) 2 (50) 1 (40) 2  
 (48) 1 (40) 2 (48) 1 (42) 2 (50)  
 1 (40) 2 (48) 1 (42) 2 (50)  
 가 , 1 (40) 2 (48)  
 1 (40) 2 (48) , 가  
 2 (48) 1 (40) 2 (48) 10 50% 1 (40)  
 1 (40) 2 (48) 1 (40) 2 (48)  
 1 (40) 2 (48) , 가  
 1 (40) 2 (48) 1 (40) 2  
 (48)  
 1 1 (40) 2 (48) 1 (42) 2 (50) Al<sub>2</sub>O<sub>3</sub> ,  
 0 15 , (42, 50) 100 (40, 48) 50 , 1  
 RTP(Rapid Thermal Process)  
 1 400 600 , 550  
 (42) 1 (42) 3 (44)  
 (44) 가 (36) , 1 (42)  
 (40) 1 (42) (36) 1  
 2 (48, 50) 2 (50) (52) 가 3  
 (44) , 1 (42) 2 (5)  
 0) 가 , 3 (44) (52) 2 (48)  
 (50) 2 (50) (50) 2 (50)  
 3 (44), 1 (48) 1 (42) , (50)  
 2 (50) , 3 (44) 2 (48)  
 , (52)  
 , (34), (36) (38)  
 1b 2  
 (210), (212), (214, 216, 218, 220 222), 1 (224),  
 (226), 2 (228), (230), (232) (234) 1a  
 26), 2 (10), (12), (14, 16, 18, 20 22), 1 (24), ( (28), (30), (32) (34)

(234) (244) , 3 (236)  
 (244) (234) 가 (242) (242) 3 (236) (236)  
 (240) (242) (240) 3 (240) 가  
 (244) (242) (240) 3 (240) (236)  
 (244) (246) (246) (234), (244)  
 (246) (254) , 1 (248, 250) (246)  
 (248) 1 (248) (248, 250) 1 (2  
 50) , 1 (248, 250) (254) 4 (252)  
 ) (242) , 1 1 (248) 1 (250)  
 가 (244) , 1 (250) 4  
 (252) (254) 4 (252), 1 (246)  
 4 (252) (254) 2 (256, 258) , 4  
 258) (260) 2 2 (256) 2 (256) 2  
 (258) (254) 2 (240, 242) / 1 (248, 250)  
 (256) 2 (258) 1 (242) , 2 2  
 58) 3 (236) (244) 가 4 , 3 (252), 2 (256, 2  
 60) (256) (258) (244) , 3 (256) (256, 2  
 (240, 242), 1 (248, 250) 2 (256, 258)  
 Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub> CeO<sub>2</sub> ,  
 242), 1 (248) 2 (256) (240), 1 (250)  
 2 (256) , 1 (248) 1 (250) 2 (256) 2  
 (258) (250) (248), 2 (258) (256), ( )  
 240) (242) (242) 1  
 ) 1a , ( ) (242)  
 (240)  
 2a 1a 2a 2c . (12)  
 , (10) LOCOS (22) 가  
 (20) (14), (16) (18)  
 , 1 (24) , 1 (24) (24) (18)  
 (26) 1 (24) (24) (30)  
 (30) (30)가 2 (28)  
 (30) 1 (24) 2 (28)  
 (32) (16) , , , , ,  
 , , , , , , , , , ,  
 (32)가 (precleaning) ,  
 2 (28) (32) 2 (28) ,  
 TiO<sub>2</sub> ,

Al<sub>2</sub>O<sub>3</sub>, BaTiO<sub>3</sub>, SrTiO<sub>3</sub>, Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>, PbTiO<sub>3</sub>, SiO<sub>2</sub>, SiN, (Ba, Sr)TiO<sub>3</sub>, (Pb,La)(Zr,Ti)O<sub>3</sub>, Pb(Zr,Ti)O<sub>3</sub>, SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub>, PZT, BST

(38), (36) (34) 1  
 (38) (38)  
 (36) (34) (38) (36) (34) 가  
 ( ) 1 (38) (38)  
 2b 가 ( ) 1 (40, 42) 1 (40, 42) 3  
 ) 1 ( 2c 44 ) 1 (42) 가 (42)  
 1 (36) 1 (42) 1 (40) 1  
 O<sub>2</sub> (40) 1 (42) 1 (40) 1 Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub>, Ce  
 (42) 1  
 1 (40) 1 (40) 1 (40) (40)  
 가 (36) 가 1 (40) 1 (36) (40)  
 가 1 (40) 1 (36)  
 1 (40) 1 (42) Al<sub>2</sub>O<sub>3</sub> 1 (40)  
 400 660 10 10 15 가 (40) Al<sub>2</sub>O<sub>3</sub> 1 (42)  
 100 80 130 가 1 (42) Al<sub>2</sub>O<sub>3</sub> 1 (42)  
 400 600 1 Al<sub>2</sub>O<sub>3</sub> 1 (40) 가 400 60 (42)  
 0 1 (42) 1 (40) 1 (40)  
 2c , 1 3 (44) 3 (44) 1  
 (24) 2 (28) , , BSG ,BPSG , TEOS , -T  
 EOS , PE-TEOS , USG , 3 (44) 1  
 (24) 2 (28)  
 4) 3 가 가 가 (44) 가 가 가 가 (SiH  
 3 (44) 가 (36)  
 , 1 (42) 1 (40, 42) 1 (42)  
 3 (44) 1 (40) 1 (42)  
 , 1 (40) 1 (42) 1 (40)  
 0) 가 , 3 (44) 1 (40) 1 (40)  
 가 , 1 가 (44)  
 , 가 1  
 3 (44), 1 (42) 1 (40) 1 (42) 1 (40) (

, 3 (44) 3 (44)  
 , (46) 2 (48) 2 (46) 2 (50) 2 (48, 50)  
 , 2 (52) 2 (48) 2 (50) 2 (50) 2 (50)  
 (52) 3 (44) 2 (50) , 가 (50)  
 2 (48) 2 (50) 2 (48) 1 (40) 1 (42)  
 (42) , 2 (48) 2 (50) 2 (48) 2 (50) 1 (40) 1  
 , 2 (48) 2 (50) Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub>, CeO<sub>2</sub>  
 , 2 (48) , 2 (50) , 2 (50)  
 2 (48) 1 (40)  
 2 (48, 50) (52) (52)  
 , , , , , 가  
 (52) (SiH<sub>4</sub>) 가 (NH<sub>3</sub>) 가 가  
 (52) 가 2 (50) , 2 (50)  
 2 (48) 2 (50) (52)  
 , 1 (48) 1 (40) , 2 (48) 2 (50)  
 , 2 (48) (52)  
 , 2 (48) 2 (50)  
 , 1b 3a 3c (210), (212), (214, 216, 218, 220 222), 1  
 3a, (224), (226), 2 (10), (228), (12), (14, 16, 18, 20 22), 1 (24),  
 2a (26), 2 (28), (30) (32)  
 (232)가 (precleaning) ,  
 2 (232) (228) 2 (228) (234)  
 (234) 2 (228) 3 (236) 3 (236) 2c 3 (44)  
 (238) 3a (238) (236) (234)  
 (242) (240) (242) (240)  
 ( 3b 244) (240) 3 (236) 가  
 (240) (240) 가 ( )  
 3b 244 (240) 2 (50) 1 (242) 2a 2c 1 1 (42)  
 2 (240) 2 (50) 1 (242) 1 (40) 2 2 (48)  
 , Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub>, CeO<sub>2</sub>  
 (240) 400 600  
 (242) (242) 400 600  
 (240) (242) 가

(242)가 (240) (242) (242) (240) 1  
 1 (40) 2 (48) (242) (244) 3b  
 3b (238) (244) (246) (244) 3b  
 (246) (240) (242) (244)  
 (244)  
 (234), (244) (246) 1  
 (248, 250) 1 (248, 250) (246) 3  
 (236) 1 (248) 1 (248) 1 (248) 1 (250) 1  
 1 (250) (248) 1 가 (244) 1 (248) 1 (250) 1  
 ( 3c 252) (244) (244)  
 1 (248) 1 (250) (240) (242)  
 (248) 1 Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub>, CeO<sub>2</sub> 1  
 1 (248) (248) (40) 2 (48) (242)  
 1 (250) 400 600  
 OS 3c 1 (248, 250) 4 (252) 4  
 (252) 1 3 (224, 228, 236) ,BSG ,BPSG ,TE  
 ) 1 3 (224, 228, 236) CVD, LPCVD, PECVD 가 4 (252)  
 2c 4 (252) 가 (244)  
 (236), 가 (240) (250) 1 (248) 1 3  
 (242)가 (242)가 4 (252) 가  
 가 가 1 (250) 1  
 (248) 1 (248) 1 (250)  
 1 (248) 가 1 (248)  
 4 (252) 가  
 1  
 4 (252), 1 (250) 1 (248)  
 1 (250) 1 (248)  
 (252) (254) 4 (252) 4  
 (260) (254) 2  
 2 2 (256) 2 (258) 2  
 1 2 (48) 2 (50)  
 2 1 2 (260)  
 60) (260) 가 2 (260) (2  
 1 2 2 (258) 2 (2  
 58) 2 (256) 2 (258)  
 260) 1 1 (248) 2 (256) 2 (258)  
 (260) 2 (256) 2 (256)  
 2 (256)



4a  
300 , 0.5 Torr Ir/IrO<sub>2</sub>/PZT(2000 )/Pt  
(AI<sub>2</sub>O<sub>3</sub>)  
10 가 ( " " )  
100 가 , 가 ( " " )  
) 100 ( 100 ) 가 , " " " " 10 ( " " ) 10  
" " 550 가 .  
" " 가 .  
" " , " " , PZT가 " " 50  
, 4b 4c , . 가  
4b Ir/IrO<sub>2</sub>/PZT/Pt  
500 , 8Torr , 1KW 1  
000 4c 2 550 , 100 .  
0 ( 550 ) 가 100 , 550 가 1  
4b 4c 가  
4b (2Pr) 67.9(μC/cm<sup>2</sup>) 4c 84.6(μC/cm<sup>2</sup>) , 2  
2 가  
4b 4b E(-9) 4c E(-10)A/cm<sup>2</sup> 4c E(-10) E(-  
-11)A/cm<sup>2</sup> , 2  
, Ir/IrO<sub>2</sub>/PZT/Pt  
4d 300 , 0.5 Torr , "PPL"  
"Normal" (AI<sub>2</sub>O<sub>3</sub>) 100 , "PPL"  
10 PZT 100 가 .  
" " 550 가 , " " "PE-TEOS"  
" " 10 , 100  
, "PPL" "PPL" "Normal" 가 .  
가 "Normal" "PPL"  
가 100 "Normal" , 10 100  
가 가 100 , 100  
"Normal" 100 가 . , "PPL" "PPL"  
100 "Normal"

PE-TEOS 가 "PPL"  
 , "Normal" 2  
 , PE-TEOS 2

가

가

가 400 600

가

(57)

1.

1 1 1 ;  
 1 1 , 가 1 1  
 1

2.

3.

1 , 1

4.

3 ,  $Al_2O_3$ ,  $TiO_2$ ,  $ZrO_2$ ,  $Ta_5O_3$   $CeO_2$

5.

1 , 1 1 10% 50%

6.

5 , 1  $Al_2O_3$

7.

6 , 1 10 15 , 1 100

8.

1 , 1 1 , ,

9.

1 , 1 ; 2 2 2  
 2 2 , 가 2 2  
 2

10.

11.

9 , 2

12.

11 , Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub> CeO<sub>2</sub>

13.

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가

14.

15.

13

1

16.

15

Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub> CeO<sub>2</sub>

17.

13

1

Al<sub>2</sub>O<sub>3</sub>

18.

17

1

10

15

1

100

19.

13

1

1

20.

13

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2

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2

2

가

21.

22.

20

2

23.

22

Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub> CeO<sub>2</sub>

24.

13

가

25.

13

24

26.

25

Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Ta<sub>5</sub>O<sub>3</sub> CeO<sub>2</sub>

27.

;

1

,

1

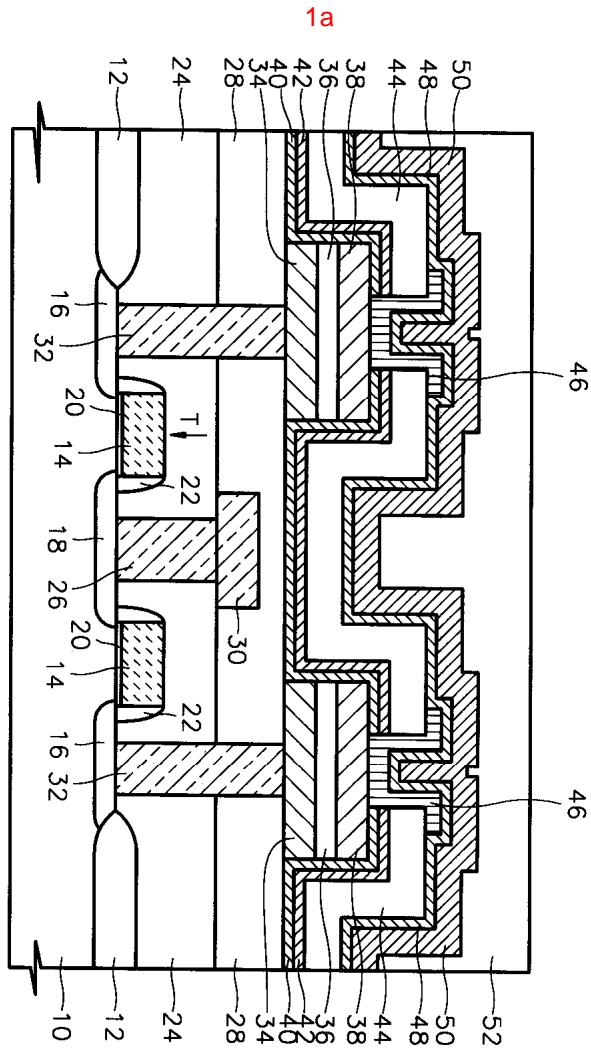
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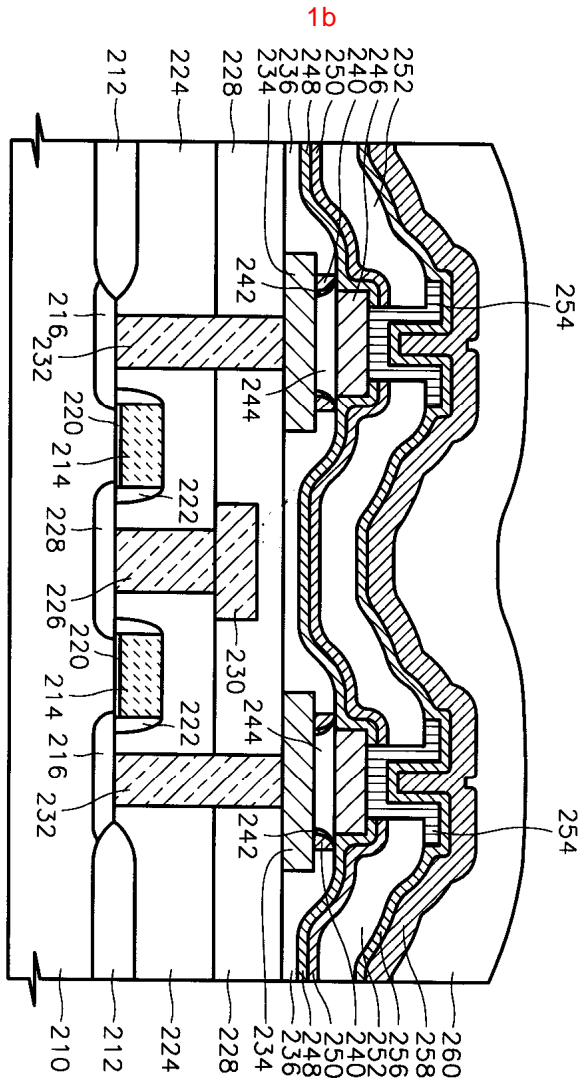
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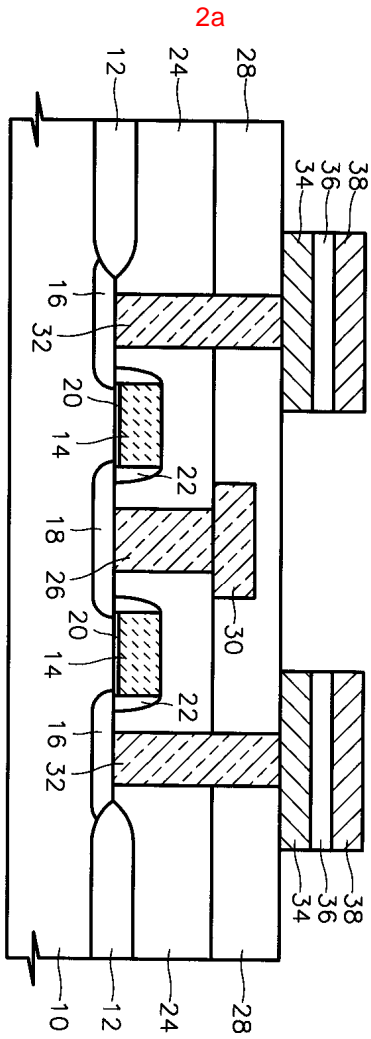
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28.

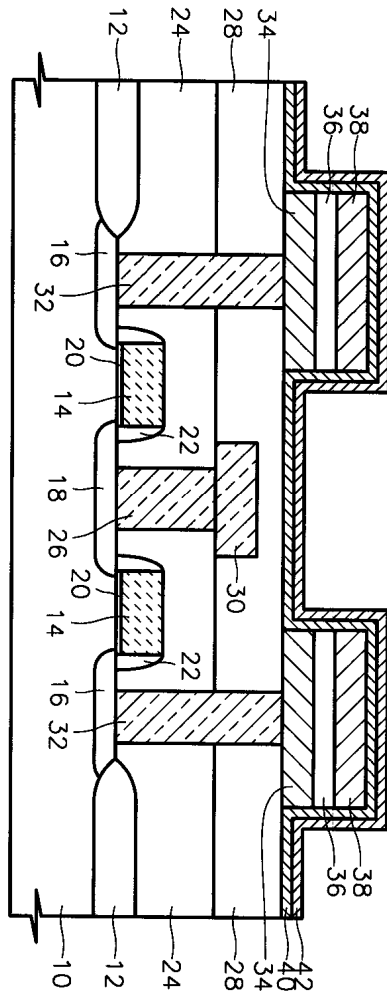
27	,	가	,	1		1	
<b>29.</b>							
27	,	1		1			
<b>30.</b>							
27	,	1					
<b>31.</b>							
30	,			Al <sub>2</sub> O <sub>3</sub> , TiO <sub>2</sub> , ZrO <sub>2</sub> , Ta <sub>5</sub> O <sub>3</sub>		CeO <sub>2</sub>	
<b>32.</b>							
27	,			1		1	10% 5
0%							
<b>33.</b>							
32	,	1		Al <sub>2</sub> O <sub>3</sub>			
<b>34.</b>							
33	,	1		10	15	1	100
<b>35.</b>							
27	,			1		1	
<b>36.</b>							
27	,						;
		2		2	2	2	
				2		2	
<b>37.</b>							
36	,	2		2		2	
		가					
<b>38.</b>							
36	,	2					
<b>39.</b>							
38	,			Al <sub>2</sub> O <sub>3</sub> , TiO <sub>2</sub> , ZrO <sub>2</sub> , Ta <sub>5</sub> O <sub>3</sub>		CeO <sub>2</sub>	
<b>40.</b>							
36	,	2		2			
<b>41.</b>							
37	,	2		2		2	
<b>42.</b>							
27	,						;
							;
							;





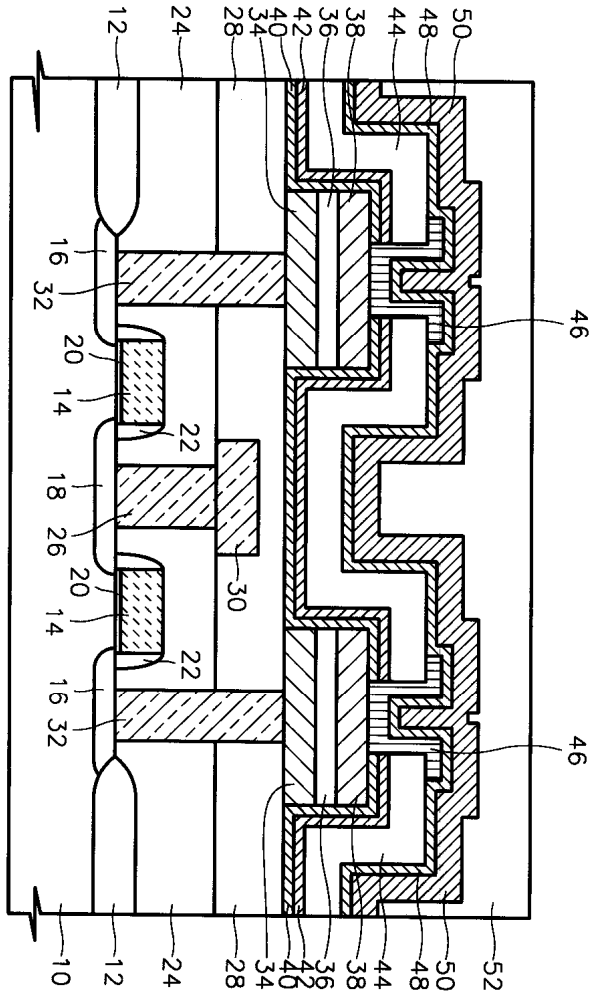


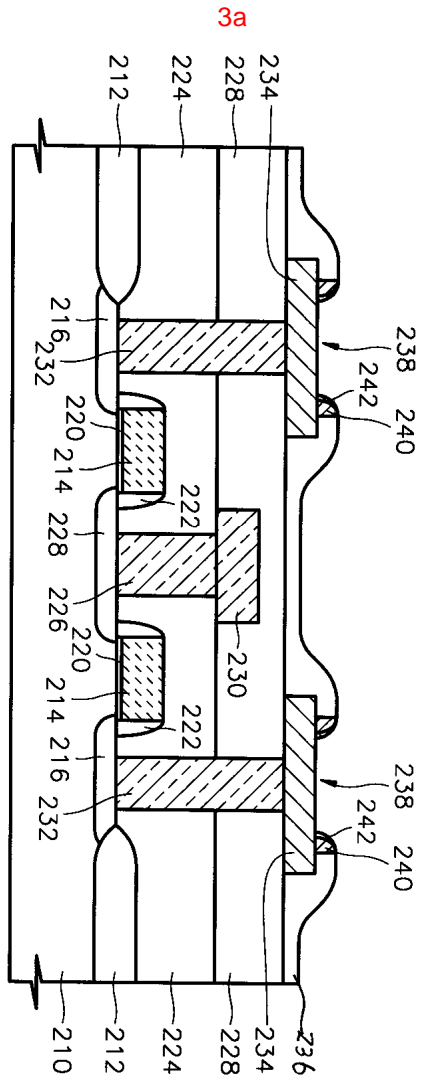
2b

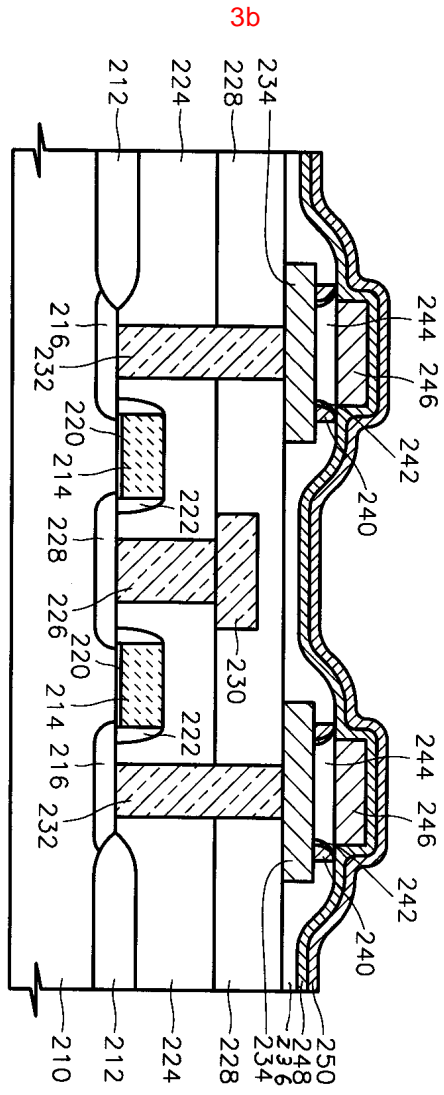




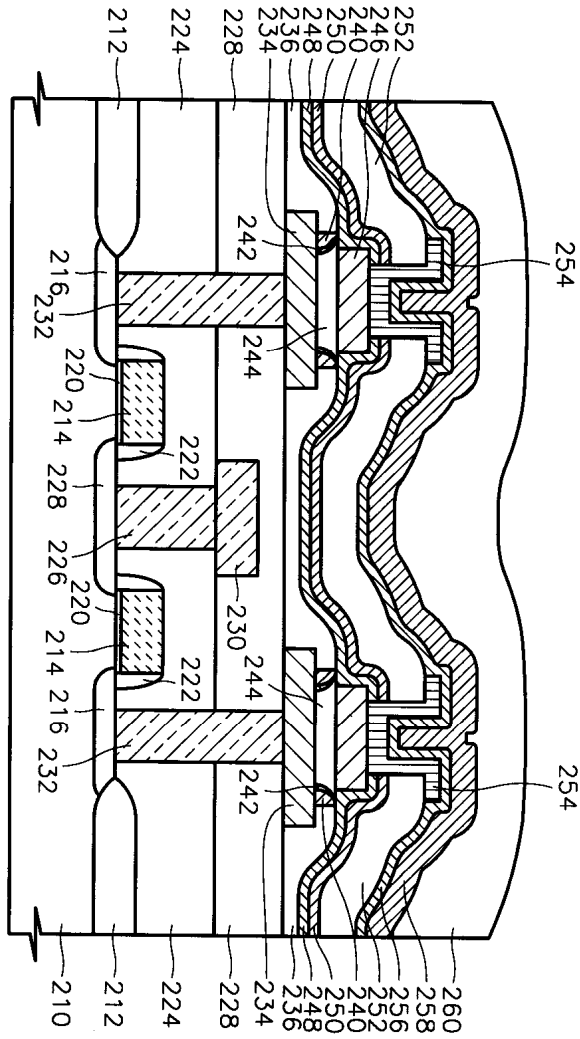
2c



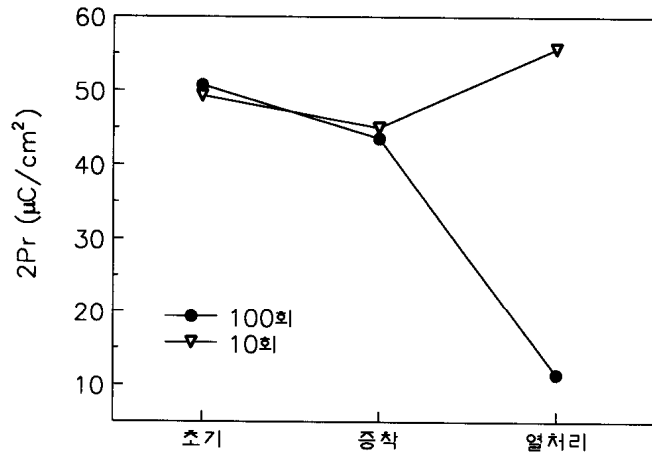




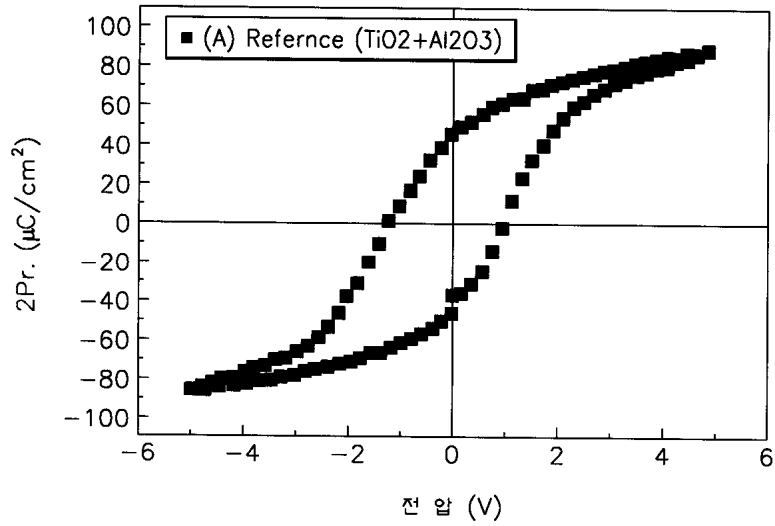
3c



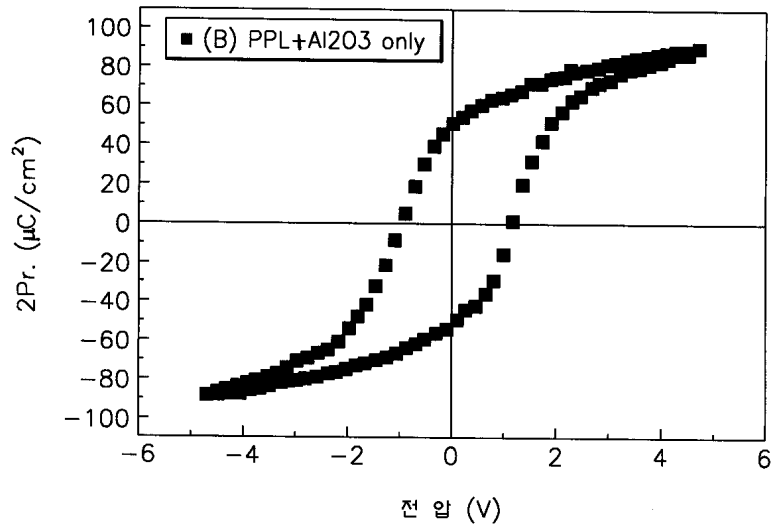
4a



4b



4c



4d

