

1
 2 6 1
 7 9 2 1 가 가
 10 11 3 가
 12 17 4

가
 가
 ,가 ,
 가
 (floating gate type

device) (floating trap type device) . 가

SONOS(Silicon Oxide Nitride Oxide Semiconductor)

1 (20), (22), (24) (27) (10) (28) (20) ,
(22) 가

가 , 가

가 ,

de-Nitride-Oxide) ONO (Oxi ,

가

가가

ONO

ONO 가

ONO 가

ONO 가

ONO

ONO

ONO

ONO 가
가

ONO

ONO

ONO

(1) 2 6 2 , (100) 1 (110) (110)

3 (121) 1 (121) (111) 1
4 ONO (160) 3 ONO (160) 1 (121) (130) CVD(chemical vapor deposition)

5 . ONO (160) 가 (140) CVD (150) , CVD 2
 , 4 ONO (160) ONO (160)
 (171) (161) . ONO (160) ONO (160)
 ONO (160) (130) (140)
 111) (130) ()
 6 , 5 2 (171) , (181) , 가 가 (1
 11') (111) 가 가 가 (1
 (181) (130) ONO (161)
 (2)
 7 9 , 1 2 4 1 가 (100) ONO 가 (172)
 7 (151) 3
 , ONO (140) 3 (172) , ONO ONO
 8 , 7 (172) (151) ONO 가 ()
 140) , 8 , ONO (141) (130)
 , ONO (162) 가 (151) 가 , ONO (162)
 (112) 가 (151) , ONO 가 ,
 (130) (182)
 9 가 8 ONO (130)
 , ONO (130) , (182)
 (3)
 10 11 1 2 3 가
 10 , 2 8 4 (173) , ONO
 4 (173) (163)
 (113) (10)
 11 , 10 4 (173) , (183)
 (4)
 12 17 4 ONO (260) , ONO (260)
 12 (100) (240) 가 (250)
 (230) , 가 , ONO ()
 260) (270) (280) (Retention)
 ONOS P
 (erase speed)가 . (1997 Symposium on VLSI Technology Diges
 t of Technical Paper P.113, "A Novel SONOS Structure for Nonvolatile Memories with Improved Data Retent
 ion") , ONO P
 13 , 12 (280), (270), ONO (260)
 (281), (271), ONO (161)
) 5 ()
 (100) 가 5 ,

14 (210) , 13 (100) (bird's beak) (281) (171)

15 (211) , 6 () , (210)

6 (100)

16 , 15 (291)

가 가 (211) 가 (291)

(211') (281) ONO (261)

17 , 16 (293) 가 가 N (281) PN

N 가 P N

4 , SONOS NMOS 가 P

(57)

1.

ONO ONO ,

가

2.

1 , 가

3.

2 , ONO ,

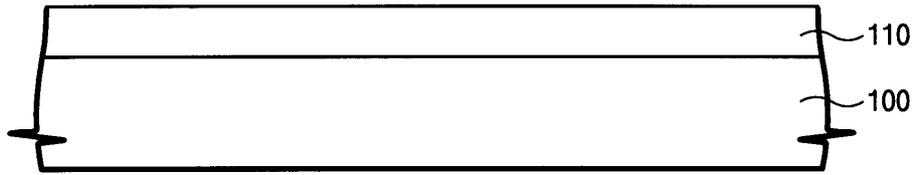
ONO 가 ,

4.

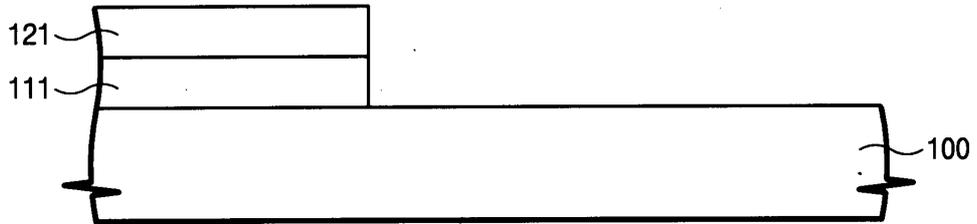
2 , ONO ,

ONO 가 ,

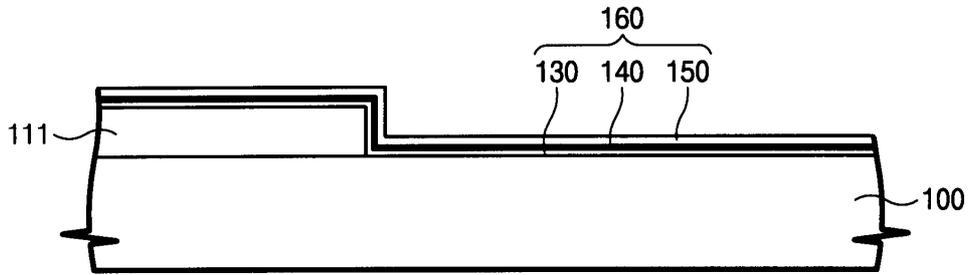
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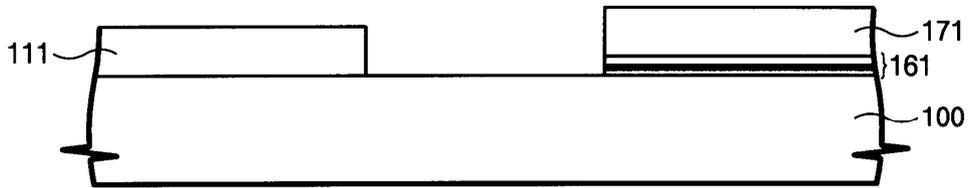
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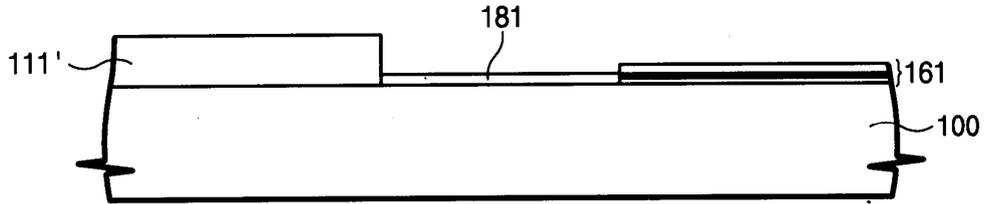
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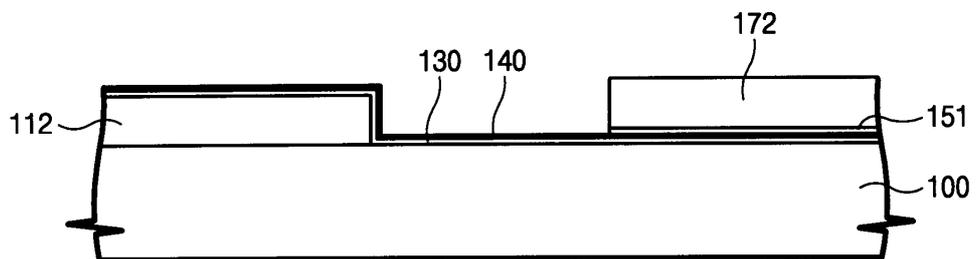
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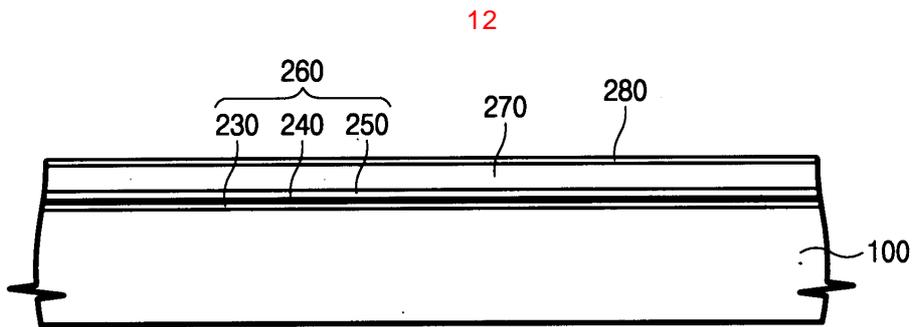
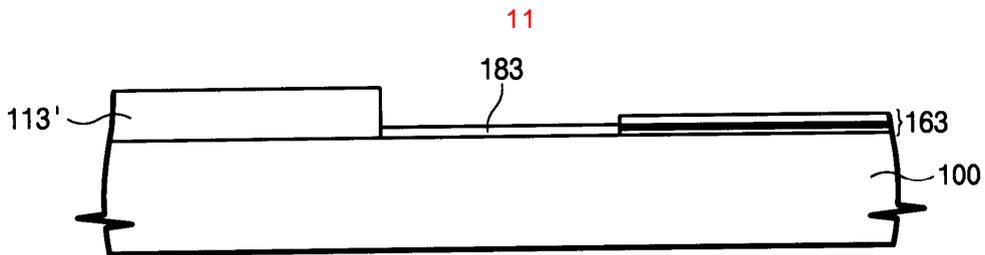
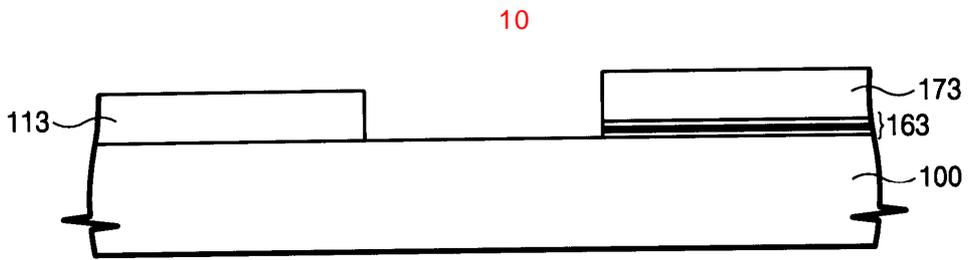
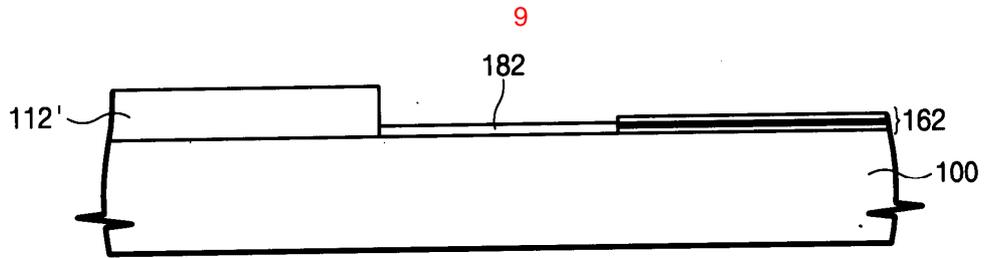
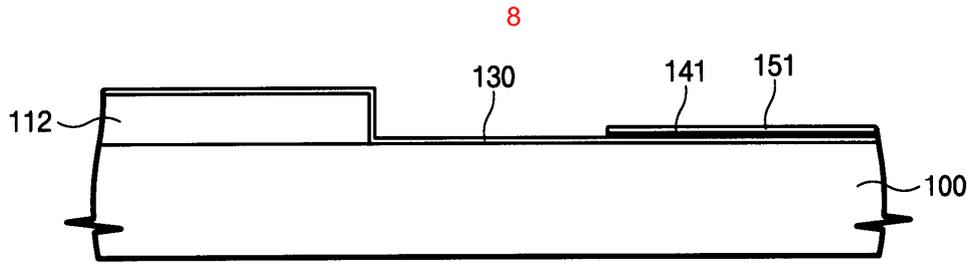


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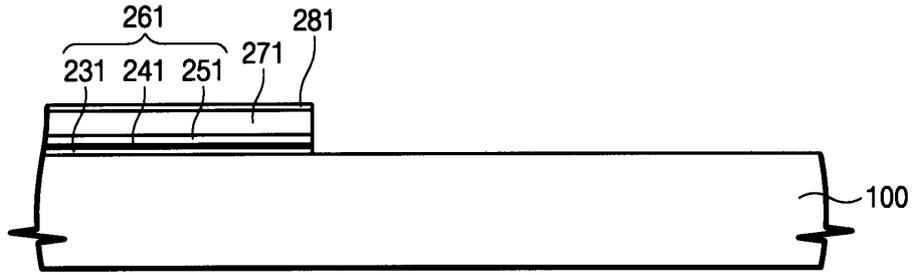


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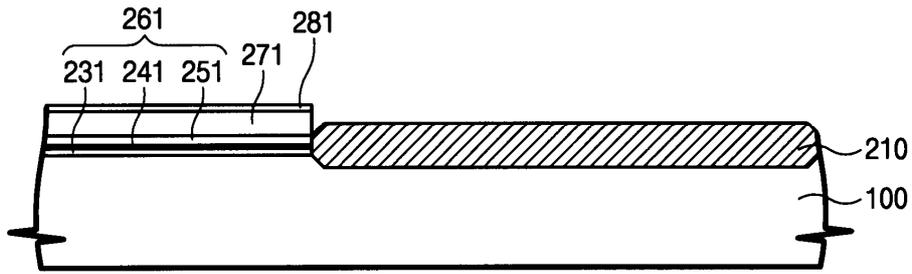




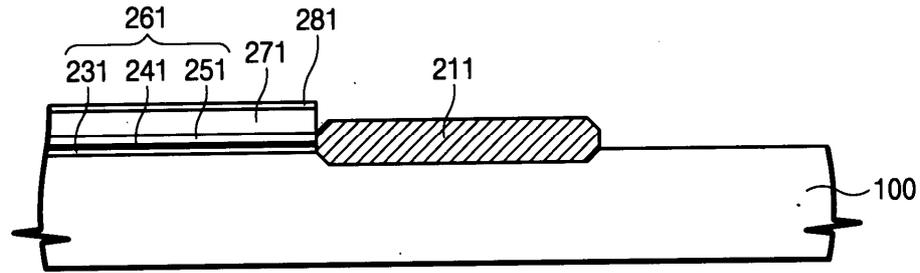
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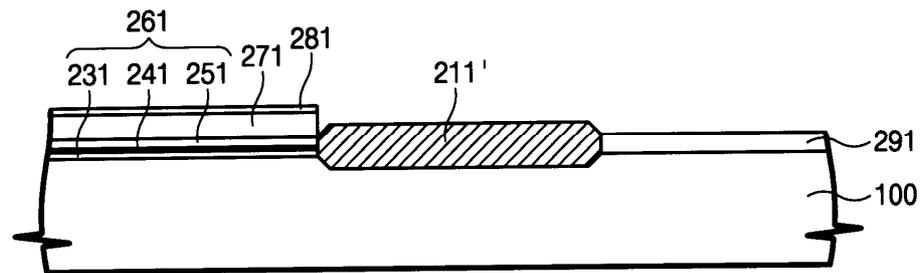
14



15



16



17

