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(73) 가 가 1 1 1

(72) 가 800가 가

(74)

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(54)

(112) ,  
(112)

가

(112)

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20 MONOS NOR  
21 MONOS NAND

101 : p  
102 :  
103, 107, 114, 143, 151, 152 :  
104 : n  
105 : p  
111 :  
112 : SiN  
113 : 1  
121 : 2  
122 : HTO  
123, 133 :  
124 :  
125 :  
131, 132 :  
141 : WSi  
142 : TEOS  
150 :

Shallow Trench Isolation) MONOS (Metal-Oxide-Nitride-Oxide-Si) SA-STI(Self-Aligned  
 가 (EEPROM) MONOS  
 14 MONOS 15  
 p (9) n (8) p (1) p (1)  
 (n (bottom) : 2), (11), (n : 3) (11) (11) (11)  
 7) SiN (5), (top) (6), (10) (10)  
 MONOS SiN (5)  
 SiN  
 MONOS SiN (7)  
 SiN (5) (+Vpg) 가 FN(Fowler-Nordheim)  
 (1) (3), (2) SiN (5) 가 SiN (5) 가 FN  
 +Vev) 가 SiN (5) 가 SiN (5) (-) (-Veg) (1) (+) (9) FN  
 MONOS 3가 가  
 (10) (4), SiN (5),  
 (6) SiN (5) (11)  
 18 (10) 가 (熱) (勵起)  
 가  
 19 (10) (12) SiN  
 (5) SiN (5) (11) 가 (10)  
 FN (13) MONOS 가  
 20 NOR MC1 MT1 , 2  
 ST1 ST2가  
 NAND MC11  
 MT11 MT1n(n 1 ) , 2 ST11 ST12가  
 NAND  
 가  
 가  
 가

1, 2, 1, 1, 2, 1, 2, 2, 1, 2

가 1nm, 10nm, 5nm, 15nm, 가 0.5nm, 7nm

가 5nm, 15nm, 가 1nm, 10nm, 가 1nm, 10nm, 가 5nm, 15nm

가 5nm, 15nm, 가 2, 가 2, 가 2, 1

3, 4, 3, 4, 1, 2

가 2, 가

가 3, 가 2, 가 3, 2, 3, 2

가 3, 가 2, 가 4, 1, 2

가 3, 가 3, 가 2, 가 4, 1,

2, 2, 가, 가, 가, 가, 가, 1, 2

1, 2, HTO, 1, 2, 3, 4, 1,

1, NAND 13, MONOS, HV(High Voltage), LV(Low Voltage)

1, p, (101), HV, (102), 10nm

(103) (101) n  
 가 n (104) p  
 (103) 가 p (105) (107) , n p  
 (105) n (106) (111)  
 3 , 0.5nm 3nm 3nm , , (111)  
 , SiN (112) (112) ,  
 N<sub>2</sub>O, NH<sub>3</sub>  
 (151) (151)  
 SiN (112) RIE(Reactive Ion Etching) , 가  
 SiN (112)  
 4 (112) (wet) (113) (111)  
 (113) , 5nm , SiN (112) (101) 1  
 5 , LV  
 (114) (114) , LV  
 (113) 1 (113) 1 2nm  
 6 (114) 2 (121) 2nm LV  
 (122) , HTO (122) , 가 SiN (112) (150) HTO(High Temperature Oxide)  
 (窒化) , N<sub>2</sub>O, NH<sub>3</sub>  
 7 (123) , HV  
 2 (121) , HTO (122) 1 (113)  
 , LV 2 (121) HTO (122)  
 , 가 /  
 , 7 13  
 7 (124) 70nm (124) 가 (123)  
 25) 200nm , TEOS (124)  
 (152) (125), (124)  
 RIE (152) (125) (124)  
 8 (152) (125) (124) , 가  
 LV (123) , HV 200nm  
 (126) (101) RIE  
 9 (131) (101) 3nm 6nm TEOS  
 (126) 가 (101) (132) , H  
 CVD (101) (126) (125) HDP(High Density Plasma) 9  
 DP (132) , CMP(Chemical Mechanical Polishing) (132)  
 , 10 (124)  
 , 900 (126) (解放)

, HF , (126)  
 11 , (124) (hot) , (126)  
 (132) (126a) , ,  
 (133) , 70nm ,  
 (133) (123) , 850  
 30 ,  
 , 가 (133) (WSi) (141) , 50nm ,  
 , 12 가 TEOS (142) , 200nm CVD ,  
 , (143)  
 TEOS (142) , 12 ,  
 SiN (112) ,  
 (143) , TEOS (142) WSi (141), (133, 123)  
 RIE (150) SiN (112) ,  
 , (後)  
 , 가 BPSG ,  
 ,  
 , SiN (112) ,  
 ,  
 , ( 1 (113), 2 가 (121) HTO (122)  
 , 가 2 가  
 HV ( 1 (113), 2 (121) HTO (122))  
 2 (121) HTO (122)) LV (121) HTO (122))  
 , WSi , WSi  
 Ti Co , 가 ,

(57)

1.

1 1 - 1 -  
 - 2 2 - 2  
 1 2 , 1

2.  
 1 1 , , 가 1nm 10nm , (bottom) , 가 0.5nm 7  
 nm , 가 5nm 15nm

3.  
 1 1 , , 가 1nm 10nm , ,  
 , 가 5nm 15nm

4.  
 1 1 , , 가 1nm 10nm , ,  
 , 가 5nm 15nm

5.  
 1 4 , ,  
 2 2 1 , , 가 5nm 15nm 2 , ,

6.  
 5 , , ,  
 3 3 1 , ,  
 4 4 2 , ,  
 3 , 4 가 , ,

7.  
 , , , 1 , ,  
 , , , 2 , ,  
 가 , , 가 , ,

8.  
 , , , 1 , ,  
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 , , , 3 , ,  
 가 , , 가 , , 가 , ,  
 2 , 3 , ,

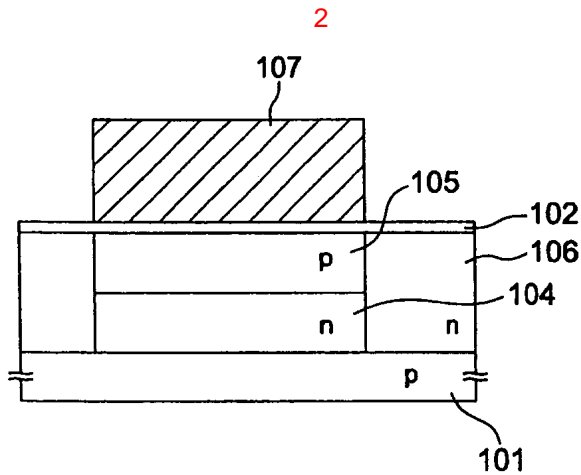
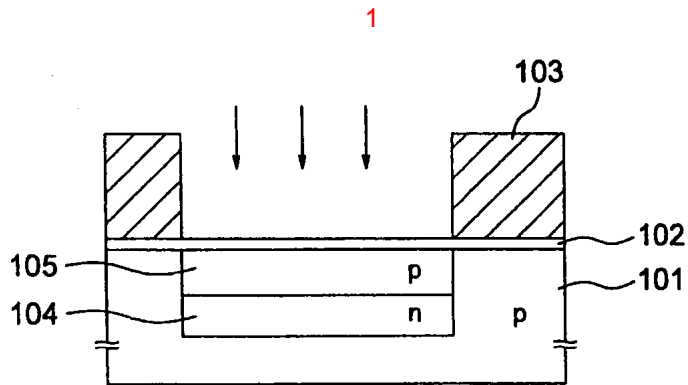
9.

3 가 2 가 1 가 1, 2 가 3 가 1, 2 가 3

10.

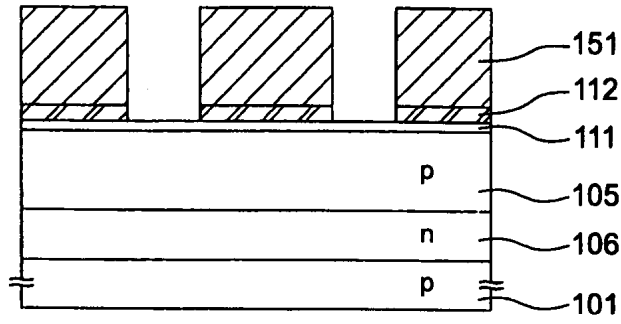
7 1 9 2

HTO(High Temperature Oxide)

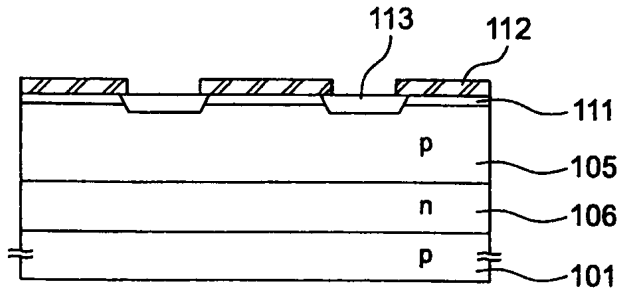




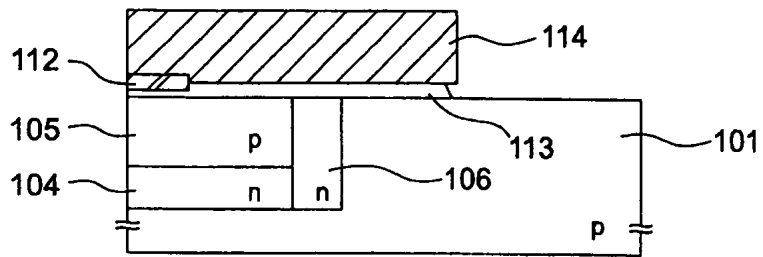
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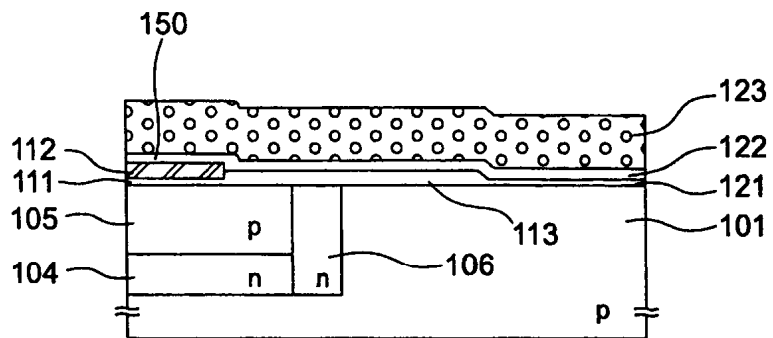
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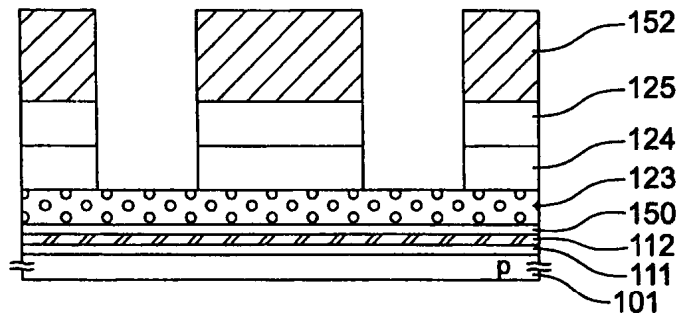
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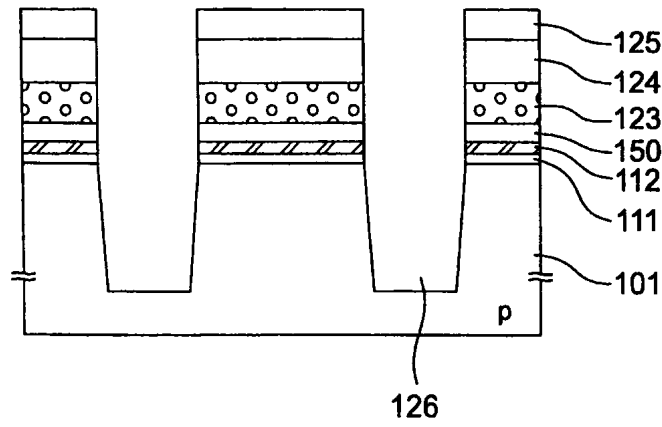
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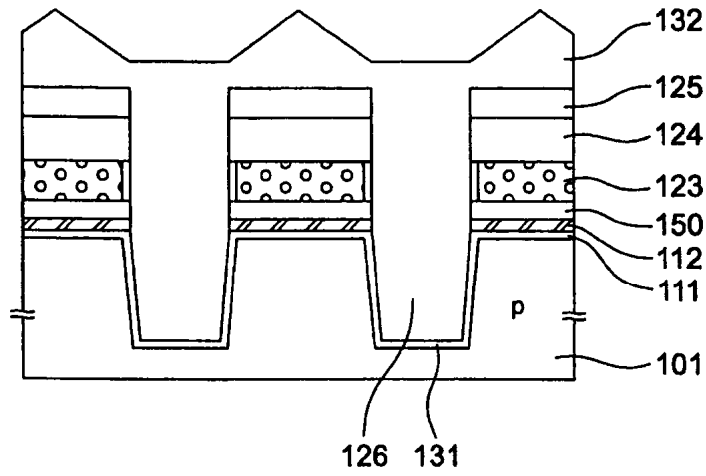
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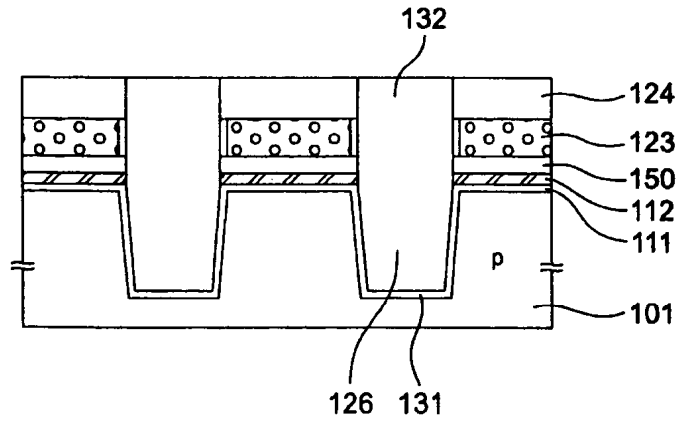
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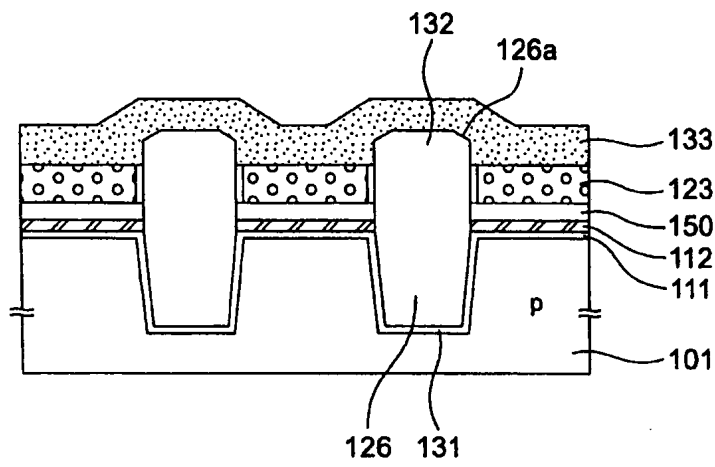
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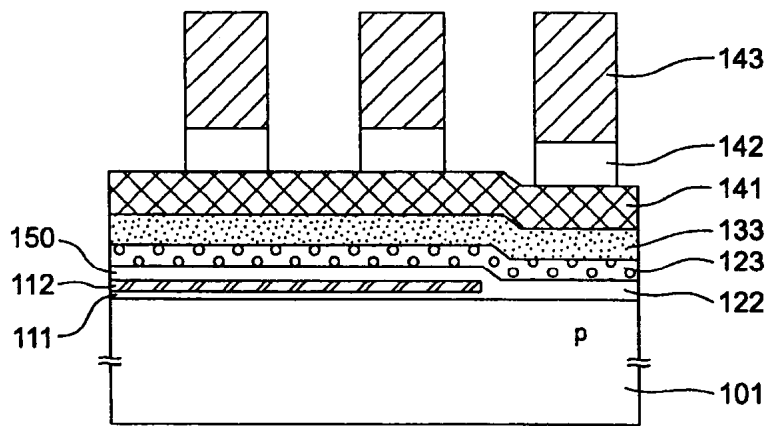
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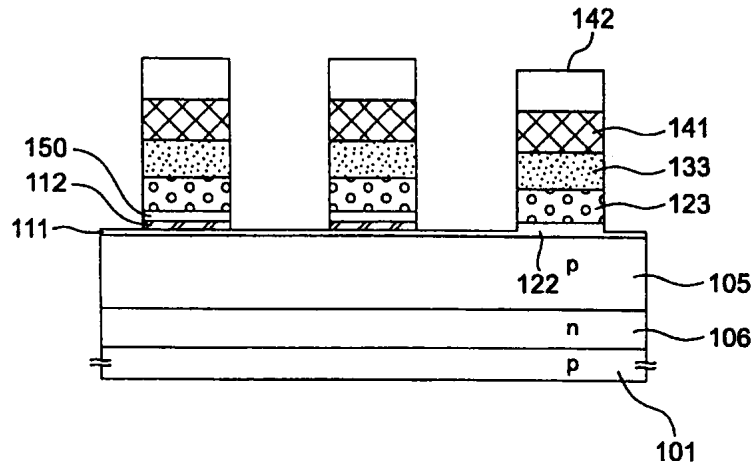
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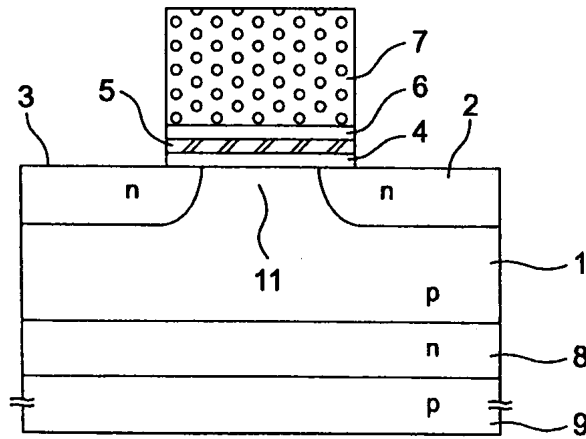
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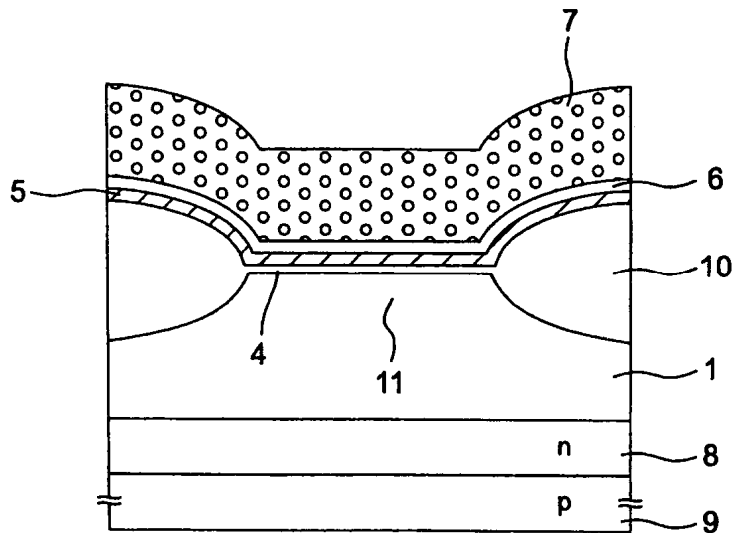
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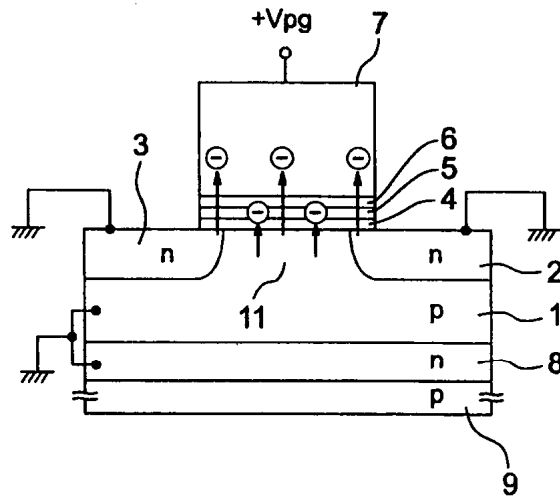
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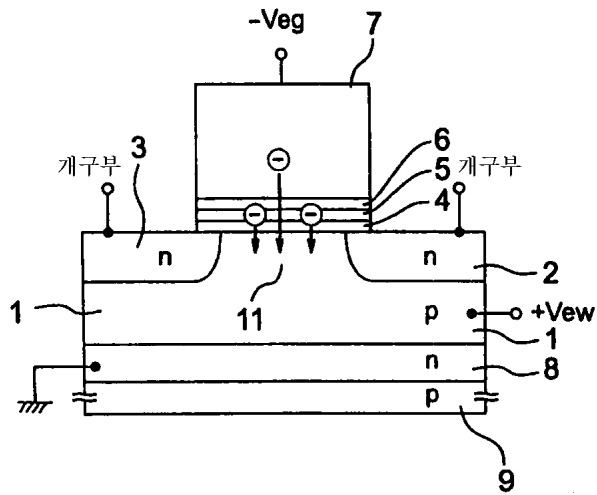
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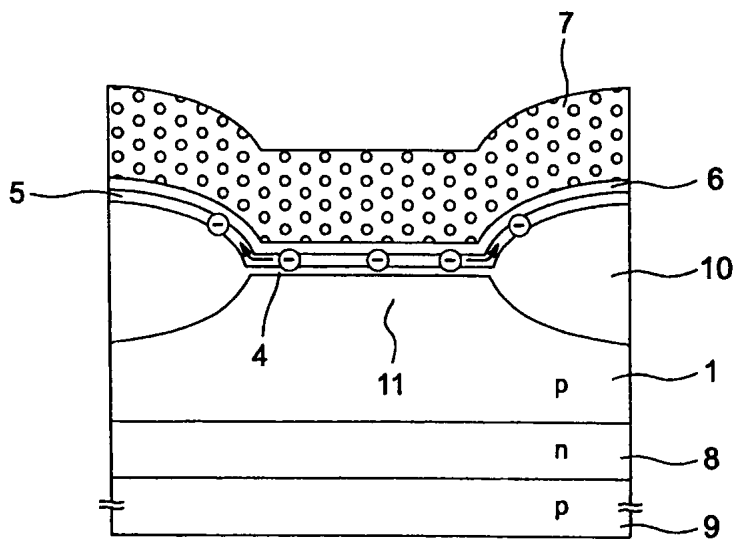
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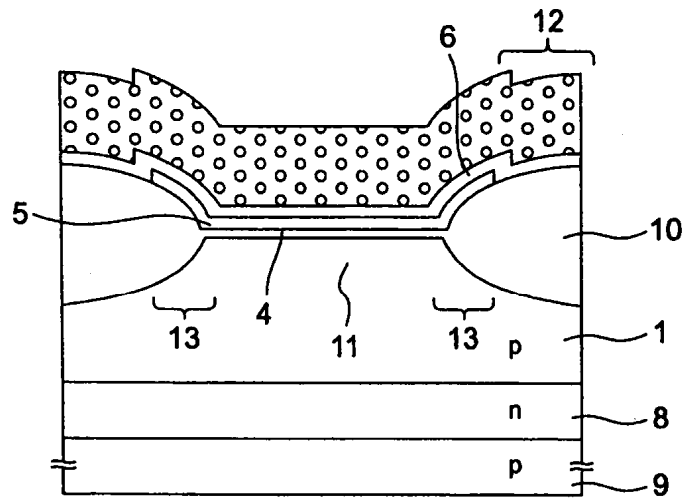
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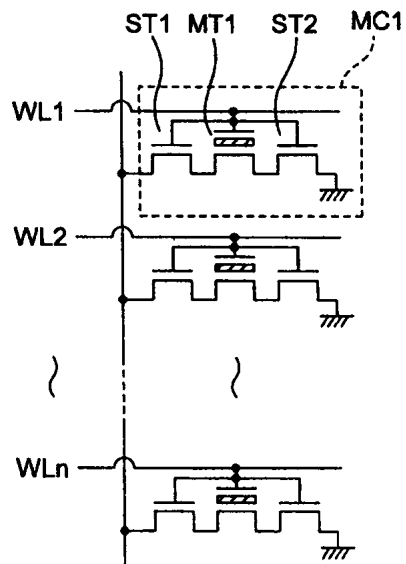
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