

(19)
(12)

(KR)
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G11C 7/06

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(11)
(24)

2004 01 13
10-0414210
2003 12 23

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(65)
(43)

10-2003-0041068
2003 05 23

(73)

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(72)

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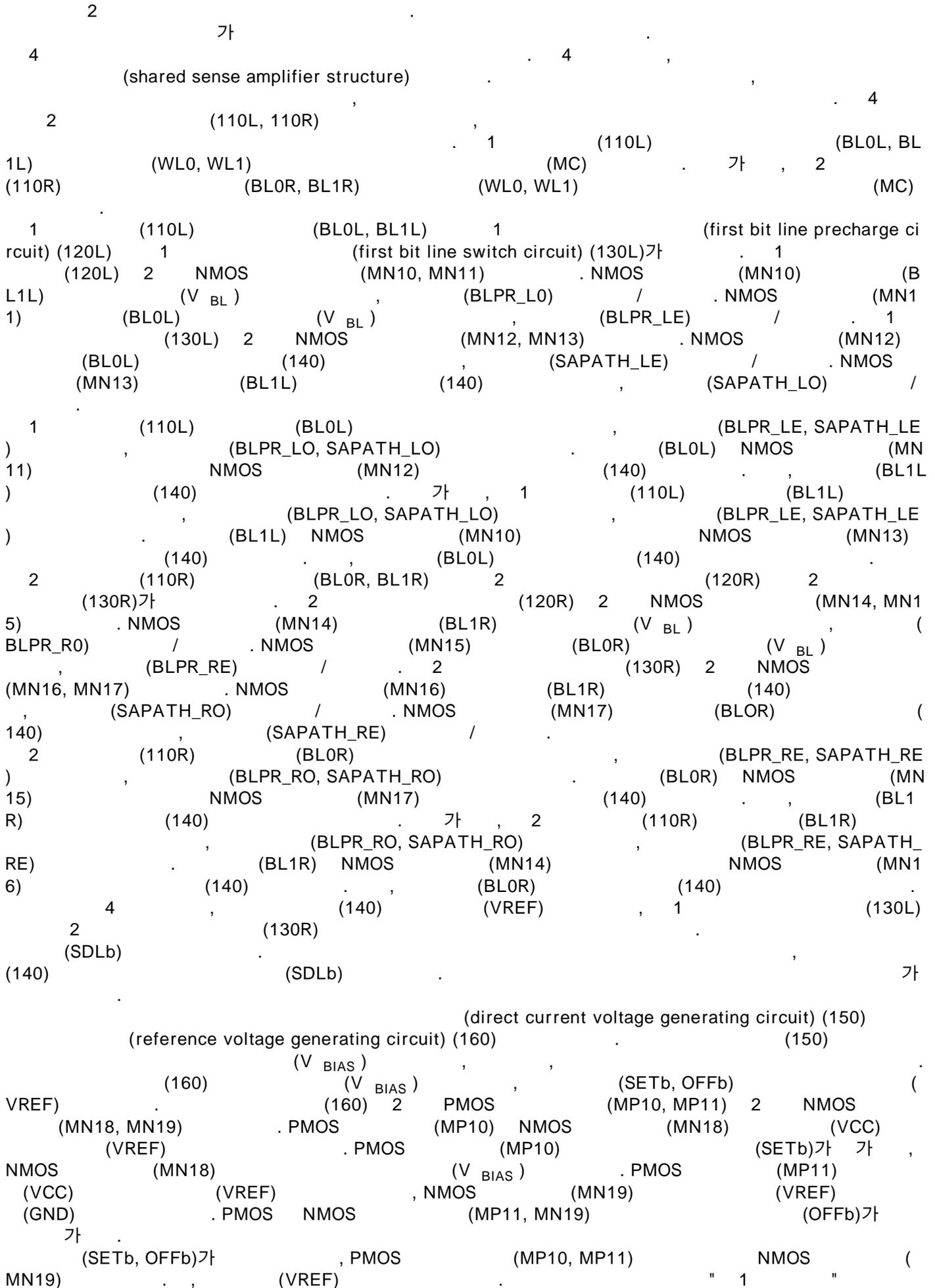
(54)

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

1 ;
 2 1 ;
 3 1 ;
 4 3 ;
 5 2 ;
 6 5 .

* 10, 100, 300 : * 12, 120, 320 :

(latch-type sense amp
 lifier)가
 2000-41576 " " 2000-9772 " " 1999-85068 " "
 5,455,786 "Ferroelectric Memory"
 5,959,922 "Ferroelectric Random Access Memory Device With Reference Cell Ar
 ray Blocks"
 6,169,424 "Self-Biasing Sense Amplifier"
 (Japanese Laid-Open Publication No.) 11-219591 "SENSE AMPLIFIER FOR MEMORY ARRAYS"
 12-76856 "SEMICONDUCTOR STORAGE" 11-2
 60064 "SENSE AMPLIFIER"
 1 (10) (BLM, BLR) (latch-type sense amplifier) (12)
 (12) 2 PMOS (MP0, MP1) 2 NMOS (MN0, MN1)
 (BLR) PMOS (MP0) (SAP) (BLM) (SAP) (BLR)
 (BLM) PMOS (MP1) (SAP) (BLR)
 (SAN) (BLR) (BLM) (MN0) (BLM) (M
 N1) (BLR) (SAN) (BLM) NMOS (14)가
 (BLM) (MC) (BLR) (Cr) (14)가
 (14) 2 NMOS (MN2, MN3) (Cr)
 2 1 1 2
 F 2 (REF_EN)가 VREF
 NMOS (MN3) (Cr) (Cr) Cr*VRE
 (Cr) (REF_EN) (high-to- low transition)
 NMOS (DMP_EN)가 (Cr)
 (BLM) (MN2) (BLR) (MC)
 (MC) '1' (BLM) (BLR) (BLR) (BLR) (BLR) (BLR)
 , 0.85V) (MC) '0'가 (BLM) (BLR) (BLR) (BLR)
 (BLR) (, 0.85V) (BLM, BLR) (BLM, BLR) (BLR) (BLR)
 (SAP) (Vcc) (SAP) (Va) 가
 (GND) 가 (BLM, BLR) 가
 가 (BLM, BLR) 가 PMOS (turn-on voltage) 가
 (threshold voltage) (BLM) 가 PMOS (MP0) (BLM) (, 1.
 (SAP) '1' 가 (BLM) (BLM) (, 1.
 1V) 가 가 가 (BLM, BLR)
 가 NMOS (SAP) (Va) NMOS
 (MN0) (BLM BLR) '0'
 (BLM) (, 0.6V) (BLM, BLR) 가
 (14) (Cr)가 NMOS (MN3)
 NMOS (MN2) (BLR)



(VCC) PMOS (MP22, MP23) (BL) -
 (Vgs) (VREF) (Na) 2 (Nb) , PMOS (MP22, MP23) , PMOS (MP22, MP23) 가 (BL) 가
 1 (Na) 2 (Nb) (MP10, MP11, MN10, MN11) 1 (Na) 2 (Nb) 가 .
 OS , '1' (BL) (VREF) PM
 1 (Na) 2 (Nb) PMOS (MP23) (Na) 2 (Nb)
) (SETb) (OFFb)
 PMOS (MP23) 가 (VREF) 2 3 (VCC)
 PMOS (MP23)가 (LS_EN, YSW) (SDLb)
 가 2 (Nb) (SDLb) NMOS (MN25) (BL) (OFFb)
 , (VREF) 가
 (MN22, MN23) (MC) (BL) PMOS NMOS
 (MN24) 가 가 (MP22, MP23) -
 1 (Na) 2 (Nb)가 (SA_EN)가 PMOS
 MOS (MP20, MP21) NMOS (MN20, MN21) N
 (MN24)가 PMOS (MP22, MP23) 2 (Nb)
 , NMOS (MN24)
 가 ,
 NMOS (VREF) 가 , 1 2 (Na, Nb) (BL)
 /) (BLM, BLR) (PMOS /
 , (140) (140)
 , 가, 가 (BL) (VREF)
 7 (active load element) PMOS (MP22, MP23) NMOS (300)
 3, MN34) 5 (MN33) 1
 (Na) (GND) , (BL) NMOS (MN33)
 (MN34) 2 (Nb) (GND) , (VREF) NMOS
 7 5
 , (MC) (BL) NMOS (MN33, MN34)
 - (MN33, MN34) - 7 (BL) (VREF) NMOS
 NMOS (MN33, MN34) - ,
 , 가
 , , 가 , , /
 , , 가 , , 가

18 22.

18 23.

1 PMOS ; 1 2 PMOS 1 NMOS ; 1 2 NMOS ; 2 PMOS ; 2 NMOS

24.

; ; ; ; ; 1 2 ; ;

NMOS

; 1 ; 2 ; 1 ; 2 NMOS

5 NMOS

1 2 ; 1 2 ; 3 ; 4 5 ; 5 NMOS ; 3 NMOS ; 4 NMOS ; 4 ;

25.

23

가 가

26.

23

3 가 ; 1 2

27.

23

28.

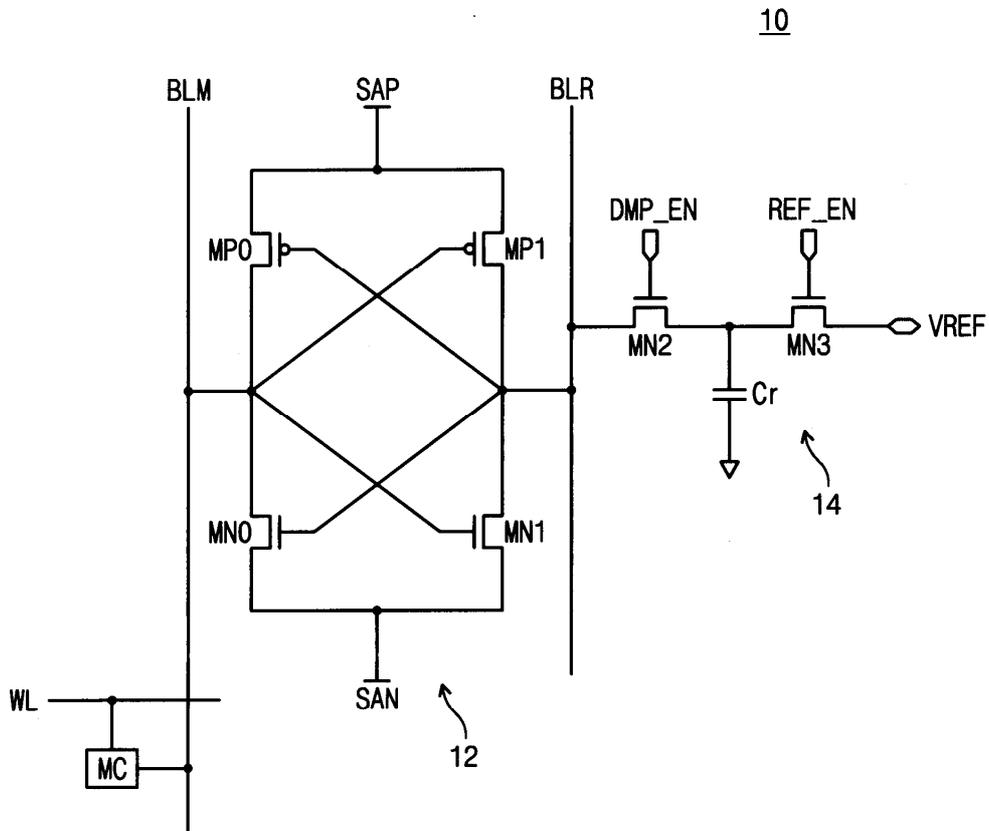
23

29.

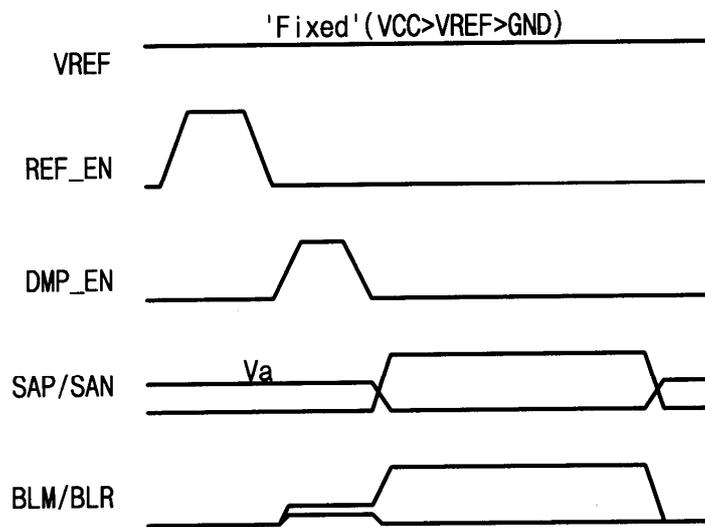
23

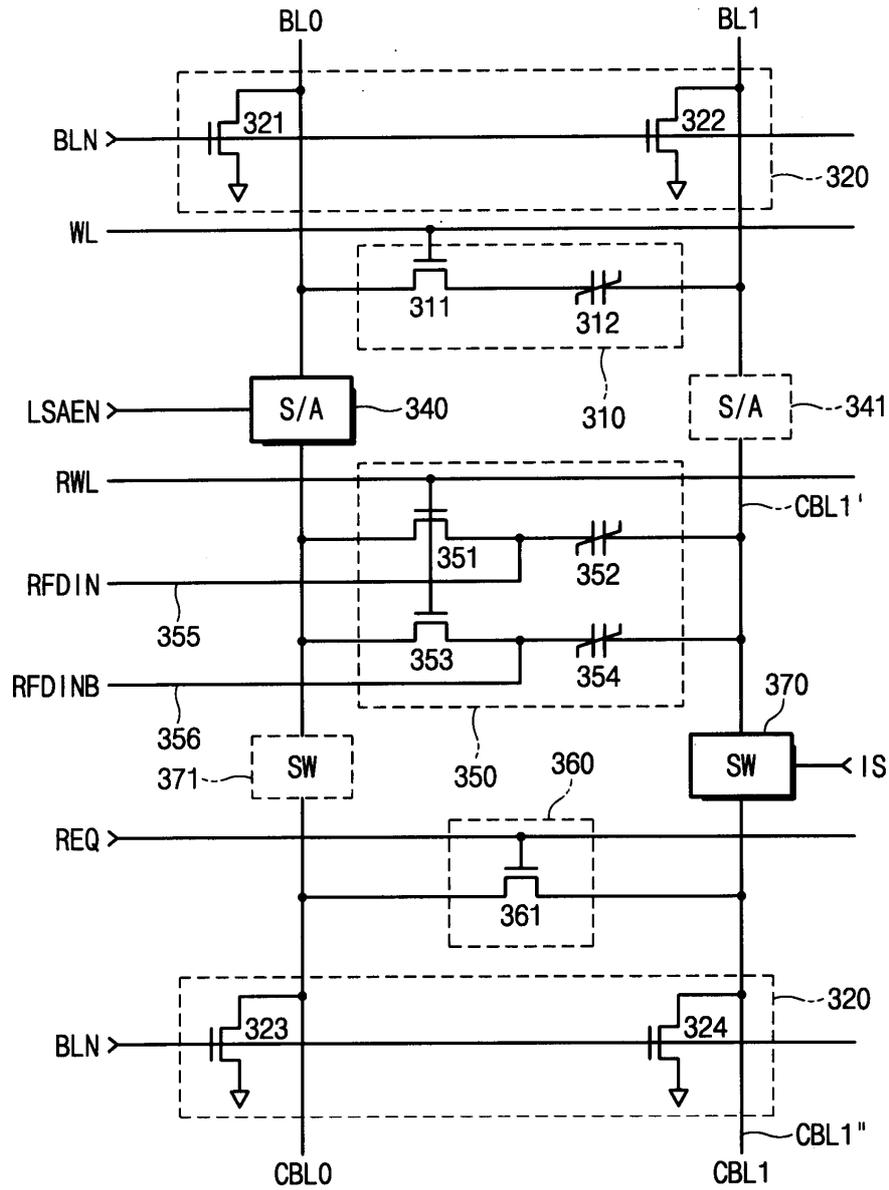
1 PMOS ; 1 2 PMOS 1 NMOS ; 1 2 NMOS ; 2 PMOS ; 2 NMOS

1
(종래 기술)



2
(종래 기술)





4

