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(21) 10 - 1998 - 0037986 (65) 1999 - 0066760
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(73) 가 가
,
2 2 3

(72) 2 2 - 3 가 가
2 2 - 3 가 가
2 2 - 3 가 가

(74)

:

(54)

L () 2 가 , LVTTL (NOR) SST
, LVTTL ()
SSTL . , SST
L . , .

| | | | | | | |
|----|-----|------|-----|---|--------------|----------|
| 1 | | 1 | | | (1000) | . |
| 2 | | 1 | | | (120) | . |
| 3 | | 1 | | | (100) | . |
| 4 | (a) | 4 | (h) | 1 | 3 | 1 (1000) |
| 5 | 2 | | | | (200) | . |
| 6 | (a) | 6 | (h) | 5 | | (200. 1) |
| 7 | | 2 | | | (200) | . |
| 8 | (a) | 8 | (h) | 7 | | (200. 2) |
| 9 | | 2 | | | (200) | . |
| 10 | (a) | 10 | (h) | 9 | | (200. 3) |
| 11 | | | | | (9000) | . |
| 12 | | | | | (1 ; LVTTL) | . |
| 13 | | SSTL | | | (2) | . |
| < | | | | | > | |

1, 104 : NOR

2, 4, 5, 6 :

3 : NAND

100, 200 :

102 :

120 :

121 :

122 :

123 :

124 :

125 :

126 :

128 :

1000 :

11 14 :

, 가

11

11 (9000) (1.1, 1.2, ..., 1.m), (900) (9.1, 9.2, ..., 9.n)

[1.1, 1.2, ..., 1.m ; (1)] EXT1, EXT2, ..., EXTm (900) (1) (900) (9.1, 9.2, ..., 9.n) (900) (D1, D2, ..., Dn) (1) TTL(Transistor Transistor Logic) LVTTL

, (1) 12

12 (1) LVTTL , NOR [, NOR (1)].

12 NOR (1) P MOS PLT1 PLT2, N MOS NLT1
NLT2 . P MOS PLT1 PLT2 VDD N MOS NLT
1 NLT2 . N MOS NLT1 NLT2

P MOS PLT2 N MOS NLT1 VIN(1
1 EXT1, EXT2, ..., EXTm)

P MOS PLT2 N MOS NLT1 CMOS . P MOS
PLT1 N MOS NLT2 , SE
L . NOR (1) P MOS PLT1 N MOS NLT2 /
/

P MOS VIN PLT2 N MOS VOUT가 . NLT1 N MOS NLT2 (900)

LVTTL , VIN 2.0V , 0.8V (

LVTTL).

LVTTL (1) MOS 가 . (1)

, SEL ()

, 12 NOR (1) SEL L , P

MOS PLT1 , N MOS NLT2 ,

VIN 가 , H VOUT VIN(2.0V) , N MOS

NLT1 L VOUT , L VIN(0.8V)

P MOS PLT2가 H VOUT가

S SEL H , P MOS PLT1 , N MO

VIN NLT2가 , NOR (2) 가 , VOUT

LVTTL VDD 3.3V , 60MHz 100MHz

, CPU, MPU 가 , 가

, LVTTL . TTL 가 , 가

, 가 가 (LVTTL)

, 가

TL , SSTL(Stub Series Terminated Logic) 가 . SS

13 , SSTL (2) P MOS PST1 PST2 N M

OS NST1, NST2 NST3 . SSTL (2) .

, SSTL (2) (2)

13 , P MOS PST1 N MOS NST1 VDD

Z1 . P MOS PST2 N MOS NST2

VDD Z1

P MOS PST1 P MOS PST2 P

MOS PST1 N MOS NST1 (X1)

N MOS NST1 , VDD×0.45V(VDD가
 3.3V 1.5V) Vref . N MOS NST2
 VIN Vref VH(, ±0.4V)

N MOS NST3 Z1 . N MOS NST3 (2)
 N MOS NST3 / 가 .

P MOS PST2 N MOS NST2 VIN
 VOUT VOUT , 11 (900) .
 , 13 (2) SEL H , (2)
 VIN 가 , VIN Vref , H VOUT가
 H VIN VOUT가 L , L VIN VOUT가

SEL L , (2) 가 , VOUT VIN
 L .

, (2) .

, 13 (2) Vref가 , N MOS
 NST1 .

, SEL H (), X1 , X1
 가 P MOS PST1 , P MOS PST1 NST1
 P MOS PST1 X1 가 .

, SEL H (), P MOS PST1 N
 MOS NST1 ()가 .
 , (9000) 13 (2) , 가 .
 ()가

, ,

, 가

, ,

1 , 2 , 가

, 1 , 2

2

2

LVTTL

SSTL

가

< 1 >

1

가

1

1

1
(124)

(1000)

(121),

(122),

(123)

(121)
(123)

(122)

A

/RAS,
(123)

/CAS,

(,
가 /WE)

(123)

(121)

(122)

(124)

(124)

(123)
(1000)

가

(1000)
(120)

(126),

(128),

(125)

(126)
(124)
(128)
(126)

(123)

(126)
(DQ)

DQ

, A (124)가 (123) (128) (DQ) DQ가 (120) ext. CLK (121) (122) ext. CLK (123), (120) ext. CKE (124) ext. CKE (125) H (Vref + VH) (L) (124) L ext. CKE SEL (125) SEL (126) (122) (128)] L (120) ext. CKE [(121), (120) (120) (120) ext. CKE CKE (120) 1 (120) 2 (120) (100), (102) NOR (104) (100) 2 (100) N2 (100) SEL CKE (100) N3 N1 Vref VOUT1 VOUT2 N4 N5 SEL (102) VOUT1 VOUT2 (102) NOR (104) VOUT1 CKE (102) (2 OUT). (100) 3 (100) NOR (1) (2) 12 (NLT1 NLT2), NOR (1) P MOS (PLT1 PLT2) N MOS

P MOS PLT1 N MOS NLT2
SEL , P MOS PLT2 N MOS NLT1
CKE .

P MOS PLT2 N MOS NLT1 N4
CKE VOUT1 , NOR (1) LVTTTL
LVTTTL VOUT1 .

13 , (2) P MOS PST1 PST2 N MOS
NST1, NST2 NST3 .

N MOS NST3 SEL N MOS
NST2 Vref . P MOS CKE , N MOS NST1
N5 SCTL CKE PST2 N MOS NST2
VOUT2 Vref VOUT2가 , (2)

(h) , 1 3 (1000) 4 (a) 4
, , (1000) (t0 t1).
, , SEL H N MOS NST3
, Z1(N MOS NST1 N MOS NST2) L
, (2)가 .

, P MOS PLT1 N MOS NLT2
Y1(P MOS PLT1 P MOS PLT2) L
, NOR (1) 가 .

H (Vref + VH) CKE가 (2)
CKE Vref , VOUT2 , NOR (1)
VOUT1 L .

, 가 L
SEL (t1).

N MOS NST3가 가 P MOS PST1 N MOS
NST1 가 Z1 , (2)
가 .

, P MOS PLT1 , Y1 가 VDD
, NOR (1)가 가 , NOR (1) CKE VOUT1
.

, ext. CKE 0.2V NOR (1)
, NOR (1) CMOS
가 , 가 .

, (2)
(2)

, 1 가 (,
)
 < 2 >
 . 2 1
 (1000)
 2 (1000) 1 (100)
 (200) . 2 (200)
 5
 3 1 (100)
 . 5 [200 ; , (200. 1)] (12),
 NAND (3) (4)
 (12) N1 SEL (/SEL)
 (4) P MOS PST1 PST2 N MOS NST1, NST2 NST3
 . 2
 , (4) MOS (11) (11) /SEL
 . N MOS NST3 (11) ,
 SEL . P MOS PST2 N MOS NST2
 N5 CKE VOUT2가 , (4)
 SSTL
 NAND (3) P MOS PLT3 PLT4, N MOS NLT3 NLT4
 . P MOS PLT3 P MOS PLT4 VDD N MOS
 NLT3 . N MOS NLT3 Y2
 ,
 P MOS PLT3 N MOS NLT3 CK
 E . P MOS PLT4 N MOS NLT4
 (12) /SEL . P MOS PLT3 N M
 OS NLT3 N4 , CKE VOUT1
 . , NAND (3) LVTTTL LVTTTL VOUT
 1
 , 5 (200. 1) 6 (a) 6 (h)
 .

SEL H ((t0 t1). , MOS NLT2
 NST3 (, Z1(N MOS NLT1 N MOS NLT2
) L , (4) .

(N , N MOS NLT4 , P MOS PLT4 , Y2
 (N MOS NLT3 N MOS NLT4) L ,
 . , NAND (3)가 가 .

H (Vref + VH) CKE가 , (4)
 CKE Vref VOUT2 . NAND (3)
 VOUT1 L .

가 L
 SEL (t1). . ,

N MOS NST3가 가 , P MOS PST1 N MOS
 NST1 Z1 (4)

2 , N MOS NLT4가 , P MOS PLT4가 Y
 가 L . , NAND (3)가 . NAND (3)
 CKE VOUT1 .

NAND (3) , ext. CKE 0.2V ,
 CMOS (3) 가 , (4) , NAND (3)
 가 , (4) 가 ,

2 (200) 7

3 (100) .

7 [200 ; , (200.2)] NOR (1) SEL (5)
 . CKE NOR (1) LVTTL VOUT1 .

(5) P MOS PST1 PST2 N MOS NST1 NST2
 . P MOS PST1 PST2, N MOS NST1 NST2
 3 (2) .

(5) (I3) P MOS PST3 . (I3)
 SEL .

P MOS PST3 VDD P MOS PST1 PST2

13) . P MOS PST3 , (/SEL) (5) P MOS PST3 / (5) SSTL .

7 (200.2) 8 (a) 8 (h)

(t0 t1). , SEL H (/SEL L) . P MOS PST3 , Z1(N MOS NST1 NST2) L (5) .

Y1(P MOS NLT2 , P MOS PLT1) L MOS PLT2 , NOR (1)가 .

H (Vref + VH) CKE가 (5) CKE VOUT2 . NOR (1) VOUT1 L .

가 SEL (t1).

P MOS PST3가 가 (5) .

Y1 가 VDD NOR (1)가 가 . NOR (1) CKE VOUT1 .

NOR (1) , ext. CKE 0.2V , NOR (1) CMOS , 가 가 (5) (5) .

2 (200) 9

3, 5 7 (100, 200) [200 ; , (200. 3)] (14), NAND (3) (6) .

(14) N1 SEL (/SEL).

(6) P MOS PST1, PST2 PST3 N MOS NST1, NST2 NST3 . 7 .

P MOS PST3 , P MOS PST3
 (14) /SEL (6) P MOS PST
 3 / 가 . , (6) SSTL .

NAND (3) P MOS PLT4 N MOS NLT4
 (14) /SEL NAND
 (3) LVTTL VOUT1 SEL CKE
 , 9 (200. 3) 10 (a) 10 (h)

SEL H ((t0 t1). ,
 PST3 Z1(N MOS /SEL L) . P MOS
 , (6) NST1 NST2) L .

, N MOS NLT4 , P MOS PLT4 , Y2
 (N MOS NLT3 N MOS NLT4) L
 , NAND (3)가 .

H (Vref + VH) CKE가 (6)
 CKE Vref VOUT2 . NAND (3)
 VOUT1 L

, 가 L
 SEL (t1).

P MOS PST3가 가 , (6) 가 .

, N MOS NLT4가 가 , Y2 가 L , NAND
 (3)가 . NAND (3) CKE VOUT1 .

NAND (3) , ext. CKE 0.2V ,
 CMOS 가 (3) , NAND (3)
 가 , (6) ,
 (6)

, 2 가 (,
)

, 가 ,

(57)

1.

(124); , 가

가 1, 2 (小振幅)

 $(1, 3)$,

2

2 (2, 4)

2.

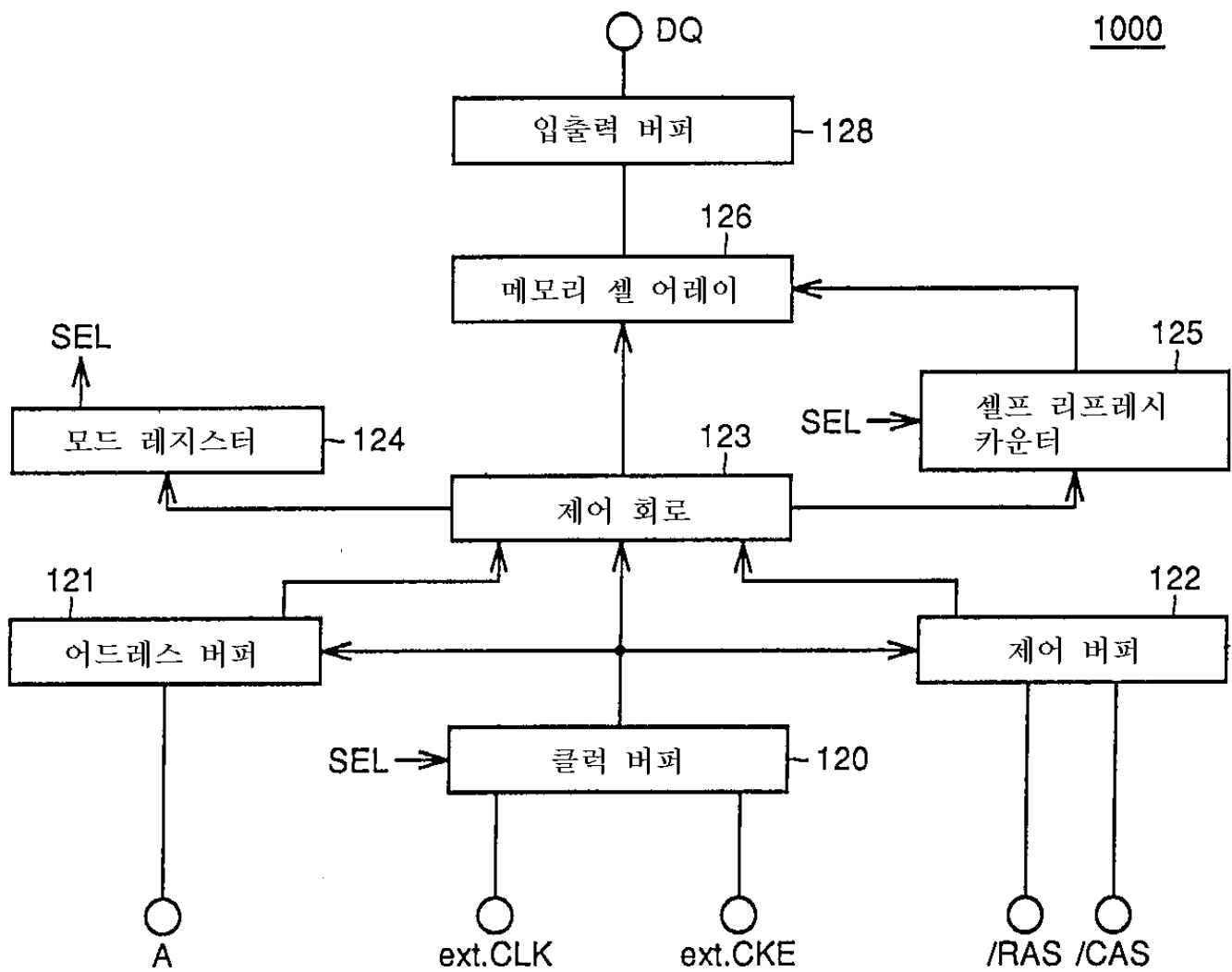
1 ,

(126);

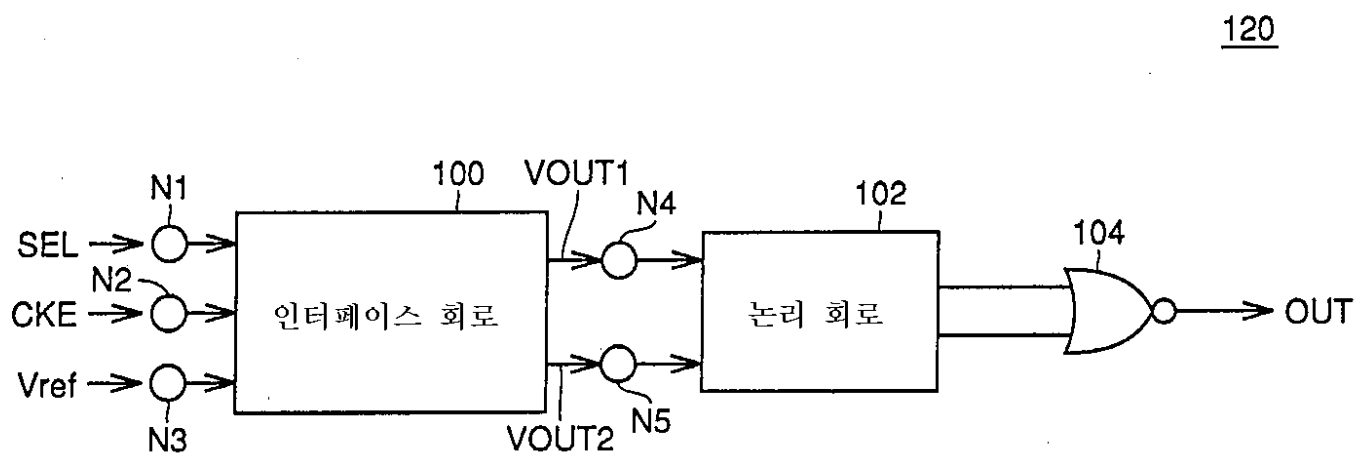
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(125)

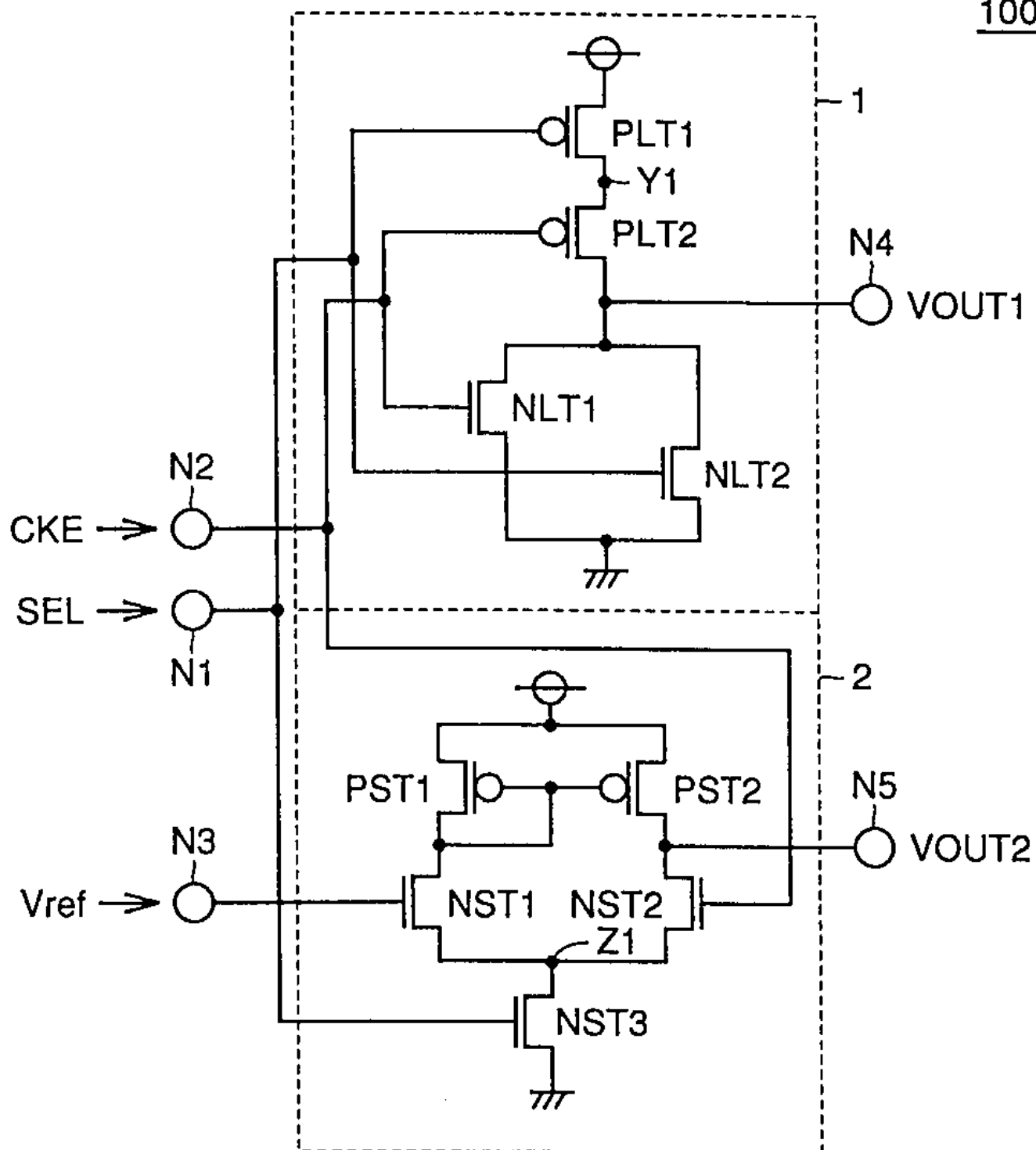
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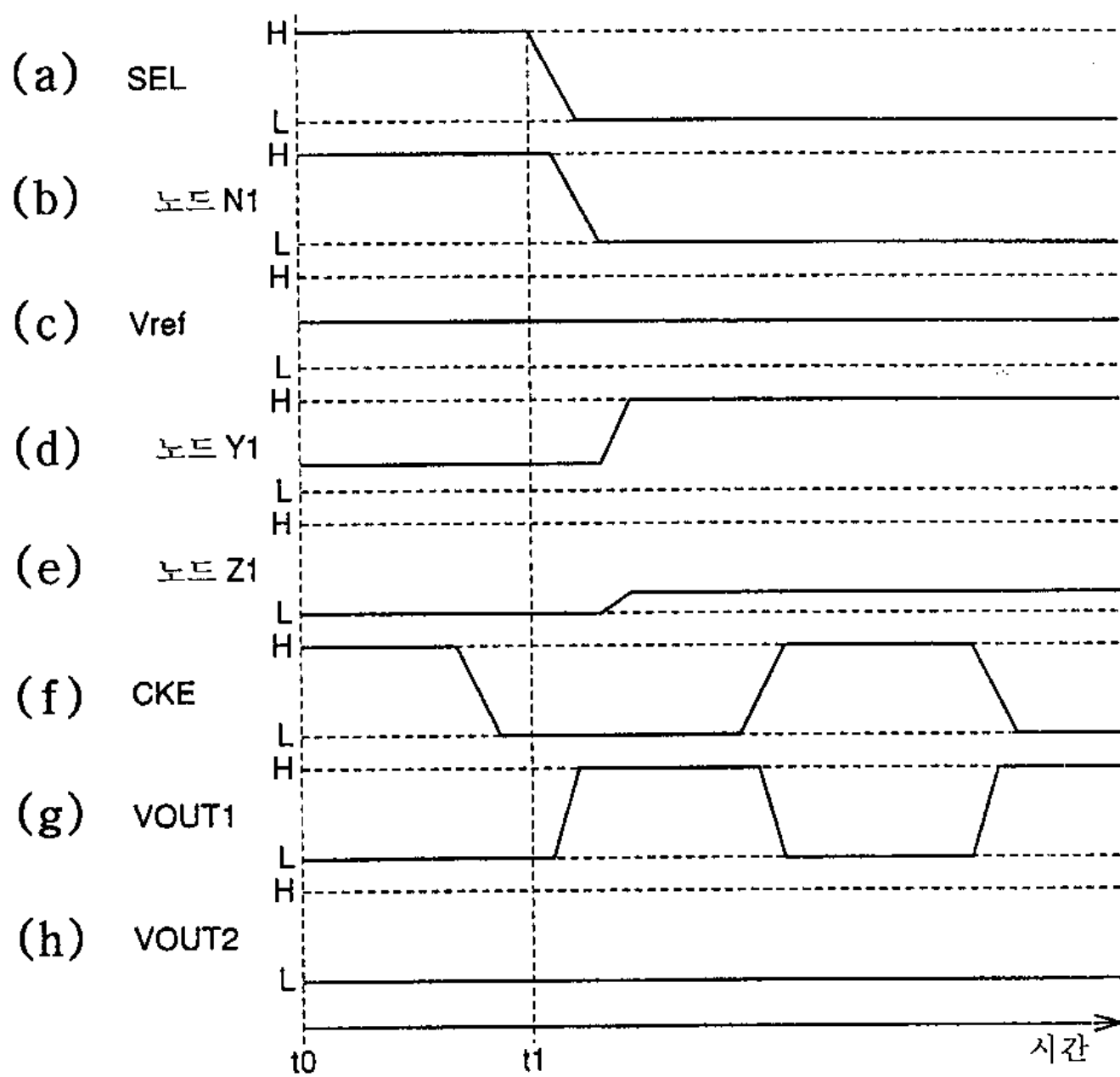


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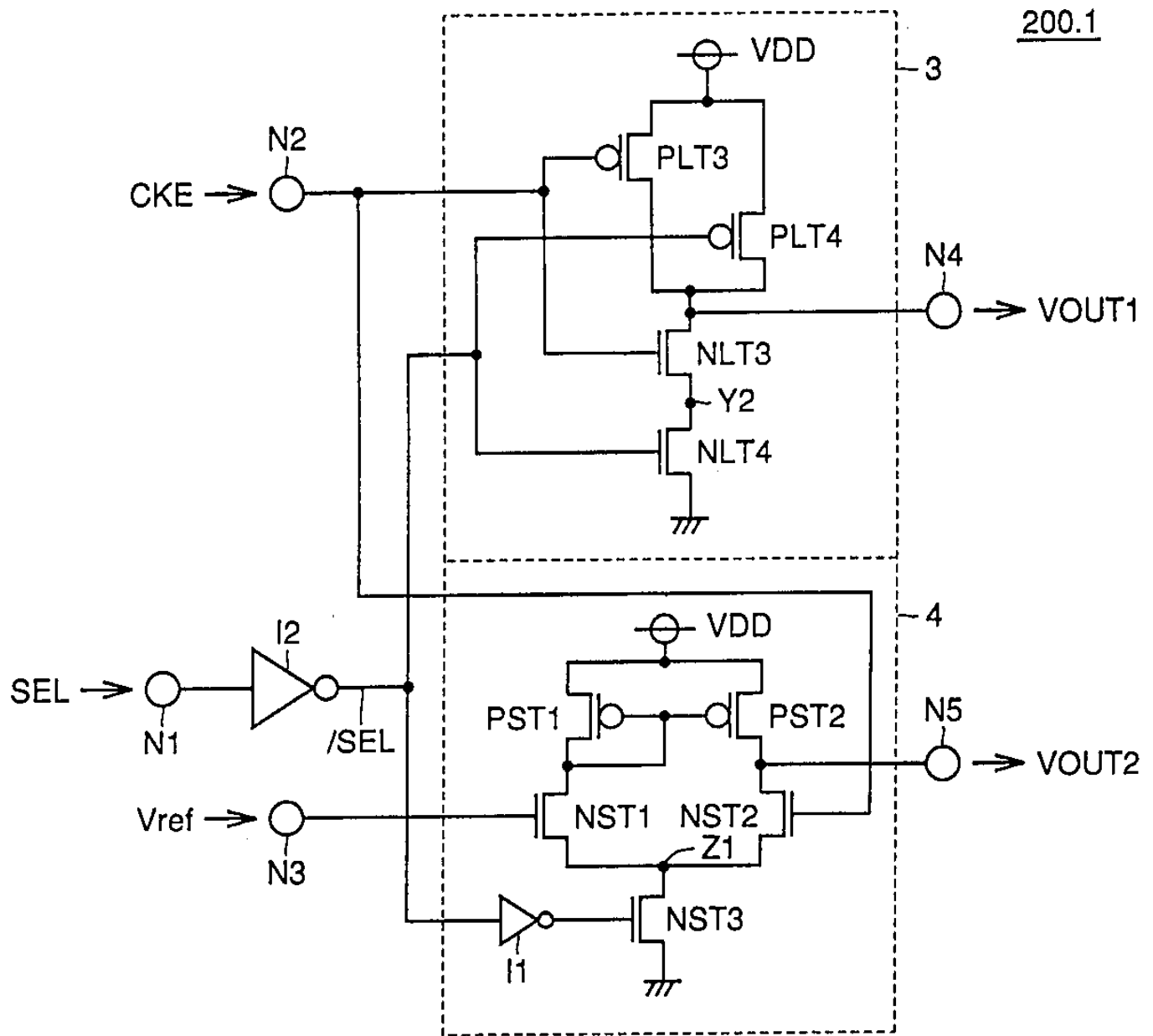


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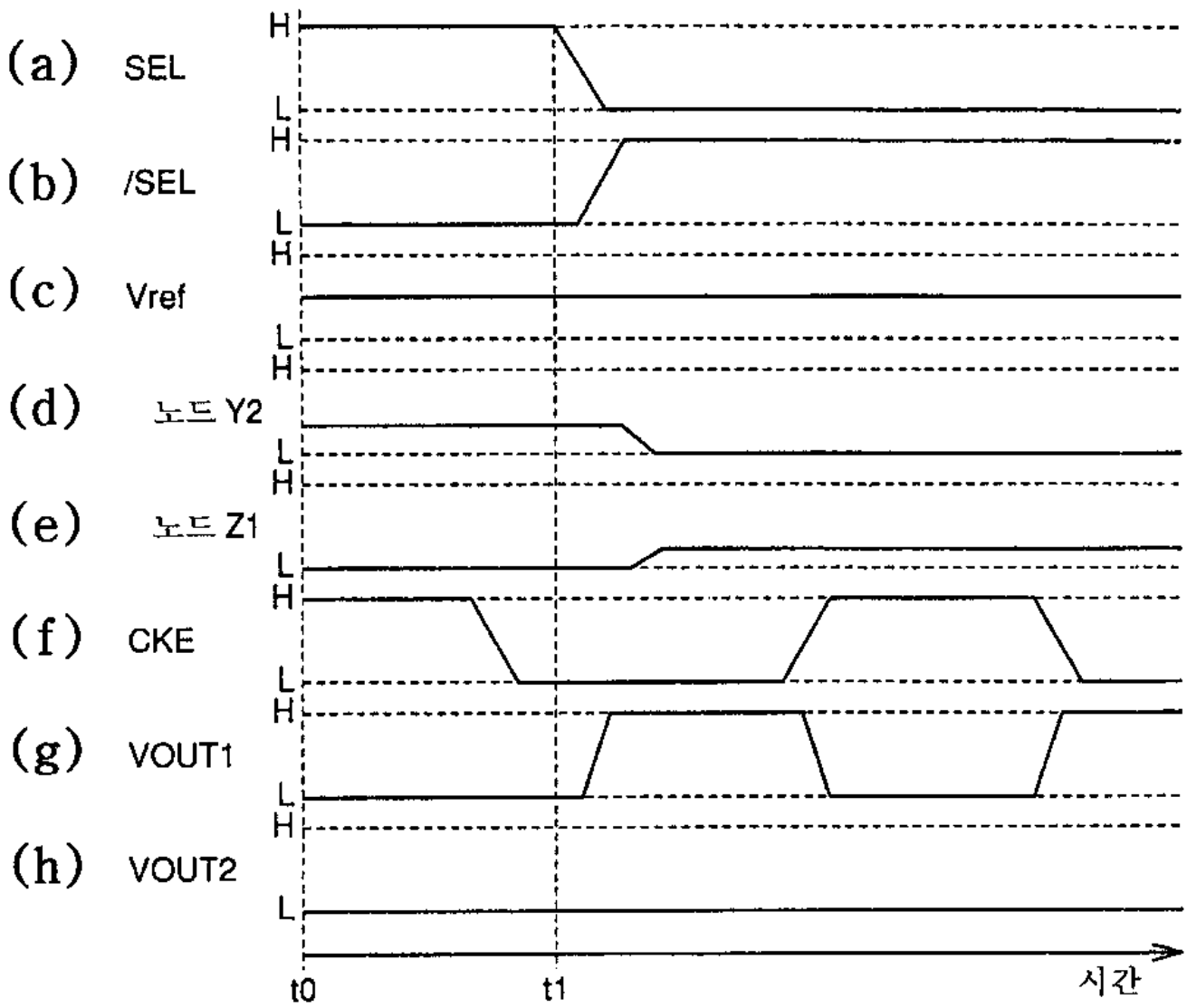
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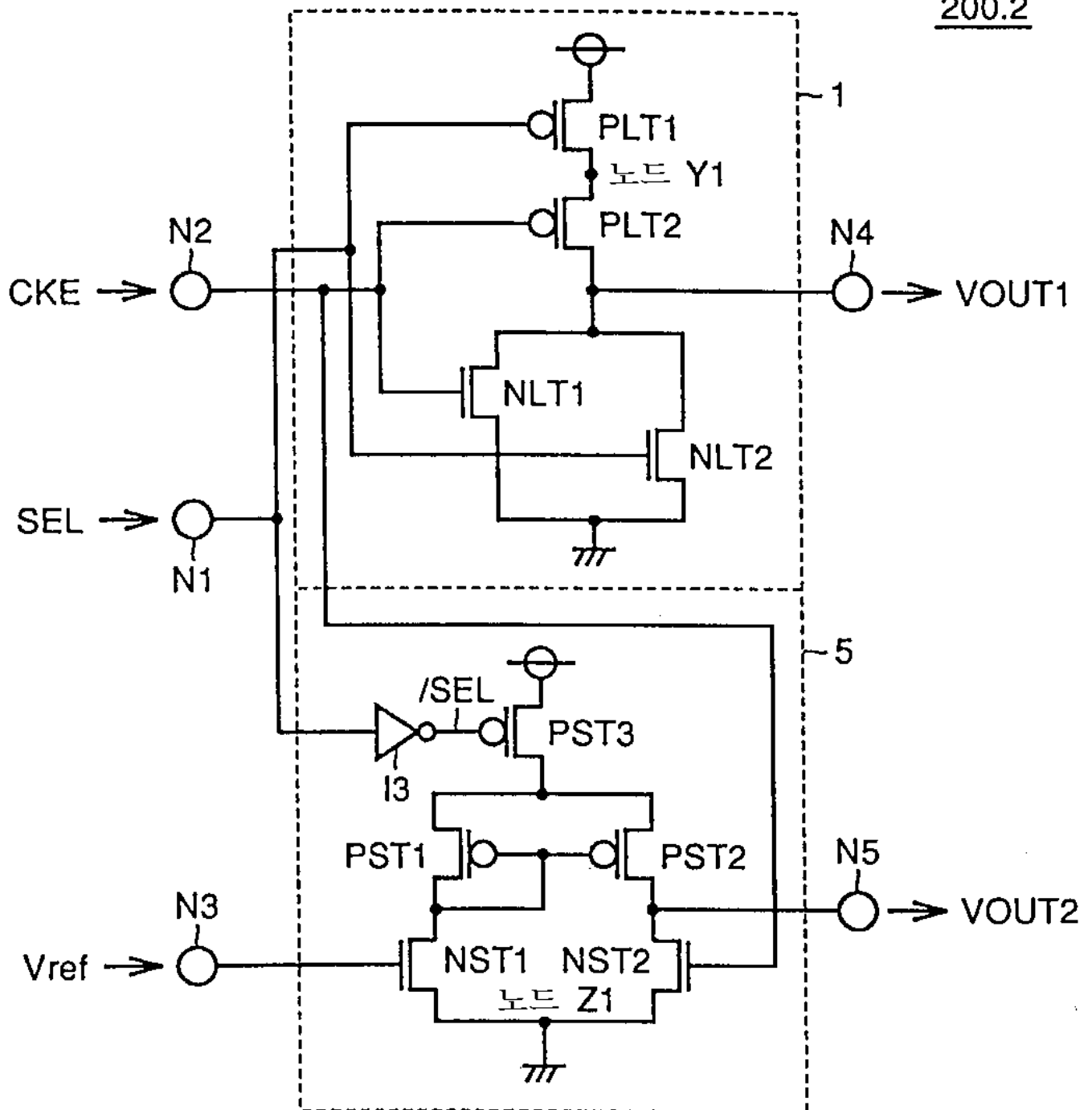
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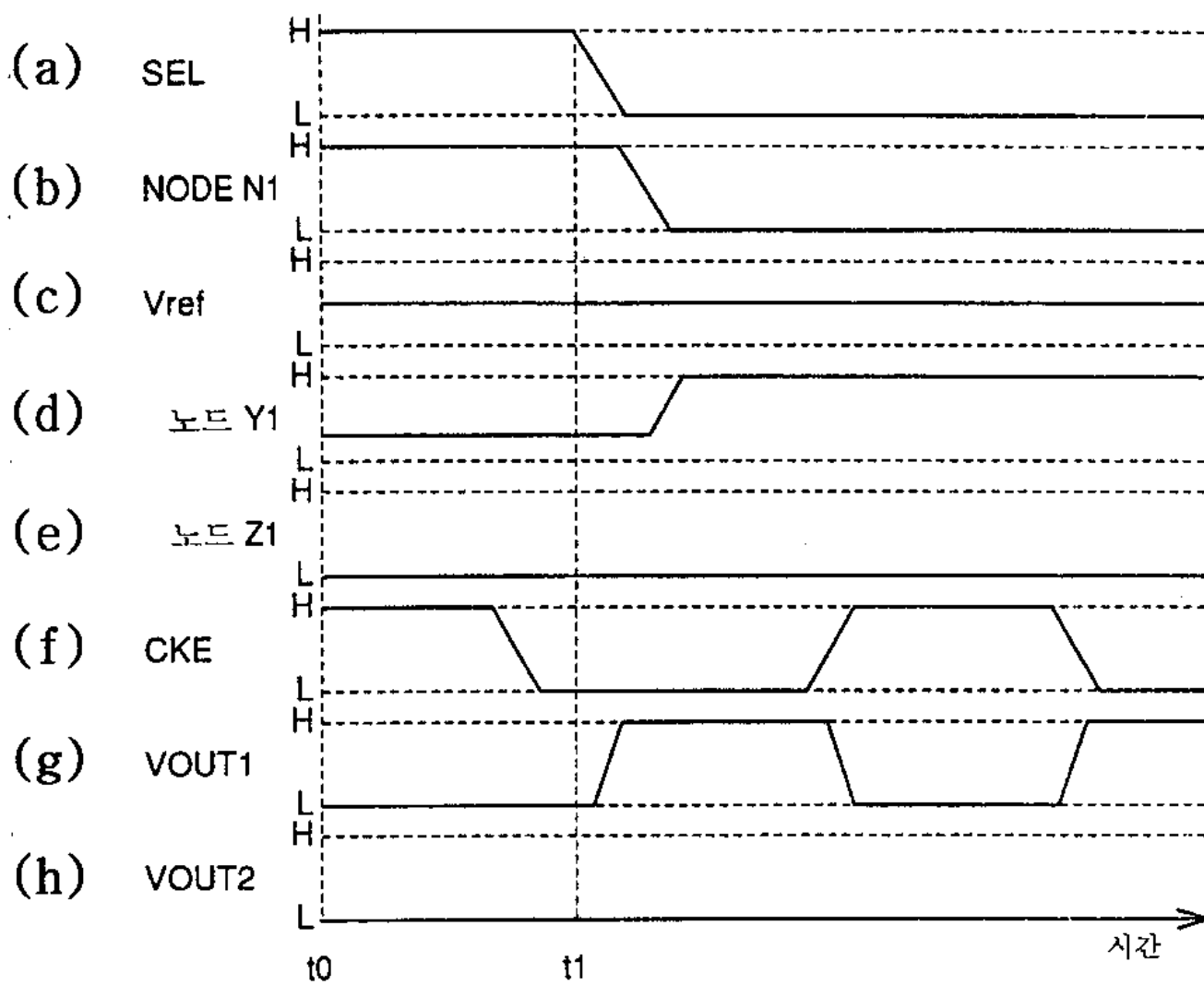


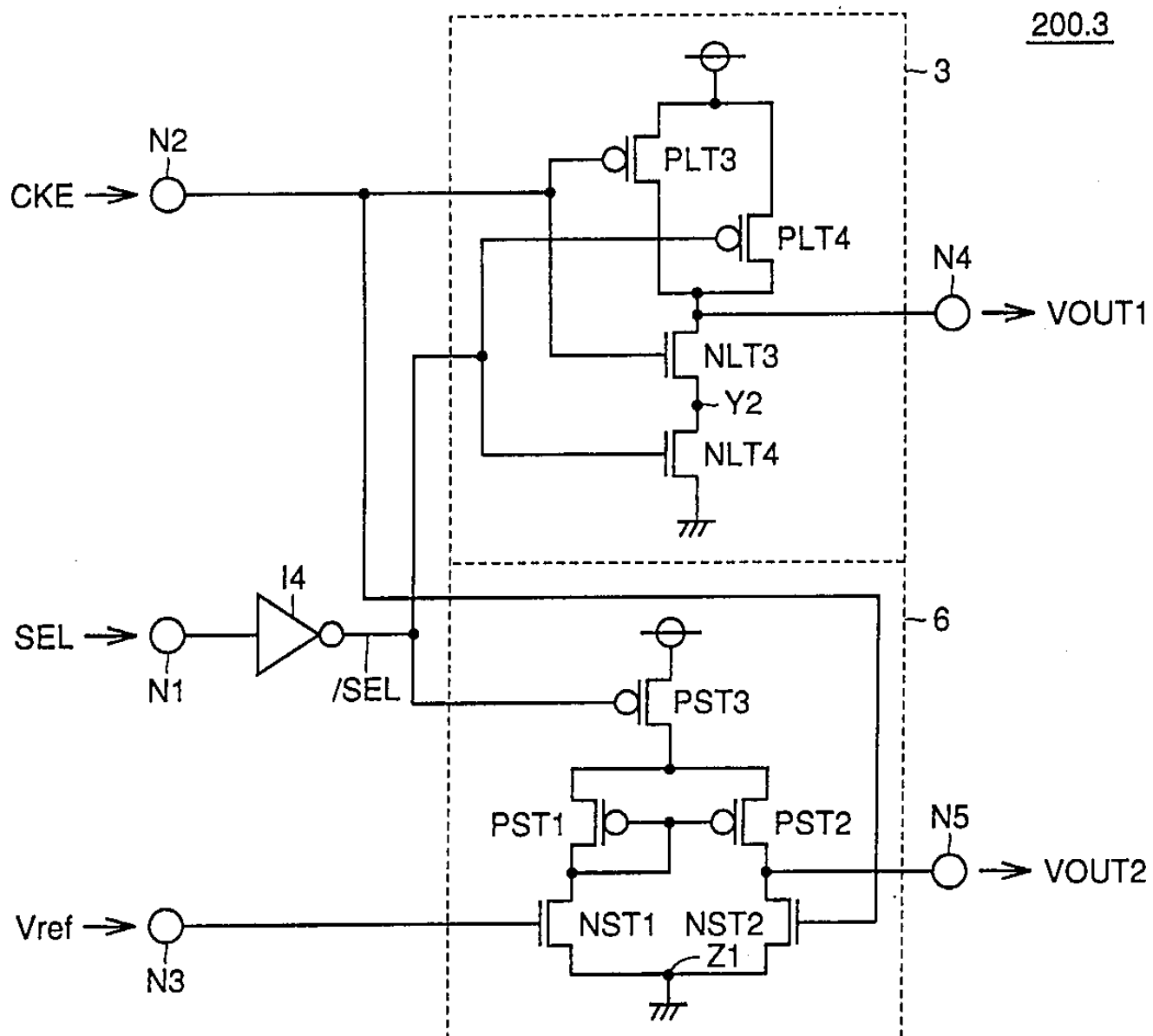
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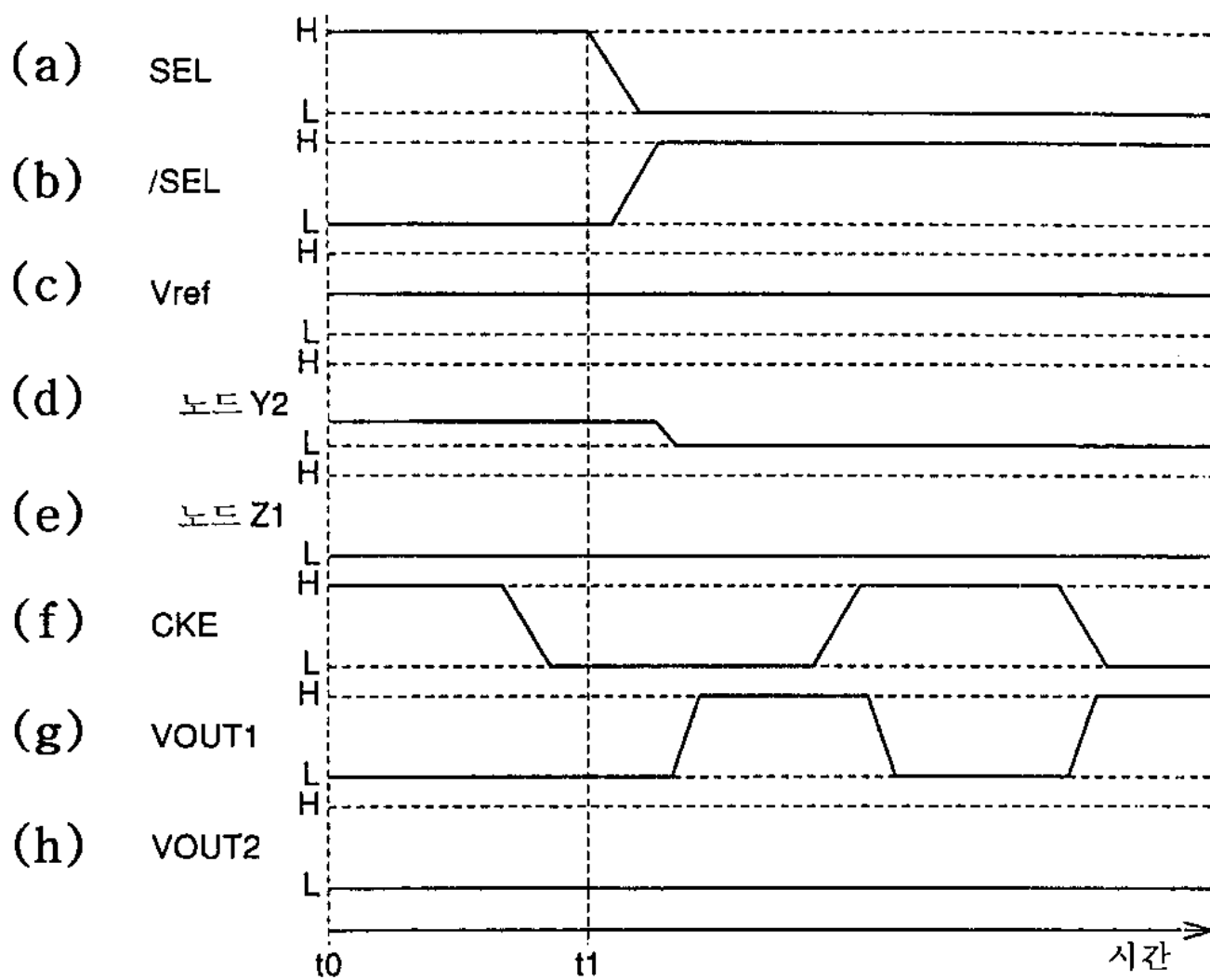
7

200.2

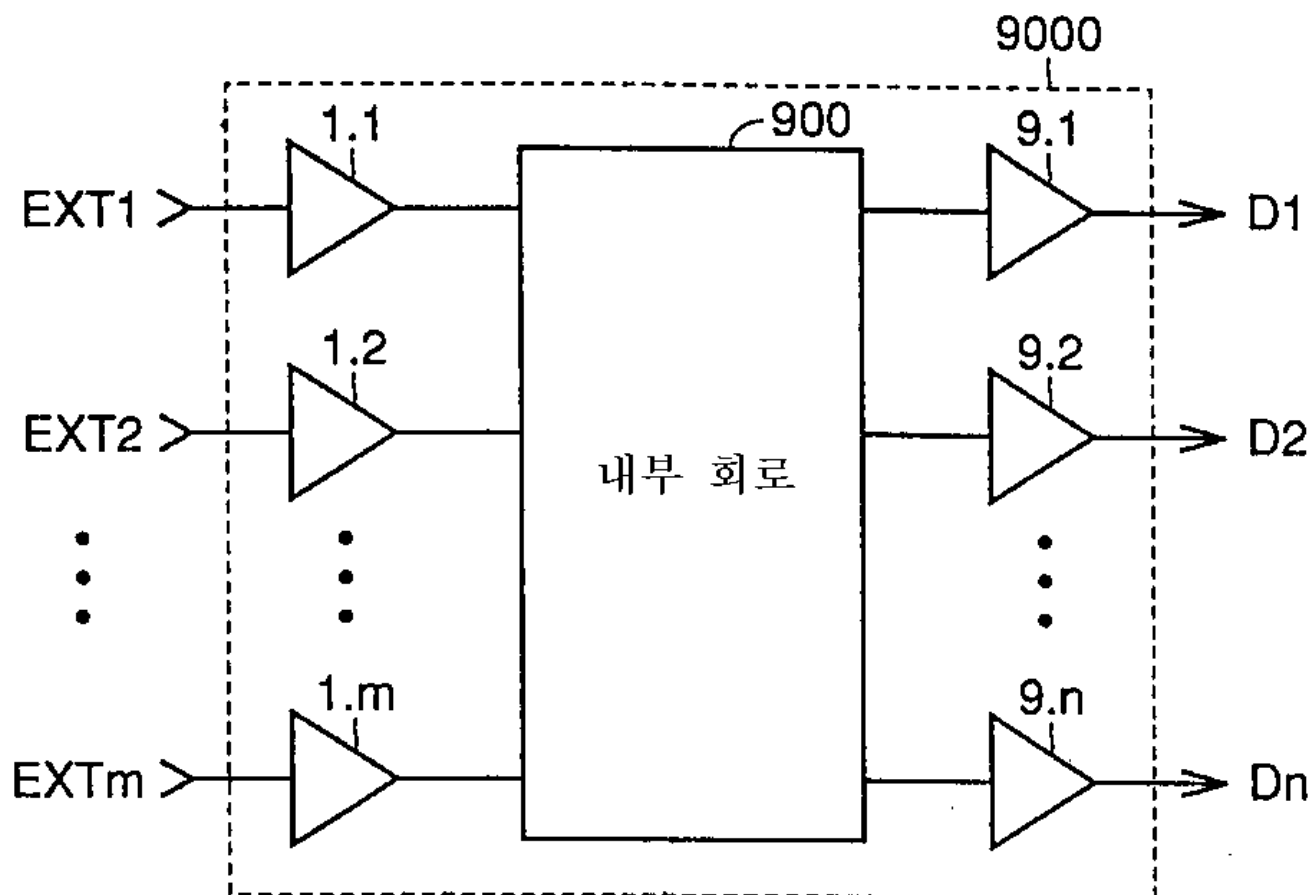


200.3

10

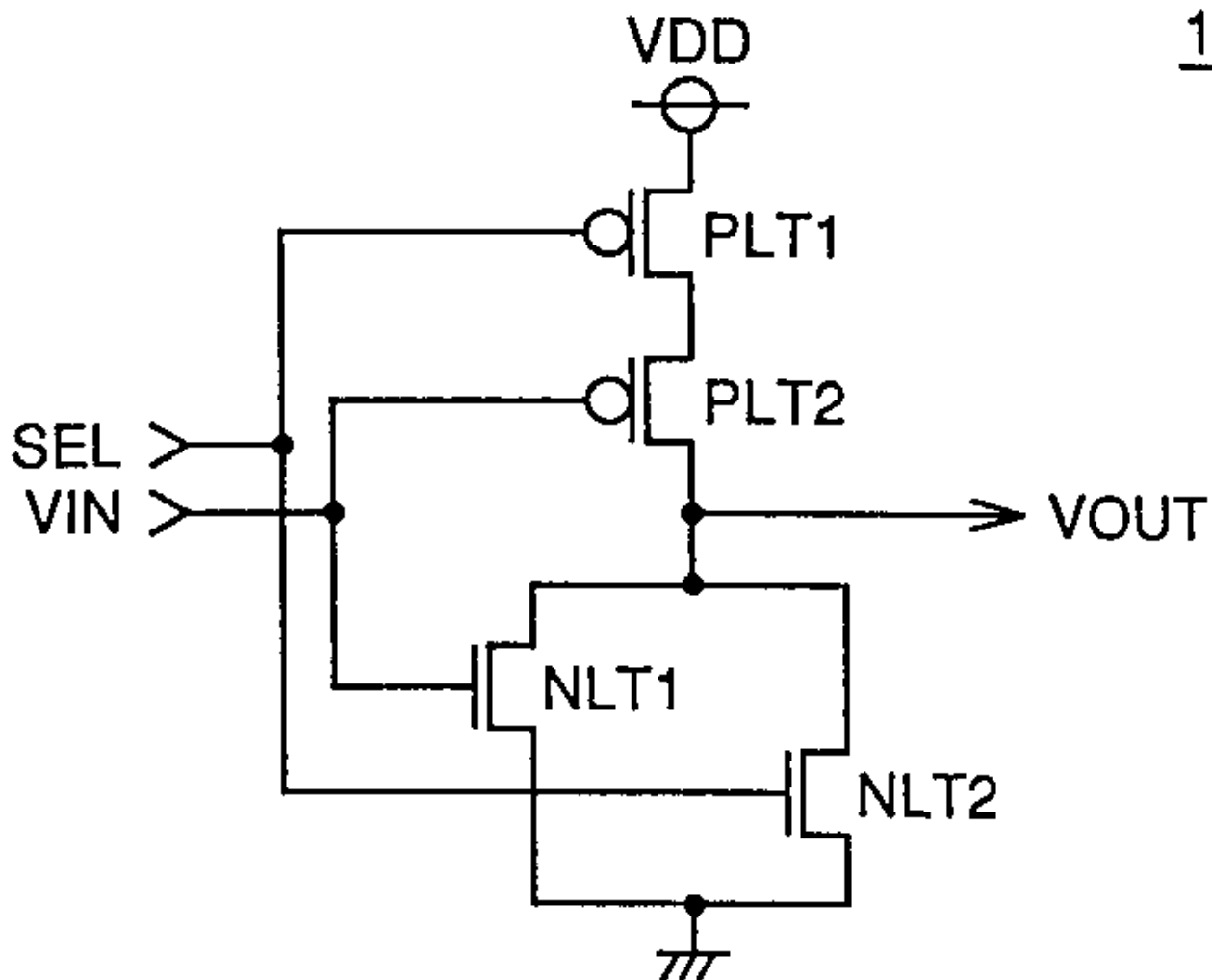


(종래 기술)



12

(종래 기술)

1

(종래 기술)

2