

**(19)**  
**(12)**

**(KR)**  
**(B1)**

(51) . Int. Cl. <sup>7</sup> H03H 11/40	(45) (11) (24)	2003 12 18 10-0410536 2003 12 01
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(21)	10-2001-0005340	(65)	2002-0065021
(22)	2001 02 05	(43)	2002 08 13

(73) 416

(72) 1 212 101 29/3

3 1162 APT10 1502

(74)

:

(54)

5a

1			
2			
3a	가	on transition	
3b	가	off transition	
4a	2a	가	on transition

4b	2b	가	off transition
5a, 5b		/	
5a	-		
5b	-		
6	1		
7	6		
8	2		
9	3		
10	4	*	
*		*	
10:	20:		
30:	31: -		
33: -	50, 90: -		
60, 100: -	70, 120:		
80, 130:			

,

가	가	(On Chip Termination)
.	1	1
가	(Source Termination)	(Output Driver)(1)
.	(swing level)	
.	,	
(3)	,	

(PVT Variation: Process, Voltage, Temperature; , , 'PVT , , )  
 (tracking) PVT /

,

1

가

가

가

,

가

,

1 ,

가

2 ,

,

2                  4

2                  (31)                  (33) 가  
2

(transmitter)      (10)      (receiver)      (20)      (Input Buffer)      (30) 가  
(30)                  -              (31)              (20)              (33)  
(on)              (off)              가  
3a              ('00000')              ('11111')              (glitch)  
(on transition)              '11111'      'a'      'b'      '가'  
                    '가'  
                    ('10)              )  
transition              '00000'      'c'      'd'      '가'  
                    '가'  
                    ('10)              )  
                    4a              3a  
                    4b              3b  
                    (off transition)  
                    2

2                  /                  가

가

가

,

가

3가

(PIC: Programmable Impedance Controller)

가 (Setup Time)

(Hold)

6 . 7 1 6

(10)

- (31) VDDQ  
(PIUC: Programmable Impedance Up Controller)

1) e Impedance Down Controller)

$$(31) \quad (41)$$

IA (41) - -

(20)  
(50)  
(50)

6 : 1 PIUC PI

DC	,	(41)		(43)	-	(31)	-	(33)
가	(41)	,	(43)	-	7	,	가	'가
가	IA가	,	가	-	(31)	-	.	.
가	'가		IB가	-	가	-	.	(33)

(50, 60)

(31) - (33) . - (31) - (50)

(33) (60)

가 (55) (60)

8

8 2

(31), - (33) (20)가  
 (PIUC: Programmable Impedance Up Controller)

(33) (63) (20) (PIDC: Programmable Impedance Down Control),

$$\text{Vref} \quad . \quad (20) \quad (70) \quad \text{가} \quad (63) \quad , \quad (70) \quad . \quad (70) \quad (6)$$

, Klatch . , (61), (63) (70)  
 (80) .

8 2

PIUC PID



D AND / NAN  
(33) , (31) (130) (31)  
(33) 가 (130) , 가  
, (10) (20) (31) (33) 가 가  
가 , 가  
/ / /  
가 가

(57)

1.

가

가

가  
가

가

가

가

가

가

1

1

3

1

가

4

1

가

5.

가

1 2 , 1 1 2  
2

가

가

1 가

2

2 가

가

1

가

가

2

가

6.

5 1

1

2

2

2

7.

가

1

1

2

2

1

가 - ,  
가 2  
가

8.

7

1

2

9.

/ 가

/

가

/

가

가

가

가

, 가

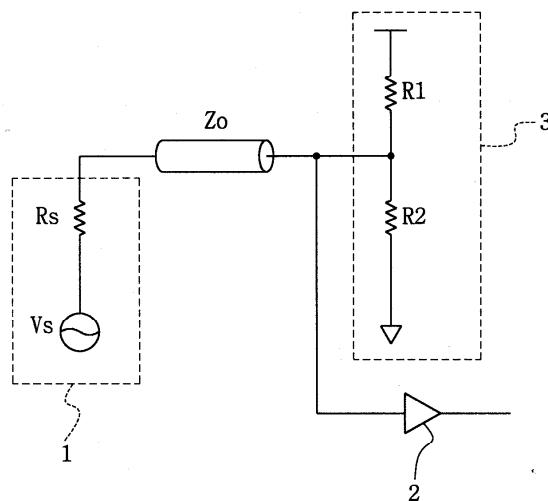
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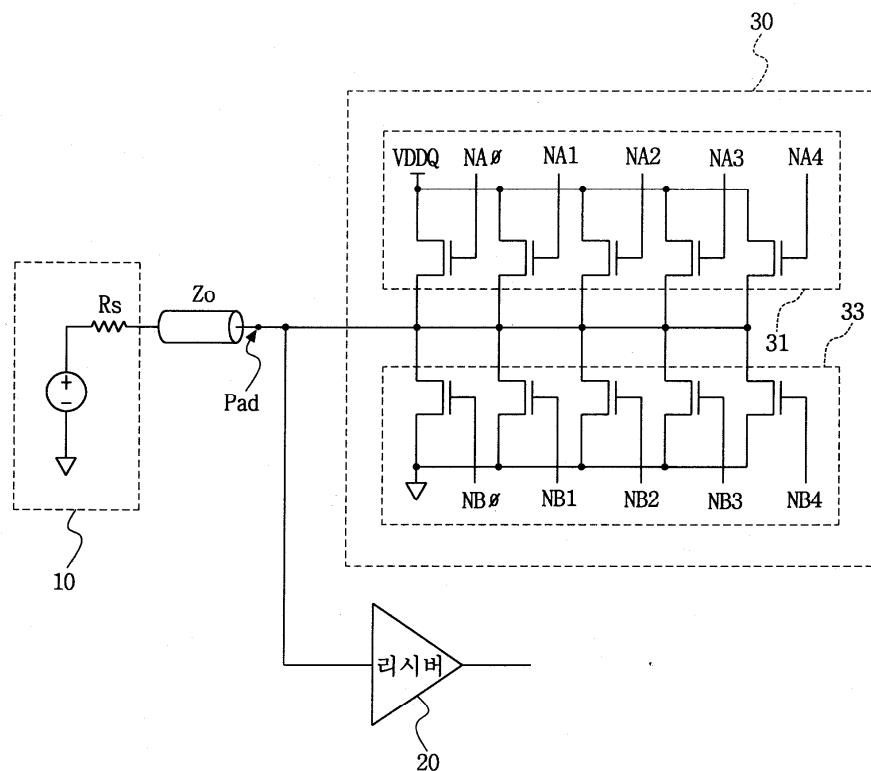
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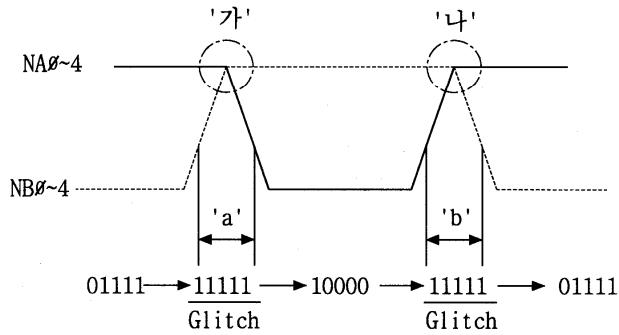
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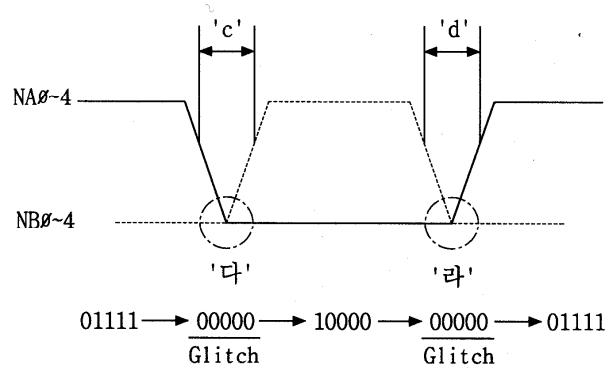
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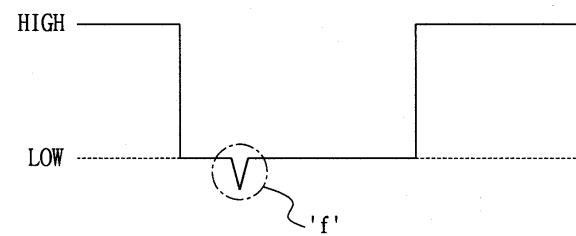
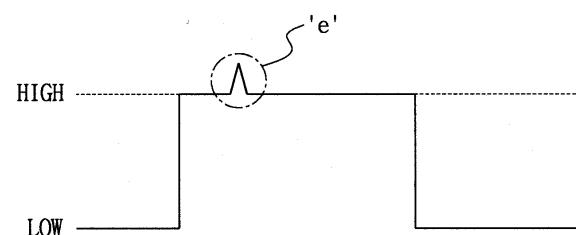
3a



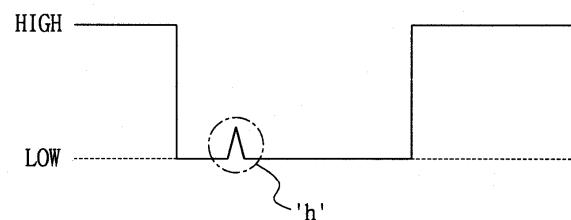
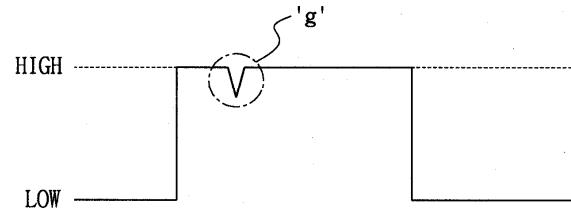
3b



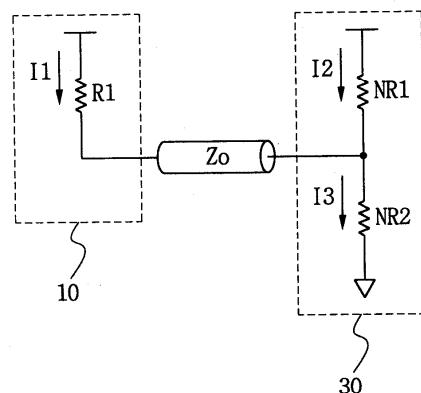
4a



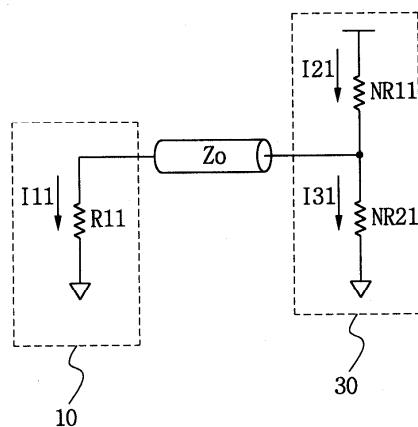
4b



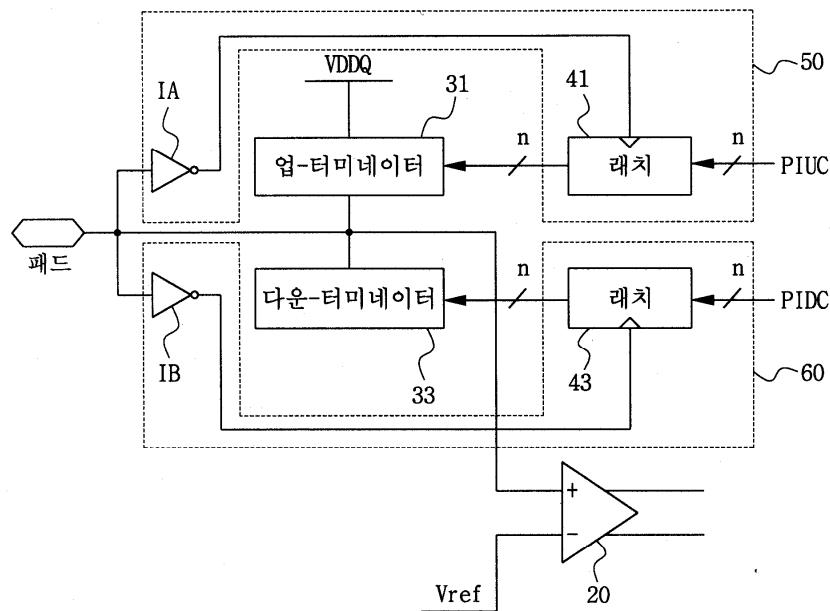
5a



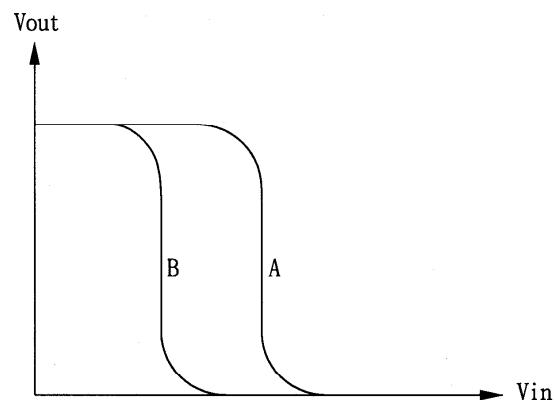
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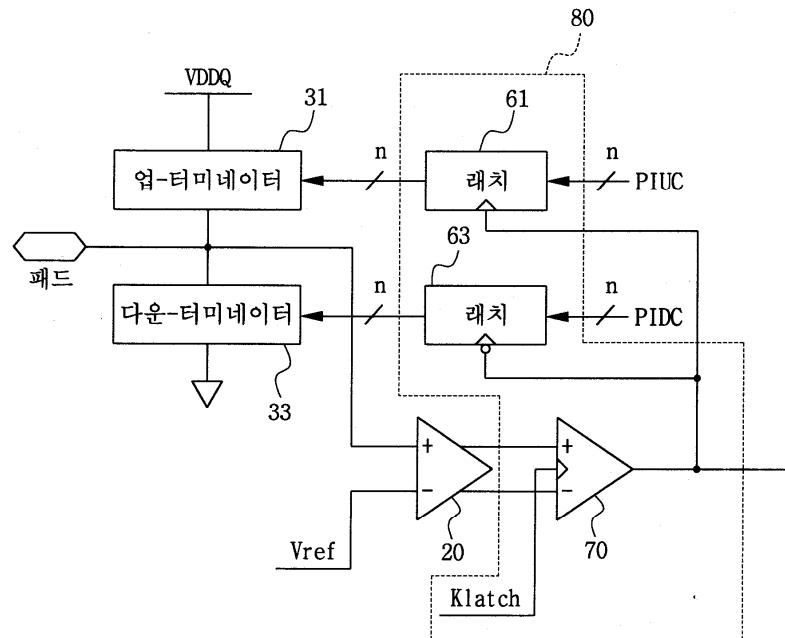
6



7



8



9

