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(12)

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3983

(71) 가 가
가
5 7 1

(72) 가 가 가 1 403 - 53

(74)

:

(54)

V_{saw} , , (10) , (11) ,
V_{ref} , (12) , 가 (12)
가 (12) 1 , 가 (12)
2 (13) , 가 .

, , , ,

1 1 .

2 2 .

3 2 .

4 .

5 3 .

6 4 .

7 1 .

8 2 .

9 .

10 .

11 .

12 .

13 .

14 .

15 .

16 .

17 CRT .

18 6 - 3347887 .

< >

10, 10A :

11 :

12 : 가 ()

13, 13A :

14 : 1

15 : 2

16 : 1 AND

17 : 2 AND

18 : OR

19 : DAC ()

71 : CRT

72 :

73 :

74 :

101 :

102 :

103 :

105, 106 :

107, 108 :

109 : 가

201 : RGB

202 : RGB

203 : CRT

204 :

205 :

206 :

207 :

208 :

209 : +B

210 :

211 :

(Cathode Ray Tube ; 「CRT」) 16 (a)
 (: 72) (73)
 (: 74) 가 가 가 가
 (74) 가 , 가 가 가
 (pincushion distortion) 16 (b)
 () (縱線) (E - 2 Raster p
 incushion distortion), (Side pincushion distortion)

(AM
)
 17 CRT
 17 , CRT (「」)
 (208) (208) (207) , Vsync (207)
 ync (206) () (206) Vo Hs
 () () (210)
 () , 가 (209)
 +B +B
 (208) , 1 (210)
 Vo가 , 1 Vo +B , 1 (210)
 +B (209) +B , (210)
 가
 (RGB) RGB (201) 가 . RGB (202)
 CRT(203) () 가 , CRT(203) (210)
 (211) 가 (204) , CRT(203)
 ())

CRT(203)

, CRT(203)

가 ,

, CRT

CRT

6 - 3348

87

5 - 308538

11 - 313222

6 - 334887

18

(: 101)

()

(102) ,

(105) ,

(: 107)

(103) ,

(106) ,

(: 108)

, 가 (109)

가

(: 113)

(104)

(102) ,

(103) ,

5 - 308538

5 - 308538

11 - 313222

2 ()+3 (S)가 ,

가 2

()

, S 가

, 3

S

, 3

, 2 3

6 - 334887

, , , 2 , 가
 , (), ()
 (102, 103) , (102, 103)
 (105, 106) ,
 가 () 가 . , (1
 07, 108) , 가 .

, , ,
 , .
 .
 , 가 (「 」) 1 , ,
 , .
 가 (「 」) , ,
 , .

, , , , ,
 가 , , , , ,
 , 가 , 가 .
 , , , , ,
 , , 가 , ,
 , 가 , 가 .
 , , 가 , 가 .

< >

가 () ,
 가 () ,
 () .
 1 , ,
 () ,
 (10) , Vref가)
 (11) , (11) 가 (12) , (10)
 가 가 (12) (12) 1 AI ,
 (13) , (12) 가 (12) Vo가 2 .

2 ,
 가 (12) , (10) ,
 가 (12) 1 ,
 가 (12) 2 ,
 (13) , 가 (12) Vo (11) .

< >

1 1 ,
 1 Vsaw ,
 Vref (10) , Vsaw Vref ,
 Vsaw - Vref (2) (11) , 가
 (12) , (10) (11) Vref
 (12) 2 A2 1 A1 (13) , (12) Vref 1
 Vo가 .

(11) (12) 가 ()
 VCA ; Voltage Controlled Amplifier) (13) (10)
 1 A1 Vc1, 2 A2 Vc2

(10) Vref
(10)

(10) (a), (10) (b) P Q가
() () (c)

Vref

(10) (c)

()

8538

가

5 - 30

5 - 308538

()

10 (c)

5 - 308538

가

()

2

2

2

1

Vsaw

Vsaw

Vref

(10)

Vsaw

Vref

가

(12)

(10)

(12)

1

A1

Vsaw

(12)

Vref

(12)

2

A2

(13)

1

가

(12)

가

(11)

(VCA)

Vcl,

2

(13)

(10)

1

A1

Vcl,

2

A2

Vc2

(12)

(11)

(12)

A

A x (Vsaw - Vref)

Vsaw

Vref

(Vsaw - Vref)

A x (Vsaw - Vref)²

Vo

(11) X, Y 가 , 2 (11) . 4
 , X, Y 가 . 4 , 가 . 4
 I_0 , 1 가 Q1 Q2, 가 Q1, Q2
 , 2, 3 Q3, Q4, Q5, Q6 , 2, 3
 A+, A- 1 X , 1
 B+, B- 2 Y X x Y 가
 Q3, Q6 I_1, I_2 $I(=I_1 - I_2)$ Q3, Q6 Q6
 () , I가 (11)가 Vo
 () , I가 (11)가 X Y
 X x Y .

(11) B+, B- (12) () ,
 A+ Vsaw A- Vref Vo가 .
 (11) $\{A \times (Vsaw - Vref)\} \times (Vsaw - Vref)$
 1 가 ,
 () ,

3 2 3 2
 , (11) (12) $A \times (Vsaw - Vref)$.
 (11) $\{A \times (Vsaw - Vref)\} \times \{A \times (Vsaw - Vref)\}$ Vo

, 4 (11) B+, B- (12) ()
 , A+, A- (12) () ,
 $A^2 \times (Vsaw - Vref)^2$ 가 . 2

, 3 5 3 Vsaw ,
 . 5 , 3 Vsaw
 () (10A) , (10A) Vsaw
 Vref1, Vref2, Vref3 Vref1, Vref2, Vref3
 (11) 가 (12) ,
 A1 A4 Vo가 (13A) ,
 (12)

(11) Vsaw , Vref (11) V
 ref Vref2 , Vsaw (11)
 Vref1, Vref2, Vref3 (10A) (11)

5 , (10A) Vref1, Vref2, Vref3 Vmax, Vmin R1, R
 2, R3, R4 , Vref1, Vref2, Vref3

(10A) ()
 A1 A4
 Vsaw (10A)
 Vref1, Vref2, Vref3
 A1 A4 (12) A

3 Vref2 Vsaw
 5 R1, R2, R3, R4 가 가
 Vref2 Vref1, Vref3
 가 EEPROM ()

3 () 1, 2 가 , 3

4 6 4 4 (12) (11)
 6 (12) (11) Vo (12) (11)
 Vsaw Vref 가 , (A x (Vsaw - Vref))
 , A x (Vsaw - Vref)² Vo

7 1 (12) (12)
 (13)

7 (13) 1, 2 1, 2 (14, 1)
 5) 1 (14) (n) (10) (10)
 n AND (16)((10) 1 1 (14)
 (10) (10) 0 0) , 2 (15) (n)
 (10)) , AND (16, 17) n (10) AND (17)(
 1 0) , AND (16, 17) n (15) , (10)
 2n n OR (18) , OR (18) n (DA
 C : 19) , (19) (12)

7 1, 2 (14, 15) n
 (10) 가 ,
 (19)가 1, 2 () 가

1, 2 (14, 15) ()
 EEPROM(가) 가 CPU ,
 1, 2 (14, 15) .
 8 2 (12) (12)
 (13) 8 (13) 7
 (13) .
 9, 10 . 9
 b)), (9 (c)) 가 CRT (9 (a)), (9 ()
 (10) , (12) , 9 (d) 8 ,
 (12) (11) ()
 (11) Vref 가 (10)),
 9 (c)
 10 , 8 ,
 CRT (10 (a)), (10 (b)), (10 (c)) 가
 (12) (VCA12), 8 Vsaw, (10)
 (11) ()
) 가 r : s (10 P () P () ()
 aw Vref r < s) (10) Vs
 P () Vref
 Q 10 (a), 10 (b) (10(d) r > s),
 Vref Q
 1 A1 Vsaw가 Vref (12) , Vref (12)
 가 (12) 2 A2 , Vo P ,
 Vref
 EEPROM () , ()
 11 (a) 1, 2 Vo(1
) , (11) , 11 (b)
 11 (a) (100mV)
 (11) Voff1
 (11) $V_{para} = K \times (V_{saw} + V_{off1})^2$,

ff2)가 (12) (, A (12)), A (12) Vo Vo=A x (Vpara+Vo
 Vo x (Voff - without) 11 ,
 (Voff - with) .

± 5V (11) Voff1 - 100mV, (12) 100
 mV , 1 A1, A2 「1」 , 11
 Vo(Voff - with) .

(a) , 18 (,) . 12
 18 (,) ,
 Vo(1) , (11)
 , 12 (b) , 12 (a) (100mV) .

()) , Vpara=K x (Vsaw+Voff1) ²가 ,
 () Voff1 , (107, 108) Voff2 , (107, 108)
 가 (109) 가 Vo Vo=A x (Vpara+Voff2)가 . ,
 , Vo=A x (Vpara+Voff2) 1 ,

± 5V 18 1 (: 102) - 100mV ,
 2 (: 103) , 1 (107) 100mV,
 2 (108) 0V, 1, 2 (107, 108) 1 ,
 12 가 100mV 가 (12 (b)) .
 가 가 15 (c)

14

11 - 313222 ,
 2 (=K1 x Vsaw²) 3 (A x K2 x Vpara x Vsin) , Vo
 13 , () 0
 , 1/4 3/4 . , 3
 3 가 2 , 0 ,

11 - 313222 2 3 , ,
 3

17

(208) , 1
 (210) .

가

3.

(「 」)

가

가

가

4.

(「 」)

가

가

가

1

2

가

가

5.

(「 」)

가

1

2

6.

(「 」) , ,
 , ,
 , 가 ,
 , 가
 .

7.

(「 」) , , ,
 , 가 , ,
 , 가 ,
 가 1 , 2 ,
 가
 가
 .

8.

(「 」) , , ,
 , 가 , ,
 , , ,
 1 , , ,
 , 2
 ,
 .

9.

5 ,

가, 1, 2 1, 2 ,
 1, 2 ,
 가 1 2
 , 가 2
 ,

10.

8 ,
 가, 1, 2 1, 2 ,
 1, 2 ,
 가 1 2
 , 가 2
 ,

11.

9 ,
 가, 1 , 1
 1 , 1
 2 , 2
 2 1 1 2
 2 1 2 , 2
 ,

12.

10 ,

가, 1 , 1

1 ,

2 , 2 ,

2 ,

1 1

2

13.

7 ,

가, , 가

14.

8 ,

가 ,

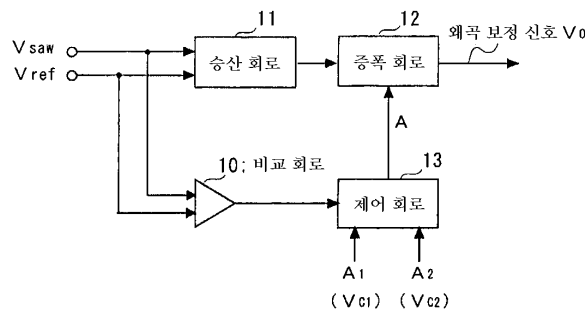
15.

1 ,

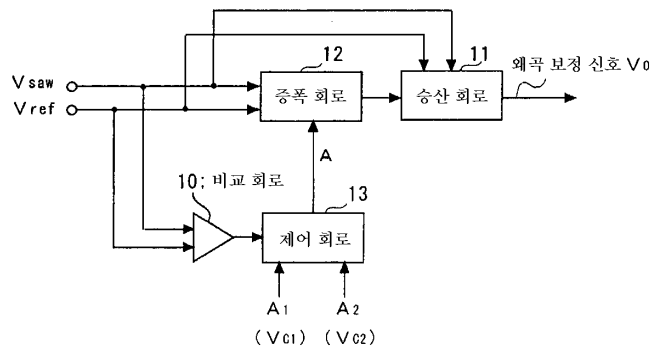
16.

9 , , , 1, 2 , 1, 2

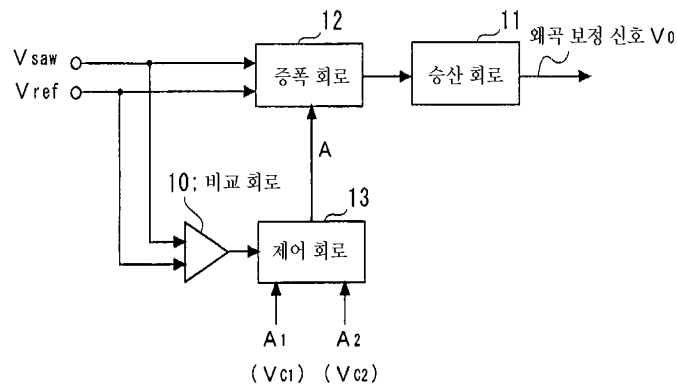
1



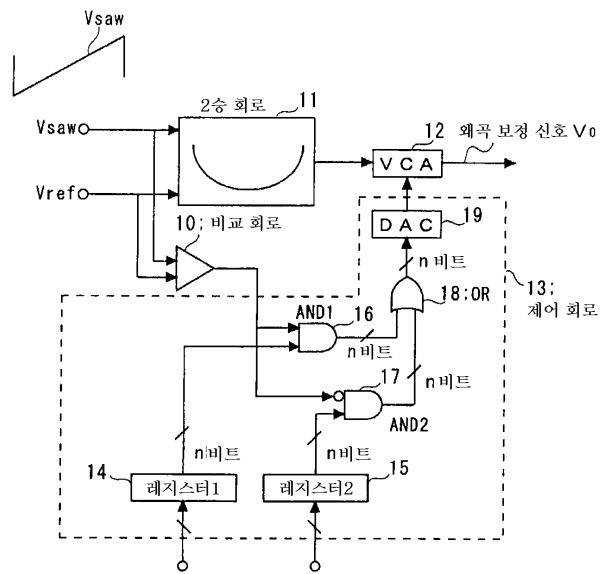
2



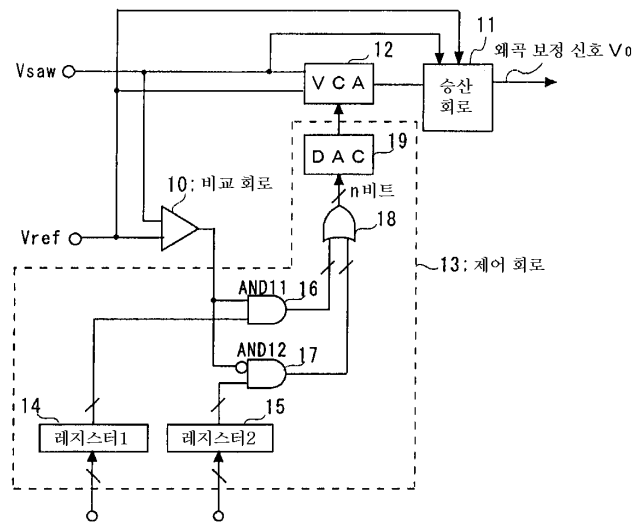
3



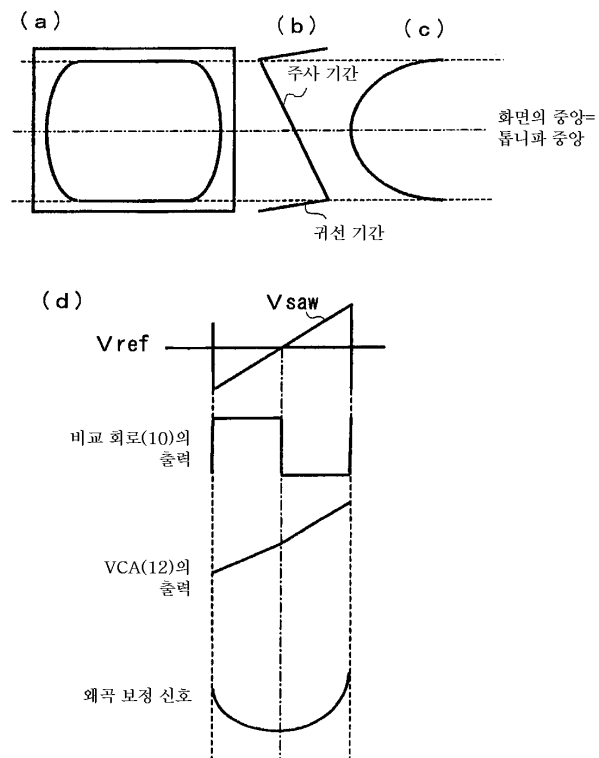
7



8

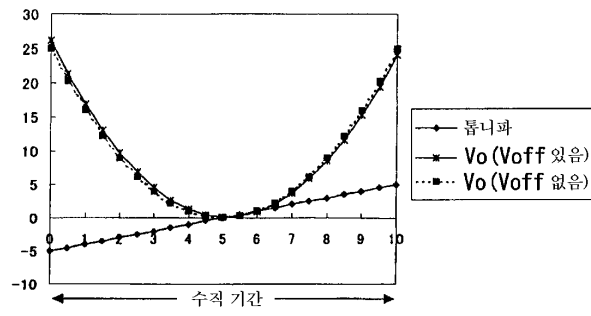


9

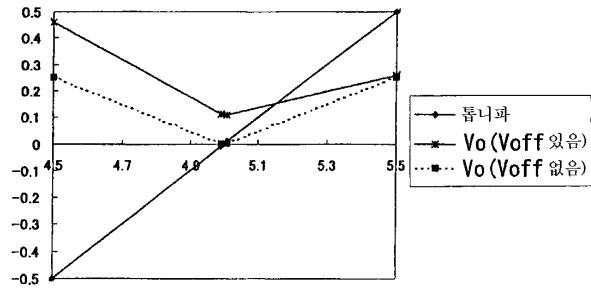


10

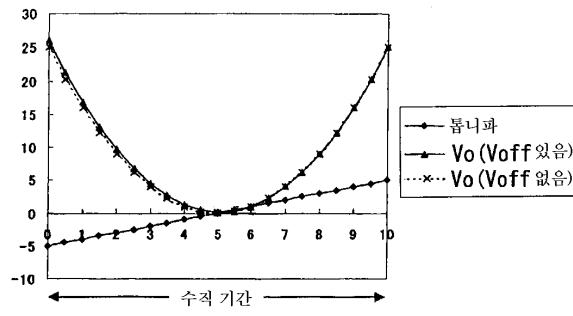
(a)



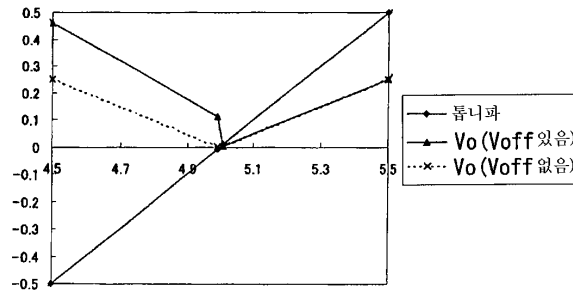
(b)



(a)

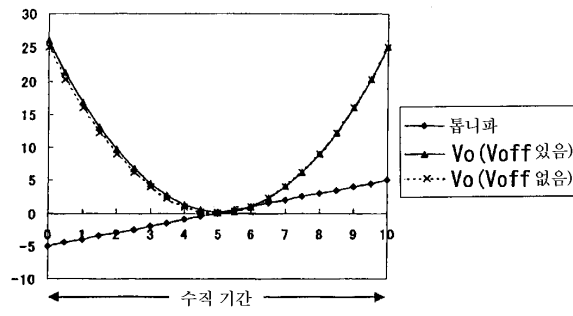


(b)

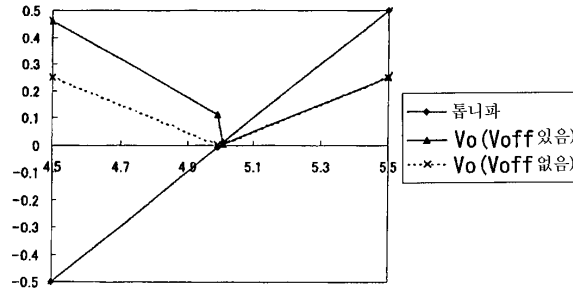


12

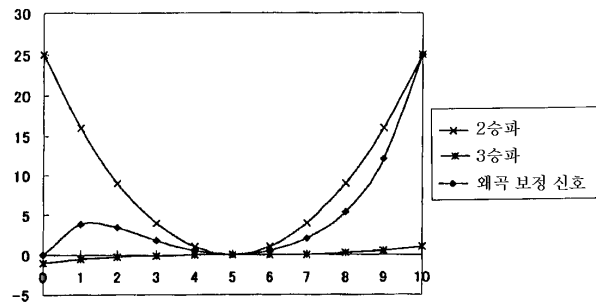
(a)



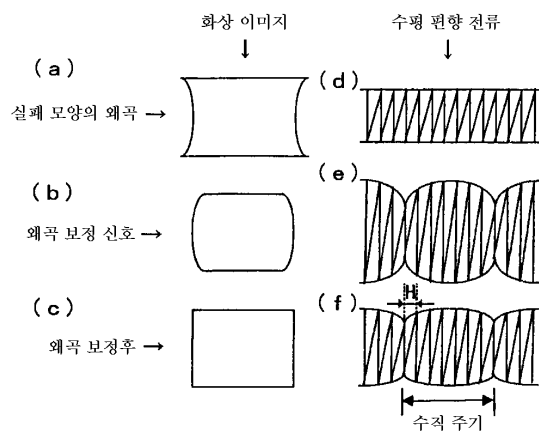
(b)



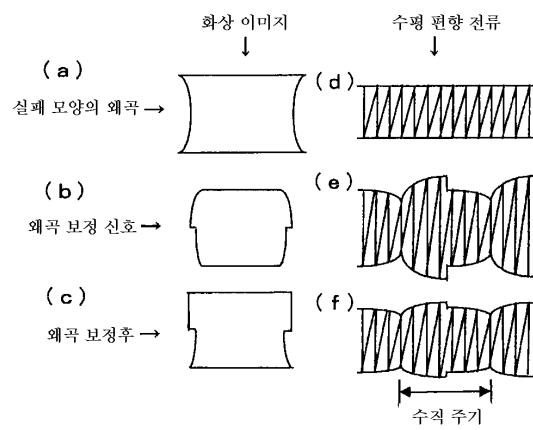
13



14

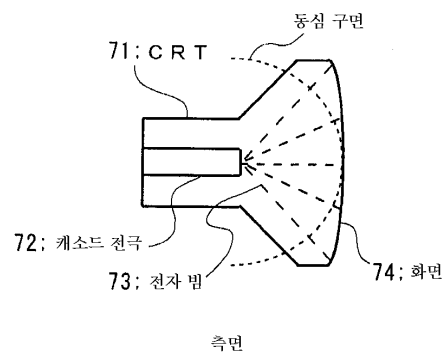


15



16

(a)



(b)

