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(12)

(KR)  
(B1)

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(45)  
(11)  
(24)

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(73)

416

(72)

2 101 1407

827

1 156-1202

LG 204 1003

(74)

:

(54)

(Vc1, Vc2) (D1, D2) 가 가 ' 1 ,  
(Vs1, Vs2) (It) (Vc3)  
(D3) 2 , Vc3 D3 가 (TOL) T  
(Ic3) 3 , Ic3 It  
OL It 4 .

5

1  
2  
3a 가 (OPC )  
3b 가 (OPC ) (OPC )  
4a 가 (OPC )  
4b 가 (OPC ) (OPC )  
5  
6a 6b  
7a  
7b  
< 51 ; 53 ; (OPC) >  
55 ; 57 ; OP  
59 ; (ADC) 61 ;  
63 ; 가 (HVPS) 65 ; PWM  
67 ; 69 ;  
71 ;

(OPC;Organic Photoconductive Cell),

가 가 가 가 가  
가 가 가 10 가  
가 가 가 가  
1 2  
1  
(13) 가 (21) 가 (HVPS; High Voltage Power Su  
pply)(23) 가 , HVPS(23) 가 (11) (shaft)  
(700V~1500V ) 가 (11) 가 (11) (13)  
가 (13) 가 가 (13) (13)가  
(13) 가 가 (13) 가 (13)  
1 (13) 가 (15)  
Analog to Digital(19) (ADC;  
Unit)(21) ECU(21) (ECU; Engine Controller  
H



$$V_{tr} = KD1 - I_{c1} \cdot R_c = KD2 - I_{c2} \cdot R_c \tag{4}$$

It , Vres가 , Vc3 D3 , Vtr, It, Rc K 5 6 Vc3 D3 .

$$V_{c3} = V_{tr} + I_t \cdot R_c \tag{5}$$

$$D3 = \frac{V_c}{K} \tag{6}$$

가 4 , TOL , TOL ;  
 It , Ic3 , It , Ic3 , TOL ;  
 가 1 3 ;  
 tage) 가 OPC (Charging Vol  
 3a 3b OPC (OPC Voltage) (Charging Potential)  
 3a , OPC 가 (OPC )가  
 가 1000V , 1Mohm 가 OPC 28 μA 가 , 20Mohm  
 가 4 μA 가 OPC 1Mohm 400V 가 20Mohm  
 600V , 3b , (OPC ) (OPC ) 가 가  
 3a 3b OPC OPC , OPC OPC OPC  
 PC 가 가 OPC OPC , OPC OPC OPC  
 가 (OPC ) (OPC ) 가  
 4a 4b (Vres)가  
 4a , (Vres)가 OPC OPC OPC OPC OPC  
 4b , 3b , OPC OPC OPC OPC OPC  
 가 OPC OPC OPC OPC OPC OPC  
 4a 4b  
 5 , 6a 6b  
 6a , (53) (51) , (51) 가  
 가 (63) , 가 (63) (ECU; 61) , (53) (I  
 c) (Vopc) (Rs; 55) , (Ic) ECU(61)  
 (Current sensing circuit; 71) 가 PWM (Pulse Width Mod  
 가 (63) 가

ule controller; 65) , (duty) / (67) (69)

(71) (57) (ADC; 59) PWM A  
A 7

$$I_c = I_s - I_f = \frac{V_s}{R_s} - \frac{KD}{R_f}$$

, I<sub>c</sub> , I<sub>s</sub> , I<sub>f</sub> , V<sub>s</sub> ( ), R<sub>s</sub> , R<sub>f</sub>  
, D PWM , K  
6a 가 (51) 가 가 6b  
6b (V<sub>th</sub>) , (V<sub>res</sub>) (51) 가 R<sub>c</sub> (51) 가 (51) 가 KVL  
8

$$KD = I_c \cdot R_c + V_{th} + V_{res} = I_c \cdot R_c + V_{tr}$$

8 R<sub>c</sub> V<sub>tr</sub> 9

$$KD1 = I_{c1} \cdot R_c + V_{tr} = V_{c1}$$

$$KD2 = I_{c2} \cdot R_c + V_{tr} = V_{c2}$$

, D<sub>2</sub>>D<sub>1</sub> , I<sub>c2</sub>>I<sub>c1</sub> .  
9 1 4 (51)  
, (D<sub>1</sub>, D<sub>2</sub>) (V<sub>s1</sub>, V<sub>s2</sub>) 1 4  
가 (R<sub>c</sub>) (V<sub>res</sub>) (V<sub>th</sub>) (V<sub>tr</sub>) 10  
(53) (V<sub>era</sub>) 10

$$V_{era} = K_{era}(V_{opc} - V_{res}) + V_{res}$$

(V<sub>opc</sub>) 11

$$V_{opc} = K_{opc} \cdot I_c + V_{era} = K_{opc} \cdot I_c + K_{era} \cdot V_{opc} + (1 - K_{era})V_{res}$$

12 (V<sub>opc</sub>) (I<sub>c</sub>)

$$V_{opc} = \frac{K_{opc} \cdot I_c}{1 - K_{era}} + V_{res} = \Delta V_{opc} + V_{res} = K_{opc} \cdot I_c + V_{res}$$

(V<sub>opc</sub>) OPC  
(V<sub>res</sub>)  
5 6a 6b

5 , 6a 6b (V<sub>opc</sub>) , ECU  
(V<sub>c1</sub>) (D<sub>1</sub>) (101 ) 가 가  
(V<sub>c1</sub>) (V<sub>s1</sub>)  
D1 (V<sub>s</sub>) V<sub>c2</sub> D2 (103 ) (V<sub>s1</sub>) (102 ) , ECU V<sub>c1</sub>

ECU 가 Vc2 D2 (Vc) (Vs2) (104 ).  
 (Vc1, Vc2), (D1, D2) (Vs1, Vs2) 1 4 (105 ). (I  
 c1, Ic2), (Rc), (Vres) (Vth) (Vtr) (106 ).  
 (LUT) (Rc) (Vth)

Rc(Mohm)	16.8	17.9	19.9
Vth(V)	520	540	580

(Vres) Vtr (Vth) (Vres) .  
 (Vth) 13

$$V_{res} = V_{tr} - V_{th} \tag{13}$$

4a (Vres) (OPC ) (Vc3) (D3)  
 (It) (108 ), 5 6 (Vres)가  
 (109 ) , OPC (It) 가 (Vc3) (D3)  
 (Vres)가 (Vc3) (Ic3) (112 ) (51) 가  
 (Vs3) 14

$$I_{c3} = \frac{Vs3}{Rs} - \frac{KD3}{Rf} \tag{14}$$

(Ic3) (It) (TOL) (TOL)  
 (Ic3) (It) (TOL) (TOL) 101  
 (Ic3) (It) (TOL)

7a , 7b

7a , 20V, 450V, 780V, 890V 가 1 350V, 600V, 640V,  
 680V , 2 600V, 650V  
 7b , 420V, 780V, 990V 가 1 650V, 760V , 2  
 660V

가 ,

가  
 가

(57)

1.

s) , (Rs) , (Vs) , (R) , (Vc) (D) Vc 가 가

가 (Vc1, Vc2) (D1, D2) 가 ; (Vs1, Vs2) (It) ; (Vc3) (D3) ; (Ic3) ; (TOL) ; TOL ; It ; 4 ;

**2.**

1 Rf가 , 2 , 가 (If) (Vs1, Vs2) , K가 ; (Ic1, Ic2), (V1, V2), (D1, D2) (Rc) (Vres) (Vth) (Vtr) ; Rc Vres (LUT) Vtr Vres ; Vres It (Vc3) (D3) ;

$$Ic1 = \frac{Vs1}{Rs} - \frac{KD1}{Rf}$$

$$Ic2 = \frac{Vs2}{Rs} - \frac{KD2}{Rf}$$

$$Rc = \frac{Vc2 - Vc1}{Ic2 - Ic1}$$

$$Vtr = KD1 - Ic1 \cdot Rc = KD2 - Ic2 \cdot Rc$$

**3.**

2 Vres가 , It Vres가 가 It 가 ;

**4.**

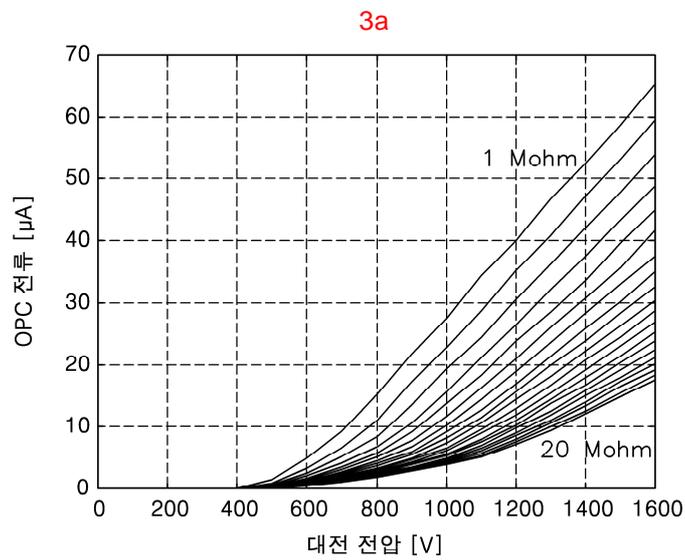
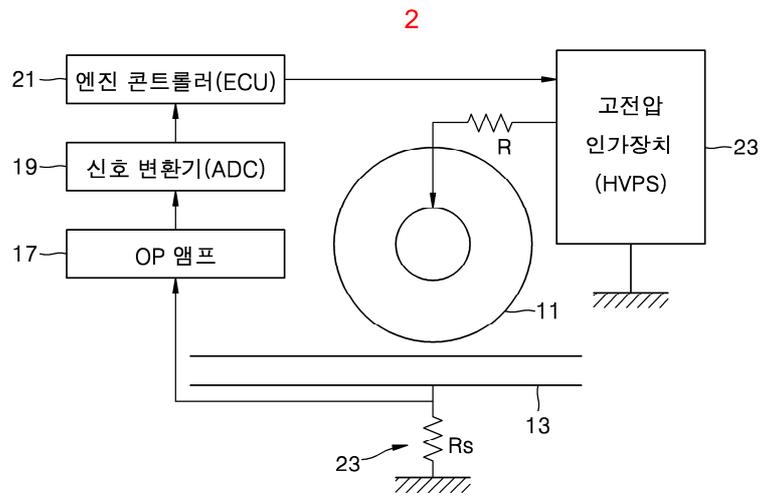
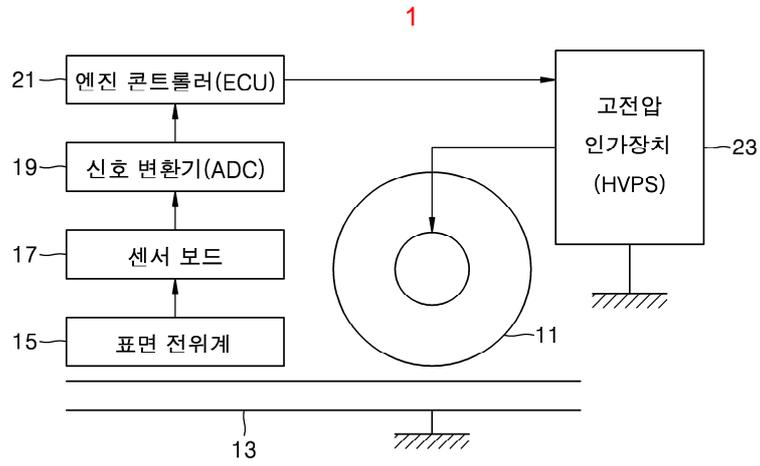
3 Vtr, It, Rc K Vc3 D3 , Vc3 D3 ;

$$Vc3 = Vtr + It \cdot Rc$$

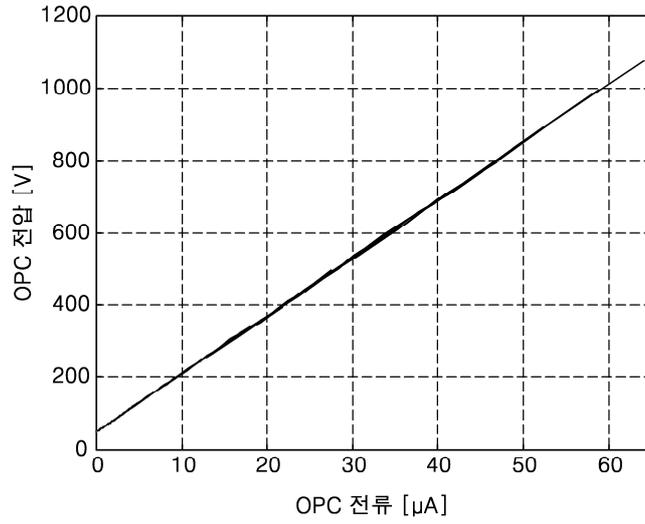
$$D3 = \frac{Vc}{K}$$

**5.**

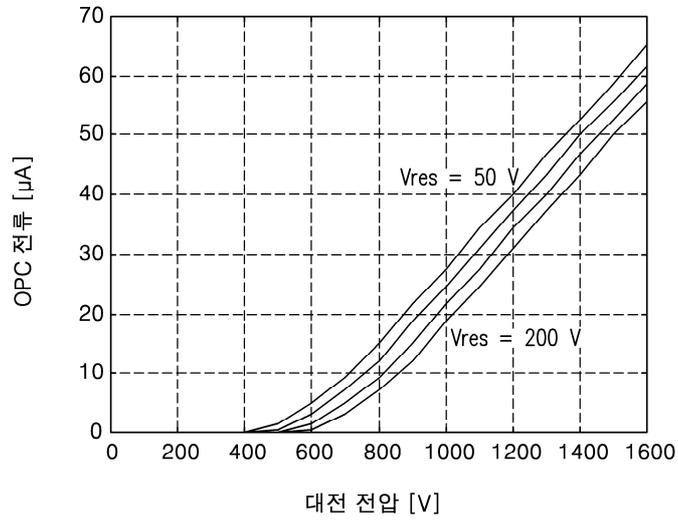
1 It 4 TOL , 4 , It ; It It Ic3 TOL ; TOL ; 가 1 3 ; ;



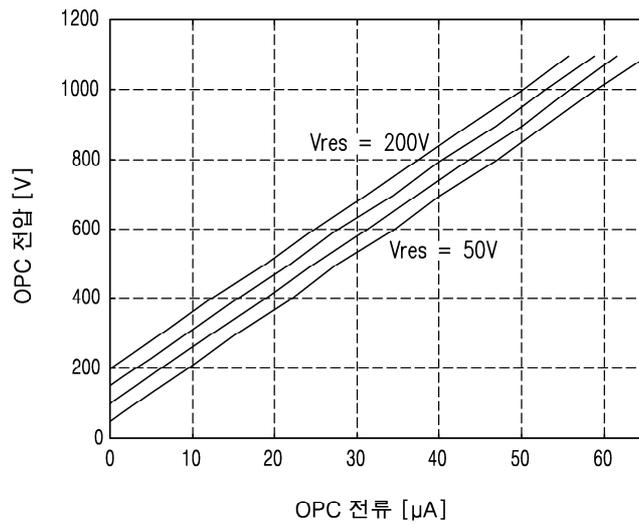
3b



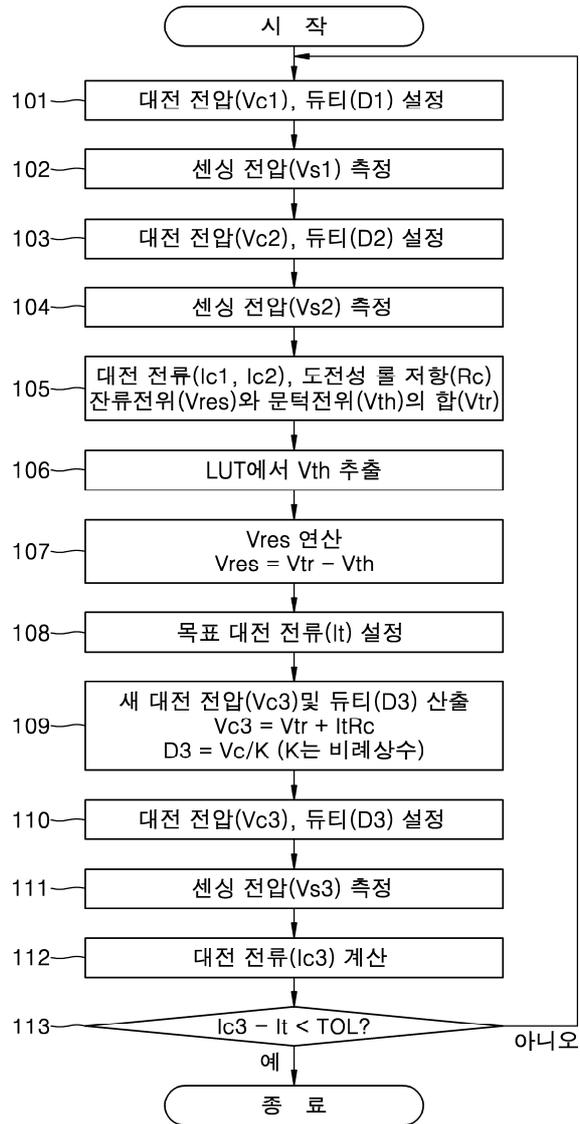
4a



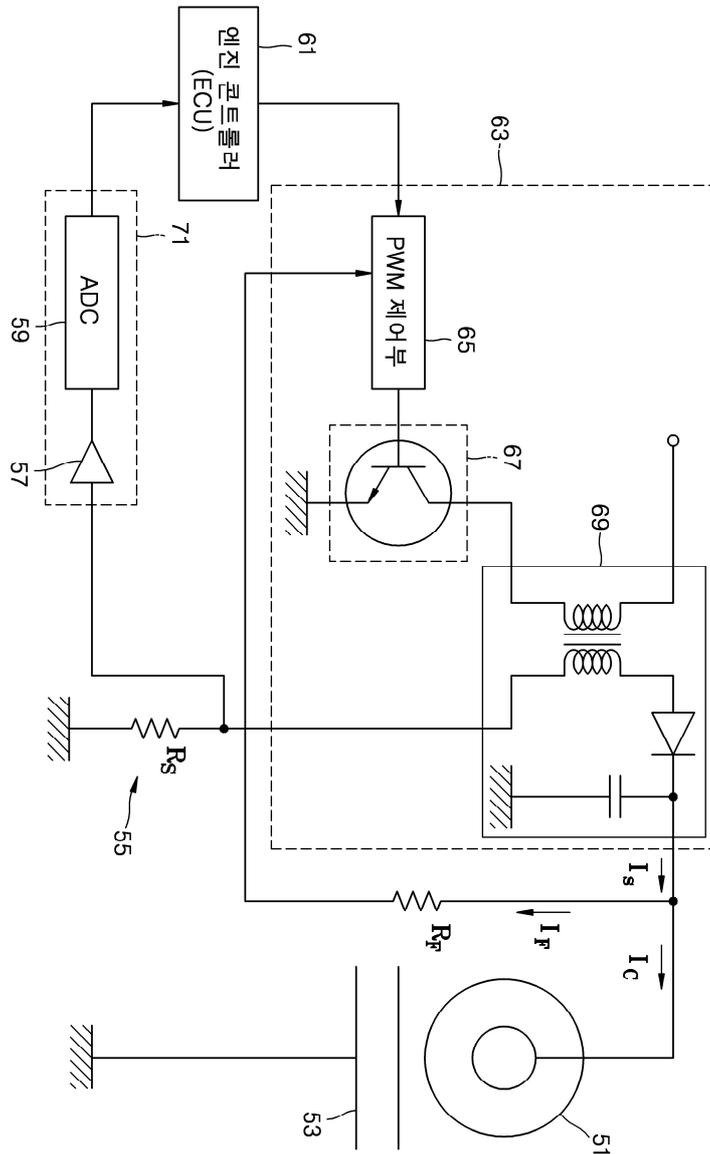
4b



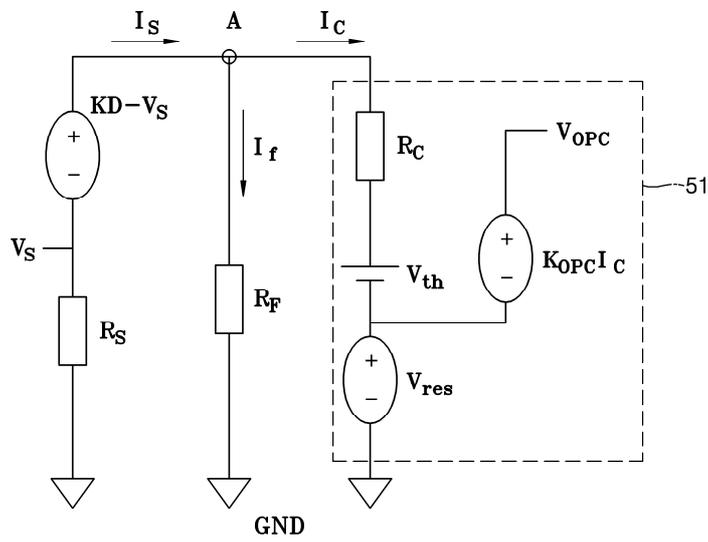
5



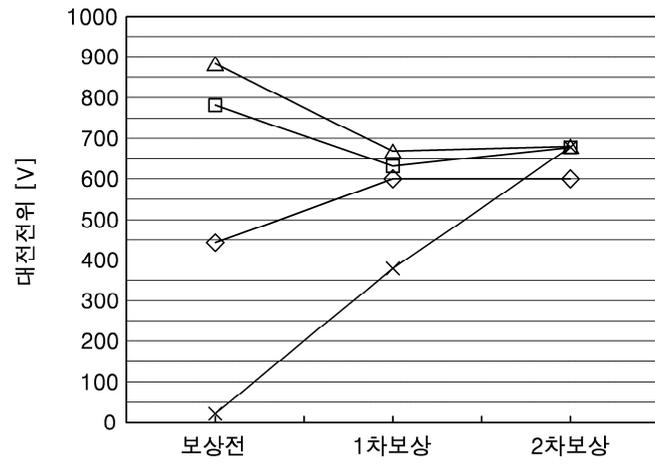
6a



6b



7a



7b

