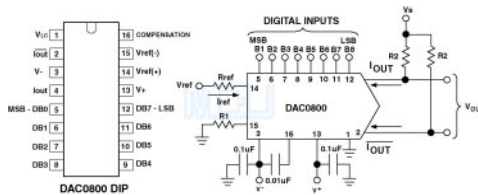


4 Peripheral

3 D/A

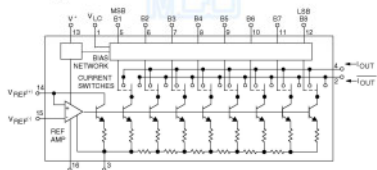
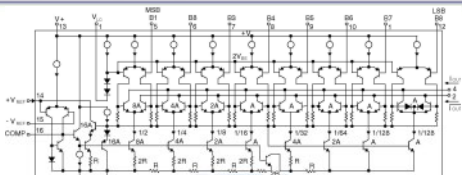
1.D/A Converter DAC0800

- 8 100ns (Settling Time)
- ±1% (Full Scale) ±1LSB(1)
- TTL, CMOS, PMOS, 33mW/±5V
- ±4.5V ±18V
- GND-0.05V ~ VCC+0.05V
- 1.1mA, 2.5mA

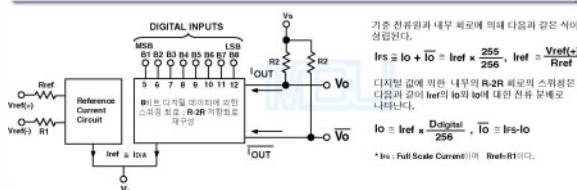


2. DAC0800

가



3.



기준 전류원과 내부 회로에 의해 다음과 같은 식이 성립한다.

$$I_{rs} \approx I_0 + I_0 \approx I_{ref} \times \frac{255}{256}, I_{ref} = \frac{V_{ref(-)}}{R_{ref}}$$

디지털 값에 의한 내부의 R-2R 회로의 스위칭은 다음과 같이 Iref의 I0와 I0에 대한 전류 분배로 나타낸다.

$$I_0 \approx I_{ref} \times \frac{Digital}{256}, I_0 \approx I_{rs} - I_0$$

* Irs : Full Scale Current, Iref: Rref(1/256)

$$I_{b/A} = \frac{I_{out+}}{I_{out-}}$$

$$I_{b/A} = I_{out+}/I_{out-}$$

$$Full\ Scale(Digital\ Input=0xFF)\ Current\ I_{rs} = I_{ref} * (255/256) = I_{out+}/I_{out-}$$

$$I_{out+} = I_{ref} * (Digital\ Input/256)$$

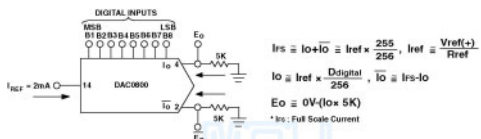
$$V_o = V_s - (I_{out+} * R_2)$$

$$V_o = V_s - (I_{ref} * R_2 * (Digital\ Input/256))$$

4. DAC0800

1

- 0x0~0xFF 0V~-10V

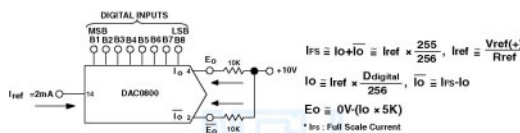


	B1	B2	B3	B4	B5	B6	B7	B8	I ₀ mA	I ₀ mA	E _O	E _O
Full Scale	1	1	1	1	1	1	1	1	1.992	0.000	-9.960	0.000
Full Scale - LSB	1	1	1	1	1	1	1	0	1.984	0.008	-9.920	-0.040
Half Scale+LSB	1	0	0	0	0	0	0	1	1.008	0.984	-5.040	-4.920
Half Scale	1	0	0	0	0	0	0	0	1.000	0.992	-5.000	-4.960
Half Scale - LSB	0	1	1	1	1	1	1	1	0.992	1.000	-4.960	-5.000
Zero Scale+LSB	0	0	0	0	0	0	0	1	0.008	1.984	-0.040	-9.920
Zero Scale	0	0	0	0	0	0	0	0	0.000	1.992	0.000	-9.960

5. DAC0800

2

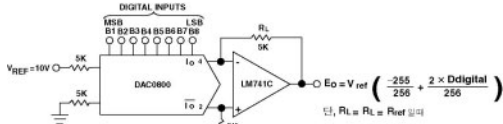
- 0x0~0xFF +10V~-10V



	B1	B2	B3	B4	B5	B6	B7	B8	E _O	E _O
Pos. Full Scale	1	1	1	1	1	1	1	1	-9.920	+10.000
Pos. Full Scale - LSB	1	1	1	1	1	1	1	0	-9.840	+9.920
Zero Scale+LSB	1	0	0	0	0	0	0	1	0.080	+0.160
Zero Scale	1	0	0	0	0	0	0	0	0.000	+0.080
Zero Scale - LSB	0	1	1	1	1	1	1	1	+0.080	0.000
Neg. Full Scale+LSB	0	0	0	0	0	0	0	1	+9.920	-9.840
Neg. Full Scale	0	0	0	0	0	0	0	0	+10.000	-9.920

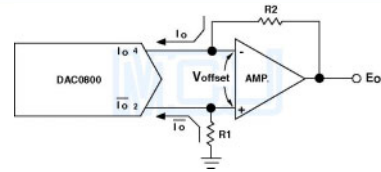
6. DAC0800 3

AMP 0x0~0xFF +10V~-10V



	B1	B2	B3	B4	B5	B6	B7	B8	E _o
Pos. Full Scale	1	1	1	1	1	1	1	1	+9.960
Pos. Full Scale-LSB	1	1	1	1	1	1	1	0	+9.880
(-)Zero Scale	1	0	0	0	0	0	0	0	+0.040
(-)Zero Scale	0	1	1	1	1	1	1	1	-0.040
Neg. Full Scale+LSB	0	0	0	0	0	0	0	1	-9.880
Neg. Full Scale	0	0	0	0	0	0	0	0	-9.960

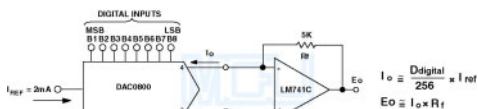
7.



$R1=R2$
 $E_o=(2I_o - I_{rs}) \cdot R1 = (2I_o - I_{rs}) \cdot R1$ -----
 $E_o = [2(D_{digital}/256) - (255/256)] \cdot I_{ref} \cdot R2$ -----
 $E_o = [2(D_{digital}/256) - (255/256)] \cdot I_{ref} \cdot R2$

8. DAC0800 4

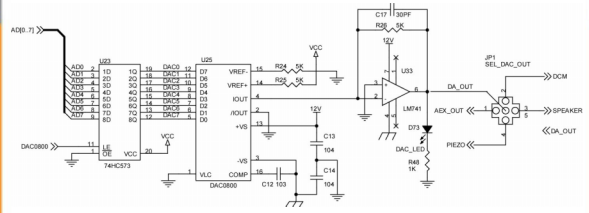
AMP 0x0~0xFF 0V~10V



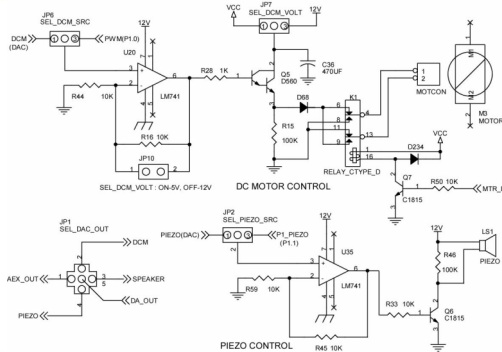
	B1	B2	B3	B4	B5	B6	B7	B8	I _o mA	E _o
Full Scale	1	1	1	1	1	1	1	1	1.992	9.960
Full Scale-LSB	1	1	1	1	1	1	1	0	1.984	9.920
Half Scale+LSB	1	0	0	0	0	0	0	1	1.008	5.040
Half Scale	1	0	0	0	0	0	0	0	1.000	5.000
Half Scale-LSB	0	1	1	1	1	1	1	1	0.992	4.960
Zero Scale+LSB	0	0	0	0	0	0	0	1	0.008	0.040
Zero Scale	0	0	0	0	0	0	0	0	0.000	0.000

9. DAC 1

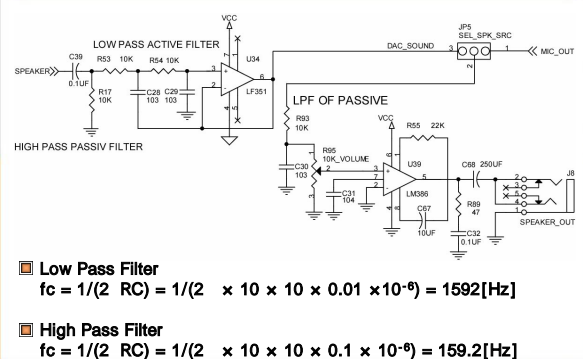
$\text{DAC0800: U23 Enable}$
 $-A15, A14, A13, A12, A11, A10, A9, A8 = 11X0001$
 $/WR \quad 0 \quad \text{High} \quad 0x0C100$
 가



10. DAC 2(DC Motor, PIEZO)



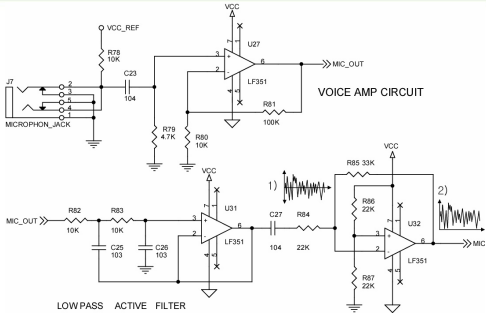
11. DAC 3(Speaker)



Low Pass Filter
 $f_c = 1/(2 RC) = 1/(2 \times 10 \times 10^3 \times 0.01 \times 10^{-6}) = 1592[\text{Hz}]$
High Pass Filter
 $f_c = 1/(2 RC) = 1/(2 \times 10 \times 10^3 \times 0.1 \times 10^{-6}) = 159.2[\text{Hz}]$

12.

3



Low Pass Filter
 $f_c = 1/(2 RC) = 1/(2 \times 10 \times 10^3 \times 0.01 \times 10^{-6}) = 1592[\text{Hz}]$

13. DAC

1,2

DAC0800 1: 가 1Hz Sin()
 D/A 가 1Hz Sin()
 . D/A 1 100

DAC0800 2: 가 LED D73 가 RV5
 A/D 가 D/A D/A

14. DAC

3

DAC0800 3: DC 가
 DAC0800 A/D DC 가
 ADC 2.5V DC 가 2.5V
 가 가 .

JP1 : D/A Converter 출력 선택 DC MOTOR로 출력
 JP7 : DC 모터 구동전압 선택 5V 선택
 JP10 : DC 모터 제어회로의 모터 제어 전압 선택 5V 제어 전압 선택(ON)



15. ADC

4

ADC0804 4: 가 DC 가
 A/D 가 가 DC

JP1 : D/A Converter 출력 선택 DC MOTOR로 출력
 JP7 : DC 모터 구동전압 선택 5V 선택
 JP10 : DC 모터 제어회로의 모터 제어 전압 선택 5V 제어 전압 선택(ON)



16. ADC

5

ADC0804 5: (Microphone) DAC0800 A/D (4KHz)

JP1 : D/A Converter 출력 선택 JP5 : Speaker입력 Source 선택

