

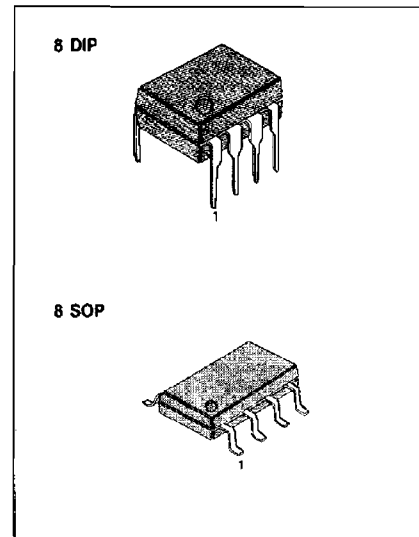
# LOW VOLTAGE DC MOTOR SPEED CONTROLLER

## USE

- Speed control or general-purpose low-voltage compact DC motor for microcassette tape recorders, radio cassettes and their equivalents.

## FEATURES

- Operating supply voltage range  
 KA2402:  $V_{CC} = 1.8V \sim 8V$   
 KA2402D:  $V_{CC} = 1.8V \sim 4.5V$
- Capable of making the applicable set compact because of a minimum to adjust speed.
- Easy to adjust speed.
- Built-in stable low reference power meeting the requirements for 2 speeds.
- $V_{REF} = 0.2V$



## ORDERING INFORMATION

Device	Package	Operating Temperature
KA2402	8 DIP	- 20°C ~ + 80°C
KA2402D	8 SOP	

## BLOCK DIAGRAM

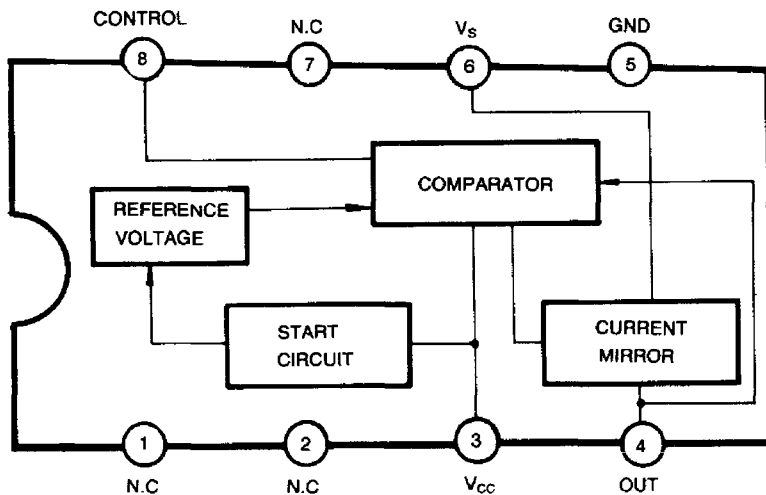


Fig. 1

**ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)**

Characteristic	Symbol	Value	Unit
Maximum Supply Voltage	V <sub>CC</sub>	10	V
Maximum Motor Current	I <sub>M (MAX)</sub>	700	mA
Power Dissipation	P <sub>D</sub>	600	mW
Operating Temperature	T <sub>OPR</sub>	-20 ~ +80	°C
Storage Temperature	T <sub>STG</sub>	-40 ~ +125	°C

**RECOMMENDED OPERATING CONDITIONS (Ta = 25°C)**

Characteristic	Symbol	Value		Unit
Supply Voltage	V <sub>CC</sub>	KA2402	1.8 ~ 8	V
		KA2402D	1.8 ~ 4.5	
Recommended Operating Temperature	T <sub>OPR</sub>	-20 ~ 60		°C

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Voltage	V <sub>REF</sub>	V <sub>CC</sub> = 3V, I <sub>M</sub> = 100mA	0.18	0.2	0.22	V
Circuit Current	I <sub>CC</sub>	V <sub>CC</sub> = 3V, I <sub>M</sub> = 100mA		2.4	6.0	mA
Current Coefficient	K	V <sub>CC</sub> = 3V, I <sub>M</sub> = 50mA I <sub>M</sub> = 100mA	45	50	55	
Saturation Voltage	V <sub>SAT</sub>	V <sub>CC</sub> = 3V, I <sub>M</sub> = 100mA		0.13	0.3	V
Voltage Characteristic of Reference Voltage	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta V_{CC}$	I <sub>M</sub> = 100mA V <sub>CC</sub> = 1.8 ~ 8V (KA2402) 1.8 ~ 4.5V (KA2402D)		0.1		%/V
Voltage Characteristic of Current Coefficient	$\frac{\Delta K}{K} / \Delta V_{CC}$	I <sub>M</sub> = 50, 150mA V <sub>CC</sub> = 1.8 ~ 8V (KA2402) 1.8 ~ 4.5V (KA2402D)		0.3		%/V
Voltage Characteristic of Reference Voltage	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta I_M$	I <sub>M</sub> = 3V I <sub>M</sub> = 20 ~ 200mA		0.005		%/mA
Current Characteristic of Current Coefficient	$\frac{\Delta K}{K} / \Delta I_M$	V <sub>CC</sub> = 3V, I <sub>M</sub> = 20, 50mA - 170, 200mA		-0.07		%/mA
Temperature Characteristic of Reference Voltage	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta T_a$	V <sub>CC</sub> = 3V, I <sub>M</sub> = 100mA T <sub>a</sub> = -20 ~ +80°C		-0.008		%/°C
Temperature Characteristic of Current Coefficient	$\frac{\Delta K}{K} / \Delta T_a$	V <sub>CC</sub> = 3V, I <sub>M</sub> = 50mA, 150mA T <sub>a</sub> = -20 ~ +80°C		0.02		%/°C

# TEST CIRCUIT

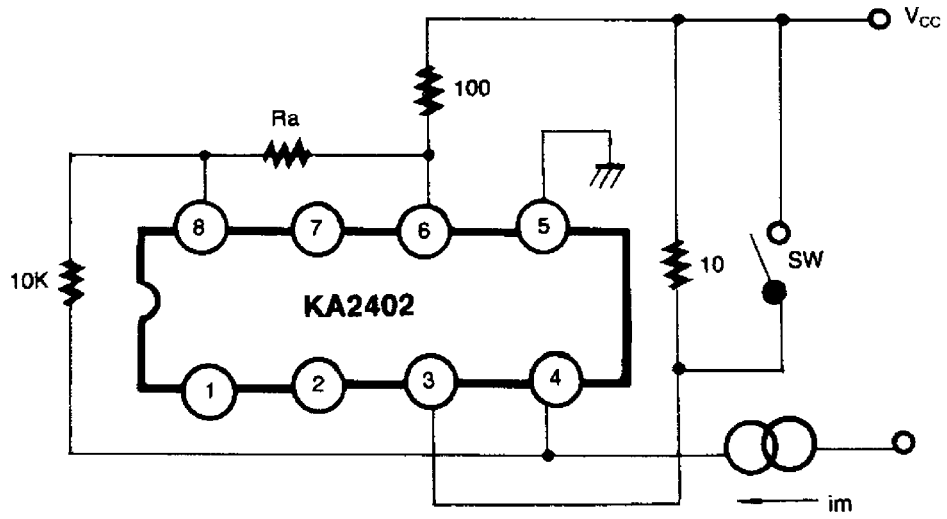


Fig. 2

# APPLICATION CIRCUIT

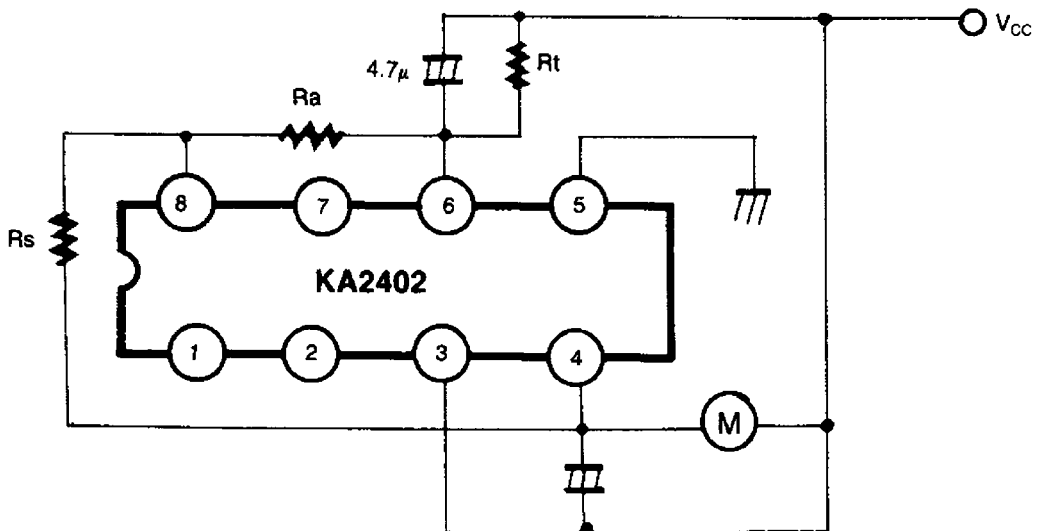


Fig. 3