

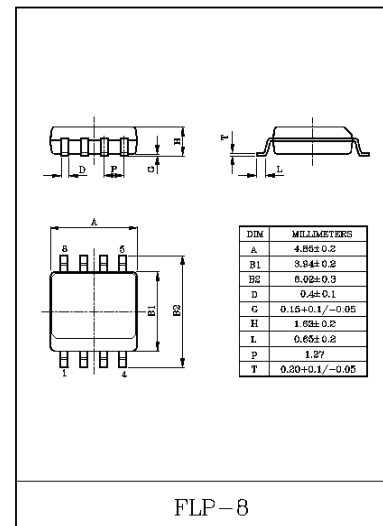
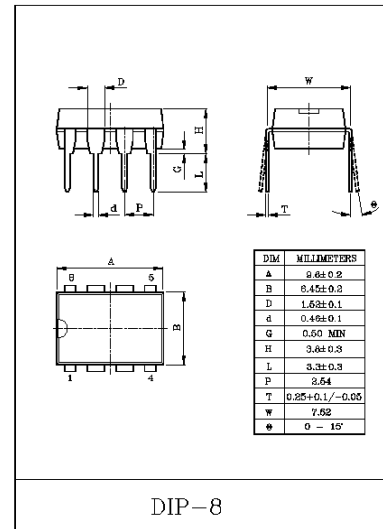
DC MOTOR SPEED CONTROLLER

FEATURES

- Wide operation voltage range : 1.8~8V
- Possible to make applicable sets compact because of minimum number of external parts required.
- Easy to adjust speed.
- On-chip stable low reference voltage capable of providing 2 speed.
- $V_{ref}=0.5V$.

MAXIMUM RATINGS ($T_a=25^{\circ}C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	10	V
Motor Current	I_M	700	mA
Power Dissipation	KIA6901P	600	mW
	KIA6901F	240	
Operating Temperature	T_{opr}	$-25 \sim 75$	$^{\circ}C$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^{\circ}C$



ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}C$, $V_{CC}=3V$, $I_M=100mA$)

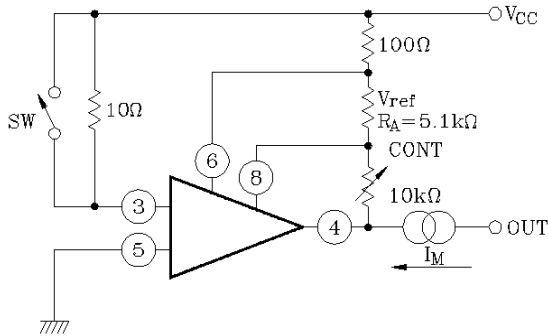
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V_{ref}	$I_M=100mA$	0.44	0.50	0.54	V
Quiescent Current	I_{CCQ}	$I_M=100mA$	-	2.4	6.0	mA
Shunt Ratio	K	$I_M=50 \sim 150mA$	45	50	55	
Output Saturation Voltage	$V_{CE(sat)}$	$I_M=200mA$	-	0.32	0.5	V
Reference Voltage Variance (Note 1)	ΔV_{ref1}	$T_a=-20 \sim 80^{\circ}C$, $I_M=100mA$	-	-0.008	-	%/ $^{\circ}C$
	ΔV_{ref2}	$I_M=20 \sim 200mA$	-	0.005	-	%/mA
	ΔV_{ref3}	$V_{CC}=1.8 \sim 8V$, $I_M=100mA$	-	0.1	-	%/V
Shunt Ratio Variance (Note 2)	ΔK_1	$T_a=-20 \sim 80^{\circ}C$, $I_M=50 \sim 150mA$	-	0.02	-	%/ $^{\circ}C$
	ΔK_2	$I_M=20 \sim 50mA$ to $170 \sim 200mA$	-	-0.07	-	%/mA
	ΔK_3	$V_{CC}=1.8 \sim 8V$, $I_M=50 \sim 150mA$	-	0.3	-	%/V

Note 1 : $\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_a$, ΔI_M , ΔV_{ref}

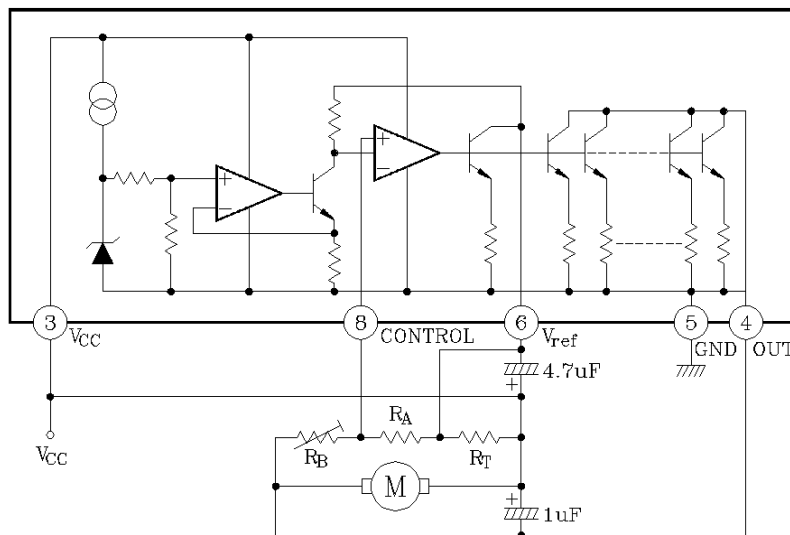
Note 2 : $\frac{\Delta K}{K} / \Delta T_a$, ΔI_M , ΔV_{ref}

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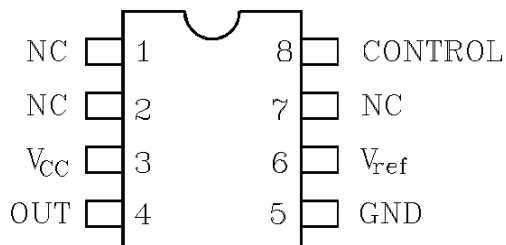
TEST CIRCUIT



EQUIVALENT CIRCUIT BLOCK DIAGRAM



PIN ASSIGNMENT



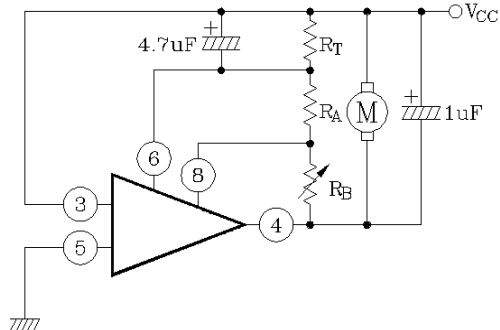
Test Method

1. V_{ref}
With SW turned ON, measure the voltage developed across R_A .
2. I_{CCQ}
With SW turned OFF, measure I_{CCQ} for the voltage developed across resistor 10Ω .
3. K
With SW turned ON, measure current I_{50} flowing through resistor 100Ω at $I_M=50mA$ and current I_{150} flowing through resistor 100Ω at $I_M=150mA$, and calculate K by using the following formula.

$$K = \frac{100}{I_{150} + I_{50}}$$
4. $V_{CE(sat)}$
With SW turned ON, connect each pin of V_{CC} , V_{ref} , $CONT$ to 3V and feed $I_M=200mA$ and measure the voltage developed across pin ④ and ⑤.

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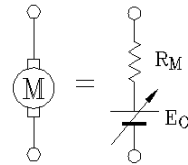
APPLICATION CIRCUIT 1 :



Unless $R_{T(max)} < K \cdot R_{M(min)}$ the operation becomes unstable.

R_A is Set to $5.1k\Omega$

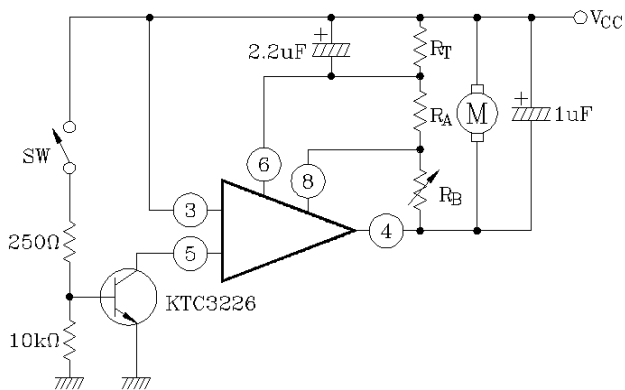
R_M =Motor DC resistance



R_M (internal resistance)
 E_0 (counter electromotive force)

The values and positions of electrolytic capacitors depend on the type of a motor to be used.

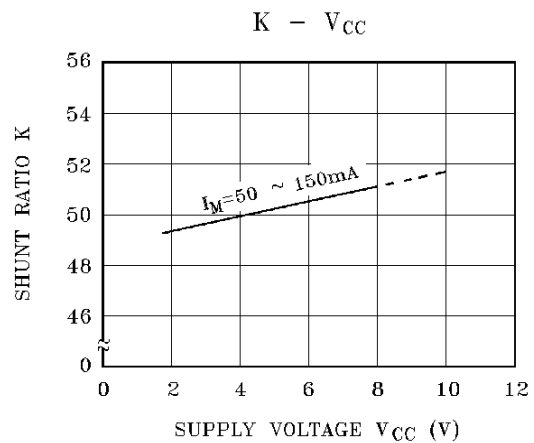
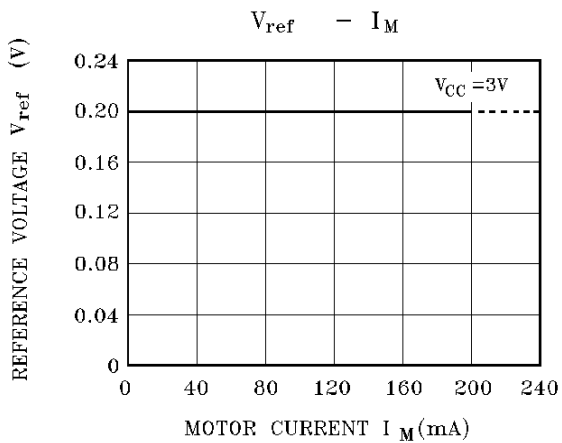
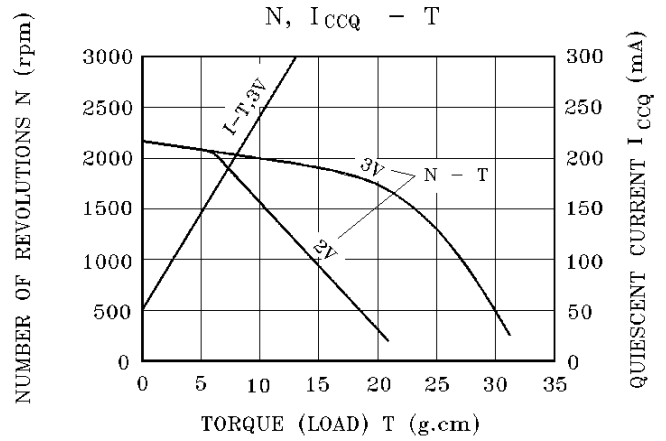
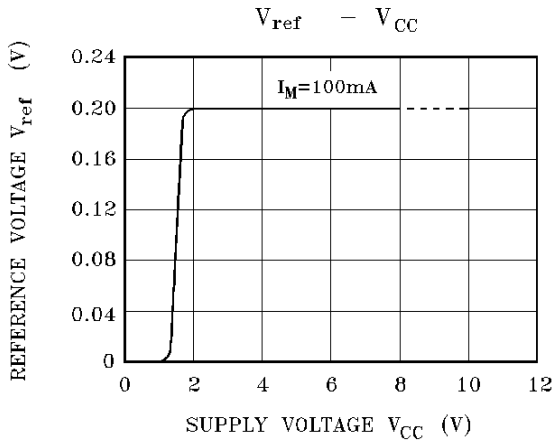
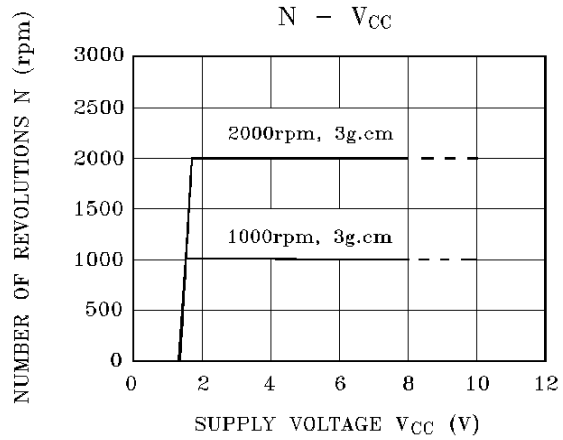
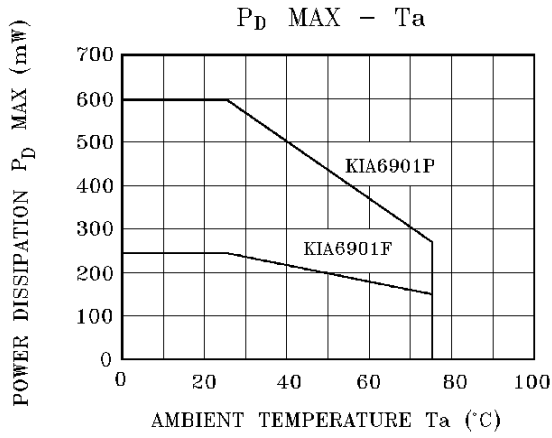
APPLICATION CIRCUIT 2 : WITH STOP CIRCUIT



$R_{T(max)} < K \cdot R_{M(min)}$

R_A is set to $5.1k\Omega$

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