

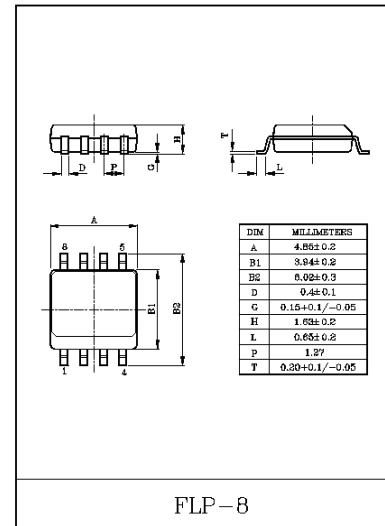
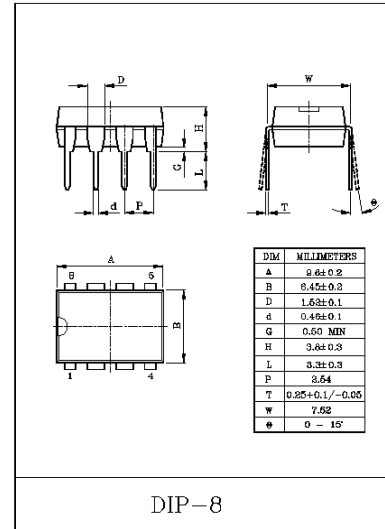
DC MOTOR SPEED CONTROLLER

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 (Ta=25°C)

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



ELECTRICAL CHARACTERISTICS (Ta=25°C, VCC=3V, IM=100mA)

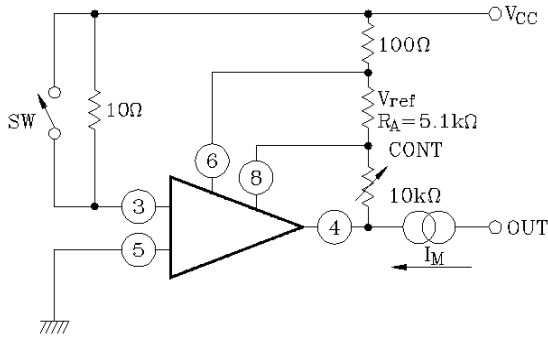
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V_{ref}	$I_M=100mA$	0.44	0.50	0.54	V
Quiescent Current	I_{CCQ}	$I_M=100mA$	-	2.4	6.0	mA
Shunt Ratio	K	$I_M=50\sim150mA$	45	50	55	
Output Saturation Voltage	$V_{CE(sat)}$	$I_M=200mA$	-	0.32	0.5	V
Reference Voltage Variance (Note 1)	ΔV_{ref1}	$T_a=-20\sim80^\circ C, I_M=100mA$	-	-0.008	-	%/°C
	ΔV_{ref2}	$I_M=20\sim200mA$	-	0.005	-	%/mA
	ΔV_{ref3}	$V_{CC}=1.8\sim8V, I_M=100mA$	-	0.1	-	%/V
Shunt Ratio Variance (Note 2)	ΔK_1	$T_a=-20\sim80^\circ C, I_M=50\sim150mA$	-	0.02	-	%/°C
	ΔK_2	$I_M=20\sim50mA$ to $170\sim200mA$	-	-0.07	-	%/mA
	ΔK_3	$V_{CC}=1.8\sim8V, I_M=50\sim150mA$	-	0.3	-	%/V

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

Note 2 : $\frac{\Delta K}{K} / \Delta T_a, \Delta I_M, \Delta V_{ref}$

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TEST CIRCUIT

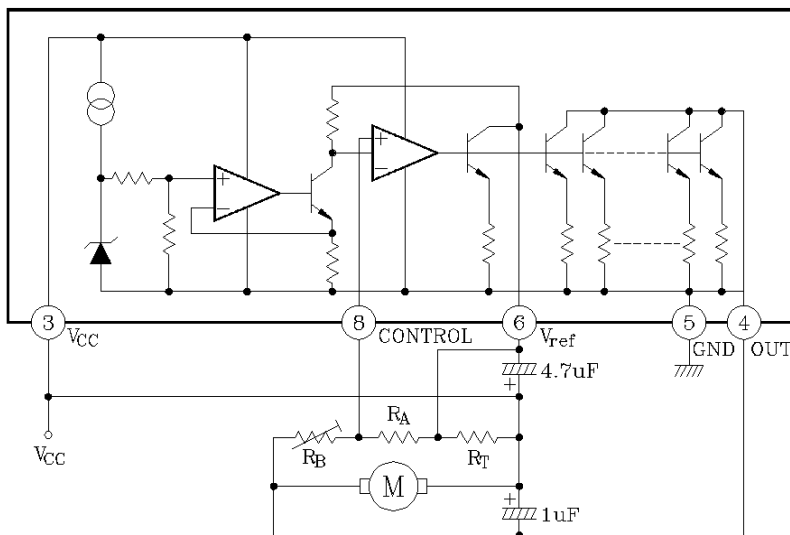


Test Method

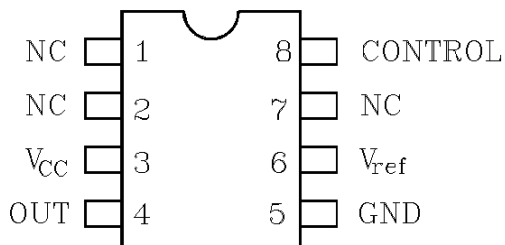
1. V_{ref}
With SW turned ON, measure the voltage developed across R_A .
2. I_{CCQ}
With SW turned OFF, measure I_{CCQ} for the voltage developed across resistor 100Ω .
3. K
With SW turned ON, measure current I_{50} flowing through resistor 100Ω at $I_M=50\text{mA}$ and current I_{150} flowing through resistor 100Ω at $I_M=150\text{mA}$, 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} , CONTROL to 3V and feed $I_M=200\text{mA}$ and measure the voltage developed across pin ④ and ⑤.

EQUIVALENT CIRCUIT BLOCK DIAGRAM

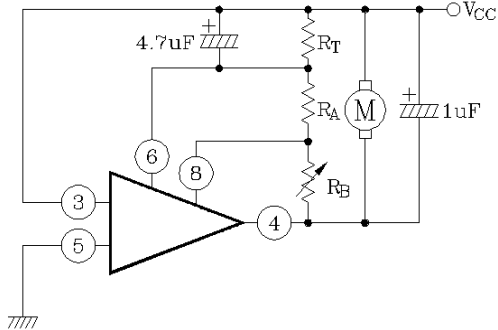


PIN ASSIGNMENT



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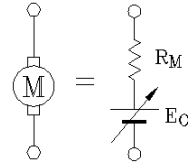
APPLICATION CIRCUIT 1 :



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

R_A is Set to $5.1k\Omega$

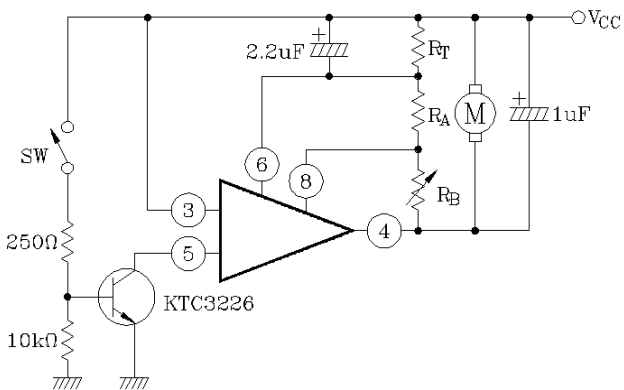
R_M =Motor DC resistance



R_M (internal resistance)
 E_O (counter electromotive force)

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

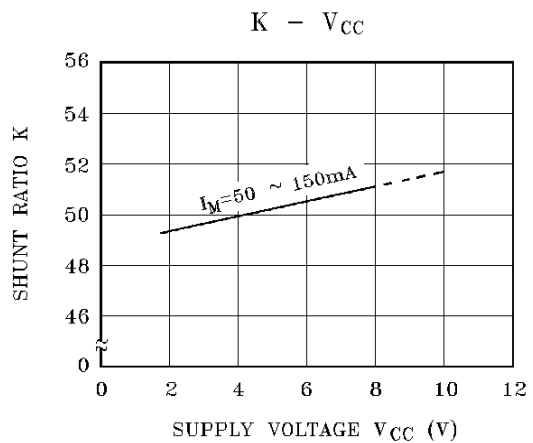
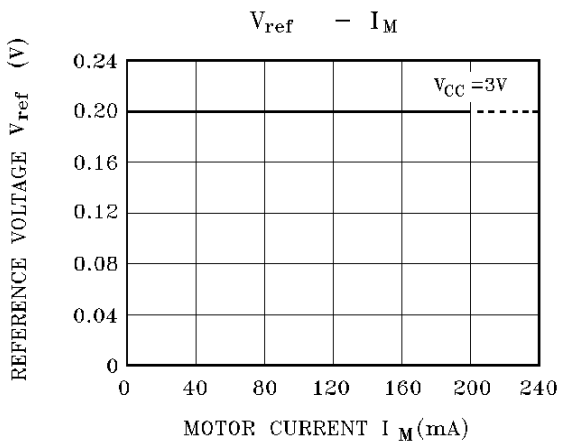
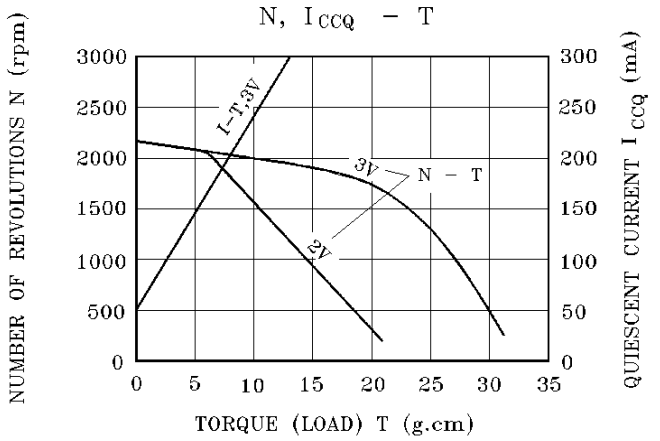
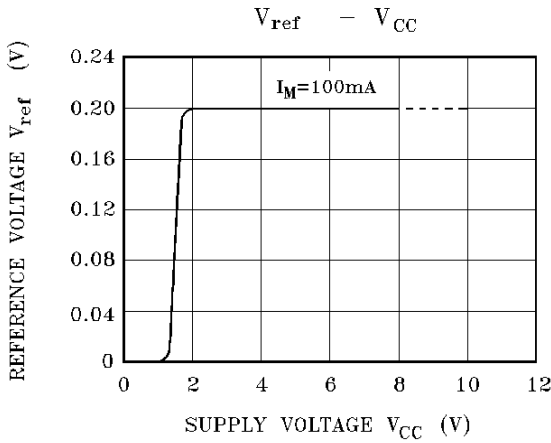
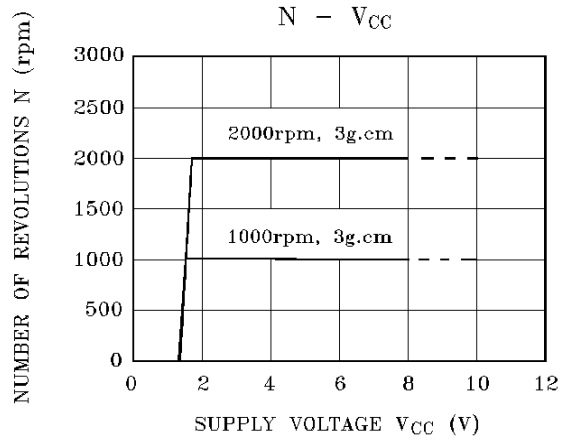
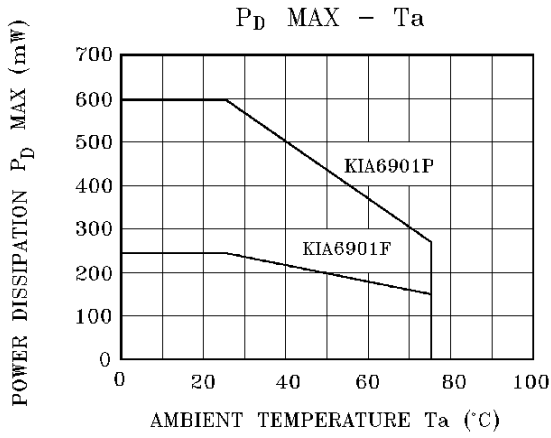
APPLICATION CIRCUIT 2 : WITH STOP CIRCUIT



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

R_A is set to $5.1k\Omega$

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