Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

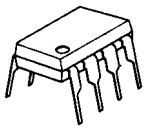
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

LOW VOLTAGE DC MOTOR CONTROLLER

■ GENERAL DESCRIPTION

The **NJM2606/06A** are integrated circuits with wide operating supply voltage range for DC motor speed control. Especially, the **NJM2606A** is suited for the applications requiring low staturation output voltage.

■ PACKAGE OUTLINE



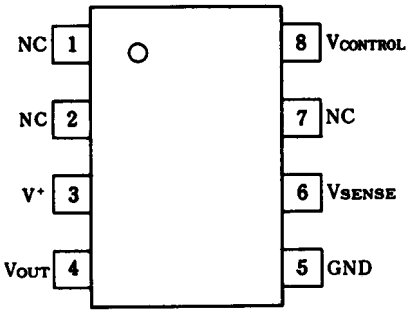
NJM2606D
NJM2606AD

NJM2606M
NJM2606AM

■ FEATURES

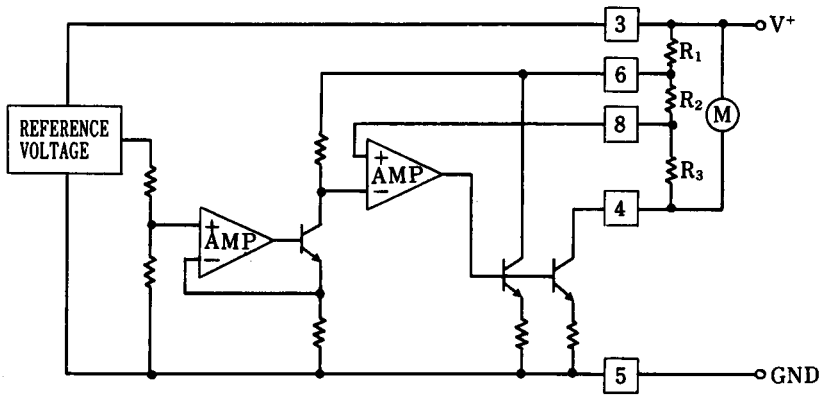
- Operating Voltage (1.8V to 8V)
- Internal Low Saturation Voltage Output Transistor
- Package Outline DIP8, DMP8
- Bipolar Technology

■ PIN CONFIGURATION



NJM2606D
NJM2606AD
NJM2606M
NJM2606AM

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	10	V
Peak-to-peak Output Current	I_{OP}	700	mA
Power Dissipation	P_D	(DIP) 500	mW
		(DMP8) 300	mW
Operating Temperature Range	T_{opr}	-20 to 75	°C
Storage Temperature Range	T_{stg}	-40 to 125	°C

(note)At SW ON. (3 sec. at motor locked or 100msec at duty factor less than 0.1%)

■ ELECTRICAL CHARACTERISTICS

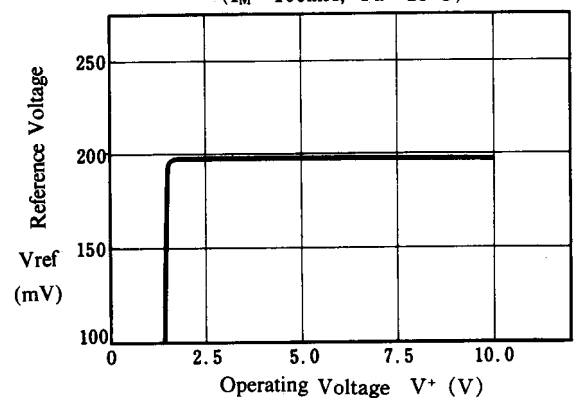
(T_a=25°C, V^+=3V, I_M=100mA)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}		-	2.4	6.0	mA
Output Saturation Voltage						
NJM2606	V_{OSAT}		-	0.18	0.3	V
NJM2606A	V_{OSAT}		-	0.13	0.18	V
Reference Voltage	V_{REF}		0.18	0.20	0.22	V
vs. Operating Voltage	ΔV_{RSV}	V^+=1.8V to 8.0V	-	0.7	8.0	mV
vs. Output Current	ΔV_{ROC}	I_M=20mA to 200mA	-	2.7	9.0	mV
vs. Ambient Temperature	ΔV_{RT}	T_a= -20°C to +75°C	-	0.04	-	mV / °C
Current Ratio	K	I_M=50mA to 150mA	45	50	55	
vs. Operating Voltage	ΔK_{SV}	V^+=1.8V to 8.0V I_M=50mA to 150mA	-	0.6	3.0	
vs. Output Current	ΔK_{OC}	I_M=(20 to 50)mA to (170 to 200)mA	-	1.0	4.0	
vs. Ambient Temperature	ΔK_{TC}	T_a= -20°C to +75°C I_M=50mA to 150mA	-	1.0	-	1 / °C

■ TYPICAL CHARACTERISTICS

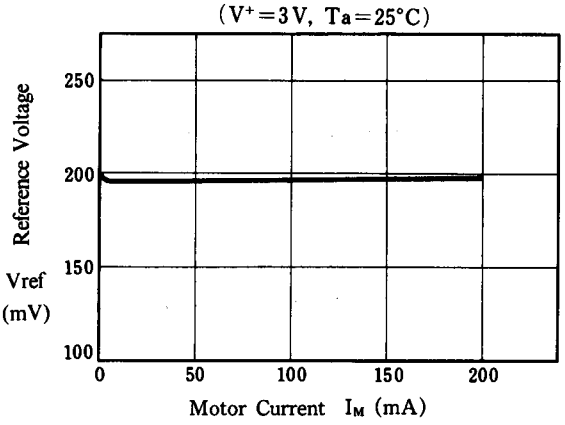
Reference Voltage vs. Operating Voltage

(I_M=100mA, Ta=25°C)



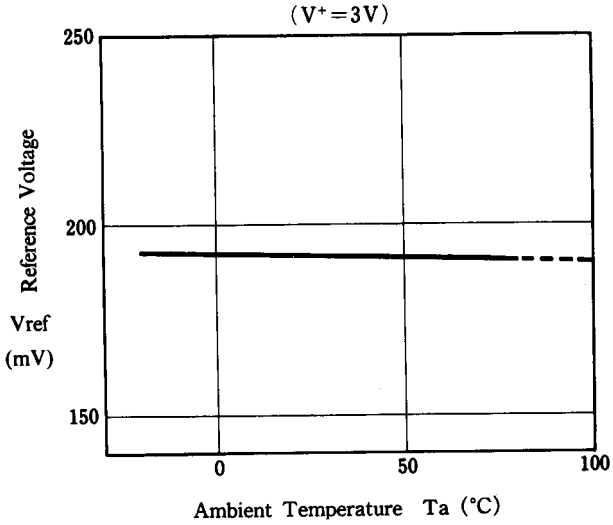
Reference Voltage vs. Motor Current

(V^+=3V, Ta=25°C)



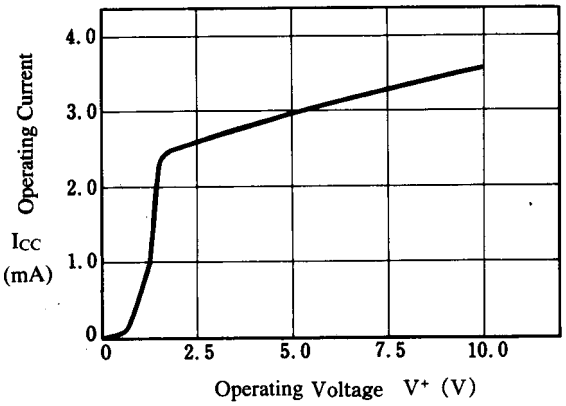
Reference Voltage vs. Temperature

(V^+=3V)



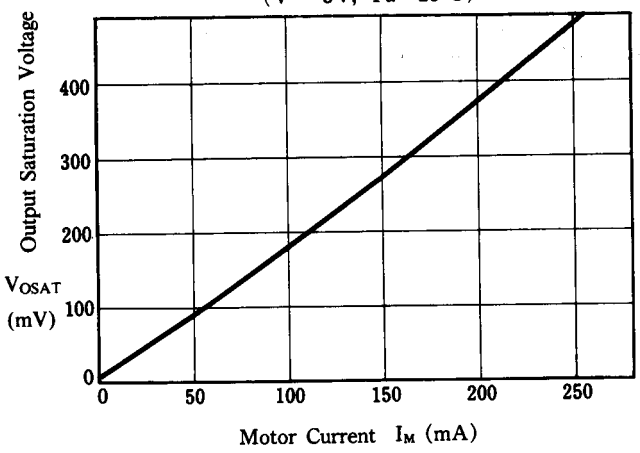
Operating Current vs. Operating Voltage

(Ta=25°C)



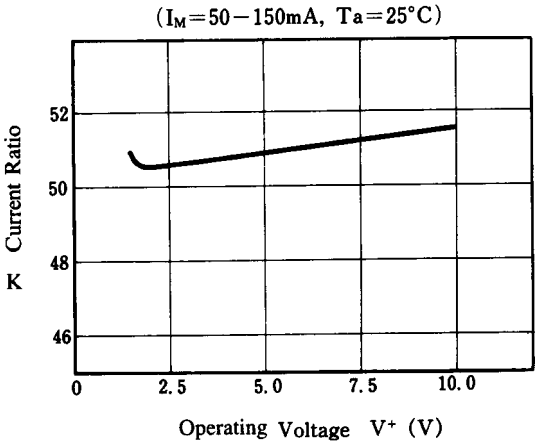
Output Staturation Voltage vs. Motor Current

(V^+=3V, Ta=25°C)



Current Ratio vs. Operating Voltage

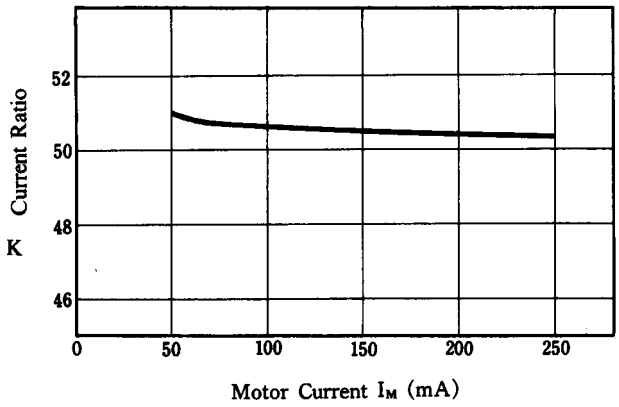
(I_M=50−150mA, Ta=25°C)



■ TYPICAL CHARACTERISTICS

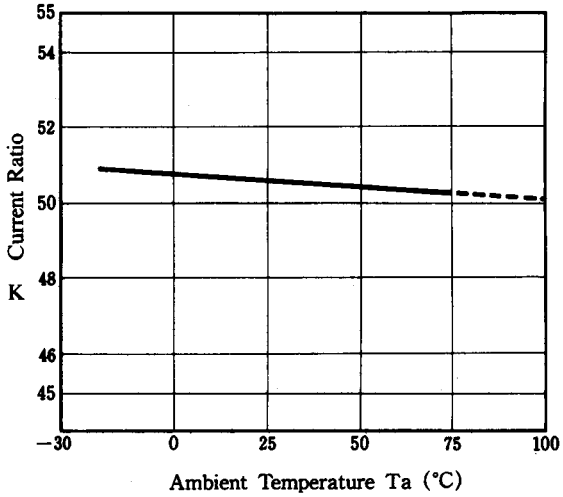
Current Ratio vs. Motor Current

(V^+=3V, Ta=25°C)



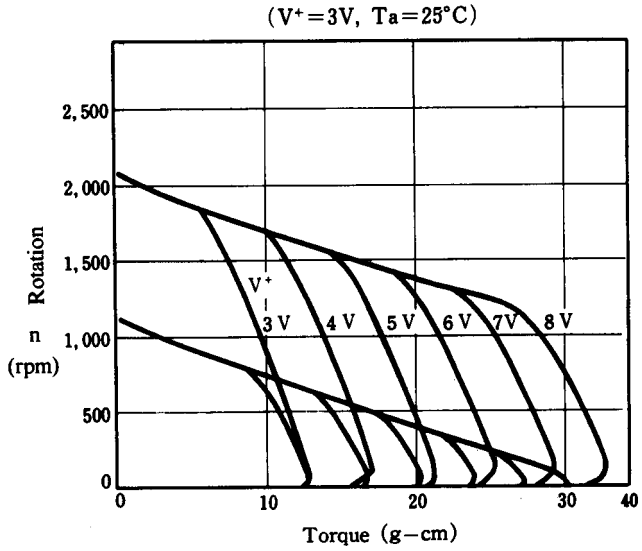
Current Ratio vs. Temperature

(V^+=3V, I_M=50~150mA)

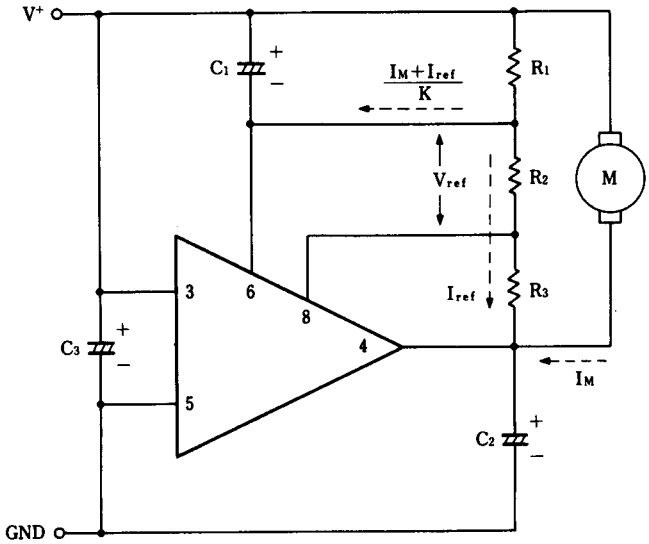


Rotation vs. Torque

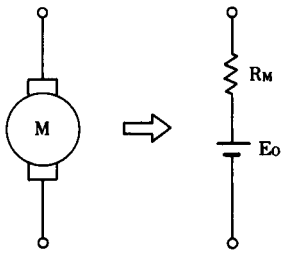
(V^+=3V, Ta=25°C)



■ TYPICAL APPLICATION



Select C_1, C_2, C_3 for each motor type.



V_{ref} : Reference Voltage
K : Current Ratio
I_M : Motor Current
R_M : Internal Resistance of Motor
E_O : Motor Counter Electromotive Voltage

The voltage applied at the motor is set as V_M, which brings the following formula.

$$V_M = (R_1 + R_2 + R_3)\, I_{ref} + R_1 \cdot \frac{I_M + I_{ref}}{K}$$

Now that, $I_{ref} = V_{ref} / R_2$ so that, (I_{ref} ≒100μA setting is appropriate)

$$V_M = \frac{V_{ref}}{R_2}(R_1 + \frac{R_1}{K} + R_2 + R_3) + \frac{R_1}{K} I_M \quad \Lambda\ \Lambda \ (1)$$

On the other hand, the voltage applied at the motor itself will be as in the following.

$$V_M = E_O + R_M \cdot I_M \quad \Lambda\ \Lambda \ (2)$$

Through (1), (2), and then leading to stabilize the control system.

$$R_M \cdot I_M > \frac{R_1}{K} \cdot I_M$$

$$\therefore R_1 < K \cdot R_M \quad \Lambda\ \Lambda \ (3)$$

Taking in consideration of deviations, $R_{1(MAX)} < K_{(MIN)} \cdot R_{M(MIN)}$ with the condition.

Items required checking in regard to the temperature coefficient

IC items

1. Reference voltage : Temperature coefficient of V_{ref}.
2. Current Ratio : Temperature coefficient of K
   *1 External component items
3. Temperature coefficient of R_1, R_2 and R_3
   The relation among these 3 parts takes the very important roll.
4. Temperature coefficient of motor internal resistance
5. Temperature coefficient of motor generative voltage
6. Temperature coefficient ratio of R_1 and R_M

Count up from 3.4.