

LOW VOLTAGE DC MOTOR CONTROLLER

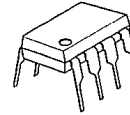
■ GENERAL DESCRIPTION

The NJM2606A is integrated circuit with wide operating supply voltage range for DC motor speed control. Especially, the NJM2606A is suited for 3V or 6V DC motor control.

■ FEATURES

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

■ PACKAGE OUTLINE

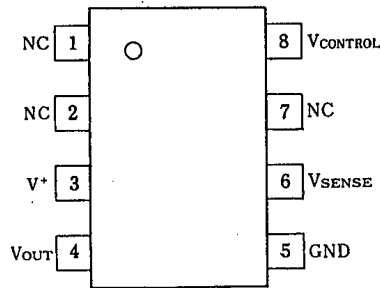


NJM2606D
NJM2606AD



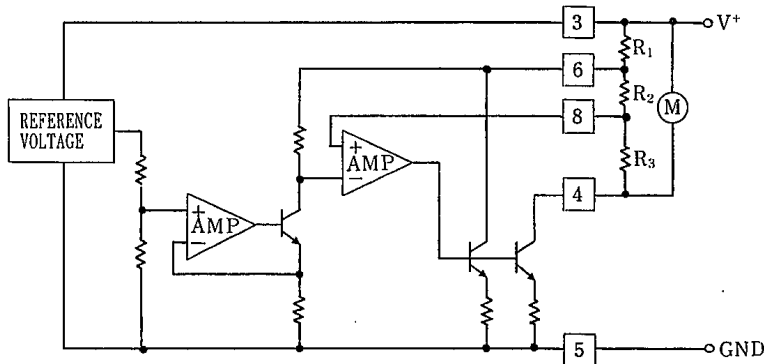
NJM2606M
NJM2606AM

■ PIN CONFIGURATION



NJM 2606D
NJM2606AD
NJM2606AM

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	10	V
Peak-to-peak Output Current	I _{op}	700	mA
Power Dissipation	P _D	(DIP8) 500	mW
		(DMP8) 300	mW
Operating Temperature Range	T _{opr}	-20~75	°C
Storage Temperature Range	T _{stg}	-40~125	°C

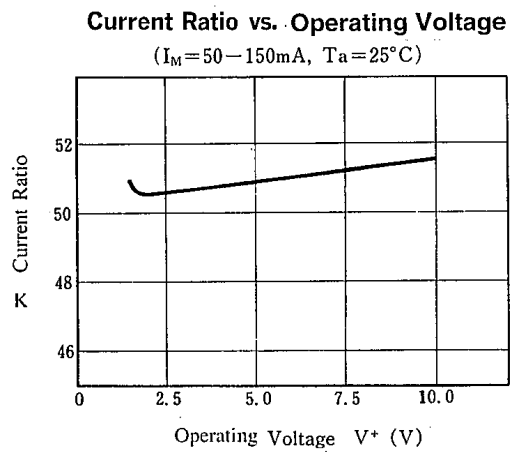
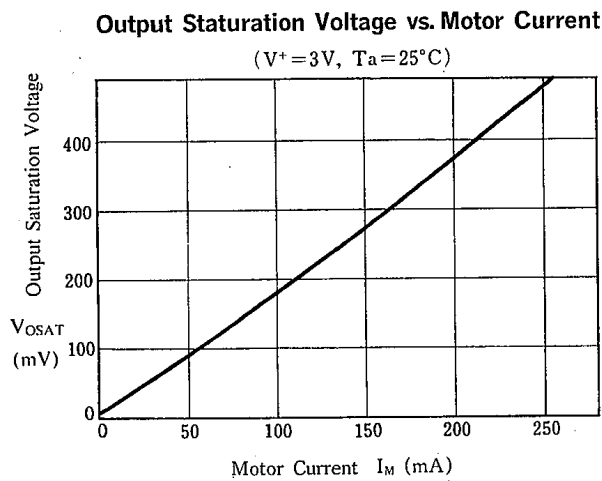
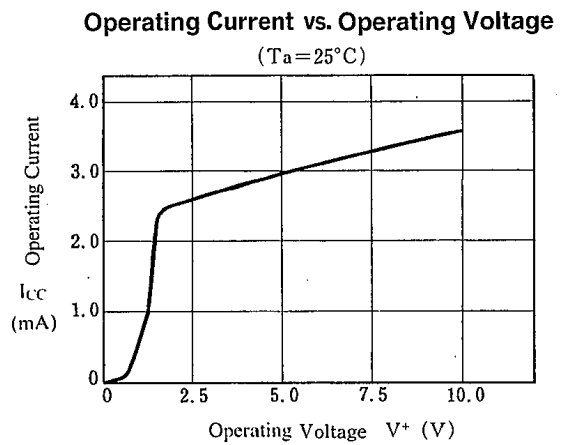
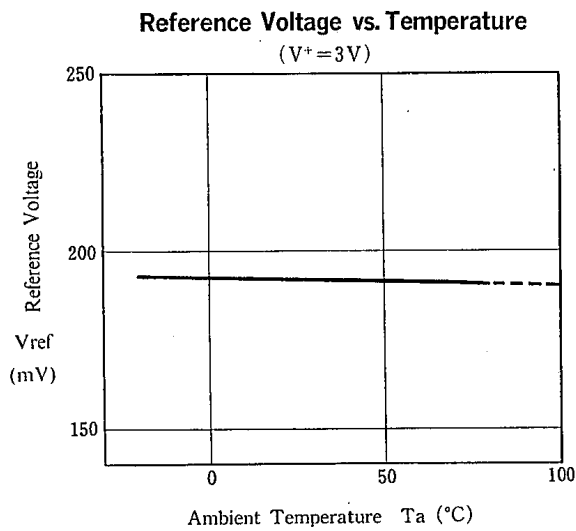
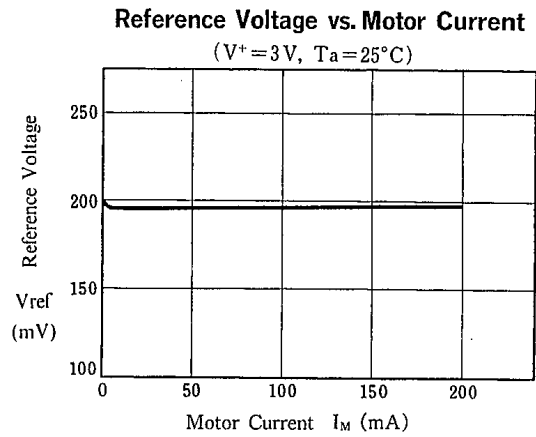
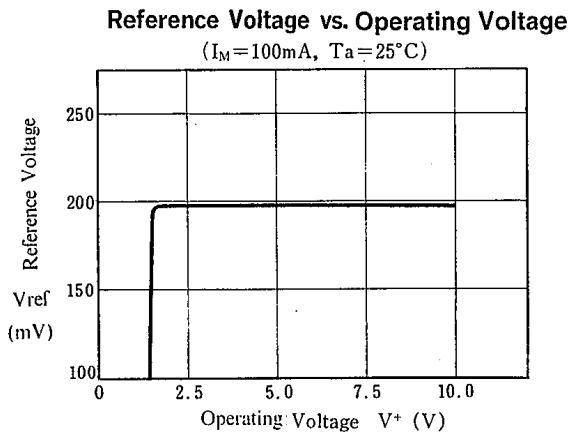
(note) At SW ON. (3 sec. at motor locked or 100msec at duty factor less than 0.1%)

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V⁺=3V, I_M=100mA)

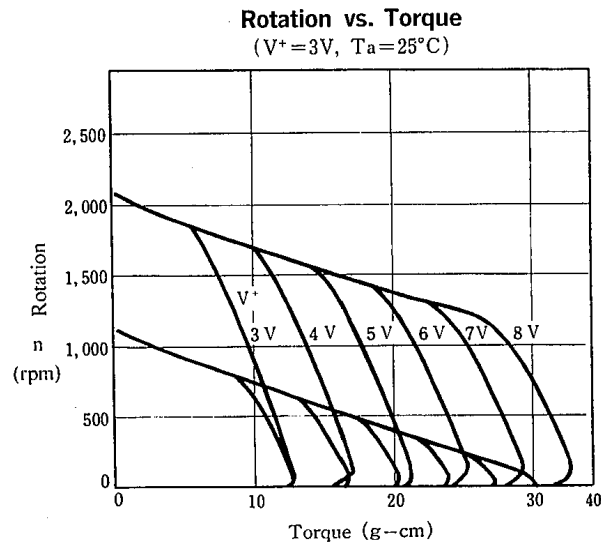
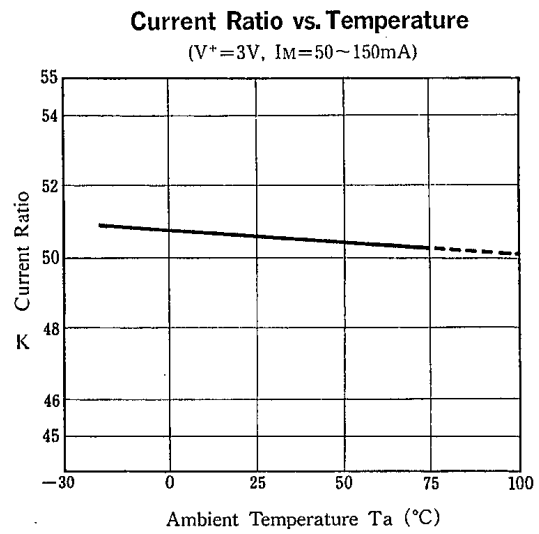
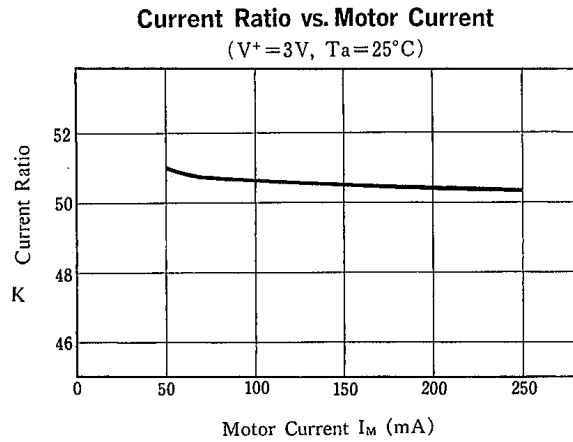
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}		—	2.4	6.0	mA
Output Saturation Voltage	V _{OSAT}		—	0.18	0.3	V
			—	0.13	0.18	V
Reference Voltage	V _{REF}		0.18	0.20	0.22	V
vs. Operating Voltage	ΔV _{RSV}	V ⁺ =1.8V~8.0V	—	0.7	8.0	mV
vs. Output Current	ΔV _{ROC}	I _M =20mA~200mA	—	2.7	9.0	mV
vs. Ambient Temperature	ΔV _{RT}	Ta=-20°C~+75°C	—	0.04	—	mV/°C
Current Ratio	K	I _M =50mA~150mA	45	50	55	
vs. Operating Voltage	ΔK _{SV}	V ⁺ =1.8V~8.0V	—	0.6	3.0	
			I _M =50mA~150mA	—	1.0	4.0
vs. Output Current	ΔK _{OC}	I _M =(20~50)~(170~200)mA	—	1.0	4.0	
vs. Ambient Temperature	ΔK _{TC}	Ta=-20°C~+75°C	—	1.0	—	1/°C
			I _M =50mA~150mA	—	1.0	—

■ TYPICAL CHARACTERISTICS



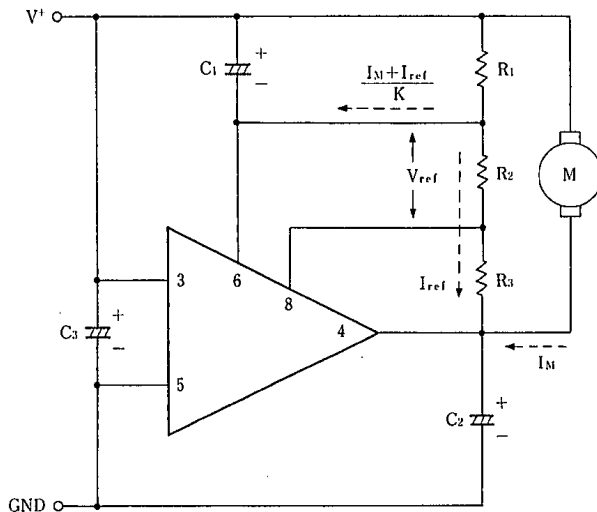
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■ TYPICAL CHARACTERISTICS

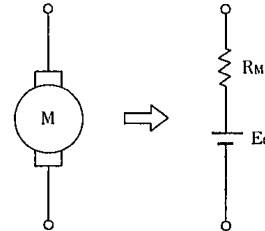


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■ TYPICAL APPLICATION



Select C₁, C₂, C₃ for each motor type.



V_{ref} : Reference Voltage
 K : Current Ratio
 I_M : Motor Current
 R_M : Internal Resistance of Motor
 E₀ : 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}/R₂ so that, (I_{ref} ≐ 100μA setting is appropriate)

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

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

$$V_M = E_0 + R_M \cdot I_M \dots\dots(2)$$

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

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

$$\therefore R_1 < K \cdot R_M \dots\dots(3)$$

Taking in consideration of deviatons, R_{1(MAX)} < K_(MIN) · 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

※ I External component items

3. Temperature coefficient of R₁, R₂ and R₃

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 R₁ and R_M

Count up from 3. 4.

MEMO

[CAUTION]

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