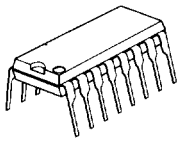
SERVO MOTOR CONTROLLER

■ GENERAL DESCRIPTION

The NJM2611 is an integrated circuit to be applied on servo motor of radio controlled operation. Wide range of operating voltage, and the NJM2611 has the feature of internal circuit of maintaining constant voltage which helps stabilizing from fluctuation caused by voltage source and the ambient temperature.

■ PACKAGE OUTLINE

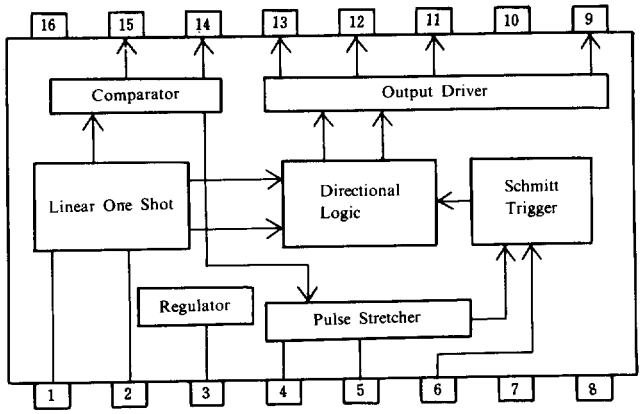


NJM2611D

■ FEATURES

- Wide Operating Voltage
- Setting up the dead band by the internal constant
- Internal Output NPN Power Transistor
- Internal Constant Voltahe Circuit
- Package Outline DIP16
- Bipolar Technology

■ BLOCK DIAGRAM



NJM2611D

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■ ABSOLUTE MAXIMUM RATINGS

(V^+=6V, Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	10.0	V
Power Dissipation	P_D	700	mW
Output Sink Current	I_{sink}	600(note)	mA
Operating Temperature Range	T_{opr}	−20～+75	℃
Storage Temperature Range	T_{stg}	−40～+125	℃

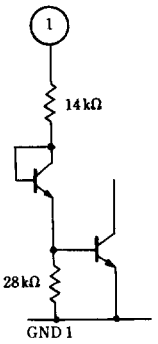
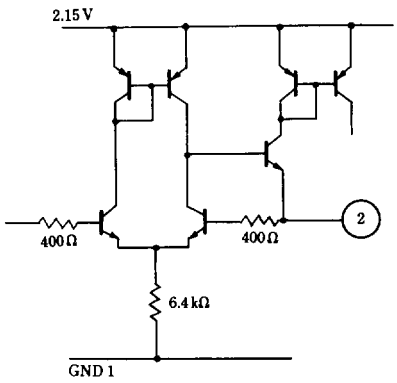
(note) Due to the pulse driving, the peak current must be maintained within the range of the maximum ratings.

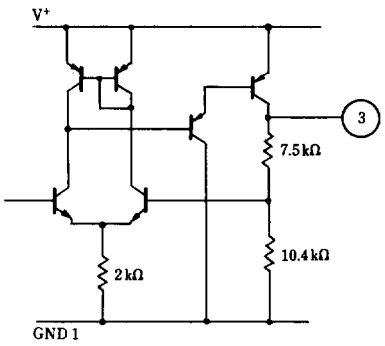
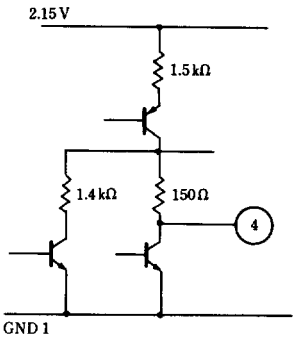
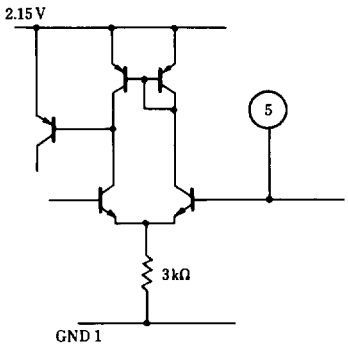
■ ELECTRICAL CHARACTERISTICS

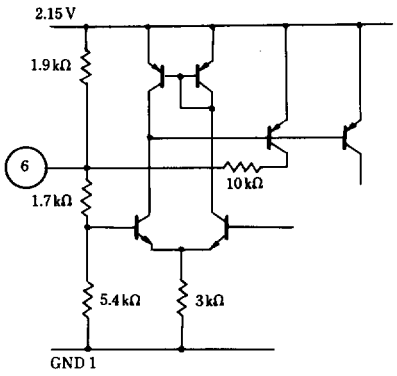
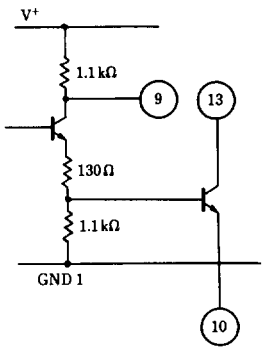
(V^+=6V, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V^+		2.5	—	7.5	V
Operating Current	I_{CC}		—	7.5	10.0	mA
Minimum Input Pulse Voltage Range	V_{IN}	At the balanced output	1.85	—	—	V
Regulator Voltage	V_{reg}		2.0	2.15	2.3	V
Line Regulation	V_{lin}	V^+=2.5～8.5V	—	—	30	mV
Output Saturation Voltage	V_{sat}	Load 12Ω	—	—	0.5	V
Dead Band	T_{DB}		—	4.0	—	μs

■ PIN DISCRIPTION

PIN NO.	PIN FUNCTION	DESCRIPTION	INSIDE EQUIVAALEUT CIRCUIT
1	V_{IN}	Input the positive pulse of more than 1.85V.	
2	R_{REF}	Constant output voltoge of 1.25V (typical). Through the resistor which is connected to this pin, and setting up the constant current to make the saw tooth sweep at pin 14. Connect the capacitor of approximately 1000 pF with the resistor on parallel.	

PIN NO.	PIN FUNCTION	DESCRIPTION	INSIDE EQUIVAALEUT CIRCUIT
3	V_{reg}	Connect the resistors along to the motor inter-locking potentiometer pulse stretcher. Connect the capacitor of more than 0.1μF.	
4	PS1	Connect the resistor between Vref. The pulse gain can be decided by this resistor and the capacitor connected to pin 5.	
5	PS2	Connect the capacitor between GND. The pulse gain can be decided by this condensor and the resistor connected to pin 4.	

PIN NO.	PIN FUNCTION	DESCRIPTION	INSIDE EQUIVAALEUT CIRCUIT
6	PSV	Nomally, this pin is used on the open state of operation. Especially, when it is reguired to make the adjustment of the dead band, connect the resistor between GND and then the dead band can be made it's expansion. (Refere to, dead band pin 6 voltage vs. pin 6 sink current characteristic)	
7	NC	No connect	
8	GND1	System GND.	
9	PNP1	Connect the external PNP transistor (Q_2) base.	
10	GND2	Power GND Large pulse current is running, therefore, connect the line by separating from the sytem GND.	

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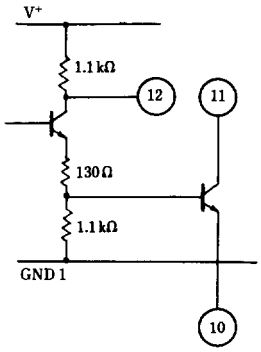
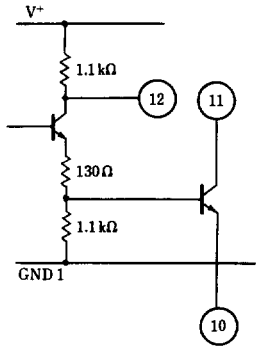
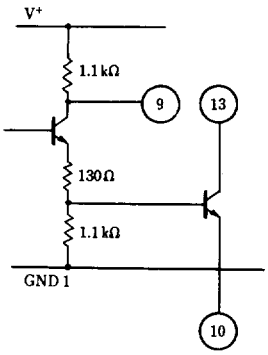
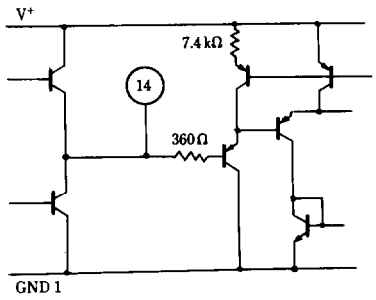
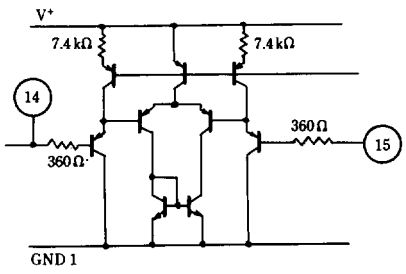
PIN NO.	PIN FUNCTION	DESCRIPTION	INSIDE EQUIVAALEUT CIRCUIT
11	OUT1	Connect the collector of the external PNP transistor, the base of which is connected to pin 9. Connect the motor between pin 13.	
12	PNP2	Connect the external PNP transistor (Q_1) base.	
13	OUT2	Connect the collector of the external PNP transistor, the base of which is connected to pin 12. Connect the motor between pin 11.	

PIN NO.	PIN FUNCTION	DESCRIPTION	INSIDE EQUIVAALEUT CIRCUIT
14	C_P	Connect the sawtooth wave generating capacitor. The motor's position shall be decided at the peak point of sawtooth wave, so that it is advisabled to select the higher precision capacitor as well as the resistor connected to pin 2.	
15	COMP	The center part of potentiometer of motor motion is to be connected. The capacitor of about 0.1μF is to be connected between GND for preventing noise. The center location can be adjusted by putting the resistor in series with the potentiometer.	
16	V^+	Power Supply	

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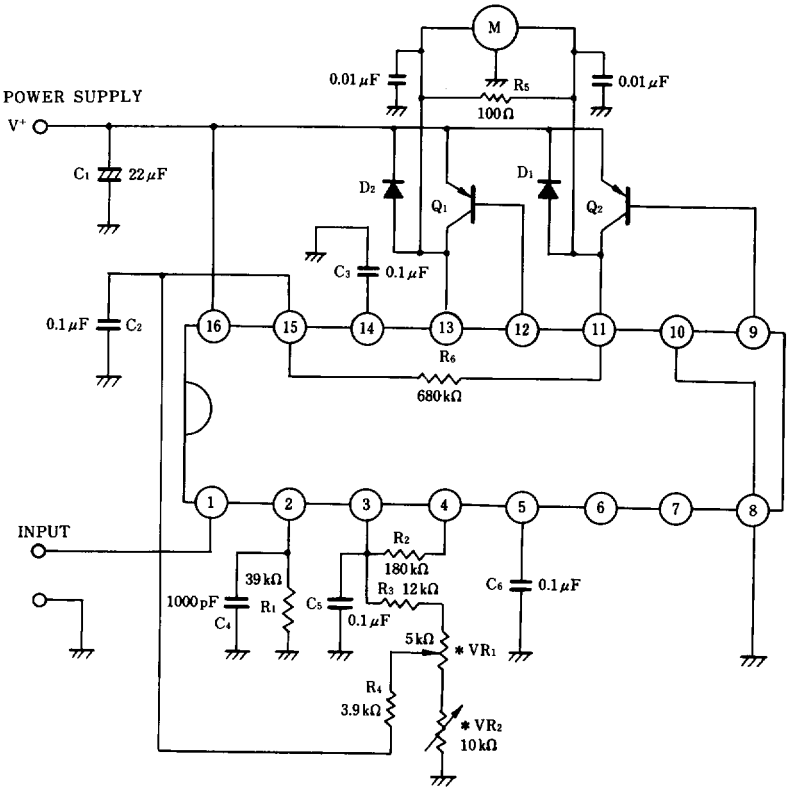
■ TYPICAL APPLICATION



Notes

(1) VR_1 : Potentiometer coupled mechanically to the servo motor

(2) VR_2 : Adjusting the motor center location

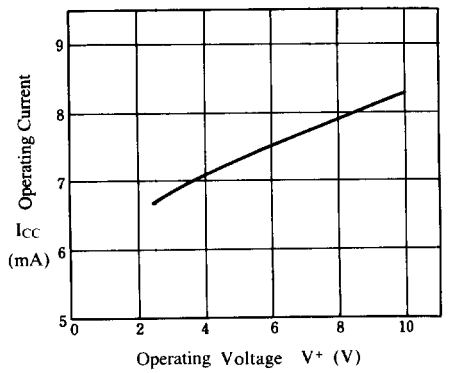
(3) Hunching prevention

- 0.01 μF Capacitor between pin 11 and GND
- 0.01 μF Capacitor between pin 13 and GND
- Diode between pin 11 and power supply
- Diode between pin 13 and power supply
- 100Ω Resistor between pin 11 and pin 13
- 680kΩ Resistor between pin 11 and GND

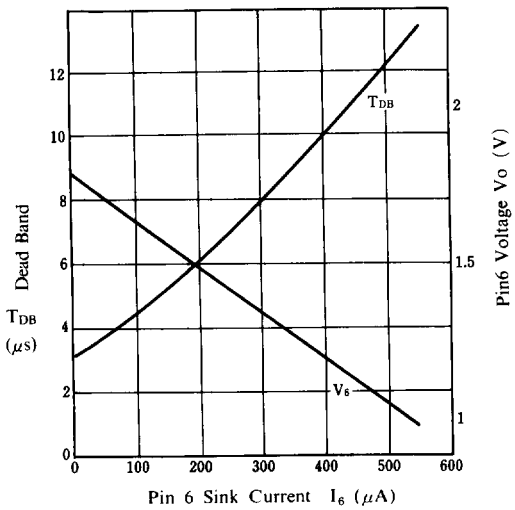
■ TYPICAL CHARACTERISTICS

Operating Current vs. Operating Voltage

(Ta=25℃)

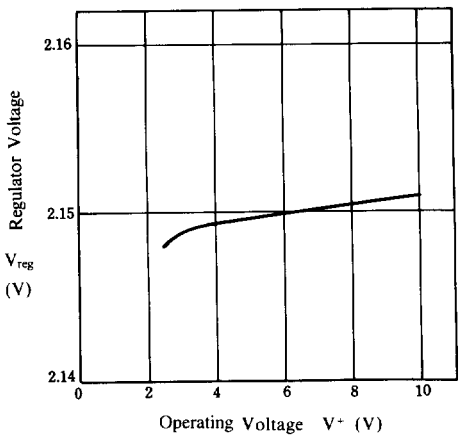


Dead Band Pin 6 Voltage vs. Pin 6 Sink Current



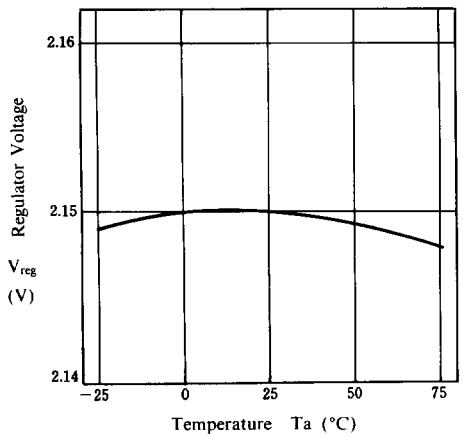
Regulator Voltage vs. Operating Voltage

(Ta=25℃)



Regulator Voltage vs. Temperature

(V^+=6V)



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