

DESCRIPTION

The M51660L is a semiconductor integrated circuit for use in servo motor control in radio control applications.

Housed in a 14-pin molded plastic zig-zag inline package (ZIP), the M51660L contributes to the miniaturization of the set.

The built-in voltage regulating circuit, and the differential comparator used in the comparator circuit provide the M51660L with extremely stable power supply voltage fluctuation characteristics and temperature change characteristics.

FEATURES

- Small circuit current 3.5mA typ.
(When output is off)
- Excellent power supply and temperature stability
- Simple setting of dead band
- Includes protection circuit for continuous "H" level input

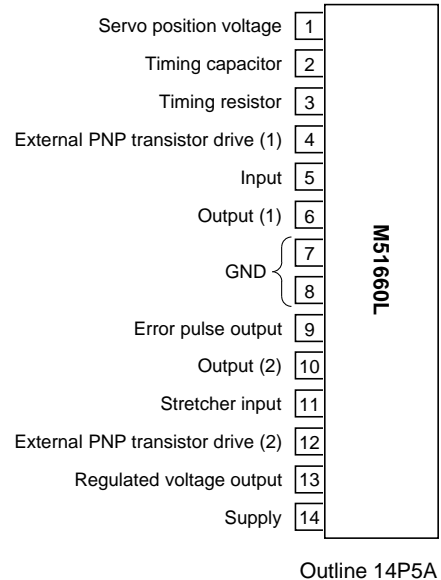
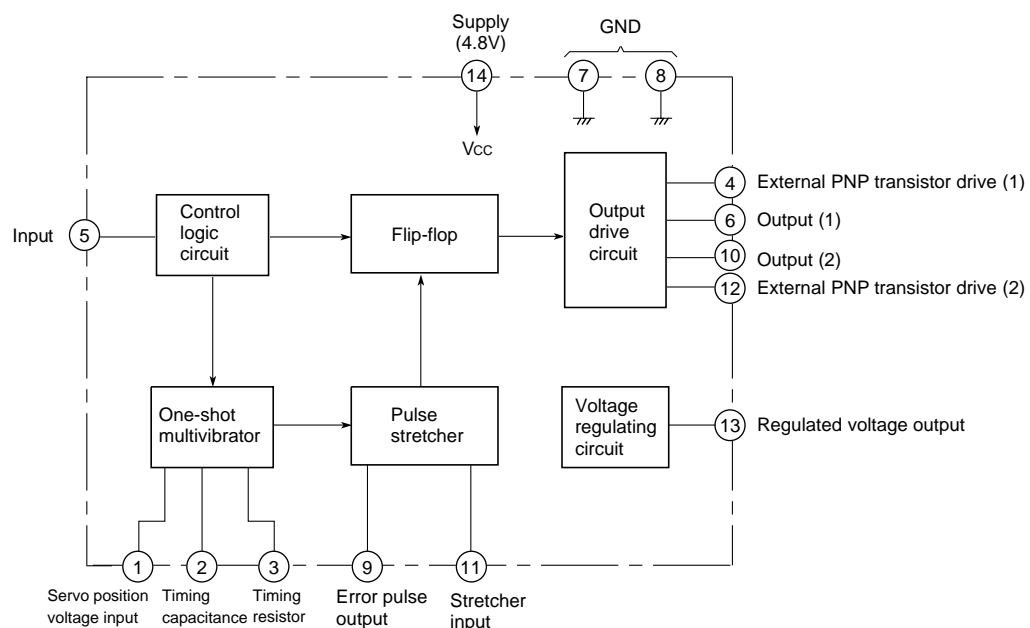
APPLICATION

Digital proportional system for radio control, and servo motor control circuit, etc.

RECOMMENDED OPERATING CONDITIONS

Supply voltage range 3.5 – 7V

Rated supply voltage 4.8V

PIN CONFIGURATION (TOP VIEW)**BLOCK DIAGRAM**

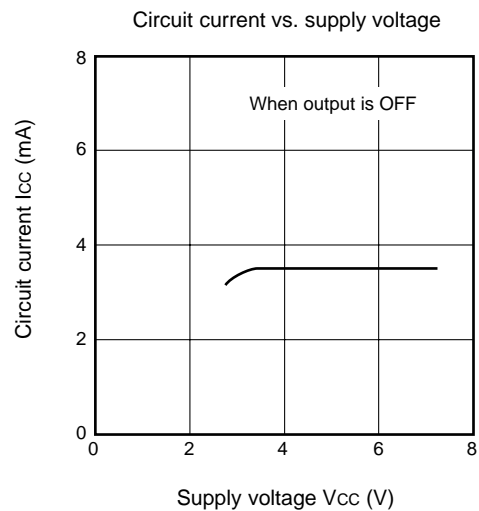
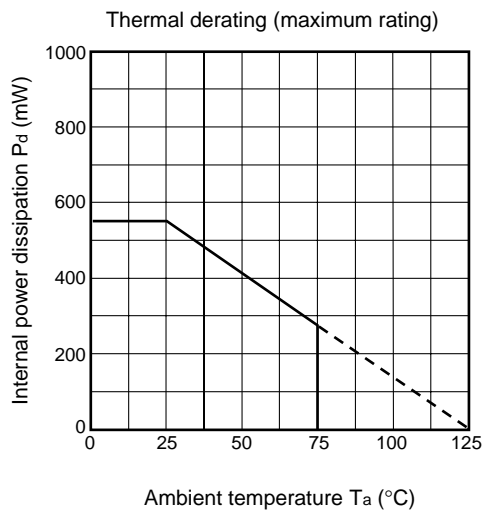
SERVO MOTOR CONTROL FOR RADIO CONTROL

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$, unless otherwise noted)

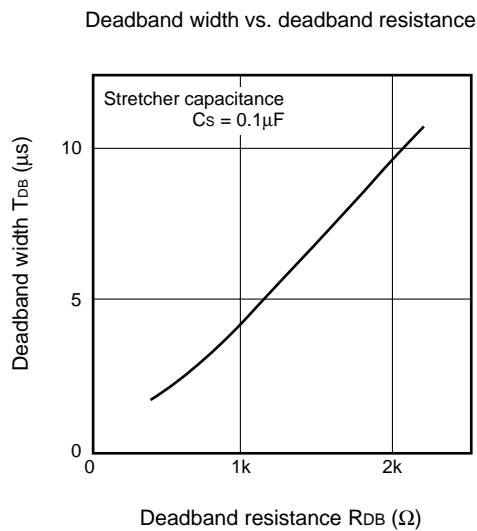
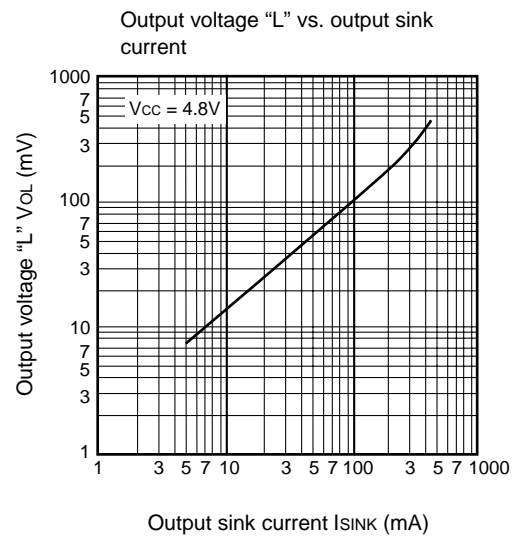
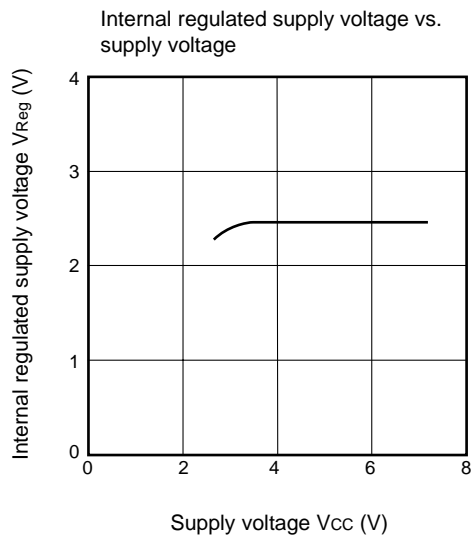
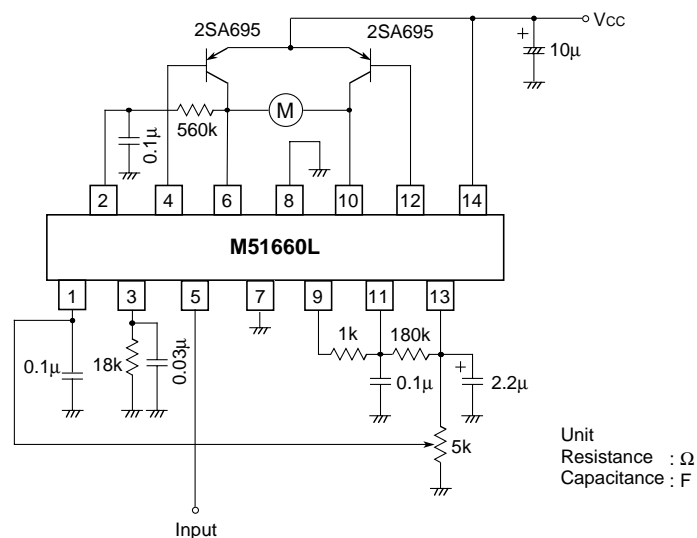
Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		7.5	V
$I_{O\text{ SINK}}$	Output sink current		500	mA
$I_{O\text{ SOURCE}}$	Output source current		200	mA
P_d	Power dissipation		550	mW
K_θ	Thermal derating range	$T_a \geq 25^\circ\text{C}$	5.5	$\text{mW}/^\circ\text{C}$
T_{opr}	Operating temperature		$-20 - +75$	$^\circ\text{C}$
T_{stg}	Storage temperature range		$-40 - +125$	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$ and $V_{CC} = 4.8\text{V}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{CC}	Circuit current	When output is OFF		3.5	5	mA
		When output is ON		20		
V_{OL}	Output voltage "L"	$I_{O\text{ SINK}} = 100\text{mA}$		0.1	0.2	V
		$I_{O\text{ SINK}} = 400\text{mA}$		0.4	0.7	
V_{OH}	Output voltage "H"	$I_{O\text{ SOURCE}} = 100\text{mA}$	3.4	3.8		V
I_{PNP}	External PNP transistor Drive current		30			mA
V_{Reg}	Internal regulated supply voltage		2.3	2.45	2.6	V
I_{Reg}	Internal regulated supply output current				3.0	mA
T_{DB}	Minimum dead band width	$R_{DB} = 510\Omega$, $C_s = 0.1\mu\text{F}$			1.5	μs

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, unless otherwise noted)

SERVO MOTOR CONTROL FOR RADIO CONTROL

**APPLICATION EXAMPLE****Servo motor control circuit for radio-controlled**

TECHNICAL APPLICATION NOTES**PIN DESCRIPTION****1. Servo Position Voltage Input Pin (Pin ①)**

Connect the potentiometer terminal for position detection that follows the output axis. Compare this voltage with the voltage of the triangular wave of pin ② and drive the motor. A capacitor of approximately $0.1\mu\text{F}$ should be connected for noise prevention.

2. Timing Capacitor Pin (Pin ②)

Connect a capacitor that will generate a triangular wave by constant current charging. A typical value is $0.1\mu\text{F}$. Also connect a feedback resistor from the output here.

3. Timing Resistor (Pin ③)

Connect a resistor that will determine the value of the constant current of pin ②. A resistor of $18\text{k}\Omega$ will yield a current of 1.0mA . A capacitor of approximately $0.03\mu\text{F}$ should be connected in parallel with the resistor to increase stability.

4. External PNP Transistor Drive ① (Pin ④)

Connect to the base of the external PNP transistor.

5. Input Pin (Pin ⑤)

Operate with a positive pulse of peak value 3V or greater.

6. Output ① Pin (Pin ⑥)

Connect a feedback resistor between this pin and pin ②.

7. Ground (pins ⑦ and ⑧)**8. Error Pulse Output pin (Pin ⑨)**

Connect a resistor between this pin and pin ⑪. The dead band will change according to the value of this resistor.

9. Output ② pin (Pin ⑩)

This is the output ② pin.

10. Stretcher Input Pin (Pin ⑪)

Connect the capacitor and resistor of the pulse stretcher section.

11. External PNP Transistor Drive ② (Pin ⑫)

Connect to the base of the external PNP transistor.

12. Regulated Voltage Output Pin (Pin ⑬)

This is the output of the internal regulated supply voltage. Make connections from this pin to a potentiometer or pulse stretcher resistor. Connect a capacitor of approximately $2.2\mu\text{F}$ for stability.

13. Supply Voltage (Pin ⑭)

The supply voltage exhibits uniform characteristics from 3.5V to 7V. Connect a capacitor of approximately $10\mu\text{F}$.
