NE543-K

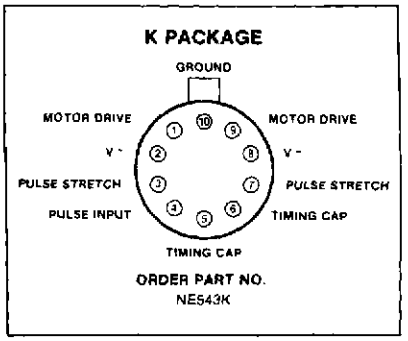
DESCRIPTION

The NE543 is a servo amplifier and pulse-width demodulator with internal motor drive transistors. It is designed for remote control applications in digital proportional systems but can be used in many other closed loop position control applications.

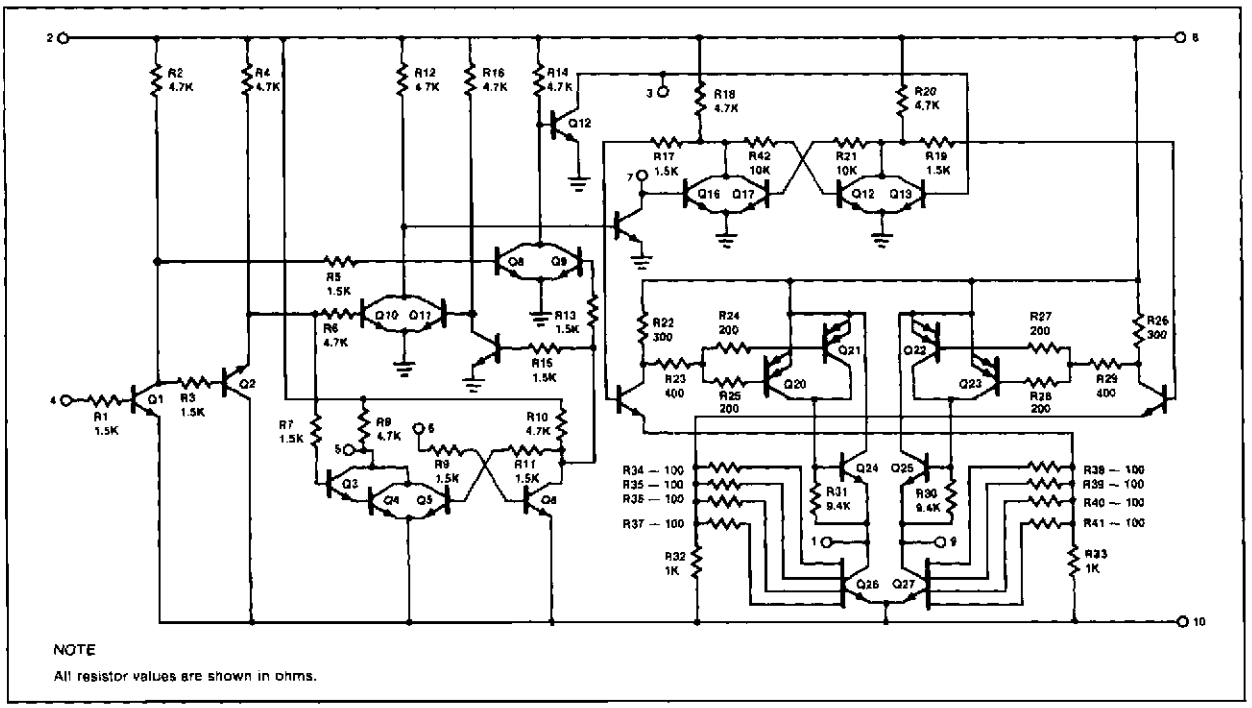
FEATURES

- **450mA load current capability without external power transistors**
- **Bidirectional bridge output with single power supply**
- **Low standby power drain**

PIN CONFIGURATION



EQUIVALENT SCHEMATIC



NOTE

All resistor values are shown in ohms.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNIT
Supply voltage	6	V
Power dissipation (T_A = +25°C)	830	mW
Output current (T_A = +25°C)	450	mA

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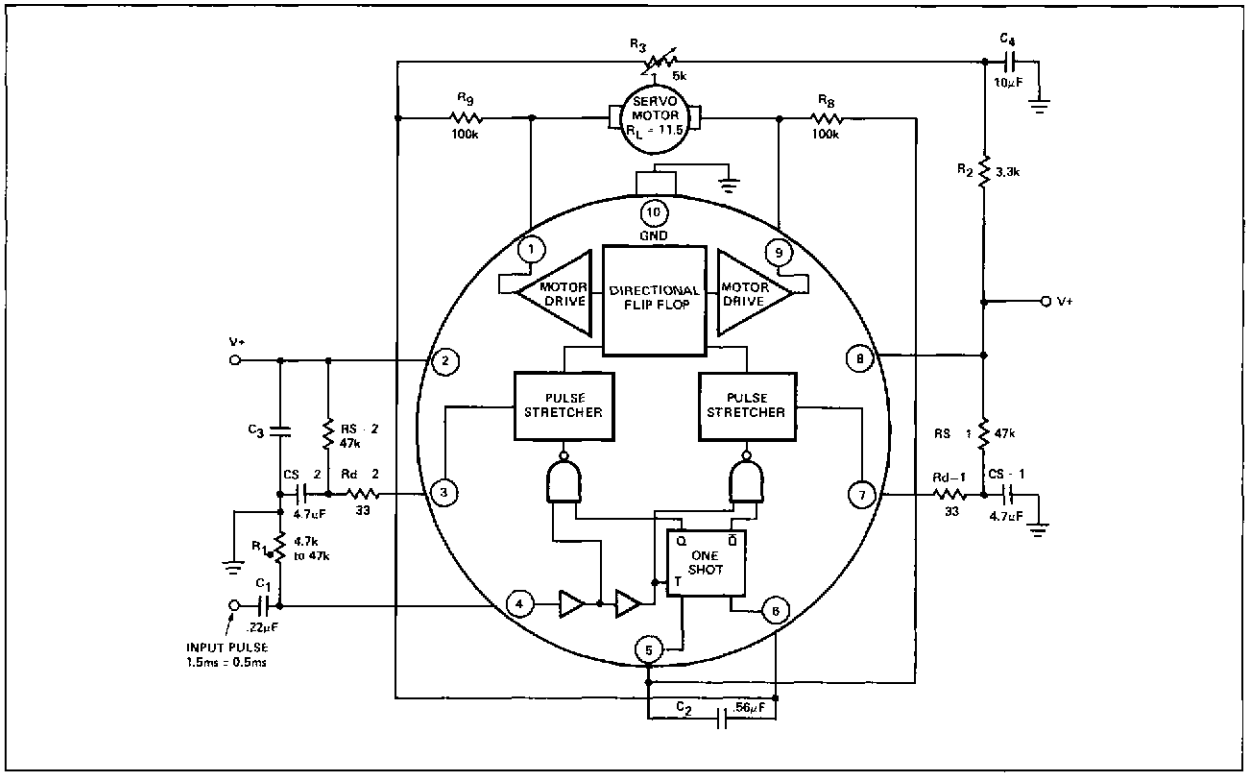
BLOCK DIAGRAM AND TYPICAL CONNECTION



NE543 SERVO DRIVER CONNECTION

The servo driver receives a nominal 1.5ms pulse from the receiver-decoder. The length of the input pulse is compared with an internally generated pulse. If the pulse durations differ by more than an allowed amount (the deadband), a pulse derived from the difference is stretched and applied to the output stage. If the input pulse is shorter, the motor is driven so as to reduce the value of R_3 and, hence, the internal pulse width. If the input pulse is longer, the motor is driven the other way so that R_3 increases and the internal pulse is lengthened. In this way, the control surface position can be made to follow the input pulse. The servo output moves over 100 degrees for pulses between 1 and 2ms. The pulses occur at 16ms intervals.

The internal pulse generator pulse width is determined by C_2 and R_2 in series with R_3. Capacitor C_4 decouples the pulse generator from the supply.

Deadband is controlled by Rd-1 and Rd-2. The 33ohm resistor sets deadband at about 4-5 microseconds (that is, the circuit will not drive the motor until the input pulse is 4 to 5 microseconds different from the internally generated pulse.)

Resistors RS-1 and RS-2 determine the amount of pulse stretching. Capacitors CS-1 and CS-2 are the pulse stretching capacitors. The value is not critical, but if changed RS-1 and RS-2 will have to be changed proportionately.

Resistors R_8 and R_9 are feedback resistors which prevent overshoot by adjusting the closed-loop damping.

Capacitor C_1 is the input coupling capacitor. Resistor R_1 can be any value in the range shown, but noise immunity is improved if it is at the low end of the range. Capacitor C_3 bypasses the power supply at the device.

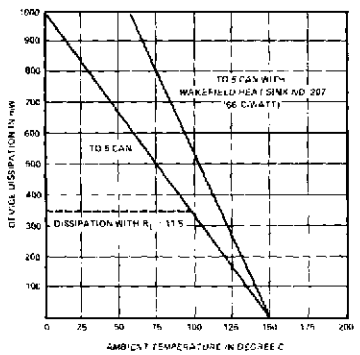
DC ELECTRICAL CHARACTERISTICS

$T_A = 25°C$, $V^+ = 4.8V$ unless otherwise specified.

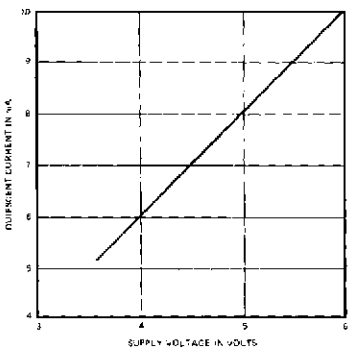
PARAMETER	TEST CONDITIONS	LIMITS			UNIT
		Min	Typ	Max	
Supply voltage		3.6	4.8	6.0	V
Idle current			8.0	10.0	mA
Input bias current			24	50	μA
Input impedance	Pin 4 or pin 6 to ground	1.9	2.4	2.8	kΩ
Output voltage	$V_S = 4.8V$, $R_L = 35\Omega$	3.30	3.75		V
Output current	$V_S = 6.0V$, $R_L = 11.5\Omega$	340	385		mA
	$V_S = 4.8V$, $R_L = 11.5\Omega$	270	280		mA
	$V_S = 3.6V$, $R_L = 11.5\Omega$	185	200		mA
Output impedance		4.0	4.8	5.4	Ω
Power dissipation	Quiescent, $R_L = \infty$		39	48	mW
	$R_L = 11.5\Omega$		350		mW

TYPICAL PERFORMANCE CHARACTERISTICS

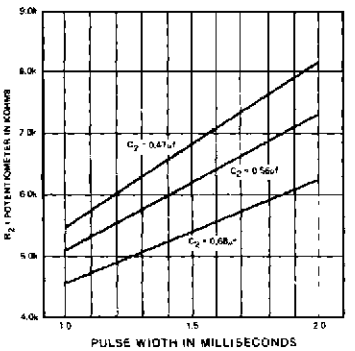
MAXIMUM DISSIPATION vs AMBIENT TEMPERATURE



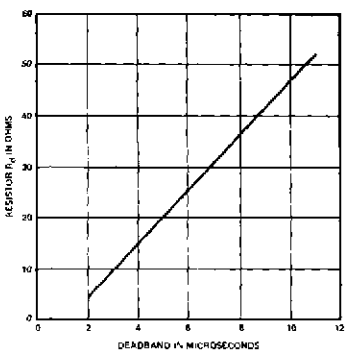
QUIESCENT CURRENT vs SUPPLY VOLTAGE



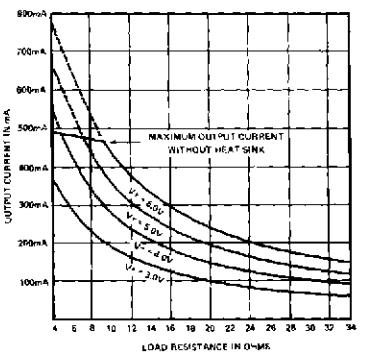
INTERNAL PULSEWIDTH vs R_3 AND C_2



DEADBAND vs RESISTOR R_d



OUTPUT CURRENT vs LOAD RESISTANCE



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TYPICAL APPLICATIONS

REMOTE CONTROL SERVO SYSTEM