# SERVO AMPLIFIER — NE544

## DESCRIPTION

The NE544 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. It incorporates a linear one shot for improved positional accuracy and outputs for external pnp motor drive transistors.

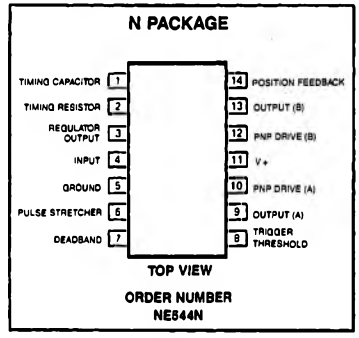
## FEATURES

- **500mA load current capability**
- **Bidirectional bridge output with single power supply**
- **Low standby power drain**
- **Adjustable deadband and trigger thresholds**
- **High linearity, 0.5% maximum error**
- **Output drive for external PNP transistors (optional)**
- **Wide supply voltage range**

## APPLICATIONS

- **Miniature position Servo**
- **Robotics**
- **Control devices**
- **Remote positioning**

## PIN CONFIGURATIONS

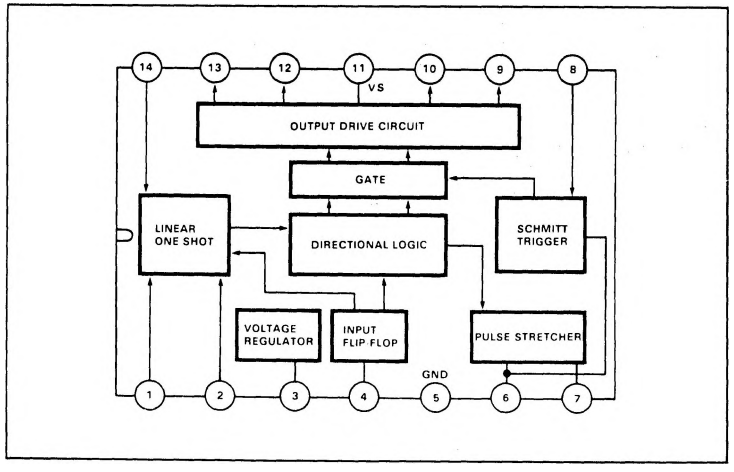



## ABSOLUTE MAXIMUM RATINGS

$T_A$ = 25°C unless otherwise specified.

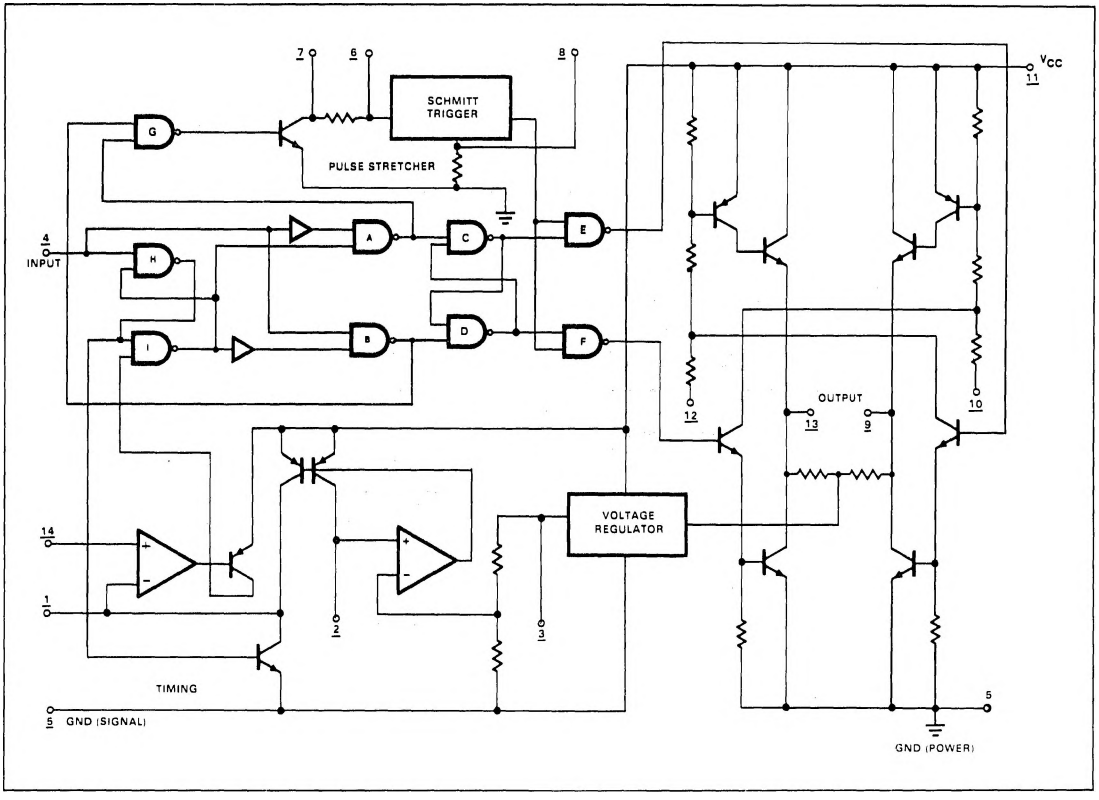
| PARAMETER | | RATING | UNIT |
|---|---|---|---|
| V+ | Supply voltage | 6.0 | V |
| $I_O$ | Output current | 500 | mA |
| $T_A$ | Operating temperature | -20 to +75 | °C |
| $T_{stg}$ | Storage temperature | -65 to +150 | °C |

## BLOCK DIAGRAM



# SERVO AMPLIFIER — NE544

## EQUIVALENT CIRCUIT SCHEMATIC



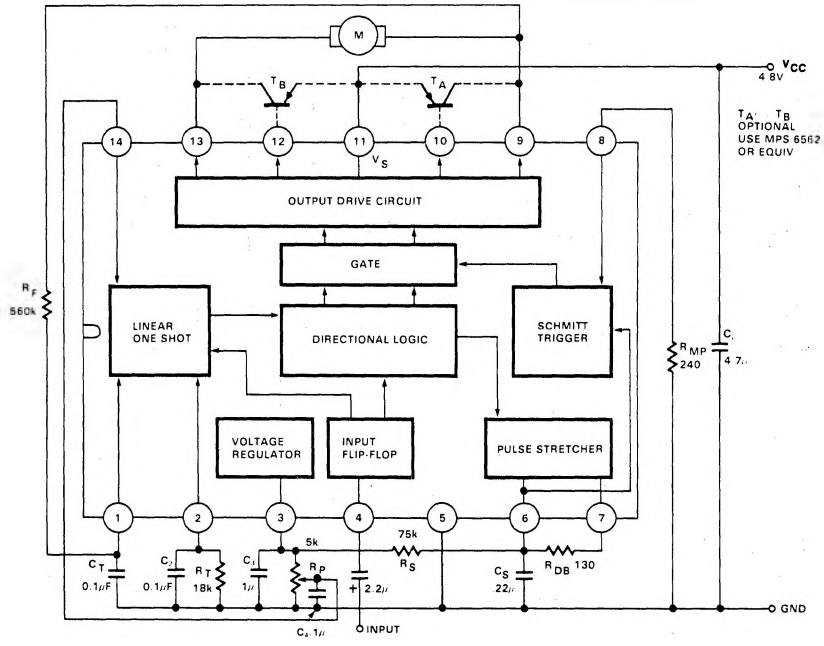

## DC ELECTRICAL CHARACTERISTICS

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

| PARAMETER | | | TEST CONDITIONS | LIMITS | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | |
| $V_{CC}$ | Supply voltage | | | 3.2 | 4.8 | 6 | V |
| $I_{CC}$ | Supply current | Pin 11 | Quiescent | 4.2 | 5.5 | 10 | mA |
| $V_{TH}$ | Input threshold | Pin 4 | | | | | V |
| | On | | | | 1.5 | | |
| | Off | | | | 1.4 | | |
| $Z_{IN}$ | Input resistance | Pin 4 | | | 18 | | kΩ |
| | Output voltage | | | | | | V |
| $V_{OL}$ | Low | | Pin 9 or 13, $I_L$ = 400mA | | 0.3 | | |
| $V_{OH}$ | High | | | | 3.9 | | |
| $V_{REG}$ | Regulated voltage | Pin 3 | | 2.1 | 2.5 | 2.9 | V |
| $\Delta V_{REG}$ | Regulation | Pin 3 | 3.9V ≤ $V_{CC}$ ≤ 6V | | 10 | | mV/V |
| | Minimum dead band | Pin 7 | $R_{DB}$ = 0 | | 1 | | μs |
| | One shot temperature coefficient | | | | .01 | | %/°C |
| | Standby output voltage | | Pin 9 and 13 | | 2.5 | | V |
| | PNP drive current | | Pin 10 and 12 | | 20 | | mA |

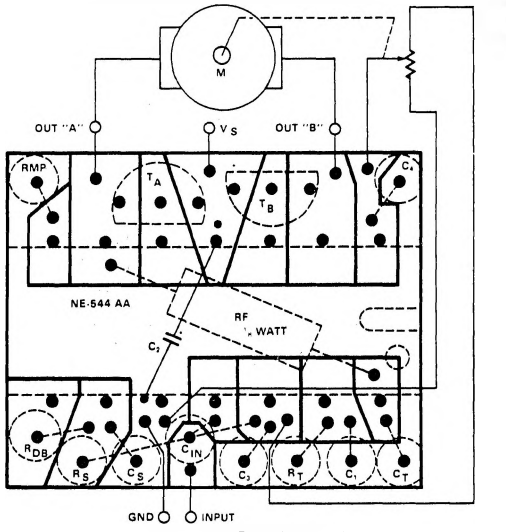
# SERVO AMPLIFIER NE544

**TYPICAL CONNECTION OF NE544N FOR LINEAR ONE SHOT TIMING**

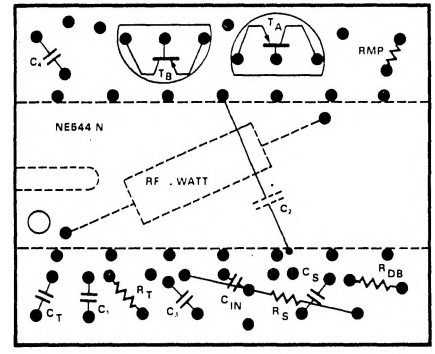


# SERVO AMPLIFIER NE544

**PC BOARD—N PACKAGE**




**Typical PC Board Layout**
**Bottom View**

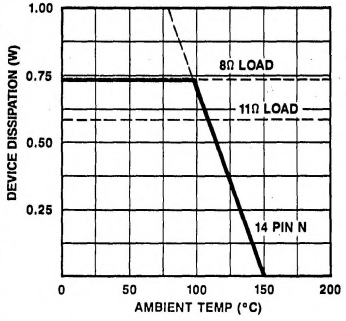



**Parts Layout**
**Top View**

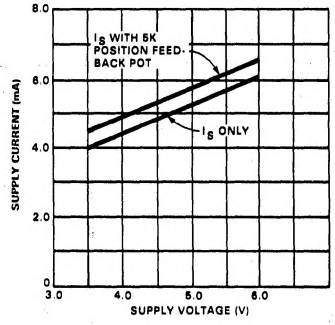
# SERVO AMPLIFIER NE544

## TYPICAL PERFORMANCE CHARACTERISTICS

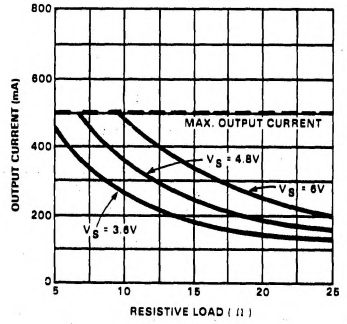
MAXIMUM DISSIPATION vs AMBIENT TEMPERATURE



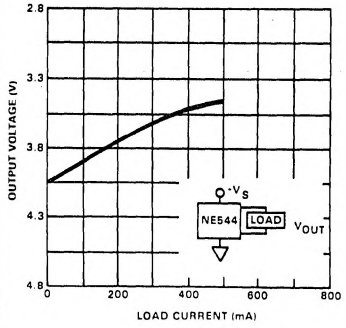

SUPPLY CURRENT vs SUPPLY VOLTAGE



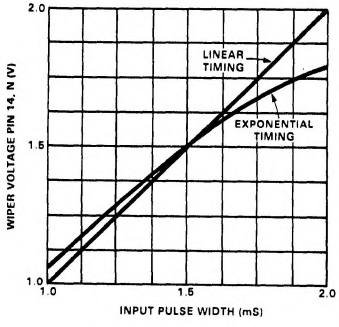

OUTPUT CURRENT vs LOAD RESISTANCE



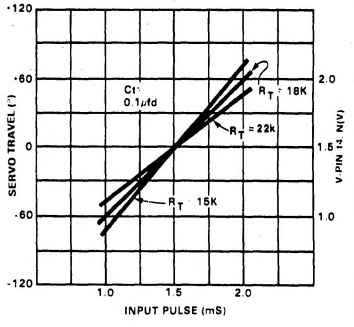

OUTPUT VOLTAGE vs LOAD CURRENT




INPUT PULSE WIDTH vs FEEDBACK POT OUTPUT




INPUT PULSE vs SERVO TRAVEL




***For additional information, consult the Applications Section.**