

MOTOR CONTROL CIRCUIT—YD5530

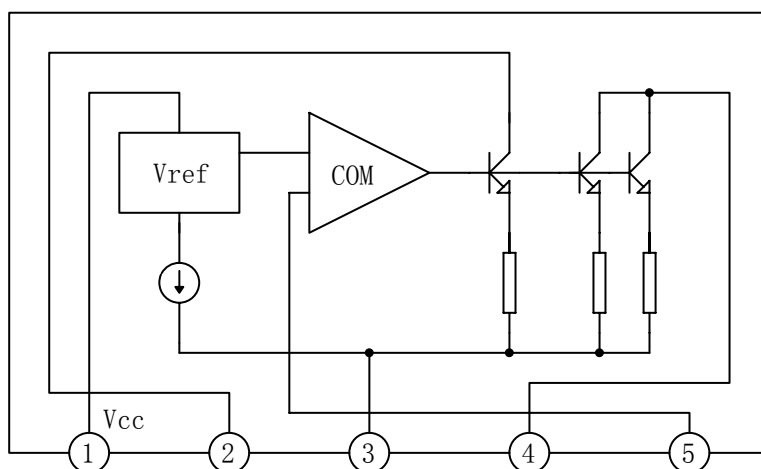
DESCRIPTION

The YD5530 is an IC designed for the rotating speed control of a compact DC motor which is used for a tape recorder, record played, etc.

FEATURES

- *Small four-lead plastic package for compact motor;
- *Fewer external parts;
- *Stable low reference voltage (0.49V typ.), wide motor speed setting;
- *Highly stable operation over a wide range of supply voltage and torque supply voltage: $V_{cc}=4.5\sim 16V$;
- *Reverse voltage protection circuit is built-in.

BLOCK DIAGRAM



| | | | | | |
|--------|----------|-----|-----|-----|------|
| NO. | 1 | 2 | 3 | 4 | 5 |
| SYMBOL | V_{cc} | CON | GND | OUT | Vref |

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ABSOLUTE MAXIMUM RATINGS (Tamb=25°C)

| PARAMETER | SYMBOL | VALUE | UNIT |
|-----------------------|------------------|----------|------|
| Supply Voltage | V _{CC} | 18 | V |
| Power Dissipation | P _D | 1.0 | W |
| Operating Temperature | T _{opr} | -20~+85 | °C |
| Storage Temperature | T _{stg} | -40~+150 | °C |

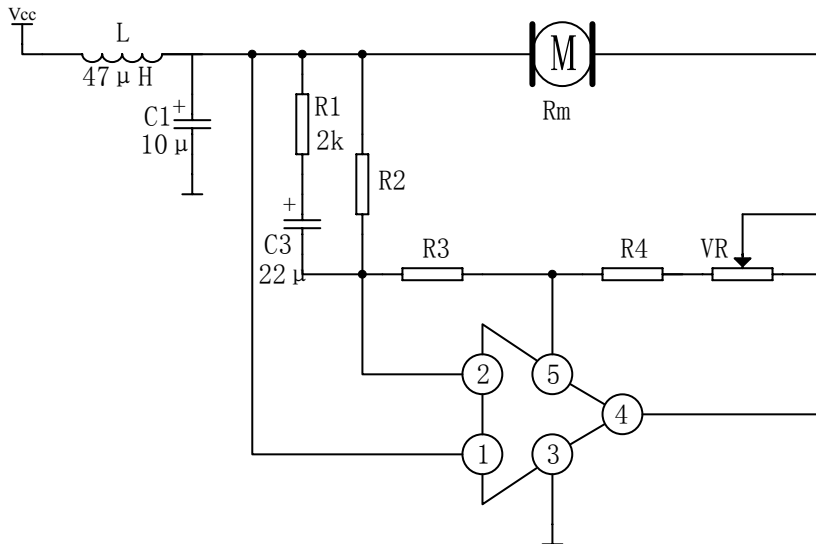
ELECTRICAL CHARACTERISTICS

(Tamb=25°C, V_{CC}=12V, Unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---------------------------------|---|---|--------|--------|------|------|
| Reference Voltage | V _{ref} | I _M =100mA | 0.46 | 0.49 | 0.52 | V |
| Quiescent Circuit Current | I _{ccq} | I _M =100mA | 2.5 | 3.5 | 6.0 | mA |
| Current Proportional Constant | K | I _M =50~150mA | 19.5 | 20.5 | 21.5 | |
| Saturation Voltage | V _{sat} | I _M =450mA | | 0.95 | 1.5 | V |
| Voltage Characteristics (1) | $\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_{CC}$ | V _{CC} =4.5V~18V I _M =100mA | -0.1 | 0 | 0.1 | %/V |
| Voltage Characteristics (2) | $\frac{\Delta K}{K} / \Delta V_{CC}$ | V _{CC} =4.5V~18V I _M =50~150mA | 0 | 0.3 | 0.8 | %/V |
| Current Characteristics (1) | $\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_M$ | I _M =20mA~200mA | -0.005 | 0.001 | 0.01 | %/mA |
| Current Characteristics (2) | $\frac{\Delta K}{K} / \Delta I_M$ | I _M =20~50mA ~170~200mA | -0.05 | 0.01 | 0.1 | %/mA |
| Temperature Characteristics (1) | $\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_{amb}$ | T _{amb} =-20°C~+85°C I _M =50~150mA | | 0.0055 | | %/°C |
| Temperature Characteristics (2) | $\frac{\Delta K}{K} / \Delta T_{amb}$ | T _{amb} =-20°C~+85°C I _M =50~150mA | | 0.01 | | %/°C |
| Bias Current | I _b | I _M =0 | 0.24 | 0.28 | 0.32 | mA |
| Temperature Characteristics (3) | $\frac{\Delta I_b}{I_b} / \Delta T_{amb}$ | I _M =0 T _{amb} =-20°C~+85°C | | -0.1 | | %/°C |
| Voltage Characteristics (3) | $\frac{\Delta I_b}{I_b} / \Delta V_{CC}$ | I _M =0 V _{CC} =4.5V~18V | -0.5 | -0.3 | 0.5 | %/V |

APPLICATION CIRCUIT

$$R2 < Rm \times 20$$



OUTLINE DRAWING

