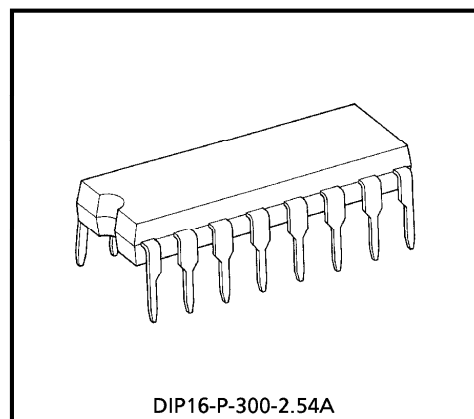


TA8081P

0.7A MOTOR DRIVER WITH DIAGNOSIS

The TA8081P is a 0.7A motor driver which directly drives a bidirectional DC motor. Inputs DI1 and DI2 are combined to select one of forward, reverse, stop, and brake modes. Since the inputs are TTL-compatible, this IC can be controlled directly from a CPU or other control system. The IC also has various protective, self-diagnostic, and standby functions.

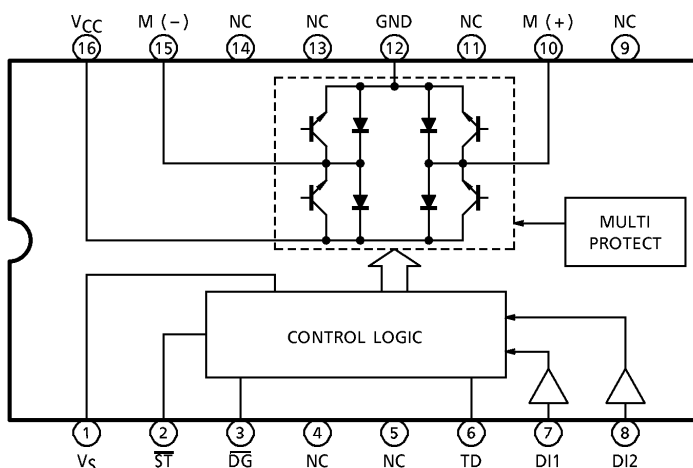


Weight : 1.0g (Typ.)

FEATURES

- Bidirectional DC motor driver.
- Current capacity : 0.7A (Max.)
- Low standby current : 100 μ A (Max.)
- Four operation modes : Forward, reverse, stop, and brake.
- Protective functions : Thermal shutdown, short-circuit protection, and over-voltage shutdown.
- Built-in counter electromotive force absorption diodes.
- Self-diagnostic output : On short-circuit detection.
- Plastic DIP-16pin.

BLOCK DIAGRAM AND PIN LAYOUT



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PIN DESCRIPTION

| PIN No. | SYMBOL | DESCRIPTION |
|---------|-----------------|---|
| 1 | V_S | Control power supply pin. This pin is completely isolated from V_{CC} . |
| 2 | \overline{ST} | When this pin is opened or grounded, the output turns off, thus reducing the current consumption to $100\mu A$ or less. If standby mode is not needed, the pin is connected to V_{CC} . |
| 3 | \overline{DG} | Self-diagnostic output pin. When the output current becomes 1.5A or more, this pin outputs a protection switching waveform similar to the waveform which would be supplied from M (+)/M (-) pin. If a capacitor is connected to the TD pin, the signal from this pin will become low after a specific delay. The output from the pin is an open-collector output. The delay time is calculated approximately by the following : $TD = 50 \times C_T$ (ms) C_T (μF)...The permissible range of C_T is from $0.01\mu F$ to $2\mu F$. |
| 4 | NC | Not connected. |
| 5 | NC | Not connected. |
| 6 | TD | Provides a delay for the \overline{DG} output. A capacitor is connected between this pin and GND. When the pin is opened, the \overline{DG} pin supplies a switching output. |
| 7 | DI1 | Output status control pin. |
| 8 | DI2 | Connects to a PNP-type voltage comparator. |
| 9 | NC | Not connected. |
| 10 | M (+) | Connects to the DC motor. Both the sink and the source have a current capacity of 0.7A. Diodes for absorbing counter electromotive force are contained on the V_{CC} and GND sides. |
| 11 | NC | Not connected. |
| 12 | GND | Grounded |
| 13 | NC | Not connected. |
| 14 | NC | Not connected. |
| 15 | M (-) | Connects to the DC motor together with pin 10 and has the same function as pin 10. This pin is controlled by the inputs from pins 7 and 8. |
| 16 | V_{CC} | Output section power supply pin. This pin has a function to turn off the output when the applied voltage exceeds 30.0V, thus protecting the IC and the load. |

TRUTH TABLE

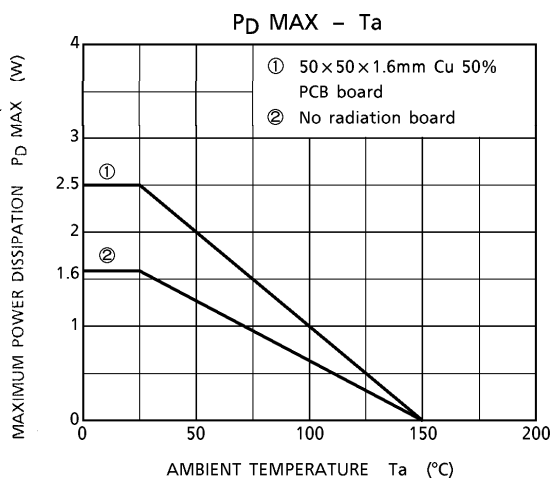
| INPUT | | | OUTPUT | | OUTPUT MODE |
|-------|-----|-----------------|----------------------|-------|----------------|
| DI1 | DI2 | \overline{ST} | M (+) | M (-) | |
| H | H | H | L | L | Brake |
| L | H | H | L | H | Reverse (CCW) |
| H | L | H | H | L | Forward (CW) |
| L | L | H | OFF (high impedance) | | Stop |
| H/L | H/L | L | OFF (high impedance) | | Standby (stop) |

MAXIMUM RATINGS (Ta = 25°C)

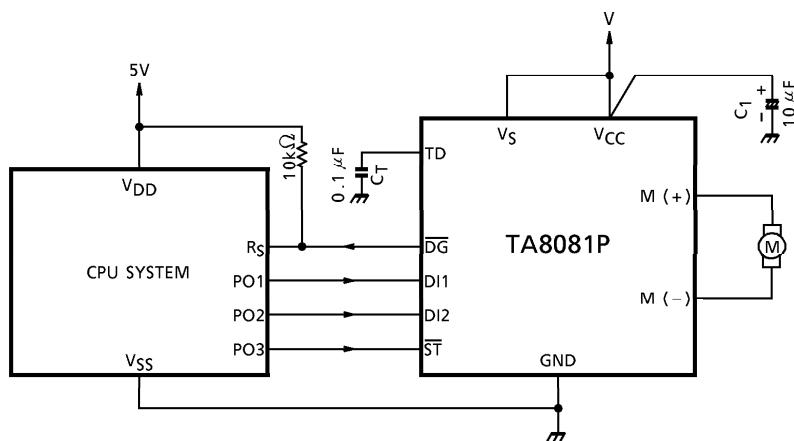
| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------|--------------------|----------------------|------|
| Power Supply Voltage | V _{CC} | 33 | V |
| | V _{CC} | 60 (1s) | |
| Input Voltage | V _{IN} | -0.3~V _{CC} | V |
| Output Current | I _{O AVE} | 0.7 | A |
| Power Dissipation | P _D | 1.6 | W |
| Operating Temperature | T _{opr} | -40~110 | °C |
| Storage Temperature | T _{stg} | -55~150 | °C |
| Lead Temperature-time | T _{sol} | 260 (10s) | °C |

ELECTRICAL CHARACTERISTICS ($V_{CC} = 6 \sim 16V$, $T_a = -40 \sim 110^\circ C$)

| CHARACTERISTIC | SYMBOL | PIN | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---------------------------|----------------------|-----------------|---------------|------------------------------------|------|------|------|------------|
| Current Consumption 1 | I_{S1} | V_S | — | Stop | — | 5 | 10 | mA |
| | I_{S2} | | — | Forward / Reverse | — | 10 | 20 | |
| | I_{S3} | | — | Brake | — | 10 | 20 | |
| Current Consumption 2 | I_{CC1} | V_{CC} | — | Stop | — | 1.0 | 2.0 | mA |
| | I_{CC2} | | — | Forward / Reverse | — | 15 | 30 | |
| | I_{CC3} | | — | Brake | — | 1.0 | 2.0 | |
| Input Voltage | V_{IL} | DI1 / DI2 | — | — | — | — | 0.8 | V |
| | V_{IH} | | — | — | 2.0 | — | — | |
| | V_{IL} | \overline{ST} | — | — | — | — | 0.5 | |
| | V_{IH} | | — | — | 2.0 | — | — | |
| Input Current | I_{IL} | DI1 / DI2 | — | $V_{IN} = 0.4V$ | -10 | — | 10 | μA |
| | I_{IH} | | — | $V_{IN} = V_{CC}$ | -10 | — | 10 | |
| | I_{IL} | \overline{ST} | — | $V_{IN} = 0.4V$ | — | — | 20 | mA |
| | I_{IH} | | — | $V_{IN} = V_{CC}$ | — | — | 2.0 | |
| Output Saturation Voltage | V_{sat} (total) | M (+) / | — | $I_O = 0.5A$, $T_c = 25^\circ C$ | — | 1.7 | 2.4 | V |
| | | M (-) | — | $I_O = 0.5A$, $T_c = 110^\circ C$ | — | 1.6 | 2.3 | |
| Output Leakage Current | $I_{LEAK \cdot U}$ | M (+) / | — | $V_{OUT} = 0V$ | — | — | -10 | μA |
| | $I_{LEAK \cdot L}$ | M (-) | — | $V_{OUT} = V_{CC}$ | — | — | 10 | |
| Output Voltage | V_{OL} | \overline{DG} | — | $I_{OL} = 3mA$ | — | — | 0.5 | V |
| Output Leakage Current | I_{LEAK} | | — | $V_{OUT} = V_{CC}$ | — | — | 10 | μA |
| Diode Forward Voltage | $V_{F \cdot U}$ | M (+) / | — | $I_F = 0.5A$ | — | 1.5 | — | V |
| | $V_{F \cdot L}$ | M (-) | | | — | 1.5 | — | |
| Over-current Detection | I_{SD} | — | — | — | 1.0 | 1.5 | 2.0 | A |
| Shutdown Temperature | T_{SD} | — | — | — | — | 150 | — | $^\circ C$ |
| Over-voltage Detection | V_{SD} | — | — | — | 27 | 30 | 33 | V |
| Standby Current | I_S | $V_{CC} + V_S$ | — | $\overline{ST} = 0V$ | — | — | 100 | μA |
| Transfer Delay Time | t_{pLH} | — | — | — | — | 1 | 10 | μs |
| | t_{pHL} | — | — | — | — | 1 | 10 | |



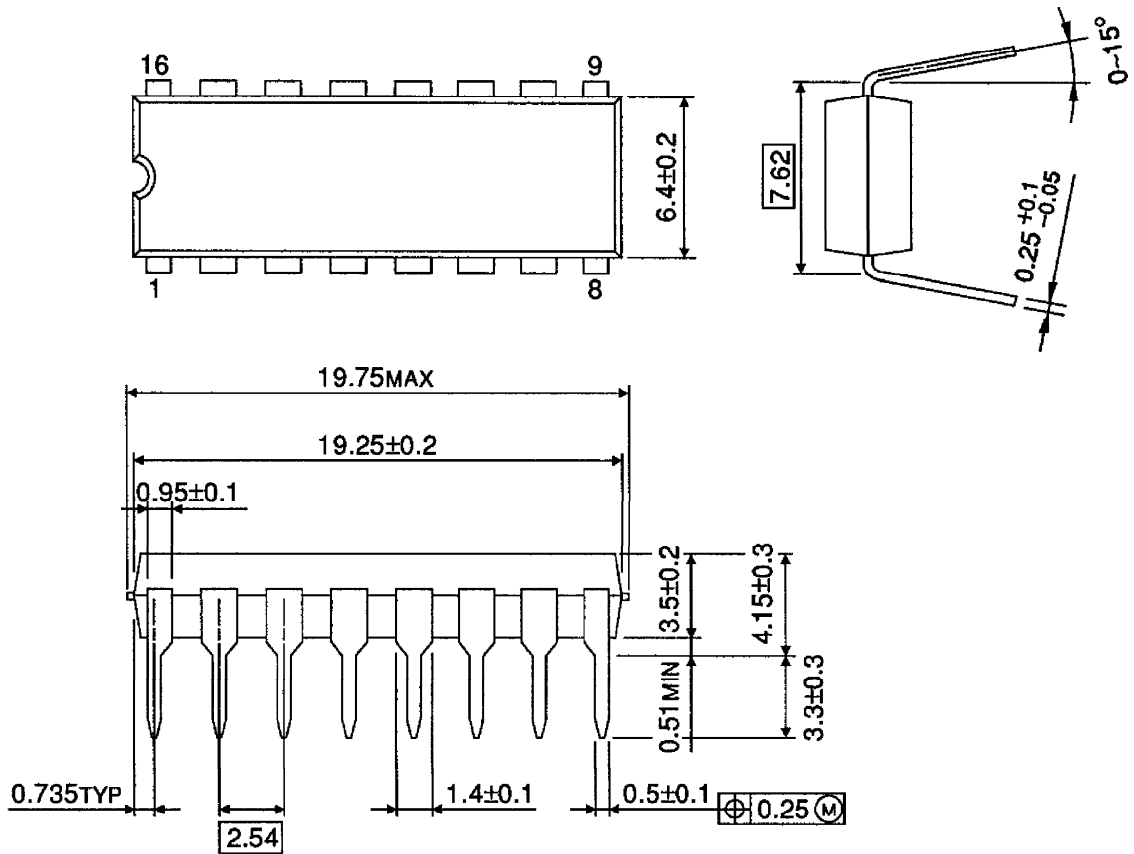
EXAMPLE OF APPLICATION CIRCUIT



Cautions for Wiring : C₁ is for absorbing disturbance, noise, etc. Connect is as close to the IC as possible.

OUTLINE DRAWING
DIP16-P-300-2.54A

Unit : mm



Weight : 1.0g (Typ.)