

TA8429H

3.0A FULL BRIDGE DRIVER

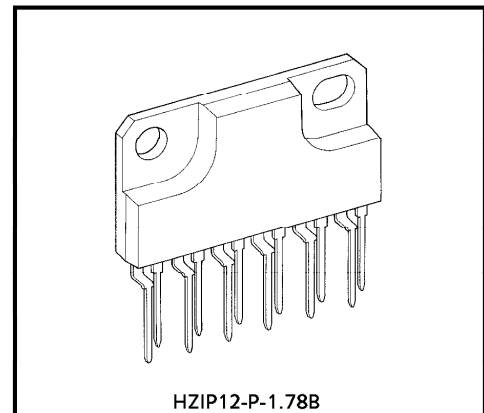
The TA8429H is full bridge driver IC for brush motor rotation control that has current capability of up to 3.0A (AVE.).

Thermal shutdown and short current protector are provided.

And also stand-by function available.

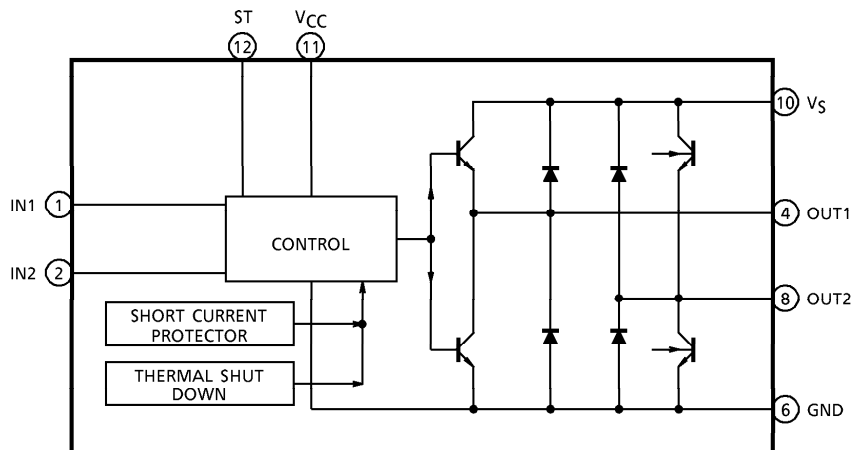
FEATURES

- Output current is as large as 3.0A (AVE.) and 4.5A (PEAK.)
- Stand-by mode available : $I_{ST} \leq 100\mu A$ (MAX.)
- Thermal shutdown and short circuit protector circuit are provided.
- 4 modes (Forward / reverse / short brake and stop) are available with 2 low active TTL compatible inputs control.
- Free wheeling diodes are equipped.
- HZIP power package sealed.
- Wide range of operating voltage : $V_{CC} = 7 \sim 27V$
 V_S (opr.) = $0 \sim 27V$



Weight : 4.04g (Typ.)

BLOCK DIAGRAM



(Note 1) Pin ③, ⑤, ⑦, and ⑨ are non connection.

(Note 2) Heat fin is connected with GND with low impedance.

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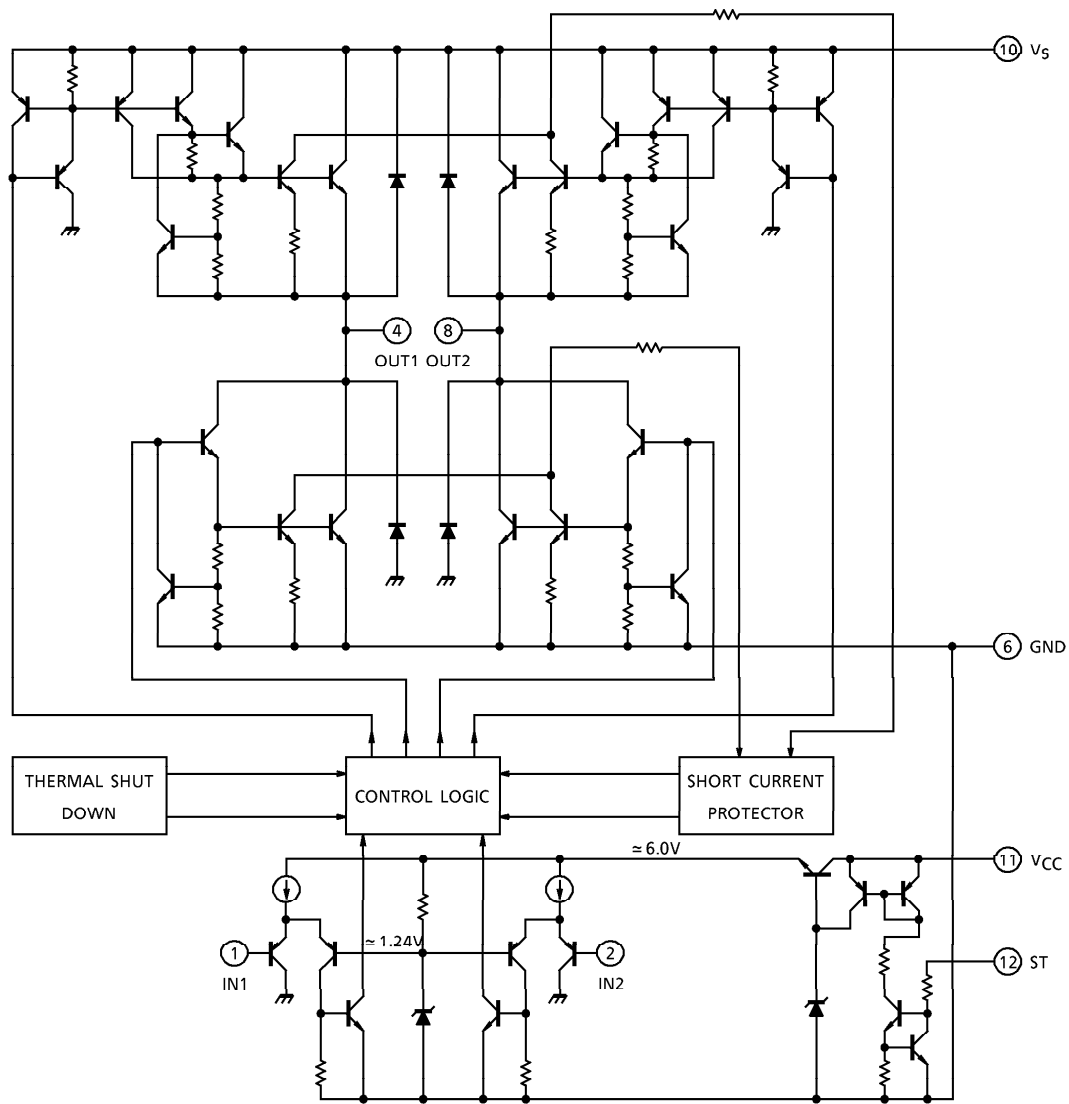
PIN FUNCTION

| PIN No. | SYMBOL | FUNCTIONAL DESCRIPTION |
|---------|----------|---|
| 1 | IN1 | TTL compatible control inputs (PNP type low active comparator inputs) |
| 2 | IN2 | |
| 3 | N.C | Non connection |
| 4 | OUT1 | Output terminals, free wheeling diodes are connected between each output with GND and V_S . |
| 5 | N.C | Non connection |
| 6 | GND | GND terminal |
| 7 | N.C | Non connection |
| 8 | OUT2 | Output terminals, free wheeling diodes are connected between each output with GND and V_S . |
| 9 | N.C | Non Connection |
| 10 | V_S | Supply voltage terminal for Motor Drive |
| 11 | V_{CC} | Supply voltage terminal for control circuit |
| 12 | ST | Stand-by terminal. Stand-by state is obtained with this terminal connected with GND (or Open). |

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INTERNAL CIRCUIT



FUNCTION

| INPUT | | | OUTPUT | | MODE |
|-------|-------|----|----------------------|------|-------------|
| IN1 | IN2 | ST | OUT1 | OUT2 | MOTOR |
| H | H | H | L | L | Short brake |
| L | H | H | L | H | CW / CCW |
| H | L | H | H | L | CCW / CW |
| L | L | H | OFF (high impedance) | | Stop |
| H / L | H / L | L | OFF (high impedance) | | Stand-by |

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------|----------------------------------|-----------------------|--------------|
| Supply Voltage | V _{CC} , V _S | 30 | V |
| Input Voltage | V _{IN} | - 0.3~V _{CC} | V |
| Output Current | AVE. | I _O (AVE.) | 3.0 |
| | PEAK | I _O (PEAK) | 4.5 (Note 1) |
| Power Dissipation | P _D | 2.25 (Note 2) | W |
| | | 21.6 (Note 3) | |
| Operating Temperature | T _{opr} | - 30~85 | °C |
| Storage Temperature | T _{stg} | - 55~150 | °C |

- (Note 1) t = 100ms
- (Note 2) No heat sink
- (Note 3) T_c = 85°C

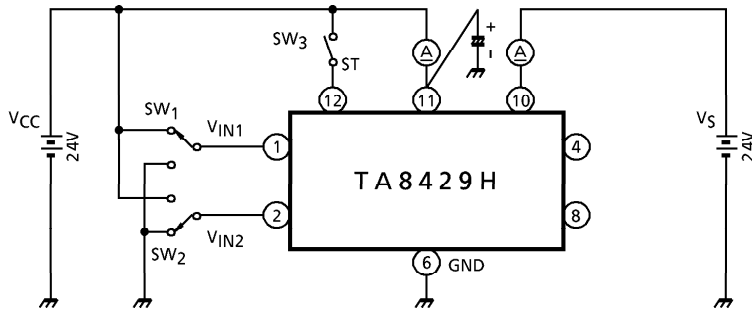
ELECTRICAL CHARACTERISTICS (V_{CC} = 24V, V_S = 24V, Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|-------------------|---------------|-----------------------------------|------|------|------|------|
| Quiescent Current (I) (V _{CC} Line) | I _{CC1} | 1 | Stop mode | — | 6 | 12 | mA |
| | I _{CC2} | | Forward / reverse mode | — | 20 | 40 | |
| | I _{CC3} | | Brake mode | — | 20 | 40 | |
| Quiescent Current (II) (V _S Line) | I _{S1} | 1 | Stop mode | — | 3 | 8 | mA |
| | I _{S2} | | Forward / reverse mode | — | 16 | 40 | |
| | I _{S3} | | Brake mode | — | 3 | 8 | |
| Input Voltage | V _{INL} | 2 | — | — | — | 0.8 | V |
| | V _{INH} | | — | 2.0 | — | — | |
| Input Current | I _{INL} | 2 | V _{IN} = GND | — | — | 12 | μA |
| | I _{INH} | | V _{IN} = V _{CC} | — | — | 10 | |
| Output Saturation Voltage (Note) | V _{sat1} | 3 | I _O = 1.5A | — | 2.1 | 2.8 | V |
| | V _{sat2} | | I _O = 3.0A | — | 3.3 | 4.1 | |
| Output Leakage Current | I _{LU} | 4 | V _L = 25V | — | — | 50 | μA |
| | I _{LL} | | V _L = 25V | — | — | 50 | |
| Diode Forward Voltage | V _{FU} | 5 | I _F = 3.0A | — | 5.0 | — | V |
| | V _{FLL} | | I _F = 3.0A | — | 1.5 | — | |
| Limiting Current | I _{SD} | — | — | — | 5 | — | A |
| Thermal Shutdown Operating Temperature | T _{SD} | — | — | — | 150 | — | °C |
| Stand-by Current | I _{ST} | 1 | — | — | — | 100 | μA |
| Propagation Delay Time | t _{pLH} | 2 | — | — | 1 | 10 | μs |
| | t _{pHL} | 2 | — | — | 1 | 10 | |

(Note) Upper and lower side total

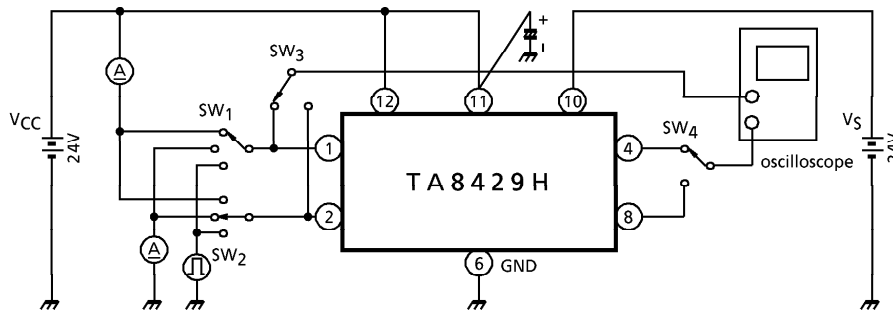
TEST CIRCUIT 1.

I_{S1} , I_{S2} , I_{S3} , I_{CC1} , I_{CC2} , I_{CC3} , I_{ST}



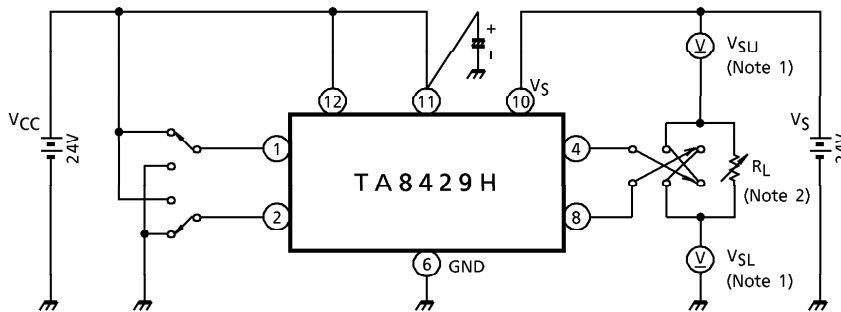
TEST CIRCUIT 2.

V_{INH} , V_{INL} , I_{INH} , I_{INL} , t_{pHL} , t_{pLH}



TEST CIRCUIT 3.

V_{sat}

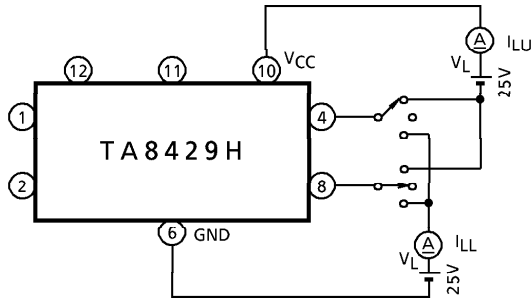


(Note 1) $V_{sat} = V_{SU} + V_{SL}$

(Note 2) Calibrate I_O to 1.5/3.0A by R_L

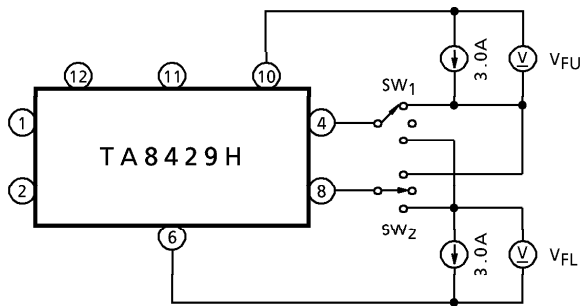
TEST CIRCUIT 4.

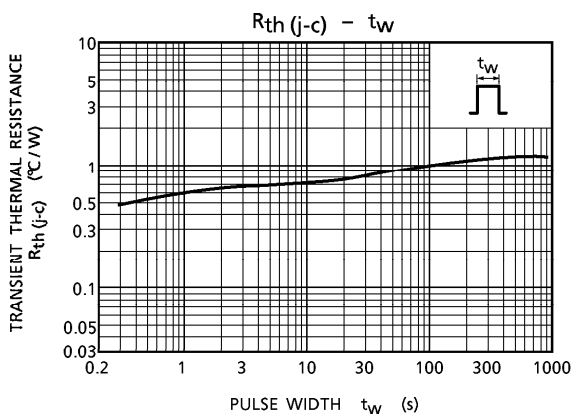
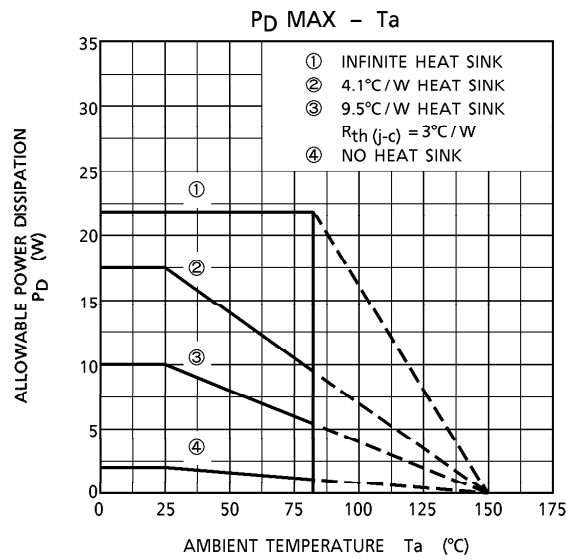
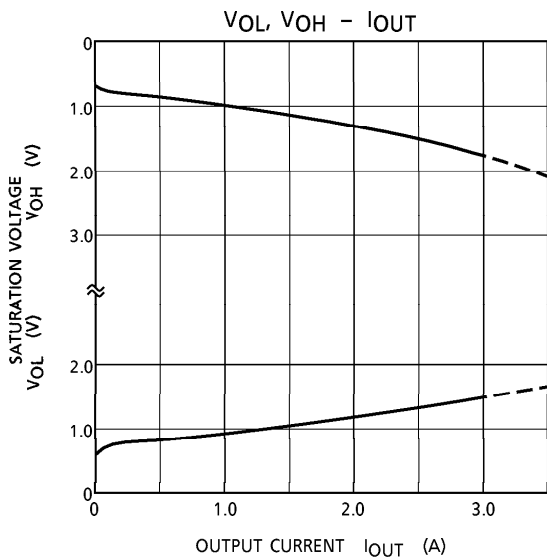
I_{LU} , I_{LL}



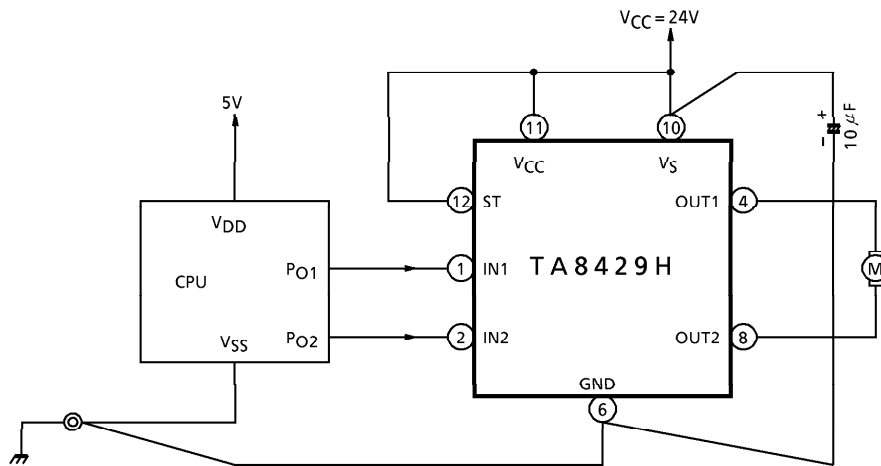
TEST CIRCUIT 5.

V_{FU} , V_{FL}

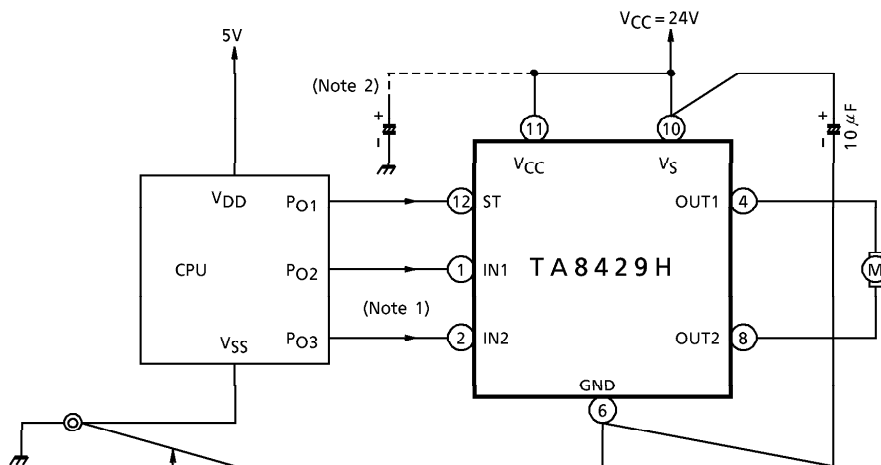




APPLICATION CIRCUIT 1. (Single power supply operation)

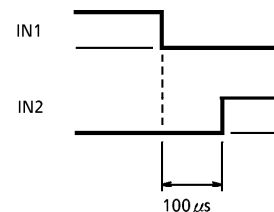


APPLICATION CIRCUIT 2. (Dual power supply (Control and Motor) operation)



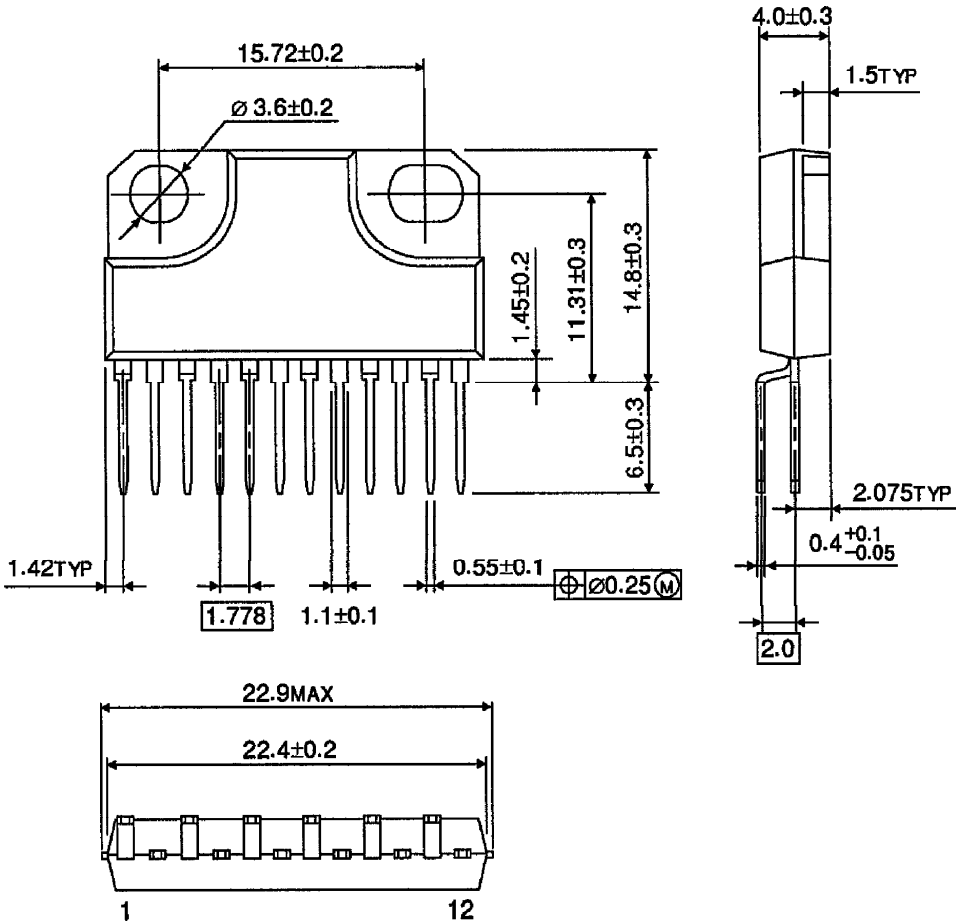
Not to have a common impedance with other lines and use low impedance wire.

- (Note 1) Recommend to take approximately $100\mu s$ of input dead time for reliable operations.
- (Note 2) Connect if required.
- (Note 3) Utmost care is necessary in the design of the output line, V_S and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



OUTLINE DRAWING
HZIP12-P-1.78B

Unit : mm



Weight : 4.04g (Typ.)