

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8429H

## 3.0A FULL BRIDGE DRIVER

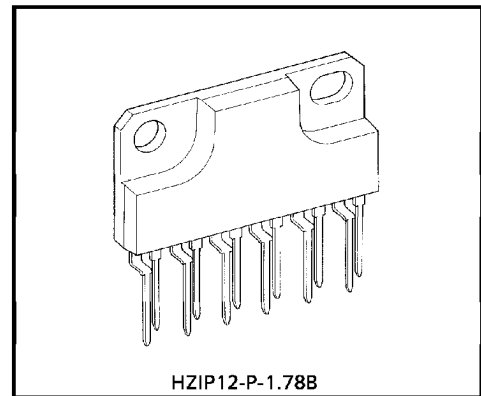
The TA8429H is full bridge driver IC for brush motor rotation control that has current capability of up to 3.0A (AVE.).

Thermal shutdown and short current protector are provided.

And also stand-by function available.

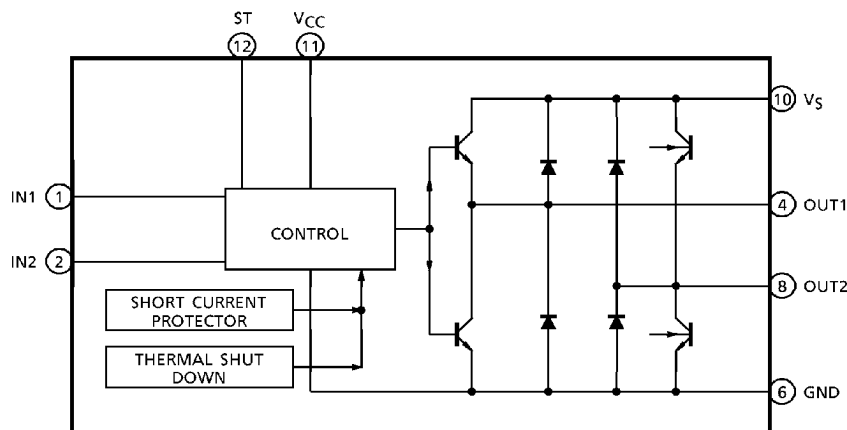
### FEATURES

- 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) Pin③, ⑤, ⑦, and ⑨ are non connection.

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

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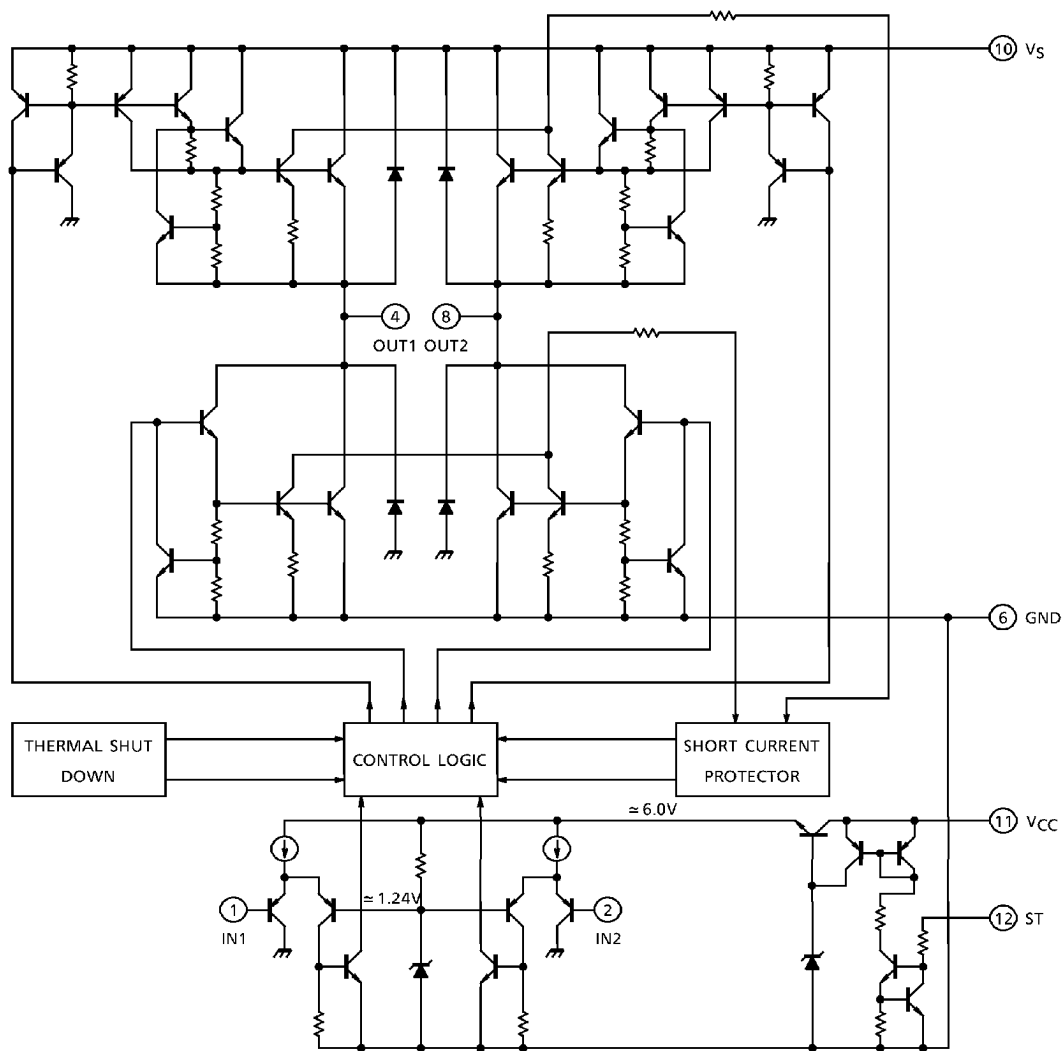
**PIN FUNCTION**

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	IN1	TTL compatible control inputs
2	IN2	(PNP type low active comparator inputs)
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		ST	OUTPUT		MODE
IN1	IN2		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) Tc = 85°C

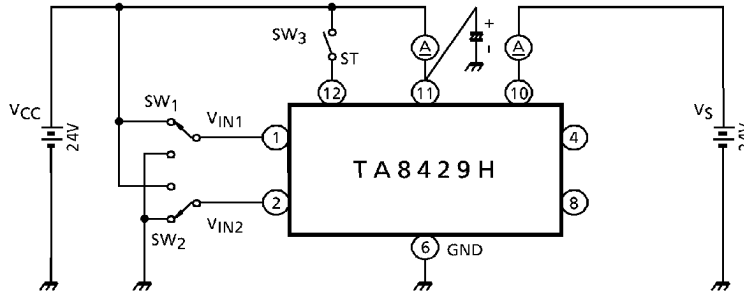
ELECTRICAL CHARACTERISTICS ( $V_{CC} = 24V, V_S = 24V, T_a = 25°C$ )

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	$\mu A$
	$I_{INH}$		$V_{IN} = V_{CC}$	—	—	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	$\mu A$
	$I_{LL}$		$V_L = 25V$	—	—	50	
Diode Forward Voltage	$V_{FU}$	5	$I_F = 3.0A$	—	5.0	—	V
	$V_{FL}$		$I_F = 3.0A$	—	1.5	—	
Limiting Current	$I_{SD}$	—	—	—	5	—	A
Thermal Shutdown Operating Temperature	$T_{SD}$	—	—	—	150	—	°C
Stand-by Current	$I_{ST}$	1	—	—	—	100	$\mu A$
Propagation Delay Time	$t_{pLH}$	2	—	—	1	10	$\mu s$
	$t_{pHL}$	2	—	—	1	10	

(Note) Upper and lower side total

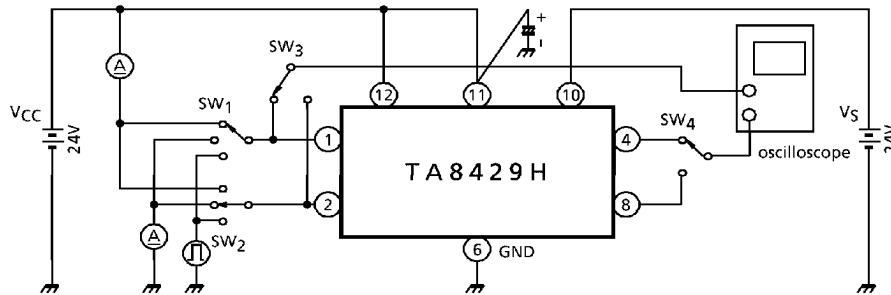
**TEST CIRCUIT 1.**

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



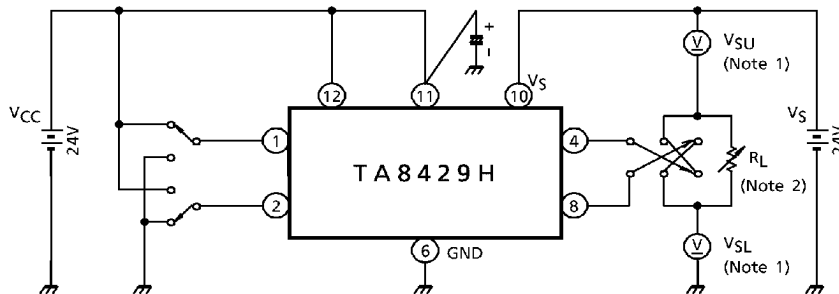
**TEST CIRCUIT 2.**

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



**TEST CIRCUIT 3.**

$V_{sat}$

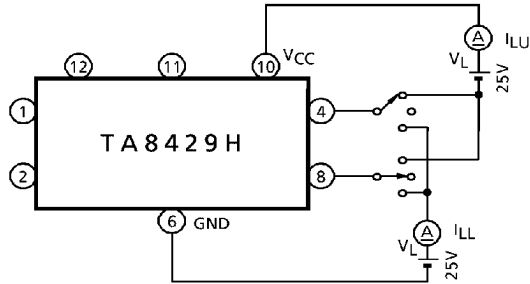


(Note 1)  $V_{sat} = V_{SU} + V_{SL}$

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

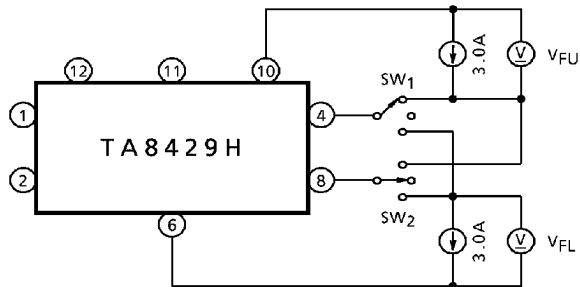
TEST CIRCUIT 4.

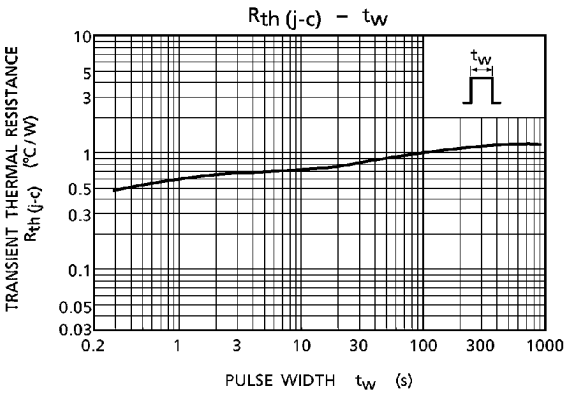
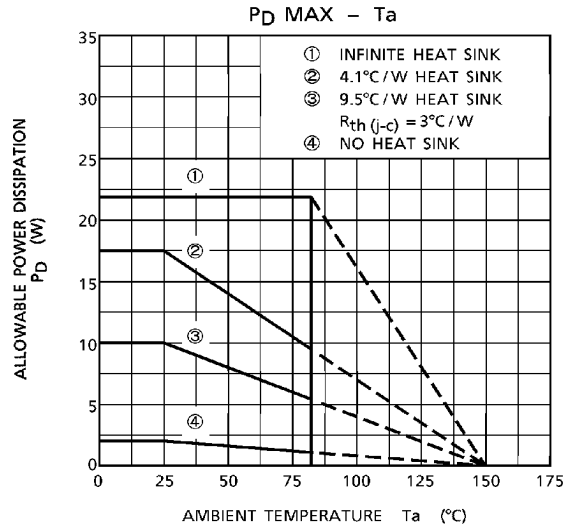
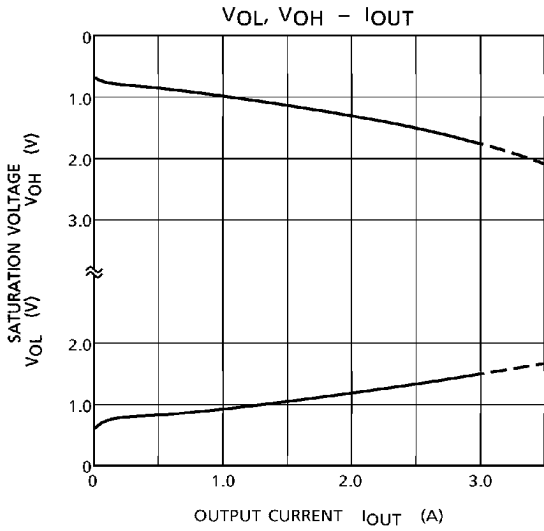
$I_{LU}$ ,  $I_{LL}$



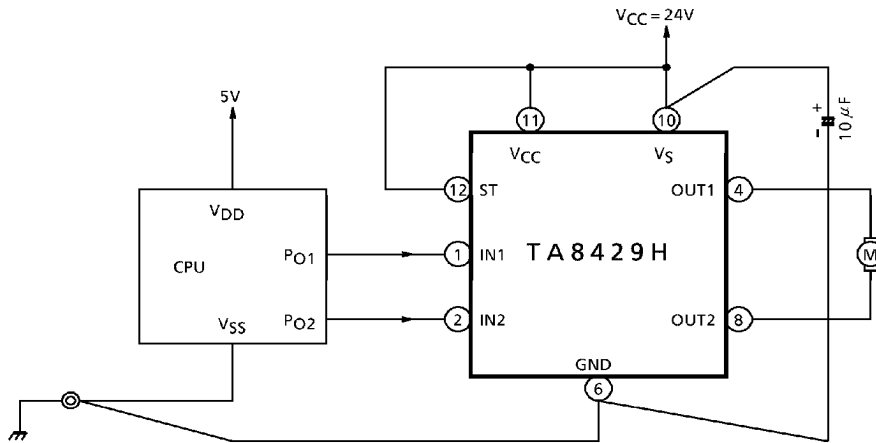
TEST CIRCUIT 5.

$V_{FU}$ ,  $V_{FL}$

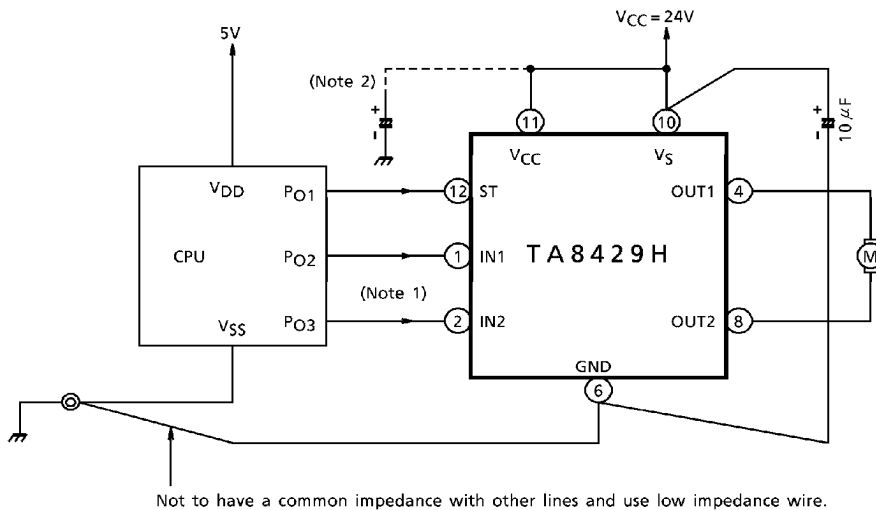




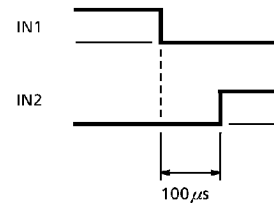
APPLICATION CIRCUIT 1. (Single power supply operation)



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



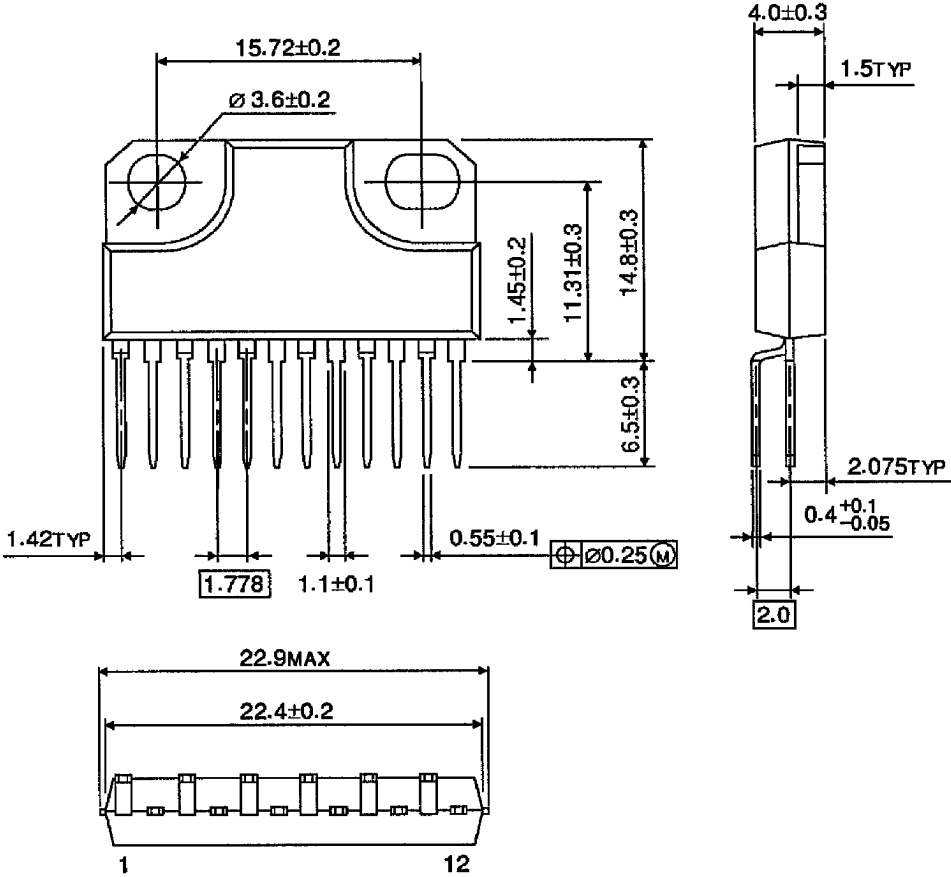
- (Note 1) Recommend to take approximately 100µs of input dead time for reliable operations.
- (Note 2) Connect if required.
- (Note 3) Utmost care is necessary in the design of the output line, VS and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or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





OUTLINE DRAWING  
HZIP12-P-1.78B

Unit : mm



Weight : 4.04g (Typ.)