TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

T A 8 4 2 9 H

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

Thermal shutdown and short current protector are provided.

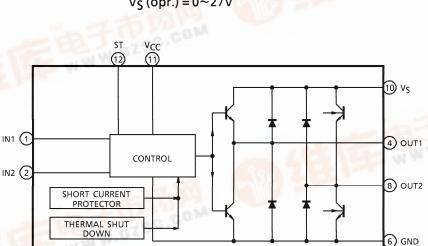
And also stand-by function available.

FEATURES

- Output current is as large as 3.0A (AVE.) and 4.5A (PEAK.)
- Stand-by mode available : $I_{ST} \le 100 \mu A$ (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 : $V_{CC} = 7 \sim 27V$

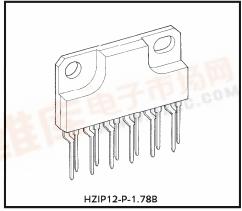
$$V_{\varsigma}$$
 (opr.) = $0 \sim 27V$

BLOCK DIAGRAM



(Note 1) Pin③, ⑤, ⑦, and ⑨ are non connection.

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



Weight: 4.04g (Typ.)

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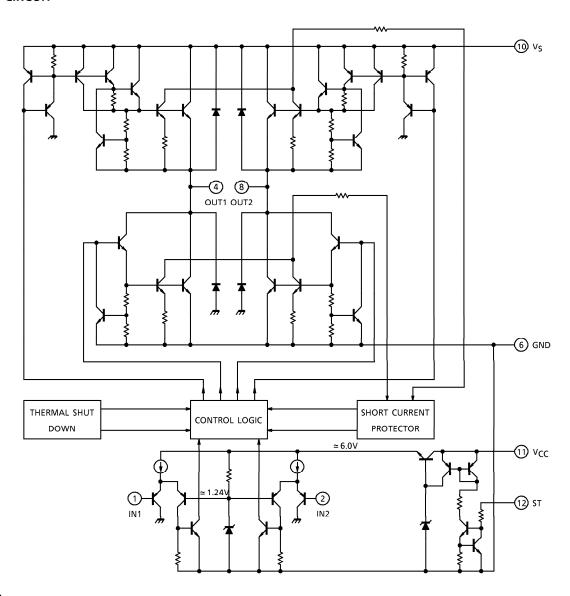
PIN FUNCTION

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	Vs	Supply voltage terminal for Motor Drive		
11	Vcc	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		ОИТРИТ		MODE	
IN1	IN2	ST	OUT1	OUT2	MOTOR	
Н	Н	Н	L	L	Short brake	
L	Н	Н	L	Н	CW/CCW	
Н	L	Н	Н	L	CCW/CW	
L	L	Н	OFF (high impedance)		Stop	
H/L	H/L	L	OFF (high impedance)		Stand-by	

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERIST	SYMBOL	RATING	UNIT		
Supply Voltage	V _{CC} , V _S	30	V		
Input Voltage	v_{IN}	−0.3~V _{CC}	٧		
Output Current	AVE.	^I O (AVE.)	3.0		
Output Current	PEAK	lo (PEAK)	4.5 (Note 1)	Δ	
Power Dissipation	D ₌	2.25 (Note 2)	W		
Power Dissipation		P_{D}	21.6 (Note 3)	**	
Operating Temperatu	T _{opr}	- 30~85	°C		
Storage Temperature	T_{stg}	- 55∼150	°		

(Note 1) t = 100 ms

(Note 2) No heat sink

(Note 3) $Tc = 85^{\circ}C$

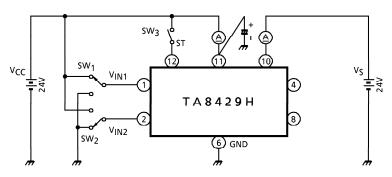
ELECTRICAL CHARACTERISTICS ($V_{CC} = 24V$, $V_S = 24V$, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Quiessent Current (I)	l _{CC1}	1	Stop mode	_	6	12	mA	
Quiescent Current (I) (VCC Line)	I _{CC2}		Forward / reverse mode	_	20	40		
(VCC Line)	lCC3		Brake mode	_	20	40		
Quiescent Current (II)	l _{S1}	⊣ ⊦	Stop mode	_	3	8	mA	
Quiescent Current (II) (V _S Line)	I _{S2}		Forward / reverse mode	_	16	40		
(v\$ Line)	ls3		Brake mode	-	3	8		
Law A Maltana	V _{INL}		_	_	_	0.8	V	
Input Voltage	VINH	2	_	2.0	_	_		
Innut Current	INL	- 2	V _{IN} = GND	_	_	12	μΑ	
Input Current	INH]	V _{IN} = V _{CC}	_	_	10		
Output Saturation Voltage	V _{sat1}	3	I _O = 1.5A	_	2.1	2.8	V	
(Note)	V _{sat2}	3	I _O = 3.0A	_	3.3	4.1		
Output Lookage Current	lLU	4	V _L = 25V	_	_	50	μΑ	
Output Leakage Current	ILL	1 4	V _L = 25V	_	_	50		
Diada Famusand Valtage	V _{FU}	5	I _F = 3.0A	_	5.0	_		
Diode Forward Voltage	V _{FL})	I _F = 3.0A	_	1.5	_	V	
Limiting Current	I _{SD}	_	-	_	5	_	Α	
Thermal Shutdown Operating Temperature	T _{SD}	_	_	_	150	_	°C	
Stand-by Current	I _{ST}	1	_	<u> </u>	_	100	μΑ	
	t _{pLH}	2	_	<u> </u>	1	10	,	
Propagation Delay Time	t _{pHL}	2	_	_	1	10	μ s	

(Note) Upper and lower side total

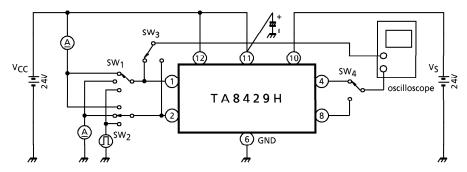
TEST CIRCUIT 1.

IS1, IS2, IS3, ICC1, ICC2, ICC3, IST



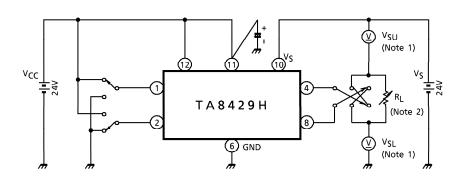
TEST CIRCUIT 2.

 $v_{INH},\,v_{INL},\,l_{INH},\,l_{INL},\,t_{pHL},\,t_{pLH}$



TEST CIRCUIT 3.

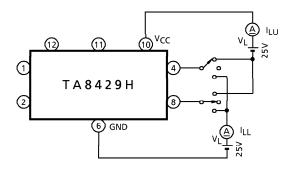
 V_{sat}



(Note 1) $V_{sat} = V_{SU} + V_{SL}$ (Note 2) Calibrate I_O to 1.5/3.0A by R_L

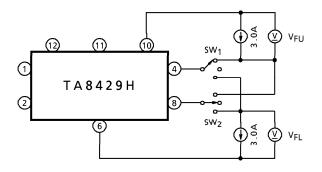
TEST CIRCUIT 4.

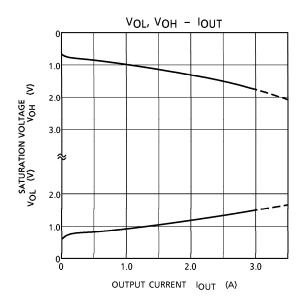
I_{LU}, I_{LL}

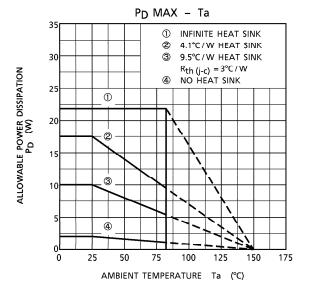


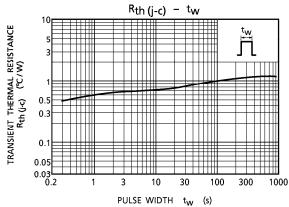
TEST CIRCUIT 5.

 $V_{\mathsf{FU}},\,V_{\mathsf{FL}}$

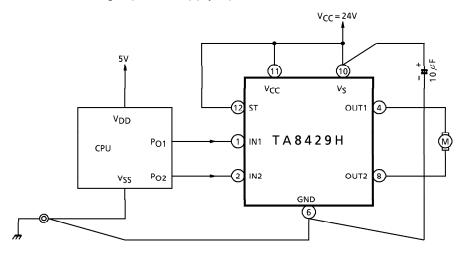




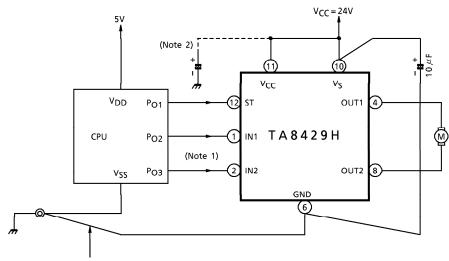




APPLICATION CIRCUIT 1. (Single power supply operation)

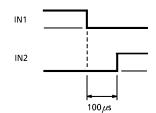


APPLICATION CIRCUIT 2. (Dual power supply (Control and Motor) operation)



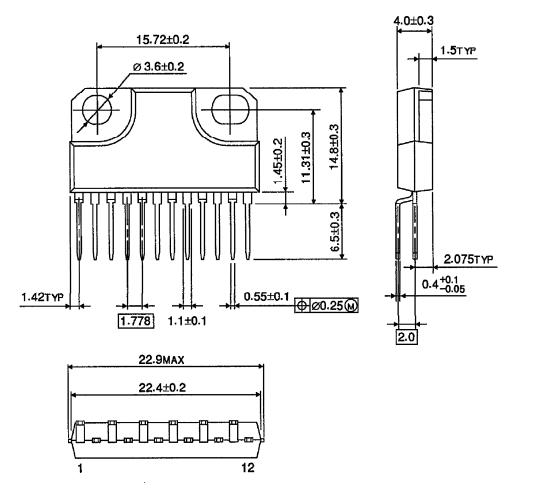
Not to have a common impedance with other lines and use low impedance wire.

- (Note 1) Recommend to take approximately 100 μ 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.)